CITY COMMISSION LONG RANGE PLANNING AGENDA
JANUARY 16, 2016
8:30 AM

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Municipal Building, 151 Martin, Birmingham, MI 48009

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BIRMINGHAM CITY COMMISSION
LONG RANGE PLANNING AGENDA
JANUARY 16, 2016
MUNICIPAL BUILDING, 151 MARTIN
8:30 A.M.

I. CALL TO ORDER AND PLEDGE OF ALLEGIANCE

Rackeline J. Hoff, Mayor

II. ROLL CALL

Laura M. Pierce, City Clerk

III. DISCUSSION ITEMS

I. 8:30 AM – 9:00 AM Finance
- A. Five-Year Financial Forecast (under separate cover)
- B. Capital Improvements/Funding Priorities

II. 9:00 AM – 10:15 AM Engineering
- A. Major & Local Streets
- B. Sidewalk Maintenance
- C. Backyard Sewer and Water Master Plan
- D. ADA Parking Requirements
- E. Downtown Parking Structure Planning

III. 10:15 AM – 10:30 AM Birmingham Shopping District
- A. Plan for Downtown construction

IV. 10:30 AM – 11:30 AM Planning
- A. City-wide Master Plan Update
- B. Regional Projects
- C. Bistro License Program Review

V. 11:30 AM – 12:30 PM Department of Public Services
- A. Enhanced Islands – Woodward Ave.
- B. Rouge River Trail Master Plan
- C. Poppleton Park Site Plan
- D. Adams Park Site Plan
- E. Kenning Park Master Plan
- F. Barnum Park

12:30 PM – 12:45 PM Lunch Break

VI. 12:45 PM – 1:00 PM Building Department
- A. Online Inspection Scheduling & Permitting

VII. 1:00 PM – 1:15 PM Police Department
- A. Organizational Changes

VIII. 1:15 PM – 1:30 PM Library
- A. Status of Proposed Adult Services Renovations
- B. Long Range Library Building Vision

IX. 1:30 PM – 1:45 PM Fire Department
- A. Chesterfield Fire Station Construction

X. 1:45 PM – 2:00 PM Historical Museum
- A. Strategic Plan

XI. 2:00 PM – 2:15 PM
- A. Citizens Academy
- B. City Logo

XI. ADJOURN

NOTICE: Individuals requiring accommodations, such as mobility, visual, hearing, interpreter or other assistance, for effective participation in this meeting should contact the City Clerk's Office at (248) 530-1880 (voice), or (248) 644-5115 (TDD) at least one day in advance to request mobility, visual, hearing or other assistance.

Las personas que requieren alojamiento, tales como servicios de interpretación, la participación efectiva en esta reunión deben ponerse en contacto con la Oficina del Secretario Municipal al (248) 530-1880 por lo menos el día antes de la reunión pública. (Title VI of the Civil Rights Act of 1964).

CITY OF BIRMINGHAM
SCHEDULE OF PROJECTED CAPITAL/OTHER COSTS
FISCAL YEARS 2016 - 2020

	DESCRIPTION	FUNDING SOURCE	STATUS OF FUNDING	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	COMMENTS
PLANNED PROJECTS									
CAPITAL PROJECTS FUND									
1	City Hall								
	Replace City Hall Boilers	General Fund	Funded	$ 90,000					
2	Baldwin Public Library								
	Replace Passenger Elevator	General Fund	Unfunded		175,000				
3	Birmingham Museum								
	Replace Allen House Siding	General Fund	Funded	80,000					
4	Fire Stations								
	Replace Chesterfield Fire Station	General Fund	Funded		3,000,000				
	Repair Concrete at Adams Fire Station	General Fund	Unfunded	91,000					
5	DPS Garage								
	Replace 5 Heaters	General Fund	Funded		26,000				Funds are available in capital projects fund
6	Ice Arena								
	Compressor Rebuild	General Fund	Funded	20,000					
	Replace Matting	General Fund	Funded	40,000					
	Outdoor Lighting	General Fund	Funded	10,000					
	Replace Flat Roof	General Fund	Partial Funded		60,000				$20,000 currently funded
	Security Cameras for Rink/Parking Lot	General Fund	Funded		20,000				Funds are available in capital projects fund
7	City Parks								
	Irrigation Updates (Shain/Barnum/Booth)	General Fund	Funded	25,000					
	Electrical Improvements (Shain)	General Fund	Funded	20,000					
	Soccer Field Improvements	General Fund	Funded	40,000					
	Poppleton Park Site Plan	General Fund	Funded	25,000					
	Barnum Park Phase II	General Fund	Funded	25,000					
	Poppleton Park Playground Equipment	General Fund	Funded	30,000					
	Park Signage	General Fund	Funded	15,000					
	Irrigation Updates (Shain/Booth)	General Fund	Funded		15,000				Funds are available in capital projects fund
	Drinking Fountains	General Fund	Funded		25,000				Funds are available in capital projects fund
	Adams Park Improvements	General Fund	Funded		50,000				Funds are available in capital projects fund
	Pembroke Park Soccer Field Improvement	General Fund	Funded		20,000				Funds are available in capital projects fund
	Springdale Shelter Porous Pavement	General Fund	Funded		42,000				Funds are available in capital projects fund
	Poppleton Park Improvement	General Fund	Partial Funded			200,000			$150,000 is available in capital projects fund
	Rouge River Trail Improvements	General Fund	Partial Funded			150,000			$36,000 is available in captial projects fund
		Donations	Partial Funded			100,000			
	Barnum Ballfield Improvement	General Fund	Unfunded			20,000			
	St. James/Poppleton Ballfield Improvement	General Fund	Unfunded			30,000			

CITY OF BIRMINGHAM
SCHEDULE OF PROJECTED CAPITAL/OTHER COSTS
FISCAL YEARS 2016 - 2020

DESCRIPTION	FUNDING SOURCE	STATUS OF FUNDING	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	COMMENTS
Kenning Park Site Plan	General Fund	Unfunded				25,000		
Kenning Park Walkway Improvements	General Fund	Partial Funded				80,000		$75,000 is available in capital projects fund
Dog Park Upgrade	General Fund	Unfunded					80,000	
Booth Park Entrance Plaza	General Fund	Unfunded					100,000	
8 Streetscape								
Park Benches/Trash Cans	General Fund	Partial Funded	30,000	35,000	35,000	35,000	35,000	$90,000 is available in capital projects fund
Bike Racks - Phase II	General Fund	Unfunded		20,000				
9 Streetlight Replacement								
Hamilton Ave. - Old Woodward to Woodward	General Fund	Funded	165,000					
Old Woodward Ave. - Willits to Brown	General Fund	Unfunded		370,000				
Maple Rd. - Bates to Woodward	General Fund	Unfunded			412,500			
S. Old Woodward - Brown to Landon	General Fund	Unfunded						
10 Bus Shelters								
Oakland and N. Old Woodward	General Fund	Funded	19,780					SMART funding = $16,756
S. Old Woodward and Merrill	General Fund	Funded	25,000					SMART funding = $20,042
W. Maple Rd. - Location to be determined	General Fund	Unfunded			25,000			SMART funding = $20,042
11 Woodward Ave. Landscaping Improvements	General Fund	Unfunded		300,000				
12 Woodward Crossing Improvement	General Fund	Partial Funded		150,000				$50,000 is available in capital projects fund
SUBTOTAL CAPITAL PROJECTS			$ 750,780	$ 4,308,000	$ 972,500	$ 140,000	$ 215,000	

CITY OF BIRMINGHAM
SCHEDULE OF PROJECTED CAPITAL/OTHER COSTS
FISCAL YEARS 2016 - 2020

DESCRIPTION	FUNDING SOURCE	STATUS OF FUNDING	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	COMMENTS
STREET FUNDS								
13 Major Street Projects	General Fund	Unfunded	$ 2,066,815	$ 2,815,000	$ 1,125,000	$ 1,375,000	$ 1,305,000	
	Federal Grant	Unfunded	1,021,000		350,000			
14 Local Street Projects	General Fund	Unfunded	2,619,000	2,725,000	1,730,000	2,517,000	1,555,000	
SUBTOTAL STREET FUNDS			$ 5,706,815	$ 5,540,000	$ 3,205,000	$ 3,892,000	$ 2,860,000	
WATER & SEWER PROJECTS								
15 Water Projects	Reserves	Unfunded	$ 868,525	$ 1,239,000	$ 1,470,000	$ 1,540,000	$ 930,000	
16 Sewer Projects	Reserves	Unfunded	2,402,474	1,845,000	1,845,000	500,000	500,000	
	Rates	Unfunded	500,000	500,000	500,000	500,000	500,000	
SUBTOTAL WATER & SEWER PROJECTS			$ 3,770,999	$ 3,584,000	$ 3,815,000	$ 2,540,000	$ 1,930,000	
PENSION AND RETIREE HEALTH CARE COSTS								
17 Pension Contributions	Various	Unfunded	$ 1,940,069	$ 1,863,849	$ 1,676,268	$ 1,549,176	$ 1,619,801	$.6M decrease from 14-15 to 15-16
Percent Funded			91.1%	91.3%	93.1%	94.1%	93.2%	
18 Retiree Health Care Contributions	Various	Unfunded	3,720,591	3,689,163	3,690,119	3,631,736	3,604,286	$1M decrease from 14-15 to 15-16
Percent Funded			42.3%	43.4%	46.1%	49.2%	51.5%	
SUBTOTAL PENSION AND RHC COSTS			$ 5,660,660	$ 5,553,012	$ 5,366,387	$ 5,180,912	$ 5,224,087	
TOTAL PLANNED CAPITAL AND OTHER COSTS			$ 15,889,254	$ 18,985,012	$ 13,358,887	$ 11,752,912	$ 10,229,087	

THE ABOVE PLANNED PROJECTS DO NOT INCLUDE PARKING SYSTEM IMPROVEMENTS INCLUDING THE ADDITION OF ANY NEW STRUCTURES OR LEVELS. ALSO NOT INCLUDED ARE ANY IMPROVEMENTS FOR THE BALDWIN PUBLIC LIBRARY.

City of Birmingham
A Walkable Community

MEMORANDUM

Engineering Dept.

DATE: **December 29, 2015**

TO: **Joseph Valentine, City Manager**

FROM: **Paul T. O'Meara, City Engineer**

SUBJECT: **Pavement Maintenance Program**

During the period of 2010 to 2013, the Engineering Dept. refined its methods relative to pavement maintenance. The effort focuses on tracking the condition of all of the streets within the permanently paved category, and using better measures to spend small amounts of money that will extend the life of the pavement (when practical). For the 2014 Long Range Planning Session, the attached report was put together mostly by former Assistant Engineer Brendan Cousino, compiling what we have found to be the most worthwhile methods of conducting this program.

The attached Powerpoint presentation is more up to date, and presents the planned street projects currently suggested for the upcoming two fiscal years. Specific streets where crack sealing and asphalt rejuvenating are proposed are not selected very far in advance, so the maps do not detail that work.

Major & Local Streets

Pavement Analysis

January 10, 2014

Table of Contents

Introduction

One of the long terms goals adopted by the City Commission at their visioning session in 2012 was:

"Continue to be proactive with infrastructure maintenance programs and reinvestment in cost-effective improvements to roads, sewers, water mains, and public facilities."

In pursuit of that goal, the Engineering Department is committed to using an asset management approach to extending the life of its current road network assets, which is the most cost effective way to maintain the road system in good condition.

Over the past several years, the City has needed to transfer funds from the General Fund to the Major and Local Street Funds to support the construction projects that have been budgeted each year. As other expenditures in the General Fund continue to increase, including the long term pension liabilities and employee and retiree health care costs, the ability of the General Fund to continue to transfer money to the street funds has been reduced.

The purpose of this study is to determine the long term capital funding needs in the the Major and Local Street Funds for capital preventative maintenance, structural rehabilitation, and reconstruction projects on the improved roads in the City Major and Local Road networks. Once the long term street funding costs have been identified, the City can proceed to consider options for a long term stable funding source.

The Engineering Department has identified the proposed streets to be reconstructed and to have major resurfacing in their Capital Improvements Plan (CIP) for the next five (5) fiscal years. This study evaluates the effect of the proposed projects identified over the next five years (2014 – 2018) on the pavement conditions of the Major and Local road networks, and projects the road conditions in the future using the funding levels calculated using the lifecycle costs of the pavements in the City's road system.

Major and Local Roads

The City of Birmingham has 84.89 total miles of road that are under its jurisdiction. Under Public Act 51 of 1951 (Act 51), responsibility for maintenance, construction, and improvement of all of the public roads in the state were assigned to various governmental bodies, including the Michigan Department of Transportation, County Road Commissions, and Cities and Villages throughout the state. Also under Act 51, the legal framework for roadway classification was set up, which designates that the City's road system is divided into City Major Roads, and City Local Roads. The City has 21.87 miles of roads in the City Major Road system, and 63.023 miles of roadway in the City Local Road System.

The City's Major and Local roads as defined by Act 51 are shown on the attached City of Birmingham Road Network Map for your reference.

Improved and Unimproved Roads

Improved Roads have been constructed with a permanent pavement structure (asphalt or concrete) that was paid for by the adjacent property owners, generally through special assessments. Unimproved

Roads were originally constructed as gravel roads, sometimes with curbs, and they have had a chipseal surface placed on top of the gravel.

The majority of the City's Local Roads were originally constructed as gravel, which were later chip sealed to help remove the dust and maintenance problems of these streets. There are also some Major Roads that were constructed in this manner as well. The City has historically taken a passive posture with respect to improving its streets, allowing property owners to determine when it was appropriate to initiate a special assessment to construct a permanent pavement. As the quality of the housing stock improved, and people's expectations increased over the years, the demand for an improved street with proper drainage of the right of way became more prevalent. During the period of 1990-2007, the City processed many requests for improving streets through special assessment districts. Nevertheless, over 35% of the streets in the City remain unimproved.

The City's Major Road system has 2.298 miles of unimproved roads, and 19.572 miles of improved roads. The City's Local Road system has 28.105 miles of unimproved roads, and 34.918 miles of improved roads. The City's Improved and Unimproved Major and Local roads are identified on the attached City of Birmingham Road Network Map.

This study focuses on the funding costs to maintain the current improved roads in the Major and Local streets system. The unimproved roads are generally cape seal surfaced streets that need to be re-sealed every 8-10 years. The City's policy for cape sealing is that 85% of the cost of the cape sealing program is special assessed to the adjacent property owners, and the remaining 15% is paid by the City out of the street funds. This is not proposed to change at this time.

Pavement Types

The two most common materials used for road paving are asphalt and concrete. They have different properties, and have different failure modes.

Asphalt is designed to be a flexible pavement surface, which slowly deforms to meet small variations in the base materials and supporting soils. Over time, the asphalt binder becomes more and more brittle, and even an adequately designed pavement will start to crack due to thermal expansion and contraction. Poorly designed pavements will show cracking much earlier due to the pavement being unable to carry the traffic loads. Once a pavement starts to crack, water can enter the pavement and base materials and weaken their ability to support the pavement and the traffic loads, which can accelerate cracking.

Concrete is a rigid pavement, which is meant to spread the vehicle loads over the base materials and supporting soils, and needs to have strength to bridge over any minor deformations or weaknesses in the base materials over time. When concrete pavements are constructed, they are designed to have joints in them to handle thermal expansion and contraction at designed intervals, and the joints are sealed to prevent water from entering the joints and the base system below. The most common places to see deterioration in a concrete pavement are at the joints, and at cracks opened up when the slabs fracture.

The existing surface materials of the Major Road network and the Local Road network are shown in the table below:

TABLE 1:
PAVEMENT TYPE SUMMARY

	MAJOR ROADS	LOCAL ROADS
Unimproved Roads (Cape Seal)	10.5% or 2.298 miles	44.6% or 28.105 miles
Asphalt Pavement	68.6% or 14.999 miles	43.5% or 27.429 miles
Concrete Pavement	20.9% or 4.573 miles	11.9% or 7.489 miles
Total Miles	**21.870 miles**	**63.023 miles**

There are several miles of roads in the City that have an asphalt overlay on the surface with an underlying concrete pavement. Those are classified as an asphalt pavement in this study, since the asphalt overlay will perform and deteriorate like other asphalt pavements, and maintenance and rehabilitation options will be generally be the same as for other asphalt roads, or they will be ready for reconstruction with their next scheduled construction activity.

Pavement Lifecycle Analysis

Pavement Deterioration

Pavements deteriorate as they age. This can be observed around the City and all around southeast Michigan. Each year, every pavement that is not reconstructed, rehabilitated, or treated with a preventative maintenance measure gets one year closer to the end of its service life. Generally, pavement deterioration or failure modes can be broadly classified into three groups:

1. Fracture/Cracking. This type of failure usually results from such things as excessive loading, fatigue, thermal changes, moisture damage, slippage or contraction. Pavement fractures can occur due to excessive loading of either the pavement section itself, or in the supporting soils or pavement base.
2. Distortion. This is in the form of deformation (e.g., rutting, corrugation and shoving), which can result from such things as excessive loading, creep, densification, settlement, swelling, or frost action.
3. Disintegration. This is generally a material property failure in the form of stripping, raveling or spalling, which can result from such things as loss of bonding between the aggregate in the pavement, chemical reactivity (e.g. Alkali-Silica Reaction), traffic abrasion, aggregate degradation, poor consolidation/compaction, binder aging, or cementitious material degradation.

All of these modes of failure affect the ride quality of the road, and if left untreated can allow for further deterioration of the entire pavement section. For instance, if cracks are not sealed shortly after forming, then water can enter and widen the cracks during freeze/thaw cycles, and saturate the road base, which weakens it and can cause further cracking and deterioration of the pavement adjacent to the crack.

The City uses the Pavement Surface Evaluation Rating (PASER) system to rate and track the pavement conditions of each road segment of the improved roads in the Major and Local road networks. The PASER system is the preferred method for Michigan agencies to rate their road pavements, and it is required by the Michigan Transportation Asset Management Council (TAMC) for reporting on the Federal Aid eligible road system.

PASER ratings for asphalt or concrete road surfaces are defined in the following tables.

TABLE 2:
ASPHALT PASER RATINGS

PASER Rating	Condition	Recommended Treatments
9 & 10	Excellent	No maintenance required
8	Very Good	Little or no maintenance
7	Good	Crack sealing and minor patching
5 & 6	Fair – Good	Preservative treatments (non-structural)
3 & 4	Poor – Fair	Structural renewal (overlay)
1 & 2	Failed	Reconstruction

TABLE 3: CONCRETE PASER RATINGS		
PASER Rating	**Condition**	**Recommended Treatments**
9 &10	Excellent	No maintenance required
8	Very Good	Crack sealing
7	Good	Crack sealing & Routine maintenance
5 & 6	Fair – Good	Surface repairs, sealing, patching
3 & 4	Poor – Fair	Extensive slab or joint rehabilitation, asphalt overlay
1 & 2	Failed	Reconstruction

A short guidance document on PASER ratings prepared by the TAMC is included in Appendix A for further information. There are several factors that contribute to the deterioration of pavements that are included in the TAMC document.

Deterioration curves show the typical PASER ratings and how they are expected to change throughout the life of a pavement. Figures 1 and 2 show the typical deterioration curves for asphalt and concrete pavements without using any preventative maintenance and/or structural rehabilitation treatments.

FIGURE 1:
ASPHALT PAVEMENT DETERIORATION CURVE

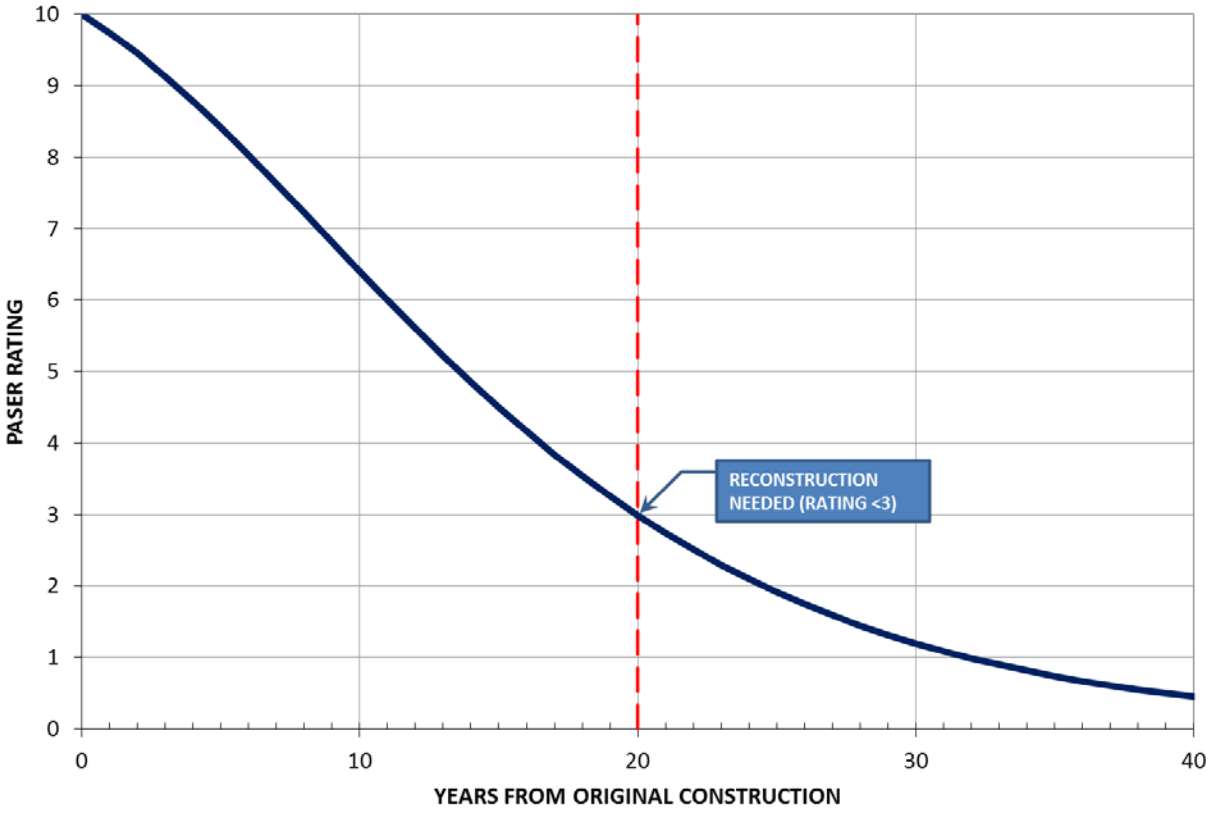


Figure 1 shows that the expected life of a new asphalt pavement from new construction until it needs to be reconstructed is expected to be approximately 20 years.

FIGURE 2:
CONCRETE PAVEMENT DETERIORATION CURVE

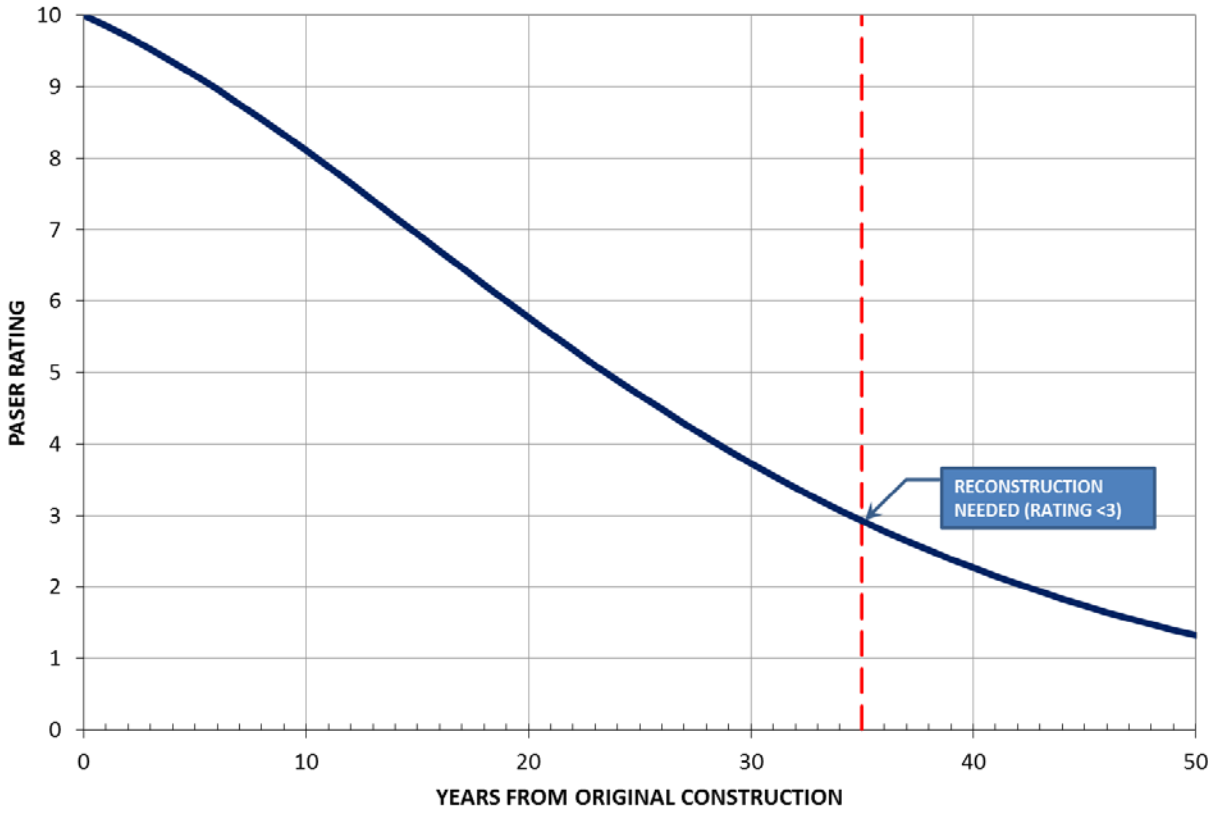


Figure 2 shows that the expected life of a new concrete pavement from new construction until it needs to be reconstructed is expected to be approximately 35 years.

Asset Management Approach

Asset Management is a method of monitoring the City's streets and optimizing the maintenance and timely replacement of pavements throughout the system to maximize the benefit to the entire system. An important aspect of this is to perform timely capital maintenance on roads before pavement conditions deteriorate to the point where they are structurally deficient. Preserving the quality of a pavement early in its life is significantly cheaper than simply waiting until it is ready for reconstruction.

The TAMC defines three general types of activities for pavement asset management: Preventative Maintenance (PM), Rehabilitation (RH), & Reconstruction (RC). PM treatments help to preserve the pavement structure as it is to keep it from deteriorating further. Examples of PM treatments including crack sealing, and rejuvenation. RH treatments generally add structural strength or replace failed portions of the pavement, such as adding an overlay, or pavement patching. Reconstruction (RC) includes the removal and replacement of the entire pavement structure, including the base.

Asphalt Preventative Maintenance and Rehabilitation Treatments

There are a very wide number of possible treatments to extend the service life of asphalt pavements, and the Engineering Department considers several possibilities for each road segment. For the purposes of estimating the costs needed to maintain the road networks over the entire lifetime of the pavement, we have limited the number of options considered under this report to those outlined below. However, the costs for those treatments are representative of the costs necessary for preservation and/or rehabilitation at a given point in a pavements service life, and will give the City several options to consider for each individual project (e.g. use a cape seal surface instead of ultra-thin hot mix asphalt (HMA) overlay, or pulverize, reshape and overlay instead of milling and overlaying, etc.)

TABLE 4:
ASPHALT PAVEMENT PREVENTATIVE MAINTENANCE
AND REHABILITATION TREATMENTS

Treatments	Candidate PASER Ratings	Treatment Type	Estimated Service Life Extension
Crack Seal and Rejuvenate	6 - 8	PM	2–3 Years
Ultra-Thin HMA Overlay	4 - 6	PM	10 Years
Mill and Resurface	3 - 5	RH	20 Years
Reconstruction	<3	RC	20 Years

Crack Sealing and Rejuvenating

Asphalt pavements are designed to act as flexible pavements, which can deform slightly in reaction to traffic loadings. As asphalt pavements age, they become more brittle, and lose their flexibility, so they begin to crack. Cracks can also develop if water penetrates the small pores in the surface of the pavement during freeze-thaw cycles. The asphalt rejuvenating agent is an asphalt emulsion which helps to restore the flexibility in asphalt pavements, and seals the surface to prevent water penetration. This is generally recommended on asphalt pavements approximately 5 years after the initial pavement is constructed.

In addition to adding the rejuvenating agent to seal the surface, this treatment includes sealing all of the existing cracks on the street with an overband crack sealing to prevent water from penetrating into the pavement and base structure. This helps to prevent the cracks from further deterioration.

Ultra-Thin HMA Overlay

The Ultra-Thin overlay process involves adding a ¾ inch layer of asphalt on top of the existing asphalt surface. Preparatory work will include the crack sealing as described above, as well as milling along the outside edges of each street, and at each manhole structure. Milling will help maintain existing curb heights. Utility structures need to be adjusted to meet the new road surface elevation. A small amount of deeper asphalt and base repairs will also occur where localized pavement failures have occurred.

The Ultra-Thin Overlay process is selected on those streets that are starting to show signs of pavement distress, to help improve ride quality and to help arrest further deterioration. Candidate streets have a

PASER rating between 4 and 6, and have limited structural deficiency cracking, which will reflect through the ultra-thin overlay surface relatively quickly since it is not a structural overlay.

Mill and Resurface

Once the top surface of the asphalt is worn down and cracked enough, a structural rehabilitation of the pavement is necessary. On the City's Major Roads, that will usually involve milling off the top 2 to 3 inches of asphalt pavement, repairing any localized pavement failures in the base pavement, and installing a new asphalt overlay on the surface. Often there are some curb repairs necessary during a project of this scope, and utility structure adjustments.

Other Asphalt Pavement Treatments

The asphalt pavement treatments described above are common throughout the industry, have all been used by the City, and are proven as effective treatments. Other asphalt pavement treatments that will be considered as each project arises and may be viable options for certain roads within the City are:

- Cape Sealing
- Micro-Surfacing
- Asphalt Patching
- Pulverize, Reshape and Overlay
- Pavement Recycling

Concrete Preventative Maintenance and Rehabilitation Treatments

There are also a wide number of possible treatments to extend the service life of concrete pavements, and the Engineering Department considers a several possibilities for each road segment when they are surveyed. A summary of the treatments considered for modeling the average lifecycle costs of the pavements for this report are shown in the table below:

TABLE 5:
CONCRETE PAVEMENT PREVENTATIVE MAINTENANCE AND REHABILITATION TREATMENTS

Treatments	Candidate PASER Ratings	Treatment Type	Estimated Service Life Extension
Crack Seal	6 – 8	PM	2–3 Years
Concrete Patching – Routine	6 – 7	RH	10 Years
Concrete Patching – Heavy	4 – 6	RH	10 Years
Asphalt Overlay	3 – 5	RH	20 Years
Reconstruction	<3	RC	35 Years

Crack Sealing

The joints that are constructed in concrete pavements to account for thermal expansion and contraction are sealed immediately after construction, but will need to be cleaned, routed, and re-sealed multiple times over the life of the pavement. In general, the first sealant installation will last approximately 10 years. Subsequent sealant installations generally do not last as long. As isolated cracks develop in the

slabs, they should also be cleaned, routed, and sealed to prevent water from penetrating. In modeling the lifecycle costs of maintaining a concrete pavement, there were two crack sealing treatments assumed early in the life of the pavement. The first was estimated to cost slightly less since there are expected to be fewer cracked slabs at that point in the life of the pavement, and cleaning out the joints will be easier.

Concrete Patching

When there is significant fracturing of the concrete slabs, it is generally indicative of further structural problems, such as base failure, utility trench settlement, structural deficiencies, or material degradation, and requires that the entire slab be removed and replaced. Often the gravel base beneath the slab needs to be removed and replaced as well. In modeling the lifecycle of the concrete pavement, we assumed that each road would be patched twice during the lifetime of the pavement. The first patching was assumed to require replacement of 10% – 15% of the surface area of the road, based on the anticipated PASER rating at the time of the patching. The second patching is assumed to be heavier, with 20% - 25% of the road surface being replaced.

Asphalt Overlay

Once the surface of the concrete pavement is too rough, and there is insufficient load transfer and significant joint deterioration, placing a structural asphalt overlay on top of the concrete pavement is an effective way to extend the life of the pavement. Often there will be repairs to the underlying concrete pavement with partial depth repairs at the joints to ensure that it will be a solid base for the new asphalt pavement.

Other Concrete Pavement Treatments

Among others, the following concrete pavement repairs will also be considered as each project arises and may be viable options for certain roads within the City are:

- Partial Depth Repairs
- Diamond Grinding
- Slab Stabilization

Reconstruction

Reconstruction is necessary when the pavement is no longer able to be rehabilitated economically to extend its service life. In an optimally managed pavement system, the need to reconstruct is minimized by using as many preventative and rehabilitative treatments as necessary throughout the life of the pavement to prevent structural damage from occurring. Given the repeated nature of traffic loading, and freeze-thaw cycles, it is expected that eventually all pavements will fail due to fatigue.

In addition to pavement failure, there can be other reasons to choose reconstruction over extending pavement life. In 2010, the Engineering Department presented a method to prioritize the road reconstruction projects using a combination of the pavement ratings, and the ratings of the sewer and water systems on each road corridor. By taking into consideration the needs of all three areas, we have been able to identify the areas where the most benefit to all three systems can be attained for the least amount of expenditure. Using road reconstruction projects to address all three infrastructure systems

concurrently not only does the City benefit in reduced long-term costs, but the public benefits by having to be exposed to construction projects less frequently. The fact is that the need to maintain the sewer and water systems will affect the selection of treatment methods and the timing of reconstruction.

In the downtown overlay zoning and triangle districts, where there is demand for redevelopment of the private properties, the timing of reconstruction may also be affected by the private development schedule. These major construction projects can affect the pavement life, and it may also be prudent to delay reconstruction of some streets adjacent to parcels that are waiting to redevelop.

Based on the memorandum from Paul O'Meara dated November 18, 2013 which was discussed at the City Commission meeting on November 25, 2013 (attached in Appendix B) regarding the reasons for choosing concrete versus asphalt when reconstructing roads, and the lifecycle costs discussed further in this report, the cost estimate for reconstruction of both existing asphalt and concrete streets was prepared assuming the new pavement will be concrete.

Modified Pavement Lifecycles

Using the preventative maintenance and rehabilitation treatments identified in Tables 4 and 5 above, the typical deterioration curves for asphalt and concrete pavements can be modified as shown below in Figures 3 and 4.

FIGURE 3:
ASPHALT PAVEMENT DETERIORATION CURVE WITH PREVENTATIVE MAINTENANCE

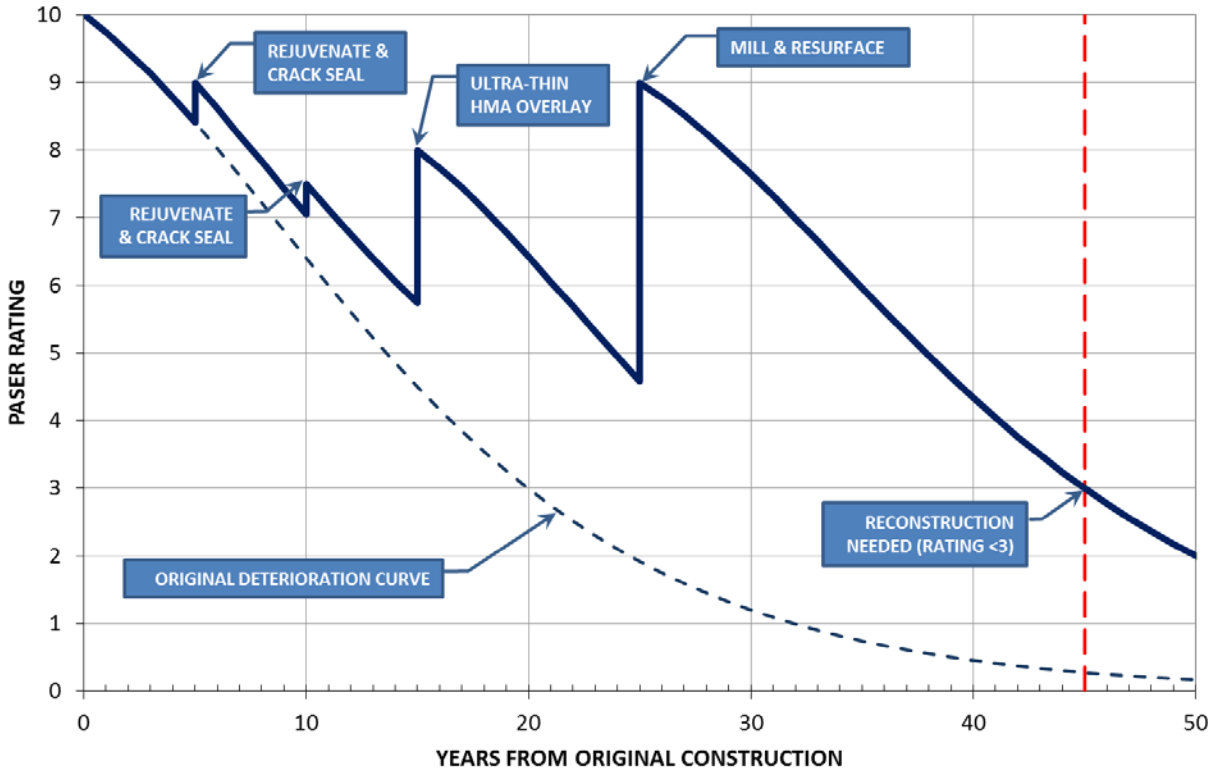


Figure 3 shows that for an asphalt pavement, using the treatments identified above when the road reaches the appropriate rating, the total life of the pavement (from initial construction until it needs reconstruction) can be extended by 25 years.

FIGURE 4:
CONCRETE PAVEMENT DETERIORATION CURVE WITH PREVENTATIVE MAINTENANCE

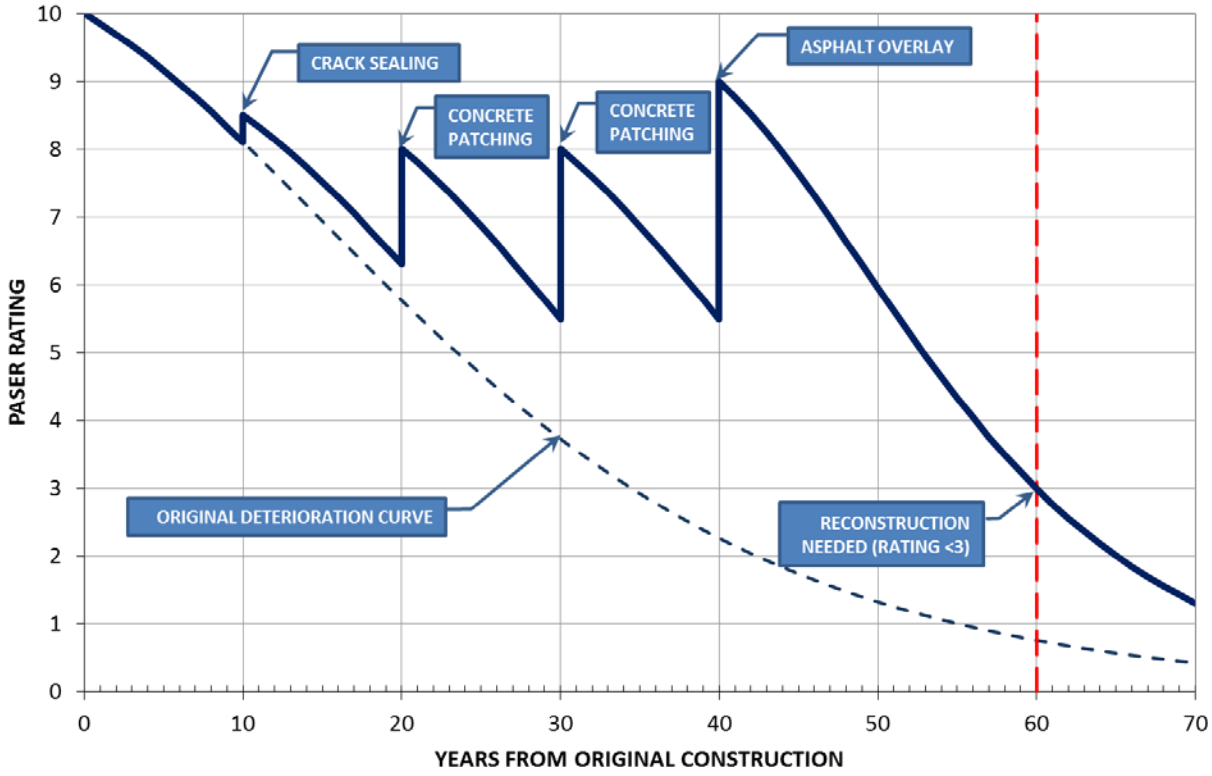


Figure 4 shows that for concrete pavement, using the treatments identified above when they when the road reaches the appropriate rating, the total life of the pavement can be extended by 25 years.

Pavement Lifecycle Costs

The lifecycle cost of the pavement is calculated by adding the cost of all of the treatments, including the reconstruction cost, and dividing by the number of years of service life of the pavement. Since all of the roads under consideration are already built, when calculating the lifecycle costs of the pavement the lifecycle of the pavement is determined from when it was placed in service until after reconstruction; at that point a new cycle will begin, so the major cost of reconstruction is only considered once in the lifecycle of the pavement.

The higher costs for construction activities on Major Roads are due to the fact that the pavement sections are usually thicker, and the average road width is higher than for Local Roads. In addition, costs of traffic control during construction are typically higher on those projects due to higher traffic levels on Major Roads.

Asphalt Roads

The preventative maintenance and structural rehabilitation treatments and costs for an asphalt pavement corresponding with the deterioration curve shown in Figure 3 are shown in Table 6 below:

TABLE 6:
LIFE CYCLE COST FOR ASPHALT ROAD
WITH PREVENTATIVE MAINTENANCE AND REHABILITATION WORK

Treatment	Year	Cost Per Mile	
		Major Road	Local Road
New Road / Reconstruction	0	$ -	$ -
Crack Seal and Rejuvenate	5	$ 30,000	$ 15,000
Crack Seal and Rejuvenate	10	$ 35,000	$ 20,000
Ultra-Thin HMA Overlay	15	$ 275,000	$ 160,000
Mill and Resurface	25	$ 700,000	$ 380,000
End of Service Life – Reconstruction Needed	45	$ 2,100,000	$ 1,400,000
TOTAL LIFECYCLE COST (PER MILE)		$ 3,140,000	$ 1,975,000
ANNUAL LIFECYCLE COST (PER MILE)		**$ 70,000**	**$ 44,000**

Concrete Roads

The preventative maintenance and structural rehabilitation treatments and costs for a concrete pavement corresponding with the deterioration curve shown in Figure 4 are shown in Table 7 below:

TABLE 7:
LIFE CYCLE COST FOR CONCRETE ROAD
WITH PREVENTATIVE MAINTENANCE AND REHABILITATION WORK

Treatment	Year	Cost Per Mile	
		Major Road	Local Road
New Road / Reconstruction	0	$ -	$ -
Crack Seal	10	$ 30,000	$ 20,000
Conc. Patching - Routine	20	$ 275,000	$ 165,000
Conc. Patching - Heavy	30	$ 400,000	$ 250,000
Asphalt Overlay	40	$ 500,000	$ 300,000
End of Service Life - Reconstruct	60	$ 2,100,000	$ 1,400,000
TOTAL LIFECYCLE COST (PER MILE)		$ 3,305,000	$ 2,135,000
ANNUAL LIFECYCLE COST (PER MILE)		**$ 55,000**	**$ 36,000**

Road Network Lifecycle Costs

Using the annual lifecycle costs of each mile of concrete or asphalt road in Major and Local road systems determined above, the long term annual costs that need to be budgeted for capital improvements in the Major and Local Street Funds can be calculated by multiplying the annual lifecycle costs by the mileage of improved roads in each of the networks, as shown in the table below.

TABLE 8: ANNUAL ROAD NETWORK LIFECYCLE COSTS						
	MAJOR ROADS			LOCAL ROADS		
	MILEAGE	ANNUAL COST PER MILE	TOTAL ANNUAL COST	MILEAGE	ANNUAL COST PER MILE	TOTAL ANNUAL COST
ASPHALT ROADS	14.999	$70,000	$1,050,000	27.429	$44,000	$1,207,000
CONCRETE ROADS	4.573	$55,000	$252,000	7.489	$36,000	$270,000
TOTALS	**19.572**		**$1,302,000**	**34.918**		**$1,477,000**

Long term, the City should plan to spend an average of the above amounts on capital improvements in the Major and Local road systems annually, and should work to identify a stable funding source for these needs. There will need to be some variability year to year, based on the projects proposed. For instance, in 2011 when W. Lincoln Ave. was reconstructed from Cranbrook to Southfield, a higher outlay was required from the Major Streets fund. Adjusting the timing of major reconstruction projects and allowing the fund balance to accrue when significant improvements are planned will be necessary if the income in the street funds is set to handle the above level of capital improvements on an average annual basis.

The above lifecycle costs are assuming that the lifecycle of the pavements in the City follow those shown on Figures 3 and 4, which are an average of the conditions experienced throughout the City. This is intended to be a network wide view, and not necessarily indicative of every road or project. It is not expected that every pavement will have exactly that lifecycle, or that each project will have the exact cost per mile or estimated timing shown above. For example, the Pierce and Merrill Street Reconstruction project in 2013 removed the original concrete pavement from Pierce Street that was installed in 1919 and widened in 1928. Through the use of asphalt overlays and milling and resurfacing multiple times over the life of the pavement, and by waiting until several years after it had failed to replace it, the road was able to last significantly longer than the deterioration curve above shows. However, there are other roads that need treatment and/or replacement before the times predicted in the deterioration curves shown above. Further, there will be variability in the cost of each individual project based on road configuration, field conditions, the need for traffic control, the ability to work on other adjacent streets, and other factors. The variability in costs is expected to be higher in the Major road system. Even though both Maple Road and Harmon are classified as Major roads, the cost to reconstruct them will be significantly different.

The lifecycle costs identified above do include improvements required by the ADA for upgrading the ramps at all pedestrian crossings. The costs for multi-modal improvements in the pavement

configuration are expected to be included in the costs for reconstruction, since starting over with a new pavement allows for greater flexibility in implementing these improvements. The costs of traffic signal improvements, pedestrian crossing warning signs, etc. are not included in the above costs, since they are being recommended in the City of Birmingham Multi-Modal Transportation Master Plan only at specific locations, and would need to be included in specific budget requests for each project.

Asset Management Strategy

Current Pavement Conditions

The first step in creating a pavement asset management program is to inventory and rate the condition of all of the pavements in the road network. The Engineering Department surveys the pavement conditions annually, and enters the PASER ratings data using RoadSoft software. Roadsoft is a roadway asset management system for collecting, storing, and analyzing data associated with transportation infrastructure. As part of the statewide roadway asset management initiative spearheaded and supported by the MDOT, Roadsoft is available to local road agencies in Michigan at no cost. RoadSoft tracks the pavement conditions, and adjusts the deterioration curves for each road to predict future pavement conditions on a network wide basis.

The number of miles of each type of pavement in the Major and Local Road networks with their current ratings are shown in the tables below.

TABLE 9:
PASER RATINGS ON IMPROVED MAJOR ROADS

	Good			Fair				Poor			
PASER RATING	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**AVG**
Asphalt	0	0.066	3.705	2.326	1.506	1.41	1.148	2.34	2.418	0	5.3
Concrete	0.364	1.926	0.213	0.176	0.364	0.309	0.532	0.707	0	0.062	6.9
TOTAL	**0.364**	**1.992**	**3.918**	**2.502**	**1.87**	**1.719**	**1.68**	**3.047**	**2.418**	**0.062**	**5.7**

TABLE 10:
PASER RATINGS ON IMPROVED LOCAL ROADS

	Good			Fair				Poor			
PASER RATING	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**AVG**
Asphalt	0.43	3.439	7.608	3.502	4.418	1.983	1.976	2.484	1.346	0	6.5
Concrete	0.67	1.271	0.157	0.289	0.661	1.532	1.353	1.297	0.502	0	5.6
TOTAL	**1.100**	**4.710**	**7.765**	**3.791**	**5.079**	**3.515**	**3.329**	**3.781**	**1.848**	**0.000**	**6.3**

TABLE 11: PASER RATINGS ON ALL IMPROVED ROADS											
	Good			Fair				Poor			
PASER RATING	10	9	8	7	6	5	4	3	2	1	AVG
IMPROVED ROADS TOTAL	1.464	6.702	11.683	6.293	6.949	5.234	5.009	6.828	4.266	0.062	6.1

A summary of the pavement conditions of the City's Major and Local Roads is shown in the table below:

TABLE 12: IMPROVED ROADS PAVEMENT CONDITION SUMMARY			
	MAJOR ROADS	LOCAL ROADS	TOTAL
Good Condition	6.274 miles 32.1%	13.575 miles 38.9%	19.849 miles 36.4%
Fair Condition	7.771 miles 39.7%	15.714 miles 45.0%	23.485 miles 43.1%
Poor Condition	5.527 miles 28.2%	5.629 miles 16.1%	11.156 miles 20.5%
Total Miles	**19.572 miles**	**34.918 miles**	**54.49 miles**

The current known ratings provide important information regarding the estimated remaining life for the pavements in the City's road network. The estimation of remaining life of service was based on the standard degradation models included in the PASER rating system. The following chart provides a breakdown of the expected remaining service life, with a PASER rating of 10 or 9 having more than 10 years of remaining service life, a rating of 8 or 7 having an RSL of 5 to 10 years, and a rating of 6 or below equating to less than 5 years RSL. The PASER rating is a reflection of the surface quality of the roadway, not an absolute indicator of quality. A roadway with a low PASER rating, or one past its Remaining Service Life is still a usable road, even if the surface is rough and difficult to maintain.

RoadSoft Modeling Analysis

Roadsoft has the ability to model the future network pavement conditions based on the existing pavement conditions, deterioration curves of the pavements, the treatments selected, the costs associated with the roadway treatments, and the project level of annual spending on road projects.

It can also optimize the future pavement conditions by varying the types of projects to be performed in the future based on a set budget amount to be spent annually. The Major and Local road networks were analyzed separately with the annual budget set at the calculated lifecycle cost for each network.

Major Roads Optimized Capital Improvements

Based on an annual budget of $1,300,000 for capital projects in the Major Street fund as calculated using the pavement system lifecycle costs, a summary of the proposed road mileage to be treated and

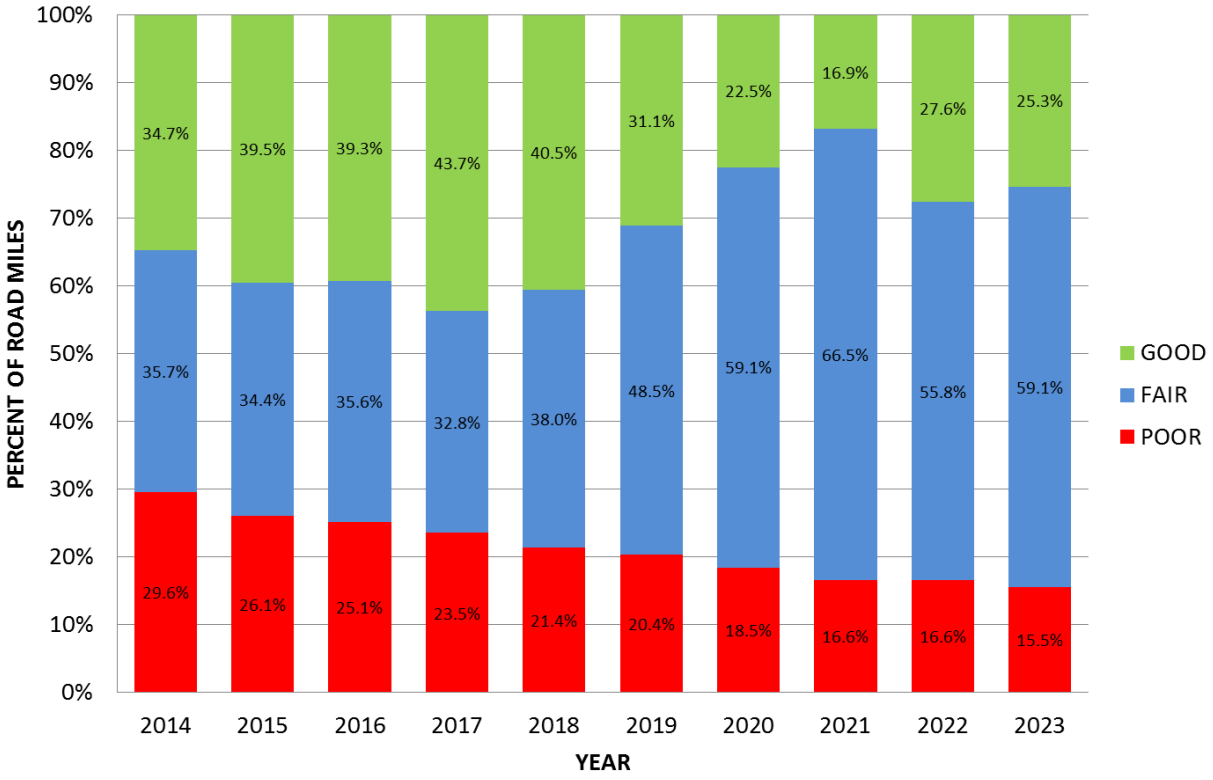
the projected spending on the types of projects over the next 5 years is summarized below, with an average of the following five years:

TABLE 13: MAJOR ROADS OPTIMIZED CAPITAL IMPROVEMENTS MILEAGE						
	2014	**2015**	**2016**	**2017**	**2018**	**Average 2019-2023**
PM	5.41	0.83	1.70	2.57	2.41	3.27
RH	1.96	1.77	1.36	0.65	0.00	1.01
RC	0.00	0.00	0.25	0.40	0.53	0.29
TOTAL	**7.36**	**2.59**	**3.30**	**3.61**	**2.94**	**4.58**

TABLE 14: MAJOR ROADS OPTIMIZED SPENDING 2014-2023						
	2014	**2015**	**2016**	**2017**	**2018**	**Average 2019-2023**
PM	$ 402,000	$ 30,000	$ 63,000	$ 233,000	$ 93,000	$ 282,000
RH	$ 898,000	$1,270,000	$ 704,000	$ 184,000	$ -	$ 311,000
RC	$ -	$ -	$ 533,000	$ 883,000	$ 1,207,000	$ 706,000
TOTAL	**$1,300,000**	**$1,300,000**	**$ 1,300,000**	**$ 1,300,000**	**$1 ,300,000**	**$ 1,299,000**

The projected pavement conditions of the improved Major Roads using the optimized capital improvements summarized above over the next 10 years are shown in the following graph.

FIGURE 5: PROJECTED MAJOR ROAD PAVEMENT CONDITIONS
$1.30 MILLION ANNUAL BUDGET OPTIMIZED SPENDING



The impact of the preventative maintenance and rehabilitation projects to prevent roads from slipping into poor condition can be clearly seen by the decreasing road mileage in poor condition, and the increasing road mileage in fair condition, with the even the road mileage in good condition decreasing over the projected time period.

Local Roads Optimized Capital Improvements

Based on an annual budget of $1,500,000 for capital projects in the Local Street fund as calculated using the pavement system lifecycle costs, a summary of the proposed road mileage to be treated and the projected spending on the types of projects over the next 5 years is summarized below, with an average of the following five years:

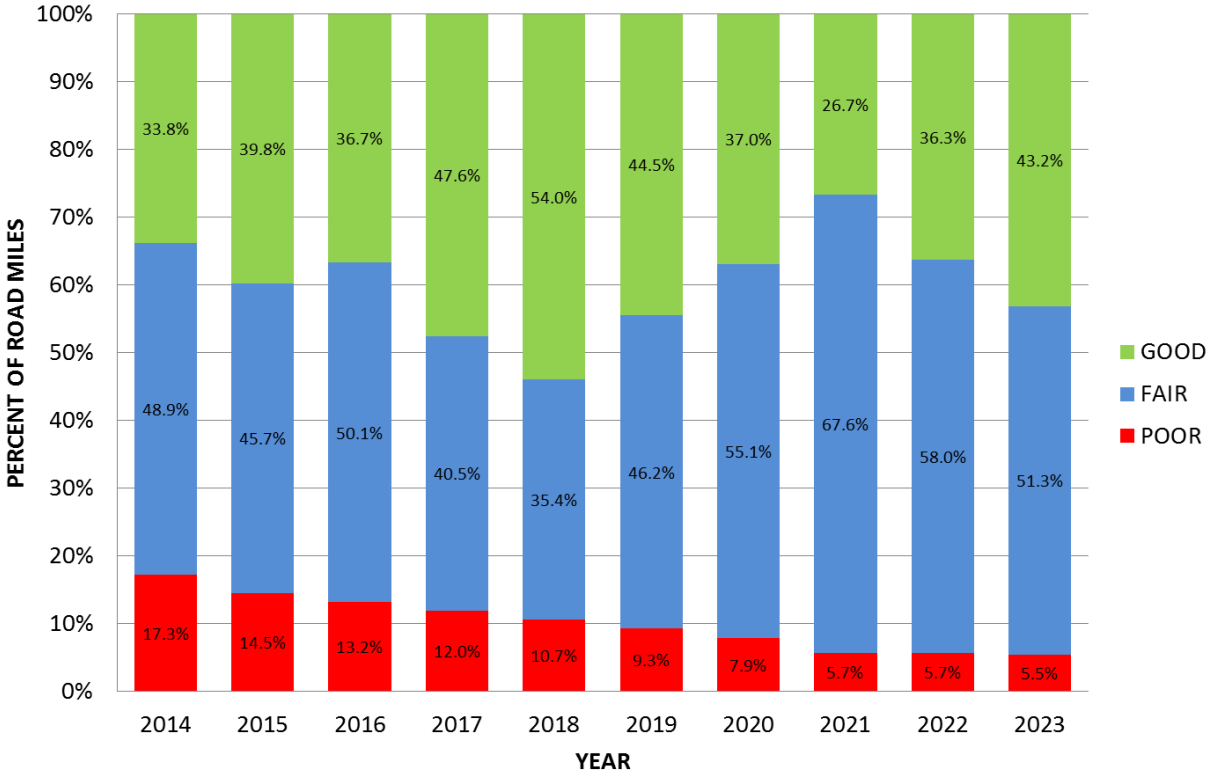
TABLE 15:
LOCAL ROADS OPTIMIZED CAPITAL IMPROVEMENTS MILEAGE

	2014	2015	2016	2017	2018	Average 2019-2023
PM	6.89	4.78	3.63	4.75	4.32	3.56
RH	3.52	2.31	1.78	0.00	0.00	1.23
RC	0.00	0.00	0.47	0.42	0.46	0.36
TOTAL	**10.41**	**7.09**	**5.87**	**5.17**	**4.78**	**5.14**

TABLE 16: LOCAL ROADS OPTIMIZED SPENDING 2014-2023						
	2014	**2015**	**2016**	**2017**	**2018**	**Average 2019-2023**
PM	$ 385,000	$ 447,000	$ 90,000	$ 878,000	$ 815,000	$678,000
RH	$ 1,115,000	$ 1,053,000	$ 735,000	$ -	$ -	$250,000
RC	$ -	$ -	$ 676,000	$ 622,000	$ 685,000	$521,000
TOTAL	**$ 1,500,000**	**$ 1,500,000**	**$ 1,501,000**	**$ 1,500,000**	**$ 1,500,000**	**$1,449,000**

The projected pavement conditions of the improved Local Roads using the optimized capital improvements summarized above over the next 10 years are shown in the graph below.

FIGURE 6: PROJECTED LOCAL ROAD PAVEMENT CONDITIONS $1.50 MILLION ANNUAL BUDGET OPTIMIZED SPENDING



The impact of the preventative maintenance and rehabilitation projects to prevent roads from slipping into poor condition can be clearly seen in the graph above by the decreasing road mileage in poor condition, and the fluctuation in road mileage between fair condition and good condition over the projected time period. The amount of reconstruction is minimized in this scenario, and is used only on the worst roads.

Proposed Capital Improvements 2014-2018

As a part of the annual budgeting process, the Engineering Department has outlined their proposed road improvement projects over the next several years. The proposed projects in the CIP in the FY2014-2015 budget are shown in the budget worksheets in Appendix C, and the rehabilitation (RH) and reconstruction (RC) projects are shown on the attached Capital Improvements Plan 2014-2019 Maps as well. A summary of the proposed improvements by type are included below in the discussions on the Major and Local Road system proposed improvements.

There are 52.3 miles of improved roads in the City of Birmingham. Each year, the city loses one year of remaining service life on each mile of road in the network, for a total of 52.3 mile years. In order to maintain the current road conditions throughout the network, the City needs to add at least that number of year miles of service life through reconstruction, or preventative maintenance to extend pavement life.

In the optimized pavement management strategies outlined above, the use of preventative maintenance and structural rehabilitation treatments is favored over reconstruction as long as the pavements are not allowed to fail completely. However, as previously noted, the need to reconstruct water and sewer systems on the streets will affect the need to reconstruct the pavement as well, even if the ideal solution for the pavement would be to extend its life through preventative maintenance or rehabilitation.

For a small road agency like Birmingham, it is not expected that every type of road treatment will be done every year. When bidding out this type of work, the City will generally receive the highest value when there is enough of each particular type of work to offset any setup or incidental project costs. For instance, in 2011 and 2012, the City's asphalt pavement maintenance projects included Ultra-thin HMA overlays, crack sealing and rejuvenating. In 2013, the asphalt pavement maintenance project included milling with structural overlays, and replacing the failed underlying concrete pavement on Purdy Street with a new gravel base and a new asphalt pavement. In addition, the proximity of streets to each other to form logical project limits can also help to reduce contractor bid prices and project costs. For these reasons, comparing each particular year of the proposed CIP with the optimized plan will not give a fair comparison, but looking at the relative spending levels on each type of treatment recommended over a 5 year period will give a better comparison.

In general, with the summer construction season straddling the City's July 1 through June 30 fiscal year, some of the projects in FY 2014-15 will be completed during the late summer or fall of 2014, and the rest will be constructed during the 2015 construction season. The Engineering Department has typically bid out the preventative maintenance, concrete patching and asphalt overlay projects to be done late in the summer or fall, with road reconstruction projects starting the following spring.

Major Roads Proposed Improvements

A summary of the road mileage on the Major Roads network proposed to be improved and the projected spending on the types of projects over the next 5 fiscal years is shown in the following tables.

TABLE 17:
MAJOR ROADS PROPOSED IMPROVEMENTS MILEAGE

PROJECT TYPE	FY 2014-2015	FY 2015-2016	FY 2016-2017	FY 2017-2018	FY 2018-2019
PM	2.361	1.5*	1.5*	1.5*	1.5*
RH	1.737	0.25*	0.25*	0.25*	0.25*
RC	0	0.575	0.544	0.547	0.606
TOTAL	**4.098**	**2.325**	**2.294**	**2.297**	**2.356**

* Estimated total based on budget amount requested each year. Locations and specific types of treatments to be determined at a later date.

TABLE 18:
MAJOR ROADS PROPOSED CAPITAL PROJECTS SPENDING

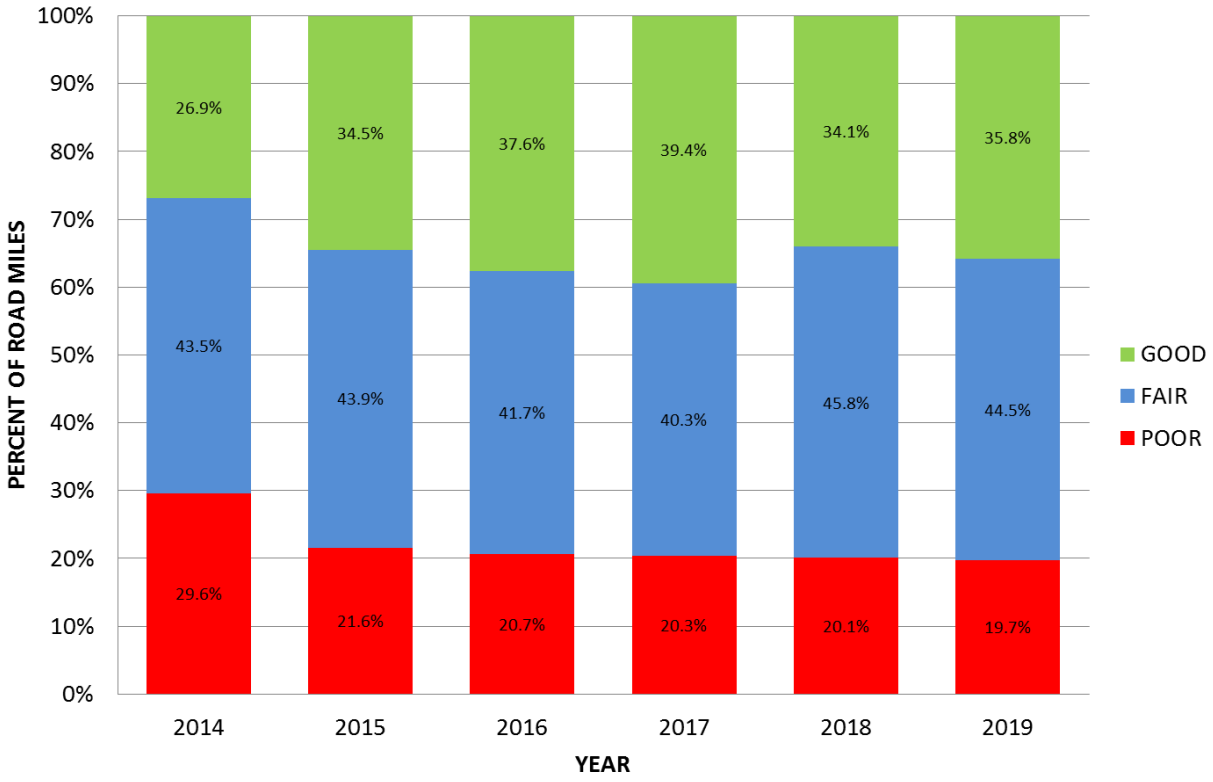
PROJECT TYPE	FY 2014-2015	FY 2015-2016	FY 2016-2017	FY 2017-2018	FY 2018-2019
PM	$ 57,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000
RH	$ 1,375,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000
RC	$ 0	$ 810,000	$ 1,820,000	$ 2,305,000	$ 1,640,000
TOTAL	**$ 1,432,000**	**$ 935,000**	**$ 1,945,000**	**$ 2,430,000**	**$ 1,765,000**

As can be seen in the tables above, in several of the next 5 years the proposed capital projects in the Major Street Funds have costs that are significantly above the projected long term annual lifecycle costs outlined above. There are three primary reasons that the proposed short term capital spending is significantly higher than the long term funding level proposed:

1. Over 28% of the Major Roads are currently in poor condition and require reconstruction or major rehabilitation to be brought back into good or fair condition before preventative maintenance measures will be effective.
2. A number of the roads proposed for reconstruction/rehabilitation in the next 5 years are located in the downtown business district, or are major regional transportation corridors. Reconstruction costs for those projects are project to be higher than the average road reconstruction costs due to the need to maintain access for local businesses and pedestrians, the roads are wider to accommodate on-street parking, and tight working conditions.
3. There are significant water and sewer needs driving the need for reconstruction on several of the major corridors, including the downtown streets.

The proposed improvements in the CIP will have a positive impact on the pavement ratings throughout the City, especially with the early major resurfacing projects on Lincoln (2014) and W. Maple Road (2015). The projected pavement ratings on the Major Roads over the next 6 years using the projects currently budgeted for this fiscal year, and the project outlined in the CIP for the next 5 years are shown in the graph below.

FIGURE 7: PROJECTED MAJOR ROAD PAVEMENT CONDITIONS WITH 2014-2019 PROPOSED CIP PROJECTS



The CIP as proposed should increase the portion of the Major Roads network in good or fair condition to above 80% of the road miles. The major impact of resurfacing W. Maple Road from Cranbrook to Southfield can be seen in the decrease in the percentage of the road miles in poor condition from 2014 to 2015. After that large project, the impact of the reconstruction projects planned approximately keeps up the replacement rate, which essentially holds the number of roads in poor condition relatively constant over the next few years. The proposed levels of preventative maintenance and rehabilitation projects over the next 5 fiscal years will help to keep the roads in good or fair condition from degrading further. The following five years it is expected that the City will need to increase the portion of the spending that goes to preventative maintenance, and decrease the portion of capital spending allocated to reconstruction. It will likely need to be higher than the optimized levels shown previously, primarily because of the need to reconstruct the water and sewer systems at the same time as the road.

Local Roads Proposed Improvements

A summary of the road mileage on the Major Roads network proposed to be improved and the projected spending on the types of projects over the next 5 fiscal years is shown in the following tables.

TABLE 19:
LOCAL IMPROVED ROADS PROPOSED IMPROVEMENT MILEAGE

PROJECT TYPE	FY 2014-2015	FY 2015-2016	FY 2016-2017	FY 2017-2018	FY 2018-2019
PM	6.258	1.543	3.0*	3.0*	3.0*
RH	0.302	0.484	0.47	0.641	1.262
RC	0.839	1.339	0.596	0.469	0.35
TOTAL	**7.399**	**3.366**	**4.066**	**4.11**	**4.612**

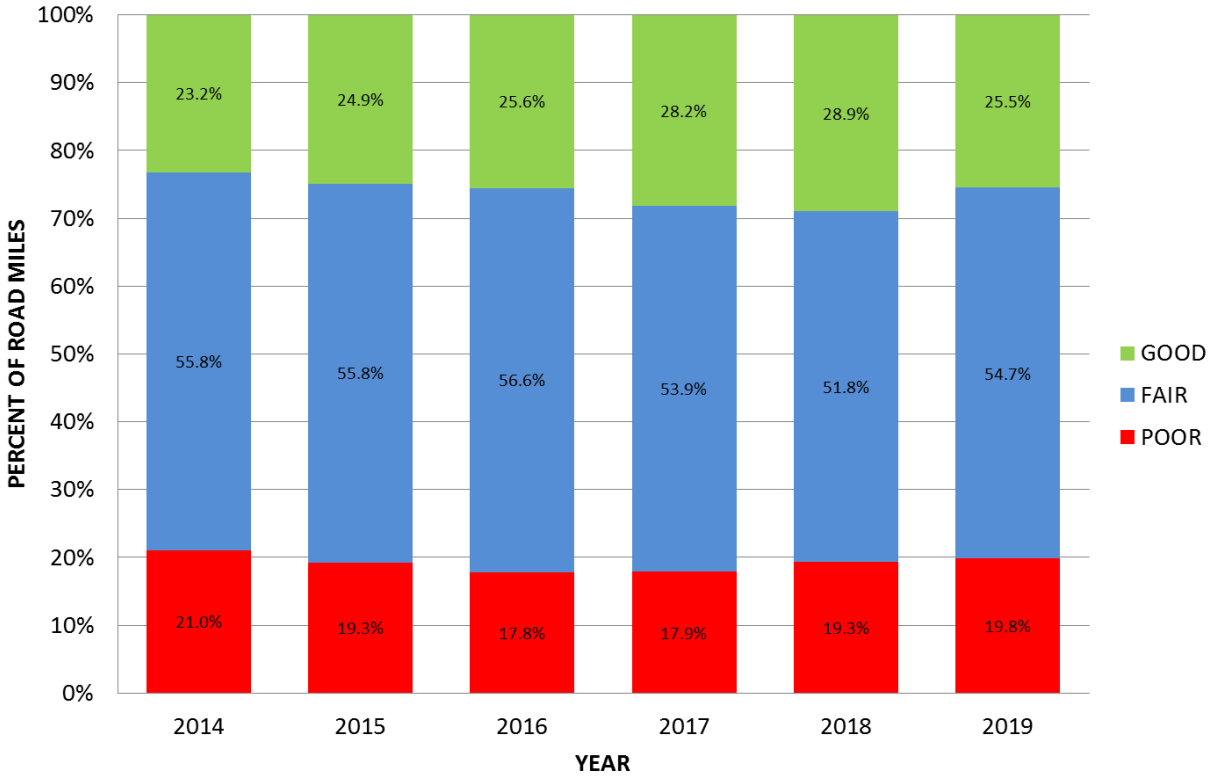
* Estimated total based on budget amount requested each year. Locations and specific types of treatments to be determined at a later date.

TABLE 20:
LOCAL IMPROVED ROADS PROPOSED CAPITAL PROJECTS SPENDING

PROJECT TYPE	FY 2014-2015	FY 2015-2016	FY 2016-2017	FY 2017-2018	FY 2018-2019
PM	$ 155,000	$ 226,000	$ 150,000	$ 150,000	$ 150,000
RH	$ 200,000	$ 335,000	$ 287,500	$ 395,000	$ 507,000
RC	$ 910,000	$ 1,200,000	$ 760,000	$ 665,000	$ 738,000
TOTAL	**$ 1,265,000**	**$ 1,761,000**	**$ 1,197,500**	**$ 1,210,000**	**$ 1,395,000**

The proposed spending level on capital projects in the Local Streets fund over the next five fiscal years is in line with the long term funding needs calculated previously. The projected pavement ratings on the Local Roads over the next 6 years using the projects currently budgeted for this fiscal year, and the project outlined in the CIP for the next 5 years are shown in the graph below.

FIGURE 8: PROJECTED LOCAL ROAD PAVEMENT CONDITIONS WITH 2014-2019 PROPOSED CIP PROJECTS



The CIP as proposed maintains the relative proportions of roads in good, fair and poor conditions in the long terms. As previously shown in the optimized spending plan, this level of funding should allow the City to increase the number of roads in good or fair condition in the long term. However, the needs of the water and sewer system drive the need for more reconstruction on the streets than under the optimized spending scenario. Maintaining over 80% of the Local Roads in good or fair condition over the long term is attainable with the proposed long term funding levels and the current preventative maintenance, rehabilitation and reconstruction patterns. If the City is able to shift more of the funding from reconstruction to preventative maintenance in the future, the percentage of roads in good or fair condition will be able to increase.

Conclusions & Recommendations:

Conclusions

The long term funding levels of the City's Major & Local Street Funds should be based on the lifecycle costs of the pavements in each network, which are:

- Major Streets Fund: $1.3 Million Annually
- Local Streets Fund: $1.5 Million Annually

The proposed capital projects in the Major Street Funds over the next 5 years have costs that are significantly above the projected long term annual costs outlined above. The primary reasons that the proposed short term capital spending higher than the long term funding level proposed:

1. A higher portion of the Major Roads are currently in poor condition and require reconstruction or major rehabilitation.
2. A number of the roads proposed for reconstruction/rehabilitation in the next 5 years are located in the downtown business district, or are major regional transportation corridors.
3. There are significant water and sewer needs driving the need for reconstruction on several of the major corridors, including the downtown streets.

Based on the proposed projects in the major road network, the pavement conditions are project to improve from approximately 72% of the major roads in Good of Fair condition in 2013 to 80% of the roads in Good or Fair condition in 2018.

After the next 5 years, the capital project spending on the Major Road system is expected to decrease to the long term levels outlined above, and the focus will be more on preventative maintenance and pavement rehabilitation projects to increase the service life of the pavements without reconstruction.

The proposed capital projects in the Local Street Funds over the next five years are in line with the above long term funding levels. Based on this level of spending, the condition of the roads in the local roads network are project to remain relatively steady with over 80% of the roads in Good of Fair condition through 2018.

Recommended Next Steps

The most important action item is to **identify a stable long term funding source** to pay for the maintenance, rehabilitation and reconstruction on the City's Major and Local Road networks. As other costs in the City's General Fund continue to increase, the ability to make large transfers to the Major and Local Street Funds each year may become more difficult to sustain. Thinking of the funding needs of the City's road system as an unfunded liability that can be paid for once in a lump sum is not necessarily a solution. As shown in the deterioration curves previously, road conditions are dynamic, and even if every road was reconstructed and in great condition now, in the future they will still need to be rehabilitated or replaced. If the road are maintained, and an effort is made to prevent pavements from deteriorating to the point where reconstruction is necessary, the funding needs of the road system

should remain relatively constant over time, whether that is through a dedicated millage or through continued General Fund transfers.

To complete the financial projections for the Major and Local Streets Funds, a **lifecycle cost analysis of the City's 12 bridges should be completed** as well. In the late 1990's and 2000's, the City reconstructed 7 of their bridges (W. Lincoln, Northlawn, Lakeside North, Lakeside South, Adams Road, N. Old Woodward, and Baldwin). According to FHWA regulations, each of the City's bridges is inspected every two years and the City performs maintenance projects to address deficiencies noted in the inspection reports and to extend the service life of the structures. Based on the results of the latest inspection in 2012, we do not expect any of the remaining bridges to need reconstruction in the near future, however to get the most accurate forecast of expenses that will need to be addressed in the Major and Local Street Funds the long term needs of the City's bridges should be considered as well.

Look for changes in Act 51. The Governor of the State of Michigan noted in his 2012 State of the State address that addressing transportation funding was one of his major priorities for the next year. There have been several proposals discussed on how to increase the state revenue to the MTF, which would then be partially disbursed to County Road Commissions and Cities in their Act 51 funding. Although there has been a lot of discussion, there has been no action taken yet. If the Governor is able to increase funding for the MTF, this will likely have the highest impact on the Act 51 income in the City's Major Street Fund, since that is where the majority of the Act 51 income is allocated. The details of how additional funds will be divided between MDOT, County Road Commissions, and Cities and Villages are not entirely clear at this time, and will need to be monitored if action on increasing road funding at the State level continues.

The City should continue to **pursue state and federal grants where they qualify** for road improvements. These are generally going to be on Major Roads, since they have a higher impact on the transportation network of the region. Any financial contributions to road rehabilitation and reconstruction costs from outside sources will help to reduce the reliance on the General Fund transfers to keep these funds in a healthy position.

Review ongoing operations and maintenance expenses. These expenses have a major impact on the financial health of the street funds. They account for more than half of the annual expenses in the funds, as shown on the financial spreadsheets, and if there can be any reduction in these ongoing costs the transfers from the City's general funds to the street funds may be able to be reduced as well.

Review other sources of income for road maintenance, rehabilitation and reconstruction costs. One potential source for income on road reconstruction projects downtown where on-street metered parking is provided is from the Auto Parking System fund. For example, on the Pierce and Merrill Reconstruction project, approximately 15% of the pavement area within the street is allocated for metered parking spaces. The costs for that area of pavement reconstruction were paid for out of the Major Streets fund, since it is a part of the street. But the City has an ongoing non-tax revenue source in parking meter fees, which are currently not used to pay for the capital cost of constructing the on-street parking spaces. A detailed study of the City's current parking rates and the ability of the fund to bear

these capital costs would be necessary to know if this is a viable option, and whether it can have a significant impact on the street funds.

The impact of the Multi-Modal Transportation Master Plan (MMTMP) on the street funds needs to be included in the long term analysis, but direction needs to be given to City staff on an implementation timeline. The creation of a standing Multi-Modal Committee (MMC) to oversee the implementation of the plan, and the direction of the City Commission on the implementation of the plan will have a major impact on the Major and Local Street Funds that cannot be fully anticipated at this time. As previously stated, costs for road reconfiguration (e.g. bump outs, lane striping, etc.) when a road is reconstructed are included in the lifecycle cost analysis. Minor costs for restriping, ADA sidewalk ramp upgrades are included in the costs for the structural rehabilitation treatments in the lifecycle cost analysis, but major reconfiguration costs (e.g. bump outs, crossing islands, tree extensions, etc.) are not included in the preventative maintenance and rehabilitation costs in the lifecycle cost analysis.

Funding for major traffic controls, signal modifications, and reconfigurations on rehabilitation projects will need to be set aside on a project specific basis in the budget at the direction of the MMC and the City Commission.

In addition, there are projects that are recommended in the MMTMP that can be implemented outside of road rehabilitation and construction projects, such as route signage and striping projects. Whether these projects get funded and implemented through a set annual outlay in the budget, or through larger projects as directed still needs to be determined.

Appendices:

Appendix A: PASER Rating Information (2 Pages)

Appendix B: Concrete vs Asphalt Pavement Memorandum dated November 18, 2013 (2 Pages)

Appendix C: Major & Local Street Fund Worksheets (8 Pages)

Asphalt PASER Descriptions

◆ Denotes PRIORITY DISTRESS

Asphalt 10 – Excellent
New construction.
No defects.
Less than 1 year old.
Only a "10" for 1 year.
Remedy / Action
No action required.

Asphalt 9 – Excellent
Like new condition.
Recent overlay.
More than 1 year old.
No defects.
Remedy / Action
No action required.

Asphalt 8 – Very Good
◆ Occasional transverse crack >40' apart.
◆ All cracks tight (hairline).
Recent seal coat or slurry seal.
Few if any longitudinal cracks on joints.
Remedy / Action
Little or no maintenance required.

Asphalt 7 – Good
◆ Longitudinal crack on paving joint open < ¼".
◆ Transverse cracks 10'-40' apart.
◆ Transverse cracks open < ¼".
First signs of wear.
Little or no crack erosion.
Little or no raveling.
Few if any patches in good condition.
Remedy / Action
Maintain with crack seal.

Asphalt 6 – Good
◆ Longitudinal cracks open ¼" – ½".
◆ Transverse cracks open ¼" – ½".
◆ Transverse cracks less than 10' apart.
◆ First sign of block cracking.
Sound structural condition.
Blocks are large and stable.
Slight to moderate polishing or flushing.
No patches or few in good condition.
Slight raveling.
Remedy / Action
Maintain with sealcoat.

Asphalt 5 – Fair
◆ Longitudinal cracks >½".
◆ Transverse cracks >½".
◆ Secondary cracks (crack raveling).
◆ < 50% of block cracking.
◆ First signs of longitudinal cracks at edges.
Sound structural condition.
Patching/wedging in good condition
Moderate raveling.
Extensive to severe flushing & polishing.
Remedy / Action
Maintain with sealcoat or thin overlay.

Asphalt 4 – Fair
◆ Longitudinal cracking in the wheel paths.
◆ Rutting ½" - 1" deep.
(error in the PASER manual)
◆ > 50% block cracking.
First signs of structural weakening
Severe surface raveling.
Multiple longitudinal & transverse cracks with slight crack erosion.
Patching in fair condition.
Remedy / Action
Structural overlay >2".

Asphalt 3 – Poor
◆ < 25% alligator cracking (first signs).
◆ Moderate rutting 1"- 2" deep.
◆ Severe block cracking.
Longitudinal & transverse cracks showing extensive crack erosion.
Occasional potholes.
Patches in fair/poor condition.
Remedy / Action
Structural overlay >2".
Patching and repair prior to a major overlay.
Milling would extend overlay life.

Asphalt 2 – Very Poor
◆ > 25% alligator cracking.
◆ Severe rutting or distortion >2".
Closely spaced cracks with erosion.
Frequent potholes.
Extensive patches in poor condition.
Remedy / Action
Reconstruction with base repair.
Crush and shape possible.

Asphalt 1 – Failed
Loss of surface integrity.
Extensive surface distress.

General TAMC PASER Rating Q & A

Reimbursement for Rater's Time
Q. Who qualifies for reimbursement as a rater?
A. "Anyone who participates in the annual PASER condition data collection of the federal-aid system and influences the rating activity MUST attend on site PASER training in the same year the data collection occurs." "New raters and seasoned raters who did not attend PASER training the year prior MUST attend one supplemental PASER webinar training session in addition to attending one physical on site session". "Individuals that are PASER Certified Raters (Pass the certification exam) are exempted from on-site training….." The full training policy and certification requirement are in the PASER on-site training workbook as well as on the TAMC web site.

Rate Distress, Not Ride
Q. The road surface has significant cracks, but it rides just fine. Should I rate it higher?
A. NO. Rate surface distress, not ride quality. Be aware of cracks in the wheelpath, they can be hard to see and don't affect the ride.

Rutting
Q. How do I know if rutting is greater than ½"?
A. Look for visual cues described during the training. Get out and measure using a straight edge and tape measure. Use caution!

Road Ownership, Use, etc.
Q. Does importance of the road influence the rating? For example, should state trunkline be rated using a different standard than a county road.
A. NO. Roads are rated the same regardless of their use, ownership or functional class.

Concrete Joint Repairs
Q. If all the joints of an old concrete pavement have had full depth repairs and the surface was diamond ground to fix surface texture problems, how should I rate this?
A. The higest rating a repaired concrete pavement can receive is a 9. No other defects can be present and the condition is "like new." However, this is not usually the case because other distresses normally remain.

Error in the Asphalt PASER Manual #4
Q. The descriptions above for Asphalt 4 say "Rutting ½" - 1" deep." That is

A. The PASER Manual says "Rutting less than ½" for rating 4. Then "Rutting 1" - 2" for rating 3. This doesn't make sense. Should be "Rutting ½" - 1" deep." Make the correction in your manual.

Crush & Shape
Q. Do you consider a crush and shape a reconstruct?
A. NO. A treatment is considered a reconstruct only if the base material is replaced or rehabilitated.

Multiple Lanes
Q. The road has multiple lanes where one lane is in much better condition than the other?
A. Rate the lane with the worst condition.

Q. Four lanes, the inside two are concrete, the outside two are asphalt?
A. Rate the worst lane, and select it as the Surface Subtype.

Distress Under a Repair
Q. I know that a surface repair was applied improperly and will degrade rapidly, should I lower the rating even though the surface looks fine now?
A. NO. Rate the current surface condition. Rate what you see, not what distresses you think might happen in the future.

Sealcoat Percentages
Q. The modified sealcoat manual rates distress by percentage of the road surface covered—it states that a rating of 6 can have 10% raveling, 10% edge distress, or 10% lane distress. Are these percentages cumulative? Can a 6 can have 30% total distress?
A. No, a 6 can only have a total of 10% distress, regardless of whether it is edge distress, lane distress or raveling.

Concrete PASER Descriptions ◆ Denotes PRIORITY DISTRESS

Concrete 10 – Excellent
New construction.
No defects.
Less than 1 year old.
Recent reconstruction.
Only a "10" for 1 year.
Remedy / Action
No action required.

Concrete 9 – Excellent
◆ Joint rehabilitation, only if no other defects are present. Like NEW.
Slight traffic wear in wheel path.
Slight map cracking.
Few pop outs.
Recent concrete overlay.
Remedy / Action
Like new condition.
No maintenance required.

Concrete 8 – Very Good
◆ Joints all in good condition.
◆ Partial loss of joint sealant.
◆ No transverse cracks.
Minor surface defects - pop outs, map cracking or slight scaling.
Isolated meander cracks (well sealed or tight).
Light surface wear.
Isolated cracks at manholes (well sealed or tight).
Remedy / Action
Little or no maintenance required.

Concrete 7 – Good
◆ Isolated transverse cracks.
◆ Full depth repairs all in excellent condition.
Minor surface scaling.
Some open joints.
Some manhole cracks
Isolated settlement or heave areas.
Pop outs could be extensive but sound.
Remedy / Action
Seal open joints.
Spot repair surface defects.

Concrete 6 – Good
◆ Meander and transverse cracks ¼" open.
◆ Transverse joints open ¼".
◆ Longitudinal joints open ¼".
Moderate surface scaling <25% of surface.
Several corner cracks tight or well sealed.
First signs of shallow reinforcement cracks.
Remedy / Action
Seal open joints and cracks.
Overlay surface raveling areas.

Concrete 5 – Fair
◆ First signs of crack or joint faulting up to ¼".
◆ First signs of joint or crack spalling.
Moderate to severe scaling or polishing between 25% to 50% of surface.
Spalling from shallow reinforcement.
Multiple corner cracks.
Remedy / Action
Grind and repair surface defects.
Some partial depth joint repairs or patching may be needed.

Concrete 4 – Fair
◆ Crack or joint faulting up to ½".
◆ Severe spalling on joints and cracks.
◆ Multiple transverse or meander cracks.
Severe scaling, polishing, map cracking or spalling > 50% of surface.
Corner cracks missing pieces or patches.
Pavement blowups.
Remedy / Action
Some full depth repairs.
Asphalt overlay or extensive surface texturing.

Concrete 3 – Poor
◆ Severe crack or joint faulting up to 1".
◆ D-Cracking evident.
◆ Many joints, transverse and meander cracks open and severely spalled.
Extensive patching in fair to poor condition.
Remedy / Action
Extensive full depth repairs.
Some full slab replacements.

Concrete 2 – Very Poor
Extensive and severely spalled slab cracks.
Extensive failed patches.
Joints failed.
Severe and extensive settlement & heaves.
Remedy / Action
Recycle or rebuild pavement.

Concrete 1 – Failed
Restricted speeds.
Extensive potholes.
Total loss of pavement integrity.
Remedy / Action
Total reconstruction.

General TAMC PASER Rating Q & A

Sealcoat Road vs. Sealcoat Treatment
Q. If I apply Sealcoat or Chip Seal on a hot mix Asphalt (HMA) road, does it become a Sealcoat road?
A. NO. Any road constructed of a structural layer of HMA is considered Asphalt. Sealcoat applied over Asphalt is a treatment. A Sealcoat "road" is simply Sealcoat over gravel.

Paved Shoulders
Q. If I have a paved shoulder that is in bad shape should I consider it in the rating?
A. NO. Disregard the shoulder. Rate only the drivable pavement, edge line to edge line.

Composite Pavement
Q. If I have a concrete pavement that was overlaid with asphalt (composite pavement) should I rate it as asphalt or concrete?
A. Rate based on the uppermost surface, in this case, asphalt; but note the Surface Subtype as Composite.

Anticipated Repairs
Q. I know a road is being reconstructed next month or I know a chip seal is scheduled before the end of the season, should I rate it higher because I know the work will be done?
A. NO. Rate the current surface condition as it exists. If construction is in progress (work is active), but you are driving on the old surface, go ahead and rate the new surface. Some barrels sitting on the side of the road is not construction in progress.

Contact Information

RoadSoft & LDC Technical Support: 906-487-2102

TAMC Coordinator: Brian Sanada, 517-373-2220

e-mail: SanadaB@michigan.gov

Center for Shared Solutions (CSS)
Framework Issues: 517-373-7910, ask for Josh Ross
PASER Data Submission via the CSS IRT web site

http://tamc.mcgi.state.mi.us/TAMC/

February 2013

City of Birmingham
A Walkable Community

MEMORANDUM

Engineering Dept.

DATE: November 18, 2013

TO: Robert J. Bruner, Jr., City Manager

FROM: Paul T. O'Meara, City Engineer

SUBJECT: Paving Materials
Asphalt vs. Concrete

The question of how the Engineering Dept. arrives at its recommendation of a paving material when building new public streets has been raised. The following memo attempts to address that issue from a historical perspective, up to the present time.

The installation of concrete streets in Birmingham dates back to the 1910's. For example, we have plans on file for the section of Pierce St. that was removed this past year (just south of Maple Rd.) indicating that it was installed as a concrete street in 1915. Like many concrete streets, it served the first half (or so) of its life as a concrete street. As the surface was getting decayed, the City extended its life by overlaying it with an asphalt surface. The asphalt surface provides a relatively inexpensive means of extending its life, in this case, about double. As the rate of road building picked up after World War II, the majority of new street projects were concrete. Many of these streets are still in service, having been overlaid with asphalt for many years. A good example is the section of Lincoln Ave. between Southfield Rd. and Woodward Ave. The section east of Pierce St. was paved in 1927. West of Pierce St. was paved in 1929. It has been resurfaced more than once, and continues to provide a stable base on which to work.

The practice of installing new concrete streets continued into the 1980's. The last "new" concrete street built from that era was Smith Ave., from Grant St. to Cummings St., in 1985. (It is 28 years old. Even though it has received little attention since, it is still in good condition, and will likely be so for many years to come.) The City Engineer made the decision to move to an asphalt paving section at that time. The motivation appeared to be that asphalt roads were easier to construct, and easier to patch, when utility repairs underneath were required.

Moving into the 2000's, our office has been less than satisfied with the longevity of its newer asphalt pavements. For example, W. Frank St., built in 1994, is in relatively poor condition. It is on the top of our priority list to be resurfaced, even though it is only 19 years old. Several other streets built in the mid-1990's have already been overlaid with an ultra-thin asphalt surface course, in an effort to delay more costly repairs. So far, the strategy appears to be working.

Historically, asphalt pavements were always cheaper than concrete. While that is still the case, the recently ongoing higher cost of petroleum products also shows up in asphalt products, making the difference in cost between the two products increasingly minor. For example, Cole Ave. was built this year at a cost of slightly under $300 per foot. The expected price for a new

asphalt road is estimated at about $275 per foot, a savings of less than 8%. The initial savings is not significant when a life cycle cost analysis reveals that resurfacing work will occur in approximately 20-30 years for asphalt, as opposed to 40-50 years for concrete.

With the long term savings in mind, the Engineering Dept. began looking harder at the public perception of a new concrete street. E. Brown St. (Old Woodward Ave. to Woodward Ave.) had been rebuilt with concrete in 2004 with successful results. When the opportunity to rebuild another downtown street came up in 2009, it seemed like a good opportunity to try concrete again (Pierce St., between Merrill St. and Brown St.). The public reaction was mostly positive, so concrete was selected on the much bigger project involving all of the Shain Park Streets in 2010. Again, the public's response was mostly positive, leading us to believe that concrete should be the material of choice for virtually all new curbed street projects in Birmingham. Starting in 2011, all such streets have been in concrete, including W. Lincoln Ave. (west of Southfield Rd.) and St. Andrews Rd. (in Pembroke Park) for its full extent. We feel that these decisions have been the correct ones for the long term financial benefit of the City of Birmingham.

There were no requests for new road paving projects during the recent recession. Clark St. is the first such request since concrete pavement became the norm in 2011. We met with the residents of Clark St. about the feasibility of installing a new pavement under a special assessment, and recommended the use of concrete. There were no objections registered until recently. A resident noted that George St. (to the north of Clark St.) was recently built new with asphalt, Purdy St. is being rebuilt this year (with asphalt), and finally, Lincoln Ave. to the south will be resurfaced with asphalt. Residents may wonder why Clark St. would be concrete, as it would appear to be inconsistent. Our response is as follows:

1. George St., built in 2010, was the last residential street in which asphalt was specified. The decision to use asphalt was made before the Shain Park Streets project was successfully completed. It was the "safe" decision at the time, but in the long run, will end up costing the City more in maintenance costs.
2. Purdy St. is considered a hybrid. Purdy St. was a concrete street installed in 1959. Its base material was in poor condition, and the asphalt overlay (installed in 1994) was in desperate need of attention. Resurfacing again was not an option. However, the curb and gutter system was still in good condition. In order to get more use out of the investment, and keep the cost of the present project down, the pavement between the curbs was completely removed, but the curbs were saved. Since the curbs are from 1959, this was not considered a completely new pavement, but rather, a lower cost method of installing a pavement with an expected 20 year service life. The less expensive asphalt material was selected on this job.
3. As discussed at the last meeting, Lincoln Ave.'s base concrete street is being saved. Only the top course of asphalt will be removed and replaced in an effort to keep the entire cost of the job down.

The Engineering Department makes decisions regarding paving materials on a case-by-case basis by attempting to balance both aesthetics and economics and would appreciate the discretion to continue to do so in the future. If the residents of Clark St. object to the use of concrete for this street, and if the City Commission would prefer asphalt, we ask that the Clark St. resolution be modified accordingly.

CAPITAL PURCHASES AND IMPROVEMENTS PROJECTION
MAJOR STREET FUND #202

		Current Year					Future Years Capital Outlay Requests				
Account Number	Project Description Total Cost Funding Source	Budgeted 2013/2014	2013/2014 Expensed As of 9/20/2013	OPEN P.O.s As of 9/20/2013	Total Estimated Expenditures 2013/2014	Budget Request 2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020
	RESURFACING/RECONSTRUCTION										
202-449.001	E. Maple Gardens Water & Sewer Improvements	-	227,142	141,726	225,000						
981.0100	Derby Rd. Reconstruction										
	N. Adams Rd. to CNRR Bridge										
	Total Cost: $325,000										
	Funding Source: Major Streets										
202-449.001	Pierce St. Reconstruction	-	2,682	111,578	110,000						
981.0100	W. Maple Rd. to Merrill St.										
	E. Merrill St. Reconstruction										
	S. Old Woodward Ave. to Pierce St.										
	Total Cost: $500,000										
	Funding Source: Major Streets										
202-449.001	N. Eton Rd. Reconstruction	750,000	7,412	52,300	800,000						
981.0100	Derby Rd. to Yorkshire Rd.										
	Total Cost: $750,000										
	Funding Source: Major Streets										
202-449.001	Lincoln Ave. Resurfacing	700,000	6,941		900,000						
981.0100	Southfield Rd. to Woodward Ave.										
	Total Cost: $700,000										
	Funding Source: Major Streets										
202-449.001	W. Maple Rd. Resurfacing	-	-	-		1,030,000					
981.0100	Cranbrook Rd. to Southfield Rd.										
	Total Cost: $1,030,000										
	Funding Source: Major Streets										
202-449.001	Asphalt Resurfacing:	-	-	-		300,000					
981.0100	Derby Rd. - CNRR Bridge to N. Eton Rd.										
	Total Cost: $285,000										
	Funding Source: Major Streets										

		Current Year					Future Years Capital Outlay Requests				
Account Number	Project Description Total Cost Funding Source	Budgeted 2013/2014	2013/2014 Expensed As of 9/20/2013	OPEN P.O.s As of 9/20/2013	Total Estimated Expenditures 2013/2014	Budget Request 2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020
202-449.001	Asphalt Resurfacing:					45,000					
981.0100	S. Chester St. - W. Maple Rd. to Martin St.	-	-	-							
	Total Cost: $45,000										
	Funding Source: Major Streets										
	Crack Sealing & Asphalt Rejuvenation:										
	Various Streets					32,000					
202-449.001	Old Woodward Ave. Reconstruction	-	-	-				1,550,000			
981.0100	Willits St. to Brown St.										
	Total Cost: $1,550,000										
	Funding Source: Major Streets										
202-449.001	Oak St. Reconstruction	-	-	-			810,000				
981.0100	N. Glenhurst Dr. to Lakepark Dr.										
	Total Cost: $810,000										
	Funding Source: Major Streets										
202-449.001	Redding Rd. Reconstruction	-	-	-				270,000			
981.0100	Lakepark Dr. to Woodward Ave.										
	Total Cost: $270,000										
	Funding Source: Major Streets										
202-449.001	S. Old Woodward Ave. Reconstruction	-	-	-					1,900,000		
981.0100	Brown St. to Landon St.										
	Bowers St. Reconstruction	-	-	-					70,000		
	S. Old Woodward Ave. to Woodward Ave.										
	Total Cost: $1,970,000										
	Funding Source: Major Streets										

		Current Year					Future Years Capital Outlay Requests				
Account Number	Project Description Total Cost Funding Source	Budgeted 2013/2014	2013/2014 Expensed As of 9/20/2013	OPEN P.O.s As of 9/20/2013	Total Estimated Expenditures 2013/2014	Budget Request 2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020
202-449.001	Capeseal (Backyard Sewer Master Plan)	-	-	-					10,000		
981.0100	Oak St. - Westwood Dr. to N. Glenhurst Dr.										
	Total Cost: $10,000										
	Funding Source: Major Streets										
202-449.001	Lawndale Ave. Reconstruction	-	-	-					75,000		
981.0100	Oakland Ave. to Woodward Ave.										
	W. Brown St. Reconstruction								260,000		
	Southfield Rd. to Chester St.										
	Total Cost: $335,000										
	Funding Source: Major Streets										
	Road Reconstruction:										
	Maple Rd. - Bates St. to Woodward Ave.									1,100,000	
	Park St. - Hamilton Ave. to E. Maple Rd.									125,000	
	Peabody St. - E. Maple Rd. to E. Brown St.									250,000	
	Total Cost: $1,525,000										
	Funding Source: Major Streets	-	-	-							
202-449.001	Grant St. Reconstruction										
981.0100	E. Lincoln Ave. to Humphrey Ave.									165,000	
	Total Cost: $165,000										
	Funding Source: Major Streets										
	Water Main Pipe Bursting:										
	Derby Rd. - N. Eton Rd. to Coolidge Hwy.										50,000
202-449.001	Pavement Maintenance / Rehabilitation					100,000	100,000	100,000	100,000	100,000	100,000
981.0100	Total Cost: On-Going										
	Funding Source: Major Streets										
202-449.001	Concrete street repair in conjunction w/sidewalk	25,000				25,000	25,000	25,000	25,000	25,000	25,000
981.0100	replacement programs										
	Total Cost: On-Going										
	Funding Source: Major Streets										

		Current Year					Future Years Capital Outlay Requests				
Account Number	Project Description Total Cost Funding Source	Budgeted 2013/2014	2013/2014 Expensed As of 9/20/2013	OPEN P.O.s As of 9/20/2013	Total Estimated Expenditures 2013/2014	Budget Request 2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020
	BRIDGES										
202-449.002-981.0100		-		-							
	Total Cost:										
	Funding Source: Major Streets										
	TRAFFIC CONTROLLERS/SIGNALS										
202-303.001-971.0100	Total Cost: On-Going	-		-							
	Funding Source: Major Streets										
	TOTAL MAJOR STREET FUND	$ 1,475,000	$ 244,177	$ 305,604	$ 2,035,000	$ 1,532,000	$ 935,000	$ 1,945,000	$ 2,440,000	$ 1,765,000	$ 175,000

CAPITAL PURCHASES AND IMPROVEMENTS

CAPITAL IMPROVEMENTS PROJECTION
LOCAL STREET FUND #203

Account Number	Project Description Total Cost Funding Source	Current Year Capital Expenditures					Future Capital Outlay Requests				
		Budgeted 2013/2014	Expense As of 9/20/2013	Open P.O.s As of 09/20/13	Total Estimated Expend 2013/2014	Budget Request 2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020
	RESURFACING/RECONSTRUCTION										
203-449.001-	S. Worth St. Realignment										
981.0100	Design **(Plannning Dept. Request)**	-				-					
	Construction - Woodward Ave. to Webster Ave.					-					
	Construction - Haynes St. to Bowers St.	200,000			-						
	Total Cost: $350,000										
	Funding Source: Local Streets										
203-449.001-	Capseal (Backyard Water Main Abandonment)										
981.0100	Yosemite Blvd. - S. Adams Rd. to Columbia Ave.	40,000			40,000	-					
	Villa Ave. - S. Adams Rd. to Columbia Ave.	40,000			40,000	-					
	Westwood Dr. - Redding Rd. to Oak St.	-				-			40,000		
	N. Glenhurst Dr. - Redding Rd. to Raynale St.	-				-			20,000		
	Lyonhurst Rd. - Redding Rd. to Raynale St.	-				-			20,000		
	Brookwood - Redding Rd. to Raynale St.	-				-			20,000		
	Total Cost: $180,000										
	Funding Source: Local Streets										
203-449.001-	Road Reconstruction:	1,050,000			1,050,000	-					
981.0100	Mohegan Ave. - Oxford Dr. to N. Adams Rd.										
	Kennesaw Ave. - Oxford Dr. to N. Adams Rd.										
	Oxford Dr. - Mohegan Ave. to Kennesaw Ave.										
	Poppleton Ave. - Mohegan Ave. to Kennesaw Ave.										
	Total Cost: $1,050,000										
	Funding Source: Local Streets										
203-449.001-	Road Resurfacing:										
981.0100	Purdy St. - E. Brown St. to Landon St.	285,000	20,029	-	325,000	-					
	W. Frank St. - Bates St. to Pierce St.				75,000	-					
	Wallace St. - Southfield Rd. to Stanley Dr.	155,000			95,000	-					
	Total Cost: $490,000										
	Funding Source: Local Streets										
203-449.001-	Road Resurfacing:										
981.0100	Landon St. - Purdy St. to Ann St.	-			50,000	-					
	Total Cost: $260,000										
	Funding Source: Local Streets										

CAPITAL PURCHASES AND IMPROVEMENTS

CAPITAL IMPROVEMENTS PROJECTION
LOCAL STREET FUND #203

Account Number	Project Description Total Cost Funding Source	Current Year Capital Expenditures					Future Capital Outlay Requests				
		Budgeted 2013/2014	Expense As of 9/20/2013	Open P.O.s As of 09/20/13	Total Estimated Expend 2013/2014	Budget Request 2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020
	Road Resurfacing:										
	W. Frank St. - Southfield Rd. to Bates St.					200,000					
203-449.001-	Road Reconstruction:										
981.0100	Henrietta St. - Northlawn Blvd. to W. 14 Mile Rd.	-				450,000					
	Southlawn Blvd. - Bates St. to Pierce St.	-				60,000					
	Maryland Blvd. - Southlawn Blvd. to W. 14 Mile Rd.					250,000					
	Mansfield Rd. - Sheffield Rd. to Bradford Rd.	-				150,000					
	Total Cost: $910,000										
	Funding Source: Local Streets										
203-449.001-	Road Reconstruction:										
985.66	Clark St. - George St. to E. Lincoln Ave.				125,000						
	New Road Construction:										
	Unnamed Street - Cole St. to 250 Ft. S. of E. Lincoln					200,000					
	Funding Source: SAD: $162,500										
	Local Streets: $37,500										
203-449.001-	Road Reconstruction:										
981.0100	Webster Ave. - S. Adams Rd. to S. Eton Rd.	-				-	700,000				
	Torry St. - Haynes Ave. to Webster Ave.	-				-	100,000				
	Total Cost: $800,000										
	Funding Source: Local Streets										
	Road Reconstruction:										
	Hamilton Ave. - N. Old Woodward to Woodward						400,000				
	Funding Source: Local Streets										
203-449.001-	Road Resurfacing:										
981.0100	Edgewood Ave. - E. Lincoln Ave. to Southlawn Blvd.	-				-	185,000				
	Catalpa Dr. - Pierce St. to Grant St.	-				-	150,000				
	Total Cost: $335,000										
	Funding Source: Local Streets										
203-449.001-	Asphalt Reconditioning/Sealing:										
981.0100	Melton Rd. - S. Eton Rd. to E. 14 Mile Rd.	-				-	66,000				
	Henrietta St. - Martin St. to W. Maple Rd.	-				-	10,000				
	Total Cost: $76,000										
	Funding Source: Local Streets										

CAPITAL PURCHASES AND IMPROVEMENTS

CAPITAL IMPROVEMENTS PROJECTION
LOCAL STREET FUND #203

Account Number	Project Description Total Cost Funding Source	Current Year Capital Expenditures: Budgeted 2013/2014	Expense As of 9/20/2013	Open P.O.s As of 09/20/13	Total Estimated Expend 2013/2014	Budget Request 2014/2015	Future Capital Outlay Requests: 2015/2016	2016/2017	2017/2018	2018/2019	2019/2020
203-449.001-	Road Reconstruction-Quarton Lake Area:										
981.0100	Raynale St. - N. Glenhurst Dr. to Chesterfield Ave.	-				-		240,000			
	N. Glenhurst Dr. - Raynale St. to Oak St.	-				-		240,000			
	Brookwood - N. Glenhurst Dr. to Raynale St.	-				-		220,000			
	Kenwood Ct. - N. Glenhurst Dr. to 230 Ft. East							60,000			
	Total Cost: $760,000										
	Funding Source: Local Streets										
203-449.001-	Road Reconstruction:										
981.0100	Hazel St. - S. Old Woodward Ave. to Woodward Ave.	-				-			125,000		
	Total Cost: $125,000										
	Funding Source: Local Streets										
203-449.001-	Road Resurfacing:										
981.0100	W. Merrill St. - Southfield Rd. to Chester St.	-				-		80,000			
	Sheffield Rd. - S. Eton Rd. to Cheltenham Rd.	-				-		95,000			
	Cheltenham Rd. - Sheffield Rd. to Dunstable Rd.	-				-		55,000			
	Dunstable Rd. - Cheltenham Rd. to Melton Rd.	-				-		57,500			
	Total Cost: $287,500										
	Funding Source: Local Streets										
203-449.001-	Road Reconstruction:										
981.0100	Bennaville Ave. - Edgewood Ave. to Grant St.	-				-			140,000		
	Chapin Ave. - Grant St. to Woodward Ave.	-				-			400,000		
	Total Cost: $540,000										
	Funding Source: Local Streets										
203-449.001-	Road Resurfacing:										
981.0100	Hidden Ravines Dr. - Southfield Rd. to End	-				-			80,000		
	Hidden Ravines Ct. - Hidden Ravines Dr. to End	-				-			40,000		
	Hidden Ravines Trl. - Hidden Ravines Dr. to End	-				-			30,000		
	Ashford Lane - Quarton Rd. to End	-				-			80,000		
	Millrace Rd. - Lakeside Rd. to End	-				-			45,000		
	Westboro Rd. - N. Adams Rd. to End	-				-			120,000		
	Total Cost: $395,000										
	Funding Source: Local Streets										
203-449.001-	Road Reconstruction:										
981.0100	Ruffner Ave. - Grant St. to Woodward Ave.	-				-				408,000	
	Townsend St. - Southfield Rd. to Chester St.	-				-				330,000	
	Total Cost: $738,000										
	Funding Source: Local Streets										

CAPITAL PURCHASES AND IMPROVEMENTS

CAPITAL IMPROVEMENTS PROJECTION
LOCAL STREET FUND #203

Account Number	Project Description Total Cost Funding Source	Current Year Capital Expenditures					Future Capital Outlay Requests				
		Budgeted 2013/2014	Expense As of 9/20/2013	Open P.O.s As of 09/20/13	Total Estimated Expend 2013/2014	Budget Request 2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020
203-449.001-981.0100	Road Resurfacing: Bowers St. - Haynes Ave. to Columbia Ave. Total Cost: $207,000 Funding Source: Local Streets	-				-				207,000	
	Road Resurface (after Water Main Installation) Bird Ave. - Pierce St. to 120 Ft. W. of Woodward Maryland Blvd. - W. Lincoln Ave. to W. 14 Mile Rd. Pembroke Rd. - W. End to N. Eton Rd. Chapin Rd. - Woodward Ave. to Torry St. Total Cost : $1,300,000 Funding Source: Local Streets										600000 300000 250000 150000
203-449.001-981.0100	Road Resurfacing: (Future locations to be determined)	-				-				300,000	
203-449.001-981.0100	Pavement Maintenance / Rehabilitation (Future locations to be determined) Total Cost: On-Going Funding Source: Local Streets	-				130,000	125,000	125,000	125,000	125,000	125000
203-449.001 981.0100	Concrete Street Repairs in Conjunction with Sidewalk Replacement Programs: Total Cost: On-Going Funding Source: Local Streets	25,000				25,000	25,000	25,000	25,000	25,000	25000
203-449.002-981.0100	**BRIDGE MAINTENANCE** Sandbar Removal - N. Lakeside Bridge Maintenance - Baldwin & (2) Lakeside Bridges Total Cost: $106,500 Funding Source: Local Streets	-				-					
	TOTAL LOCAL STREET FUND	$ 1,795,000	$ 20,029	$ -	$ 1,800,000	$ 1,465,000	$ 1,761,000	$ 1,197,500	$ 1,310,000	$ 1,395,000	$ 1,450,000
	Other Sewer/Water Projects Sewer Lining	750,000			-	750,000	750,000	750,000	750,000		

MAPS:

City of Birmingham Act 51 Road Network Map (1 Page)

City of Birmingham 2013 PASER Ratings Map (1 Page)

Capital Improvement Plan Maps – 2014 through 2018 (6 Pages)

City of Birmingham
A Walkable Community

CITY OF BIRMINGHAM
ACT 51
ROAD NETWORK MAP

Legend

- Improved City Major Road
- Improved City Local Road
- Other Roads
- Unimproved City Major
- Unimproved City Minor
- County Local Rd
- County Primary Rd
- State Trunkline

City of Birmingham
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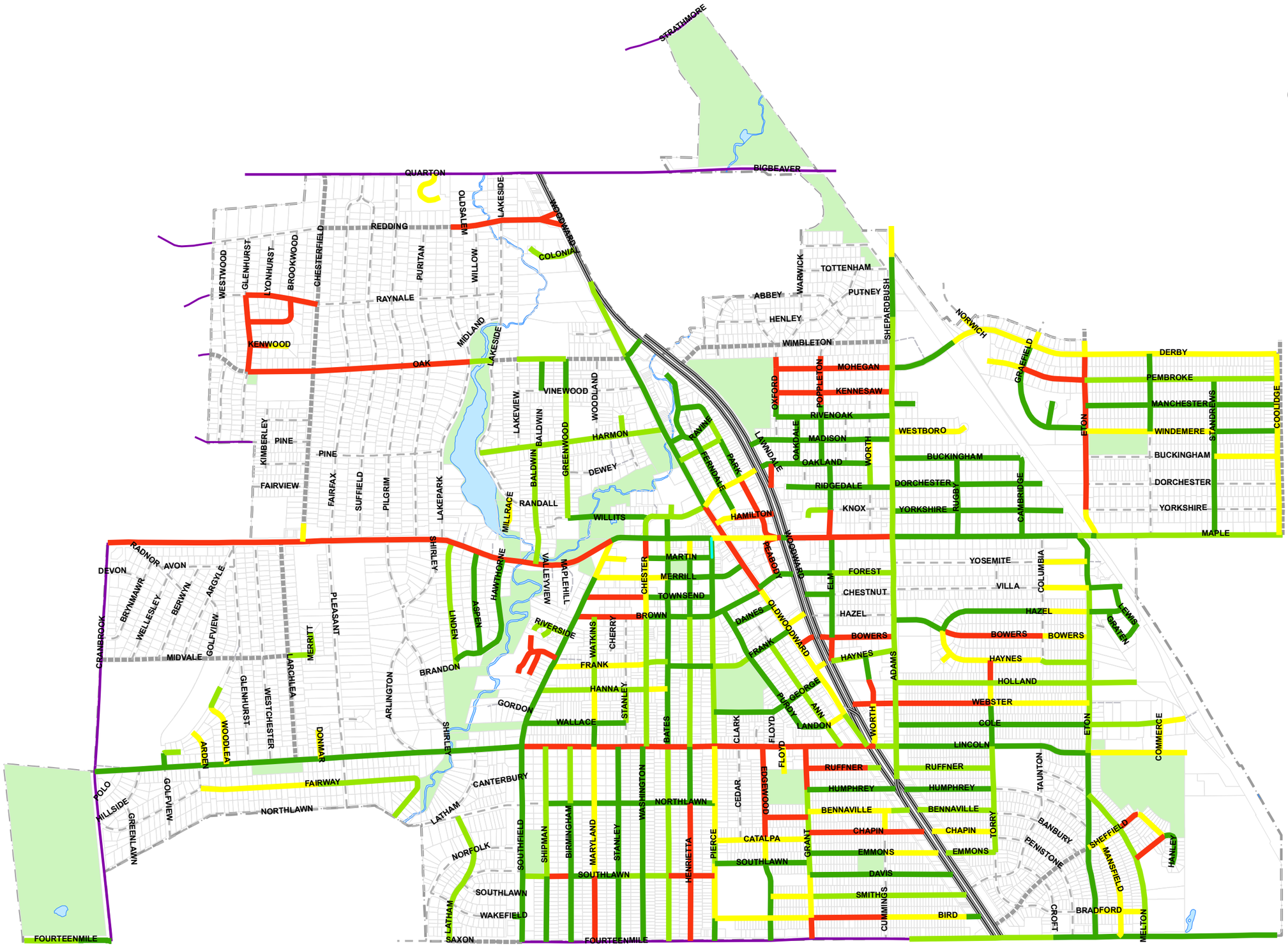
CITY OF BIRMINGHAM IMPROVED ROADS 2013 PASER RATINGS

Legend

PASER RATING

- 1 - 3
- 4 - 5
- 6 - 7
- 8 - 10
- Other Roads
- Unimproved City Major
- Unimproved City Minor
- County Local Rd
- County Primary Rd
- State Trunkline



0 0.125 0.25 0.5 Miles

SIDEWALK MAINTENANCE PROGRAM

2B

SIDEWALK MAINTENANCE PROGRAM

- Birmingham has about 129 miles of public sidewalks.
- Birmingham maintains sidewalks on its state and county streets as well as all City streets.
- Birmingham is obligated to keep all sidewalks within reasonable repair.
- In accordance with American Disabilities Act (ADA) handicap ramps must be reconstructed to current standards whenever:

1. They are damaged for whatever reason and need repair.
2. The adjacent street is being reconstructed, resurfaced, or cape sealed.

Residential Section Repairs

Traditional remove and replace.

Hazard removed by grinding.

The City General Fund pays for the majority of these repairs.

Residential Section Repairs

Sidewalk crossing a driveway.

Sidewalk repair at a “private” tree.

Owners generally pay at driveway crossings,
or if a tree on private property has caused damaged.

Central Business District Repairs

Brick paver panel.

Wide sidewalk replacement.

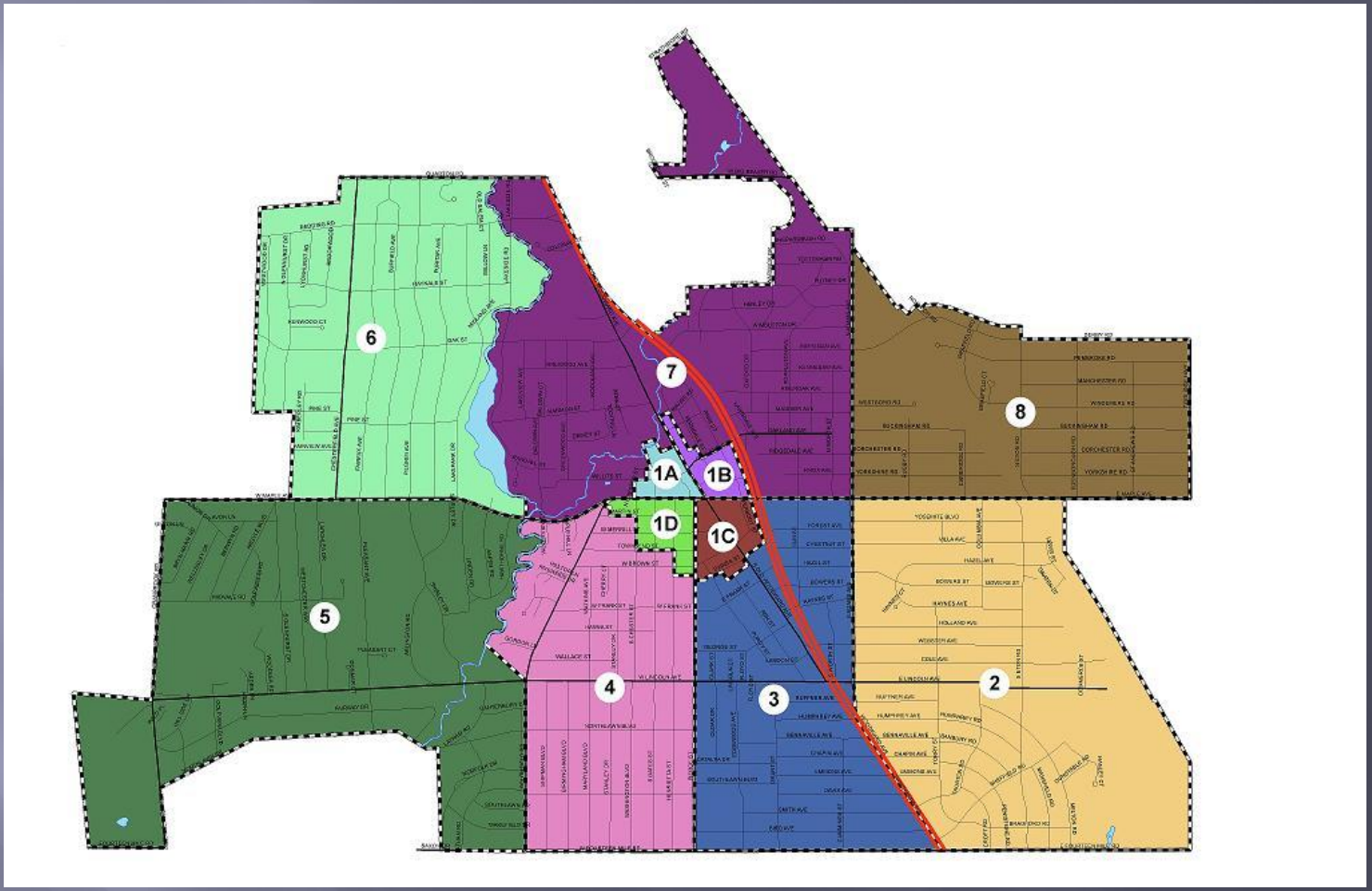
Extra wide sidewalk areas as well as special pavements are charged to the adjacent property owners.

Central Business District Repairs

Exposed aggregate sealer.

Caulked joint maintenance.

Extra wide sidewalk areas as well as special pavements
are charged to the adjacent property owners.



Birmingham inspects and repairs sidewalks by sections. One of the 7 large sections and one-fourth of the Central Business District is completed each year.
In 2016, repairs will be in Sections 1A and 6.
Estimated total cost is $160,000.

Special Assessment Districts

Hamilton Ave. Reconstruction
Total sidewalk costs estimated at $210,000

Questions?

City of Birmingham
A Walkable Community

MEMORANDUM

Engineering Dept.

DATE: **January 5, 2016**

TO: **Joseph Valentine, City Manager**

FROM: **Paul T. O'Meara, City Engineer**

SUBJECT: **Backyard Sewer and Water Master Plan Approved July, 2011**

Attached is the information that was put together for the City Commission's review just before a public hearing was held on the Backyard Sewer and Water Master Plan. The Master Plan was prepared initially to address the long term future plans for the subdivisions in the City that had homes or other buildings primarily operating on a sewer and/or water main that was located along back property lines. Such systems have been deemed difficult to maintain due to their location.

After working with an ad hoc committee on the topic, it was decided that:

1. Blocks where the majority of the buildings are connected to a backyard sewer system will be lined and continue to be maintained by the City. The majority of homes impacted by this policy are located within Quarton Lake Subdivision, although one block within E. Maple Gardens and one block in Birmingham Villas also apply. At the time of the plan creation, the City only had access to one block in Birmingham Villas. Since then, many efforts have been taken to acquire easements. The City has been advised that it must be 100% successful on a given block before it can proceed with the lining. At this time, 5 out of 21 blocks in the Quarton Lake area are ready for lining.
2. All backyard water mains should be phased out by building a new water main and water services to all homes on the street side, and giving each property owner ten years to disconnect and reconnect to the front system. All subdivisions have now been constructed in this manner, and all are within the ten year period where they must disconnect.
3. Due to the extensive research done on the long term future of the Quarton Lake Subdivision, it was decided that this area is a great candidate to get flows out of the combined sewer system, and divert storm water to ground water recharging or storm sewers that will direct water to the Rouge River or Quarton Lake. Water diverted to the surface water system will be cleaned in the sewer system prior to discharging into the river. Cleaning systems of this nature have now been installed on W. Lincoln Ave. (2011) and Oak St. (2015). Additional units are planned as more storm sewers are built. Projects planned for 2017 and 2018 in the Quarton Lake area will make additional progress toward this goal. Taking storm water out of the combined sewer system will reduce sewage treatment costs for the entire City, as well as eventually reduce Retention Treatment Basin (RTB) maintenance costs.

As a part of the environmental initiative that this plan studied, it was recommended that a second paving alternative be offered to residents wishing to pave their streets. Instead of a concrete curb and gutter section, an asphalt paved road with engineered drainage in the shoulders would also be offered, which would encourage more storm water entering the groundwater system. Such a road system inherently will have a shorter service life and ultimately require more maintenance. The City Commission later expressed disagreement about offering this as a full alternative to a concrete curbed section, unless the residents continued to be responsible for long term maintenance. Such a position is consistent with what was done on Dewey St. east of Greenwood Ave., which was reconstructed without curbs in 2007. Staff has since taken this approach with residents considering having their street paved.

MEMORANDUM

DATE: June 1, 2011

TO: Robert J. Bruner, Jr., City Manager

FROM: Paul T. O'Meara, City Engineer

APPROVED: Robert J. Bruner, Jr., City Manager

SUBJECT: Backyard Sewer & Water Master Plan
Public Hearing & Final Approval

As described in detail in the attachments, the Engineering Dept. has prepared a master plan to address ongoing maintenance issues with aging public sewers and water mains located in private backyards. The Master Plan provides a road map to not only renew or abandon backyard facilities so that they can be relied upon for many years to come, it also works to provide storm sewer outlets that will divert large portions of the northwest quadrant of the City's drainage to the Rouge River, while also addressing street water main and pavement replacement needs in the subject areas. The Master Plan has been distributed to all property owners with backyard facilities, and neighborhood meetings have been held. Postcards were sent to all of the same owners notifying them of this public hearing, should they wish to provide comment to the City Commission.

At this time, the Engineering Dept. recommends that the City Commission approve the Master Plan as the main guiding document that will direct our office on how to proceed with the several projects needed to achieve this large scale objective. The Plan provides a general road map; individual fiscal year budget approvals and contractor awards will come before this body as each project is designed and built.

SUGGESTED RESOLUTION:

To approve the Backyard Sewer & Water Master Plan as prepared by the Engineering Dept., including the policy statements therein, to be used as a guiding document to address the backyard sewer and water system needs of the City of Birmingham.

MEMORANDUM

DATE: April 27, 2011

TO: Robert J. Bruner, Jr., City Manager

FROM: Paul T. O'Meara, City Engineer

APPROVED: Robert J. Bruner, Jr., City Manager

SUBJECT: Backyard Sewer & Water Master Plan
Public Hearing Recommendation

INTRODUCTION:

The following is a brief chronology of this issue since it was presented to the Commission late last year:

November 22, 2010 – After several months of research and planning, the Engineering Dept. presented the proposed Master Plan to the City Commission. The Commission was generally receptive. Since the issue was being presented for the first time, no resolution was passed. However, Commissioner McDaniel suggested that staff work with community representatives of the affected areas, and bring them into the process.

December 15, 2010 –

Staff invited the members of the former Streets, Sewer, and Water Ad Hoc Committee, as well as the current homeowners association representatives, to a meeting. Nine interested residents attended. Staff was advised to provide better answers and information relative to how individual homeowners would be affected.

January 22, 2011 –

The Master Plan was revised to reflect the additional information requested from the meeting in December, and an update was presented to the City Commission at the Long Range Planning Session. The Commission was again generally receptive.

March, 2011 –

The attached informational booklet was assembled and mailed to all property owners affected by the plan within the neighborhoods of Birmingham Villas and East Maple Gardens. A meeting was held on March 24, 2011, at the Dept. of Public Services facility. Approximately 50 people were in attendance. The attached presentation was reviewed, and many good questions were received. The general tone of the meeting

was receptive. Two residents in attendance expressed frustration that they had invested several thousand dollars in the past to rebuild their backyard connections because they were failing, and they were not very pleased to be asked to spend additional funds now to disconnect. While we acknowledge that these people are in a bad position, those that have not yet had to do this (the majority) should be encouraged to see the City have a plan in place ready to implement, so that they too hopefully will not be in the same position in the future.

April, 2011 –

The attached informational booklet was assembled and mailed to all property owners affected by the plan within the Quarton Lake Estates neighborhood, east of Chesterfield Ave. A meeting was held on April 14, 2011, at City Hall. Approximately 40 people were in attendance. The attached presentation was prepared but not used that evening, due to unexpected computer network problems being experienced that day. However, staff did present the information contained within the presentation. Again, the general tone of the meeting was receptive. Staff emphasized that the biggest question as we embark on this effort is how well the easement acquisition effort will go. Members of the homeowners association were present, as was former Commissioner Don Carney. They have all expressed interest in helping in this regard, which is appreciated.

SUMMARY:

Based on the above summary, the Engineering Dept. feels confident that the large majority of property owners within these areas are either passive or in favor of the proposed Backyard Sewer & Water Master Plan. Due to the size of this endeavor, we recommend that all involved parties be invited to a public hearing so that the City Commission can take any comments directly from those most affected, and then consider formal adoption of the plan. The following page summarizes the proposals contained within the plan:

In order to have a clear direction and path to resolution of this ongoing maintenance issue that will become more significant with time, the Engineering Dept. recommends that the City Commission prepare to approve the attached Backyard Sewer & Water Master Plan. Extensive public communication efforts have been completed so that as many people as possible are informed and aware of what is proposed. No actual assessment districts are being created at this time, and a public hearing is not required to proceed with approval of the plan. However, due to the large number of property owners impacted by the plan, a hearing is recommended to ensure that residents with concerns can be heard prior to final plan adoption.

SUGGESTED RESOLUTION:

RESOLVED, that the City Commission shall meet on Monday, June 13, 2011 at 7:30 P.M., for the purpose of conducting a public hearing to consider the approval of the Backyard Sewer & Water Master Plan.

BACKYARD SEWER & WATER MASTER PLAN HIGHLIGHTS

RECOMMENDED EIGHT YEAR (2011-2018) CAPITAL IMPROVEMENT PLAN

Internal inspection and lining of all backyard sewers slated for rehabilitation.	21,000 ft. (Quarton L.) 2,800 ft. (East Side)
Installation of sewer laterals in the right-of-way for properties being asked to disconnect from the backyard City sewer within ten years.	15 homes, 5 multi-family properties
Installation of new public water mains and water service laterals for properties being asked to disconnect from the backyard City water main within ten years.	8 homes (Quarton L.) 146 homes (East Side) 8 multi-family properties
Offer relining and repair of backyard sewer laterals (as special assessments).	Unknown (roughly 400 homes)
Acquire easements for all backyard sewers remaining in service.	342 homes 3 multi-family properties
Install storm sewer improvements to divert more storm flow to river.	280 acres of runoff (ultimate goal)

(All quantities listed above are approximate.)

RECOMMENDED POTENTIAL COSTS TO HOMEOWNERS

Backyard sewer lining special assessment (voluntary).	$6,000
City sewer maintenance (required annual fee for those who are not repairing lateral that contributes roots to City sewer).	$100-$500 annual charge
Backyard tap excavation and repair (voluntary).	$5,000 - $6,000
Water service reconnection to front of house. (City cost applies if work is done after first 12 months).	$2,600 - $4,000 (contractor cost) $1,665 (City cost)
Sewer service reconnection to front of house. (City cost applies if work is done after first 12 months).	$4,000 - $6,500 (contractor cost) $200 (City cost)

(All costs are estimates. Costs reflect excavation and plumbing costs, not remodeling or landscaping repairs. Additional costs are expected for multi-family properties that involve more complex plumbing systems.)

RECOMMENDED POLICY CHANGES

All properties with backyard sewers will be required to provide easement prior to obtaining building permits.	
Residents requesting permanent paving will be encouraged to consider uncurbed street (with edge drains) as option to standard pavement with curb and gutter.	Evergreen-Farmington Drainage District

RETURN TO AGENDA

MEMORANDUM

DATE: **November 17, 2010**

TO: **Thomas M. Markus, City Manager**

FROM: **Paul T. O'Meara, City Engineer**

APPROVED: **Thomas M. Markus, City Manager**

SUBJECT: **Back Yard Sewer and Water Systems Long Term Master Plan**

The attached proposed master plan has been prepared by the Engineering Dept. to provide a holistic approach and direction to addressing the upcoming needs of the City's public sewers and water mains located in back yards. As well as our own previous project experience, the plan takes knowledge and information from four major sources:

1. The discussions of the Streets, Sewer, and Water Ad Hoc Committee (2008).
2. The attached "Quarton Lake Area Storm Relief Sewer Study" prepared by Hubbell, Roth, & Clark earlier this year.
3. The knowledge and experiences gained by neighboring cities that have also been addressing rear yard sewer issues within the last ten years.
4. Input from the City Attorney's Office.

Attachments to help convey this information are provided in the following three attachments:

1. Back Yard Sewer and Water Systems Long Term Master Plan
2. Quarton Lake Area Storm Relief Sewer Study
3. Presentation for the meeting of November 22, 2010.

It is our hope to get some solid direction from the City Commission in the near future. In order to achieve the large amount of work involved, an eight year plan is suggested, and the work proposed in 2011 is necessary to start the work moving in a progressive manner. Street projects already budgeted within the east side neighborhoods (St. Andrews Rd. in 2011 and E. Maple Rd. in 2012) will be designed taking cues from this plan. Direction from the Commission will also be helpful in formulating budget recommendations for the 2011-2012 fiscal year. Due to the large scope of the plan, two resolutions are offered:

SUGGESTED RESOLUTION A:

To adopt the Back Yard Sewer and Water Long Term Master Plan as the policy guide for the City of Birmingham to address the rehabilitation needs of the city's public sewers and water main in back yards, and to direct staff to begin planning and budgeting for the work as proposed accordingly.

SUGGESTED RESOLUTION B:

To receive and endorse the Back Yard Sewer and Water Long Term Master Plan as the general direction for a policy guide for the City of Birmingham to address the rehabilitation needs of the city's public sewers and water main in back yards, and to request staff to return to the City Commission with the following additional information for further review and discussion:

1._____

2._____

....

CITY OF BIRMINGHAM
ENGINEERING DEPT.

A. INTRODUCTION

SEWER, WATER, STREETS AD HOC COMMITTEE

At the February 9, 2009 City Commission meeting, a final report from the Sewer, Water, Streets Ad Hoc Committee was presented. In brief, the report noted that the majority of the committee, on a 6-3 vote, passed the following motion,

To recommend the following to the City Commission:

- ***Continue the water improvement plan and the schedule for adopting it with the water mains in the street, consistent with current City policy;***
- ***Reline the sewers in these three areas as appropriate and necessary, seeking permission from residents when necessary;***
- ***Continue the same City policy regarding roads; however, in these three areas[1] the road improvement will not be tied to moving the sewers.***

The opposing three members of the committee also submitted a minority report, which was also endorsed by the Engineering Dept. The minority report endorsed the installation of combined sewers on each street, with the eventual abandonment of all back yard public sewers.

After hearing both sides, the City Commission approved the following motion:

To direct staff to prepare a specific report addressing three issues: more information and costs associated with the directional boring option, secondly, to get answers with regard to easement and access, and re-cameraing all or a portion of the existing rear yard sewers.

Action taken on the three working points is as follows:

1) Exploring the directional boring option:

As a part of studying the difficulty of forcing hundreds of homes off the back yard sewer system, the Ad Hoc Committee had explored the feasibility of boring sewer laterals from the street up to the face of residences, with the goal of minimizing damage to existing landscape. While this was offered as a mitigating option to the potential difficulty of this task, questions remained as to its feasibility and impact. Should the back yard sewers be maintained, however, the need to explore this option goes away. As explained further in

[1] "These three areas" refers to the Quarton Lake Estates subdivision, that section predominantly east of Chesterfield Ave., the Birmingham Villa subdivision (north of Villa Ave. and west of Columbia Ave.), and Birmingham Maple Gardens subdivision (north of Maple Rd. and east of Eton Rd.)

this report, relining and maintaining the majority of the back yard sewer system will be recommended, therefore, exploring this option does not seem necessary at this time.

2) Provide answers with regard to easements and access.

A report with respect to this issue is provided below, under **Appendix A.**

3) Inspection of the existing back yard sewer system.

During the Ad Hoc Committee discussions, the City's consultant Hubbell, Roth, & Clark, Inc. (HRC) indicated (using the limited information available) that if all of the rear yard sewers are lined and maintained for future service, approximately 25 locations throughout the Quarton Lake area could require excavation to correct serious deficiencies that lining alone would not resolve. It was pointed out, however, that the majority of the rear yard sewer system had not been inspected internally (using a camera) since 1995.

As a result of the Commission's directive, the Engineering Dept. bid a sewer inspection pilot project in September, 2009. The project televised about 3,500 feet of rear yard sewer in the Quarton Lake Subdivision. The sections televised were throughout the neighborhood, focusing on those segments that were in the worst condition in 1995. (A map of the actual sewer segments televised is in **Appendix B.**) The work was conducted in October and November, 2009, and reviewed by HRC. The results generally revealed that the sections that were in the worst condition in 1995 have continued to decay, and are more in need of repair than they were at that time.

Discussions more recently held with HRC have further explored the ability to repair the defects using the lining process, comparing them to the ones that absolutely cannot be repaired without excavation. It appears that this topic deserves further study, and is discussed in more detail in **Appendix C.** In order to limit damage to rear yards, a policy needs to be set forth identifying how differing conditions within each homeowner's sewer lateral will be addressed. This topic is also explored in **Appendix C.**

METER-BASED BILLING IN THE EVERGREEN-FARMINGTON SEWAGE DISPOSAL SYSTEM (EFSDS)

The Ad Hoc Committee finished its study in November, 2008. At that time, the City of Birmingham was being charged for sewage treatment based on water meter readings, as well as a smaller component measuring the storm water component flowing through the Retention Treatment Basins. In early 2009, the Oakland Co. Water Resources Commissioner's Office (OCWRC) unveiled its new plan to issue sewage treatment bills in the EFSDS based solely on sewage meters placed so that the flow contribution from each community can be measured and billed accordingly. In February, 2009, for the first time, it became clear how much impact this change would have financially on the City of Birmingham. The change in billing started in July, 2009, under a three-year phase in process, which is currently underway. When it is finished, the City can expect sewage treatment costs about 65% higher than they were previously, or about $850,000 annually.

(The EFSDS billings affect the drainage area which contains the Quarton Lake Subdivision. They do not affect the other "East Side" neighborhoods with rear yard sewers that were studied by the Committee. We do not foresee any change in billing in the future for the George W. Kuhn Drainage District (GWK), which drains the easterly side of Birmingham.)

The majority of the EFSDS drainage area is served by separated sanitary sewer systems. The other communities in the district do not discharge nearly as much storm water into the sewer system as a combined sewer system does. The new billing system will further encourage separated communities to rehabilitate their sanitary sewers where they are known to be leaky, to help reduce ground water infiltration. Making such efforts for a combined sewer system such as Birmingham is not nearly as effective, as the system has been built with all of its drains directing all storm water straight to the sewer system, where it can then be treated. The most cost-effective way to reduce Birmingham's ongoing sewage treatment bill is to reduce the amount of acreage being discharged into the sewer system. The Quarton Lake Subdivision is immediately adjacent to the Rouge River. Since it needs significant sewer, water, and street rehabilitation, this area is likely the City's best opportunity to consider the long term cost implications of building a storm sewer system to direct large amounts of flow to the river, rather than to the combined sewer system. If the study moved west beyond Chesterfield Ave. to include the remaining northwest corner of the City, such a project would result in additional savings other than just reducing the cost of sewage treatment. By reducing the amount of flow to the Bloomfield Village RTB, we would reduce the City's percentage of acreage being discharged to the basin (compared to the total flow going to it), which would result in a reduced percentage of annual maintenance cost for which Birmingham is responsible.

Knowing that the homeowners in the Quarton Lake area will generally remain opposed to being forced to reconnect to a street sewer system, especially given the ongoing decline in property values, it appeared important to determine the amount of funds that could be saved should the City invest in its back yard sewer system through rehabilitation, and plan to move forward on improving its streets with a new storm sewer system that will direct water to the river instead of combined sewers. With that thought in mind, HRC was hired to help develop a new storm-system based master plan, helping to identify both upcoming construction costs, as well as annual recurring savings the City would experience by reducing combined sewer flows. The highlights of that study are described below.

The East Side neighborhoods that were also a part of the Ad Hoc Committee's study do not have the option of removing storm water from the sewer system, and since the billing of sewage treatment has not changed for this area, the HRC study did not focus on those areas. However, the Engineering Dept. has done further research of the particular blocks to better understand what would be involved in a rear yard sewer and/or water system abandonment, and the master plan referenced below has recommendations for those areas as well.

QUARTON LAKE SUBDIVISION SEWER SYSTEM CONCLUSIONS

At the time the Ad Hoc Committee presentation was made in February, 2009, it was clear that there were some serious hurdles to overcome no matter which choice was made with respect to the fate of the rear yard sewers.

If the Commission chose the Committee recommendation, problems included:

A1) Justifying the burden of cost to the general rate-payer by approving the multi-million dollar rehabilitation of a sewer system that is on private property, knowing that a whole new storm sewer system would still have to be constructed as each street in the area gets paved.

A2) Figuring how best to cope with the question of easement acquisition for sewers that the public must rely on, and the City must maintain.

A3) Determining how many rear yards would have to be excavated to repair areas that could not be lined.

If the Commission chose the minority/staff position, problems included:

B1) Approving a burden on a select but large group of homeowners who would be required to cause damage to their own basements and front yards, at the cost of several thousand dollars each.

B2) Determining how best to move forward on installation of replacement combined sewers, (and abandonment of the rear yard sewers) should homeowner interest in street paving decline as a result of imposed sewer lateral replacement costs.

With the imposition of escalating sewage treatment costs in the EFSDS, it is helpful to step back and review the entire concept, and as spelled out in the report, the three problems listed above under the Committee recommendation can now be reconsidered:

A1) The burden of cost to the general rate-payer can be better justified when the changes that are being made will result in annual savings to the system of about $93,000 to $132,000 in annual sewage treatment and RTB maintenance costs.

A2) A closer review of the true legal concerns of operating sewers without easements when compared to other local cities coping with the same problems reveals that other cities in this area have dealt with the problem by acquiring temporary access easements, or no easement at all. (Detailed information is in Appendix A.)

A3) Given that a detailed survey of 10% of the sewer system revealed that no locations need to be excavated without question, we expect that only a small number (likely less than ten system wide) will be found necessary as a part of the proposed system repairs.

As described in the attached report, Alternative E provides the best long-term opportunity to reduce annual sewage treatment and RTB maintenance charges, and is the least expensive alternative that does not require disconnection of the rear yard sewer laterals. While it does require a commitment on the part of the City to move forward with timely sewer improvement projects, it addresses three important issues for the sewer system in this area:

1) The aging rear yard sewer system will be completely rehabilitated and ready to operate for many decades to come.
2) The remaining unimproved streets will have an improved storm sewer outlet ready to be connected to and utilized as residents become ready for improved street pavements.
3) The northwestern section of the City (between the west city limit and Chesterfield Ave.) will have its storm sewer capacity shortage issue addressed for the least possible cost.

While Alternative E has a significant cost, the Engineering Dept. recommends that the Commission proceed with its implementation as outlined below in the attached Master Plan.

EAST SIDE SUBDIVISIONS SEWER SYSTEM CONCLUSIONS

The east side subdivisions with rear yard sewer systems differ from the Quarton Lake area in the following ways:

1) The sewers are within the George W. Kuhn Drainage District. They are not located anywhere near any open water body, such as the Rouge River. Attempting to direct the storm flow from the adjacent streets out of the combined sewer system is not a feasible option. Further, the vast majority of the drainage district is a combined sewer system, meaning that the costs are already apportioned in such a manner that all communities have historically paid the high rate of combined sewage treatment costs in this district. The OCWRC's office will not have the motivation to go to the effort of changing the billing methodology in this district that existed in the EFSDS, and we expect that there should not be any upcoming major changes in sewage treatment costs in this area.
2) The adjacent streets have historically had access to a sanitary sewer both in the rear yard and in the street, with the exception of 2001 to 2199 E. Maple Rd. **Appendix D** contains sewer and water lateral connection maps that clarify the number of homes and multi-family buildings that are currently connected to rear yard sewers and water mains. The majority of buildings in each block of the study area other than two are already connected to sewers in the street. It is recommended that rear yard sewers be lined and maintained on the following two blocks:

i) In Birmingham Villas, the block between Maple Rd. and Yosemite Blvd. (east of Adams Rd.).
ii) In East Maple Gardens, the block between Yorkshire Rd. and Maple Rd., and east of Eton Rd.

For the remaining blocks, when the long term cost of rehabilitating and maintaining rear yard sewers exceeds the cost of disconnecting the remaining buildings, a strong argument to abandon rear yard sewers can be made. It is recommended that the rear yard sewers in the other five blocks within East Maple Gardens be planned for abandonment according to the schedule referred to below. (In fact, since the two blocks to the east of St. Andrews Rd. already have no buildings connected to them, the Engineering Dept. plans to officially abandon the sewers on these two blocks in the upcoming 2011 sewer project currently being designed for construction next year.)

3) The study areas contain rear yard water mains as well as rear yard sewers. The City has already conducted rear yard water main abandonment programs in the recent past, with the successful 2005 project in the Acacia Park area, which involved rear yard water mains in six blocks of that neighborhood. Since disconnecting homes and buildings from rear yard water mains is not nearly as onerous or expensive as sewer connections, it is recommended that the City proceed with the plan to abandon these rear yard water mains.

SUMMARY

Supported by the Appendices and the HRC study, the following Master Plan is presented for consideration and approval by the City Commission. While the list of suggested projects requires significant funding on the part of the sewer fund, it will address several deficiencies in the infrastructure that will benefit the City and its property owners for many years to come. The system benefits that will be received, in order of priority, are:

- Rehabilitate or abandon all rear yard sewers and water mains to reduce the chance of system failures requiring emergency work and damage to private properties.
- Provide sewer capacity in areas where deficiencies are known to exist, while rehabilitating old sewers in the right-of-way where needed.
- Replace or rehabilitate permanent pavements and water mains in the study area that are also in need of work.
- Divert storm flows from large acreage areas to the Rouge River to assist in reducing ongoing sewage treatment and RTB maintenance charges.

B. IMPLEMENTATION AND TIME SCHEDULE

Code:

QL = Quarton Lake Subdivision
BV = Birmingham Villas Subdivision
EMG = East Maple Gardens Subdivision

(Cost estimate reflects sewer costs only; water main and pavement work not listed.)

YEAR	PROJECT DESCRIPTION	AREA	CONSTR. COST ESTIMATE
2011	Internally inspect all rear yard sewers not inspected in 2009 (not including those sewers scheduled to be abandoned).	QL BV EMG	$120,000
2012-2015	Excavate and repair rear yard sewers as needed, reline rear yard sewers, rehabilitate rear yard manholes (1/4 of total length each year for 4 years).	QL BV EMG	$600,000 per year
2012	E. Maple Rd. – Adams Rd. to Eton Rd. Upgrade sewer where needed. Replace water main, provide water services for all properties to start process of disconnection from rear. Replace pavement.	BV	$60,000
2013	Dorchester Rd. – Eton Rd. to Coolidge Hwy. Yorkshire Rd. – Eton Rd. to Coolidge Hwy. Install new water mains, provide sewer and water service laterals to property lines where needed to start process of disconnections from rear, replace cape seal.	EMG	$300,000
2014	Yosemite Blvd. – Adams Rd. to Columbia Ave. Villa Ave. – Adams Rd. to Columbia Ave. Old Salem Ct. – North End to Redding Rd. Install new water mains, provide water service laterals to property lines where needed to start process of disconnections from rear, replace cape seal.	BV QL	$0
2015	W. Maple Rd. – Chesterfield Ave. to Rouge River Upgrade/rehab. sewer system, selected water main improvements, pavement resurfacing.	QL	$460,000
2016	Oak St. – Glenhurst Dr. to Rouge River Install storm sewer, rehab. sanitary sewer, replace water main, pavement.	QL	$1,110,000

2017	Raynale St. – Glenhurst Dr. to Chesterfield Ave. Glenhurst Dr. – Raynale St. to Oak St. Brookwood – Glenhurst Dr. to Raynale St. Redding Rd. – Lakepark Dr. to Lakeside Dr. Install storm sewer, replace water main, pavement. Raynale St. – Chesterfield Ave. to Willow Lane Convert combined sewer to storm sewer.	QL	$460,000
2018	Westwood Dr. – Redding Rd. to Oak St. Glenhurst Dr. – Redding Rd. to Raynale St. Lyonhurst Rd. – Redding Rd. to Raynale St. Brookwood – Redding Rd. to Raynale St. Oak St. – Westwood Dr. to Glenhurst Dr. Install new storm sewer, replace water main & cape seal.	QL	$340,000

Note: - Although the plan view for Alternate E depicts installation of storm sewer improvements along the Pine St. corridor, this work is not listed on the above timetable. The City, as a general rule, does not install underground sewer or water improvements on an uncurbed, unimproved street unless a petition is received for that work. The majority of the drainage area upstream of the Pine St. corridor consists of such streets. Should that policy still be in effect at that time, the Pine St. corridor conversion would have to be postponed pending the installation of permanent pavements on the majority of these streets (south of Oak St. and west of Chesterfield Ave.) so that the currently functioning combined sewage overflow structure at Pine St. and Chesterfield Ave. could be disconnected.

Likewise, the remaining north/south streets in the Quarton Lake area between Chesterfield Ave. and the river are not specifically listed above, pending requests for permanent pavement from the residents. Once interest in such projects develops, the City will likely want to explore with the homeowners an alternative selection process that could include a traditional curbed street vs. a more LID (low impact development) approach, which would help reduce the strain on the downstream storm water quality interceptors, as well as the potential for pollutants into the river and lake.

The above noted policy was set aside for the 2014 project on Yosemite Blvd. and Villa Ave., to allow the City to take the rear yard water mains on these streets out of service, which otherwise may take many more years if the City is not pro-active on this issue.

APPENDIX A

POLICY STATEMENT REGARDING EASEMENT ACQUISITIONS WHILE MAINTAINING REAR YARD PUBLIC SEWERS

ROUTINE SEWER LINING

About 15% of the rear yard sewers in the Quarton Lake Subdivision have been lined. It is the intention of this plan to line all of the remaining rear yard sewers in this subdivision, as well as the sewers to be left in service in the Birmingham Villas and East Maple Gardens subdivisions. Using the other nearby jurisdictions that have lined sewers in rear yards within the last ten years as a guide, the following policy is suggested for lining sewers:

The current easement conditions within the subject areas breaks down as described:

Quarton Lake Subdivision

No Easement	52%
Five Foot Easement	48%

Birmingham Villas Subdivision

Eight Foot Easement (Vacated Alley) 100%

East Maple Gardens Subdivision

No Easement 100%

As shown above, about half of the proposed project has insufficient easements, while the other half has none. Either way, it is unclear that the easements as described give the City the right to access various locations by trespassing through side yards. The plats that have no easements will be referred to below as "Group A" for purposes of this discussion. The plats that have five foot public easements at the rear yard lot line (combined for a total of a ten foot wide easement) shall be referred to below as "Group B." The following process is recommended to acquire access:

1. Approximately one-fourth of the total sewers to be lined will be done in one year's contract, (about 8,000 ft. per year) with the goal of getting all lining done within a four year period, at a cost of about $600,000 per year.

2. Each manhole will be located by DPS staff early in the design process, with the suggested route or routes mapped out to best access each manhole. Alternate routes will also be identified when such alternates make sense. Several months prior to the proposed project, property owners involved in each preferred access route shall be contacted by the Engineering Dept. in writing with the request that they sign an easement similar to the one attached.

3. Within Group A, where no easements exist, a blanket easement form will be developed by the City Attorney's office. The blanket easement will ask the property owner to sign the easement, which will not designate a specific width along the rear of the property where the sewer exists. Rather, it will state that the owner grants the City the right to access their property (in general) only for the purposes of maintaining the rear yard public sanitary sewer. Statements shall be made within the document that the City shall be obligated to choose the "least impact" method for repairs at all times, and that all damages done to properties in the pursuit of sewer repairs shall be addressed by the City with no cost to the homeowner, provided full and unimpeded access is provided when needed. Easement documents shall be acquired from all homeowners prior to lining a particular sewer. Easement documents shall be recorded and run with the land.

4. Within Group B, where five foot public easements exist, properties along preferred access routes to manholes shall have the same blanket easement documents forwarded for signing. Properties between manholes (where no access is needed) will not be contacted.

5. The Engineering Dept. staff is small and is not able to expend large amounts of time acquiring easements. Should experience on the first round reveal that certain easements are requiring significant effort on the part of staff to obtain, then staff will have the right to contract with a private consultant that specializes in communicating and working with homeowners on easement acquisitions, working for a flat fee per easement obtained. Any such contract will have to be reviewed and approved by the City Commission.

6. The City routinely issues building permits to homes on properties where the rear yard sewer is functioning. Since the master plan will be endorsing the long term use of these sewers, the City has to have the ability to require the owner to provide an easement on the City's standard form granting a ten foot wide strip of land at the rear of the property for maintenance and access purposes. The form to be signed has generalized language that allows the City to use adjacent property as needed beyond the easement to access it (attached). Unlike the temporary easements referred to above, the easement form being used in this process allows for a recorded, permanent easement, worded such that the City has the right to access it via side yards as well. Many easements have already been obtained at no cost to the City using this process, when permits are requested for either complete new home construction, or for additions or major improvements to the property where the Engineering Dept. has participated in the review. On a rare occasion, the owner has taken issue to this request, and has refused to sign the easement form, claiming that such an act reduces the value of the property. By approving the Master Plan, the City Commission will be endorsing this policy, thereby encouraging staff to withhold the issuance of such permits until such easement requests are signed.

MAIN LINE SEWER REPAIRS

As discussed elsewhere in this report, the City staff will make every effort to repair rear yard sewers without the use of excavation. However, should locations be identified within Group B that must absolutely be excavated, the City will work to obtain an easement. (The blanket easements being acquired for all Group A properties would cover this issue for all Group A properties.) The easement will be considered temporary in nature, and will expire after the work is completed. Should the owner not wish to grant the easement, the consultant referenced above in number 4 would be retained to assist in the effort. If this second effort also fails, the City will review with legal counsel the advisability of proceeding to condemnation.

APPENDIX B

QUARTON LAKE TELEVISED SEWER INSPECTION PILOT PROJECT

APPENDIX C

POLICY STATEMENT REGARDING EXCAVATIONS WHILE REHABILITATING BACK YARD PUBLIC SEWERS

Once the City has made a decision to repair and continue the operation of back yard public sewers, an operating policy must be prepared that considers the following factors:

1. All City sewers shall be repaired and left in a condition as close to "as new" as possible to allow for optimum performance and reduced maintenance schedules for decades to come.
2. Homeowners that are relying on clogged, damaged, or poor performing sewer service laterals need to be provided the opportunity to repair them at an efficient, reasonable cost. Further, if a poorly maintained sewer lateral connection will result in root infestation returning to the main line sanitary sewer, the City needs to have the right to access and repair the lateral in such a manner that removal of the roots can be assured.
3. Excavations and damage to private property must be avoided wherever possible.

A fine line must be found that best respects these competing objectives. The following policy statements have been developed as a suggested direction to take that hopefully finds the best approach for all parties concerned. The statements have been split into two parts, the first considering the goal of repairing the City main line sewers, the other considering the goal of repairing private sanitary sewer laterals.

MAIN LINE SANITARY SEWER REPAIRS

During discussions with the Streets, Sewer, and Water Ad Hoc Committee, the general understanding was that if all the back yard sewers were repaired and lined, there could be approximately 25 locations where an excavation crew would have to enter a rear yard location and perform an excavation prior to lining, due to the poor condition of the pipe. After exploring this issue further with other cities that have lined rear yard sewers, the City now feels that this number can be substantially reduced, leaving the option open for only a small number of locations where pipe may be found to be crushed or collapsed. The following policy position is provided:

1. The majority of defects found in these back yard sewers can be categorized as:

    a. Cracked pipe that has formed voids to the sides or top of the sewer.
    b. Sewers with poor grade where the slope of the pipe is either too flat or uphill, resulting in standing water conditions.

a. Cracked Pipe and Voids:

The City sewer has several locations where portions of the pipe have cracked over the years, or in extra bad areas, pieces of pipe have fallen out. Typically, the soil behind the pipe has washed out to some degree, but there is enough stiffness in the soil beyond the trench that has not been weakened, that it forms a bridge over the pipe opening. The liner can be designed with the appropriate amount of stiffness so that when sections of missing pipe are encountered (typically less than 12 inches long), it will maintain the typical shape of the pipe through these locations. The liner may have a "dimple" form where there is no original pipe for the liner to rest against, but this will not result in a measurable defect in performance.

By passing through these multiple locations, excavation can be avoided. There is some risk in the future that the soil behind these locations will continue to shift and fill in the area behind the new lined pipe, which may result in some settlement that could in time reach the surface. Settlement problems of a minor nature will be considered the homeowner's duty to repair as they see fit. If major settlement is found, further investigation would be warranted to ensure the ongoing integrity of the City sewer and/or the homeowner's sewer lateral.

b. Sewers with Poor Grade:

Sewers with nearly flat or uphill sections result in standing water conditions. When sewage encounters a standing water condition, it tends to stand still for a time until enough flow is present to push it further downstream. Sewage standing still results in solids being left in the low spot in the pipe. Repeated deposition of sewage in the pipe eventually results in clogged pipe if not maintained on a regular basis.

Poorly draining sewers are a common reason that high maintenance sewers must be cleaned on a regular basis. The majority of the rear yard sewers, particularly in the Quarton Lake subdivision, are cleaned on a short time rotation of either two or four months, which results in high labor and equipment costs for the City. The high frequency has been developed to help avert past problems of sewers getting clogged, resulting in the possibility of property damage. Lining the sewers will allow for the flow characteristics to improve such that cleanings should be reduced. However, when dips in the pipe are not addressed, there will still be the propensity for sewage to sit in low spots, which will still require more frequent cleanings than a newly installed modern sewer. How much time the sewers can go without cleaning (after lining) will be something that will have to be determined on a street by street basis once the lining has been done, and the amount of solids being left in low spots can be determined.

2. The majority of sewers being discussed are small 8 inch diameter pipes. The only sewer that is larger is the section under discussion in the Birmingham Villas Subdivision

between Maple Rd. and Yosemite Blvd. When dealing with small pipe, there is not a lot of room for water to get through should a pipe section be crushed or collapsed. Due to the inability to properly send a liner through a severely damaged pipe, such a location would require an excavation. As noted in the main report, about 10% of the Quarton Lake Subdivision sewers were inspected in 2009. None of these sewer segments contained such sections that would warrant an excavation at that time, which is encouraging. However, the possibility remains large that there will be some locations that cannot be lined, and excavation will be required. If the remaining sewers are all inspected at one time (recommended for 2011), and even if no locations are located at that time, it will still be as many as four years (if the master plan is followed) before all sewers are lined. During the interim, problems could develop that may not be discovered until the lining contractor performs their preparatory inspections. It is recommended that the lining contracts have bid quantities established in the proposal that will establish a set price for a sewer point repair in a rear yard, payable by the location (up to 20 feet long). A separate price for topsoil and sod repair would also be established, payable by the square yard. Should more unique items such as special shrubbery, trees, pavements, etc., have to be removed, these would likely be repaired on a negotiated basis with the individual property owner. Depending upon the complexity of the items, the City would consider establishing a value to be reimbursed, and then allow the homeowner to arrange the repairs at their discretion.

It is also important to note that the rear yard sewers in both Quarton Lake Estates, and in East Maple Gardens, tend to flow in one direction for a half mile before terminating. The rear yard sewers tend to cross rights-of-way such as Raynale St. or Pine St. (in Quarton Lake), or St. Andrews Rd. (in East Maple Gardens). Should we locate bad sections of pipe, or even dips worthy of repair, they should be identified for point repairs due to their easy access, prior to lining.

PRIVATE SEWER LATERAL REPAIRS

Whenever the City is replacing sewer in the right-of-way, defects found at the connection between the sewer lateral and the main line sewer are repaired at City expense. Whenever a street is being replaced in its entirety, the City now requires the adjacent property owner to pay the contractor's per linear foot cost to remove and replace the pipe (if the existing is over 50 years old), payable by special assessment. The policy is good for the homeowner in that it allows a maintenance problem to be addressed at a cost typically 20% to 40% of the cost that they would pay on their own. The policy is good for the City because it reduces the chance of a new pavement being cut open in the future for repairs to the laterals. In the back yards, there are several differences that need to be considered when developing a repair policy:

1. The lateral is entirely on private property. The City has no responsibility to replace either the sewer or the improvements above it on grade. In fact, the City does not have legal access to the sewer lateral unless it is voluntarily provided by the property owner.
2. Restoration costs incurred while making sewer lateral repairs is not a cost that would be present otherwise. Restoration costs cannot be redirected to other City funds, such as on a street paving project.
3. Repair of the sewer lateral through various means is truly a decision best made by the owner, as the performance of the lateral does not affect any other party, except at the tap.

As mentioned in #3 above, the City has an interest in the quality of the tap, or connection, of the lateral to the City sewer. Therefore, the following policy points are provided with the thought that it is in the City's best interest to make the lowest cost repair of the sewer tap area possible, while providing homeowners cost efficient voluntary options to repair their sewer lateral as well.

Sewer lateral connections at the City sewer will be in varying conditions. For example, using the data found in 2009 internal inspections that were made, the following was found on these City sewer segments:

Homes Within Service Area: 72
Capped, Inactive Services: 64
Active Services: 59 (of which 24 were factory made wyes, 35 were "break-in" taps)
Active Services with Roots: 15 (25%)
Active Services with Protruding Taps: 8 (14%)
Active Services that are Misaligned: 0 (0%)

Capped services are easily covered over as a part of the lining process. Protruding taps would be ground down by the lining contractor prior to sending the liner down the pipe, so it is not compromised. After the liner has hardened, the lining contractor sends a small robot down the sewer, and cuts open the active sewer connections to allow drainage into the sewer to resume. The following policy will be followed with respect to repair of sewer lateral connections:

1. ALL SEWER LATERAL CONNECTIONS

   Regardless of what condition the tap is found, all homeowners with aging sewer laterals should be offered the opportunity to have it lined. A database showing the age of each sewer lateral within the rehabilitation area will be developed. All sewer laterals over 30 years old should be offered a voluntary option to have a cleanout installed, and the existing sewer lateral relined. The offer to be involved would be similar to our current program offering homeowners the chance to contract with the contractor directly to upgrade their water service to 1 inch dia. The contractor would prepare a standard contract stating the terms, and what is offered, and the unit price being made available. The contract would likely require all surface restoration items

to be handled separately by the homeowner after the sewer lateral lining is complete. However, since only a cleanout is installed at the surface, damage should be minimal. The contractor would be required to get a plumbing permit for each job, at the normal rate.

2. SEWER LATERAL CONNECTIONS WITH VISIBLE ROOTS

While roots growing into the City sewer from a lateral can result in impaired performance to the main line sewer, it is important to develop a repair method that keeps unwanted damage to rear yards to a minimum. First, all roots that can be removed from the main line sewer using the lining contractor's normal equipment will first be done. After this step, the camera would be sent down the pipe, and each sewer lateral would be photographed. If it appears that the lateral has visible roots within it, as seen from the main line sewer, a photograph will be taken. The picture would be mailed to the owner of the home being serviced by the subject lateral, recommending that they contract with the liner contractor to have their service relined. (Using another contractor would be an option as well, provided the work is approved by the City, and confirmed as complete using the owner's contractor's camera inspection as a record.) If the owner does not respond voluntarily to the suggested repair within 30 days, they would be added to a recommended special assessment district. The assessment district would have two options:

a. If the owner is willing to give a temporary easement for the contractor to install the cleanout and have the lateral lined, the same lining process would proceed as it would have had the owner accepted the voluntary offer to contract for this service. However, now, the work would be done and paid for under a City contract, and the homeowner would be able to finance the cost through the City's normal 10 year special assessment payback procedure (the cost may be higher, however, due to the need for the contractor to remobilize to the work site).
b. If the owner refuses to give a temporary easement, then the sewer lateral would not be relined. However, the household would be added to a maintenance special assessment district. Here is a suggested example of how the maintenance assessment district would work:

   After the first year of lining, about 25% of the rear yard sewers would be lined involving 145 homes. Of those 145, 36 were identified as having root infestation in their sewer lateral. Of those 36, 30 homes voluntarily, or through the assessment process, had their service laterals lined at their expense. The remaining 6 owners that refused to allow access would become a part of the maintenance special assessment district. The Dept. of Public Services would be notified where the 6 homes are, and would put the subject City sewers on a one-year rotation for cleaning and televising (the frequency could be adjusted up or down based on a camera

inspection completed after one year). The cost to enter the subject sewer segments with maintenance equipment and remove the roots from the City sewer would be added up, including the cost of labor and equipment using standard charge out rates. The cost for the work for that year would be evenly divided by the 6 homeowners and billed to them as a special assessment. The estimated cost, using this example, would be $136 per year per assessed home. Therefore, those homeowners not willing to cooperate would be responsible for the additional cost of maintaining the sewers.

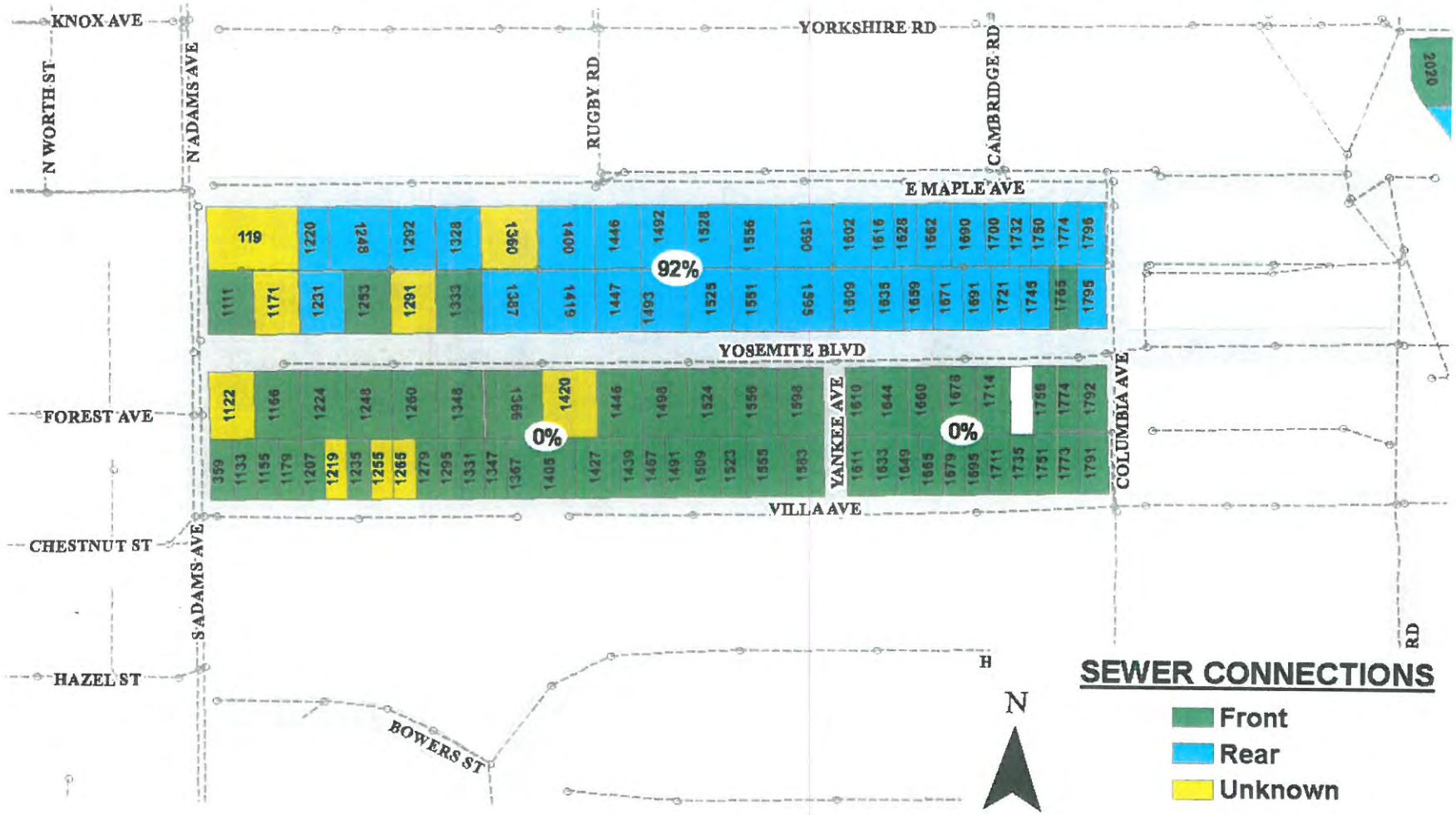
3. MISALIGNED SEWER LATERAL CONNECTIONS

Although none of the sewer laterals in the 2009 pilot area had this condition, it is highly likely that a small number will be encountered over the course of the project. As viewed from the camera in the City sewer, a misaligned sewer lateral will appear as though the pipe forming the lateral has shifted either down, or to one side, making the effective opening available for sewage to flow reduced in size. While the shift may have occurred years ago, and is now stable, it is also possible that the shift is still in progress, and is getting worse with time. The City will be able to prepare a still photo of the misaligned pipe. A letter of explanation will be forwarded to the homeowner with the photo attached. The City will suggest that it is in the homeowner's best interest to have the tap excavated and repaired at their expense. A unit price to repair a sewer tap will be a bid contract item. Surface restoration will not be the contractor's responsibility, but will be handled by the homeowner after the repair is done. Due to the need to review the details with the homeowner, as well as reviewing details and problems that may arise depending on the location of the tap, this work will go through the City's contract. The City will be the billing agent, and will add a 15% administration fee. The homeowner's participation would be voluntary, as this work is not something that will impact the integrity of the City sewer if it is left undone. The homeowner will also have the option of hiring their own contractor. The normal permit and inspection fees will apply.

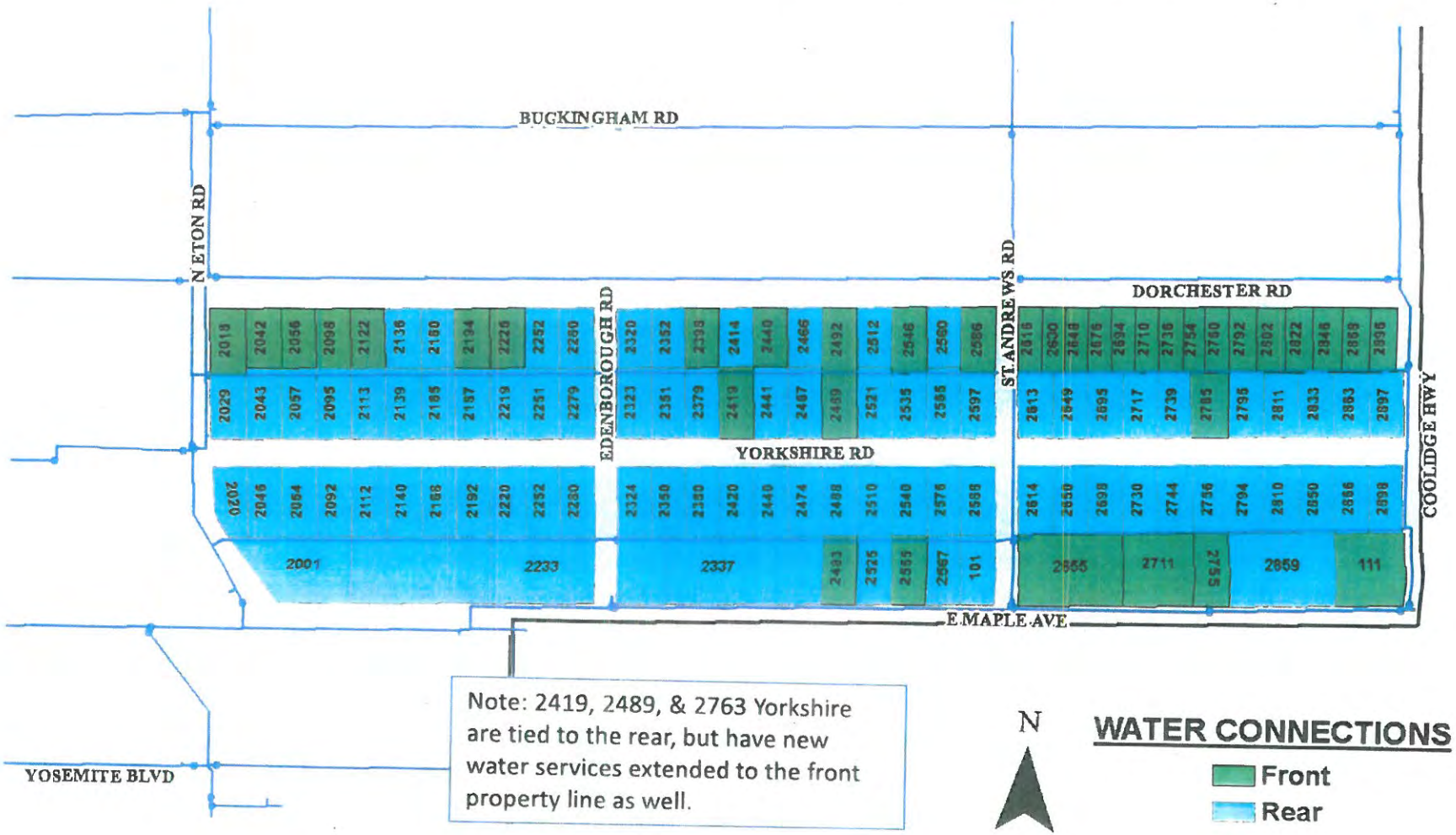
E. MAPLE GARDENS
SEWER CONNECTIONS MAP

APPENDIX D

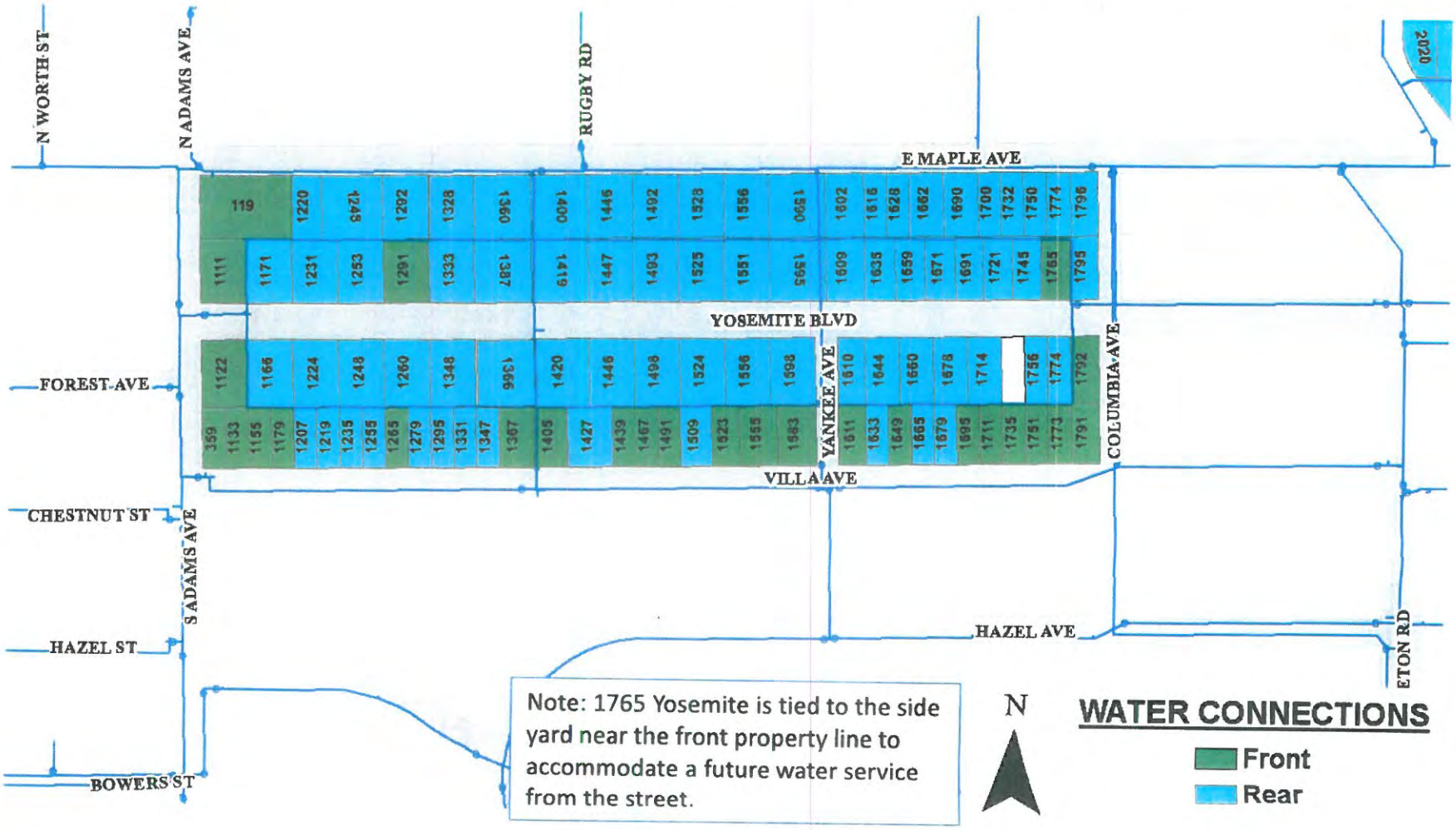
BIRMINGHAM VILLAS
SEWER CONNECTIONS MAP



E. MAPLE GARDENS
WATER CONNECTIONS MAP



BIRMINGHAM VILLAS
WATER CONNECTIONS MAP



Quarton Lake Area Storm Relief Sewer Study

FOR THE

City of Birmingham
A Walkable Community

CITY OF BIRMINGHAM

JULY 2010 (DRAFT)
SEPTEMBER 2010 (FINAL)

Prepared by:

HRC

HUBBELL, ROTH & CLARK, INC.
Consulting Engineers
555 Hulet Drive • P.O. Box 824
Bloomfield Hills, MI 48303-0824

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Section 1 - Introduction

On March 8, 2010, the City Commission for the City of Birmingham authorized the completion of the Quarton Lake Sewer System Study to evaluate the feasibility and impact of constructing a storm relief sewer system in the subdivisions west of Quarton Lake. The Study would serve as an update to the Engineering Feasibility Study for infrastructure improvements (sewer, water & streets) in the Quarton Lake Area completed in October 2008.

The Study Area consists of the neighborhoods west of Quarton Lake, roughly bounded by Quarton Road to the north, Maple Road to the south, Quarton Lake/Rouge River to the east, and Chesterfield Road to the west. The Study Area is expanded from Chesterfield Road to the western City Limits for evaluation of a second storm relief sewer alternative. The Study Area is depicted on Figure 1.

The entire Study Area lies within the Evergreen Farmington Sewage Disposal District (EFSDS) that collects sanitary sewage and transports it to the Detroit Water & Sewerage Department (DWSD) sanitary interceptor network, which eventually drains to the DWSD wastewater treatment plant in Detroit. The EFSDS is operated by the Oakland County Water Resources Commissioner (OCWRC), and serves fifteen communities in Oakland County. The City of Birmingham operates a combined sewer system, where sewage and storm water are collected in the same network of pipes. During dry weather, the collected sewage discharges to the EFSDS. During wet weather, as flows increase in the combined sewer system, some of the flow is diverted to a retention treatment basin (RTB) where it is either temporarily stored until flows decrease in the EFSDS, or during certain high-intensity rainfall events, overflows to the Rouge River after primary treatment and disinfection. Construction of three RTBs along the Rouge River was completed by OCWRC in the mid to late 1990s serving the combined sewer communities within the EFSDS. Portions of the City of Birmingham are tributary to each of the three basins, and in particular, the part of Study Area east of Chesterfield drains to the Birmingham CSO RTB, while the area west of Chesterfield drains to the Bloomfield Village CSO RTB. Figure 1 also shows these pertinent features of the sewage collection system.

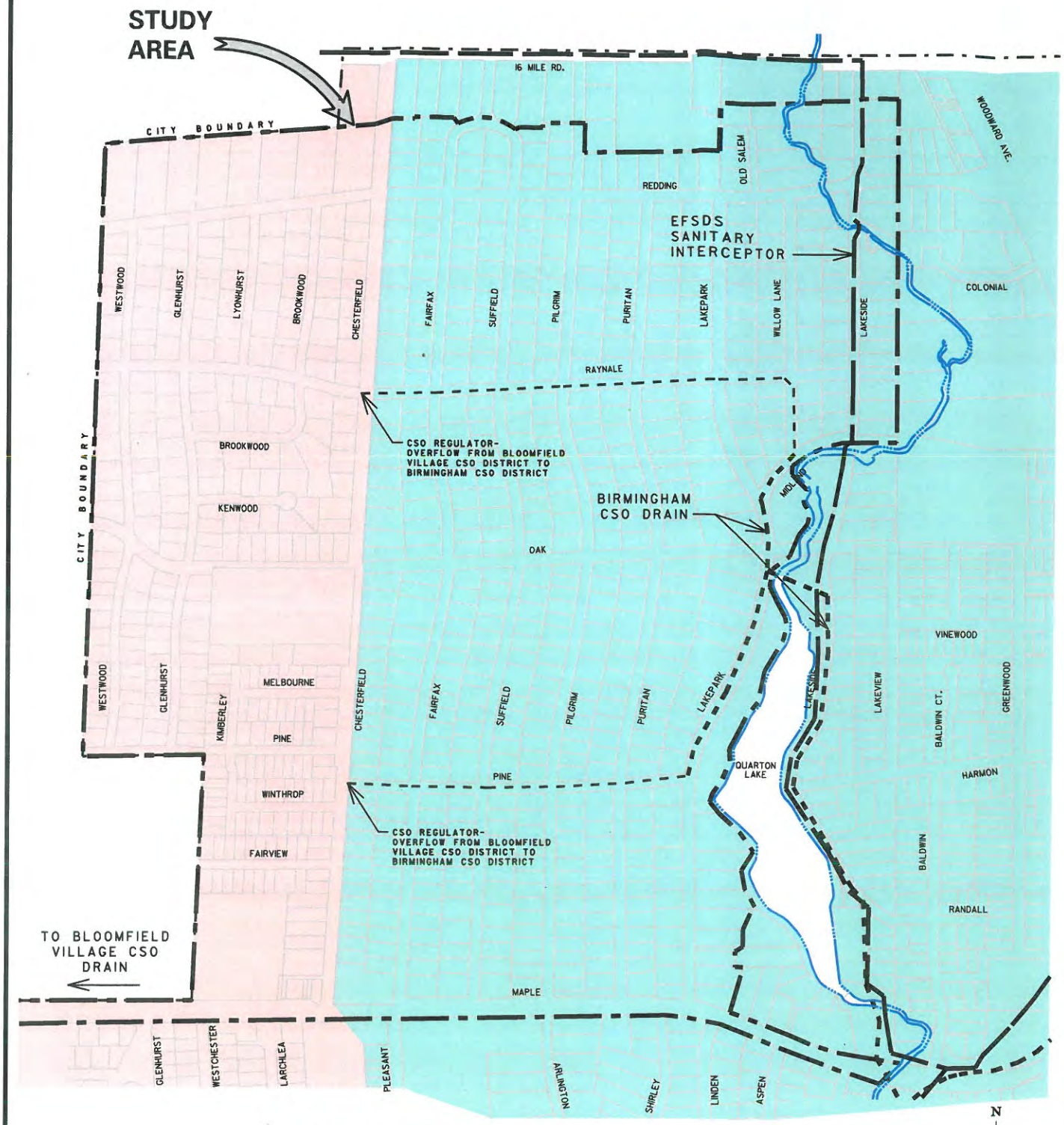
In the past sewage disposal costs in the EFSDS were billed to communities on the basis of water consumption as recorded by each community's master water meter. OCWRC is in the process of changing the billing system that will be based on the metered flow in the EFSDS. While the combined sewer communities were previously charged for the storm water present in the combined sewers under a "storm water surcharge" or for measured flow when the RTBs were dewatered back into the EFSDS, the EFSDS

meter-based billing will result in an increase of sewage charges to the combined sewer communities as compared with what they had been billed in the past.

This change in the billing method was not implemented when the previous Quarton Lake Area study was completed in 2008, and the long-term impact of the increased sewage disposal costs in the district may affect a basic assumption made in the previous study. Because of the large investment made by the City of Birmingham in the three RTBs that would allow the City to maintain its combined sewer system as opposed to a more costly sewer separation program, the sewer improvements recommended in the 2008 study assumed that the current division of surface drainage area between the combined sewers and the existing storm sewers on Redding, Midland, Oak, and Pine would not be changed.

The purpose of this report is to develop feasible storm relief sewer alternatives that would increase the amount of surface drainage from the Study Area to outlet to the Rouge River/Quarton Lake, and in turn will reduce the amount of storm water in the combined sewer system that has to be disposed of in the EFSDS. This report will estimate the potential cost savings that may be achieved by the removal of storm water from the EFSDS. This will be compared to the costs estimated for the construction of the storm relief sewer alternative.

Increasing storm water flow to the River/Lake will have an environmental impact on Quarton Lake, which has also been significantly invested in by the City, and the Study will address the impact and long-term maintenance costs associated with mitigating the negative impacts. In addition, removal of storm water from the Bloomfield Village CSO Drain system would result in a decrease of the City's apportionment for operation and maintenance cost. The Study can be considered as an update to the 2008 Study, which can be referenced for further information and background on the Quarton Lake Area.



QUARTON LAKE AREA SEWER STUDY PROJECT AREA

CITY OF BIRMINGHAM

JOB NO.	DATE	FIGURE
20100145	JULY 2010	1

HRC
HUBBELL, ROTH & CLARK, INC
Consulting Engineers
555 HULET DRIVE P.O. BOX 824
BLOOMFIELD HILLS, MICH. 48303 - 0824
PHONE: (248) 338-9241
FAX (1st. Floor): (248) 454-6312
FAX (2nd. Floor): (248) 338-2592
WEB SITE: http://www.hrc-engr.com

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Section 2 - Summary & Conclusions

In this Study, two storm relief sewer alternatives were preliminarily developed to address the sewer system needs in the Quarton Lake area. This Study serves as an update to the Engineering Feasibility Study for infrastructure improvements (sewer, water & streets) in the Quarton Lake area that was completed in October 2008. In the 2008 Study, the distribution of surface drainage area between the combined sewer system and existing storm sewers was not significantly altered. The two storm relief sewer alternatives developed herein will increase the drainage area to the Rouge River and Quarton Lake, and reduce the area tributary to the combined sewer system. The feasibility of these alternatives are being explored because of the rising sewage disposal costs being incurred in the Evergreen Farmington Sewage Disposal System (EFSDS). This report only addresses the engineering and technical aspects of this project. As with any major public undertaking, other factors will have a significant influence that must be considered by the decision makers, including legal issues, funding alternatives, and political ramifications.

The sewers in the Study Area have generally exceeded their expected design life of 50 years, and should be rehabilitated or replaced when streets are reconstructed or as the need arises. The sewers in the Study Area are mostly combined sewers (carry both sanitary and storm flows), with some separate storm sewers on Redding and Oak that outlet to the Rouge River or Quarton Lake. Most of the homes in the Study Area east of Chesterfield are served by sanitary sewers located in the rear-yards.

As part of the 2008 Study, sewer system improvement alternatives were developed centered around the question as to whether these rear-yard sewers should be maintained or abandoned. The majority opinion of the ad-hoc committee formed to address these issues was to maintain the rear-yard sewers, as represented by sewer system improvement Alternative A. The minority opinion of the ad-hoc committee, as well as that of the City staff, was to abandon the rear-yard sewers and install new combined sewers on all of the streets, as represented by Alternative B. However, the change in the billing methodology combined with strong public sentiment against this option, helped initiate the idea to consider the storm relief sewer alternatives. Alternative C was a combination of Alternatives A and B, maintaining the rear-yard sewers for a period of time long enough to allow homeowners to reconnect their sewer services from the rear-yard sewers to the new street sewers. Alternative C was not supported by any members of the ad-hoc committee or City staff, and is no longer under consideration. The two storm relief sewer alternatives developed herein provide for maintaining the existing rear-yard sewer network, and are comparable in scope to Alternative A, except that the drainage area tributary to Quarton Lake will be expanded.

For the existing rear-yard sewers, rehabilitation of the sewers is critical for maintaining the long-term confidence in the public sewer system. However, uncertain easement conditions, if easements exist at all, increase the risk to the City for operating and maintaining the sewer system. Answering the questions related to the easement issues is beyond the scope of this Study, but will be essential in developing a more specific scope of work for addressing the sewer needs in the Study Area.

TREATMENT COST FOR STORM WATER

The portion of the Study Area east of Chesterfield is located within the Drainage District for the Birmingham CSO Drain, and west of Chesterfield is in the Drainage District for the Bloomfield Village CSO Drain. In both districts, sanitary waste is disposed of in the EFSDS. In the past, sewage costs were billed to the City based on water consumption (as measured from the City's master water meter records) plus a storm water surcharge for operating a combined sewer system. The billing of sewage costs in the EFSDS will use a sewage meter-based method in the future, which accounts for all of the flow in the sewer in the same manner, whether sanitary flow or storm flow, and results in a significant increase in charges to the City.

Based on data provided by OCWRC for the percentage of quarterly rainfall captured by the combined sewer system (as measured at the three retention treatment basins), an estimate was made of what the disposal costs of this captured storm water could be for the Study Area. With the existing distribution of drainage area between the storm sewer outfalls (63 acres) and the combined sewer system (335 acres), the estimated annual cost of sewage disposal of storm water generated from the Study Area can range from $60,000 to $123,000.

There are also costs to the City associated with discharging storm water to the river/lake. With each alternative developed, an end-of-pipe storm water quality manufactured treatment device (SWQMTD) is included at each outfall to the river/lake to mitigate negative environmental impacts related to increasing the surface runoff. Each of these devices requires bi-annual inspection and removal of accumulated sediment and debris. The annual maintenance cost for each device is estimated to be $3,200.

APPORTIONMENT COSTS FOR RTB O&M

Both combined sewer drainage districts have a retention treatment basin (RTB) built to collect wet weather flows that exceed the capacity of the connections to the EFSDS. For many smaller storm events, the excess flow is collected in the RTB and then pumped back to the EFSDS after the flow in the interceptor recedes. During certain, extreme storm events, the flow collected by the RTB exceeds its storage capacity and will overflow to the Rouge River. Prior to any overflow from the RTB, the waste water receives primary

treatment (settlement & skimming) and disinfection in accordance with the NPDES Permit issued by the Michigan Department of Natural Resources and Environment (MDNRE).

The RTB's are operated and maintained by the Oakland County Water Resources Commissioner (OCWRC). The cost for operations and maintenance of the RTB's is apportioned to the communities or agencies that are responsible for contributing flow to each of them. For the Birmingham CSO RTB, 96.86% of the O&M costs are apportioned to the City of Birmingham. For the Bloomfield Village CSO RTB, Birmingham's share of the O&M costs 22.905%.

With construction of either storm relief sewer Alternative D or E, the amount of land area tributary to the combined sewer system, and ultimately to each of the RTB's will be reduced. In the Bloomfield Village CSO Drainage District, this would result in reducing Birmingham's share of the O&M costs to 20.464% or 16.987%, respectively. Based on the latest billing information made available (first quarter, 2010), the resulting annual savings to the City of Birmingham would be $18,000 with Alternative D, or $56,000 with Alternative E.

COMPARISON OF ALTERNATIVES

For the purpose of evaluation, it is assumed that the improvements in Alternative A can be considered as the "base" plan, and the two storm relief alternatives will be compared to it with respect to estimated construction cost and potential savings resulting from removal of storm water from the EFSDS. With all of the alternatives, it is assumed that streets would be reconstructed to the City-standard cross-section with curb and gutter, and road grading would be improved to increase the efficiency of capturing storm runoff, thereby increasing the amount of rainfall that could be collected by 25%.

- **ALTERNATIVE A (2008 STUDY) UPDATE**

  The sewer system improvements included in Alternative A include construction of new storm sewers in the streets to handle storm drainage for the area. New sewers are sized to provide the necessary capacity relief for the 10-year design storm. With this alternative, relief will be provided for the Quarton Lake area east of Chesterfield Road, consisting of approximately 580 residences. The preliminary estimated construction cost for Alternative A is $6,533,000. The storm sewer outfalls to the Rouge River or Quarton Lake on Redding and Oak will be maintained, otherwise the new storm sewers on other streets will discharge to the Birmingham CSO Drain system. The estimated annual cost of sewage disposal for storm water captured from the Study Area after implementation of Alternative A (332 acres remaining

tributary to combined system) can range from $78,000 to $151,000. With Alternative A, two SWQMTDs are included at Redding and Oak, with an annual maintenance cost estimated to be $6,400.

- **ALTERNATIVE D – STORM RELIEF SEWER (EAST OF CHESTERFIELD)**

  The sewer system improvements included in Alternative D are functionally similar to those in Alternative A, except that additional outfalls to the river/lake are proposed at Midland, Pine and Maple to maximize the amount of storm flow that can be removed from the combined sewer system. New sewers are sized to provide the necessary capacity relief for the 10-year design storm. With this alternative, relief will be provided for the Quarton Lake area east of Chesterfield Road, consisting of approximately 580 residences. The preliminary estimated construction cost for Alternative D is $6,703,000. In addition to the storm outfalls at Redding and Oak, new outfalls would be installed at Midland, Pine and Maple, thereby reducing the drainage area to the Birmingham CSO Drain system. The estimated annual cost of sewage disposal for storm water generated from the Study Area after implementation of Alternative D (172 acres remaining tributary to combined system) can range from $38,000 to $80,000. With Alternative D, five SWQMTDs are included at Redding, Midland, Oak, Pine and Maple with an annual maintenance cost estimated to be $16,000. When compared to Alternative A, the potential annual savings associated with removing storm water from the combined sewer system can range from $40,000 to $71,000.

- **ALTERNATIVE E – STORM RELIEF SEWER (WEST CITY LIMITS TO QUARTON LAKE)**

  The sewer system improvements included in Alternative E are functionally similar to those in Alternative D for the area east of Chesterfield, except that the storm relief sewers are extended to relieve the areas west of Chesterfield, and existing sewers on Raynale/Willow Lane and Pine would be converted to storm sewers. New sewers are sized to provide the necessary capacity relief for the 10-year design storm. With this alternative, relief will be provided for the Quarton Lake area both east and west of Chesterfield Road, consisting of approximately 930 residences. The preliminary estimated construction cost for Alternative E is $7,705,000. In addition to the storm outfalls at Redding and Oak, new outfalls would be installed at Midland, Pine and Maple, thereby reducing the drainage area to the Birmingham CSO Drain and Bloomfield Village Drain systems. The estimated annual cost of sewage disposal for storm water generated from the Study Area after implementation of Alternative E (102 acres remaining tributary to combined system) can range from $17,000 to $38,000. With Alternative E, nine SWQMTDs are included at Redding, Midland, Oak, Pine and Maple with an annual maintenance cost estimated to be $28,800. When compared to Alternative A, the potential annual savings associated with removing storm water from the combined sewer system can range from $55,000 to $104,000.

- **SEWER SYSTEM IMPROVEMENTS – BLOOMFIELD VILLAGE CSO AREA**

  With the proposed storm relief sewers west of Chesterfield, Alternative E will benefit a larger area than Alternative A or D alone. In order to make an equivalent comparison between all the alternatives, the future sewer system improvements needed in the Bloomfield Village CSO Drain District area (west of Chesterfield, north of Maple) would have to be considered, and the costs for which would be added to those for Alternative A and Alternative D. The proposed improvements would include new combined and storm relief sewers that would remain connected to the combined sewer system and the Bloomfield Village CSO Drain. New sewers are sized to provide the necessary capacity relief for the 10-year design storm. The rehabilitation of existing combined sewers that would remain in service are also included in these improvements. With these improvements, relief will be provided for the area west of Chesterfield Road and north of Maple Road, consisting of approximately 350 residences. The preliminary estimated construction cost for the future Bloomfield Village CSO Area sewer improvements is $2,601,000, and would be added to the costs estimated for Alternative A and Alternative D for the purpose of comparison in this Study.

The preliminary estimated costs are summarized in Table 2.1, and more details are provided in the separate sections of this Report.

Table 2-1 – Storm Relief Sewer Summary

	EXISTING CONDITION	ALTERNATIVE A (FROM 2008 STUDY)	STORM RELIEF SEWER ALTERNATIVE D	STORM RELIEF SEWER ALTERNATIVE E
Tributary Area to Storm Sewer Outlets to Rouge River/Quarton Lake	63 acres	80 acres	228 acres	307 acres
Tributary Area to Combined Sewer - Birmingham CSO Drain	155 acres	182 acres	27 acres	27 acres
Tributary Area to Combined Sewer - Bloomfield Village CSO Drain	180 acres	150 acres	145 acres	75 acres
Estim. Savings in Annual Sewage Charges (2010 $'s, low-end of range)	-	$ (18,000)	$ 39,900	$ 54,900
Estim. Savings in Reapport. BVD RTB Annual O&M Charges	-	$ 5,600	$ 18,000	$ 56,300
Estim. Annual Maintenance Cost for SW Quality Treatment Measures	-	$ 6,400	$ 16,000	$ 28,800
Potential Net Annual Savings after Implementation	-	$ (18,800)	$ 41,900	$ 82,400
Prelim. Construction Cost Estimate - Initial Phase QL Sewer Work	-	$ 2,191,800	$ 2,377,100	$ 2,658,500
Prelim. Construction Cost Estimate - Secondary Phase QL Sewer Work	-	$ 1,481,400	$ 1,395,000	$ 1,597,800
Prelim. Construction Cost Estimate - QL Sewer Rehabilitation Work	-	$ 2,859,400	$ 2,931,100	$ 3,356,750
Sub-Total Preliminary Construction Cost Estimate for Quarton Lake Area	-	$ 6,532,600	$ 6,703,200	$ 7,613,050
Prelim. Construction Cost Estimate - Future Sewer Relief BVD District	-	$ 2,275,300	$ 2,275,300	-
Prelim. Construction Cost Estimate - Future Sewer Rehab. BVD District	-	$ 325,650	$ 325,650	-
Total Estimated Construction Cost	-	$ 9,133,550	$ 9,304,150	$ 7,613,050
Administration, Engineering, Legal, Cap. Interest & Contingencies (35%)	-	$ 3,196,700	$ 3,256,500	$ 2,664,600
Total Estimated Project Cost	-	$ 12,330,250	$ 12,560,650	$ 10,277,650
Number of Residences Benefitted with Implementation of Project	-	580 (QL) 350 (BVD)	580 (QL) 350 (BVD)	930 (QL + BVD)
Project Cost per Residence Benefitted	-	$ 13,258	$ 13,506	$ 11,051

DISCUSSION OF FOOTING DRAIN REMOVAL

With each of these alternatives, some storm flow will remain in the combined sewer system. Even if all the catch basins in the area were disconnected from the combined sewer, storm flow continues to enter the system from connected footing drains and through joint leaks or defects in the sewer pipes. Experience has shown that footing drain removal programs in the region are only cost-effective when a number of circumstances are met. In a separated sanitary system, the flow from footing drains may significantly contribute to sanitary sewer overflows (SSOs) or basement flooding and the operating municipality may be subject to fines. Birmingham operates a combined sewer system that has been sized to accommodate a large amount of storm flow, so even if basement flooding occurred, it is usually not attributed to the accumulated effect of the footing drain connections, but rather to excess flow entering the system at the catch basins.

Another major factor in the cost-effectiveness of footing drain removal programs are the ground conditions, both at the surface and below. Areas that have poorly graded lots and clayey soils generally have more success in a footing drain removal program. In the Quarton Lake area, many lots are well graded and it is believed that a sandy layer of soil exists near the surface that allows more infiltration than may occur in other parts of the City.

The cost per home to remove the footing drain connection from the sanitary service and install a new sump pump system can be estimated at $10,000 to $15,000 per home. With 580 homes in the Quarton Lake area, the cost for a comprehensive footing drain removal program would likely be $6 million to $9 million, and would therefore not be a cost-effective solution for removing additional storm water from the combined sewer system. However, when new homes are built or significantly rebuilt and there is a storm sewer present in front of the home, it would be prudent to have the homeowner install a sump pump system for their footing and basement floor drains that can outlet to the storm sewer. This would benefit the homeowner by reducing the risk of basement flooding due to sewer backups (eliminating a hydraulic connection between the combined sewer system and the floor drains), and would benefit the City by reducing the amount of storm flow entering the combined sewer system.

Section 3 - Treatment Cost for Storm Water

The entire Study Area lies within the Evergreen Farmington Sewage Disposal District (EFSDS) that collects sanitary sewage and transports it to the Detroit Water & Sewerage Department (DWSD) sanitary interceptor network, which eventually drains to the DWSD wastewater treatment plant in Detroit. The EFSDS is operated by the Oakland County Water Resources Commissioner (OCWRC), and serves fifteen communities in Oakland County. The City of Birmingham operates a combined sewer system, where sewage and storm water are collected in the same network of pipes. During dry weather, the collected sewage discharges to the EFSDS. During wet weather, as flows increase in the combined sewer system, some of the flow is diverted to a retention treatment basin (RTB) where it is either temporarily stored until flows decrease in the EFSDS, or during certain high-intensity rainfall events, overflows to the Rouge River after primary treatment and disinfection. Construction of three RTBs along the Rouge River was completed by OCWRC in the mid to late 1990s serving the combined sewer communities within the EFSDS. Portions of the City of Birmingham are tributary to each of the three basins, and in particular, the part of Study Area east of Chesterfield drains to the Birmingham CSO RTB, while the area west of Chesterfield drains to the Bloomfield Village CSO RTB.

All of the storm water entering the combined sewer system will be billed as sanitary sewage under the EFSDS meter-based billing methodology. Because of the expected overall increase in sewage disposal charges based on this methodology, the cost of treating storm water as sewage will be evaluated and compared to the cost of treating the storm water prior to the discharge to the Rouge River.

Constructing either of the storm relief sewer alternatives will reduce the tributary land area to the combined sewer system and RTB's by increasing the area tributary to the Rouge River through the storm sewers. In the Bloomfield Village CSO Drain District, the reduction of land area within the City of Birmingham that is tributary to the RTB may be significant enough to warrant a re-apportionment of the ongoing operations and maintenance costs. The potential re-apportionment that would result from construction of Alternative D or E will be evaluated and compared to the current apportionment to estimate the potential savings.

SEWAGE DISPOSAL COST ANALYSIS

With the meter-based billing methodology being implemented in the EFSDS, all of the flow entering the City's sewer system can be accounted for and billed. The sources of flow in the City's sewer system include everyday sanitary waste and groundwater infiltration, as well as rain dependent inflow and infiltration (RDII). To reduce sewage treatment costs billed to the City, the amount of flow in the sewers would need to be reduced.

- **Sanitary Waste** – Majority of sanitary waste is from residential areas and would be difficult to reduce significantly because population density is fairly steady. Promoting water conservation through use of energy efficient appliances (dishwashers, clothes washers) and low-flow bathroom fixtures could have some small impact.

- **Groundwater Infiltration** – Groundwater infiltration can enter the sewer system through pipe joints and defects, as well as building footing drains, when located below the groundwater table. For much of Birmingham, this is not a factor because the native subsurface soils consist mostly of clay soils, which do not promote a long-term groundwater aquifer.

- **Rain Dependent Inflow & Infiltration (RDII)** – Rain dependent inflow includes flow entering the sewer system during rain events through catch basins, manhole covers and directly connected downspouts. Infiltration enters the sewer pipes and manholes through joints and defects, as well as through building footing drains. Being a combined sewer system, the RDII component is a significant part of the total amount of sewage, most of it by design from the catch basins connected to the system. RDII can be reduced by replacing old sewers with new pipe having water-tight joints, restricting flow from catch basins, disconnecting downspouts, removing footing drain connections, or constructing storm sewers.

In the Quarton Lake area, the most significant way to reduce the RDII would be installing storm relief sewers that divert surface runoff out of the combined sewer system completely by outletting to the Rouge River or Quarton Lake. Currently, storm sewers that outlet to the river/lake exist on Redding, Midland, Lakeside, Oak, and Lakepark, with a total tributary surface drainage area of approximately 85 acres, with approximately 335 acres tributary to the combined sewer system. The storm relief sewer alternatives presented in this Study will add to the amount of surface drainage area that is tributary to the storm sewer outfalls, and correspondingly decrease the amount tributary area to the combined sewer system. This reduction in tributary area to the combined sewer system will reduce the volume of rainwater that enters the system, which will result in savings in the sewage disposal costs.

In the 2008 Quarton Lake Area Engineering Feasibility Study, the entire public infrastructure (sewers, water main and streets) was studied, and in particular, the sewer alternatives revolved around the question of whether the existing rear-yard sewer network should be maintained or abandoned. The majority opinion of the ad-hoc committee (set forth by resolution of the City Commission) regarding this question was that the rear-yard sewer network would be maintained, as represented by Alternative A. In Alternative A, new storm sewers would be constructed, but the current distribution of drainage area between the combined sewer system and storm sewers with outlets to the river/lake was not significantly altered. Refer to the 2008 Study for more information regarding Alternative A.

In Section 4 of this Study, two storm relief sewer alternatives, Alternatives D and E, have been developed to increase the amount of surface drainage area to the storm sewers with outlets to the river/lake, and include construction of an additional outfall at Maple. In Alternative D, the areas between Chesterfield and Quarton Lake are included in the storm relief. In Alternative E, the areas west of Chesterfield have been included as well. Refer to Section 4 of this Study for more information regarding these storm relief sewer alternatives.

The amount of precipitation that occurs in a given year is variable. On average, the annual precipitation for Birmingham is approximately 32 inches. For the purpose of this Study comparing one alternative to another, this average annual rainfall is assumed to be constant.

The amount of RDII that enters the sewer system is proportional to the amount of rainfall that occurs, and is also variable. Factors that influence this include amount of impervious surface area, efficiency of surface grading to promote drainage, ability of soils to accept rainfall percolating into the ground, and the intensity of a given storm event. When new sewers are designed, an appropriate runoff coefficient is assumed considering these factors for a particular design storm event (e.g. 10-year storm). In reality, the majority of the precipitation that occurs annually happens during the much more frequent storm events that are smaller than the design storm event. To analyze the impact of the storm relief sewer alternatives on sewage disposal costs from the Study Area, the amount of RDII in the combined sewer system from the study area will be calculated on an annual basis, and compared with similar calculations for the combined area considering the effect of the storm relief sewers.

Operational data provided by OCWRC for the RTBs (Q3-2008 to Q1-2010) suggest that the percentage of rainfall that was captured in sewer system over the entire drainage district, as measured on a quarterly basis, ranges from 11% to 20% in the Birmingham CSO District, and 9% to 21% in the Bloomfield Village CSO

District. Assuming that conditions in the Study Area are similar to each district overall, then Table 3.1a shows the potential sewage disposal cost from the Study Area for existing conditions and considering the changes made with each alternative.

Table 3.1a – Sewage Disposal Costs in Study Area (2010 $s)

	QUARTON LAKE STUDY AREA	BIRMINGHAM CSO	BLOOMFIELD VILLAGE CSO	TOTAL FOR STUDY AREA
EXISTING	COMB. SEWER TRIB. AREA	155 ac	180 ac	335 ac
	ANNUAL RAINFALL	32 inches	32 inches	
	% CAPTURED AT RTB	11% to 20%	9% to 21%	
	RAIN DEPENDANT INFLOW	3.5 to 6.4 in.	2.9 to 6.7 in.	
	SW TREATMENT CHARGE	$15.40/mcf	$15.40/mcf	
	ANNUAL SW TREATMENT COST	$31K to $55K	$29K to $68K	$60K to $123K
ALTERNATIVE A (2008 REPORT)	COMB. SEWER TRIB. AREA	182 ac	150 ac	332 ac
	ANNUAL RAINFALL	32 inches	32 inches	
	% CAPTURED AT RTB	14% to 25%	12% to 26%	
	RAIN DEPENDANT INFLOW	4.5 to 8.0 in.	3.8 to 8.4 in.	
	SW TREATMENT CHARGE	$15.40/mcf	$15.40/mcf	
	ANNUAL SW TREATMENT COST	$46K to $81K	$32K to $70K	$78K to $151K
ALTERNATIVE D	COMB. SEWER TRIB. AREA	27 ac*	145 ac	145 ac + 27 ac*
	ANNUAL RAINFALL	32 inches	32 inches	
	% CAPTURED AT RTB	14% to 25%	12% to 26%	
	RAIN DEPENDANT INFLOW	4.5 to 8.0 in.	3.8 to 8.4 in.	
	SW TREATMENT CHARGE	$15.40/mcf	$15.40/mcf	
	ANNUAL SW TREATMENT COST	$7K to $12K	$31K to $67K	$38K to $80K
ALTERNATIVE E	COMB. SEWER TRIB. AREA	27 ac*	66 ac + 9 ac*	66 ac + 36 ac*
	ANNUAL RAINFALL	32 inches	32 inches	
	% CAPTURED AT RTB	14% to 25%	12% to 26%	
	RAIN DEPENDANT INFLOW	4.5 to 8.0 in.	3.8 to 8.4 in.	
	SW TREATMENT CHARGE	$15.40/mcf	$15.40/mcf	
	ANNUAL SW TREATMENT COST	$7K to $12K	$16K to $35K	$23K to $47K

*NOTE: FOOTING DRAIN CONTRIBUTION REPRESENTED BY ASSUMING 0.04 AC PER HOME IN AREAS WITH STORM RELIEF SEWERS

With any of the proposed alternatives for storm relief sewers in the Study Area, all of the storm flow in the combined sewer system will not be able to be completely removed. Footing drains will remain connected to the combined sewers and a certain amount RDII will still be enter the sewer through leaking joints and defects, even though much less than existing because the design surface drainage will be collected by the

storm sewer system. To account for this remaining RDII after the storm relief sewers would be constructed, the number of homes connected to the combined sewers were totaled, and a nominal tributary area was assigned to each.

For the purpose of evaluating the future cost of sewage disposal, Table 3.1b below shows the potential sewage disposal cost from the Study Area for existing conditions and considering the changes made with each alternative based on a future sewage disposal rate in 2020 (6.0% increase per year).

Table 3.1b – Sewage Disposal Costs in Study Area (2020 $s)

	QUARTON LAKE STUDY AREA	BIRMINGHAM CSO	BLOOMFIELD VILLAGE CSO	TOTAL FOR STUDY AREA
EXISTING	COMB. SEWER TRIB. AREA	155 ac	180 ac	335 ac
	ANNUAL RAINFALL	32 inches	32 inches	
	% CAPTURED AT RTB	11% to 20%	9% to 21%	
	RAIN DEPENDANT INFLOW	3.5 to 6.4 in.	2.9 to 6.7 in.	
	SW TREATMENT CHARGE	$27.58/mcf	$27.58/mcf	
	ANNUAL SW TREATMENT COST	$55K to $99K	$52K to $121K	$107K to $220K
ALTERNATIVE A (2008 REPORT)	COMB. SEWER TRIB. AREA	182 ac	150 ac	332 ac
	ANNUAL RAINFALL	32 inches	32 inches	
	% CAPTURED AT RTB	14% to 25%	12% to 26%	
	RAIN DEPENDANT INFLOW	4.5 to 8.0 in.	3.8 to 8.4 in.	
	SW TREATMENT CHARGE	$27.58/mcf	$27.58/mcf	
	ANNUAL SW TREATMENT COST	$82K to $146K	$58K to $125K	$139K to $271K
ALTERNATIVE D	COMB. SEWER TRIB. AREA	27 ac*	145 ac	145 ac + 27 ac*
	ANNUAL RAINFALL	32 inches	32 inches	
	% CAPTURED AT RTB	14% to 25%	12% to 26%	
	RAIN DEPENDANT INFLOW	4.5 to 8.0 in.	3.8 to 8.4 in.	
	SW TREATMENT CHARGE	$27.58/mcf	$27.58/mcf	
	ANNUAL SW TREATMENT COST	$12K to $22K	$56K to $121K	$68K to $142K
ALTERNATIVE E	COMB. SEWER TRIB. AREA	27 ac*	66 ac + 9 ac*	66 ac + 36 ac*
	ANNUAL RAINFALL	32 inches	32 inches	
	% CAPTURED AT RTB	14% to 25%	12% to 26%	
	RAIN DEPENDANT INFLOW	4.5 to 8.0 in.	3.8 to 8.4 in.	
	SW TREATMENT CHARGE	$27.58/mcf	$27.58/mcf	
	ANNUAL SW TREATMENT COST	$12K to $22K	$29K to $62K	$41K to $84K

*NOTE: FOOTING DRAIN CONTRIBUTION REPRESENTED BY ASSUMING 0.04 AC PER HOME IN AREAS WITH STORM RELIEF SEWERS

APPORTIONMENT COSTS FOR RTB O&M

The portion of the Study Area east of Chesterfield is located within the Drainage District for the Birmingham CSO Drain, and west of Chesterfield is in the Drainage District for the Bloomfield Village CSO Drain. These are both combined sewer drainage districts, and have a retention treatment basin (RTB) built to collect wet weather flows that exceed the capacity of the allotted connections to the EFSDS. For many smaller storm events, the excess flow is collected in the RTB and then pumped back to the EFSDS after the flow in the interceptor recedes. During certain, intense storm events, the flow collected by the RTB will exceed its storage capacity and will overflow to the Rouge River. Prior to any overflow from the RTB, the waste water receives primary treatment (settlement & skimming) and disinfection in accordance with the NPDES Permit issued by the Michigan Department of Natural Resources and Environment (MDNRE).

The RTB's are operated and maintained by the Oakland County Water Resources Commissioner (OCWRC). The cost for operations and maintenance of the RTB's is apportioned to the communities or agencies that are responsible for contributing flow to each of them. For the Birmingham CSO RTB, 100% of the O&M costs are apportioned to the City of Birmingham. For the Bloomfield Village CSO RTB, 22.095% of the O&M costs are apportioned to the City of Birmingham.

With construction of either of the storm relief sewer alternatives, the amount of land area tributary to the combined sewer system, and ultimately to the RTB's, will be reduced. In the Bloomfield Village CSO Drain District, the reduction of land area within the City of Birmingham that is tributary to the RTB may be significant enough to warrant a re-apportionment of the ongoing operations & maintenance costs. Table 3.2 shows the potential re-apportionment that would result from construction of Alternative D or E. Assuming an annual operations & maintenance cost of $1,102,000 (based on estimated 2010 annual assessment), the reduction in Birmingham's share of the cost may be reduced by $18,000 or $56,000, respectively. Note that the method used to calculate the apportionment percentage were based on those used in the 2009 Re-Apportionment Study prepared for the Charter Township of Bloomfield. After final design of the alternative that is chosen to be implemented is complete, a separate Apportionment Study would need to be prepared and submitted to OCWRC for approval.

Table 3.2 – Bloomfield Village CSO Drain RTB O&M Apportionment

	Initial Apportionment		2009 Reapportionment		Storm Relief Alt. D		Storm Relief Alt. E	
	Equiv. Area (AxC)	Apport. Share	Equiv. Area (AxC)	Apport. Share	Equiv. Area (AxC)	Apport. Share	Equiv. Area (AxC)	Apport. Share
BIRMINGHAM	141.000	19.290%	141.000	**22.095%**	127.910	**20.464%**	101.730	**16.987%**
		$ 212,575		**$ 243,491**		**$ 225,512**		**$ 187,196**
Bloomfield Hills	43.294	5.923%	43.294	6.784%	43.294	6.926%	43.294	7.229%
		$ 65,271		$ 74,764		$ 76,330		$ 79,666
Bloomfield Township	414.010	56.640%	349.891	54.830%	349.891	55.978%	349.891	58.425%
		$ 624,173		$ 604,222		$ 616,876		$ 643,842
R.C.O.C.	132.646	18.147%	103.958	16.291%	103.958	16.632%	103.958	17.359%
		$ 199,981		$ 179,524		$ 183,283		$ 191,296
TOTAL	730.950	100.000%	638.143	100.000%	625.053	100.000%	598.873	100.000%
Estimated Total Annual RTB O&M Cost: $ 1,102,000								

STORM WATER DISCHARGE COST ANALYSIS

Currently, a portion of the Study Area is tributary to Quarton Lake and reaches of the Rouge River through the storm outfalls at Redding, Midland, Oak and Pine. The proposed storm relief sewer alternatives will increase the amount of area tributary to the lake and river, as shown on Table 3.3. Storm water discharges to water courses have been demonstrated to raise environmental and water quality concerns, especially if not mitigated in the design of the storm sewer system. The environmental impacts to the lake resulting from implementation of these alternatives will vary with each, but will essentially consist of increasing the volume and peak rates of the storm water runoff as compared to existing conditions. Possible impacts could be classified as follows:

- **Flood Control** – additional storm water discharge can increase the flood stage and duration.
- **Water Quality** – streets and residential yards contribute various pollutants and materials that could significantly impact the receiving water body. Pollutants (metals, salts, oils), sediment and nutrients degrade water quality and can harm plants, fish and other aquatic species.
- **Administrative** – additional storm water area could impact the NPDES General Stormwater Permit (Phase II) Program, in both required fees and additional effort for wet-weather monitoring operations.

Table 3.3 – Storm Outfall Characteristics

		REDDING U/S Q.L.	MIDLAND U/S Q.L.	OAK U/S Q.L.	PINE QUARTON LAKE
EXISTING	AREA	18.2 ac	3.6 ac	39.5 ac	1.2 ac
	% IMPERVIOUS	38%	40%	30%	50%
	Q (10-YR)	21.1 cfs	4.8 cfs	40.7 cfs	1.9 cfs
	Q (1-YR)	8.1 cfs	2.0 cfs	15.8 cfs	0.8 cfs
ALTERNATIVE A (2008 REPORT)	AREA	29.3 ac	3.6 ac	45.9 ac	1.2 ac
	% IMPERVIOUS	36%	40%	36%	50%
	Q (10-YR)	29.8 cfs	4.8 cfs	47.1 cfs	1.9 cfs
	Q (1-YR)	12.1 cfs	2.0 cfs	19.1 cfs	0.8 cfs
ALTERNATIVE D	AREA	29.3 ac	52.2 ac	45.9 ac	51.6 ac
	% IMPERVIOUS	36%	39%	36%	42%
	Q (10-YR)	29.8 cfs	57.5 cfs	47.1 cfs	58.9 cfs
	Q (1-YR)	12.1 cfs	23.3 cfs	19.1 cfs	23.6 cfs
ALTERNATIVE E	AREA	30.7	89.6 ac	67.7 ac	82.2 ac
	% IMPERVIOUS	37%	39%	36%	41%
	Q (10-YR)	31.9 cfs	95.7 cfs	68.0 cfs	87.5 cfs
	Q (1-YR)	12.8 cfs	38.3 cfs	27.9 cfs	35.2 cfs

It should be noted that the upstream area of the watershed tributary to Quarton Lake is approximately 20 square miles (12,800 acres), so the increase in runoff from the proposed alternative is not that significant considering the entire watershed (Alternative E would have a 2% increase). However, efforts should be taken to mitigate negative environmental impacts where required by MDNRE or where cost effective.

There is limited area to construct certain mitigation measures, including forebays, detention ponds, rain gardens, or bioswales. Included in each of the Alternatives are storm water quality manufactured treatment devices (SWQMTDs). These units would be installed near each of the five new outfalls within the road right-of-way or public property, and would be in an "offline" configuration where low flows are diverted through the device and higher flows can bypass. This configuration treats the most polluted portion of storm water that occurs during the "first flush" or with smaller rain events. The SWQMTDs trap floatable debris and remove sediment from the flow, thereby reducing the sediment load and pollutants that are associated with that, including oils, metals and certain nutrients.

Required maintenance for these units includes bi-annual inspection and removal of accumulated sediment and debris. The annual cost for the required bi-annual maintenance of the five SWQMTDs would be approximately $16,000 ($1,600 each time, twice a year at five locations). This work could be completed by City DPS staff and equipment.

Other private-participation measures that could mitigate the environmental impacts could be implemented, but unless a significant number of residents participate, the effect cannot be counted on. These types of measures include public education on managing lawns and yards, installing private rain gardens & bioswales, installing rain barrels & cisterns. Section 5 of this Study explores alternate environmental impact mitigation strategies further.

Section 4 - Storm Relief Sewer Alternatives

In this Study, two alternatives were preliminarily developed for addressing the sewer concerns in the neighborhoods west of Quarton Lake. These alternatives differ from those presented in the 2008 Engineering Feasibility Study for the Quarton Lake Area in that proposed storm relief sewers would increase the surface drainage area that is tributary to five outfalls to the Rouge River or Quarton Lake. Increasing the storm water flow to the river/lake raises some environmental concerns that would be mitigated with the proposed improvements. For each of the storm relief sewer alternatives, the scope of work and associated preliminary construction cost estimate will be presented, as well as a discussion on implementation and staging of the program.

The Study Area consists of the neighborhoods west of Quarton Lake, roughly bounded by Quarton Road to the north, Maple Road to the south, Quarton Lake/Rouge River to the east, and Chesterfield Road to the west. The Study Area is expanded from Chesterfield Road to the western City Limits for evaluation of a second storm relief sewer alternative.

ALTERNATIVE A (2008 STUDY) UPDATE

In the 2008 Quarton Lake Area Engineering Feasibility Study, the entire public infrastructure (sewers, water main and streets) was studied, and in particular, the sewer alternatives revolved around the question of whether the existing rear-yard sewer network should be maintained or abandoned. The majority opinion of the ad-hoc committee (set forth by resolution of the City Commission) regarding this question was that the rear-yard sewer network would be maintained, as represented by Alternative A. In Alternative A, new storm sewers would be constructed, but the current distribution of drainage area between the combined sewer system and storm sewers with outlets to the river/lake was not significantly altered. The cost of rehabilitation of the existing sewers that would remain in service is also included in this alternative. Refer to the 2008 Study for more information regarding Alternative A.

In this Study, Alternative A has been updated to include costs for storm water quality manufactured treatment devices (SWQMTDs) at the Redding, Midland, Oak, and Pine outfalls. These devices allow for some separation of oils, containment of floatable debris, and provide for settlement of solids prior to discharge. The small devices would be installed in a catch basin immediately upstream of the outfalls at Midland and Pine. Small devices are considered to be products that are aluminum or fiberglass inserts in normal-sized (4-ft. or 5-ft. diameter) catch basins. Medium devices would be installed near the outfalls at

Redding and Oak, and would be installed in an off-line configuration, which allows the higher intensity storms to bypass the device so as not to re-entrain the collected sediments and debris. Although not absolutely mandated by the current regulations, it is anticipated that with any new project where storm sewer outfalls are installed or reconstructed, permit requirements from the Michigan Department of Natural Resources (MDNRE) will strongly encourage the implementation of measures for improving the quality of water being discharged to the waters of the State.

Alternative A would benefit the part of the Study Area east of Chesterfield. Figures A1 and A2 from the 2008 Study showing the proposed sewers for Alternative A are included at the end of this Section. The preliminary construction cost estimate for the updated Alternative A is approximately $6,533,000, and is included at the end of this Section for reference.

In order to make an equivalent comparison between this Alternative A and Alternative E, the future sewer system improvements needed in the Bloomfield Village CSO Drain District area (west of Chesterfield, north of Maple) would have to be considered, and the costs for which would be added to those for Alternative A. The proposed improvements would include new combined and storm relief sewers that would remain connected to the combined sewer system and the Bloomfield Village CSO Drain. New sewers are sized to provide the necessary capacity relief for the 10-year design storm. The rehabilitation of existing combined sewers that would remain in service are also included in these improvements. With these improvements, area benefitted by the project would be expanded to include the area west of Chesterfield Road and north of Maple Road. The preliminary estimated construction cost for the future Bloomfield Village CSO Area sewer improvements is $2,601,000, and would be added to the costs estimated for Alternative A, to have a total construction cost of $9,134,000.

It is understood that the likely staging of this program would consist of construction of the larger sewers on the east-west streets first, and then the branches on the north-south streets would follow as residents petitioned for their streets to be paved. Alternative A can be readily implemented in this manner as each sewer run on the east-west streets is not dependent on the other work.

ALTERNATIVE D – STORM RELIEF SEWER (EAST OF CHESTERFIELD)

In Storm Relief Sewer Alternative D, new storm sewers would be constructed in the part of the Study Area east of Chesterfield, all of which would outlet to the Rouge River or Quarton Lake (as opposed to Alternative A where some of the storm sewers outlet to the Birmingham CSO Drain). The existing large diameter combined sewers on Raynale and Pine, which serve as overflow outlets from the Bloomfield Village Drain CSO regulators on Chesterfield, would remain as combined sewers, and the proposed storm sewers on these streets would be constructed parallel to them. The existing 21" to 27" diameter combined sewer on Maple would be converted to a storm sewer, and a new outfall would be constructed downstream of the bridge on Maple. The cost of rehabilitation of the existing sewers that would remain in service are also included in this alternative.

Costs for storm water quality manufactured treatment devices (SWQMTDs) at the Redding, Midland, Oak, Pine and Maple outfalls are included with this alternative. As stated previously, these devices allow for some separation of oils, containment of floatable debris, and provide for settlement of solids prior to discharge. Medium devices would be installed near the outfalls at Redding, Oak and Maple, and would be installed in an off-line configuration, which allows the higher intensity storms to bypass the device so as not to re-entrain the collected sediments and debris. Large devices would be installed near the outfalls at Midland and Pine, and would be installed in an off-line configuration, which allows the higher intensity storms to bypass the device so as not to re-entrain the collected sediments and debris. Although not absolutely mandated by the current regulations, it is anticipated that with any new project where storm sewer outfalls are installed or reconstructed, especially when the drainage area and/or impervious surface area is increasing, permit requirements from the Michigan Department of Natural Resources (MDNRE) will strongly encourage the implementation of measures for improving the quality of water being discharged to the waters of the State.

Alternative D would benefit the part of the Study Area east of Chesterfield. Figures D1 and D2 showing the proposed sewers for Alternative D are included at the end of this Section. The preliminary construction cost estimate for Alternative D is approximately $6,721,000, and is included at the end of this Section for reference.

In order to make an equivalent comparison between this Alternative D and Alternative E, the future sewer system improvements needed in the Bloomfield Village CSO Drain District area (west of Chesterfield, north of Maple) would have to be considered, and the costs for which would be added to those for Alternative D. The proposed improvements would include new combined and storm relief sewers that would remain connected to the combined sewer system and the Bloomfield Village CSO Drain. New sewers are sized to

provide the necessary capacity relief for the 10-year design storm. The rehabilitation of existing combined sewers that would remain in service are also included in these improvements. With these improvements, area benefitted by the project would be expanded to include the area west of Chesterfield Road and north of Maple Road. The preliminary estimated construction cost for the future Bloomfield Village CSO Area sewer improvements is $2,601,000, and would be added to the costs estimated for Alternative D, to have a total construction cost of $9,304,000.

It is understood that the likely staging of this program would consist of construction of the larger sewers on the east-west streets first, and then the branches on the north-south streets would follow as residents petitioned for their streets to be paved. Before the combined sewer on Maple can be converted to a storm sewer, the rehabilitation of the existing sanitary sewer by replacement or pipe-bursting with upsized pipes should be completed. A period of time may be required to clean-out the sanitary debris from the converted sewer (or track down unexpected sanitary connections) before the flow can be allowed to discharge to the river. Otherwise, Alternative D can be readily implemented in the suggested manner as the other sewer runs on the east-west streets are not dependent on the other work.

ALTERNATIVE E – STORM RELIEF SEWER (WEST CITY LIMITS TO QUARTON LAKE)

In Storm Relief Sewer Alternative E, new storm sewers would be constructed in the part of the Study Area both east and west of Chesterfield, all of which would outlet to the Rouge River or Quarton Lake. This alternative provides relief to the remaining combined sewer system in this portion of the Bloomfield Village CSO Drain District for the 10-year design storm. The existing large diameter combined sewers on Raynale and Pine, which serve as overflow outlets from the Bloomfield Village Drain CSO regulators on Chesterfield, would be converted to storm sewers with this alternative, and the proposed storm sewers on the intersecting streets would be connected to them. The existing 21" to 27" diameter combined sewer on Maple would be also be converted to a storm sewer, and a new outfall would be constructed downstream of the bridge on Maple. The cost of rehabilitation of the existing sewers that would remain in service is also included in this alternative.

Costs for storm water quality manufactured treatment devices (SWQMTDs) at the Redding, Midland, Oak, Pine and Maple outfalls are included with this alternative. As stated previously, these devices allow for some separation of oils, containment of floatable debris, and provide for settlement of solids prior to discharge. Medium devices would be installed near the outfalls at Redding, Oak and Maple, and would be installed in an off-line configuration, which allows the higher intensity storms to bypass the device so as not to re-entrain the collected sediments and debris. Large devices would be installed near the outfalls at Midland and Pine,

and would be installed in an off-line configuration, which allows the higher intensity storms to bypass the device so as not to re-entrain the collected sediments and debris. Although not absolutely mandated by the current regulations, it is anticipated that with any new project where storm sewer outfalls are installed or reconstructed, especially when the drainage area and/or impervious surface area is increasing, permit requirements from the Michigan Department of Natural Resources (MDNRE) will strongly encourage the implementation of measures for improving the quality of water being discharged to the waters of the State.

Alternative E would benefit the entire Study Area, from the western City limits to Quarton Lake. Figures E1 and E2 showing the proposed sewers for Alternative E are included at the end of this Section. The preliminary construction cost estimate for Alternative E is approximately $7,705,000, and is included at the end of this Section for reference.

It is understood that the desired staging of this program would consist of construction of the larger sewers on the east-west streets first, and then the branches on the north-south streets would follow as residents petitioned for their streets to be paved. However, with this alternative, before the combined sewers on Raynale and Pine can be converted to storm sewers, all of the proposed storm sewers west of Chesterfield must be installed to sufficiently relieve the remaining combined sewer system. Before the combined sewer on Maple can be converted to a storm sewer, the rehabilitation of the existing sanitary sewer by replacement or pipe-bursting with upsized pipes should be completed. A period of time may be required to clean-out the sanitary debris from the converted sewers (or track down unexpected sanitary connections) before the flow can be allowed to discharge to the river. Otherwise, Alternative E can be readily implemented in the suggested manner as the other sewer runs on the east-west streets are not dependent on the other work.

SEWER REHABILITATION

In general, the sewers in the Study Area have exceeded their expected design life of 50 years, with most of the sewer being constructed in the 1920s and 1930s. The video inspection of the sewers performed in 1994 to 1996 revealed a substantial amount of sewer defects, including root intrusions, vertical misalignments (dips), horizontal misalignments, offset joints, and cracked/broken pipe segments. In 2009, a sewer rehabilitation pilot program was initiated in the Quarton Lake area, where approximately 5,000 feet of sewer pipe was televised again. The 2009 televising confirmed the findings from the studies completed in the 1990s, and showed that some of the more severe defects have further degraded since that time. It is our understanding that a number of sewer lines in the Quarton Lake area are cleaned by City DPS crews on a monthly or bi-monthly basis due to root intrusions or debris collecting in dips affecting the flow in the sewer.

For each of the storm relief sewer alternatives presented in this Study, a certain amount of costs for sewer rehabilitation is included. With each alternative, some of the existing sewers will remain in service, and in order to restore their effective service life, it is cost effective to repair and rehabilitate them. Sewer rehabilitation could consist of a number of different techniques and products, but for simplicity, only a limited number are indicated on the preliminary construction cost estimate. Other methods or products could be substituted at similar costs, but full evaluation of all rehabilitation methods was beyond the scope of this Study. Many of these methods are considered as "trenchless", meaning they involve a minimal amount of excavation, surface disruption and related restoration. Following is a general description of some rehabilitation methods that potentially could be used in the Study Area:

- **Sewer Relining**

  The resin impregnated fabric inversion lining process (introduced by Insituform) involves saturating a poly-fabric liner with heat-setting resin which is then inverted into the sewer (like pulling a sock inside-out). Hot water is circulated through the pipe causing the resin to cure, thereby forming a pipe within a pipe. Service connections are reinstated remotely from within the pipe using a robotic pipe cutter. This work is usually performed from the existing manholes. This method is cost effective for smaller diameter sewers (18" and smaller), compared to removing and replacing the sewer by open-cut methods.

- **Sewer Slip-lining**

  This method involves pulling a new, slightly smaller diameter pipe, through the existing host pipe. The resulting annular space between the outside of the new pipe and inside of the old pipe is pressure-grouted. Service connections are reinstated by excavating outside the pipe and making a new connection. This work is usually performed from an excavated pit at one end of the sewer run (some products such as fold-and-form pipe can be lowered through existing manholes). This method is usually only practical for larger diameter (greater than 18") sewers where the loss in pipe capacity is not a concern.

- **Pipe Bursting**

  This method involves pulling a pneumatic hammer tool through the old sewer line, breaking the sewer in the process. As this hammer is pulled though, a new pipe is attached to fill the resulting void space. It is common to install a new, slightly larger diameter pipe with this process. Service connections are reinstated by excavating outside the pipe and making a new connection. This work is usually performed from excavated pits at both ends of the sewer line. This method is only cost effective for small diameter (12" and smaller) pipes that have relatively few service connections (as compared to replacement by open-cut methods).

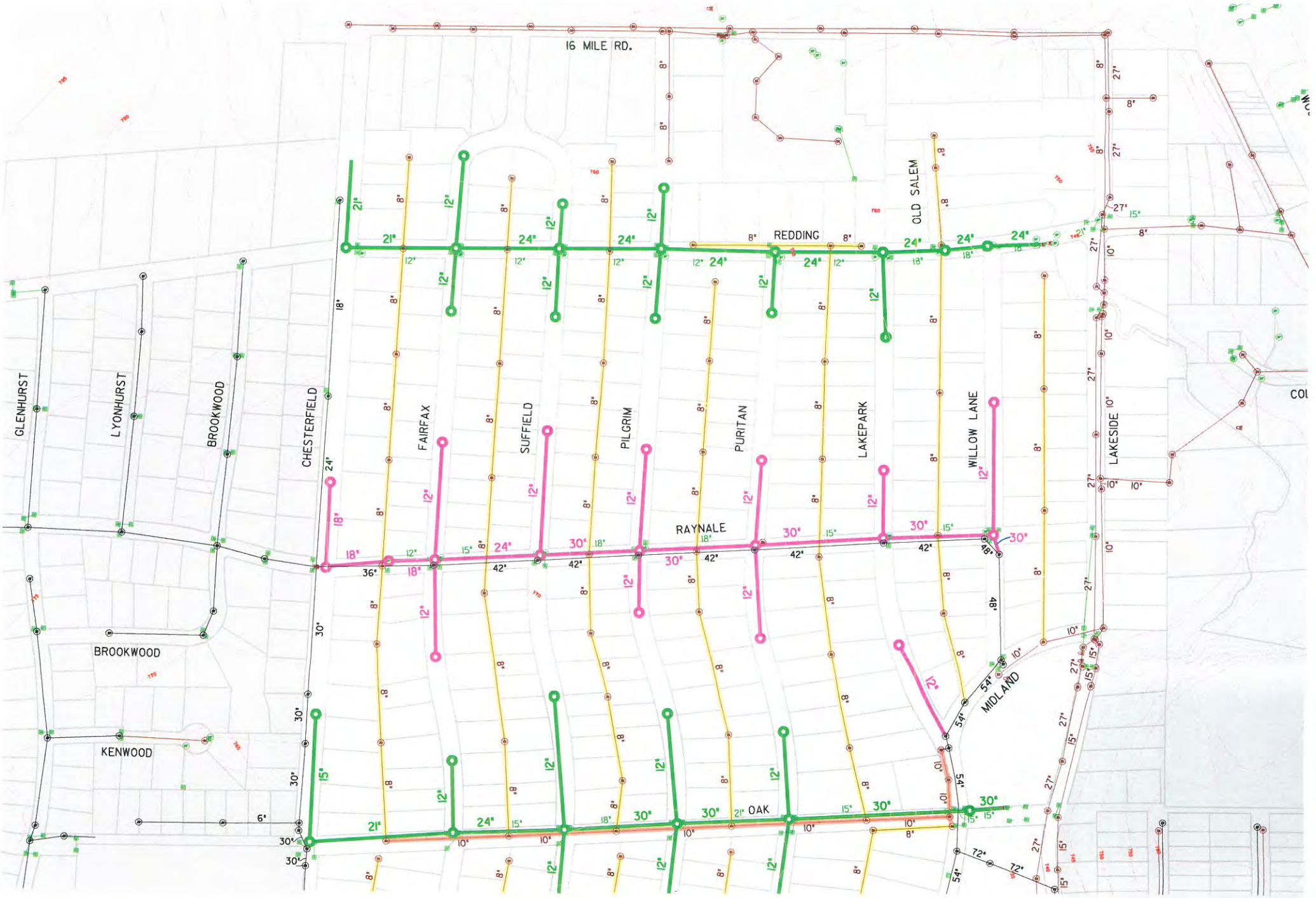
- **Joint Grouting/Root Control**

  This method involves chemical treatment of roots, physical removal of dead roots, and remote grouting of sewer joints to reduce infiltration and inhibit future root growth. This method can be used in sewers that are in relatively good structural condition (free of cracks). This work is performed from the existing manholes.

- **Sewer Point Repair**

  This work involves excavating a limited portion of a sewer line to remove and replace defective sewer pipe. These repairs are usually 20 feet or less in length and are for repairing severely cracked/collapsed pipe sections or to removed major dips in the sewer line that frequently collect debris. In many cases, point repairs are required to allow other rehabilitation work, such as sewer relining, to be completed.

Although sewer rehabilitation is shown on the figures and costs are included in the preliminary construction cost estimates, the scope-of-work is preliminary in nature, and would need further refinement after completing an internal pipe inspection program to determine their current conditions. The sewer rehabilitation work can be completed in phases, either in conjunction with the overall reconstruction program or as a separate sewer rehabilitation program based on prioritization of sewer conditions.



LEGEND:

EX. SANITARY SEWER

PROPOSED STORM SEWER TO EXIST. OUTFALL

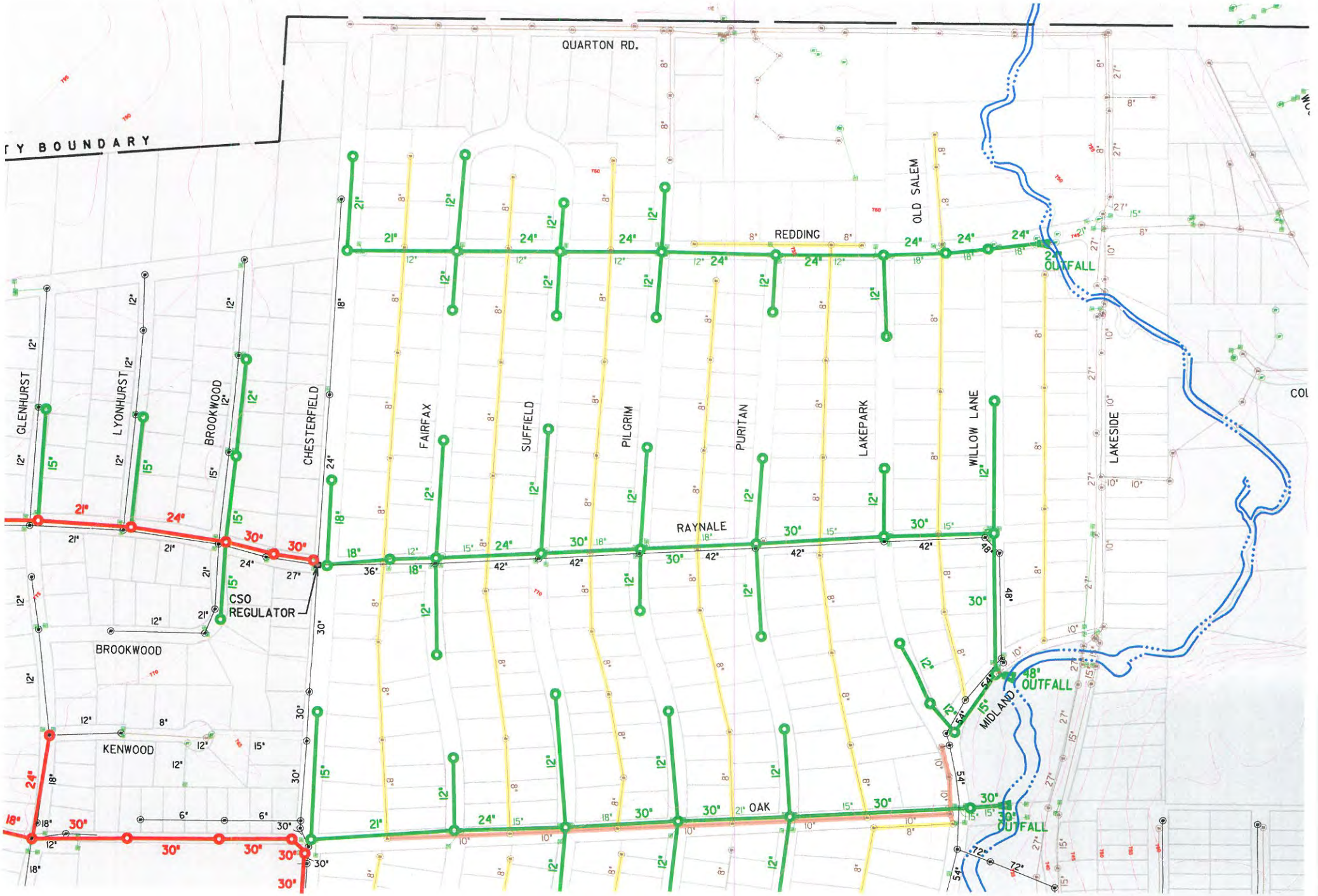
QUARTON LAKE
MAINTAIN RE
CITY OF


OAK
PINE
MAPLE
GLENHURST
KIMBERLEY
WINTHROP
FAIRVIEW
CHESTERFIELD
FAIRFAX
SUFFIELD
PILGRIM
PURITAN
LAKEPARK
LAKESIDE
LAKEVIEW
BALDWIN CT.
BALDWIN
VINEWOOD
QUARTON LAKE
WESTCHESTER
LARCHLEA
PLEASANT
ARLINGTON
SHIRLEY
LINDEN
ASPEN
RANDAL
SEWER
PROPOSED STORM SEWER TO EXIST. OUTFALL
PROPOSED STORM SEWER DISCH. TO CSO SYSTEM
QUARTON LAKE
MAINTAIN RE
CITY OF

PRELIMINARY COST ESTIMATE

ITEM	DESCRIPTION	QUANTITY	UNITS		RATE	UNITS	COST
	New Storm Sewers (outlet to Rouge River)						
	New 12" Storm Sewer	3,820	L.F.	@	$100	per L.F.	$382,000
	New 15" Storm Sewer	420	L.F.	@	$120	per L.F.	$50,400
	New 21" Storm Sewer	1,100	L.F.	@	$150	per L.F.	$165,000
	New 24" Storm Sewer	2,270	L.F.	@	$170	per L.F.	$385,900
	New 30" Storm Sewer	1,450	L.F.	@	$190	per L.F.	$275,500
	Storm Water Quality MTD, Medium	2	EA.	@	$60,000	EACH	$120,000
	Storm Water Quality MTD, Small	2	EA.	@	$15,000	EACH	$30,000
	New Storm Sewers (outlet to CSO system)						
	New 12" Storm Sewer	7,730	L.F.	@	$100	per L.F.	$773,000
	New 15" Storm Sewer	2,300	L.F.	@	$120	per L.F.	$276,000
	New 18" Storm Sewer	920	L.F.	@	$130	per L.F.	$119,600
	New 24" Storm Sewer	690	L.F.	@	$170	per L.F.	$117,300
	New 30" Storm Sewer	4,310	L.F.	@	$190	per L.F.	$818,900
	New 36" Storm Sewer	760	L.F.	@	$210	per L.F.	$159,600
	Rehabilitate Existing Combined Sewers						
	Reline 8" Combined Sewer	29,980	L.F.	@	$55	per L.F.	$1,648,900
	Sewer Point Repair	25	EACH	@	$10,000	EACH	$250,000
	Replace 10" Combined Sewer (pipe bursting method)	5,400	L.F.	@	$120	per L.F.	$648,000
	Manhole Rehabilitation	85	EACH	@	$2,500	EACH	$212,500
	Rehabilitate Large Combined Sewers (Chesterfield, Raynale and Pine)		LUMP SUM				$100,000
	PRELIMINARY ESTIMATED CONSTRUCTION COST						***$6,533,000***

This preliminary cost estimate is for public sewer work only, for the streets shown on the attached maps, and does not include any work on private properties. The purpose of this preliminary estimate is to provide budgetary information for planning of the overall project. The unit prices for sewer would include installation of necessary manholes, catch basins, single residential service connection, making connections to existing sewers, and abandoning existing sewers. The preliminary costs do not include any cost for surface restoration or paving. The preliminary cost assumes the work would be completed as part of an overall street reconstruction project, not as a stand-alone project. Sewer lengths are approximate, and will be finalized during project design. The necessity for additional sewer work may become apparent during final design as well.



LEGEND:

EX. SANITARY SEWER

PROPOSED STORM SEWER TO EXIST. OUTFALL

QUARTON LAKE
STORM RELIEF S

CITY OF


OAK
MELBOURNE
KIMBERLEY
CHESTERFIELD
FAIRFAX
SUFFIELD
PILGRIM
PURITAN
LAKEPARK
LAKESIDE
LAKEVIEW
VINEWOOD
BALDWIN CT.
BALDWIN
PINE
CSO REGULATOR
WINTHROP
FAIRVIEW
CITY BOUNDARY
QUARTON LAKE
48" OUTFALL
MAPLE
CONVERT MAPLE SEWER TO STORM
WESTCHESTER
LARCHLEA
PLEASANT
ARLINGTON
SHIRLEY
LINDEN
ASPEN
30" OUTFALL
PROPOSED STORM SEWER
PROPOSED COMBINED SEWER
QUARTON LAKE
STORM RELIEF S

PRELIMINARY COST ESTIMATE

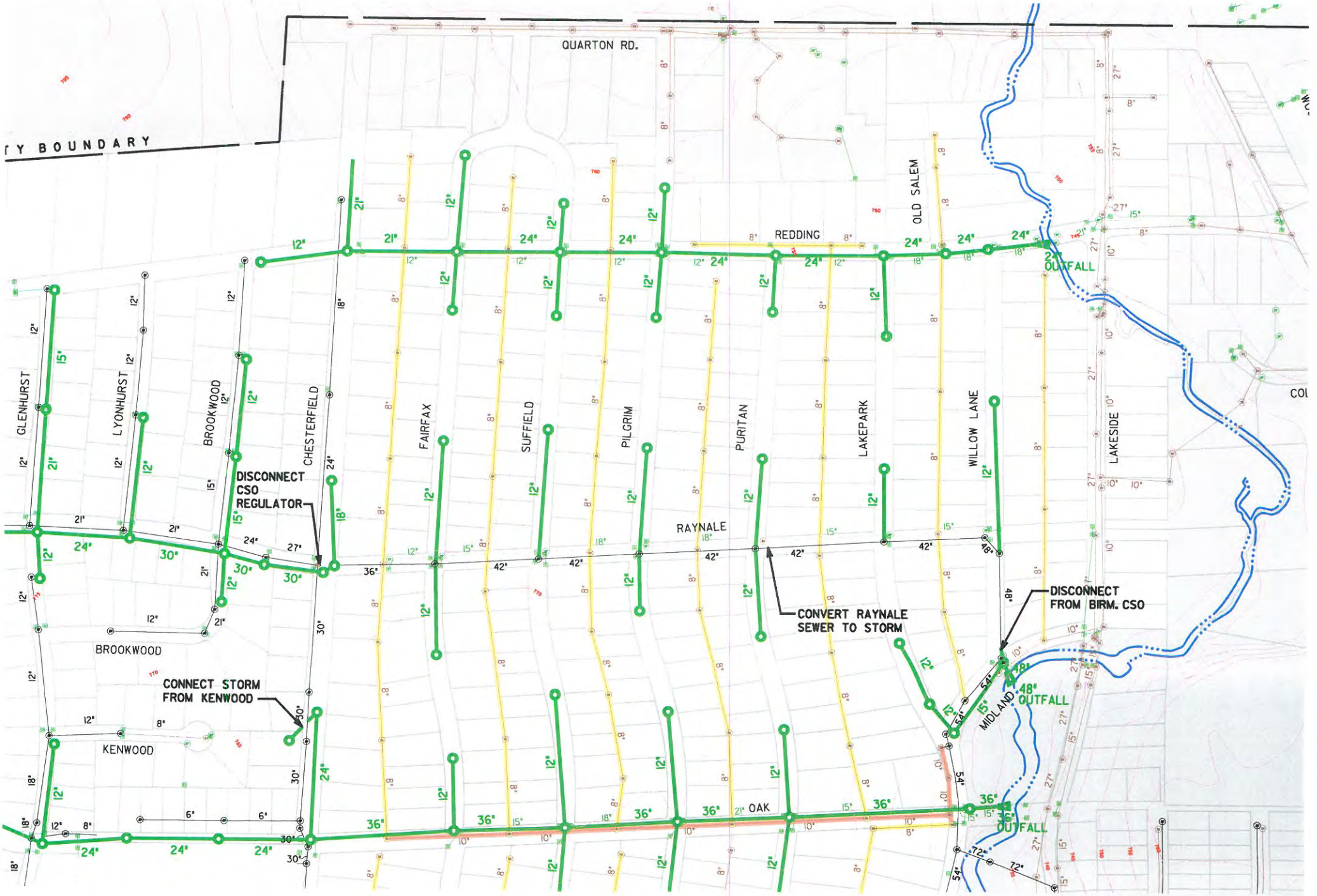
ITEM	DESCRIPTION	QUANTITY	UNITS		RATE	UNITS	COST
	New Storm Sewers Intial Phase (Primary E-W Streets & Chesterfield, pt. Willow Lane)						
	New 12" Storm Sewer	570	L.F.	@	$100	per L.F.	$57,000
	New 15" Storm Sewer	1,190	L.F.	@	$120	per L.F.	$142,800
	New 18" Storm Sewer	790	L.F.	@	$130	per L.F.	$102,700
	New 21" Storm Sewer	1,100	L.F.	@	$150	per L.F.	$165,000
	New 24" Storm Sewer	2,920	L.F.	@	$170	per L.F.	$496,400
	New 30" Storm Sewer	3,950	L.F.	@	$190	per L.F.	$750,500
	New 36" Storm Sewer	1,120	L.F.	@	$210	per L.F.	$235,200
	New 48" Storm Sewer	190	L.F.	@	$250	per L.F.	$47,500
	Storm Water Quality MTD, Large	2	EA.	@	$100,000	EACH	$200,000
	Storm Water Quality MTD, Medium	3	EA.	@	$60,000	EACH	$180,000
	New Storm Sewers Secondary Phase (Secondary N-S Streets)						
	New 12" Storm Sewer	10,710	L.F.	@	$100	per L.F.	$1,071,000
	New 15" Storm Sewer	2,700	L.F.	@	$120	per L.F.	$324,000
	Rehabilitate Existing Combined Sewers						
	Reline 8" Combined Sewer	29,980	L.F.	@	$55	per L.F.	$1,648,900
	Sewer Point Repair	25	EACH	@	$10,000	EACH	$250,000
	Replace 10" Combined Sewer (pipe bursting method)	5,060	L.F.	@	$120	per L.F.	$607,200
	Manhole Rehabilitation	90	EACH	@	$2,500	EACH	$225,000
	Rehabilitate Large Combined Sewers (Chesterfield, Raynale, Pine and Maple)		LUMP SUM				$200,000
	PRELIMINARY ESTIMATED CONSTRUCTION COST						***$6,703,000***

This preliminary cost estimate is for public sewer work only, for the streets shown on the attached maps, and does not include any work on private properties. The purpose of this preliminary estimate is to provide budgetary information for planning of the overall project. The unit prices for sewer would include installation of necessary manholes, catch basins, single residential service connection, making connections to existing sewers, and abandoning existing sewers. The preliminary costs do not include any cost for surface restoration or paving. The preliminary cost assumes the work would be completed as part of an overall street reconstruction project, not as a stand-alone project. Sewer lengths are approximate, and will be finalized during project design. The necessity for additional sewer work may become apparent during final design as well.

PRELIMINARY COST ESTIMATE

ITEM	DESCRIPTION	QUANTITY	UNITS		RATE	UNITS	COST
	New Combined Sewers & Storm Sewers Intial Phase (Maple & west of Chesterfield)						
	New 18" Combined Sewer	640	L.F.	@	$150	per L.F.	$96,000
	New 21" Combined Sewer	300	L.F.	@	$170	per L.F.	$51,000
	New 24" Combined Sewer	1,210	L.F.	@	$190	per L.F.	$229,900
	New 30" Combined Sewer	3,940	L.F.	@	$210	per L.F.	$827,400
	New 36" Combined Sewer	1,080	L.F.	@	$230	per L.F.	$248,400
	New 18" Storm Sewer	190	L.F.	@	$130	per L.F.	$24,700
	New 21" Storm Sewer	440	L.F.	@	$150	per L.F.	$66,000
	New 24" Storm Sewer	1,830	L.F.	@	$170	per L.F.	$311,100
	New Storm Sewers Secondary Phase (west of Chesterfield)						
	New 12" Storm Sewer	1,880	L.F.	@	$100	per L.F.	$188,000
	New 15" Storm Sewer	1,940	L.F.	@	$120	per L.F.	$232,800
	Rehabilitate Existing Combined Sewers						
	Reline 10" Combined Sewer	860	L.F.	@	$65	per L.F.	$55,900
	Reline 12" Combined Sewer	170	L.F.	@	$75	per L.F.	$12,750
	Reline 18" Combined Sewer	600	L.F.	@	$95	per L.F.	$57,000
	Rehabilitate Combined Sewers (west of Chesterfield)		LUMP SUM				$200,000
	SUBTOTAL PRELIM. ESTIMATED CONSTRUCTION COST						***$2,601,000***
	PRELIM. ESTIM. CONSTRUCTION COST FOR ALT. D						***$6,703,000***
	TOTAL PRELIM. ESTIM. CONST. COST (ALT. D + BVD AREA)						***$9,304,000***

This preliminary cost estimate is for public sewer work only, for the streets shown on the attached maps, and does not include any work on private properties. The purpose of this preliminary estimate is to provide budgetary information for planning of the overall project. The unit prices for sewer would include installation of necessary manholes, catch basins, single residential service connection, making connections to existing sewers, and abandoning existing sewers. The preliminary costs do not include any cost for surface restoration or paving. The preliminary cost assumes the work would be completed as part of an overall street reconstruction project, not as a stand-alone project. Sewer lengths are approximate, and will be finalized during project design. The necessity for additional sewer work may become apparent during final design as well.



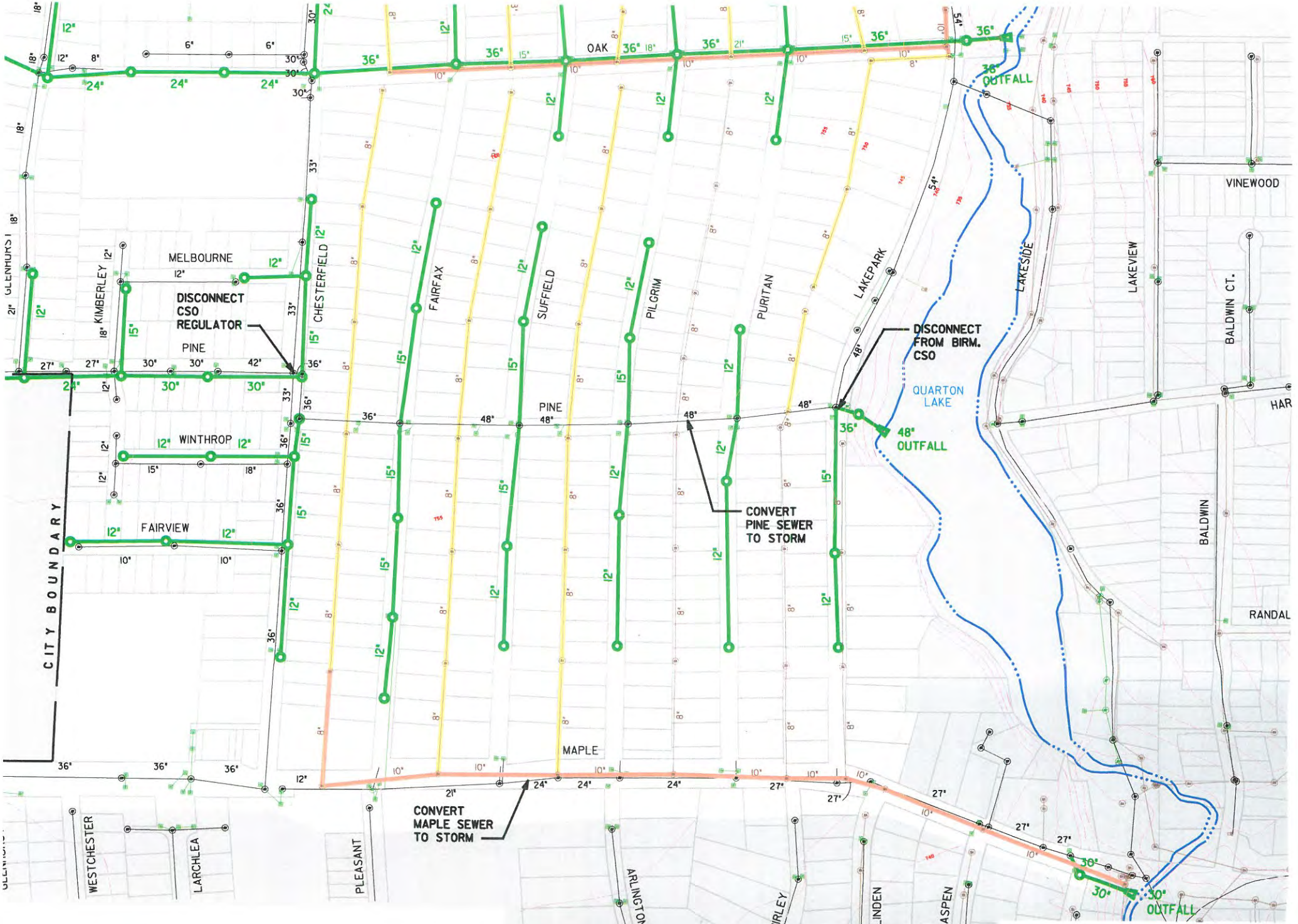
LEGEND:

EX. SANITARY SEWER

PROPOSED STORM SEWER TO EXIST. OUTFALL

QUARTON LAKE
STORM RELIEF S

CITY OF


OAK
MELBOURNE
KIMBERLEY
CHESTERFIELD
FAIRFAX
SUFFIELD
PILGRIM
PURITAN
LAKEPARK
LAKESIDE
LAKEVIEW
BALDWIN CT.
VINEWOOD
BALDWIN
RANDAL
HAR
PINE
WINTHROP
FAIRVIEW
MAPLE
CITY BOUNDARY
DISCONNECT CSO REGULATOR
DISCONNECT FROM BIRM. CSO
CONVERT PINE SEWER TO STORM
CONVERT MAPLE SEWER TO STORM
QUARTON LAKE
36" OUTFALL
48" OUTFALL
30" OUTFALL
WESTCHESTER
LARCHLEA
PLEASANT
ARLINGTON
SHIRLEY
LINDEN
ASPEN
SEWER
PROPOSED STORM SEWER TO EXIST. OUTFALL
SEWER RELINING
QUARTON LAKE
STORM RELIEF S
CITY OF

PRELIMINARY COST ESTIMATE

ITEM	DESCRIPTION	QUANTITY	UNITS		RATE	UNITS	COST
	New Storm Sewers Initial Phase (Chesterfield & West of Chesterfield)						
	New 12" Storm Sewer	4,670	L.F.	@	$100	per L.F.	$467,000
	New 15" Storm Sewer	1,730	L.F.	@	$120	per L.F.	$207,600
	New 18" Storm Sewer	1,360	L.F.	@	$130	per L.F.	$176,800
	New 21" Storm Sewer	400	L.F.	@	$150	per L.F.	$60,000
	New 24" Storm Sewer	1,880	L.F.	@	$170	per L.F.	$319,600
	New 30" Storm Sewer	1,270	L.F.	@	$190	per L.F.	$241,300
	Storm Water Quality MTD, Small	4	EA.	@	$15,000	EACH	$60,000
	New Storm Sewers Initial Phase (Redding, Oak & Maple)						
	New 21" Storm Sewer	650	L.F.	@	$150	per L.F.	$97,500
	New 24" Storm Sewer	1,890	L.F.	@	$170	per L.F.	$321,300
	New 30" Storm Sewer	300	L.F.	@	$190	per L.F.	$57,000
	New 36" Storm Sewer	2,240	L.F.	@	$210	per L.F.	$470,400
	Storm Water Quality MTD, Medium	3	EA.	@	$60,000	EACH	$180,000
	New Storm Sewers Secondary Phase (Midland & Pine Outfalls, Secondary N-S Streets)						
	New 12" Storm Sewer	10,760	L.F.	@	$100	per L.F.	$1,076,000
	New 15" Storm Sewer	2,750	L.F.	@	$120	per L.F.	$330,000
	New 36" Storm Sewer	80	L.F.	@	$210	per L.F.	$16,800
	New 48" Storm Sewer	220	L.F.	@	$250	per L.F.	$55,000
	Storm Water Quality MTD, Medium	2	EA.	@	$60,000	EACH	$120,000

PRELIMINARY COST ESTIMATE

ITEM	DESCRIPTION	QUANTITY	UNITS		RATE	UNITS	COST
	Rehabilitate Existing Combined Sewers						
	Reline 8" Combined Sewer	29,980	L.F.	@	$55	per L.F.	$1,648,900
	Reline 10" Combined Sewer	860	L.F.	@	$65	per L.F.	$55,900
	Reline 12" Combined Sewer	170	L.F.	@	$75	per L.F.	$12,750
	Reline 18" Combined Sewer	600	L.F.	@	$95	per L.F.	$57,000
	Sewer Point Repair	25	EACH	@	$10,000	EACH	$250,000
	Replace 10" Combined Sewer (pipe bursting method)	5,060	L.F.	@	$120	per L.F.	$607,200
	Manhole Rehabilitation	90	EACH	@	$2,500	EACH	$225,000
	Rehabilitate Large Combined Sewers (Chesterfield, Raynale, Pine & Maple)		LUMP SUM				$200,000
	Rehabilitate Combined Sewers (west of Chesterfield)		LUMP SUM				$300,000
	PRELIMINARY ESTIMATED CONSTRUCTION COST						***$7,613,000***

This preliminary cost estimate is for public sewer work only, for the streets shown on the attached maps, and does not include any work on private properties. The purpose of this preliminary estimate is to provide budgetary information for planning of the overall project. The unit prices for sewer would include installation of necessary manholes, catch basins, single residential service connection, making connections to existing sewers, and abandoning existing sewers. The preliminary costs do not include any cost for surface restoration or paving. The preliminary cost assumes the work would be completed as part of an overall street reconstruction project, not as a stand-alone project. Sewer lengths are approximate, and will be finalized during project design. The necessity for additional sewer work may become apparent during final design as well.

Preliminary Estimate based on ENR Construction Cost Index of 8805 (June 2010)

Section 5 - Environmental Impact Mitigation

Implementation of the storm relief sewer alternatives developed in this Study will increase the amount of runoff being discharged to the Rouge River and Quarton Lake. Storm water discharges to water courses have been demonstrated to raise environmental and water quality concerns, especially if not mitigated in the design of the storm sewer system. The City has made a substantial investment in improving the water quality in Quarton Lake and increasing the recreational opportunities for residents, so some measures would be warranted to ensure that the water quality in Quarton Lake would not be jeopardized.

BASIC ENVIRONMENTAL IMPACT MITIGATION STRATEGY

The alternatives developed for the Study assume the City standard road section and mainly traditional methods for storm water quality control centered around collecting sediment in the catch basin sump. Increasing the frequency of normal City maintenance practices such as catch basin cleaning and street sweeping in the Quarton Lake area will also help reduce pollutant loadings into Quarton Lake. End-of-pipe storm water quality manufactured treatment devices (SWQMTD's) are included to provide an additional level of storm water quality treatment in anticipation of permit requirements from State of Michigan DNRE. While the SWQMTD's can effectively improve water quality of storm water by collecting floatable debris, trapping oils, and allowing settlement of solids and the removal of other pollutants associated with the solids, they do not address concerns over the potential detrimental effects of increases in the volume of runoff, increase in dissolved nutrients, and increase in receiving water temperature.

Cost effective means for addressing these concerns include construction of detention basins with sediment forebays, and networks of vegetated swales and/or rain gardens/bioswales. Unfortunately, there is limited opportunity to employ measures such as this in the Quarton Lake areas due to lack of public property to build on, limited right-of-way space, and presence of mature trees along the roadways. Infiltration trenches or beds can address these concerns as well, but cannot be relied on in the Birmingham area because the predominant native soil conditions are not conducive to infiltration, and frozen ground conditions during the winter months can impede any infiltration capacity that may be present.

ALTERNATE ENVIRONMENTAL IMPACT MITIGATION STRATEGY

An alternate approach to storm water management in the Quarton Lake area that could be employed, especially on the secondary north-south streets, is to take a low impact development (LID) storm water design approach. The LID approach addresses many of the environmental concerns associated with increasing the tributary area draining to Quarton Lake, including minimizing the increase in storm water volume. LID involves modification of standard public practices for managing storm water in road rights-of-way and also requires private participation to be successful. The main objectives of this approach are to mimic the pre-development site hydrology, and treat, store and/or infiltrate rainwater near where it falls (source control). Areas developed with natural hydrologic functions create redundancies in storm water management practices and improves the aesthetics and habitat values of the area.

Although implementation of a LID approach may reduce the volume of storm runoff being transported directly to the storm sewer system, trunk-line storm sewers (notably on the east-west streets in Quarton Lake area) should still be designed for the 10-year design storm. LID measures usually are most effective for the more-frequent, lower intensity storm events that occur throughout the year. During the infrequent, high intensity storms, many LID measures will be in an overflow or bypass condition and the peak flow rate being delivered to the storm system may not be significantly reduced as compared to traditional storm water management measures. A commitment to the LID approach on a neighborhood basis may allow for installation of smaller-sized, end-of-pipe storm water quality manufactured treatment devices (SWQMTD's) at the outfalls because some treatment of some storm water would be occurring closer to the source throughout the neighborhood instead of only at the end of the pipe.

With the LID approach, there are a number of opportunities to secure grant funding for both the public work and private participation. Storm water quality improvement grants are currently available through the Rouge Program Office (RPO), Alliance of Rouge Communities (ARC), Great Lakes Commission (GLC), State of Michigan, and EPA Great Lakes Restoration Initiative (GLRI). Each type of grant has different application deadlines, local match requirements, and other restrictions.

Modifications to standard public practices could include the following, and their applicability and feasibility will vary street-by-street based on site constraints or limitations:

- **Street Width**

  Maintain narrow street width (22 feet at minimum) to minimize increase in paved surface area thereby minimizing increase in runoff volume and peak runoff rate. To reduce the potential for longitudinal cracking along the edges of asphalt roads, a drivable concrete ribbon should be installed. As an alternative, full-width concrete pavement could be considered. Restrictions to street parking will apply with the narrow street width.

- **Gravel Shoulders**

  Install gravel shoulders (2 feet wide) in lieu of concrete curb & gutter to minimize increase in paved surface area thereby minimizing increase in runoff volume and peak runoff rate.

- **Rain Gardens**

  Where practicable, install rain gardens at existing low points at street intersections. Rain gardens store runoff to reduce the peak discharge rate, and also reduce runoff volume by encouraging infiltration and evapo-transpiration through the vegetative plantings. Plant selection is critical to minimize ongoing maintenance. With certain plants, maintenance could be limited to annual mowing.

- **Dry Swales & Underdrain**

  Along the streets where practicable, install shallow swales (6" below edge of road) to receive runoff from the road and sidewalks. Perforated underdrain pipe would be installed under the swales to collect and transport rain water that cannot be infiltrated. Maintenance basins (2-ft. diameter, 2-ft. deep sumps) with bee-hive grates would be installed in front of each lot. Future sump pump connections could be made to the maintenance basins. The underdrain system would connect to the main storm relief sewers along the east-west streets.

- **Street-side Parking**

  Modify ordinance to require private street-side parking areas be constructed using porous materials such as gravel, geocells, brick pavers, or porous pavement. Maintenance of street-side parking areas should remain the responsibility of the homeowner it serves.

- **Cisterns**

  Install cisterns near Quarton Lake to collect runoff that can be used for irrigation of turf and plants in public areas.

Examples of ways private participation can reduce the potential negative environmental impacts of increasing the tributary drainage area to Quarton Lake could include the following:

- **Vegetative Management Education Program**
  Educate the local residents on the use of phosphorous-free fertilizers, water conservation, etc.

- **Rain Barrel Program**
  Purchase & install rain barrels to collect roof runoff that can be used for irrigation.

- **Rain Gardens/Bioswales**
  Integrate rain gardens and bioswales in landscaping to control runoff from roofs and paved surfaces.

- **Porous Pavements**
  Encourage the use of porous paving materials (porous concrete, porous asphalt, brick pavers, gravel-filled geocells) for driveways and patios. Porous pavement materials can also be effectively used in strips at the bottom edge of sloped pavements.

The cost to implement LID measures is not necessarily more than "traditional" measures, and in some cases, may be less initial cost. However, ongoing maintenance costs may be higher when compared to the traditional approach. The maintenance costs are generally manageable, and efforts could be made to shift some of that burden onto other entities. Individual residents are currently responsible for maintaining the right-of-way in front of their homes, and the effort or cost for the dry-swales would be similar to graded turf. It might be possible to enlist the help of neighborhood associations to maintain rain gardens at the street intersections and along Quarton Lake.

Table 5.1 illustrates certain LID measures and associated implementation costs, storage capacity (if applicable) and maintenance considerations. Table 5.2 provides a break-down of costs for the alternate LID road cross-section described herein, and can be compared to the similar table in the 2008 Study (Table 3-1) for the City standard road section.

Table 5.1 – Example Low Impact Development Measures

TYPE	STORAGE CAPACITY	COST DATA	MAINTENANCE CONSIDERATIONS
Increase Catch Basin Cleaning/ Street Sweeping Frequency	N/A	$1,500-$2,000/year	Quarterly cleaning and CB inspections in project area
City-wide Phosphorous-free Fertilizer Program	N/A	$10,000 (consultant & community labor costs)	N/A
Vegetative Management Education Program	N/A	$5,000 (consultant & community labor costs)	N/A
Rain Gardens/Bioswales	Varies	$5-7/cubic foot	Bi-annual weeding
Resident Rain Barrel Program	40-75 gal. each	$50-100 each	Inspect spigots, downspouts bi-annually
Vegetated Swales	10-year storm	$1-2/linear foot	Annual inspections for erosion, damage to vegetation; Annual mowing
Cisterns - use water to irrigate turf surrounding lake	200-10,000 gallons	$100-15,000/each (not including cost of installation or pumps)	Annual inspections for leaks, accumulation of sediment, pump maintenance
Constructed Filters - TSS, TP, TN removal	Varies	Varies upon media used; $10,000-15,000 construction costs	Quarterly inspections and maintenance as needed
Infiltration Trenches - TSS, TP, NO3 removal; decreased water temps	Maximum 2 acres	$20-30/cubic foot	Bi-annual inspection and cleaning of CBs and inlets and maintenance of overlying vegetation as needed
Level spreaders (often used with plant buffers and other BMPs) - potential reductions in water volumes	10-year storm	$5-20/linear foot	Quarterly inspections and maintenance (clogged inlets, erosion, etc.)

Table 5.2 – Paving Construction Cost Break-Down for LID Road Section

Assumptions for LID Road Construction:
20 foot wide asphalt road with 18" wide concrete ribbon on each side
2-ft. wide gravel shoulder
Partial edgedrain
4" asphalt over 8" aggregate base
New concrete drive approaches (2 each, 10 feet wide at ROW)
20% sidewalk replacement
Restore with blown-in compost, seed & mulch blankets
Street Drainage includes perforated underdrain & maintenance basins (not mainline sewer)

R.O.W. Width 60 feet
Typical Lot Width 80 feet

Item	Quantity	Units	Unit Price	Cost
Asphalt Pavement	178 SY	39 ton @	$ 70 per ton	= $ 2,738
Concrete Road Edging	160 LF	@	$ 14 per LF	= $ 2,240
Gravel Shoulder	160 LF	14 ton @	$ 20 per ton	= $ 284
Aggregate Base	276 SY	110 ton @	$ 18 per ton	= $ 1,984
Conc. Drive Approach	11.5 LF	276 SF @	$ 8 per SF	= $ 2,208
Conc. Sidewalk	160 SF	@	$ 5 per SF	= $ 800
Restoration	174 SY	@	$ 7 per SY	= $ 1,216
Remove Pavement	178 SY	@	$ 4 per SY	= $ 711
Remove Drive/Sidewalk	436 SF	@	$ 1 per SF	= $ 436
Station Grading	0.8 STA	@	$1,600 per STA	= $ 1,280
Edgedrain	160 LF	@	$ 6 per LF	= $ 960
Misc. Street Drainage (perforated underdrain & maintenance basins)				$ 1,000
Traffic/SESC/Tree Protect				$ 500
5% for Additional Work at Intersections				$ 818
10% for Contingencies				$ 1,718
		TOTAL CONSTRUCTION COST		$18,894 for 80 ft of road
		AVERAGE CONSTRUCTION COST		$ 236 per LF

Section 6 - Present Worth Analysis

A monetary evaluation of Alternatives D and E was completed to assist in comparison between the two with respect to total estimated project cost, differing useful service live, future operations & maintenance costs, and potential savings in costs to the City for transportation/treatment of storm water in the combined sewer system and the apportionment of the operations & maintenance cost for the Bloomfield Village CSO retention treatment basin. A total present worth analysis of these factors takes into account of the fact that money changes value over time and that public works projects generally have more complex cash flows that take place over time. The methods used to complete the total present worth analysis are based on the guidelines set forth in the Michigan Department of Environmental Quality Clean Water Revolving Funds Project Plan Preparation Guidance document (July 2010).

Present worth can be thought of as the sum of money needed to be invested now at a given interest (discount) rate over a certain time period that would provide exactly the funds required to make all necessary expenditures. The present worth analysis completed for this Study include the following components:

- Planning Period – 20 years (required period by MDNRE/USEPA)
- Capital Costs – preliminary estimated construction costs for the work plus costs (35% of construction cost) for administration, engineering & contingencies – refer to preliminary cost estimates in Section 4 of this Study
- Capitalized Interest – interest charges that occur during the time needed to construct the project
- Operation, Maintenance & Replacement Costs – only future operation & maintenance costs were considered, replacement costs are not considered because the useful life of all components in the project are greater than the planning period of 20 years
- Revenue Generated – neither alternative will directly generate revenue, however, the potential cost savings for removing storm water from the combined sewer system as well as the potential savings in the apportioned O&M costs for the Bloomfield Village CSO RTB that could be realized with implementation of this project can be considered as revenue generated for the purpose of this analysis

- Salvage Value – the value of the project components at the end of the planning period based on a straight-line depreciation of the component (planning period divided by useful life times the capital cost)
- Discount Rate – set by US EPA, currently at 4-3/8%

With the present worth analysis, certain key assumptions are made to ensure a relevant comparison of the alternatives, and are summarized as follows:

- All costs must be included
- Evaluation should not be done on a per-user basis, but on the total project costs
- Each alternative must address the need of the project
- Alternatives must be equivalent with respect to the number of customers benefited and provide the same ultimate system capacity

The capital costs for each alternative were taken from the preliminary estimated construction costs included in Section 4 of the Study, and are based on costs for similar sewer projects adjusted to a ENR Construction Cost Index of 8805 (June 2010). The useful life used in the analysis included 50 years for new sewers, 30 years for sewer relining/rehabilitation, and 40 years for the storm water quality treatment devices (50 years for structure, 20 years for internal mechanical components). Because Alternative D more readily implementable as compared to Alternative E (does not require relief work west of Chesterfield before Raynale and Pine combined sewers can be converted to storm), the costs for interest during construction is set at 6 years, compared to 10 years for Alternative E. In order for Alternative D to be considered equivalent to Alternative E with respect to the area and number of customers benefitted by the project, future combined and storm relief sewer work in the area west of Chesterfield Road (Bloomfield Village CSO Drainage District) needed to be added to the project. The total present worth for Alternatives D is $12,244,000 ($931,000 annual equivalent cost), and for Alternative E is $10,498,000 ($798,000 annual equivalent cost). The present worth analysis for Alternative D and E is presented in Table 6.1 and 6.2, respectively.

Table 6.1 – Quarton Lake Area-Storm Relief Sewer Alternative D

COMPONENT	COST	USEFUL LIFE	PRESENT WORTH
New Storm Sewers on Primary Streets Const. Cost	$ 1,997,100	50	$ 1,997,100
New Storm Sewers on Secondary Streets Const. Cost	$ 1,395,000	50	$ 1,395,000
Future Combined/Storm Sewers in BVD District Const. Cost	$ 2,275,300	50	$ 2,275,300
New SWQ MTD's Const. Cost	$ 380,000	40	$ 380,000
Sewer Rehabilitation Const. Cost	$ 2,931,100	30	$ 2,931,000
Future Sewer Rehabilitation in BVD District Const. Cost	$ 325,650	30	$ 325,650
Admin, Engin, Legal, Cap. Interest & Contingencies (35%)	$ 3,256,453		$ 3,256,453
Interest During Construction (6-years)	$ 2,123,178		$ 2,123,178
Salvage Value at 20 years	$ (4,676,023)		$ (1,985,852)
Annual O&M Cost ($0.10 per LF sewer + $3,200 per SWQMTD)	$ 23,405		$ 307,775
SUBTOTAL PRESENT WORTH SEWER IMPROVEMENTS			$ 13,005,705
Potential Annual Savings from Remov. Storm Water from EFSDS	$ (39,900)		$ (524,684)
Potential Annual Savings for Reapport. of BVD RTB O&M	$ (18,000)		$ (236,700)
TOTAL ESTIM. PRESENT WORTH FOR ALTERNATIVE D			$ 12,244,321
ANNUAL EQUIVALENT COST			$ 931,128

TIME PERIOD 20 years

DISCOUNT RATE 4.375%

Table 6.2 – Quarton Lake Area-Storm Relief Sewer Alternative E

COMPONENT	COST	USEFUL LIFE	PRESENT WORTH
New Storm Sewers on Primary Streets Const. Cost	$ 1,815,700	50	$ 1,815,700
New Storm Sewers on Secondary Streets Const. Cost	$ 2,080,600	50	$ 2,080,600
New SWQ MTD's Const. Cost	$ 360,000	40	$ 360,000
Sewer Rehabilitation Const. Cost	$ 3,356,750	30	$ 3,356,750
Admin, Engin, Legal, Cap. Interest & Contingencies (35%)	$ 2,664,568		$ 2,664,568
Interest During Construction (10-years)	$ 2,762,227		$ 2,762,227
Salvage Value at 20 years	$ (3,636,697)		$ (1,544,462)
Annual O&M Cost ($0.10 per LF sewer + $3,200 per SWQMTD)	$ 35,356		$ 464,931
SUBTOTAL PRESENT WORTH SEWER IMPROVEMENTS			$ 11,960,314
Potential Annual Savings from Remov. Storm Water from EFSDS	$ (54,900)		$ (721,934)
Potential Annual Savings for Reapport. of BVD RTB O&M	$ (56,300)		$ (740,344)
TOTAL ESTIM. PRESENT WORTH FOR ALTERNATE E			$ 10,498,036
ANNUAL EQUIVALENT COST			$ 798,331

TIME PERIOD 20 years

DISCOUNT RATE 4.375%

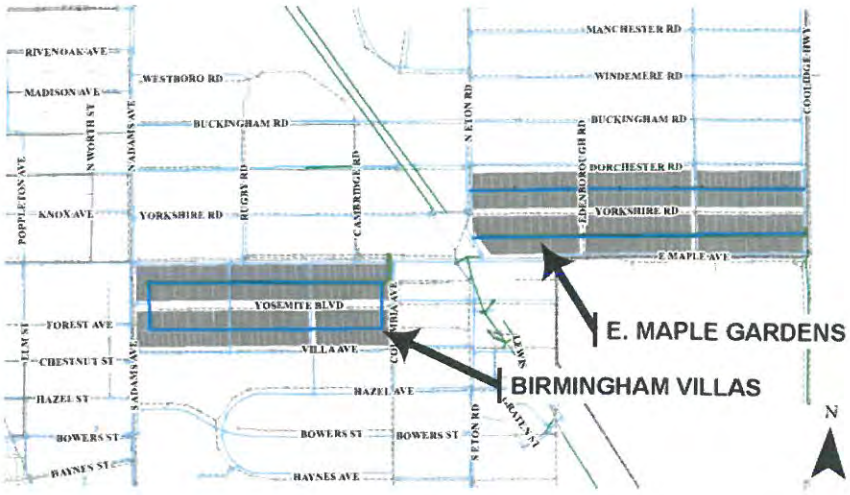
CITY OF BIRMINGHAM
ENGINEERING DEPARTMENT

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

- Brief review of the discussions held since 2008.
- Presentation of the staff's new recommendation.
- Proposed policy regarding sewer laterals.
- Proposed method to reduce back yard excavations.
- Proposed easement acquisitions
- Proposed nine-year construction plan.

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN



BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

- In 2007-08, interest in repairing cape sealed roads in Quarton Lake Subdivision was strong.
- In 2008, the City Commission appointed the Streets, Sewer, and Water Ad Hoc Committee to help develop a long term plan for the City's aging rear yard sewers and water mains.
- The findings of the Committee were presented to the City Commission on Feb. 9, 2009, with a recommendation passed on a 6-3 vote:

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

To recommend the following to the City Commission:

- ***Continue the water improvement plan and the schedule for adopting it with the water mains in the street, consistent with current City policy;***
- ***Reline the sewers in these three areas as appropriate and necessary, seeking permission from residents when necessary;***
- ***Continue the same City policy regarding roads; however, in these three areas the road improvement will not be tied to moving the sewers.***

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

A minority report, from the other three members of the Committee, was also submitted. It was endorsed by the Engineering Dept. It recommended the installation of combined sewers on each street, with the eventual abandonment of all back yard public sewers.

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

The City Commission passed the following motion:

To direct staff to prepare a specific report addressing three issues: more information and costs associated with the directional boring option, secondly, to get answers with regard to easement and access, and re-cameraing all or a portion of the existing rear yard sewers.

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

DIRECTIONAL BORING OPTION:

- To better understand the objections of the majority of the Committee, the Commission wished to better understand staff's position that the sewer service laterals could be bored.
- Not much information had been obtained relative to how the boring would work, or how much it would cost.
- Due to staff's current recommendation to line the back yard sewers, boring sewer service laterals to each house is no longer needed, so the need to explore this issue in depth has gone away.

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

- EASEMENTS AND ACCESS
- INSPECTION OF THE EXISTING BACKYARD SYSTEM

- Both of these issues are explored in greater depth below.

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

REVISED STAFF PROPOSAL

- In 2008, staff strongly advocated the installation of a new combined sewer in the street, with the intention of forcing all homes off the existing sewer by changing the plumbing in their house and in their front yard.
- Today, staff is recommending that if the majority of adjacent properties are currently connected to a rear yard sewer, the public sewer should be repaired and lined, provided proper easements can be acquired.

What changed?

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

- In 2009, the OCWRC office changed the way sewage treatment is billed for the westerly 2/3 of the City.
- Further review of similar projects completed by neighboring cities revealed that backyard excavations prior to lining can almost always be avoided.
- The political feasibility of forcing hundreds of homeowners to revise their plumbing and install a new sewer lateral to the front at their own expense must be considered.

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

OCWRC SEWAGE METER BASED BILLING SYSTEM

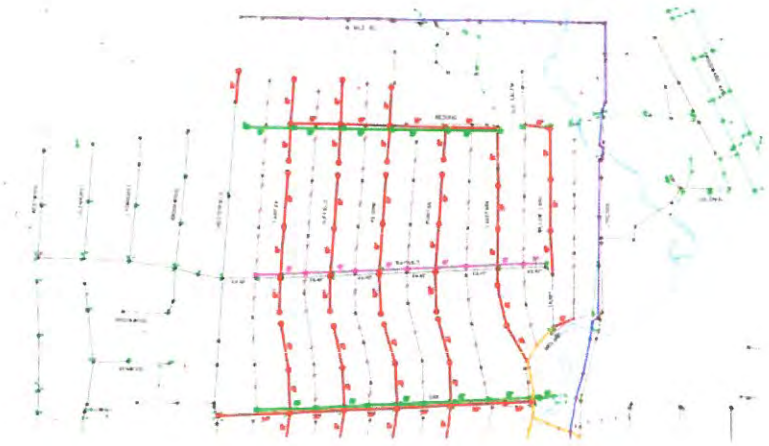
- From July, 2009 to July, 2011, OCWRC is phasing in sewer charges based on the full measurement of all flows, both sanitary and storm.
- Combined sewer systems are being charged the full cost of treatment – the cost burden has been shifted significantly.
- By 2011, sewage treatment costs within the EFSDS will be about 65% higher, or about $850,000 annually.

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

OCWRC SEWAGE METER BASED BILLING SYSTEM

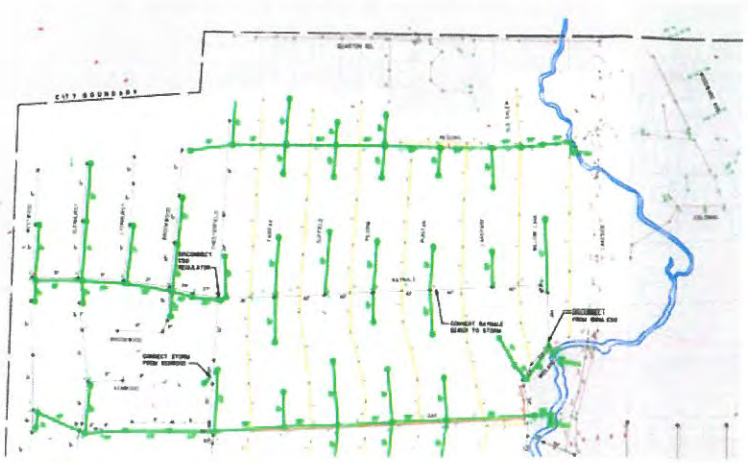
- Separated communities get reduced share of overall sewage district's charges.
- Separated communities can reduce costs even further by lining sewers and manholes, or "drying up" their systems.
- Combined sewer systems intentionally connected all storm flows into the sewer – "drying up" is not an efficient option.
- Birmingham must explore ways to reduce storm water flows.
- Quarton Lake Subdivision, with its need to have its sewer and street system overhauled, offers #1 best opportunity to reduce storm flows, and sewage treatment charges, long term.

2008 QUARTON LAKE SEWER RECOMMENDATION



2008 QUARTON LAKE SEWER RECOMMENDATION

2010 QUARTON LAKE RECOMMENDATION



2010 QUARTON LAKE RECOMMENDATION

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

- Expanding the storm sewer improvements to the west City limit expands the opportunities to get storm water out of the sewer system.
- Annual savings, if the conversion were made today, is estimated at $93,000-$132,000 annually.
- The project provides defined storm outlet for future street paving projects in Quarton Lake.
- The project addresses sewer capacity shortfall in NW corner of the City.

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

ENVIRONMENTAL CONCERNS

Increasing storm water flows to the river and lake will have to be reviewed and approved by the MDNRE.

Ensuring this change does not degrade water quality would require implementing physical improvements, as well as a shift in policy direction.

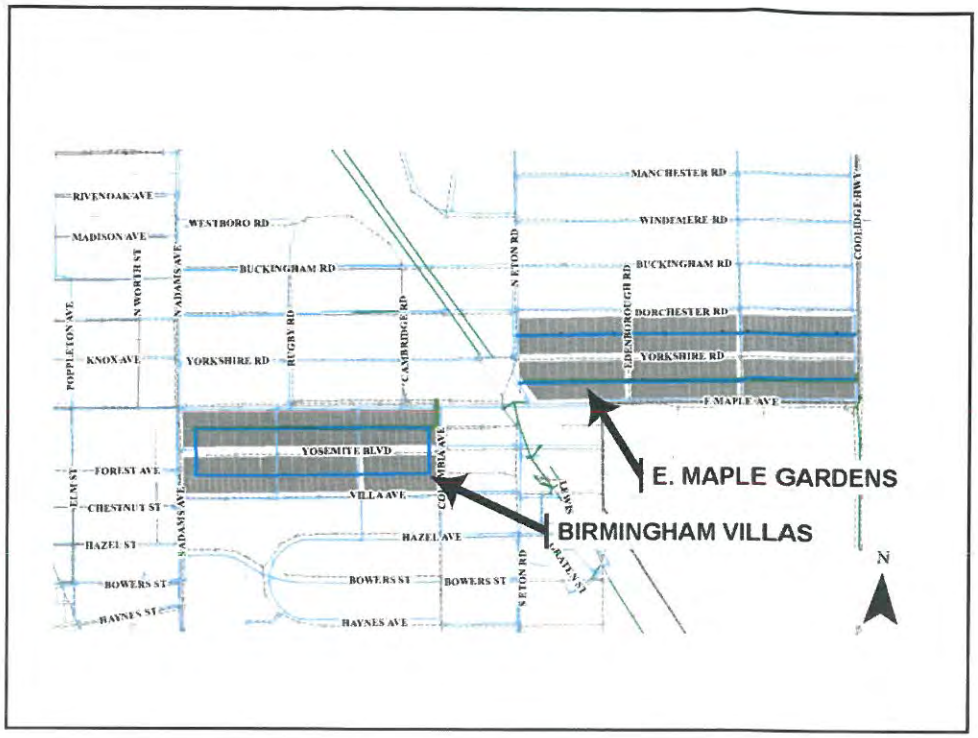
BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

"End of pipe" treatment could potentially be bio-swale as well (similar to Booth Park)

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

POLICY DIRECTION FOR FUTURE

- Street widths
- Gravel shoulders, edge drains on uncurbed streets
- Require sump pump connections to edge drain system
- Porous pavements required on parking pads
- Encourage improved water quality practices on private property within the storm sewer district
  1. Private rain gardens at storm drains
  2. Promotion of phosphorous-free fertilizers
  3. Encouraging use of rain barrels
  4. Encouraging porous pavements in low traffic areas



E. MAPLE GARDENS
SEWER CONNECTIONS MAP

BIRMINGHAM VILLAS
SEWER CONNECTIONS MAP

E. MAPLE GARDENS
WATER CONNECTIONS MAP

BIRMINGHAM VILLAS
WATER CONNECTIONS MAP

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

WATER LATERAL REPAIR POLICY

- Redirecting water laterals to street is not as costly or disruptive to existing house and landscaping as sewer laterals.
- Birmingham has successfully started water main abandonment process and house disconnections with six blocks of homes in Acacia Park area.
- Birmingham is providing ten year disconnection period for homeowners. About 60% of homes in Acacia Park have disconnected since 2005.
- It is recommended that water mains abandonment process be started so all remaining backyard water mains can be abandoned, using same process as done in the past.

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

SEWER LATERAL REPAIR POLICY

- When replacing street pavements, the City requires sewer laterals be replaced in the ROW, at property owner expense.
- In the ROW, the City has an interest in seeing sewer laterals are properly maintained on City property.
- In back yards, the lateral is on private property. The City's interests are more focused on the connection to the City sewer. The City has no legal access to the remainder of the sewer lateral. The policy must be modified.

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

SEWER LATERAL REPAIR POLICY

- As they get older, sewer laterals in rear yards will be difficult to repair.
- Lining services can be done more efficiently when many services are being done in a small area.
- Using vacuum truck technique, a small excavation hole would be required to install a cleanout on the lateral, then the rest of the pipe could be lined without further damaging the rear yard.
- The City should offer an opportunity to have their sewer lateral lined, by facilitating each property owner to voluntarily enter into a contract directly with the contractor.

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

SEWER LATERAL REPAIR POLICY

Using data from the camera work done in 2009, the following data was collected from these particular sewers:

- Homes Within Service Area: 72
- Capped, Inactive Services: 64
- Active Services: 59
- Active Services with Roots: 15 (25%)
- Active Services with Protruding Taps: 8 (14%)
- Active Services that are Misaligned: 0 (0%)

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

SEWER LATERAL REPAIR POLICY – ROOT INFESTATION

- The City can remove roots entering the City sewer during lining process, but if the service is a convenient point of entry, they will grow back.
- Photos of root infested service connections will be taken and mailed to property owners, encouraging them to have service replaced or lined.
- If property owner fails to do so, they would be added to a new special assessment district. The assessment district would have two options.

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

SEWER LATERAL REPAIR POLICY – ROOT INFESTATION

- If the owner is willing to give a temporary access easement, the City's contractor would install a cleanout and liner as described above, but under the provisions of a special assessment district.
- If the owner is not willing to give an easement, they would be included in an assessment district sharing the costs of checking and cleaning their City sewers on a more frequent basis to ensure that flows are not blocked in the future by roots from under-maintained sewer laterals.

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

SEWER LATERAL REPAIR POLICY – MISALIGNED CONNECTIONS

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

SEWER LATERAL REPAIR POLICY – MISALIGNED CONNECTIONS

- Property owners with misaligned sewer lateral connections would be sent a photograph of their tap.
- Property owners would be offered the opportunity to have their tap excavated and repaired under a voluntary special assessment district.

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

BACKYARD EXCAVATIONS TO REPAIR CITY SEWERS

- City sewer repairs in backyards was discussed extensively at Ad Hoc Committee meetings.
- Backyard lining projects in other nearby cities have not required many, if any, excavations.
- Sewers inspected with camera in 2009 (considered the worst areas) revealed no locations where an excavation would be mandatory prior to lining.
- Lining materials can be specified that successfully "bridge over" holes in pipes.

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

EASEMENT POLICY

All of the subject sewers are located within platted subdivisions. The status of the easements where backyard sewers will be lined breaks down as follows:

Quarton Lake Subdivision	
No Easement	52%
Five Foot Easement	48%
Birmingham Villas Subdivision	
Eight Foot Easement (Vacated Alley)	100%
East Maple Gardens Subdivision	
No Easement	100%

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

EASEMENT POLICY

(WHEREVER SEWER LINING IS PROPOSED)

- "Blanket" easement document will have to be signed for all properties where no easement exists. Where old platted easements exist, "blanket" form will be required only where access to manholes is needed to line sewer.
- "Blanket" easement would not restrict use of the property any more than it already is (by presence of backyard public sewer).
- The City would be responsible for any damages caused while on property.
- Entire project area will have easements solicited at the same time. Those areas where easements are proving difficult to acquire will have lining projects delayed as a result.
- Engineering Dept. may require outside consulting assistance for easements that are difficult to acquire.

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

RECOMMENDED MASTER PLAN

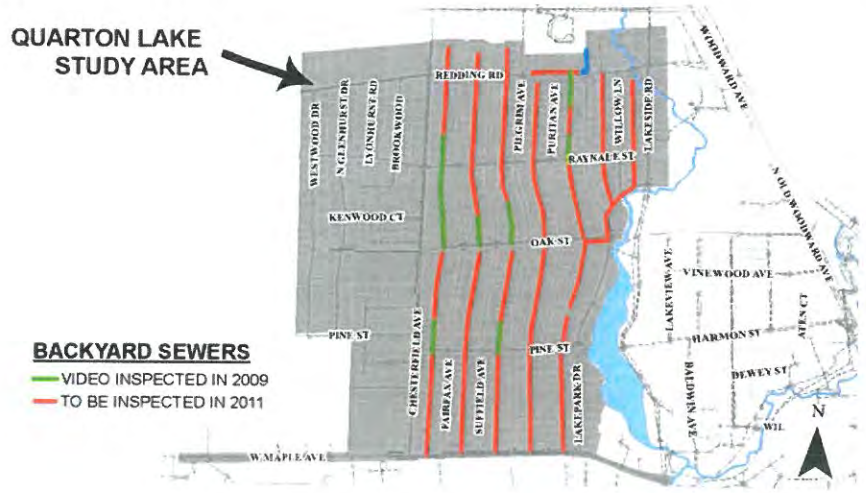
The Engineering Dept. recommends adopting the following master plan to either abandon or rehabilitate all public sewers and water mains located in backyards by 2018.

Projects are being recommended to achieve the following gains, in order of priority:

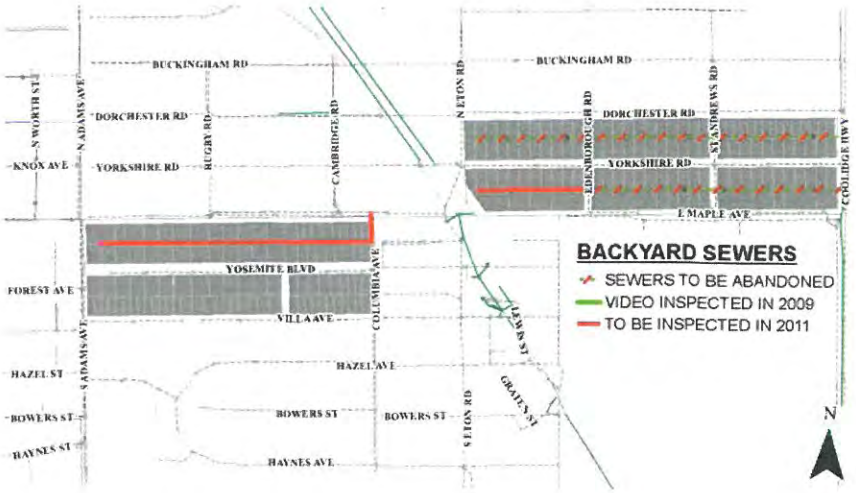
BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

1) All backyard facilities will addressed to greatly reduce the chance of unexpected failures and emergency work, and the private property damages that go along with such events.
2) Providing additional sewer capacity to the system in general in these neighborhoods, where deficiencies currently exist.
3) Replace or rehabilitate public street pavements in these neighborhoods, where work is needed.
4) Divert storm flows away from the combined sewer system for significant acreage, to help reduce ongoing sewage treatment and RTB maintenance charges.

2011 $120,000

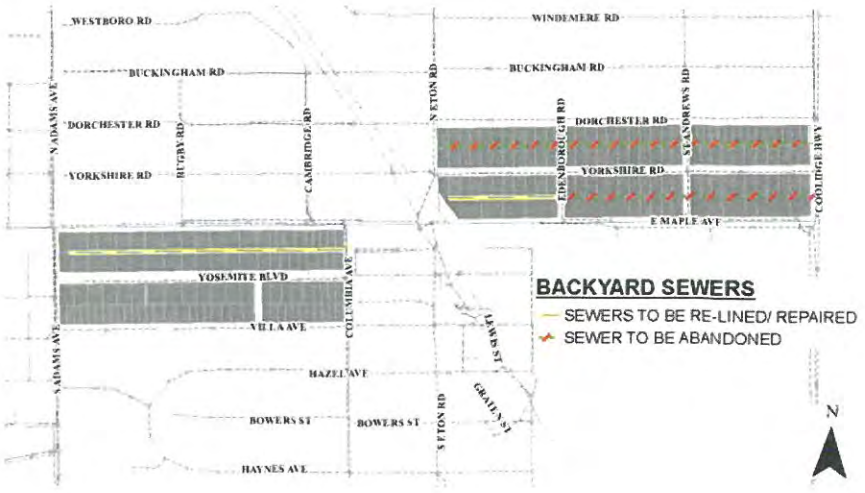


2011 $120,000



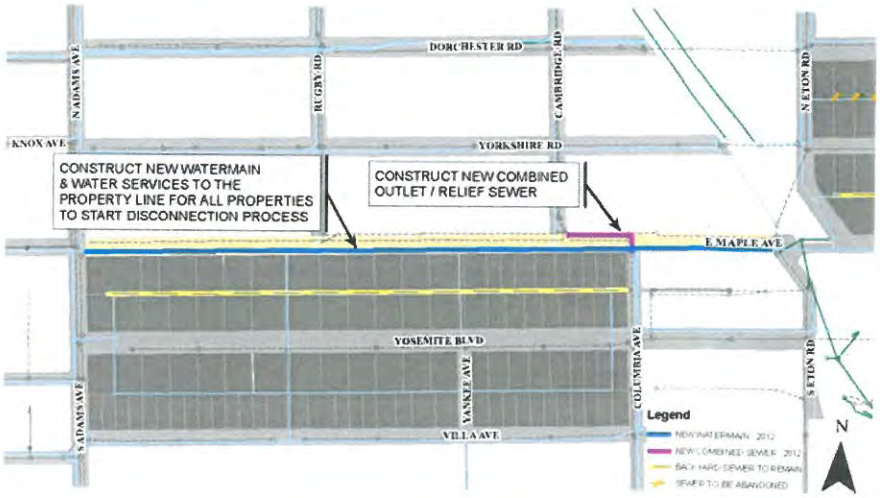
2012-2015 $600,000 annually

2012-2015 $600,000 annually



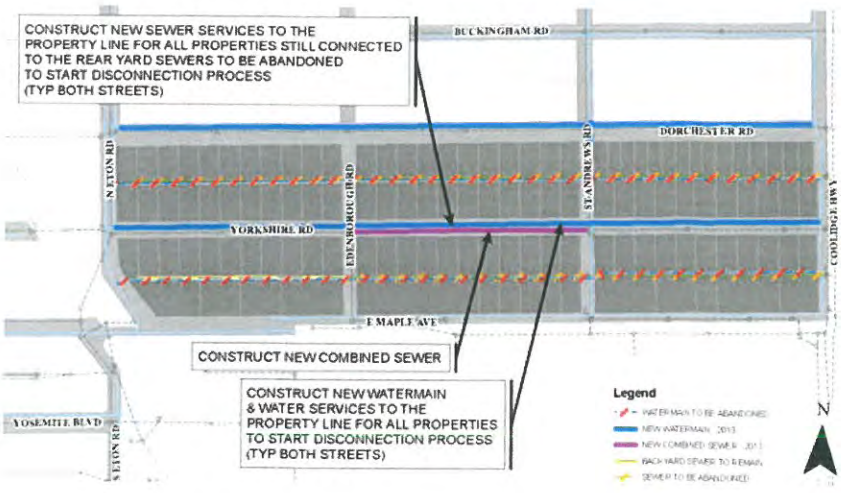
2012

$60,000

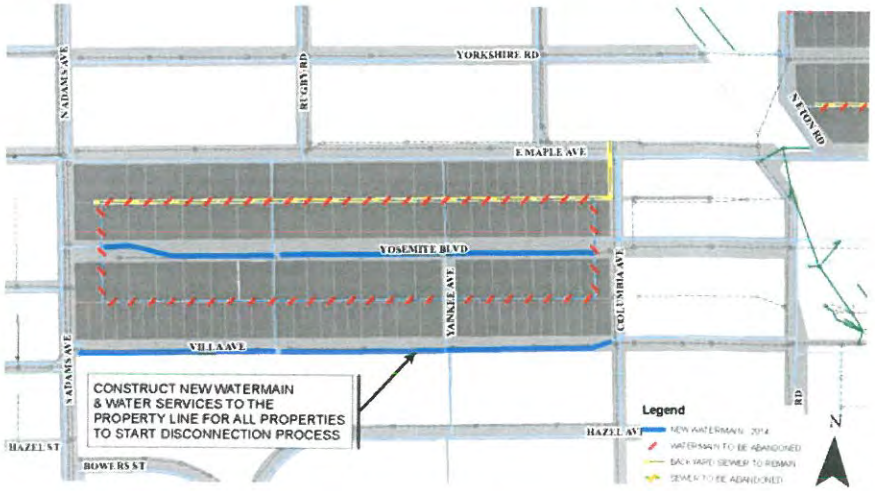


2013

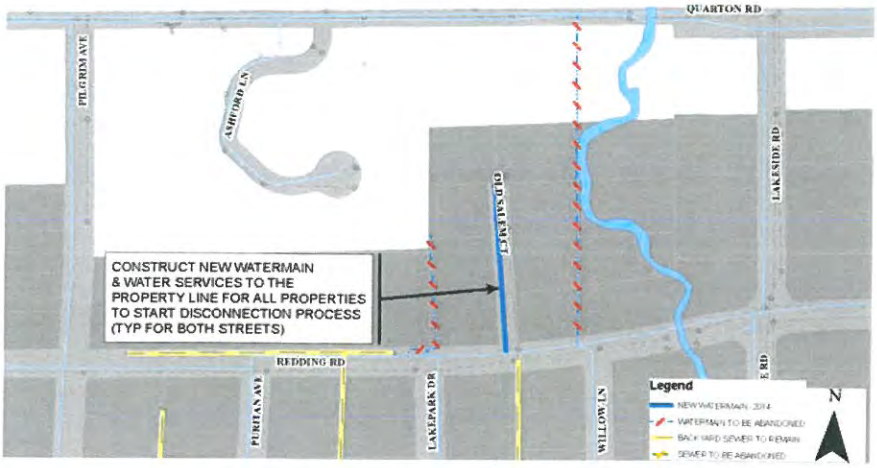
$300,000



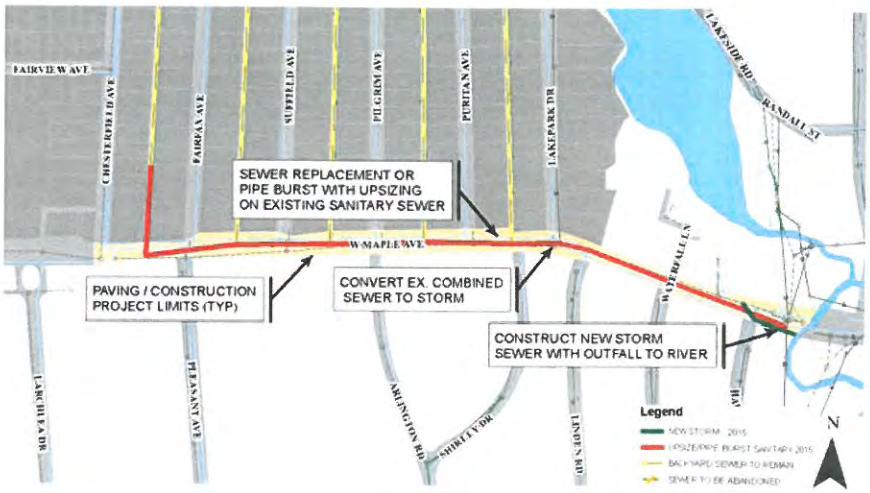
2014 $0


YORKSHIRE RD
N ADAMS AVE
RUGBY RD
E MAPLE AVE
N TUOLUMNE RD
YOSEMITE BLVD
YANKEE AVE
COLUMBIA AVE
VILLA AVE
S ADAMS AVE
CONSTRUCT NEW WATERMAIN & WATER SERVICES TO THE PROPERTY LINE FOR ALL PROPERTIES TO START DISCONNECTION PROCESS
HAZEL ST
BOWERS ST
Legend
N

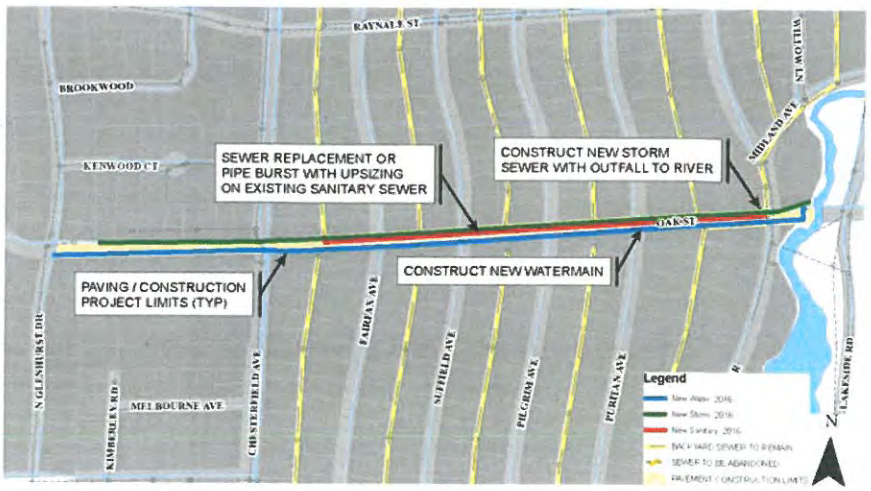
2014 $0


QUARTON RD
PILGRIM AVE
ASHFORD LN
OLD SANTA FE TRL
LAKESIDE RD
CONSTRUCT NEW WATERMAIN & WATER SERVICES TO THE PROPERTY LINE FOR ALL PROPERTIES TO START DISCONNECTION PROCESS (TYP FOR BOTH STREETS)
REDDING RD
PURITAN AVE
LAKEPARK DR
WILLOW LN
E RD
Legend
N

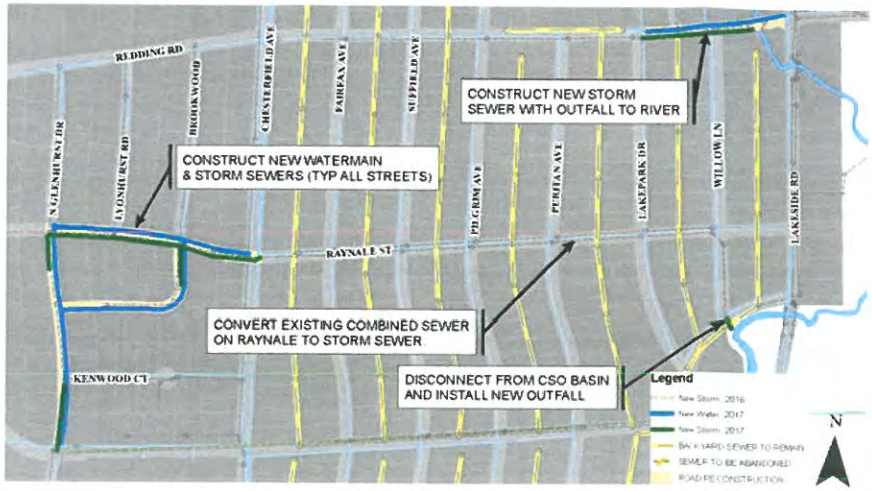
2015 $460,000



2016 $1,110,000



2017 $460,000



2018 $300,000

BACK YARD SEWER AND WATER MAIN SYSTEMS
LONG TERM MASTER PLAN

MEMORANDUM

DATE: January 5, 2010

TO: Joseph Valentine, Interim City Manager

FROM: Paul T. O'Meara, City Engineer

APPROVED: Joseph Valentine, Interim City Manager

SUBJECT: Backyard Sewer & Water Systems
Long Term Master Plan
Long Range Planning Session Update

On November 22, 2010, the Engineering Dept. presented a comprehensive master plan to the City Commission. The plan laid out a suggested eight-year plan to fully address, through either rehabilitation or abandonment, all of the public sewers and water mains located in backyards. The Commission was generally supportive, and directed staff to fully correspond with interested stakeholders to receive their input to the plan before it is adopted.

On December 15, 2010, the Engineering Dept. hosted a special morning meeting on the topic. Most of those that were invited attended, and all areas were represented. Attendees included[1]:

JC Cataldo, former member of the Ad Hoc Committee, representing the Quarton Lake Subdivision.

Dorothy Conrad, former member of the Ad Hoc Committee, representing the East Maple Gardens Subdivision.

Jim Cubera, former member of the Ad Hoc Committee, representing the Birmingham Villas Subdivision.

Carroll DeWeese, former member of the Ad Hoc Committee, representing the City at-large position on the Committee.

Tom McDaniel, former member of the Ad Hoc Committee, representing the City Commission.

Gregory Moore, member of the Quarton Lake Homeowners Association Board.

Tom Norman, husband of Karen Norman, former member of the Ad Hoc Committee, representing the Quarton Lake Subdivision.

Stuart Sherman, former member of the Ad Hoc Committee, representing the City Commission.

Eleanor Siewert, former member of the Ad Hoc Committee, representing the City at-large position on the Committee.

[1] References to the "Ad Hoc Committee" are referring to the Sewer Water Streets Ad Hoc Committee that was formed in 2008 to study this topic. The Committee was disbanded in February, 2009, after issuing their findings to the City Commission.

Michael Fenberg, also on the Quarton Lake Homeowners Association Board, was also invited, but could not attend. Staff support included Brendan Cousino and I, as well as Wally Alix and Jim Surhigh of Hubbell, Roth, & Clark.

The attendees were generally supportive, and offered good advice on some areas where the plan needed clarification. Before discussing the suggested clarifications, it will be beneficial to consider the time line to unveil the plan to the property owners affected by it. A suggested timetable of events from now until the Winter of 2012 has been laid out to identify the first suggested steps that would be taken once the plan is approved. For example, within the next few months, informational booklets would be prepared and mailed to all affected property owners. Specific booklets would be created for the Quarton Lake area and the East side neighborhoods, as many of their issues are different. The booklets would be geared toward providing the information they would be interested in. It is suggested that the booklet would also be coupled with an invitation to attend a public hearing where the City Commission would consider adopting the plan.

The following summarizes the issues that were raised at the December 15 meeting, with notes as to how they will be addressed:

1. What are the estimated costs to the homeowners impacted by this plan?
2. Will the City provide a certain time period when homeowners can plan to have their backyard services disconnected? Will there be a period when the fees charged by the City are waived?

There are five general areas where costs would be charged directly to homeowners. Estimated costs and policies will be clarified in the informational pamphlets noted above. (Additional information on how some costs were generated are provided in Appendix A of this report.)

a) **Backyard sewer lateral lining special assessment:** Whether voluntary or mandatory (in the event that the lateral is introducing roots into the City sewer), estimated at $6,000 per property, not including surface restoration (damage should generally be minimal).
b) **Backyard tap excavation special assessment** (voluntary to those who have a misaligned sewer tap): estimated at $5,000 to $6,000 per property, not including surface restoration (restoration costs will vary substantially depending on improvements in place both at the excavation, and along the route the excavation equipment must use to access it).
c) **City sewer maintenance special assessment** (mandatory to those who have a lateral introducing roots into the City sewer, yet refuse to allow contractor access to line the lateral): estimated at $100 to $500 per year ongoing, and subject to change as costs change through the years, until lateral is repaired.
d) **Water service connection and meter relocation to front of house** (mandatory within 10 years for all backyard water service connections): A portion of costs will be payable to a private contractor for all work done on

private property. The property owner will be free to hire any viable contractor to do the work, as long as they can secure a permit. The work will vary largely depending on the obstacles that are present both in the front yard and in the basement or crawl space. The cost is estimated at $2,600 to $4,000, with the majority of the homes to be completed at the lower end of the spectrum. The City will also charge fees to inspect the private contractor's work, make the connection to the new system, install a new water meter in the basement (and remove the old one at the same time). No work is required in the rear yard other than to locate and turn off the valve to the old water service lateral. As an incentive, the plan recommends waiving all City fees if the work is done within the first year. Fees payable to the City, as listed in the City Code, are as follows:

Internal Plumbing Inspection, 1 inch dia. pipe or smaller	$ 80
Internal Plumbing Inspection, 1-1/4 inch or 1-1/2 inch dia. pipe	$ 85
Internal Plumbing Inspection, 2 inch diameter pipe	$ 95
Water Service Lateral Inspection, 2 inch dia. or smaller	$ 115
Water Service Connection, 1 inch dia.	$1,790
Water Service Connection, 1-1/2 inch dia.	$2,010
Water Service Connection, 2 inch dia.	$2,210
Old Meter Removal and New Meter Installation, 1 inch dia.	$ 470
Old Meter Removal and New Meter Installation, 1-1/2 inch dia.	$ 595
Old Meter Removal and New Meter Installation, 2 inch dia.	$1,565

e) **Sewer service connection to the front of the house:** (mandatory within 10 years for all backyard sewer service connections on sewers scheduled to be abandoned): The majority of the cost will be payable to a private contractor for all work done on private property. The property owner will be free to hire any viable contractor to do the work, as long as they can secure a permit. The work will vary largely depending on the obstacles that are present both in the front yard and in the basement or crawl space. The cost is estimated at $4,000 to $6,500. The City will also charge fees to inspect the private contractor's work, one being within the house, the other within the front and back yards. As an incentive, the plan recommends waiving all City fees if the work is done within the first year. Fees payable to the City, as listed in the City Code, are as follows:

Internal Plumbing Inspection	$ 100
Sewer Service Lateral Inspection	$ 100

A special class of properties that will be more difficult to estimate involve the apartment and condominium buildings located along Maple Rd., between Edenborough Rd. and Coolidge Hwy. Eight properties (some involving more than one building) will be required to disconnect their water service. All have either 1½ inch or 2 inch service taps to the rear now. We do not expect that costs will be much larger than the individual home costs listed above, but there may be some unique hardships that will have to be worked through on an individual basis. Five properties, each containing

one building each, have a backyard sewer connection that will have to be disconnected. The costs involved on these will be more difficult, as in at least three of the cases, parking lot drains as well as sanitary sewer services will be affected. Extra attention will have to be offered to these properties to determine the most cost-effective means to address this issue.

3. The change in the City's road paving policy needs to be clarified. Will leaf pickup services be changed?

In the easterly 40% of the city (within the George W. Kuhn Drainage District), there have been no changes with respect to sewage treatment charges. Since the current road paving policy has been tested and works well, we do not recommend any changes to the policy in this area.

In the westerly 60% of the city (within the Evergreen-Farmington Drainage District), the change to a sewage meter based billing system suggests that the road paving policy be modified. A road paving project should be looked upon as an opportunity to reduce the flow to the sewer, thereby reducing sewage treatment costs for all rate payers. Whether the street to be paved is in a separated sewage area or not, we recommend offering two options:

a) The traditional fully curbed street (26 foot wide back-to-back of curb) option must continue to be offered for those neighborhoods that want the benefits that a curbed street brings, including longer service life (and the promise of maintenance from the City) as well as leaf pickup.
b) For those that prefer an uncurbed street, the City should endorse a 22 foot wide asphalt street with 2 ft. wide gravel shoulders. The uncurbed street would not have as long of a service life, so future projects would be subject to assessments, and leaf pickup would still not be available. The benefits, however, would be releasing more water into the groundwater table, allowing discharge to the combined sewer system to be reduced.

It is noted that the more choices the City offers, the more opportunity for disagreement amongst the members of the potential special assessment district, making it more difficult to form a majority in favor of any cross-section. If experience proves that offering a choice creates more problems than it solves, the policy would potentially have to be modified back to just one choice.

4. What are the City's costs for cleaning and maintaining the backyard sewers in the Quarton Lake neighborhood every 2 months? How much does the City expect to save in the future once the sewers have been lined?

The frequency of cleaning, and the related costs are detailed in Appendix A. Based on the assumptions in the appendix, it is estimated that the City will save about $36,000 in sewer maintenance costs per year. Of this $36,000, a portion will be recouped as a special assessment, although the amount is totally dependent on the number of residents that opt not to have their sewer lateral lined. For purposes of the example

in the appendix, about $6,100 in revenue would be received to help cover this ongoing cost.

5. Will the City consider installing the water mains using horizontal directional drilling (HDD) in either of these neighborhoods and using a plastic pipe (HDPE or C-900 PVC)?

The master plan recommends the installation of a new water main on Yosemite Blvd. in 2014. The City's current standard allows only ductile iron pipe on new water main installations. However, this project offers a unique opportunity in Birmingham in that the right-of-way is wide, and the street is currently unimproved (with no plans to pave it in 2014). Generally, boring public water main on streets in Birmingham would still require digging holes in the street in front of each house to make a connection to the new water main, as well as disconnecting from the old water main. Since there is no existing water main on Yosemite Blvd., and since the parkway is wide enough to allow all excavations to occur outside of the paved surface, the City should consider current boring technologies such as those noted above. We have started the research task into this idea, and will seriously consider it for this project. There are long term considerations, such as the additional tools, fittings, and equipment that our DPS would have to purchase to maintain this new pipe, as well as training and maintaining staff with expertise on the repair methods. Benefits could include reduced construction cost, and reduced excavation in the right-of-way, which has the added benefit of not creating as many new drainage problems as traditional open trench excavation would. Since it is not slated until construction in 2014, we are not prepared to make a firm recommendation on this idea at this time.

6. A note should be made that hydrants will be installed on the streets when the new water mains are installed, which will help improve available fire flows in these areas.

The master plan has been modified to clarify that streets that currently have no water main (such as Yosemite Blvd.) will be designed with an appropriate fire hydrant layout as a part of their water main project, to help improve fire flows in these areas.

Summary

Based on the generally receptive nature of the stakeholders assembled in December, we plan to place the item on the February 14, 2011 Commission agenda, requesting to set a public hearing date of March 21, 2011. Between these two dates, informational booklets will be mailed, and community meetings will be held to allow the public to fully understand the nature of the recommendations. Should the master plan be approved at that time, the Engineering Dept. will begin working on the items listed for Spring, 2011, on the attached suggested timetable.

Backyard Sewer & Water Systems
Long Term Master Plan
Long Range Planning Session Update

APPENDIX A

Detail Regarding Cost Estimates

The following information is provided to better explain the thought process involved in arriving at some of the cost figures stated in the main report, in order of appearance:

1. City sewer maintenance special assessment

Currently, the City tries to jet clean all City sewers on at least a 2 year rotation. Sewers that are in fair condition are cleaned on a 1 year rotation, while those in poor condition are cleaned every 2 months. About 15% of the back yard sewers in the City are on the 2 month interval (about 1 mile total), while the remaining back yard sewers (5.5 miles) are on a 1 year interval. Considering labor and equipment costs, the cost to clean the back yard sewers that are on the 2 month interval is currently costing the City about $3,900. Cleaning the entire back yard system once per year is about $25,000. After all the backyard sewers are lined, we expect that some can be reduced to a 2 year interval, while others will be left at or reduced to a 1 year interval, due to either low spots in the pipe, or root infested lateral taps, or both. At this point, several assumptions must be made to arrive at a number. If half of the backyard sewers are cleaned every year (instead of the standard 2 years) after lining due to either low spots or roots (from laterals), and half of that half (or 25%) are strictly due to root infested laterals, then 25% of the $25,000 price being expended to clean the entire back yard system is being spent due to roots, or $6,250. This cost would come up once every 2 years, as every other year it would have been cleaned under the normal rotation. Therefore, the special assessment district would be responsible for an annual payment of half of $6,250, or $3,125. If there are 20 homes in the district (those homes with root infested sewers that refused to line their sewer lateral), then each would be billed $156 as an extra sewer cleaning fee annually (subject to change as cleaning costs change or membership within the district changes).

2. Water service connection and meter relocation to front of house

As stated in the plan, all work within the right-of-way would be done by a City contractor, at no cost to the homeowner. The remaining work for a private contractor would be to provide a plumbing template at the front of the basement for a new water meter (to be installed by the City), cap the pipe where the meter existed previously (at the rear of the basement), and to install a 1 inch copper pipe (typically) from the front wall of the basement to the front property line. Water pipes can often be bored in the front yard, keeping damage to grass, trees, shrubs, and front porches to a minimum. The simple, low cost price (at $2,600) involves a relatively open basement, where the meter can be installed on the front wall, and connected to a copper pipe in the ceiling

relatively close. If the plumbing is such that the copper pipe needs to be installed across the basement ceiling, the additional cost would be less than $500. In some cases, if the front basement wall has obstructions, such as a porch with a deep footing, it may be advantageous to enter the house on the side. Additional excavation and boring in the yard could increase the cost by up to $1,000.

3. Sewer service connection to the front of the house:

Again, all work and costs in the right-of-way would be addressed by the City. The remaining work for a private contractor would be to extend a sewer lateral from the new front connection point at the property line to the house (either front, side, or back, depending on each house's situation), and connect it to the main sanitary sewer stack in the basement, as well as to the low point in the footing drain system. The main sanitary sewer stack is typically easy to locate, and does not require much damage to the basement, even when the basement is finished as living space. The footing drain system will unfortunately likely drain to the rear of the basement, making the option of extending the service around to the rear of the house attractive for some. If the basement is open and unfinished, trenching the footing drain outlet through the basement floor to the front of the house will often be cheaper. On the outside, if there are mature trees, shrubs, porches, or patios in conflict with the new lateral, short sections up to 20 feet can be excavated without much additional cost. Most sewer projects of this nature can be done with minor amounts of damage to the landscaping, and the costs quoted above (on the high end) include some allowance for those that need to hire an outside landscaping contractor to repair any damage caused by the sewer lateral relocation.

BACKYARD SEWER AND WATER SYSTEMS MASTER PLAN
SUGGESTED TMETABLE

DATE	ACTIVITY
Late Winter, 2011	Send information package to all homeowners. Specific packages will be prepared for Quarton Lake and East Side, as issues are different. Conduct public hearing (inviting all affected property owners) in front of the City Commission to approve master plan.
Spring, 2011	Begin easement solicitations by mail for all sewers that will remain in system: 1) Obtain blanket easements on all properties in plats where no easements exist. 2) Obtain blanket easements where access to manholes is required. Prepare bidding documents for internal sewer inspection contract.
Summer, 2011	Internally inspect all backyard sewers that will remain in service. Abandon 1 or 2 blocks of backyard sewers in E. Maple Gardens Sub. as a part of St. Andrews Rd. sewer project. Send second round of easement solicitations by mail for those that did not respond to first request; identify problem properties.
Fall, 2011	Review all data from inspections, identify any potential main line excavations, review easement status of proposed excavations. Determine first year lining program area. Identify remaining unsecured easements, hire consultant to begin working on obtaining them.
Winter, 2012	Prepare bidding documents for lining project, Phase I. Notify homeowners within Phase I area that have a lateral over 30 years old (but whose connection is satisfactory) that they are invited to participate in a voluntary special assessment district, and that they must respond by a certain date if they wish to participate. An estimated cost of $6,000 will be provided in correspondence. Notify homeowners within the Phase I area that have root infestation at the City sewer connection that they will be placed in a required special assessment district, with the choice being a lined sewer lateral (at $6,000), or to be billed for additional City sewer maintenance at a cost TBD (but should be less than $500 per year).

BACKYARD SEWER AND WATER SYSTEMS MASTER PLAN
SUGGESTED TMETABLE

Winter, 2012 Continued	Notify homeowners within the Phase I area that have misaligned sewer connections at the City sewer that they are invited to participate in a voluntary special assessment distrct to have the tap excavated and reconstructed, and that they must respond by a certain date if they wish to participate. An estimated cost of less than $6,000 will be provided in the correspondence (not including landscaping or lining).
	Prepare bidding docuements for E. Maple Rd. Reconstruction, Adams to Eton.
	Notify homeowners on E. Maple Rd. of requirement to disconnect the backyard water service within ten years, and provide assistance in getting process started for each home as needed.

City of Birmingham
A Walkable Community

Date: March 16, 2011

TO: Property Owners in Birmingham Villas and East Maple Gardens Subdivisions

RE: City of Birmingham Backyard Sewer and Water Systems Master Plan

Dear Property Owner,

You are being sent this package of information because our records indicate that you are the owner of a property within the above neighborhoods (see Figure 1, attached). Further, our records indicate that you are likely receiving water (and in some cases sewer) services from a City main located at the rear of your property. The City is in the process of developing a master plan on how best to operate, maintain, or disconnect these mains in the future. We encourage you to review these materials closely. The plan has been reviewed and endorsed by the City Commission. Before moving forward, it is important that we get input from those most affected. The attached information packet has been assembled so that you may better understand what is proposed.

After reviewing the booklet, if you wish to learn more, or if you wish to have questions answered, you are invited to attend an informational meeting on this topic scheduled for **Thursday, March 24, at 7:00 PM**. The meeting will be held at the City's Dept. of Public Services Building, located at 851 S. Eton Rd. (two blocks north of Lincoln Ave.). The vehicle gate will be opened to accommodate parking on site, and the front door to the street will be open as well. If you are not able to attend the meeting, and wish to discuss this matter further with City staff, you are welcome to call our office at 248-530-1850, during the hours of 8 AM to 5 PM, Monday through Friday.

Sincerely,

Paul T. O'Meara
City Engineer

Brendan Cousino
Assistant City Engineer

151 Martin Street • P.O. Box 3001 • Birmingham, MI 48012-3001
(248) 530-1800 • Fax (248) 530-1080 • http://ci.birmingham.mi.us

City of Birmingham
A Walkable Community

Date: March 16, 2011

TO: Old Salem Ct. Property Owners

RE: City of Birmingham Backyard Sewer and Water Systems Master Plan

Dear Property Owner,

You are being sent this package of information because our records indicate that you are the owner of a property on Old Salem Ct. Further, our records indicate that you are likely receiving water services from a City main located at the rear of your property. As will be explained in the attached booklet, these water mains are old, and due to their inaccessible location, are problematic. The City is in the process of developing a master plan on how best to phase out and disconnect these mains in the future. We encourage you to review these materials closely. The plan has been reviewed and endorsed by the City Commission.

The majority of the water mains still operating in backyards are located on the east side of the City, along the Maple Rd. corridor. The water mains servicing Old Salem Ct. are the only ones in the system in your immediate area. Therefore, the attached booklet has been written with an emphasis on the issues present in those neighborhoods, however, the need to plan for an eventual disconnection applies to Old Salem Ct. as well. The attached booklet refers to water main/sewer/paving projects planned for the next several years. A water main and road repair project is also planned for Old Salem Ct., tentatively in 2014. If the City Commission ultimately approves this schedule, the disconnection process described within the booklet would begin in 2014.

Before moving forward, it is important that we get input from those most affected. The attached information packet has been assembled so that you may better understand what is proposed.

After reviewing the booklet, if you wish to learn more, or if you wish to have questions answered, you are invited to attend an informational meeting on this topic scheduled for **Thursday, March 24, at 7:00 PM**. The meeting will be held at the City's Dept. of Public Services Building, located at 851 S. Eton Rd. (two blocks north of Lincoln Ave.). The vehicle gate will be opened to accommodate parking on site, and the front door to the street will be open as well. If you are not able to attend the meeting, and wish to discuss this matter further with City staff, you are welcome to call our office at 248-530-1850, during the hours of 8 AM to 5 PM, Monday through Friday.

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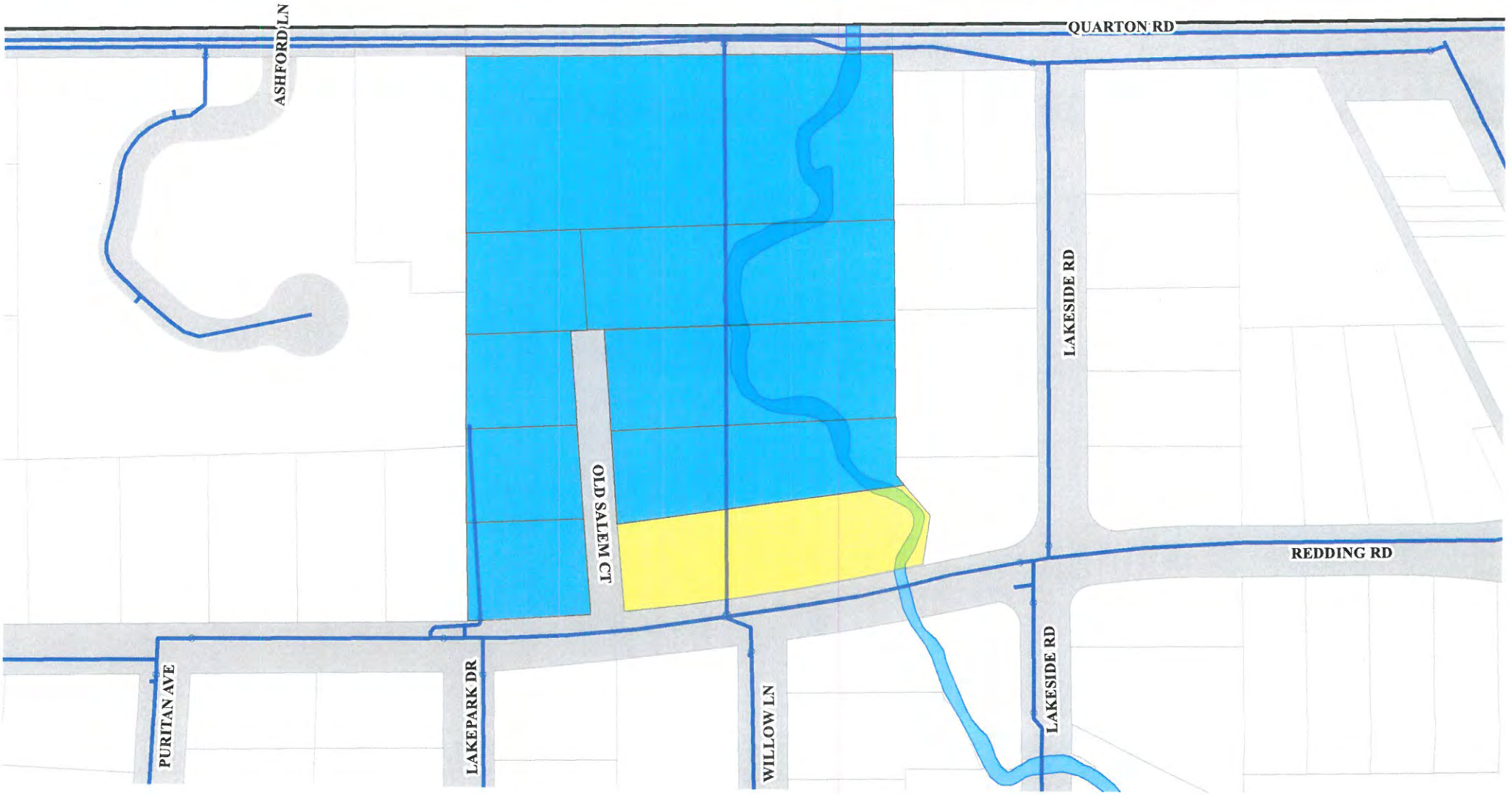

Figure 9:

Old Salem Ct.
Existing Water Connections

N

0 62.5 125 250 375 500
Feet

Water Connections

Old Salem Ct

Rear or Side

Vacant Property

Water Main

City of Birmingham
A Walkable Community

Date: March 16, 2011

TO: Property Owners on St. Andrews Rd.

RE: St. Andrews Rd. Paving Project – Contract #4-11(P)

Dear Property Owner,

We encourage you to review the attached package of information describing the need to begin phasing out the use of the backyard water main and sewer system in your neighborhood. The attachments will help describe how most of you need to eventually be disconnected from the backyard water main, and in a few cases, the backyard sewer.

The City plans to reconstruct the water, sewer, and pavement on the entire length of St. Andrews Rd. during the spring and summer of 2011. Plans have been prepared, and the contractor selection process is currently underway. Work could begin as early as April. Once details of the timing have been confirmed, you will be receiving a separate mailing that will provide more information specific to the project.

As a part of the project, the water and sewer systems will be improved on St. Andrews Rd. When dealing with backyard utility connections, being located on a corner property can be a big benefit. While others need to consider relocating pipelines in basements to allow a front yard connection, that can often be avoided on corner lots by running the service lateral from its current point in the backyard, and turning it in the direction of the side street. With that in mind, we are planning to install, as a part of the City project, water and sewer service laterals for each house or multi-family building along the St. Andrews Rd. route that will need one, in accordance with the Backyard master plan. After reviewing the materials, we encourage you to consider what the best location for a reconnection would be for your particular property. Please let us know your preference, and we will install the service as per your request. There will be no charge for this work at this time.

Once the St. Andrews Rd. project is completed, should the Master Plan be approved by the City Commission, you will then be notified relative to the appropriate time period beginning wherein you will be encouraged to disconnect from either the water main or the sanitary sewer.

We look forward to hearing from you to receive your input relative to where the water or sewer connection should be placed. If we do not hear from you, we will install them in what appears to be the most logical location, for your future use. Once you are ready to ask questions or provide feedback relative to this issue, we welcome your call at 248-530-1836, or your email at pomeara@ci.birmingham.mi.us.

Sincerely,

Paul T. O'Meara, P.E.
City Engineer

151 Martin Street • P.O. Box 3001 • Birmingham, MI 48012-3001
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City of Birmingham
A Walkable Community

ENGINEERING DEPARTMENT

AN INFORMATIONAL REPORT

BACKYARD SEWER & WATER MASTER PLAN PROPOSAL

BIRMINGHAM VILLAS SUBDIVISION
&
EAST MAPLE GARDENS SUBDIVISION

AN INFORMATIONAL REPORT

BACKYARD SEWER & WATER MASTER PLAN PROPOSAL

BIRMINGHAM VILLAS & EAST MAPLE GARDENS SUBDIVISIONS

TABLE OF CONTENTS

SECTION 1: HISTORY

1. THE EARLY DAYS

A map of the area, and the limits of the two subject subdivisions are shown in Figure 1.

Birmingham Villas was subdivided in 1914, as a part of Troy Township. It was annexed by the Village of Birmingham in 1925. Similarly, East Maple Gardens was subdivided in 1923, and annexed by the Village in 1926.

As was considered acceptable at that time, the public water main and sanitary sewer systems for these neighborhoods were constructed along the rear property lines, as shown on Figures 2 and 3. While this design allowed a reduced initial construction cost for the developer, it clearly did not consider the long term ramifications of attempting to maintain these pipelines. We have no exact record of the age of these backyard pipelines, but it appears that they were installed and operating at the time the village annexed these areas. There was no storm sewer system in either area at that time.

In Birmingham Villas, combined sewers were built on both Yosemite Blvd. and Villa Ave. by 1940. Also in 1940, a larger combined sewer was installed in the alley between Maple Rd. and Yosemite Blvd. The alley was later vacated (split up and turned over as private property to the adjacent owners) in 1951. Although not shown on Figure 2, a backyard sewer was also installed south of Yosemite Blvd. Interestingly, the Village Engineer knew early on that using a sewer in the backyard would be problematic. The official sewer map for the City indicated that no buildings were allowed to connect to the backyard sewer between Yosemite Blvd. and Villa Ave. after 1925, and that it would no longer be maintained.

In East Maple Gardens, combined sewers were constructed on Dorchester Rd. and Yorkshire Rd. by 1929.

Sewer improvements were also built on E. Maple Rd. at various times, although these were often done as regional projects, rather than specifically to provide drainage to the immediately adjacent properties.

Based on the above, although sewer improvements have been made to provide some storm drainage to these neighborhoods, no real investment has been made in either the water main or the backyard sewer systems. Now that these pipes are all well over 80 years old, we need to begin planning for their rehabilitation, or eventual abandonment.

2. BIRMNGHAM CRESTVIEW SUBDIVISION

A similar situation existed in an area subdivided about the same time in the Birmingham Crestview Subdivision. It is located to the northeast of the intersection of 14 Mile Rd. and Southfield Rd. In 2005, the City needed to provide storm drainage improvements in this area. In order to address all water and sewer issues in the area at the same time, the City created a plan to

eventually phase out the public backyard water mains in this area. The program has been a success, with almost 70% of the homes now reconnected to a newer, improved water system. It was used as a model for some elements of the plan now being suggested for the subject neighborhoods.

3. QUARTON LAKE ESTATES SUBDIVISION

The Quarton Lake Estates Subdivision is a large area that encompasses most of the northwest corner of Birmingham, from Quarton Lake, west to the west City limits. It currently has about 375 homes connected to a backyard sewer, and 8 homes connected to a backyard water main.

In 2008, some homeowners asked the City to help them begin discussions about improving the condition of their streets. Many streets had no storm sewers or curbs, and a thin chip seal surface that was in poor condition. Rather than moving forward with the construction of new pavements, the Engineering Dept. raised the question about how best to handle the backyard sewers. Similar to your neighborhoods, the sewer system was built in 1922, and is showing many signs that it should be either retired or repaired. Since the decision to retire or repair the sewers was not a simple one, the City Commission created a nine-member committee to study the issue and make a recommendation.

4. SEWER, WATER, STREETS AD HOC COMMITTEE

The Sewer, Water, Streets Ad Hoc Committee met for nine months. Membership included representatives from the Quarton Lake area, as well as two representatives from the east side neighborhoods that are the subject of this report. Two members were also appointed to represent Birmingham at large. The Committee studied many things, including:

- The feasibility of relining the public sanitary sewers, and the costs involved.
- The lack of storm sewers in the Quarton Lake area.
- The best methods to repair homeowners' sanitary sewer laterals in rear yards.
- The experience (noted above) in Crestview Subdivision relative to backyard water main disconnections.
- The relatively simple job of disconnecting a backyard water service, and the more difficult nature of a backyard sewer service disconnection.
- The poor water pressure and fire protection available in the current systems, both in the Quarton Lake area, and in the east side neighborhoods.
- The conditions that would require an excavation crew to enter backyards, excavating to repair pipelines.
- The City's requirements to acquire easements in backyards should the City's sewer be repaired and left in service.

In February, 2009, after meeting for nine months, the Committee, (on a 6-3 vote), recommended to the City Commission suggesting that the City move forward with lining public backyard sewers, replace the water main system in the streets where needed, and allow paving projects to move forward independent of the sewer issue.

After reviewing the report, the City Commission identified concerns that needed clarification before moving forward:

- The difficulty of securing easements from every property owner.
- The long term costs to the City due to having to reline backyard sewers, build a separate storm sewer system, and the eventual operation of two sewers (front and back) on each street.
- The frequency of excavations in backyards.

Taking the above direction, as well as attempting to implement strategies to reduce long term costs to the system, the Engineering Dept. has developed a master plan that was first presented to the City Commission last November. The Commission endorsed the plan, and asked that its details be released to those that would impacted by it. After completion of this process, a public hearing will be announced to allow for public comment prior to final adoption of the plan.

SECTION 2: BACKYARD SEWER AND WATER SYSTEM MASTER PLAN

A. SEWER SYSTEM PLAN

1. BIRMINGHAM VILLAS

As was noted above, the backyard sewer between Maple Rd. and Yosemite Blvd. was replaced in 1940, when the backyards were still accessible with an alley. The newer pipe has been inspected and found to be in relatively good condition, perhaps not needing any further reconditioning at this time. We propose to keep this pipe in service, for the following reasons:

- The pipe is in good condition, with relatively few defects.
- It is larger than the original pipe, starting at 12 inch diameter at the upstream end, and ending with 21 inch pipe when it reaches Columbia Ave., significantly reducing the chance of clogging.
- The sewer was built in an alley (now a dedicated 16 ft. wide easement) that has helped keep homeowners from building structures too close to it.
- While records are incomplete on some homes, it is clear that the large majority of homes (about 92%) are currently connected to the rear yard sewer (as detailed in Figure 4).

Although we will continue to require new homes to connect to the street sewer, we do not intend to require any changes to the existing homes' connections.

Since the sewer is in relatively good condition, it is not clear whether the sewer will be relined at this time. The sewer will be inspected later this year with an internal camera, and a decision will be made whether to move forward with relining. Whether the City sewer is relined or not, the individual sewer lateral repair programs listed below (in Section 2.A.4.) will still apply.

Regarding the backyard sewer between Yosemite Blvd. and Villa Ave., as was noted above, the City declared that no homes should be connected to this sewer in 1925 (prior to hardly any development within the neighborhood). (The sewer is not depicted on Figure 2.) As shown on Figure 4, we have no record of any active connections to this sewer. Should any homeowners feel that they are connected to this sewer for whatever reason, and you would like to review your situation in detail, you are encouraged to call us directly. At this time, no plans are in place to make any changes to this backyard sewer.

2. EAST MAPLE GARDENS

The original sewer system in this neighborhood is well over 80 years old. It was built of 8 inch diameter clay pipe, in short 2 foot long sections. The pipes are in relatively poor condition. The majority of the properties (other than one block of Maple Rd.) have had access to an alternate sewer in the adjacent streets for many decades. As shown on Figure 5, the opportunity to connect to a street sewer has allowed the majority of the buildings to be connected to the front.

Unlike the sewer noted above in Birmingham Villas, the sewers in this neighborhood have several drawbacks:

- The pipes are in relatively poor condition. Relining is strongly recommended if they are to be left in service.
- The sewers are all 8 inch diameter, meaning they were sized to take only sanitary sewer flows (from bathrooms, kitchen sinks, and laundry rooms). However, most connected homes also have their footing drains discharging to these sewers as well, which can allow much more water in the pipe during wet times of year. The smaller size also allows for the pipe to become clogged easier when there is a severe defect, root growth, or if large, non-biodegradable items are being flushed down the drain.
- The sewers were not built in an easement or alley, leaving the City no legal access to maintain them. Although property owners typically grant access when there is an emergency, we cannot move forward with planned restoration projects unless all property owners sign easements, which can take significant effort to obtain.
- The lack of dedicated easements also means that property owners have not always considered the backyard sewer (or water main) when locating garages, carports, swimming pools, or other structures that are very difficult to excavate around.
- Other than the block immediately east of Eton Rd., between Yorkshire Rd. and Maple Rd., there are relatively few properties currently connected to this system.

Given the many issues that this sewer system has, the City is recommending that the majority of it be slated for abandonment in the long term. The exception would be the block east of Eton Rd., between Yorkshire Rd. and Maple Rd., where about 71% (a clear majority) are connected to the backyard sewer. For that one block, it is recommended that the City move forward with relining this pipe, and offering the options listed below for restoration of laterals (where needed) in Section 2.A.4. below.

3. SEWER ABANDONMENT PLAN

For those property owners connected to a backyard sewer (in East Maple Gardens) outside of the one block referenced above in section 2.A.2., the following information applies. If your house or multi-family building is connected to a backyard sewer, the master plan being considered will eventually schedule this sewer for abandonment.

If the plan is approved, below is the proposed chain of events:

a) A water and sewer improvement project is tentatively scheduled on Dorchester Rd. and Yorkshire Rd. for the 2013 construction season. (The timing is subject to subsequent budget approval by the City Commission that will occur at a later date.) The project will include new water mains on both streets, sewer upgrades (where needed), and replacement of the paved surface with new gravel subbase and chip seal (similar to what is in place today). For those properties that need to disconnect from the backyard sewer, the project will also include new sewer service lateral extended from the City sewer to the property line (a foot past the City sidewalk). The new lateral may be placed anywhere across the frontage of the property, as directed by the owner, provided the location does not result in damage to an existing tree. The work on this project would be funded by the City's Sewer Fund, and would not involve any assessments to the adjacent property owners. Although no new pipelines are proposed for Maple Rd., sewer laterals would be installed from the existing City sewer to the property line for the multi-family buildings that also must disconnect from the backyard sewer.

b) At the time the project is completed, all property owners would receive written notice of the City's intention to abandon the backyard sewer that they are currently connected to. The property owner would be notified that they will be required to complete plumbing improvements on their property such that, within ten years of receipt of the notice, all sanitary sewage discharge currently draining to the backyard sewer would be redirected to the front, presumably using their new sewer lateral. The cost of the work required on private property will be the responsibility of the property owner. If the owner is able to make the changes to the internal plumbing such that the redirection to the front is completed within 12 months, the City will waive all permitting fees that would be paid as a part of this work. Estimates of cost are available in Appendix A of this report.

c) At the time the notice is sent, the City would also file paperwork at the Oakland Co. Registrar's Office to be filed on each property's title work clarifying that this requirement is in place. As such, the current property owner would be able to sell the property without making the sewer system improvements, but potential buyers would be alerted to this issue as a part of the sale negotiation.

d) If the owner chooses not to make the sewer improvements within the first 12 months, the City's inspection fees for the work will apply.

e) Approximately one year prior to the end of the ten year period, the City would remind the owner again of their duty to disconnect from the City backyard sewer.

f) If 100% disconnection is still not achieved after ten years, the City will notify the remaining property owners that regular maintenance of the City backyard sewer will

be ending, and that any damages caused due to flooding in the future as a result of the sewer no longer draining as needed will not be responsibility of the City. If 100% disconnection has been achieved, the City will move forward to fill the sewer with flowable concrete, and close off the sewer to help avoid sinkholes in the future.

With respect to the multi-family properties on Maple Rd., some of the existing parking lots have underground drainage systems for which we have no records. Should the plan be approved, the Engineering Dept. will encourage dialogue between the owner and/or association president of each property to better understand their private drainage systems, and to work together to provide a new drainage outlet that accommodates the entire property's needs with a new system that flows toward Maple Rd. Due to the additional complexity involved with these properties, we encourage representatives of these properties to contact the Engineering Dept. for direct consultation.

4. SEWER REPAIR PLAN

As noted above, there are two blocks where the plan proposed to keep the backyard City sewer in operation: the block in Birmingham Villas (between Maple Rd. and Yosemite Blvd.), and in East Maple Gardens, the block immediately east of Eton Rd., between Yorkshire Rd. and Maple Rd. If the plan is approved, below is the proposed chain of events for these two blocks:

a) On the block east of Eton Rd., letters requesting that a blanket easement form be signed will be mailed to each owner along the route. The easement form would grant the City permission to access the property as needed into the future to maintain the City sewer located on their property. The legal document will be notarized, and recorded to become part of the property's permanent title work. No compensation will be offered. Should there be owners not inclined to sign the easement, relining of the sewer will be delayed until these issues can be resolved. The suggested language that would appear on the easement is provided in Appendix B.
b) Prior to the end of 2011, the City will internally inspect the backyard sewer using a camera system made for this purpose. Problems with the existing pipe will be noted, as well as building connections that are either root infested, failed, or misaligned. The location of each issue will be recorded. Similar inspections of the majority of backyard sewers throughout the City will be conducted at the same time.
c) Using data from all the inspections, as well as considering progress being made on easement collection, the City will prepare a sewer relining plan that will address all of the backyard sewers inspected throughout the City. The master plan projects that, should easements be received as hoped, the relining program could be accomplished throughout the City during the period of 2012 to 2015. It is not known what year these particular sewers would be lined.
d) Once the time for the backyard sewer lining project is approaching, each property along the route will be notified as needed relative to three potential special assessments:
    i) <u>Backyard sewer lateral lining special assessment:</u> Since each property has a sewer lateral connection in the backyard, it is assumed that relining this

pipe (the pipe between your house and the City sewer) could be a desirable option for repair without the need to excavate. We should be able to offer this service at a reduced cost from what it would be if individual owners attempted to hire a contractor on their own. All buildings with backyard sewer connections over 30 years old would be offered the voluntary opportunity to be assessed to have a contractor line their sewer lateral. The contractor would have to build a cleanout pipe on their existing lateral, using suction that would create only a small hole in their yard, keeping damage to the landscaping to a minimum. After the cleanout is installed, a liner could be installed from that point which would give the pipe a new, structurally sound internal coating that would eliminate the concern of root intrusion, and provide many more decades of service. The estimated cost of the assessment is $6,000 per property, which could be paid at once, or paid in ten installments over a ten year period, with interest due on the remaining balance.

ii) City sewer maintenance special assessment: One of the major reasons for lining the City sewer is to eliminate the problem of root intrusion into the pipe. However, if a homeowner's sewer lateral connection has many defects that allow roots to enter, those roots may eventually grow to the City sewer and begin to clog it as well. When the City sewer is inspected, those laterals that serve as a point of entry for roots into the City sewer will have their service photographed, and sent to them. They will be asked to participate in the assessment described above in i), at their cost. If they decline, they will be required to participate in an annual ongoing assessment to assist in the City's increased costs to maintain this sewer as a result of their lateral contributing roots into the main line. The amount of the assessment will vary depending upon how many backyard sewers have laterals in this situation, however, at this time, we estimate the cost would be between $100 and $500 per year, ongoing until the owner agrees to repair their lateral.

iii) Backyard tap excavation special assessment: On occasion, the internal camera inspection may reveal that a sewer tap has become misaligned, or settled, over the years. An example of this can be found in Fig. 6. A misaligned sewer lateral will eventually cause drainage problems for the homeowner that will need to be addressed. A picture of the sewer lateral would be forwarded to the property owner, notifying them of this concern, and offering them a voluntary special assessment to have the sewer tap excavated and repaired. Excavation equipment would have to enter the backyard at the point of the tap, and a small hole would be dug to access the sewer tap, and allow it to be reconstructed. The cost of the assessment is estimated at $5,000 to $6,000, not including surface restoration costs, which can vary considerably depending on the nature of the yard and its location. The amount due to the City would be payable either in one sum, or in ten installments over a ten year period, with interest due on the remaining balance.

Upon completion of the backyard sewer lining, all property owners would be connected to a more reliable City sewer for many years to come.

B. WATER SYSTEM PLAN

As noted above, the water systems for the two subject neighborhoods are well over 80 years old, and in the case of Birmingham Villas, approaching 100 years old. Water main breaks, some of which have occurred within the last year, are disruptive and difficult to repair. Fortunately, to date, the breaks have not occurred in areas where garages or other expensive improvements have been built either over the main, or in close proximity to it. The City must begin implementing a plan to address this situation before more difficult circumstances arrive.

The majority of the existing water mains were built as 4 inch diameter. In addition, until the early 1960's, Birmingham operated its own water treatment plant, from an underground well water source. The well water was high in iron, which formed a thick layer of rust inside the pipes, effectively reducing the inside of the pipes down to about 2 inch diameter. The minimum size used for local street water mains today is an 8 inch diameter, which provides significantly more volume of water to each customer and fire hydrant (when needed). Therefore, unlike the sewer discussion above, maintaining the water mains in their current location is not just a matter of lining, but significantly increasing the size of the pipe. Currently available construction practices do not provide a simple, cost-efficient means to improve these mains (by replacing them with a larger pipe). Further, if an attempt was made to replace the pipe in its current location, an open cut excavation would be required at each home's connection to the main, which would occur in each backyard. Attempting to use the existing water main location would also prolong the problems associated with their difficult to access location, and would not allow the opportunity to provide fire hydrant access at the street.

The effort involved to disconnect and reconnect water service laterals is also a simpler, less disruptive procedure compared to the sewer service laterals discussed above. Water services are small, 1 inch pipes, as compared to sewer services, which are larger 4 inch pipes. Water services are also able to go up and down, and make turns as needed. Sewer pipes, however, must be laid in such a manner that all the water flows down hill, and bends should be avoided.

Finally, as noted above, the City has experience with a similar initiative in the Birmingham Crestview Subdivision, where over 100 homes have been asked to disconnect their water service, over a ten year period, starting in 2005. To date, almost 70% of the involved properties have followed through with the reconnection, and are now enjoying improved water pressure and a more reliable water source.

Given the above considerations, the City plans to move forward with a plan to eventually abandon all of the water mains in the backyards within these two neighborhoods. For your reference, Figures 7 and 8 are provided to indicate the homes or multi-family buildings we have recorded as being connected to the backyard water mains at this time.

If the plan is approved, below is the proposed chain of events:

a) A pavement replacement project is tentatively scheduled for the half mile long section of E. Maple Rd., between Adams Rd. and Eton Rd. (subject to budget approval) for the 2012 construction season. As a part of the project, the water main will be replaced, as well as sewer upgrades (where needed). For the homes on the south side of the street, currently connected to the backyard water main, a new water service lateral (minimum 1 inch in size) will be installed from the main to the property line (about one foot south of the City sidewalk). The new lateral may be placed anywhere across the frontage of the property, as directed by the owner, provided the location does not result in damage to an existing tree. The water system upgrades on this project would be funded by the City's Water Fund, and would not involve any assessments to the adjacent property owners.
b) As was noted above in Section 2.A.3.a) above, a project is scheduled on Dorchester Rd. and Yorkshire Rd., tentatively set for 2013 construction. Similar to the Maple Rd. project described in the above paragraph, water service laterals would be extended from the water main to the property line for all properties that are currently connected to the backyard water mains. Although no new water main is being installed on Maple Rd. (between Eton Rd. and Coolidge Hwy.), new water services would be installed as a part of the project, and extended to the property line.
c) Finally, in 2014, a water main replacement project is planned for Yosemite Blvd. and Villa Ave. in the Birmingham Villas subdivision. Since there is no curb and gutter drainage system on these streets, the City will explore methods of water main installation that could significantly reduce excavation, thereby reducing damage to the streets and the adjacent parkways. As in the above projects, water services would be installed from the new mains to the property lines, in front of each home that is currently connected to the backyard water mains.
d) In each of the above three projects, fire hydrants will be installed on all streets getting new water mains, laid out to assure that all buildings within the area receive adequate fire protection in the event of an emergency.
e) At the time each project is completed, all property owners would receive written notice of the City's intention to abandon the backyard water main that they are currently connected to. The property owner would be notified that they will be required to complete plumbing improvements on their property such that, within ten years of receipt of the notice, the connection in the backyard will be abandoned, and all fresh water for use on the property will be obtained from the water main in the street. The cost of the work required on private property will be the responsibility of the property owner. If the owner is able to make the changes to the internal plumbing such that the redirection to the front is completed within 12 months, the City will waive all permitting and meter installation fees that would be paid as a part of this work. Estimates of cost are available in Appendix A of this report.
f) At the time the notice is sent, the City would also file paperwork at the Oakland Co. Registrar's Office to be filed on each property's title work clarifying that this requirement is in place. As such, the current property owner would be able to sell the

property without making the water system improvements, but potential buyers would be alerted to this issue as a part of the sale negotiation.

g) If the owner chooses not to make the water improvements within the first 12 months, the City's inspection fees for the work will apply.
h) Approximately one year prior to the end of the ten year period, the City would remind the owner again of their duty to disconnect from the City backyard water. The mailing would reference Section 114-58 of the City Code, which speaks to penalties that can be applied to property owners that fail to disconnect from the water main in a timely manner.
i) If 100% disconnection is still not achieved after ten years, the City will review the number of properties involved, and consider its option to force compliance, including enforcement of penalties as stipulated in the ordinance, or turning the water main off.

SECTION 3: SUMMARY

The City acknowledges the disruption and financial costs that will be involved to many of the property owners impacted by this plan. The plan has been crafted to be a compromise between what is reasonable for the City-wide ratepayer to pay and what the directly benefitting property owners are being asked to pay. We hope the information contained herein has been helpful, and if there are questions raised by this report that need further clarification, feel free to contact the Engineering Dept. directly.

APPENDIX A

SEWER AND WATER CONNECTION RELOCATION PROJECT COST CONSIDERATIONS

SEWER SYSTEM RECONNECTIONS

Since there are many variables involved when working on private property, the best method to complete a sewer flow routing to the front of the property is a matter that takes individual study on the part of a property owner's preferred plumbing contractor, while considering the owner's needs as well. For example, if an older house has an unfinished basement with laundry facilities, but a well landscaped front and back yard, a preferred option could be the following:

- The contractor would locate the main plumbing "stack" that collects flow from the upper levels of the home and drops through the basement into the floor, where it quickly turns (underground) and exits the house toward the back wall. This pipe can be reconstructed along the basement ceiling to flow to the front wall, where it could drop down to a depth about five feet below grade, and exit the house.
- The laundry facilities, as well as the footing drains (which would likely flow around the outside edge of the basement walls, and collect at the same point the plumbing stack now exits the house) could be directed to a pit in the basement floor, which would then be pumped up, connecting to the new pipe being installed across the basement ceiling.
- In order to reduce damage to the front yard landscaping (and porches if they are present), the contractor could dig a bore access pit in the front yard (near the sidewalk) and bore a new 4 inch plastic pipe towards the house, to collect the sewage at the point it exits the house. At the sidewalk, the new pipe would be connected to the sanitary sewer lateral that will be installed by the City.
- No work would be required in the backyard.

In another example, if the house has a relatively new remodeled basement with carpeting, drywall, a bathroom, etc., working in the basement could be difficult. In this case, the best option may be for the contractor to locate the point where the sewage exits the rear of the house, and excavate at that point, constructing a new sanitary sewer lateral that would wrap around the back of the house to the front yard, and then connecting to the street. In this option, there would be no work done inside the house.

Estimated Costs:

As described above, methods and strategies will vary, so a range of costs must be provided. After reviewing the issue with a reputable contractor, we estimate the contractor's cost to make these changes would range between $4,000 and $6,500 for a single family home. Should several homeowners be able to contract the same contractor at the same time, costs would be reduced since the contractor would be able to accomplish more while their equipment is in the neighborhood.

A plumbing inspection is required as a part of the work described above. Typically, the contractor would have an inspection done for the internal work, and a separate inspection for the pipe laying, as the pipe cannot be buried until it has been inspected. Each inspection is charged at $100. The inspection fees will be waived if the property owner can complete the work within the first 12 months after the sewer lateral is installed in the right-of-way.

WATER SYSTEM RECONNECTIONS

Similar to the discussion above for sewer reconnections, the method and path of work for the water service will vary depending upon the circumstances on each property. One key difference in the case of the water system is that the distance from the water main to the water meter must be kept as short as possible. Long, circuitous paths around to the back of the house will not be approved. The City's meter must be moved to the front of the basement, from its current location at the rear. If the owner prefers, the water service can be bored in the front yard, reducing the damage to the landscaping. The basement wall will be cored about five feet below ground level, and the plumbing contractor will prepare the plumbing in the basement for the installation of a meter, typically using 1 inch copper pipe (larger pipe can be used if desired, at extra cost). No work is required in the backyard on the part of the plumbing contractor.

Estimated Costs:

Again working with a reputable local contractor, the cost to reconnect the water service to the front of the house will generally range from $2,600 to $4,000, for a single family home installing a 1 inch service. As noted above, working with neighbors to have several homes completed by the same contractor would clearly help keep this cost down. Further, for those that need to have both water and sewer reconnections done, both pipes can be installed in the same trench, which means that the cost of the work should be less than the sum of the numbers listed above.

City costs will vary depending upon the size of the pipe installed, so a list of prices is provided below.

Internal Plumbing Inspection, 1 inch dia. pipe or smaller	$ 80
Internal Plumbing Inspection, 1-1/4 inch or 1-1/2 inch dia. pipe	$ 85
Internal Plumbing Inspection, 2 inch diameter pipe	$ 95
Water Service Lateral Inspection, 2 inch dia. or smaller	$ 115
Old Meter Removal and New Meter Installation, 1 inch dia.	$ 470
Old Meter Removal and New Meter Installation, 1-1/2 inch dia.	$ 595
Old Meter Removal and New Meter Installation, 2 inch dia.	$1,565

For the typical home, one plumbing inspection will be charged ($80), one water service lateral inspection ($115), and one meter removal and replacement ($470), for a total of $665. These costs can be waived if the work is completed within the first 12 months.

APPENDIX B

SEWER EASEMENT

KNOW ALL MEN BY THESE PRESENTS, that _____ _____, whose address is _____ _____, Grantor, and the **CITY OF BIRMINGHAM,** a Michigan Municipal Corporation, whose address is 151 Martin Street, P.O. Box 3001, Birmingham, Michigan, 48012-3001, Grantee, does hereby grant to the said Grantee, the right to construct, operate, maintain, install, repair, and/or replace sewers and manholes where currently located, and access across and through the following described land situated in the City of Birmingham, for the of One Dollar ($1.00), to wit:

(insert legal description of the property)

and to enter upon sufficient land adjacent to said easement for the purpose of the construction, operation, maintenance, installation, repair and/or replacement thereof.

The premises so disturbed by reason of the exercise of any of the foregoing powers, shall be reasonably restored to its original condition by Grantee.

This instrument shall be binding upon and inure to the benefit of the parties hereto, their heirs, representatives, successors, and assigns and the covenants contained herein shall run with the land.

IN WITNESS WHEREOF, the undersigned hereunto affixed _____ signatures this _____ day of _____, A.D., 2010.

In the Presence of:

WITNESSES

_____

_____

OWNER(s)

_____

_____

STATE OF MICHIGAN)
) ss:
COUNTY OF)

On this ____ day of _____A.D., 2011, before me personally appeared _____ to me personally known, who being duly sworn, did each for themselves acknowledge said instrument to be their free act and deed.

_____
Notary Public

County, Michigan

My Commission Expires:

Drafted by:

Timothy J. Currier
200 E. Long Lake Road, Ste. #110
Bloomfield Hills, MI 48304

After Recording, return to:

City of Birmingham
City Clerk
151 Martin Street, P.O. Box 3001
Birmingham, MI 48012-3001

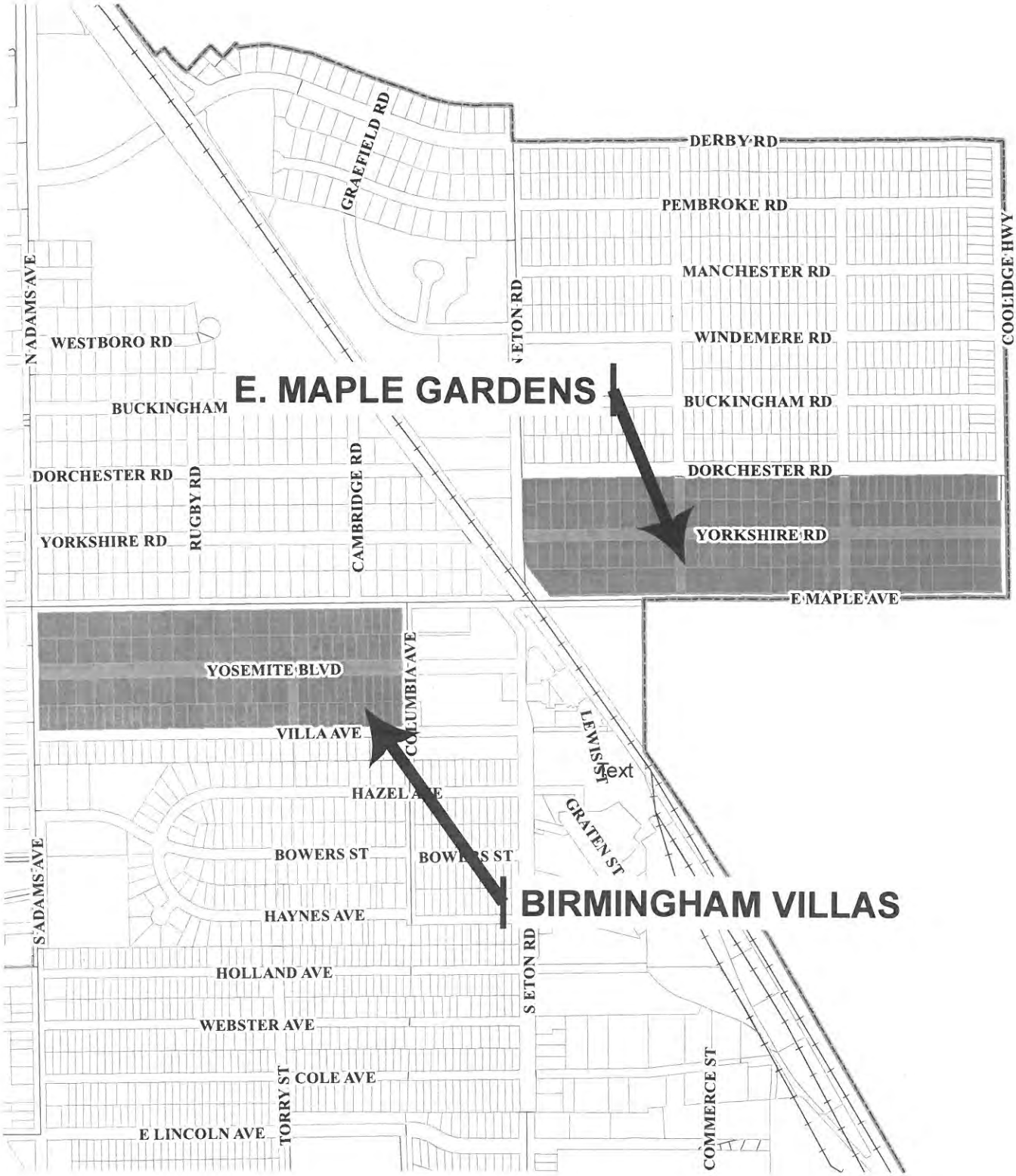
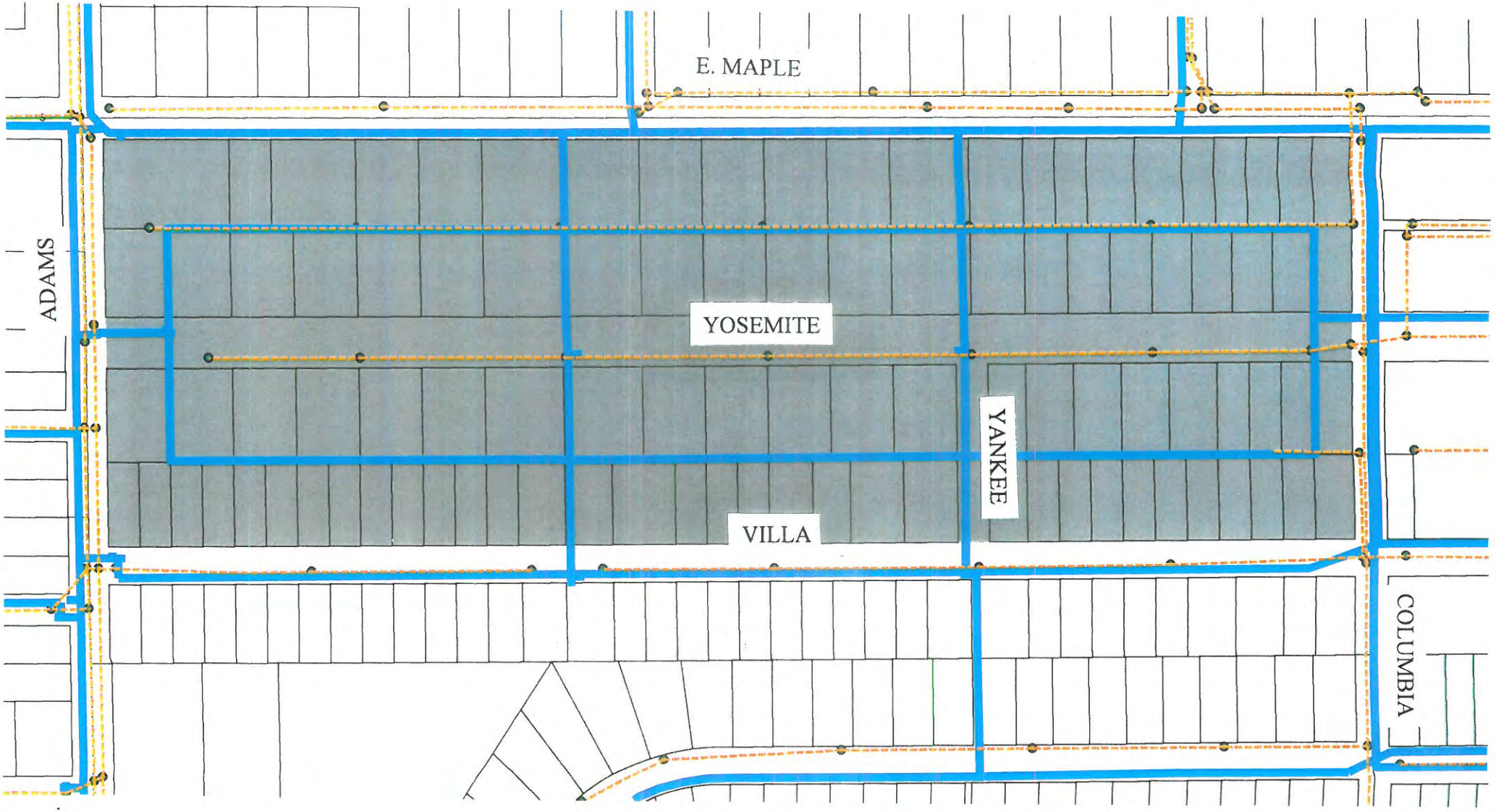


FIGURE 1:

Birmingham Villas and East Maple Gardens Subdivisions



Existing Utilities

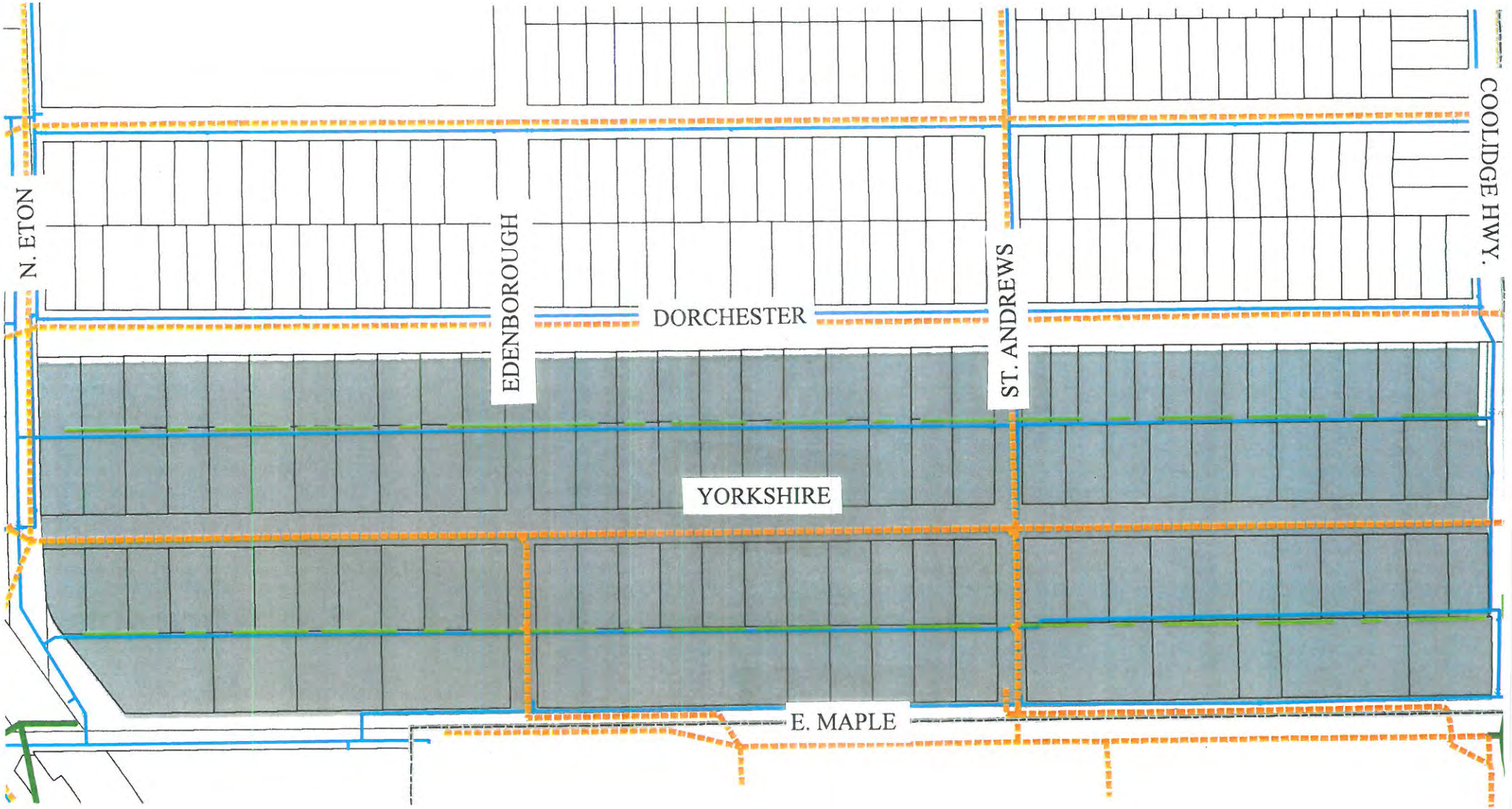
- Combined Sewer
- Sanitary Sewer
- Storm Sewer
- Water Main

N

0 75 150 300 450 600 Feet

FIGURE 2:

Birmingham Villas
Existing Utilities



Existing Utilities

- Combined Sewer
- Sanitary Sewer
- Storm Sewer
- Water Main

N

0 87.5 175 350 525 700 Feet

FIGURE 3:

East Maple Gardens
Existing Utilities

FIGURE 4:

Birmingham Villas
Existing Sewer Connections

Note: The percentage values represent the percent of properties per block that have a rear sewer service.

N

0 55 110 220 330 440

Feet

SEWER CONNECTIONS

Birmingham Villas

- Front
- Rear
- Unknown

FIGURE 5:

East Maple Gardens
Existing Sewer Connections

Note: The percentage values represent the percent of properties per block that have a rear sewer service.

N

0 75 150 300 450 600 Feet

SEWER CONNECTIONS

- Front
- Rear
- Unknown

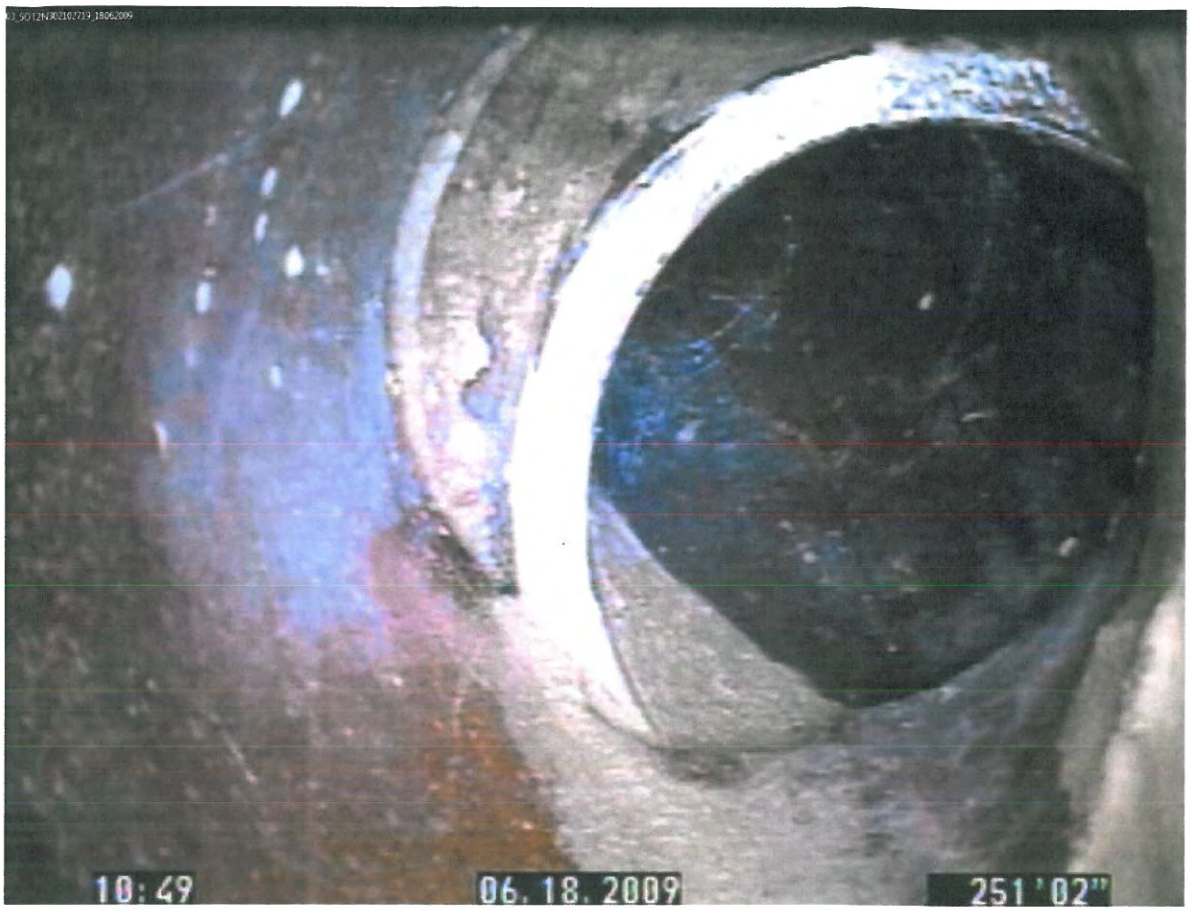


FIGURE 6:

Misaligned Sewer Connection
(as seen from City Sewer)

FIGURE 7:

Birmingham Villas
Existing Water Connections

N

0 55 110 220 330 440
Feet

WATER CONNECTIONS

Front
Rear

FIGURE 8:

E. Maple Gardens
Existing Water Connections

Note: 2419, 2489, and 2765 Yorkshire are tied to the rear, but have newer water services extended to the front property line as well.

N

0 80 160 320 480 640
Feet

WATER CONNECTIONS

Front
Rear

CITY OF BIRMINGHAM
ENGINEERING DEPT.

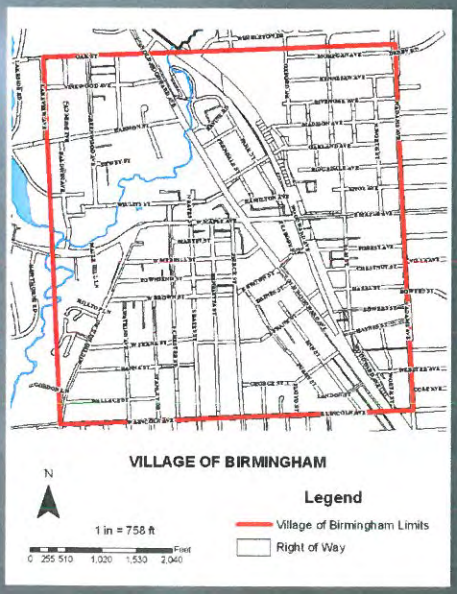
BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

EAST SIDE NEIGHBORHOODS
INFORMATIONAL MEETING
MARCH 24, 2011

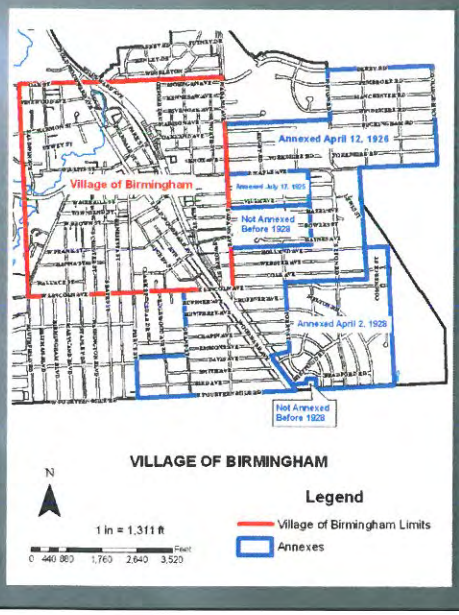
OUTLINE/AGENDA:

- Neighborhood history
- Backyard sewer system today
- Backyard water system today
- Proposed City projects for the area
- Sewer disconnection process
- Water disconnection process
- Sewer repair process
- Next steps

BACKYARD WATER AND SEWER SYSTEMS LONG TERM MASTER PLAN



BACKYARD WATER AND SEWER SYSTEMS LONG TERM MASTER PLAN



BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

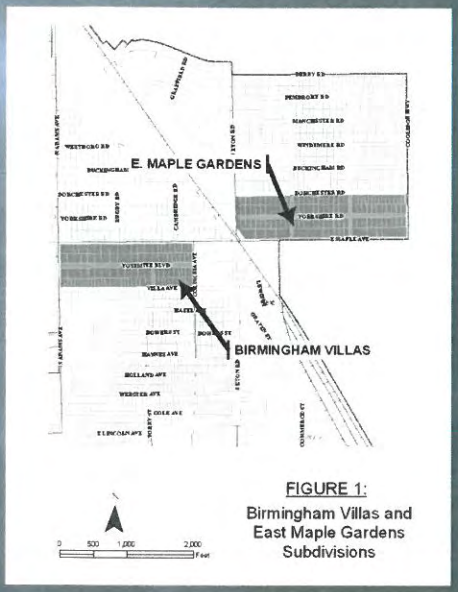


FIGURE 1:
Birmingham Villas and East Maple Gardens Subdivisions

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

FIGURE 2:
Birmingham Villas
Existing Utilities

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

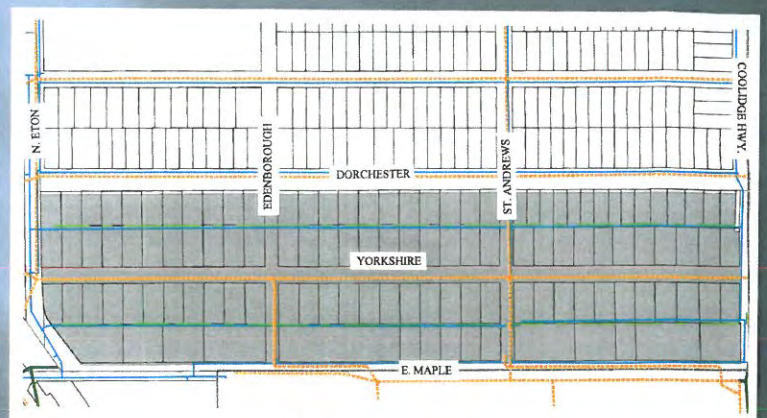


FIGURE 3:
East Maple Gardens
Existing Utilities

Existing Utilities
- Combined Sewer
- Sanitary Sewer
- Storm Sewer
- Water Main

N
0 87.5 175 350 525 700 Feet

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

Figure 9:
Old Salem Ct.
Existing Water Connections

N
0 62.5 125 250 375 500 Feet

Water Connections
Old Salem Ct
- Rear or Side
- Vacant Property
- Water Main

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

BACKYARD SEWERS

- Pipes are all over 85 years old.
- Pipes have many flat or even uphill sections, resulting in low spots that collect debris.
- Small, 8 inch diameter pipe with 2 ft. pipe lengths
- Multiple joints open up, allowing roots to enter.
- Failures are difficult to repair due to being on private property – some are under garages or carports, near underground pools, etc.

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

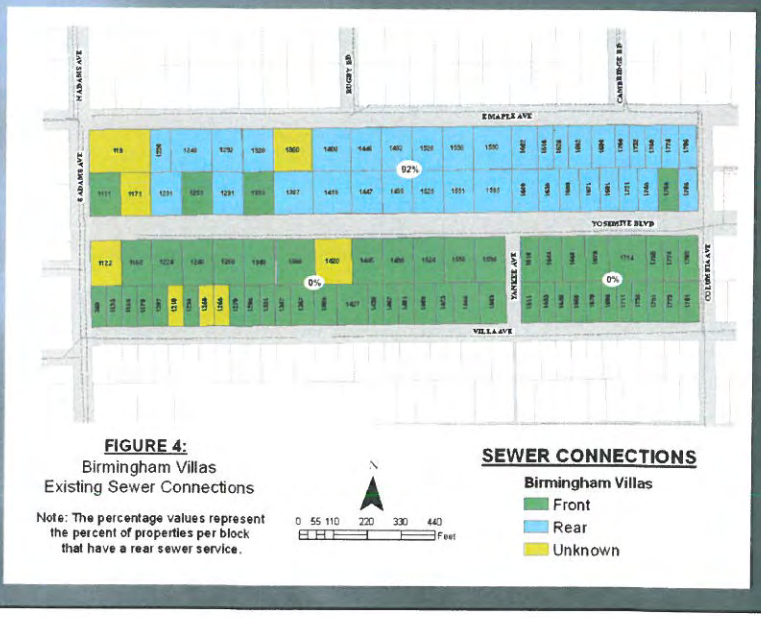


FIGURE 4:
Birmingham Villas
Existing Sewer Connections

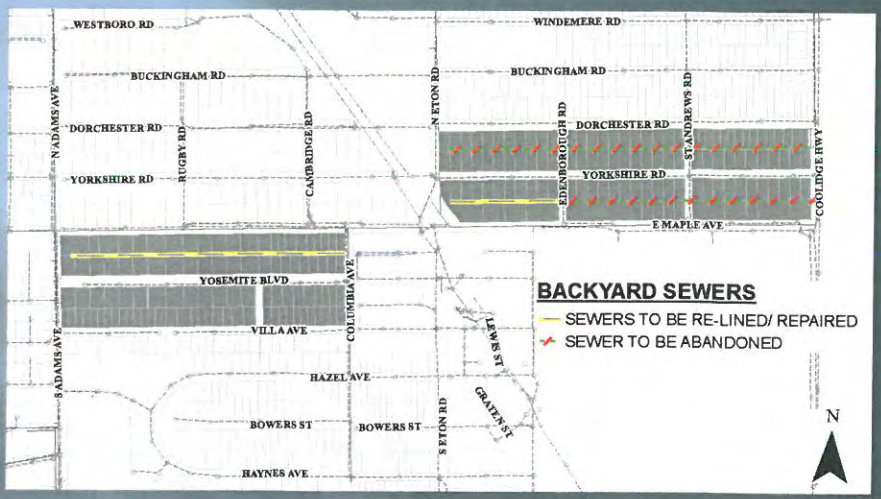
Note: The percentage values represent the percent of properties per block that have a rear sewer service.

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

FIGURE 5:
East Maple Gardens
Existing Sewer Connections

Note: The percentage values represent the percent of properties per block that have a rear sewer service.

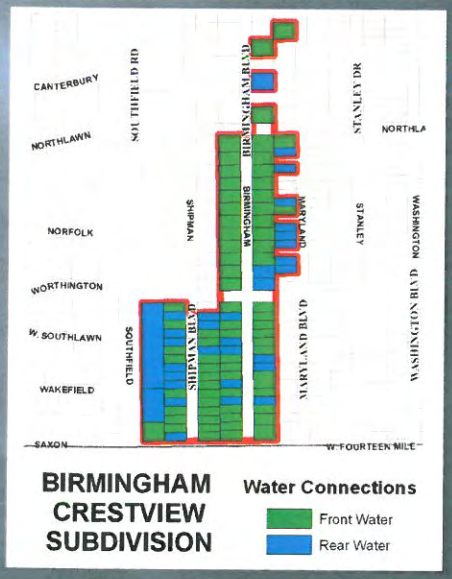
BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN



BACKYARD WATER MAINS

- Majority of pipes are 4 inch diameter, with effective diameter reduced to about 2 inch diameter due to rust deposits.
- Available pressure to buildings is insufficient.
- Streets without water mains have inadequate fire protection.
- Failures are difficult to repair due to being on private property – some are under garages or carports, near underground pools, etc.

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN



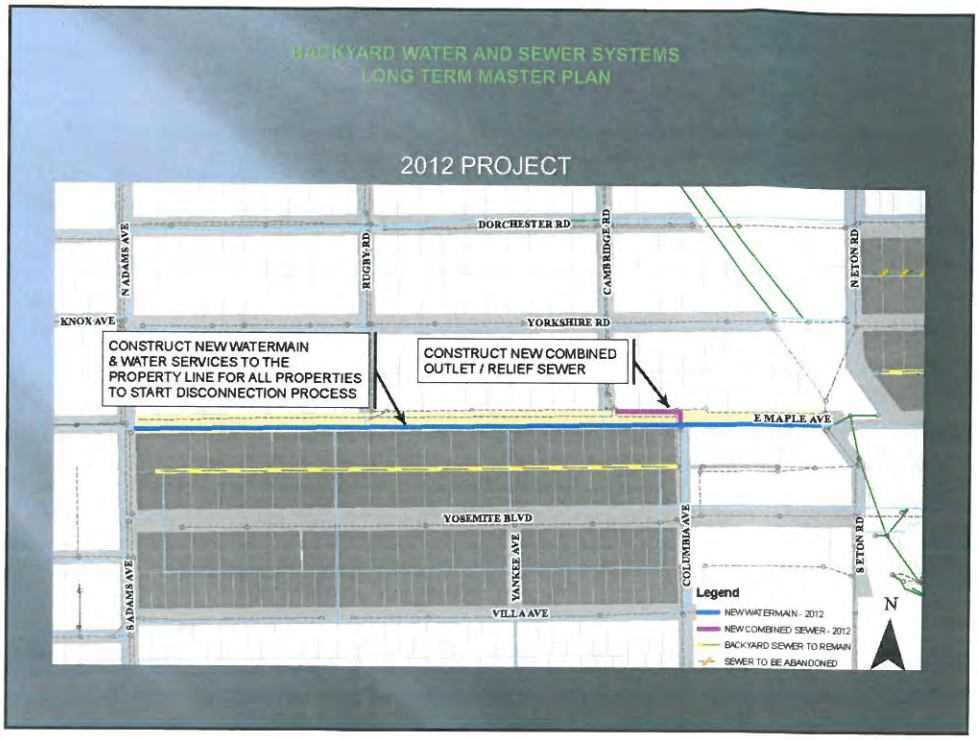
BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

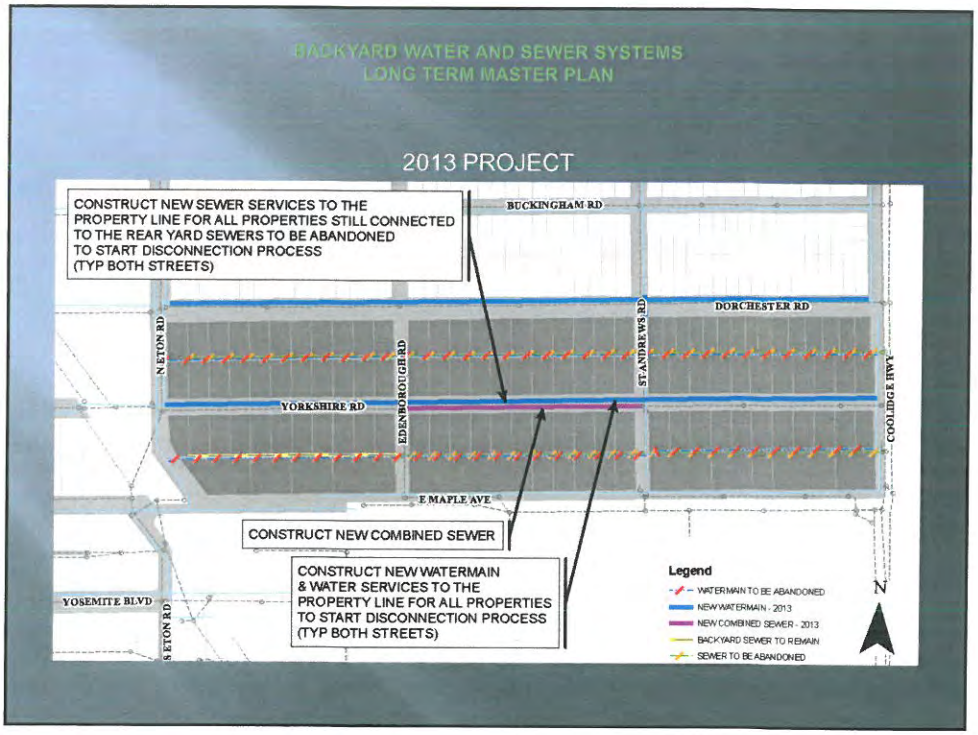
FIGURE 7:
Birmingham Villas
Existing Water Connections

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

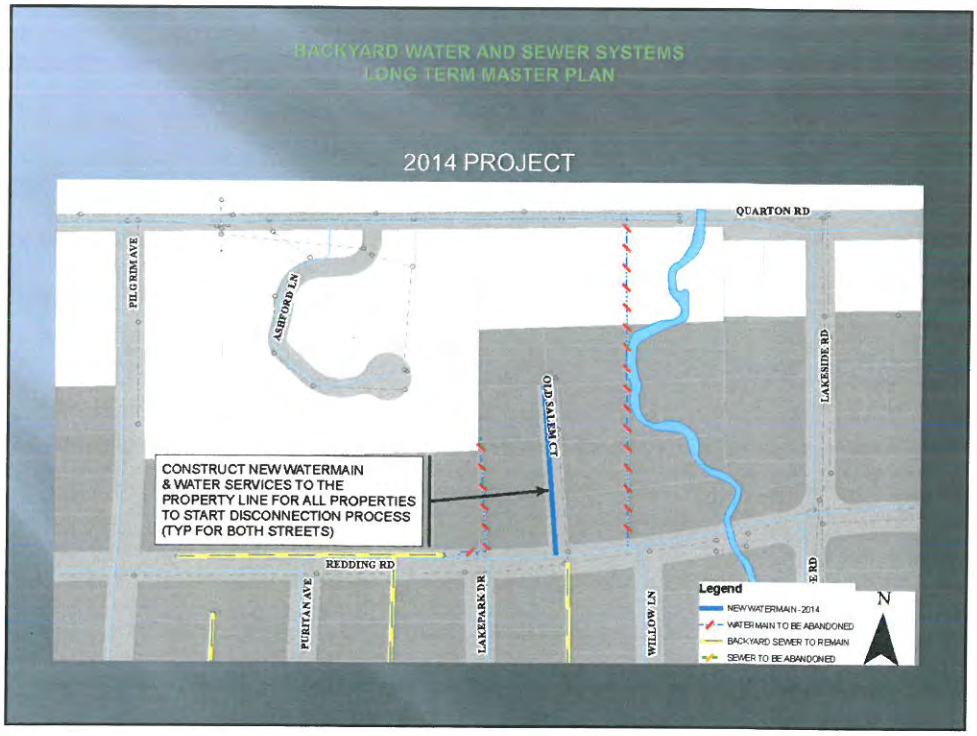
FIGURE 8:
E. Maple Gardens
Existing Water Connections

Note: 2419, 2489, and 2765 Yorkshire are tied to the rear, but have newer water services extended to the front property line as well.


BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN
2012 PROJECT
DORCHESTER RD
N ADAMS AVE
RUGBY RD
CAMBRIDGE RD
N ETON RD
KNOX AVE
YORKSHIRE RD
CONSTRUCT NEW WATERMAIN & WATER SERVICES TO THE PROPERTY LINE FOR ALL PROPERTIES TO START DISCONNECTION PROCESS
CONSTRUCT NEW COMBINED OUTLET / RELIEF SEWER
E MAPLE AVE
YOSEMITE BLVD
YANKEE AVE
COLUMBIA AVE
S ETON RD
S ADAMS AVE
VILLA AVE
Legend
NEW WATERMAIN - 2012
NEW COMBINED SEWER - 2012
BACKYARD SEWER TO REMAIN
SEWER TO BE ABANDONED
N


BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN
2013 PROJECT
CONSTRUCT NEW SEWER SERVICES TO THE PROPERTY LINE FOR ALL PROPERTIES STILL CONNECTED TO THE REAR YARD SEWERS TO BE ABANDONED TO START DISCONNECTION PROCESS (TYP BOTH STREETS)
BUCKINGHAM RD
DORCHESTER RD
N ETON RD
EDENBOROUGH RD
ST ANDREWS RD
COOLIDGE HWY
YORKSHIRE RD
E MAPLE AVE
CONSTRUCT NEW COMBINED SEWER
CONSTRUCT NEW WATERMAIN & WATER SERVICES TO THE PROPERTY LINE FOR ALL PROPERTIES TO START DISCONNECTION PROCESS (TYP BOTH STREETS)
YOSEMITE BLVD
S ETON RD
Legend
WATERMAIN TO BE ABANDONED
NEW WATERMAIN - 2013
NEW COMBINED SEWER - 2013
BACKYARD SEWER TO REMAIN
SEWER TO BE ABANDONED
N


BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN
2014 PROJECT
N ADAMS AVE
RUGBY RD
YORKSHIRE RD
NEWTON RD
E MAPLE AVE
YOSEMITE BLVD
YANKEE AVE
COLUMBIA AVE
VILLA AVE
S ADAMS AVE
CONSTRUCT NEW WATERMAIN & WATER SERVICES TO THE PROPERTY LINE FOR ALL PROPERTIES TO START DISCONNECTION PROCESS
HAZEL ST
BOWERS ST
HAZEL AVE
RD
Legend
NEW WATERMAIN - 2014
WATERMAIN TO BE ABANDONED
BACKYARD SEWER TO REMAIN
SEWER TO BE ABANDONED
N


BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN
2014 PROJECT
QUARTON RD
PLG RDM AVE
ASHFORD LN
OLD SALEM CT
LAKESIDE RD
CONSTRUCT NEW WATERMAIN & WATER SERVICES TO THE PROPERTY LINE FOR ALL PROPERTIES TO START DISCONNECTION PROCESS (TYP FOR BOTH STREETS)
REDDING RD
PURITAN AVE
LAKEPARK DR
WILLOW LN
E RD
Legend
NEW WATERMAIN - 2014
WATERMAIN TO BE ABANDONED
BACKYARD SEWER TO REMAIN
SEWER TO BE ABANDONED
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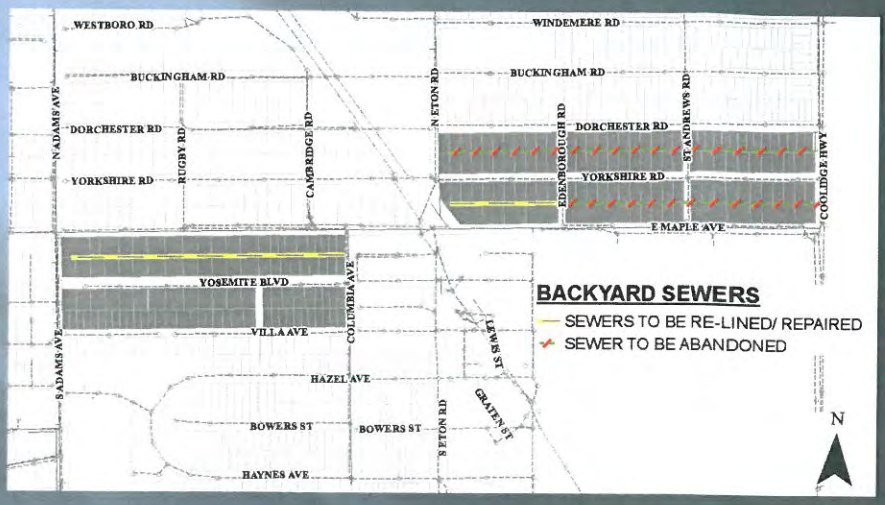
BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

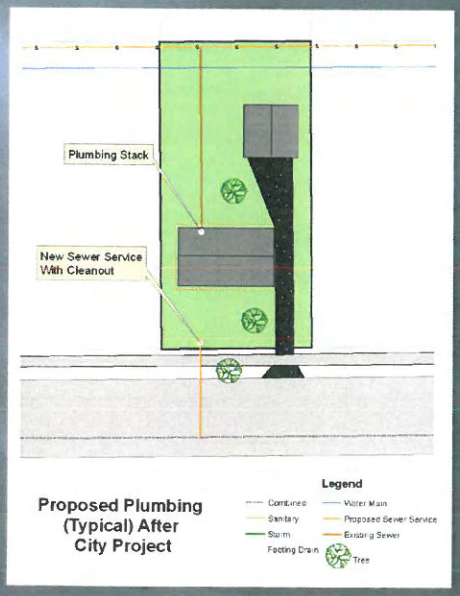


BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

SEWER DISCONNECTION PROCESS

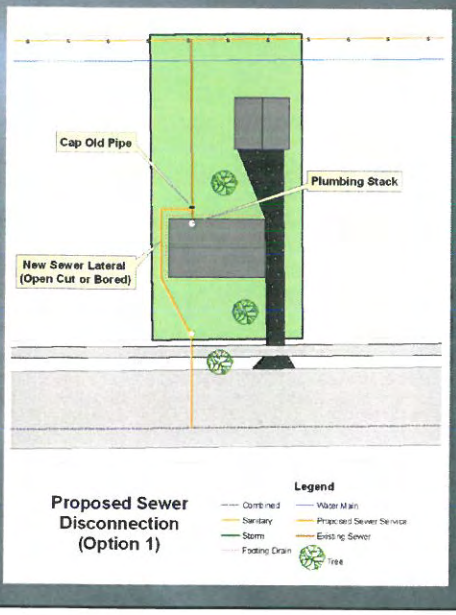
- After project is complete, each property owner would receive written notice of the City's plan to abandon the backyard sewer, and the need to disconnect. Disconnection will vary a lot from house to house. The cost to disconnect will vary between about $4,000 and $6,500.
- Maintenance of the sewer will continue until all properties are disconnected, or no longer than ten years.
- The City will waive all City fees for owners that disconnect within first 12 months after notification. Fees will generally total $200 for plumbing inspections.

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN



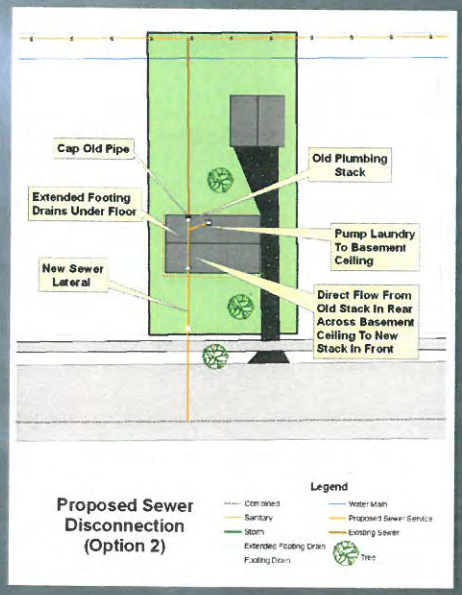
Proposed Plumbing (Typical) After City Project

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN



Proposed Sewer Disconnection (Option 1)

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

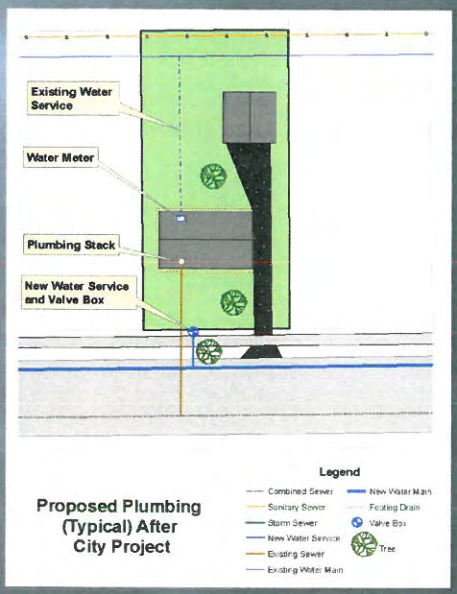


BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

WATER DISCONNECTION PROCESS

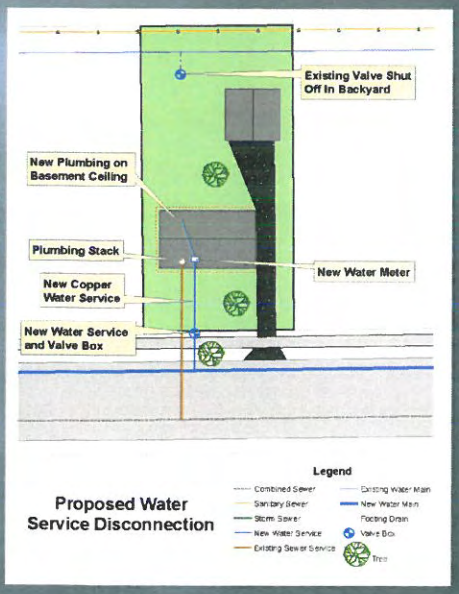
- After project is complete, each property owner would receive written notice of the City's plan to abandon the backyard water main, and the need to disconnect. Disconnection will vary a lot from house to house. The cost to disconnect will vary between about $2,600 and $4,000.
- The water main will remain in operation until all properties are disconnected, or no longer than ten years.
- The City will waive all City fees for owners that disconnect within first 12 months after notification. Fees will generally total $665 for plumbing inspections and new water meter installation.

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN



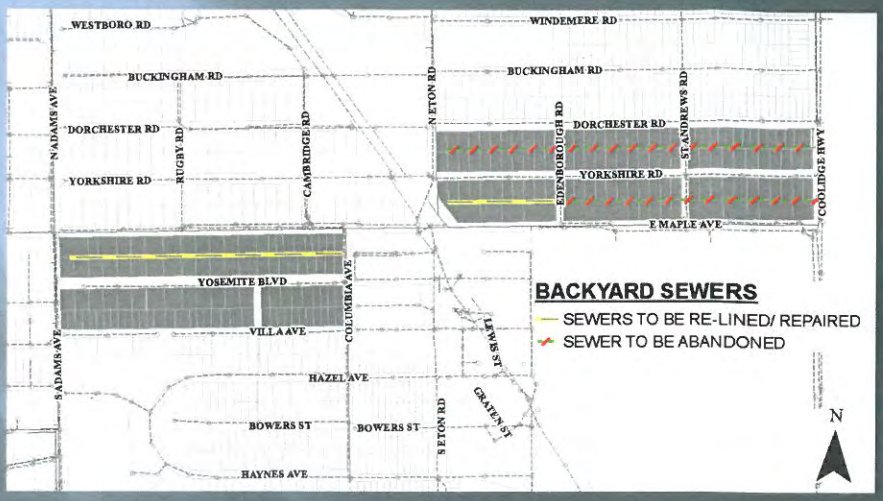
Proposed Plumbing (Typical) After City Project

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN



Proposed Water Service Disconnection

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN



BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

SEWER REPAIR PLAN

- The City will inspect both sewers to determine appropriate repair method (2011)
- The City will send written requests to all owners on the East Maple Gardens sewer segment requesting easements for future access and maintenance (2011).
- The City will line backyard sewers as needed (some time between 2012 and 2015). Potential assessments will apply for various repairs to owner's backyard sewer laterals and taps.

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

SEWER LATERAL REPAIRS

1. Lateral lining special assessment – Voluntary opportunity to line existing pipe from house to sewer (est. cost = $6,000).
2. Sewer maintenance assessment – If roots are reaching City sewer through tap, owner must agree to #1 above, or contribute to increased City maintenance (annual estimate range $100 to $500).
3. Backyard tap excavation assessment – Voluntary opportunity for taps needing repair – (est. cost = $5,000 to $6,000).

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

NEXT STEPS:

- Receive input from property owners.
- Modify the master plan, if necessary, to incorporate resident input.
- Update City Commission.
- Schedule public hearing to review public input and consider approving master plan.
- Video Inspect Back Yard Sewers to be re-lined.

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

QUESTIONS:

Paul O'Meara, City Engineer
248-530-1836
pomeara@ci.birmingham.mi.us

Brendan Cousino, Assistant City Engineer
248-530-1839
bcousino@ci.birmingham.mi.us

City of Birmingham
A Walkable Community

Date: April 4, 2011

TO: Quarton Lake Estates Subdivision Property Owners

RE: City of Birmingham Backyard Sewer and Water Systems Master Plan

Dear Property Owner,

You are being sent this package of information because our records indicate that you are the owner of a property within the section of Quarton Lakes Estates primarily serviced by backyard sewers. As will be explained in the attached booklet, these sewers are old, and due to their inaccessible location, are problematic. The City is in the process of developing a master plan on how best to phase out and disconnect these sewers in the future. We encourage you to review these materials closely. The plan has been reviewed and endorsed by the City Commission.

Before moving forward, it is important that we get input from those most affected. The attached information packet has been assembled so that you may better understand what is proposed.

After reviewing the booklet, if you wish to learn more, or if you wish to have questions answered, you are invited to attend an informational meeting on this topic scheduled for **Thursday, April 14, at 7:00 PM**. The meeting will be held at the Municipal Building, 151 Martin St. Please plan to enter through the Police Dept. door located on the Pierce St. side of the building. If you are not able to attend the meeting, and wish to discuss this matter further with City staff, you are welcome to call our office at 248-530-1850, during the hours of 8 AM to 5 PM, Monday through Friday.

Sincerely,

Paul T. O'Meara
City Engineer

Brendan Cousino
Assistant City Engineer

151 Martin Street • P.O. Box 3001 • Birmingham, MI 48012-3001
(248) 530-1800 • Fax (248) 530-1080 • http://ci.birmingham.mi.us

City of Birmingham
A Walkable Community

ENGINEERING DEPARTMENT

AN INFORMATIONAL REPORT

BACKYARD SEWER & WATER MASTER PLAN PROPOSAL

QUARTON LAKE ESTATES SUBDIVISION

AN INFORMATIONAL REPORT

BACKYARD SEWER & WATER MASTER PLAN PROPOSAL

QUARTON LAKE ESTATES SUBDIVISION

TABLE OF CONTENTS

SECTION 1: HISTORY

1. THE EARLY DAYS

A map of the study area is shown in Figure 1. The area within the study area currently serviced by backyard sanitary sewers is also depicted, shown in red.

The Quarton Lake Estates subdivision as it exists today, was actually subdivided as several different pieces of land, from 1916 to 1936.

As was considered acceptable at that time, the sanitary sewer system in the highlighted area was constructed along the rear property lines, as shown on Figures 2 and 3. While this design allowed a reduced initial construction cost for the developer, it clearly did not consider the long term ramifications of attempting to maintain these pipelines. To compound matters, legal easements providing access to these sewers are either nonexistent or inadequate. The backyard sewers were all constructed of 8 inch diameter clay pipe, using 2 ft. long pipe sections. After many years of service, the sewers are becoming difficult to maintain, and the City needs to begin planning for their rehabilitation.

2. STREETS, SEWER, AND WATER COMMITTEE

The large majority of the public streets in this area are considered unimproved, meaning that they are basically a gravel road without a drainage system that has been re-sealed over many years with an asphalt-based chip seal product. The chip seal was first introduced in the late 1940's, and has been supplemented several times since (the expected life of a chip seal is about 7 to 10 years). Since there is no drainage system, rain water tends to either flow downhill to a storm drain (usually at intersections), or it sits until it can be absorbed into the ground, which can result in rough street edges.

In 2008, the chip seal streets were getting near the end of their life cycle. In addition, the poor drainage of some areas was considered a nuisance to some residents. The City received requests to consider the reconstruction of streets in this area. Typically, streets can be reconstructed on an individual, as-needed basis. However, the City did not want to begin planning for the installation of permanent street pavements until the question of how to address the backyard sewers had been addressed. From the City's perspective, it would have been preferable to construct new combined sewers in the street that could accommodate both the storm drainage needs of the street, as well as the sanitary sewer needs of the homes. Under this scenario, each home would be required to eventually reroute their internal plumbing, disconnecting their backyard sewer connection, and making a new connection to the street system. Since there are approximately 375 homes in the area that this would impact, it was a decision that would require detailed analysis and review. With that in mind, the Streets, Sewer, and Water Ad Hoc Committee was formed.

The Committee met for nine months. Membership included representatives from the Quarton Lake area, as well as representatives from two neighborhoods on the east side of Birmingham

that had similar issues. Two members were also appointed to represent Birmingham at large. The Committee studied many things, including:

- The feasibility of relining the public sanitary sewers, and the costs involved.
- The lack of storm sewers in the Quarton Lake area.
- The best methods to repair homeowners' sanitary sewer laterals in rear yards.
- The relatively simple job of disconnecting a backyard water service, and the more difficult nature of a backyard sewer service disconnection.
- The poor water pressure and fire protection available in the current systems, both in the Quarton Lake area, and in the east side neighborhoods.
- The conditions that would require an excavation crew to enter backyards, excavating to repair pipelines.
- The City's requirements to acquire easements in backyards should the City's sewers be repaired and left in service.

In February, 2009, the Committee, (on a 6-3 vote), recommended to the City Commission suggesting that the City move forward with lining public backyard sewers, replace the water main system in the streets where needed, and allow paving projects to move forward independent of the sewer issue.

The majority recommendation of the Committee was in conflict with the City staff recommendation of abandoning the backyard system. After reviewing the report, the City Commission identified concerns that needed clarification before moving forward:

- The difficulty of securing easements from every property owner.
- The long term costs to the City due to having to reline backyard sewers, build a separate storm sewer system, and the eventual operation of two sewers (front and back) on each street.
- The frequency of excavations in backyards.

3. SEWAGE METER BASED BILLING SYSTEM

As noted above, the Engineering Dept. staff had recommended that the backyard sewer systems eventually be abandoned, largely to simplify the sewer system in this area, and its related maintenance costs. Part of this perspective was based on the concept that Birmingham had spent millions of dollars on Retention Treatment Basins (RTBs) in the 1990's, and directing all water (storm and sanitary) into the combined sewer system, as it was now designed for. By treating <u>all</u> water from the sewer system, it would guarantee the best water quality for the Rouge River and Quarton Lake.

Once sewage is collected by the City's sewer system, it is directed to larger sewers owned and operated by the Oakland Co. Water Resources Commissioner's Office (OCWRC). The OCWRC has historically apportioned sewage treatment costs amongst the various cities in the district by basing it on the volume of water sold at each water meter (similar to how the City bills each individual customer). Since Birmingham operates as a combined sewer system, an additional storm water charge was billed by the OCWRC each quarter to account for the rainfall that

entered the system the previous three months. In early 2009, the OCWRC announced that it would be changing the way sewage treatment would be billed. It was felt that the system of sewage meters generally set up at each City's border would now be accurate enough to determine the actual quantity of sewage entering the system from each City. While such a system may appear fair and equitable, it has been shown that it will greatly increase our costs (based on their estimates of about $850,000 annually) as it is phased in over three years. For Birmingham, which has heavily invested in its combined sewer system and its Retention Treatment Basins, to now have to pay a much larger share of the region's sewage treatment bill is a serious burden.

Now that the rules of the game have changed, the Engineering Dept. realized that the most efficient way to reduce Birmingham's sewage treatment costs would be to keep as much storm water out of the combined sewers as possible. The Quarton Lake neighborhood, which already needs a lot of sewer system improvements, represents the best opportunity the City has to accomplish this goal. Moving in this new direction, the Engineering Dept. has developed a master plan that has two main goals:

1. Construct a system of storm sewers that will help direct as much flow from the Quarton Lake neighborhood to the Rouge River as possible, thereby removing it from the combined sewer system, and reducing the City's sewage treatment bills.
2. Rehabilitate the backyard sewer system to operate as the neighborhood's ongoing sanitary sewer system, thereby eliminating the need to disconnect each home from it.

The master plan was first presented to the City Commission last November. The Commission endorsed the plan, and asked that it be refined after additional public input has been obtained. After completion of this process, a public hearing will be announced to allow for public comment prior to final adoption of the plan.

SECTION 2: BACKYARD SEWER AND WATER SYSTEM MASTER PLAN

A. BACKYARD SANITARY SEWER SYSTEM PLAN

1. SEWER LINING RECOMMENDATION

As shown in Figures 2 and 3, each block within the subject area has a backyard sewer running through it. The majority of the sewers are now over 85 years old. The sewers were built of 8 inch diameter clay pipe, in short 2 foot long segments. In recent years, the sewers have had to be cleaned on a regular basis, in order to keep them flowing. The two biggest obstacles to ongoing operation of the sewers are:

a) Root intrusion, both from open joints and from homeowner's sewer taps.
b) Flat or uphill sections of pipe, which allow for standing water conditions. Standing water allows debris in the sewage to sit in the low spots, which results in the ongoing need to clean the sewer.

As seen on Figure 3, there are 10 blocks of backyard sewers located between Oak St. and Maple Rd. Three of those blocks have been rehabilitated with a liner within the last 20 years. These blocks were selected because the condition of the sewers was very poor, and action needed to be taken to keep them in service. Lining is a popular rehabilitation method that has been in use since the 1970's. It is a fiberglass resin that is inserted into the sewer in a soft fabric form. Pressured hot water is then added to the sewer, where the resins begin to react and adhere to the old sewer from within. After several hours of curing, the water is released, and a new, hardened surface is present to act as a new pipe within the old one. Once the liner is hard, a robot is sent down the pipe, and each existing sewer tap is opened back up, allowing flow from each house to resume. The new liner has the capability of remaining structurally sound, even as the old pipe continues to crack around it. It also keeps out roots (except at sewer taps). It has a new, smooth inner surface, which keeps water flowing faster, reducing the chance of clogs. Where the sewer is currently flat or flowing uphill however, it cannot resolve the standing water issue.

It is clear that the existing sewers are aging. Since they are located in difficult access areas where excavation is impractical, we recommend that the City initiate a program of lining all remaining backyard sewers. The master plan as outlined below provides for lining all of the sewers over a four year period, thereby avoiding the problem of sewer disconnections from each house, and also significantly reducing the maintenance tasks these sewers currently require. A suggested list of projects is provided below.

2. SEWER LINING PLAN TIMETABLE

If the master plan is approved, the following suggested steps are recommended for the proposed sewer rehabilitation work:

a) As referenced above, the easements allowing the City legal access to all of the backyard sewers within this area are inadequate. If the City is going to move forward with such a large investment in its backyard sewer system, it must first obtain legal access to work on them. As a first step, the City will be sending letters to every property owner requesting that a blanket easement form be signed. Where no easement currently exists, every property owner on the block would be asked to sign the form. In those areas where 5 foot easements currently exist, only those in the area of existing manholes would be asked to sign. The easement form would grant the City permission to access the property as needed into the future to maintain the City sewer located on their property. The legal document will be notarized, and recorded to become part of the property's permanent title work. No compensation will be offered. Should there be owners not inclined to sign the easement, relining of the sewer will be delayed until these issues can be resolved. The suggested language that would appear on the easement is provided in Appendix A.

b) Prior to the end of 2011, the City will internally inspect the backyard sewers using a camera system made for this purpose. Problems with the existing pipe will be noted, as well as building connections that are either root infested, failed, or misaligned. The location of each issue will be recorded. Similar inspections of the majority of backyard sewers throughout the City will be conducted at the same time.

c) Using data from all the inspections, as well as considering progress being made on easement collection, the City will prepare a sewer relining plan that will address all of the backyard sewers inspected throughout the City. The master plan projects that, should easements be received as hoped, the relining program could be accomplished throughout the City during the period of 2012 to 2015. It is not known what year each particular sewers would be lined.

d) All residents also need to be aware that the inspections are expected to reveal a small number of isolated areas where the City sewer is in very poor condition. Conditions may be so poor that it must be excavated and rebuilt prior to lining. The City hopes to avoid excavations whenever possible, knowing the disruption that they cause. We expect there to be less than ten locations throughout the entire project area that will require such excavations. The City will work with all impacted homeowners on an individual basis when such excavations are discovered, and shall also be responsible for all costs relative to restoring any damages on private property.

e) Once the time for the backyard sewer lining project is approaching, each property along the route will be notified as needed relative to three potential special assessments:

   i) Backyard sewer lateral lining special assessment: Since each property has a sewer lateral connection in the backyard, it is assumed that relining this pipe (the pipe between your house and the City sewer) could be a desirable option for repair without the need to excavate. We should be able to offer this service at a reduced cost from what it would be if individual owners attempted to hire a contractor on their own. All buildings with backyard sewer connections over 30 years old would be offered the voluntary opportunity to be assessed to have a contractor line their sewer lateral. The contractor would have to build a cleanout pipe on their existing lateral, using suction that would create only a small hole in their yard, keeping damage to the landscaping to a minimum. After the cleanout is installed, a liner could be installed from that point which would give the pipe a new, structurally sound internal coating that would eliminate the concern of root intrusion, and provide many more decades of service. The estimated cost of the assessment is $6,000 per property, which could be paid at once, or paid in ten installments over a ten year period, with interest due on the remaining balance. For your reference, Figures 4 and 5 indicate those homes that are currently connected to a backyard sewer, as well as those that would be eligible for this special assessment.

   ii) City sewer maintenance special assessment: One of the major reasons for lining the City sewer is to eliminate the problem of root intrusion into the pipe. However, if a homeowner's sewer lateral connection has many defects that allow roots to enter, those roots may eventually grow to the City sewer and begin to clog it as well. When the City sewer is inspected, those laterals that serve as a point of entry for roots into the City sewer will have their service photographed, and sent to them. They will be

asked to participate in the assessment described above in i), at their cost. If they decline, they will be required to participate in an annual ongoing assessment to assist in the City's increased costs to maintain this sewer as a result of their lateral contributing roots into the main line. The amount of the assessment will vary depending upon how many backyard sewers have laterals in this situation, however, at this time, we estimate the cost would be between $100 and $500 per year, ongoing until the owner agrees to repair their lateral.

iii) Backyard tap excavation special assessment: On occasion, the internal camera inspection may reveal that a sewer tap has become misaligned, or settled, over the years. An example of this can be found in Fig. 6. A misaligned sewer lateral will eventually cause drainage problems for the homeowner that will need to be addressed. A picture of the sewer lateral would be forwarded to the property owner, notifying them of this concern, and offering them a voluntary special assessment to have the sewer tap excavated and repaired. Excavation equipment would have to enter the backyard at the point of the tap, and a small hole would be dug to access the sewer tap, and allow it to be reconstructed. The cost of the assessment is estimated at $5,000 to $6,000, not including surface restoration costs, which can vary considerably depending on the nature of the yard and its location. The amount due to the City would be payable either in one sum, or in ten installments over a ten year period, with interest due on the remaining balance.

Upon completion of the backyard sewer lining, all property owners would be connected to a more reliable City sewer for many years to come.

B. STORM SEWER SYSTEM PLAN

As noted above, the master plan recommends sewer lining in the Quarton Lake area over the course of four years, 2012 to 2015. Once the majority of the backyard system has been repaired, the plan recommends that attention be turned to a series of projects that would achieve the following objectives:

a) Provide storm sewer improvements to direct rainwater and groundwater away from the combined sewer system as much as practical, and direct it to the Rouge River. Storm water directed to the river would first flow through one or more storm water quality treatment devices to remove pollutants from the water (such as trash, sediments, oils, etc.), in accordance with current requirements from the MI Dept. of Environmental Quality.
b) Replace water mains in the same areas that are nearing the end of their practical service lives.
c) Provide needed repairs to many of the streets in the area.

Following is a list of street/sewer/water projects that would address the needs of the listed streets:

PROPOSED YEAR	PROJECT DESCRIPTION
2015	W. Maple Rd. – Chesterfield Ave. to Rouge River Upgrade/rehabilitate sewer system, selected water main improvements, pavement resurfacing.
2016	Oak St. – Glenhurst Dr. to Rouge River Install storm sewer, rehab. sanitary sewer, replace water main, pavement.
2017	Raynale St. – Glenhurst Dr. to Chesterfield Ave. Glenhurst Dr. – Raynale St. to Oak St. Brookwood – Glenhurst Dr. to Raynale St. Redding Rd. – Lakepark Dr. to Lakeside Dr. Install storm sewer, replace water main, pavement. Raynale St. – Chesterfield Ave. to Willow Lane Convert combined sewer to storm sewer.
2018	Westwood Dr. – Redding Rd. to Oak St. Glenhurst Dr. – Redding Rd. to Raynale St. Lyonhurst Rd. – Redding Rd. to Raynale St. Brookwood – Redding Rd. to Raynale St. Oak St. – Westwood Dr. to Glenhurst Dr. Install new storm sewer, replace water main & cape seal.

As can be seen, the intention is to implement several projects focusing on some of the east/west corridors through the neighborhood. Once improved storm sewers have been built, the City will then focus on the streets mostly west of Chesterfield Ave. and north of Oak St., where needs in all three areas (street, sewer, and water) are also apparent.

Many readers may wonder why many other streets are not noted in the master plan. Those streets tend to be the streets that have no curbs, and are serviced by a chip seal pavement. Large investments cannot be scheduled for these streets because the cost of the new pavement would become an assessment against the adjoining property owners. The City, as a rule, does not schedule or initiate such projects until there is a demonstrated interest on the part of the owners on a particular street showing that they are interested in such a project. Any residents living on a street without curbs that would like more information on how to start the process toward a street construction project (other than those listed above) are welcome to call our office for more details.

SECTION 3: SUMMARY

We hope that this report helps clarify the general intent of the City with respect to the long term maintenance needs of the sewer system in your area. Cooperation on the part of each owner and resident will be needed to accomplish the plan's goals, especially in the following ways:

a) Granting of the blanket easement required for the majority of owners within the subject area, so that the City has legal access to its system.

b) Serious consideration towards participation in the voluntary special assessments geared towards assisting you in maintaining your private sewer lateral, particularly if it is getting old.
c) Cooperation during the various construction projects that will occur in the area over the upcoming several years.

If you have any further questions, you are welcome to call our office at 248-530-1850.

APPENDIX A

SEWER EASEMENT

KNOW ALL MEN BY THESE PRESENTS, that _____ _____, whose address is _____ _____, Grantor, and the **CITY OF BIRMINGHAM,** a Michigan Municipal Corporation, whose address is 151 Martin Street, P.O. Box 3001, Birmingham, Michigan, 48012-3001, Grantee, does hereby grant to the said Grantee, the right to construct, operate, maintain, install, repair, and/or replace sewers and manholes where currently located, and access across and through the following described land situated in the City of Birmingham, for the of One Dollar ($1.00), to wit:

(insert legal description of the property)

and to enter upon sufficient land adjacent to said easement for the purpose of the construction, operation, maintenance, installation, repair and/or replacement thereof.

The premises so disturbed by reason of the exercise of any of the foregoing powers, shall be reasonably restored to its original condition by Grantee.

This instrument shall be binding upon and inure to the benefit of the parties hereto, their heirs, representatives, successors, and assigns and the covenants contained herein shall run with the land.

IN WITNESS WHEREOF, the undersigned hereunto affixed _____ signatures this _____ day of _____, A.D., 2010.

In the Presence of:

WITNESSES	OWNER(s)
_____	_____
_____	_____

STATE OF MICHIGAN)
) ss:
COUNTY OF)

On this ____ day of _____A.D., 2011, before me personally appeared _____ to me personally known, who being duly sworn, did each for themselves acknowledge said instrument to be their free act and deed.

_____
Notary Public

County, Michigan

My Commission Expires:

Drafted by:

Timothy J. Currier
200 E. Long Lake Road, Ste. #110
Bloomfield Hills, MI 48304

After Recording, return to:

City of Birmingham
City Clerk
151 Martin Street, P.O. Box 3001
Birmingham, MI 48012-3001

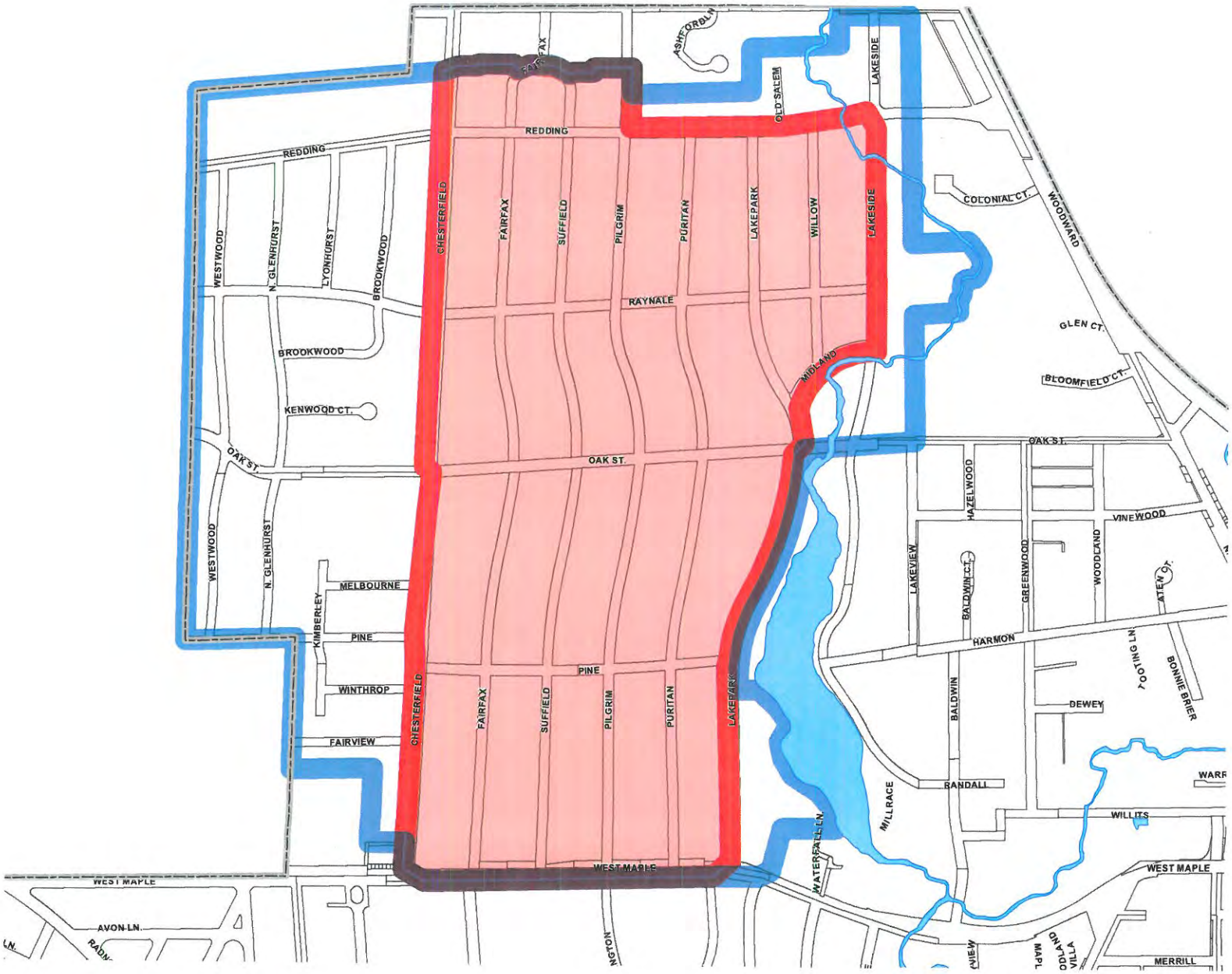


FIGURE 1:

QUARTON LAKE SUBDIVISIONS STUDY AREAS

STUDY AREAS

- Quarton Lake Study Area
- Backyard Sewer Area
- Backyard Sewer Area

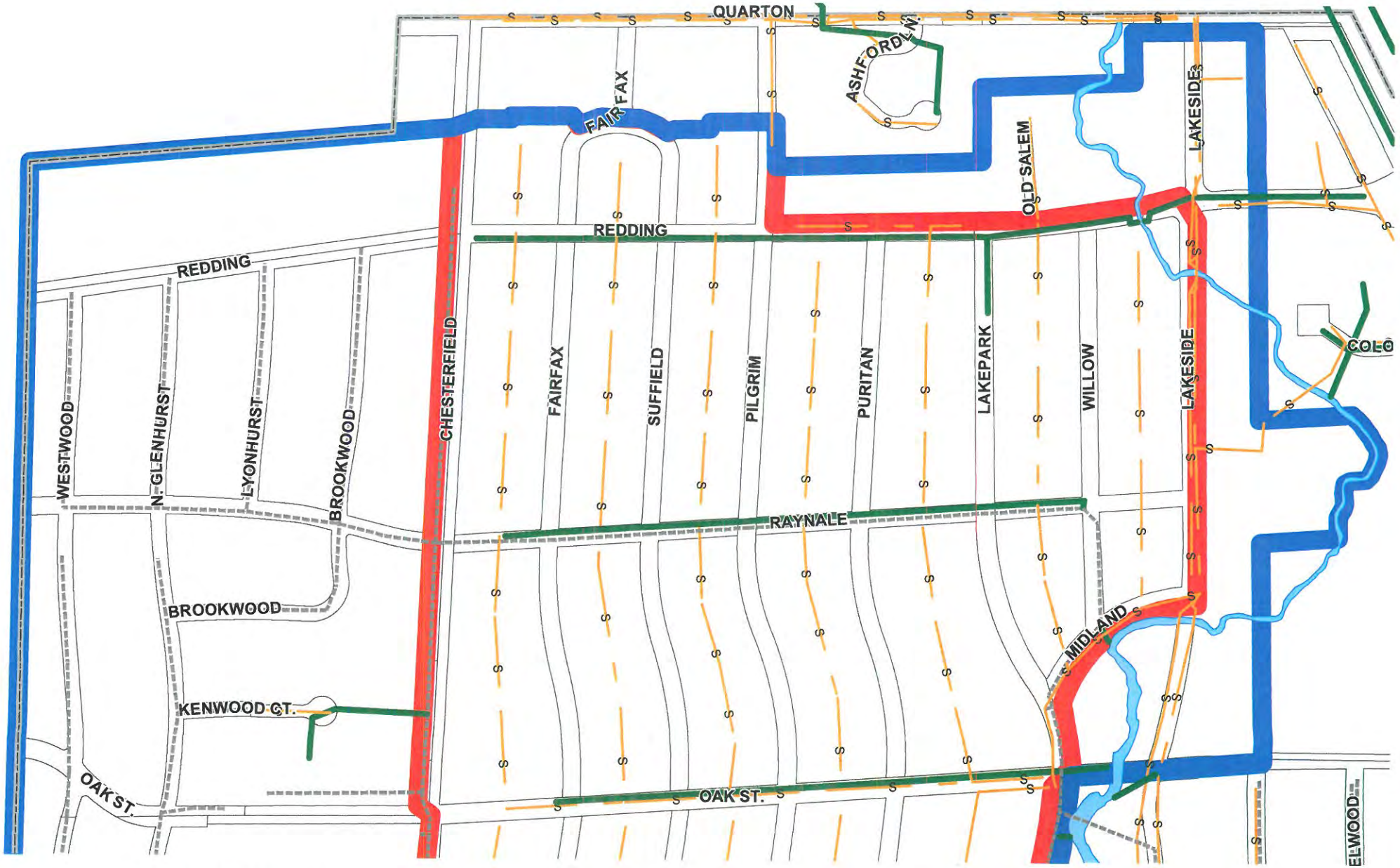


FIGURE 2:
EXISTING SEWERS QUARTON LAKE AREA NORTH OF OAK STREET

LEGEND

- Quarton Lake Study Area
- Backyard Sewer Area
- Combined Sewer
- Sanitary Sewer
- Storm Sewer

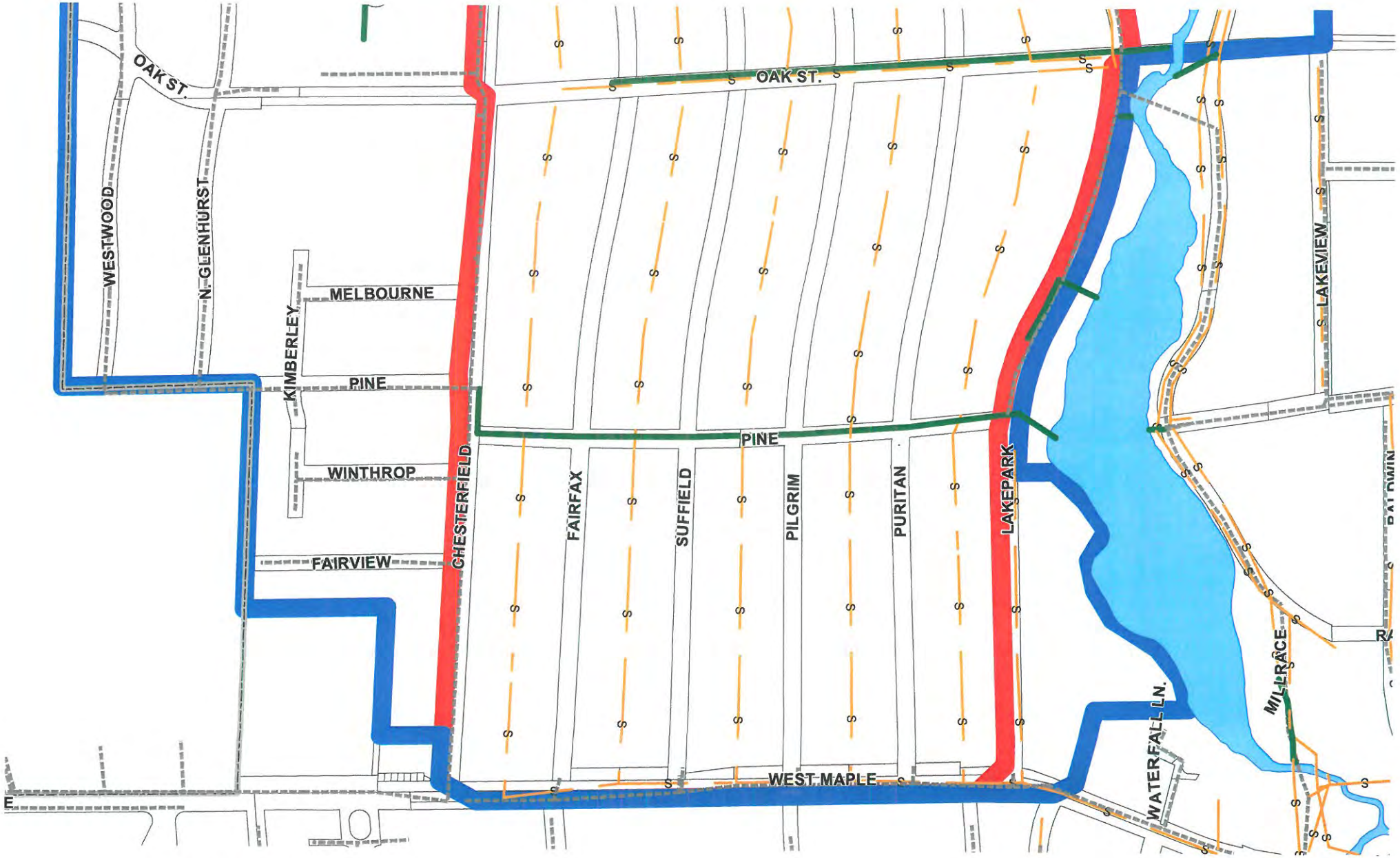


FIGURE 3:

EXISTING SEWERS QUARTON LAKE AREA SOUTH OF OAK STREET

LEGEND

- Quarton Lake Study Area
- Backyard Sewer Area
- Combined Sewer
- Sanitary Sewer
- Storm Sewer

FIGURE 4:

QUARTON LAKE AREA NORTH OF OAK ST EXISTING SEWER CONNECTIONS

Sewer Connections

- Front
- Rear
- Unknown
- Both
- STUDYAREA

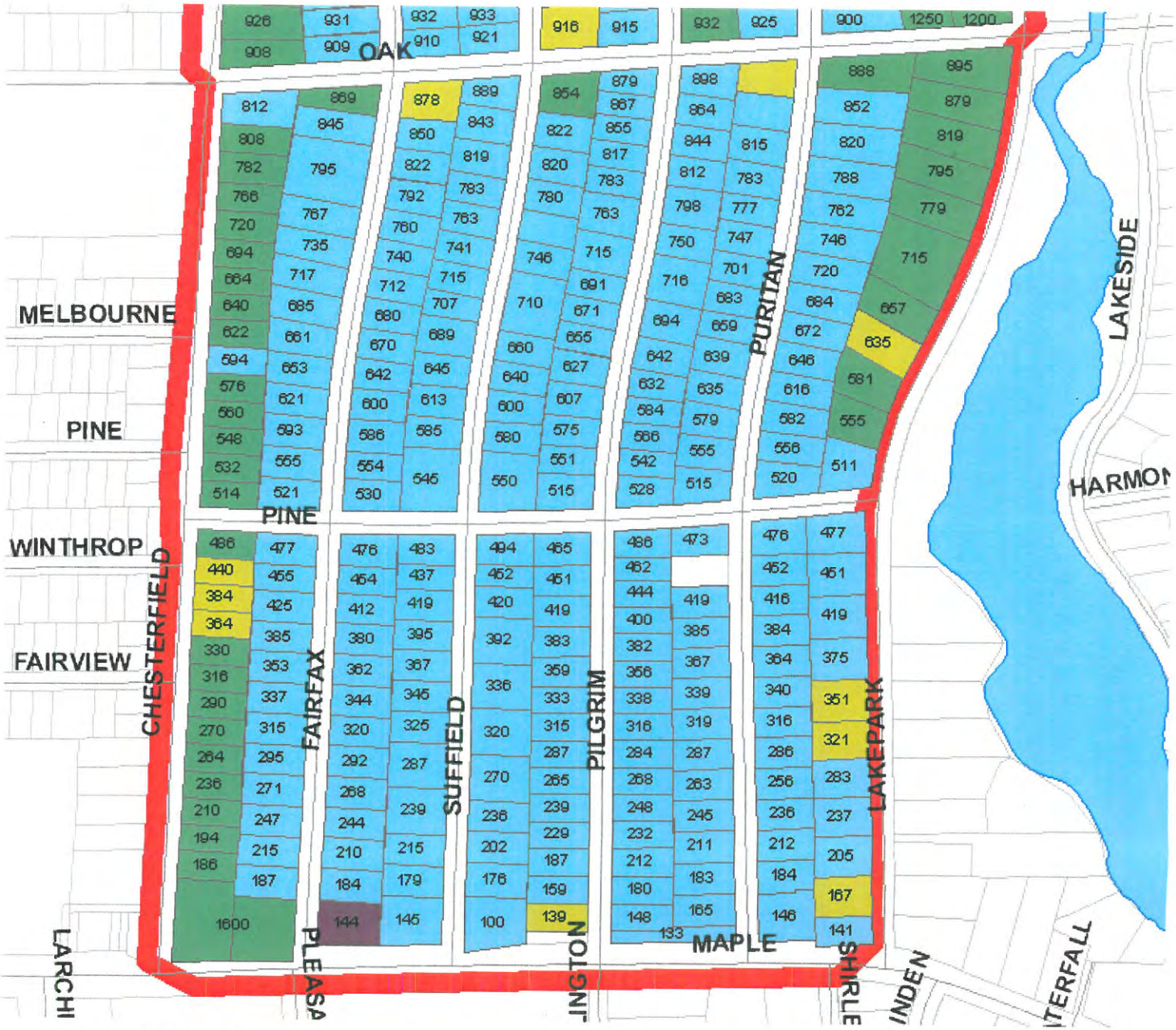


FIGURE 5:

QUARTON LAKE AREA SOUTH OF OAK ST EXISTING SEWER CONNECTIONS

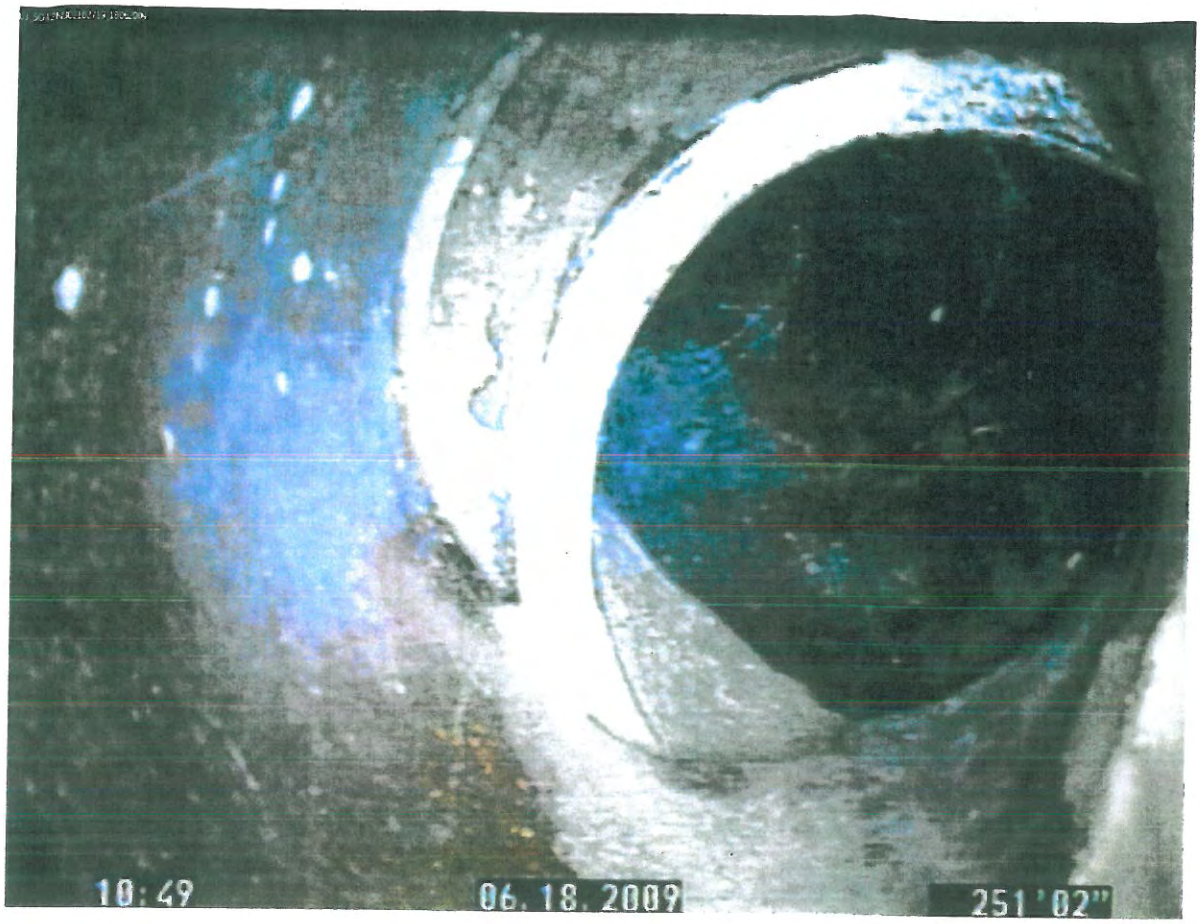


FIGURE 6:

Misaligned Sewer Connection
(as seen from City Sewer)

CITY OF BIRMINGHAM
ENGINEERING DEPT.

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

QUARTON LAKE ESTATES
INFORMATIONAL MEETING
APRIL 14, 2011

OUTLINE/AGENDA:

- Neighborhood sewer system overview
- Backyard sewer system today
- Proposed projects (8 year plan)
- Impact on individual homeowners
- Easement acquisition
- Next steps

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

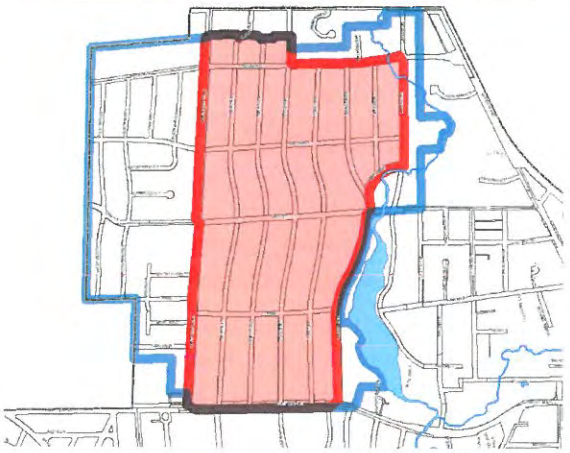


FIGURE 1:
QUARTON LAKE SUBDIVISIONS STUDY AREAS

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

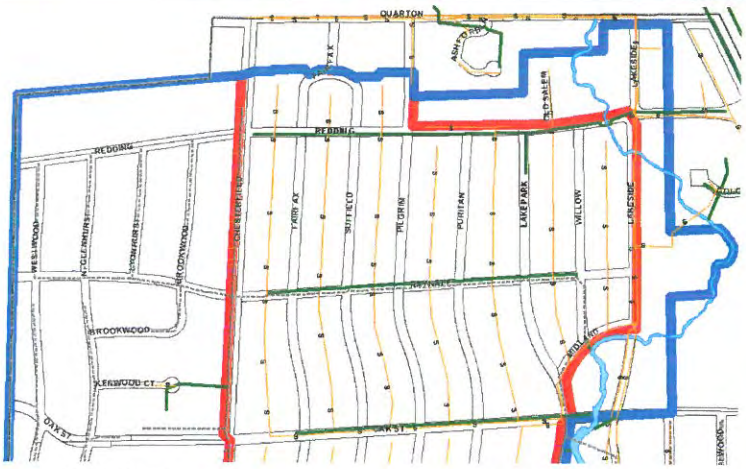


FIGURE 2:
EXISTING SEWERS QUARTON LAKE AREA NORTH OF OAK STREET

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

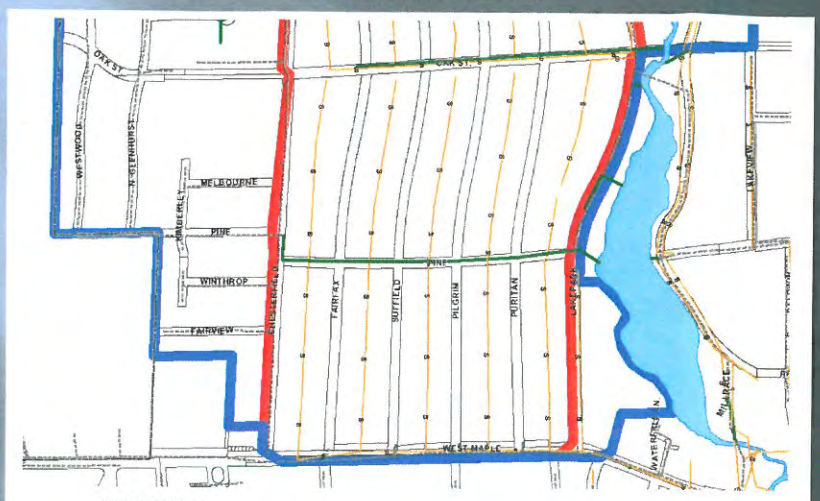


FIGURE 3:
EXISTING SEWERS QUARTON LAKE AREA SOUTH OF OAK STREET

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

BACKYARD SEWERS

- Majority of pipes are over 85 years old.
- Pipes have many flat or even uphill sections, resulting in low spots that collect debris.
- Small, 8 inch diameter pipe with 2 ft. pipe lengths
- Multiple joints open up, allowing roots to enter.
- Failures are difficult to repair due to being on private property – some are under garages or carports, near underground pools, etc.

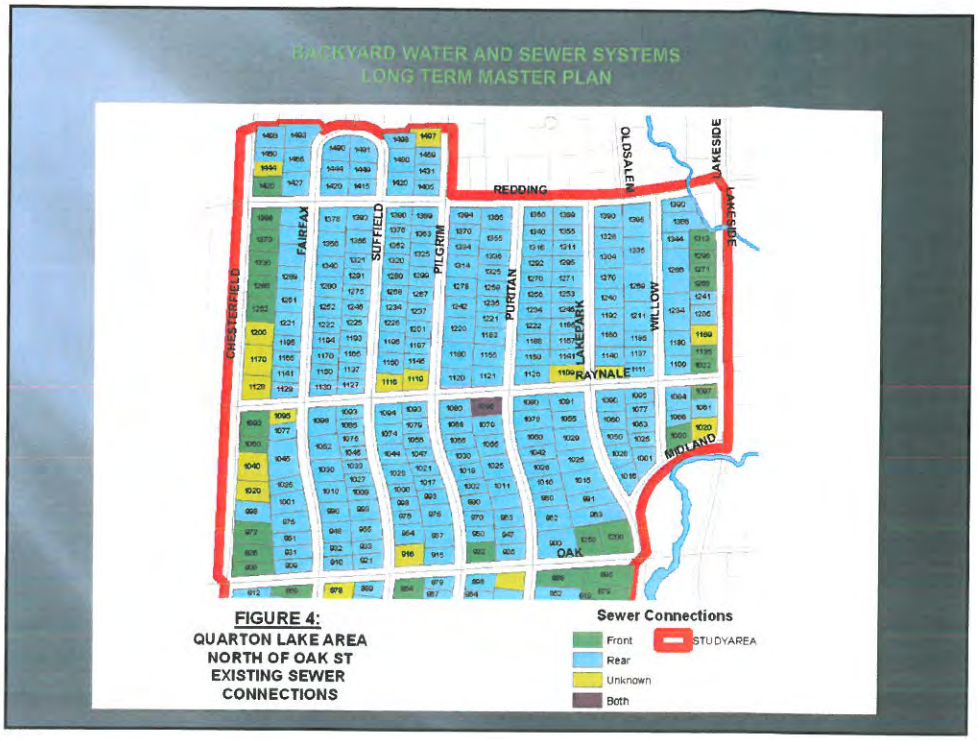
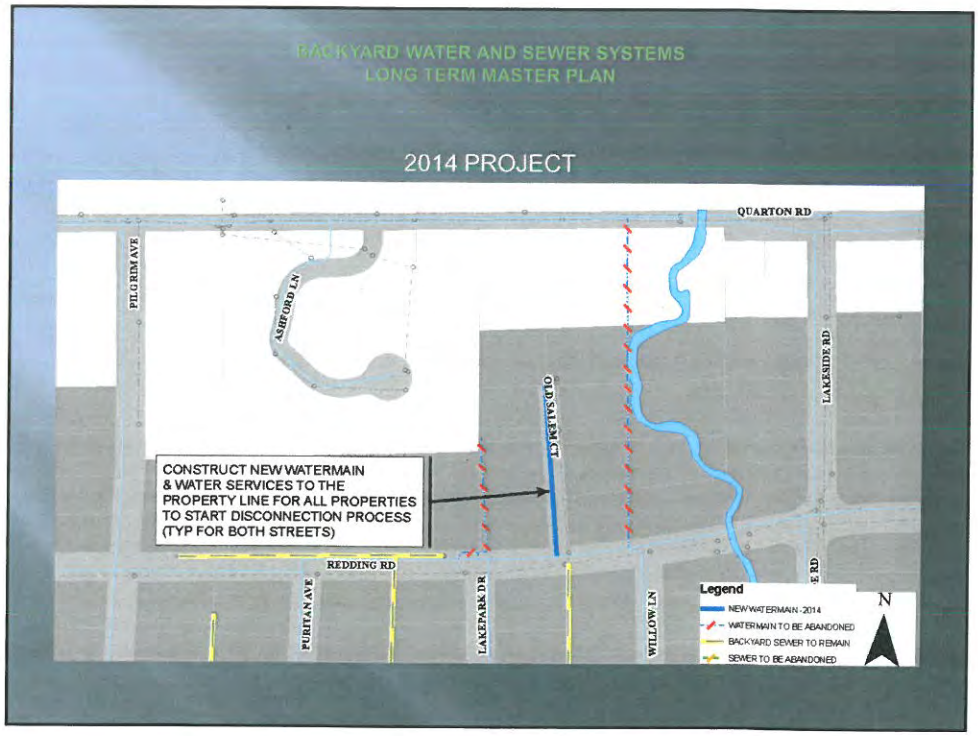


FIGURE 4:
QUARTON LAKE AREA NORTH OF OAK ST EXISTING SEWER CONNECTIONS

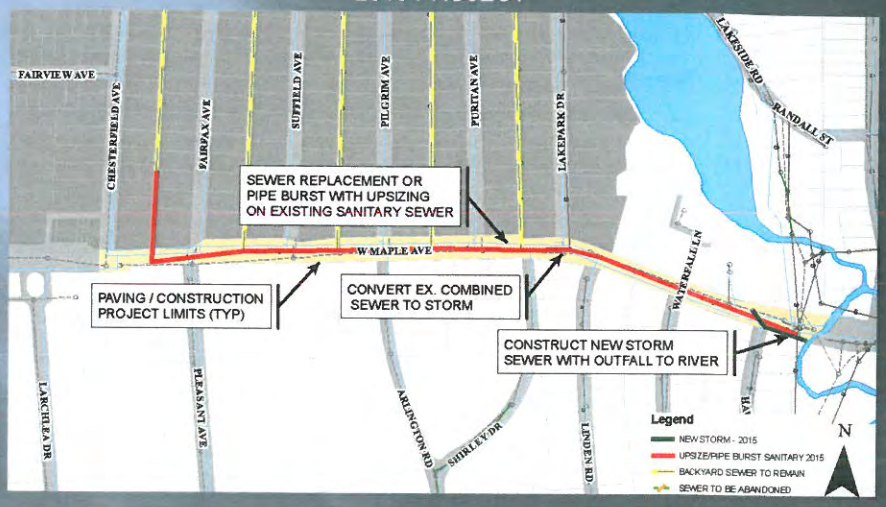
FIGURE 5:
QUARTON LAKE AREA SOUTH OF OAK ST EXISTING SEWER CONNECTIONS


BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN
2012 – 2015 LINING PROGRAM
BACKYARD SEWERS
PREVIOUSLY RELINED
2012-2015 LINING PROGRAM
REDDING RD
WESTWOOD DR
N GLENHURST DR
LYONHURST RD
BROOKWOOD
PILGRIM AVE
PURITAN AVE
WILLOW LN
LAKESIDE RD
WOODWARD AVE
RAYNALE ST
KENWOOD CT
OAK ST
PINE ST
CHESTERFIELD AVE
FAIRFAX AVE
SUFFIELD AVE
LAKEPARK DR
W MAPLE AVE
LAKEVIEW AVE
VINEWOOD AVE
HARMON ST
DEWEY ST
BAYPARK AVE
ATEN CT
N


BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN
2014 PROJECT
QUARTON RD
PILGRIM AVE
ASHFORD LN
OLD SALEM CT
LAKESIDE RD
CONSTRUCT NEW WATERMAIN & WATER SERVICES TO THE PROPERTY LINE FOR ALL PROPERTIES TO START DISCONNECTION PROCESS (TYP FOR BOTH STREETS)
REDDING RD
PURITAN AVE
LAKEPARK DR
WILLOW LN
Legend
NEW WATERMAIN - 2014
WATERMAIN TO BE ABANDONED
BACKYARD SEWER TO REMAIN
SEWER TO BE ABANDONED
N

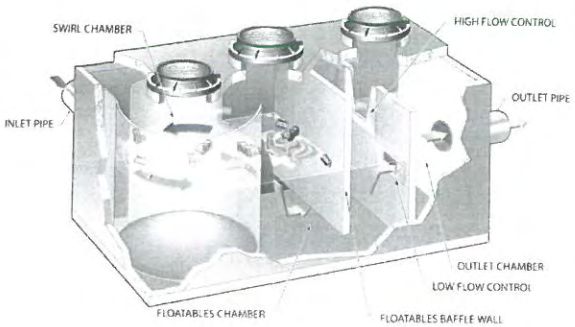
BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

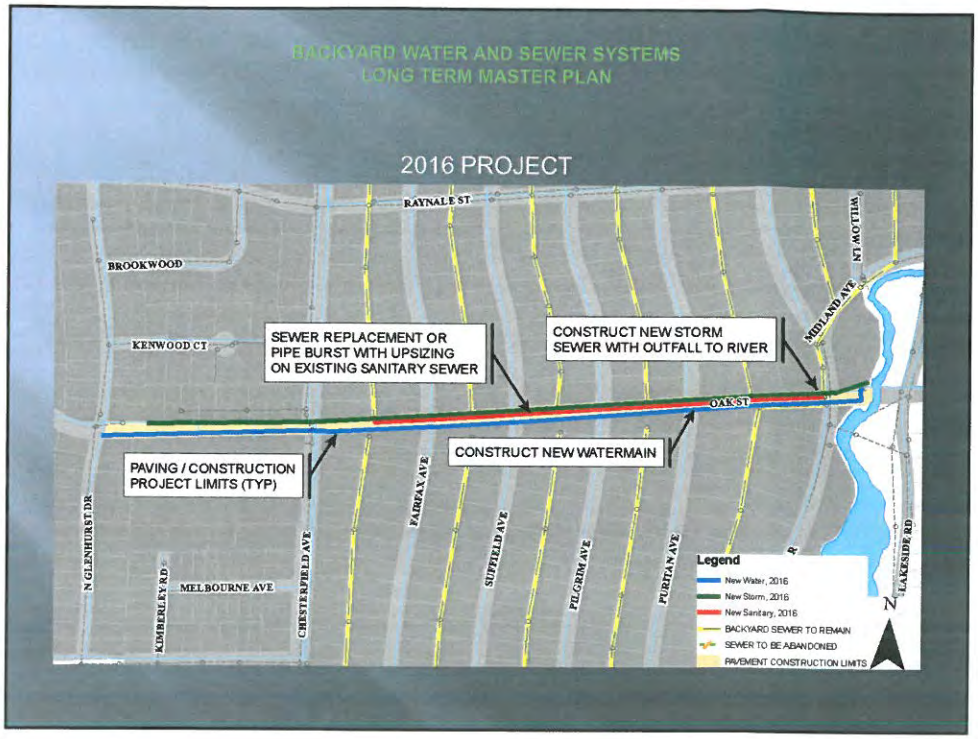
2015 PROJECT

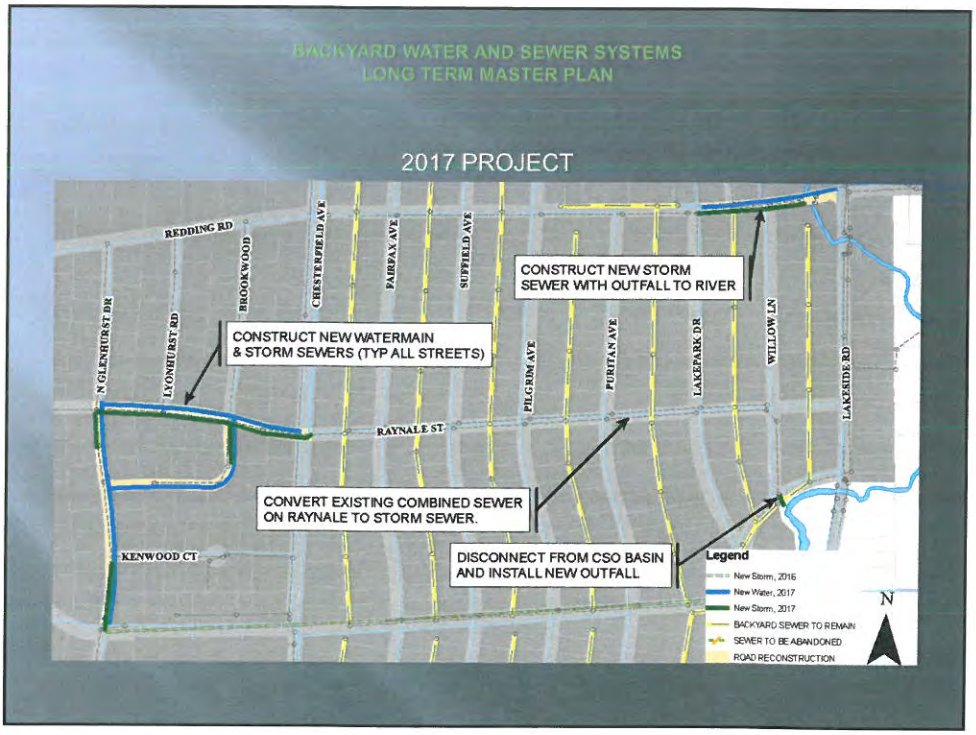


BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

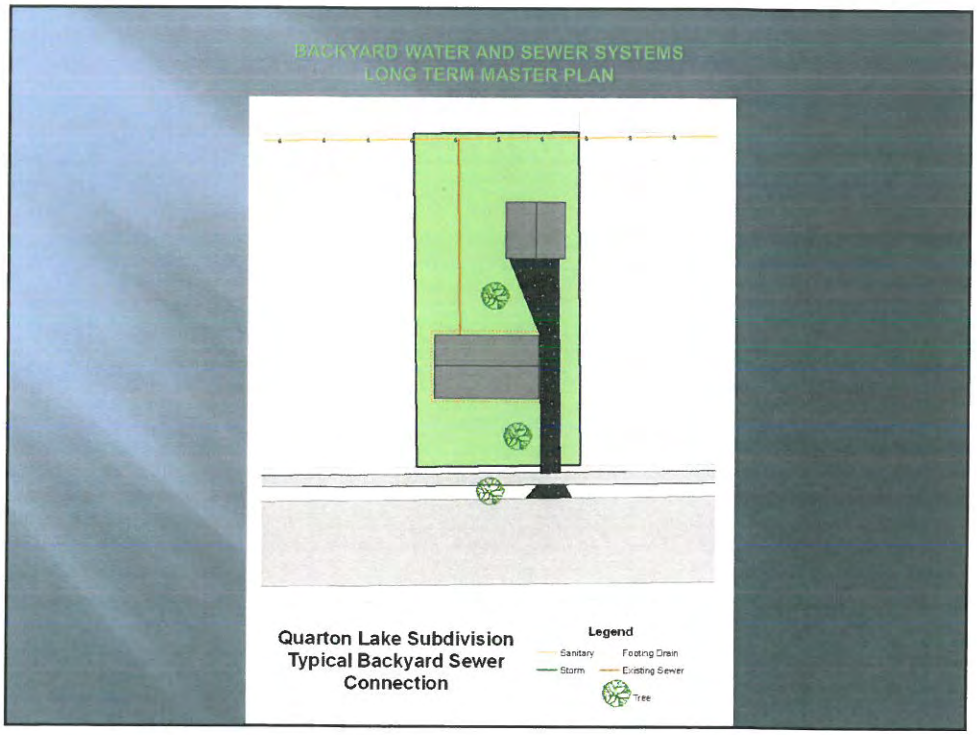
STORM WATER QUALITY TREATMENT DEVICE



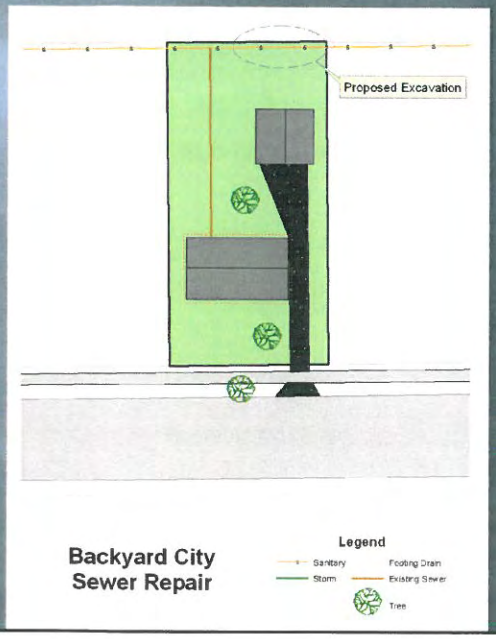

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN
2016 PROJECT
RAYNALE ST
BROOKWOOD
KENWOOD CT
SEWER REPLACEMENT OR PIPE BURST WITH UPSIZING ON EXISTING SANITARY SEWER
CONSTRUCT NEW STORM SEWER WITH OUTFALL TO RIVER
MIDLAND AVE
OAK ST
CONSTRUCT NEW WATERMAIN
PAVING / CONSTRUCTION PROJECT LIMITS (TYP)
N GLENHURST DR
KIMBERLEY RD
MELBOURNE AVE
CHESTERFIELD AVE
FAIRFAX AVE
SUFFIELD AVE
PILGRIM AVE
PURITAN AVE
LAKESIDE RD
Legend
New Water, 2016
New Storm, 2016
New Sanitary, 2016
BACKYARD SEWER TO REMAIN
SEWER TO BE ABANDONED
PAVEMENT CONSTRUCTION LIMITS
N


BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN
2017 PROJECT
REDDING RD
BROOKWOOD
CHESTERFIELD AVE
FAIRFAX AVE
SUFFIELD AVE
CONSTRUCT NEW STORM SEWER WITH OUTFALL TO RIVER
N GLENHURST DR
LYONHURST RD
CONSTRUCT NEW WATERMAIN & STORM SEWERS (TYP ALL STREETS)
PILGRIM AVE
PURITAN AVE
LAKEPARK DR
WILLOW LN
LAKESIDE RD
RAYNALE ST
CONVERT EXISTING COMBINED SEWER ON RAYNALE TO STORM SEWER.
KENWOOD CT
DISCONNECT FROM CSO BASIN AND INSTALL NEW OUTFALL
Legend
New Storm, 2016
New Water, 2017
New Storm, 2017
BACKYARD SEWER TO REMAIN
SEWER TO BE ABANDONED
ROAD RECONSTRUCTION
N


BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN
2018 PROJECT
REDDING RD
N GLENHURST DR
LYONHURST RD
BROOKWOOD
CHESTERFIELD AVE
FAIRFAX AVE
SUFFIELD AVE
PILGRIM AVE
CONSTRUCT NEW WATERMAIN & STORM SEWERS (TYP ALL STREETS)
RAYNALE ST
REPLACE CAPESEAL ROAD SURFACE (TYP)
WESTWOOD DR
KENWOOD CT
Legend
New Storm, 2016
New Storm, 2017
New Storm, 2018
New Water, 2018
BACKYARD SEWER TO REMAIN
SEWER TO BE ABANDONED
N


BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN
Quarton Lake Subdivision
Typical Backyard Sewer
Connection
Legend
Sanitary
Footing Drain
Storm
Existing Sewer
Tree

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

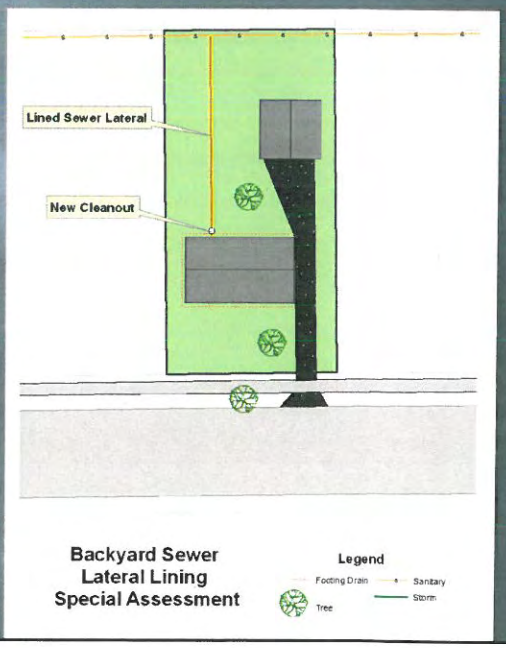


BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

Estimated Cost of Lining = $6,000.

Price is dependent on participation.

Participation will usually be voluntary.



BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

CITY SEWER MAINTENANCE SPECIAL ASSESSMENT

Roots can still penetrate lined sewers through old laterals.

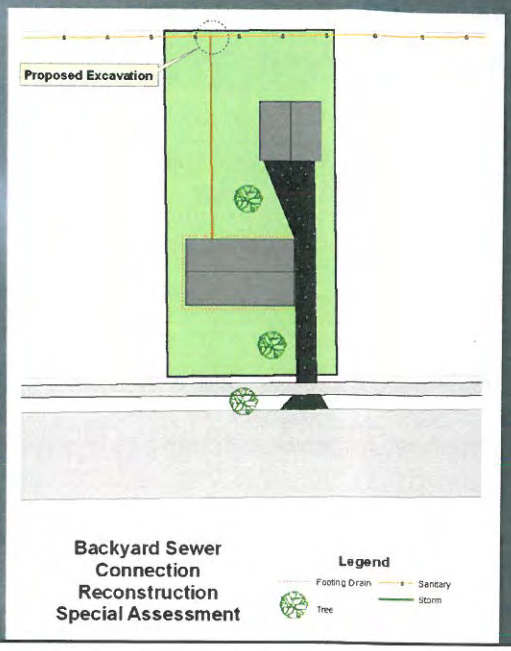
Maintenance assessment will cover increased costs (est. $100 to $500 annually).

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

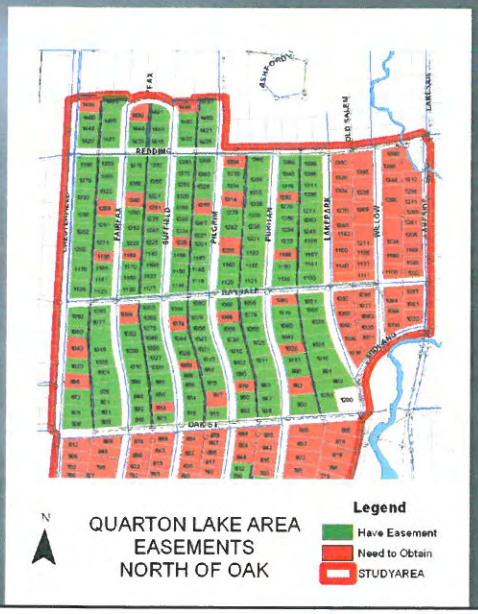
MISALIGNED SEWER CONNECTIONS

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

Estimated Cost =
$5,000 to $6,000



BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN



BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

"BLANKET" EASEMENT REQUIRED

City is investing over $2 million in backyard sewer system.

Legal access to system is needed.

Homeowners choosing not to sign will hold up lining process for entire block.

Easement allows access to backyard, but City is responsible for all damages.

Work in backyards will be avoided whenever possible.

SEWER
EASEMENT

KNOW ALL MEN BY THESE PRESENTS, that _____ whose address is _____, Grantor, and the **CITY OF BIRMINGHAM**, a Michigan Municipal Corporation, whose address is 151 Martin Street, P.O. Box 3001, Birmingham, Michigan, 48012-3001, Grantee, does hereby grant to the said Grantee, the right to construct, operate, maintain, install, repair, and/or replace sewers and manholes where currently located, and access across and through the following described land situated in the City of Birmingham, for the of One Dollar ($1.00), to wit:

Lot 41, Quarton Lake Estates

and to enter upon sufficient land adjacent to said easement for the purpose of the construction, operation, maintenance, installation, repair and/or replacement thereof.

The premises so disturbed by reason of the exercise of any of the foregoing powers, shall be reasonably restored to its original condition by Grantee.

This instrument shall be binding upon and inure to the benefit of the parties hereto, their heirs, representatives, successors, and assigns and the covenants contained herein shall run with the land.

IN WITNESS WHEREOF, the undersigned hereunto affixed _____ signatures this ____ day of _____, A.D., 2011.

In the Presence of:

WITNESSES

_____

_____

OWNER(s)

_____

_____

On this ____ day of _____ A.D., 2010, before me personally appeared _____ to me personally known, who being duly sworn, did each for themselves acknowledge said instrument to be their free act and deed.

_____
Notary Public

Oakland County, Michigan

My Commission Expires

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

MASTER PLAN ACTION STEPS

- The City will inspect backyard sewers to determine appropriate repair method (2011)
- The City will send written requests to the majority of owners in Quarton Lake subdivision (east of Chesterfield) requesting easements for future access and maintenance (2011).
- The City will line backyard sewers as needed (some time between 2012 and 2015). Potential assessments will apply for various repairs to owner's backyard sewer laterals and taps.

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

MASTER PLAN ACTION STEPS (continued)

- The City will install water main on Old Salem Ct. (2014)
- The City will improve Maple Rd. corridor (2015).
- The City will improve Oak St. corridor (2016).
- The City will conduct street/sewer/water projects in NW corner of Quarton Lake Subdivision (2017 & 2018).

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

NEXT STEPS:

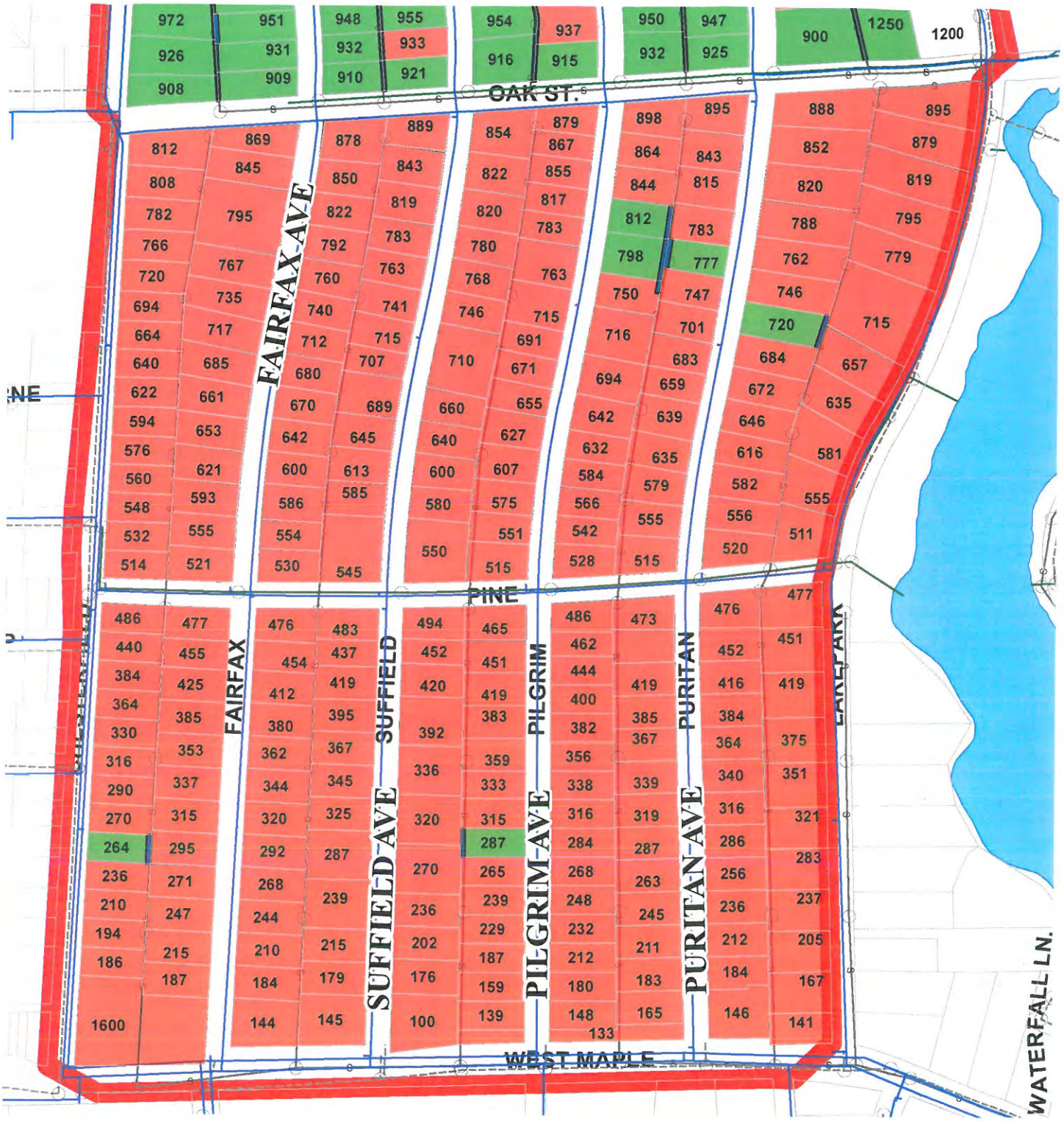
- Receive input from property owners.
- Modify the master plan, if necessary, to incorporate resident input.
- Update City Commission.
- Schedule public hearing to review public input and consider approving master plan.
- Video Inspect Back Yard Sewers to be re-lined.

BACKYARD WATER AND SEWER SYSTEMS
LONG TERM MASTER PLAN

QUESTIONS:

Paul O'Meara, City Engineer
248-530-1836
pomeara@ci.birmingham.mi.us

Brendan Cousino, Assistant City Engineer
248-530-1839
bcousino@ci.birmingham.mi.us



N

QUARTON LAKE AREA EASEMENTS SOUTH OF OAK

Legend

- Have Easement
- Need to Obtain
- STUDYAREA

N

QUARTON LAKE AREA EASEMENTS NORTH OF OAK

Legend

- Have Easement
- Need to Obtain
- STUDYAREA

HANDICAPPED PARKING POLICY UPDATE

City of Birmingham
Auto Parking System

HANDICAPPED PARKING POLICY UPDATE

- Americans with Disabilities Act (ADA) first passed in 1991.
- Marked handicapped parking spaces installed in parking structures and municipal lots in 1992.
- No changes were required for on-street parking.

HANDICAPPED PARKING POLICY UPDATE

Current on-street parking policy:

No on-street marked handicapped parking spaces exist. Handicapped parkers are allowed to:

1. Park at any metered parking space for as long as desired, at no cost.
2. Park at any yellow curbed zone, as long as vehicle is not causing traffic disruption.

City has received complaints that current policy is abused by some.

HANDICAPPED PARKING POLICY UPDATE

ADA Code change in recent past now requires that ALL new parking meters are accessible. All operable parts must be no more than 42 inches above grade.

City is now complying as meters are moved or replaced.

HANDICAPPED PARKING POLICY UPDATE

In 2016, new ADA code will require on-street marked handicapped parking wherever individually marked spaces are provided.

- Spaces shall be installed whenever a street is reconstructed or resurfaced.
- Spaces shall be at ratio of 1 vehicle for every 25 spaces provided on a block.
- Spaces shall be demarcated with blue paint, blue meter post, and handicapped parking sign.
- Spaces on angled parking areas are encouraged.
- On parallel parking, a five foot wide loading zone on passenger side will be required when sidewalks are 14 ft. wide or greater.

2016 PROPOSED CONSTRUCTION:
HAMILTON AVE. (3 blocks) AND PARK ST. (1 block)
Three handicapped parking spaces proposed.

TOTAL IMPACT:

64 Existing Spaces converted to handicapped use only, metered and enforced at the same time limit as other meters in the immediate area.
Total on-street spaces = 1,065 (6%)

Currently, handicapped parkers are encouraged to park on the street:

- Close to destination
- Free
- No time limit

Recent survey on a busy shopping day, a total of 121 different vehicles were observed parked with a handicapped permit. About 80% (almost 100 vehicles) were in metered spaces.

What's Next?

- Detailed Review at Advisory Parking Committee Meeting (January 20)
- If recommended, proceed to City Commission in February.
- Spaces will be constructed fully ADA compliant on Hamilton Ave. project.
- Spaces on other streets will be retrofitted by end of June, 2016.

DOWNTOWN BIRMINGHAM
AUTO PARKING SYSTEM

Planning for Future Public Parking Needs

January 16, 2016

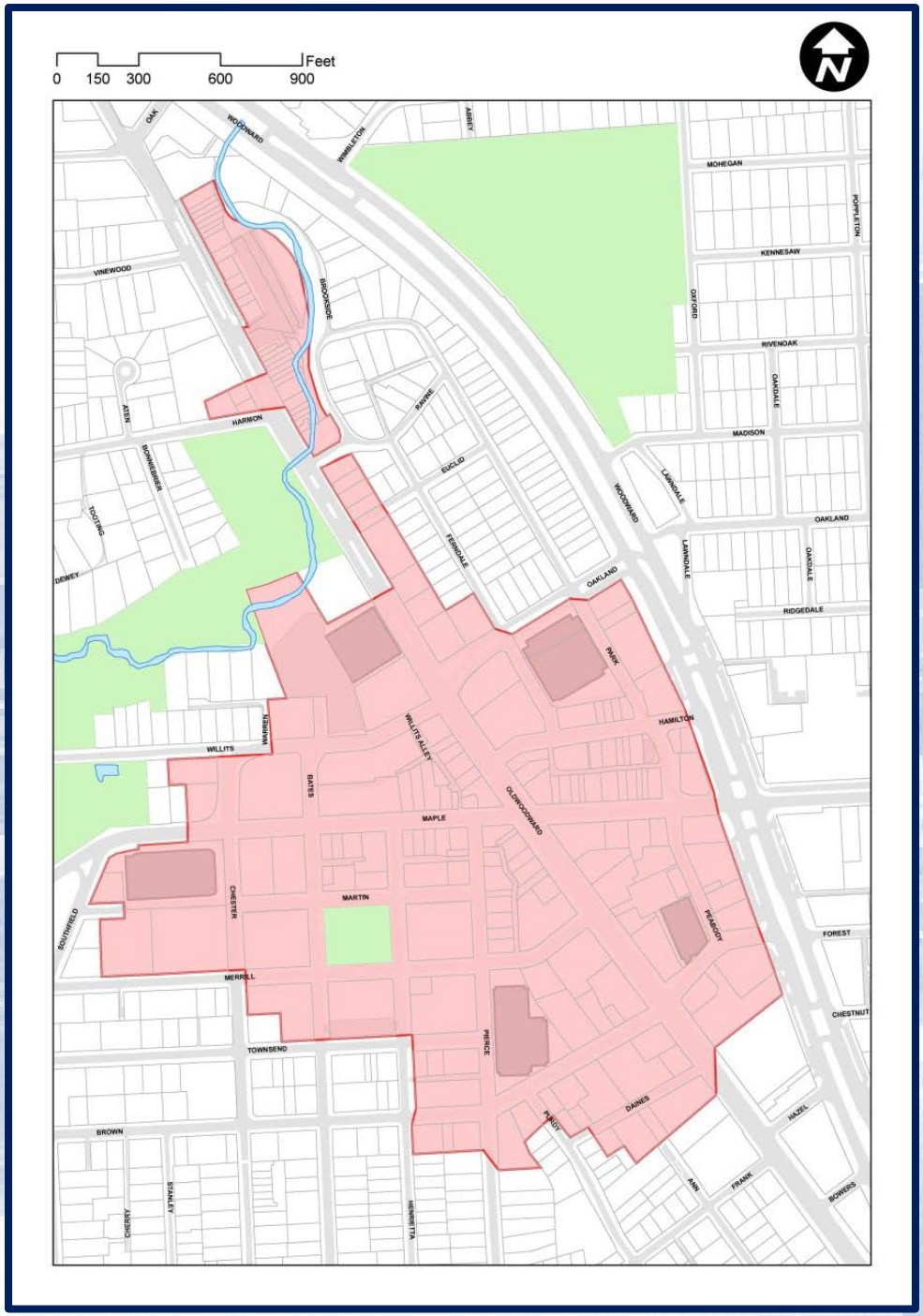
AUTO PARKING SYSTEM

A BRIEF HISTORY

- 1940's – First Parking Meters are Installed
- 1955 – 1973 – Eight parcels purchased for parking lots
- 1966 – N. Old Woodward Ave. Parking Structure built
- 1968 – Pierce St. Parking Structure built
- 1970 – Parking Lot #2 split for Ring Road construction
- 1974 – Park St. Parking Structure built
- 1984 – Peabody St. Parking Structure built
- 1989 – Chester St. Parking Structure built
- 2009 – Parking Lot #7 reduced for Shain Park expansion
- 2013 – Parking demand increases
- 2014 – Parking study conducted to help determine needs
- 2015 – Ad Hoc Parking Development Committee formed

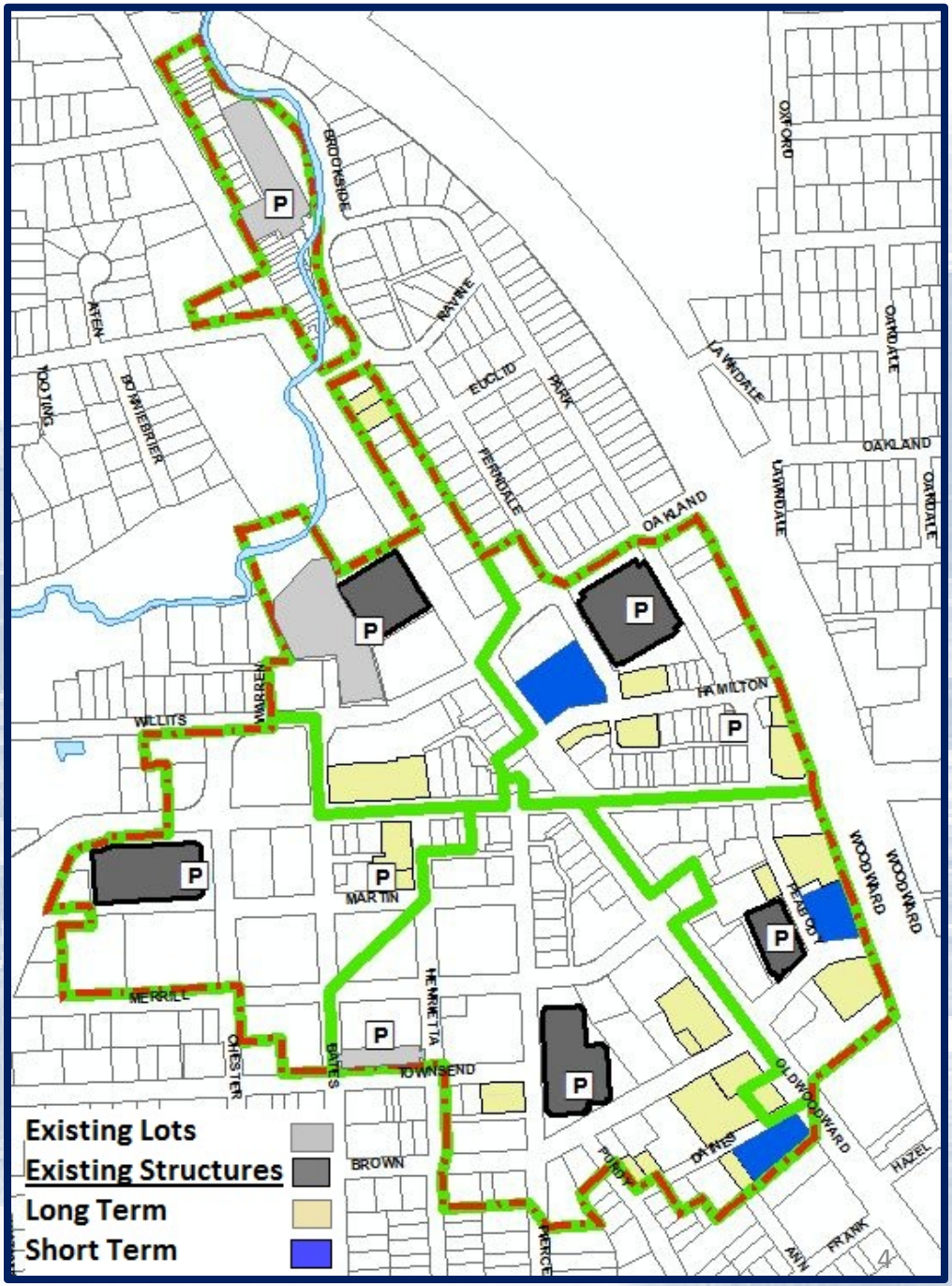
DOWNTOWN PARKING ASSESSMENT DISTRICT

AUTO PARKING SYSTEM



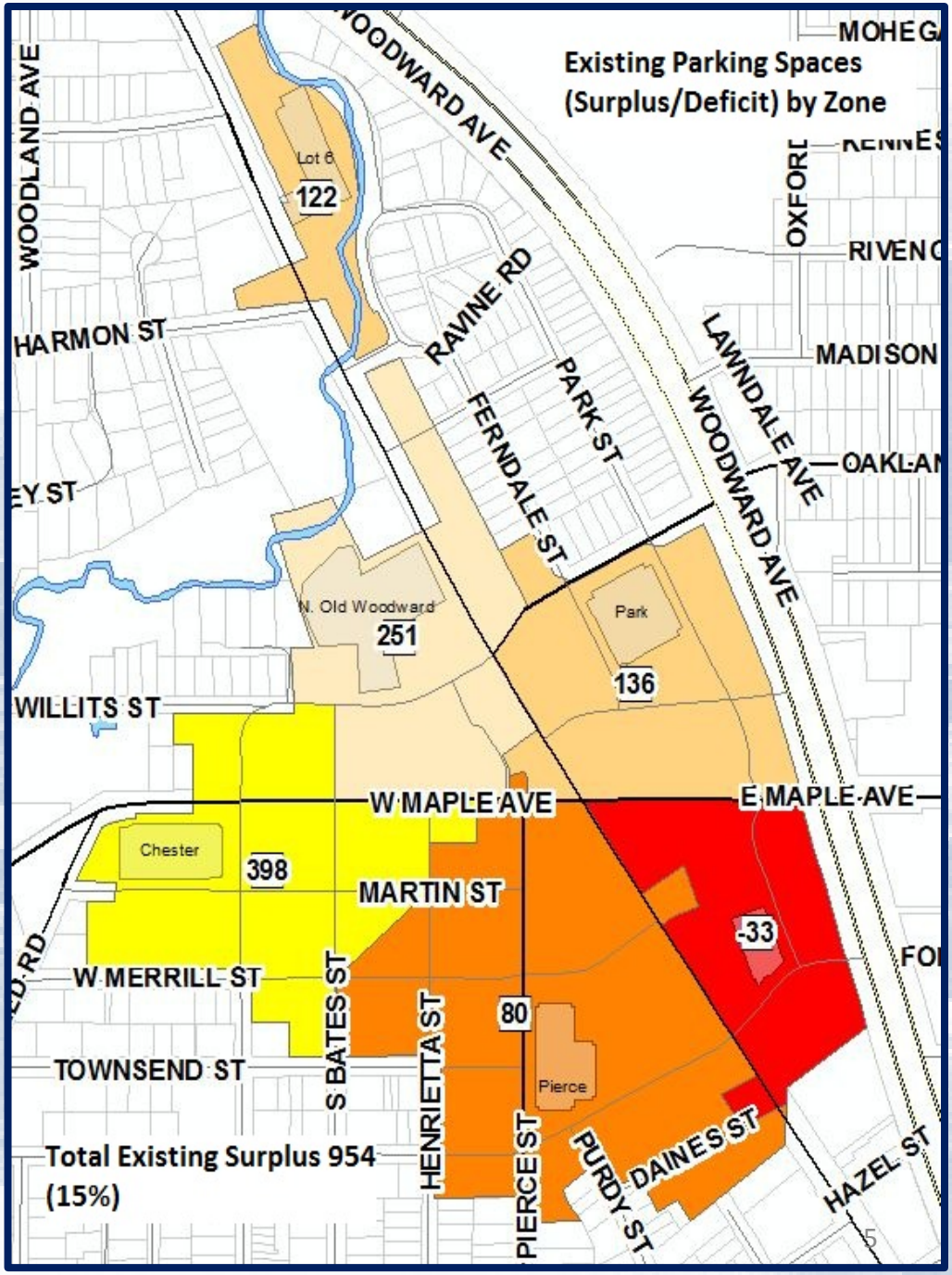
SHORT TERM & LONG TERM DEVELOPMENT PROJECTIONS

AUTO PARKING SYSTEM



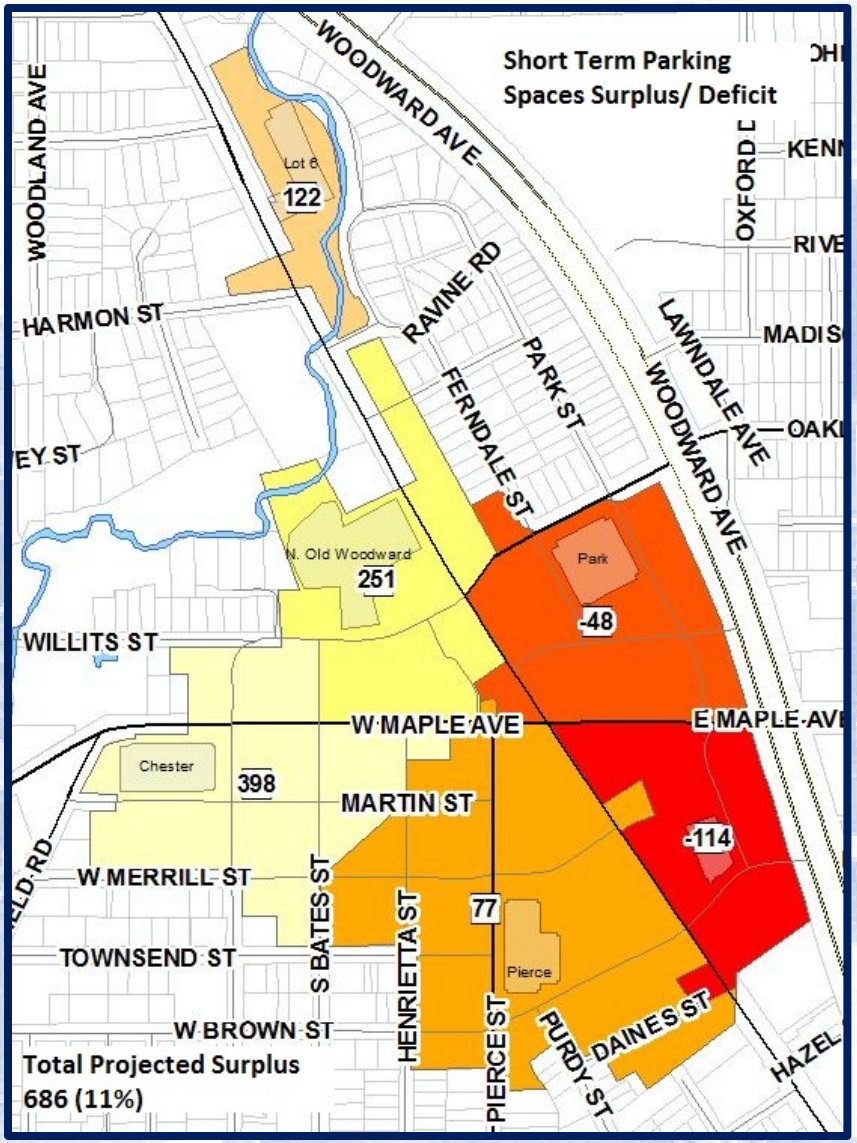
EXISTING PARKING SPACES SURPLUS/ DEFICIT BY ZONE

BASED ON 1 PARKED VEHICLE FOR EVERY 564 GROSS SQ.FT. OF COMMERCIAL SPACE.



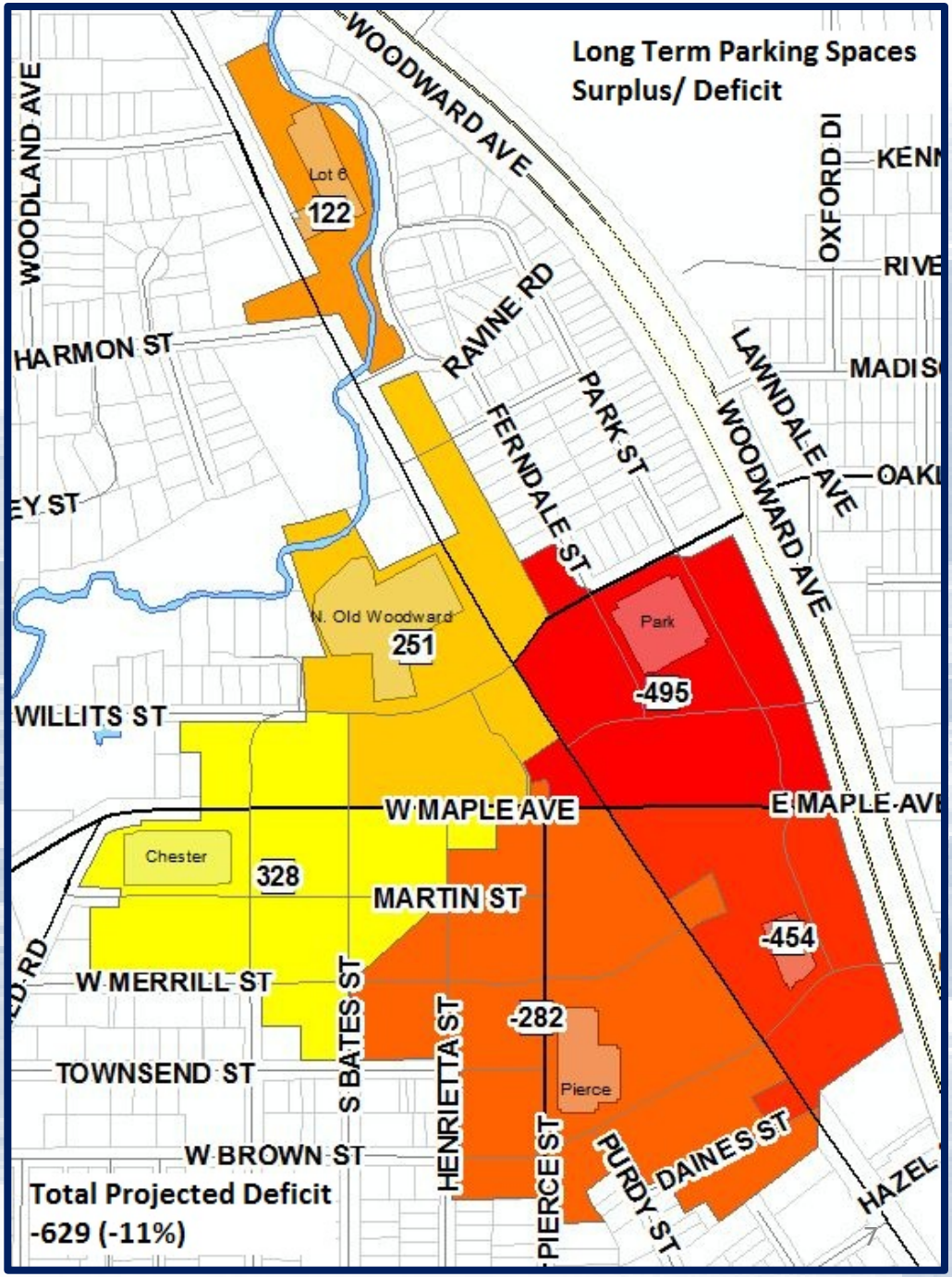
FUTURE PARKING SPACES

(SHORT TERM) SURPLUS/DEFICIT



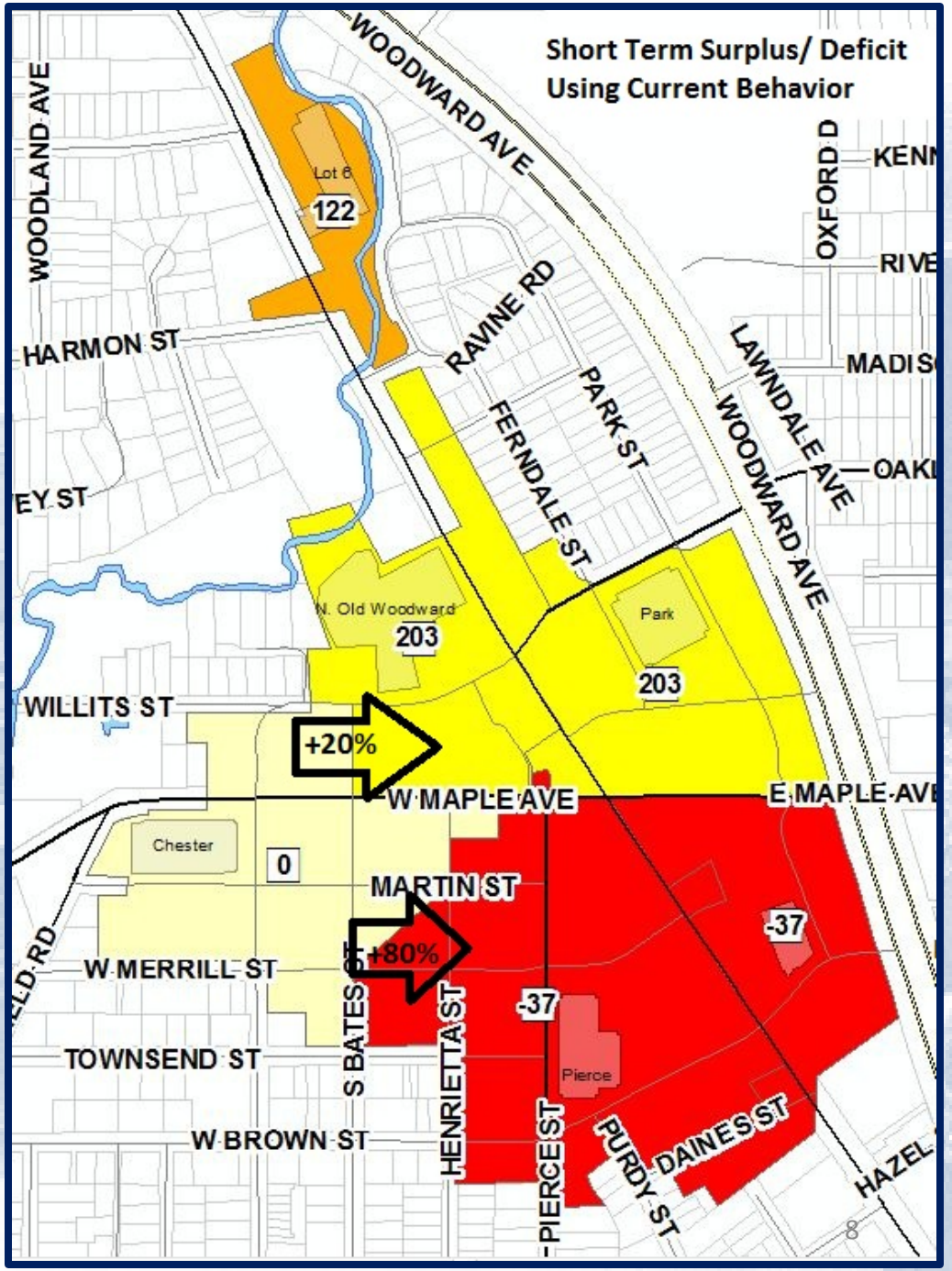
FUTURE PARKING SPACES

(LONG TERM) SURPLUS/DEFICIT



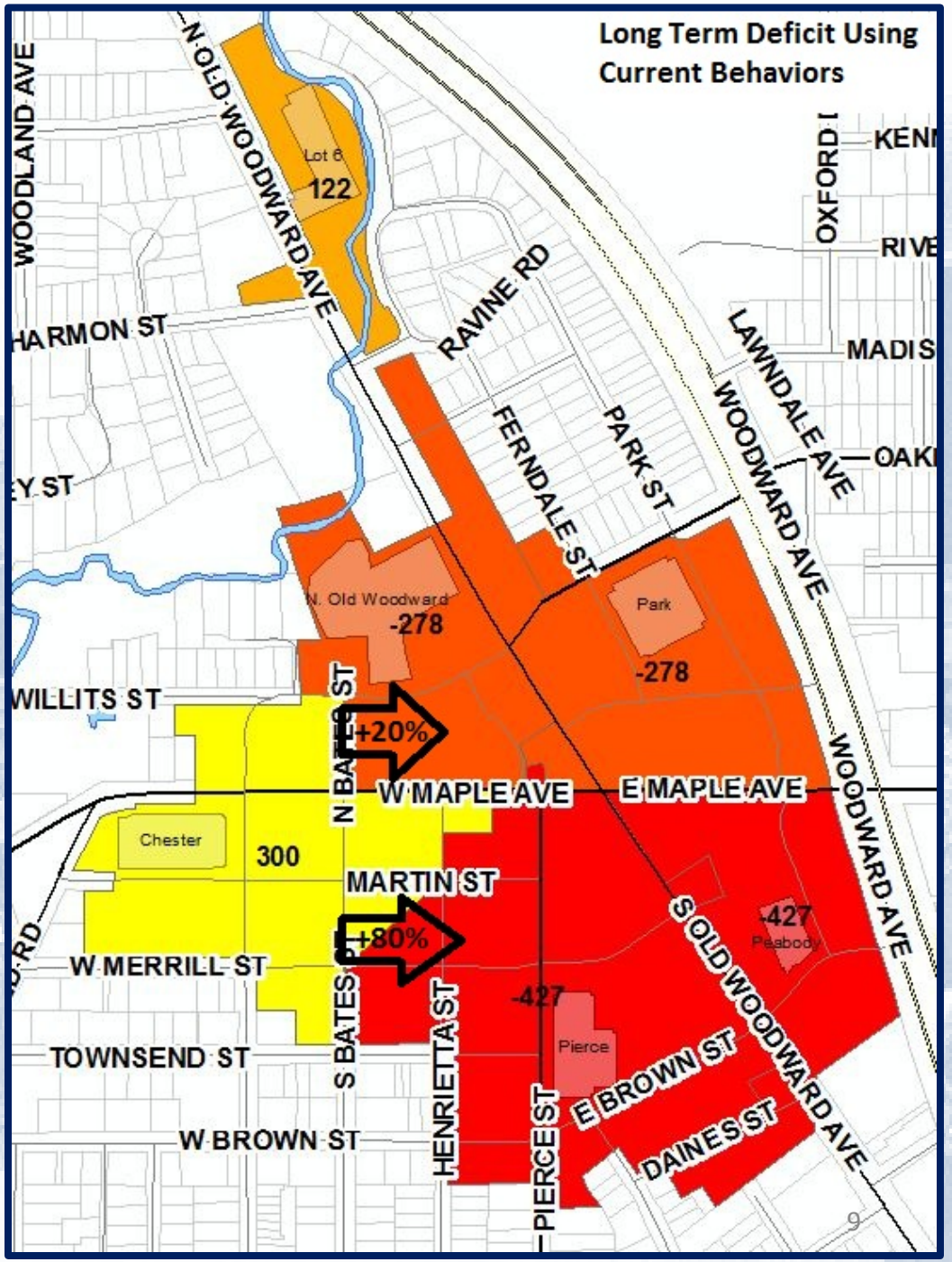
FUTURE PARKING SPACES

SURPLUS/DEFICIT (SHORT TERM) USING CURRENT BEHAVIORS



FUTURE PARKING SPACES

SURPLUS/DEFICIT (LONG TERM) USING CURRENT BEHAVIORS



AD HOC PARKING DEVELOPMENT COMMITTEE

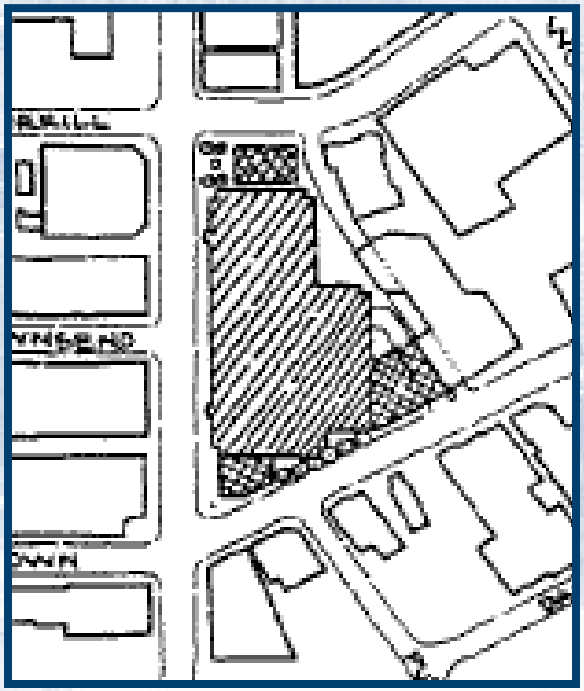
Members:

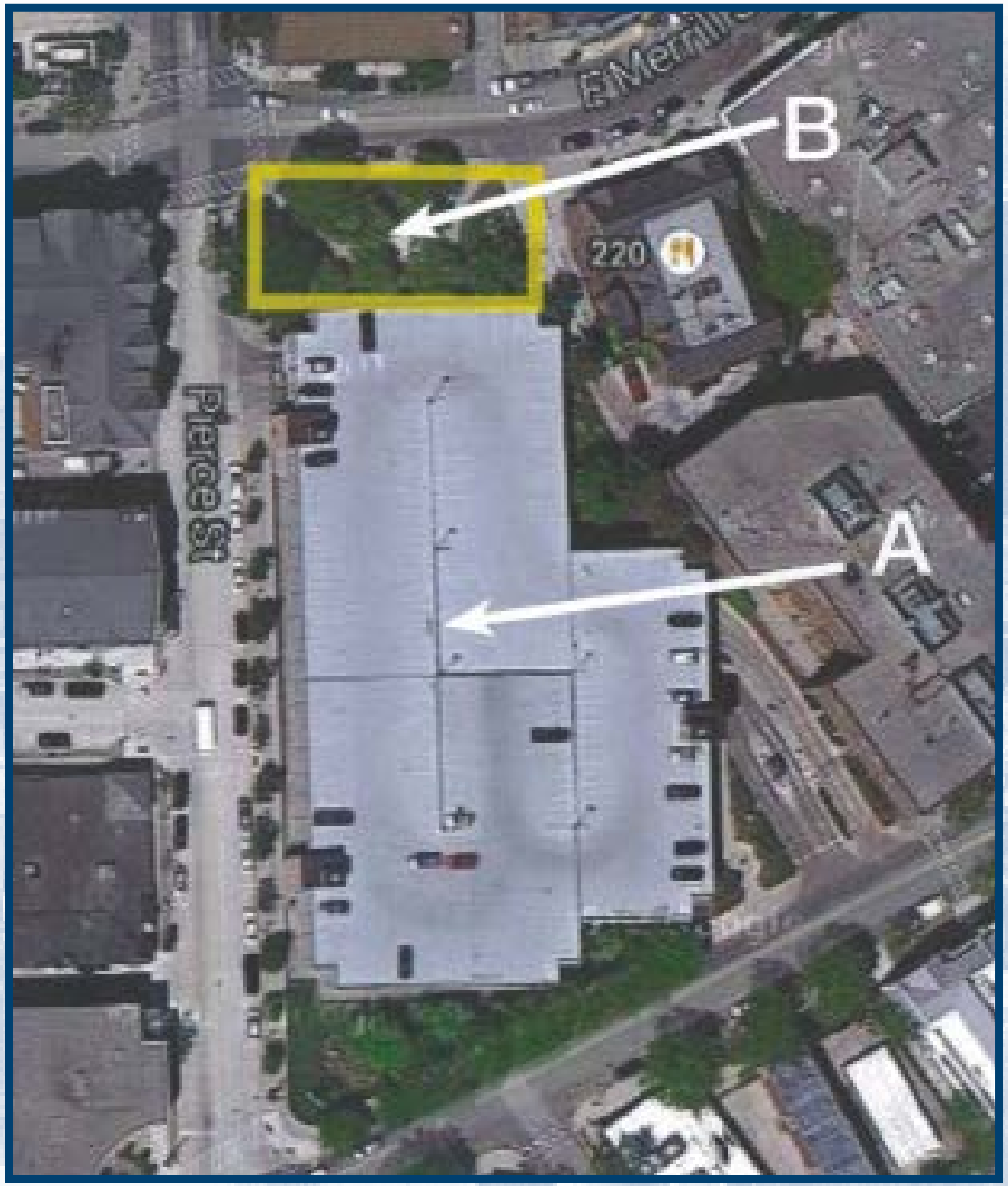
Richard Astrein – Principal Shopping District Rep.
Scott Clein – Planning Board Rep.
Rackeline Hoff – City Commissioner
Terry Lang – Resident with Financial Background
Mark Nickita – City Commissioner
Judith Paskiewicz – Advisory Parking Committee Rep.
Vacant – Resident with Development Background

Assisted by Consulting Team:
Saroki Architects / Carl Walker Parking Consultants / LSL Planning

PIERCE STREET OPTION:

EXPAND PIERCE STREET STRUCTURE





DPZ 1996

PIERCE STRUCTURE PRELIMINARY WORK:

EXISTING SITE PLAN

Existing Parking Summary:

Surface Total Spaces:	0 spaces
5 Level Structure Total Spaces:	720 spaces
Existing Combined Total Spaces:	720 spaces

SAROKI ARCHITECTURE

Carl Walker

Existing Site Plan
(333 Pierce St.)

Birmingham Parking Expansion
333 Pierce Street
Birmingham, MI
City of Birmingham
Site Plan
Scale 1" = 30'
December 9, 2015

PIERCE STRUCTURE PRELIMINARY WORK:

SCHEME 1- VERTICAL ADDITION

Key Site Elements:

Existing parking structure to remain with a new (2) level vertical addition.
New Mixed Use Building at East Merrill.
New Mixed Use Building at Brown Street.

Proposed Parking Summary:

Current Total Parking at Existing Site:	720 spaces
Desired Total Site Parking: (desired 427 additional spaces to south half of the central business district)	1147 spaces
Surface Total Spaces:	0 spaces
7 Level Structure Total Spaces:	1,000 spaces
Total Added Parking Spaces over the existing count of 720 spaces:	280 Spaces

SAROKI ARCHITECTURE

Carl Walker

333 Pierce Street
Existing Structure with Vertical Addition
Scheme 1

Birmingham Parking Expansion
City of Birmingham

PIERCE STRUCTURE PRELIMINARY WORK:

SCHEME 2- PROPOSED NEW STRUCTURE

Key Site Elements:

New Parking Structure.
New Mixed Use Building at East Merrill.
(With parking below grade).

Proposed Parking Summary:

Current Total Parking at Existing Site:	720 spaces
Desired Total Site Parking:	1147 spaces
(desired 427 additional spaces to south half of the central business district)	
Surface Total Spaces:	0 spaces
6 Level Structure Total Spaces:	1,000 spaces
7 Level Structure Total Spaces	1,173 spaces
Total Added Parking Spaces over the existing count of 720 spaces:	453 Spaces

SAROKI ARCHITECTURE

Carl Walker

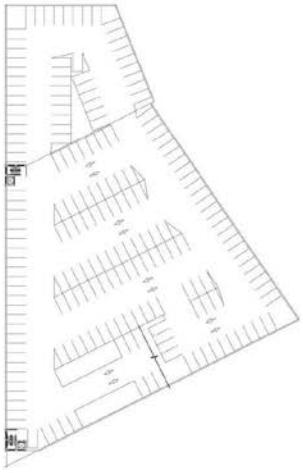
333 Pierce Street
Proposed New Structure

Birmingham Parking Expansion
City of Birmingham

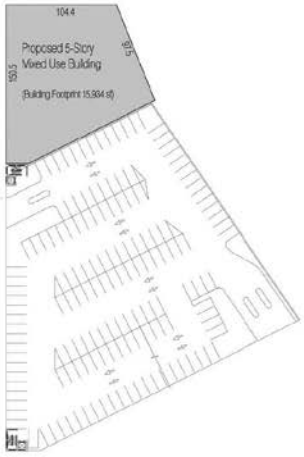
SCHEME 2

PIERCE STRUCTURE PRELIMINARY WORK:

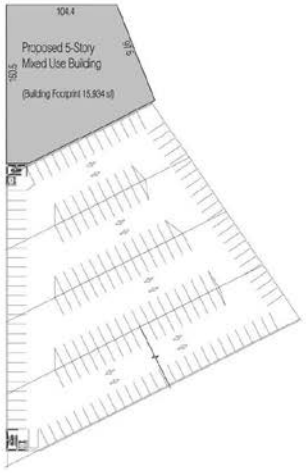
SCHEME 2- PROPOSED NEW STRUCTURE



Level B1
(193 spaces)



Level 1
(147 spaces)



Levels 2-6(7)
(172 spaces)

SAROKI ARCHITECTURE

Carl Walker

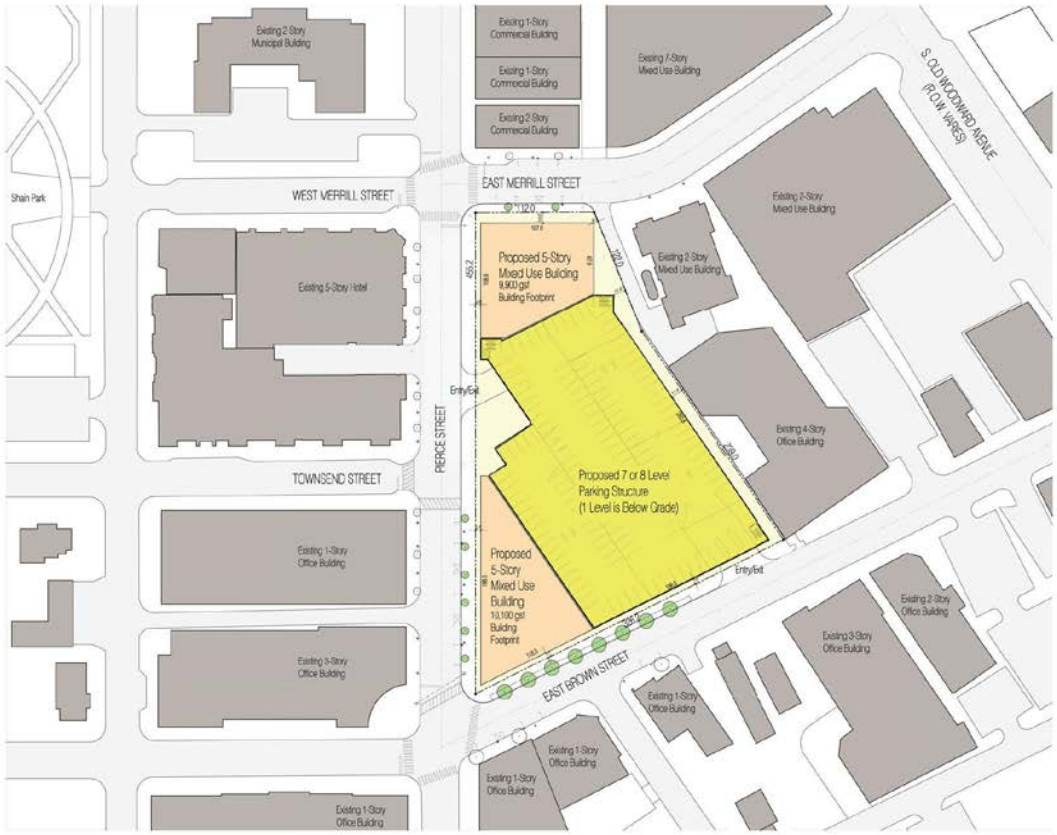
333 Pierce Street
Proposed New Structure - Floor Plans

Birmingham Parking Expansion
City of Birmingham

SCHEME 2

PIERCE STRUCTURE PRELIMINARY WORK:

SCHEME 3- PROPOSED NEW STRUCTURE



Key Site Elements:

New Parking Structure.
New Mixed Use Building at East Merrill. (With parking below grade)
New Mixed Use Building at Brown Street. (With parking below grade)

Proposed Parking Summary:

Current Total Parking at Existing Site:	720 spaces
Desired Total Site Parking: (desired 427 additional spaces to south half of the central business district)	1147 spaces
Surface Total Spaces:	0 spaces
7 Level Structure Total Spaces:	970 spaces
8 Level Structure Total Spaces	1,100 spaces
Total Added Parking Spaces over the existing count of 720 spaces:	380 Spaces

SAROKI ARCHITECTURE

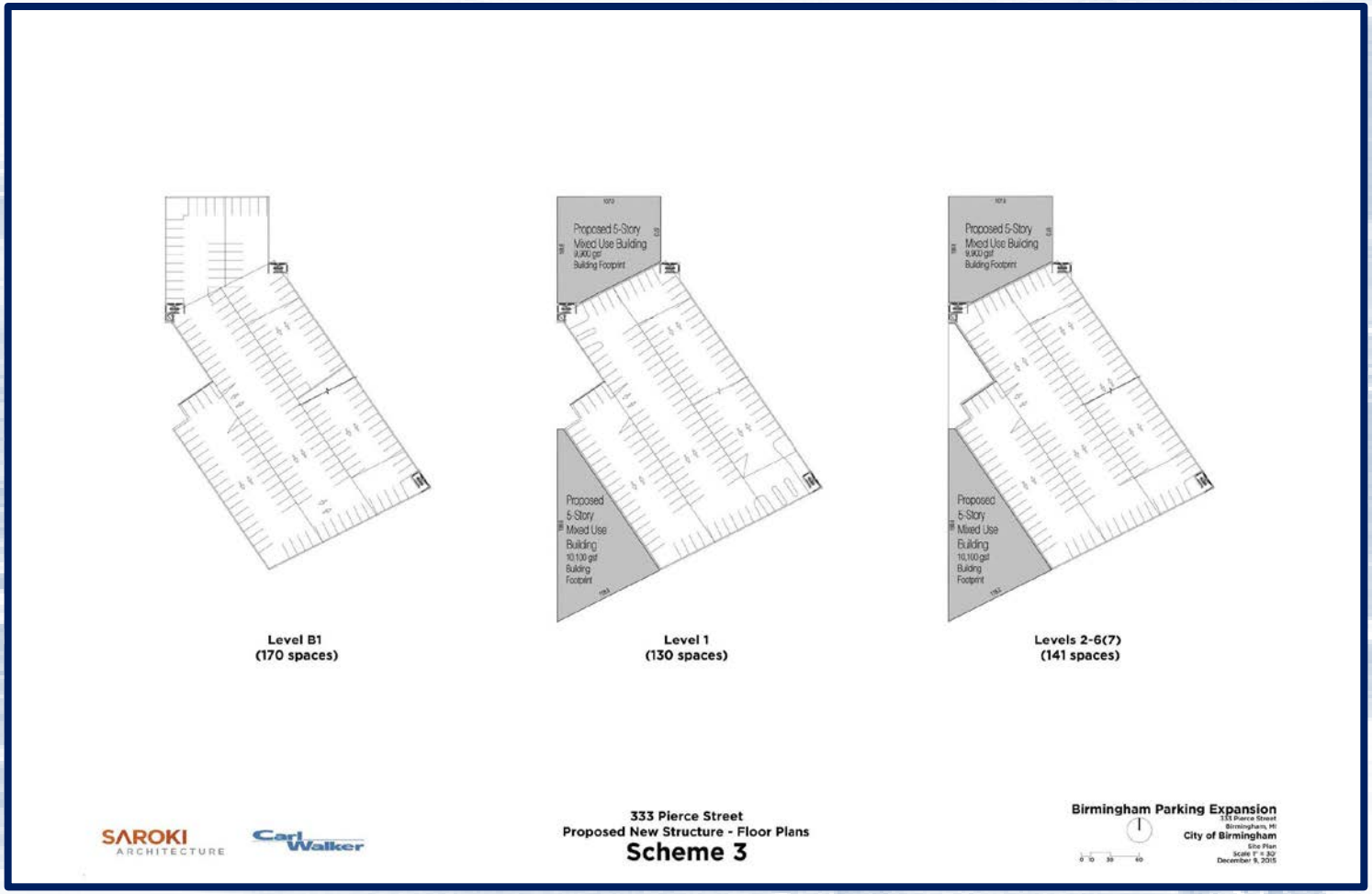
Carl Walker

333 Pierce Street
Proposed New Structure
Scheme 3

Birmingham Parking Expansion
City of Birmingham

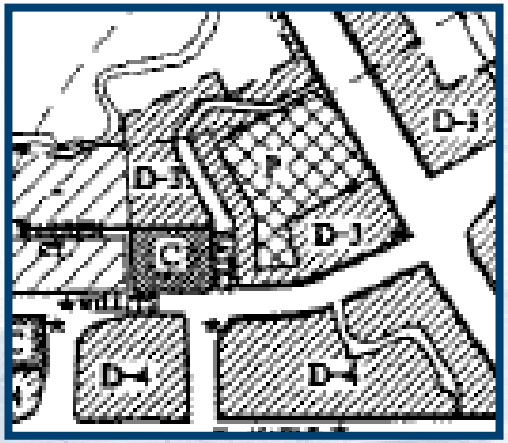
PRELIMINARY WORK:

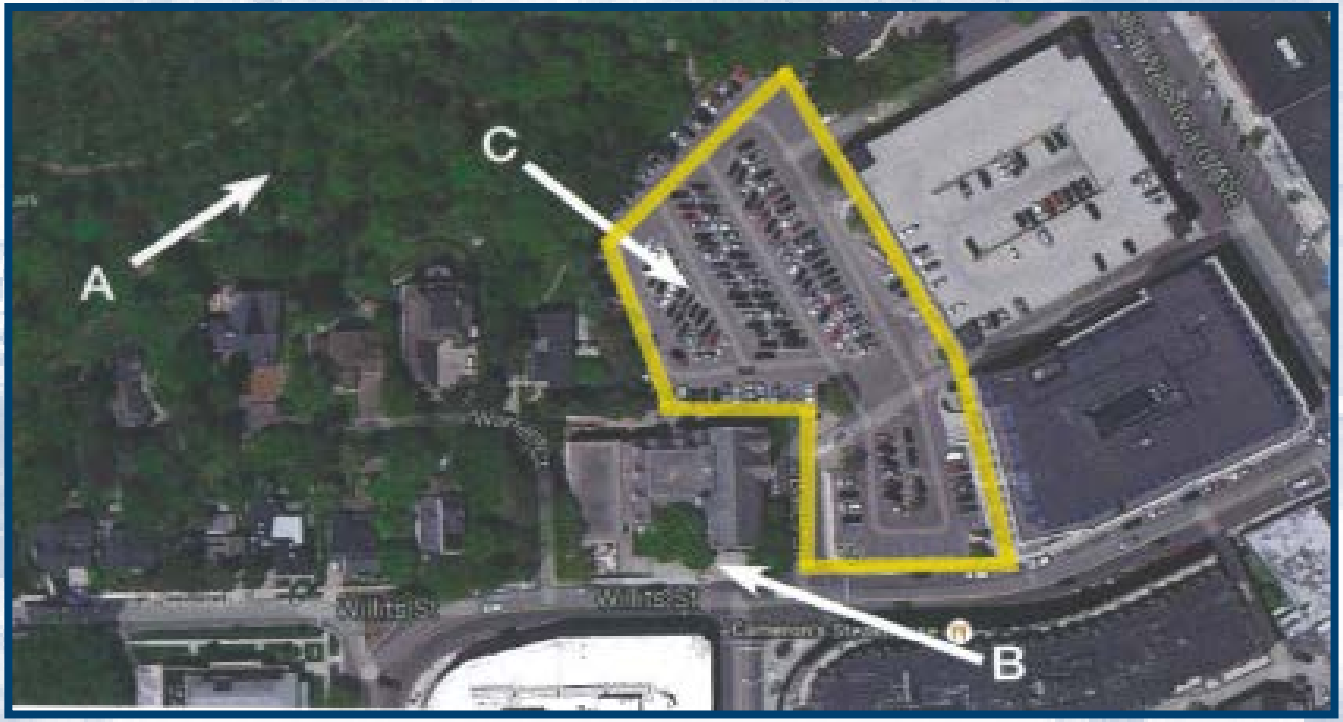
SCHEME 3- PROPOSED NEW STRUCTURE



N. OLD WOODWARD OPTION:

PARKING LOT #5 N. OLD WOODWARD AVE. STRUCTURE





SPECIFIC PROJECT 6:
THE WILLITS BLOCK

Finding: The superblock behind the North Woodward Garage has development potential.

Discussion: Behind the North Woodward Garage is a large site overlooking the Rouge River Park that is now used as a surface parking lot. It has the potential for expanding the existing parking deck by a contiguous addition (avoiding the need for additional ramps). But it is too beautiful a site, facing the park as it does, to reserve entirely for parking.

The site could be edged with apartments or townhouses facing the park, facing the Baptist Church, and facing Willits Street, masking the parking deck in the process. This housing could be built before the parking expansion, because the Woodward Garage is under-utilized.

The street formed by the new housing would be an extension of Bates Street and would continue on to Old Woodward by occupying the deck's north-side service road. The sale of these edge parcels for housing would create a one-time fund for the City (perhaps to be used for the Shain Park and Martin Street Specific Projects.)

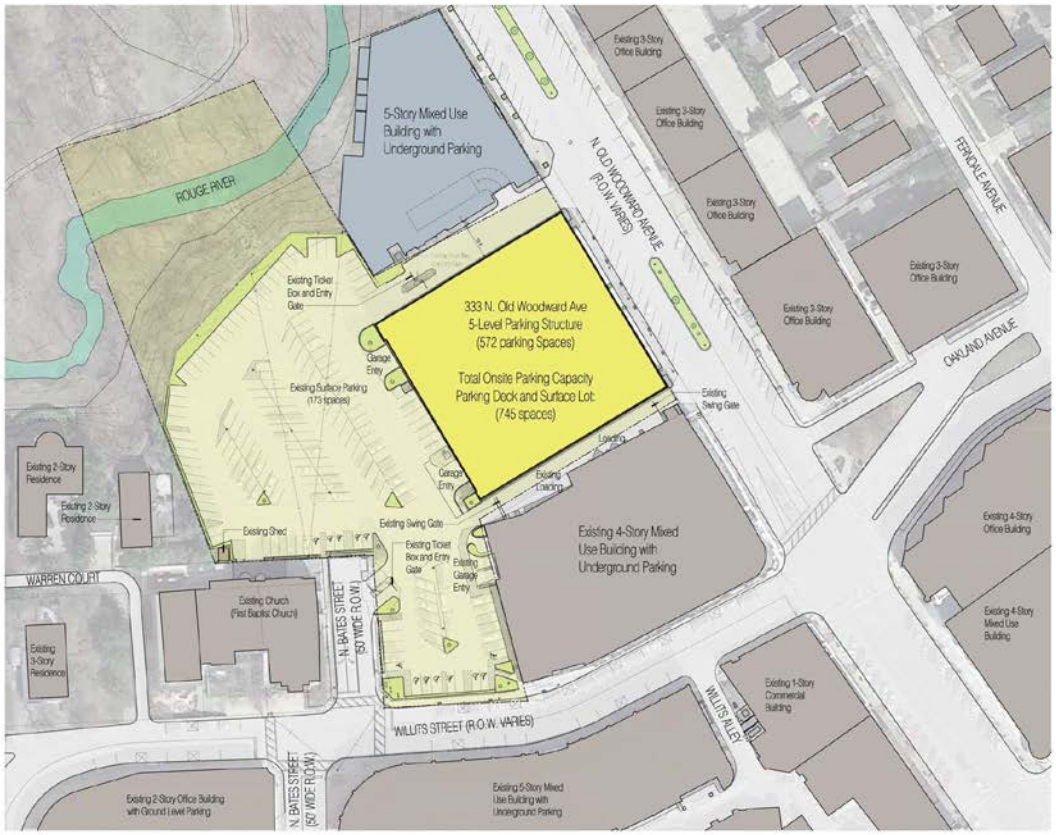
Recommendation: Sell the edges of the Willits site, perhaps no deeper than 30 feet, to a housing developer, and retain the rest for the parking deck expansion. When sold for development, this special project has the potential of raising a substantial one-time revenue for the City.

References:

- Precedent: Some successful and very shallow townhouses screening parking decks at Mizner Place, Boca Raton, Florida.
- Appendices G – 1 and G - 7.
- Illus. 56.

DPZ 2014

WOODWARD STRUCTURE PRELIMINARY WORK:
EXISTING SITE PLAN



Existing Parking Summary:

Surface Total Spaces:	179 spaces
5 Level Structure Total Spaces:	572 spaces
Existing Combined Total Spaces:	745 spaces

SAROKI ARCHITECTURE

Carl Walker

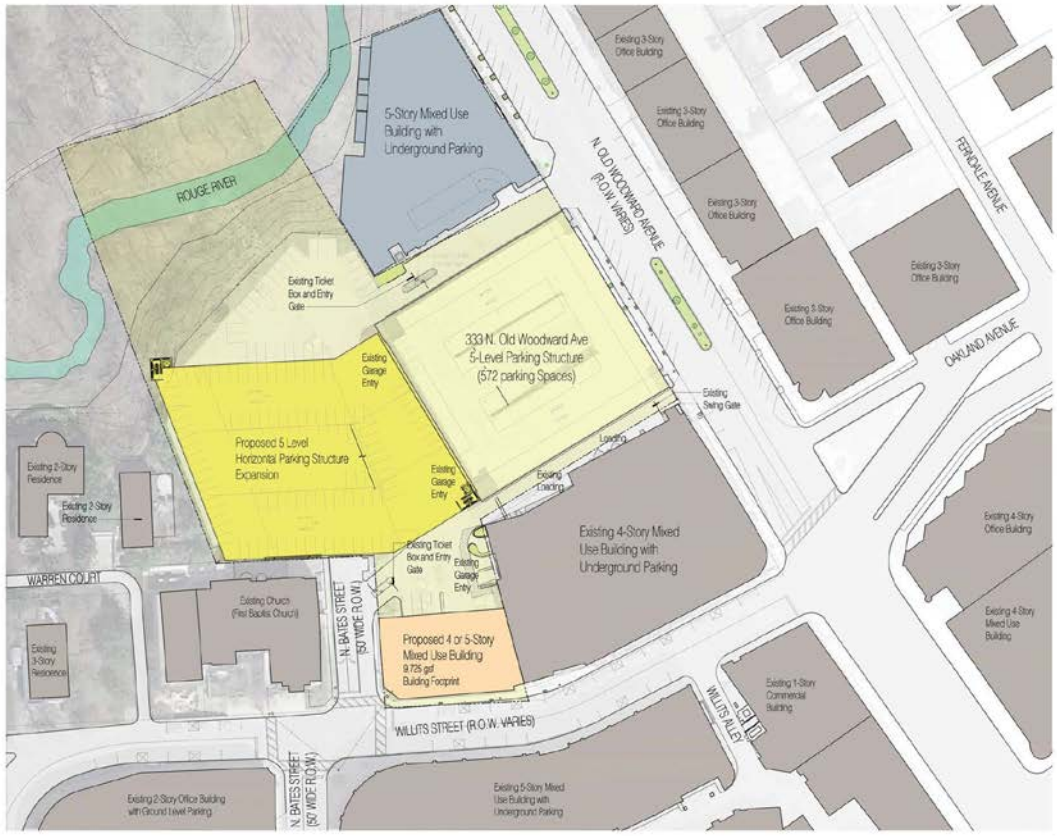
Existing Site Plan
(333 N. Old Woodward)

Birmingham Parking Expansion
333 N. Old Woodward Avenue
Birmingham, MI
City of Birmingham

Scale 1" = 30'
December 9, 2015

WOODWARD STRUCTURE PRELIMINARY WORK:

SCHEME 1- HORIZONTAL EXPANSION



Key Site Elements:

New Horizontal Parking Structure Expansion
New Mixed Use Building at Willits

Proposed Parking Summary:

Current Total Parking at Existing Site:	745 spaces
Desired Total Site Parking: (desired 278 additional spaces to north half of the central business district)	1023 spaces
Surface Total Spaces:	31 spaces
5 Level Existing Structure Total Spaces: (6 spaces lost at tie-in with new structure)	566 spaces
4 Level Horizontal Expansion Structure Total Spaces:	495 spaces
Proposed Combined Total Spaces:	1092 Spaces
Total Added Parking Spaces over the existing count of 745 spaces:	347 Spaces

SAROKI ARCHITECTURE

Carl Walker

333 N. Old Woodward
Existing Structure With Horizontal Expansion
Scheme 1

Birmingham Parking Expansion
333 N. Old Woodward Avenue
Birmingham, MI
City of Birmingham
Scale 1" = 30'
December 9, 2015

WOODWARD STRUCTURE PRELIMINARY WORK:

SCHEME 2- PROPOSED NEW STRUCTURE

Key Site Elements:

Bates Street Extension Road - 25' Wide Road
New Parking Structure
New Mixed Use Building at Woodward
New Mixed Use Building at Willits
(2) New Residential Buildings

Proposed Parking Summary:

Current Total Parking at Existing Site:	745 spaces
Desired Total Site Parking: (desired 278 additional spaces to north half of the central business district)	1023 spaces
Surface Total Spaces:	10 spaces
5 Level Structure Total Spaces:	709 spaces
6 Level Structure Total Spaces	859 spaces
Proposed Combined Total Spaces:	
(With 5 Level Structure)	719 Spaces
(With 6 Level Structure)	869 Spaces
Total Added Parking Spaces over the existing count of 745 spaces:	124 Spaces

SAROKI ARCHITECTURE

Carl Walker

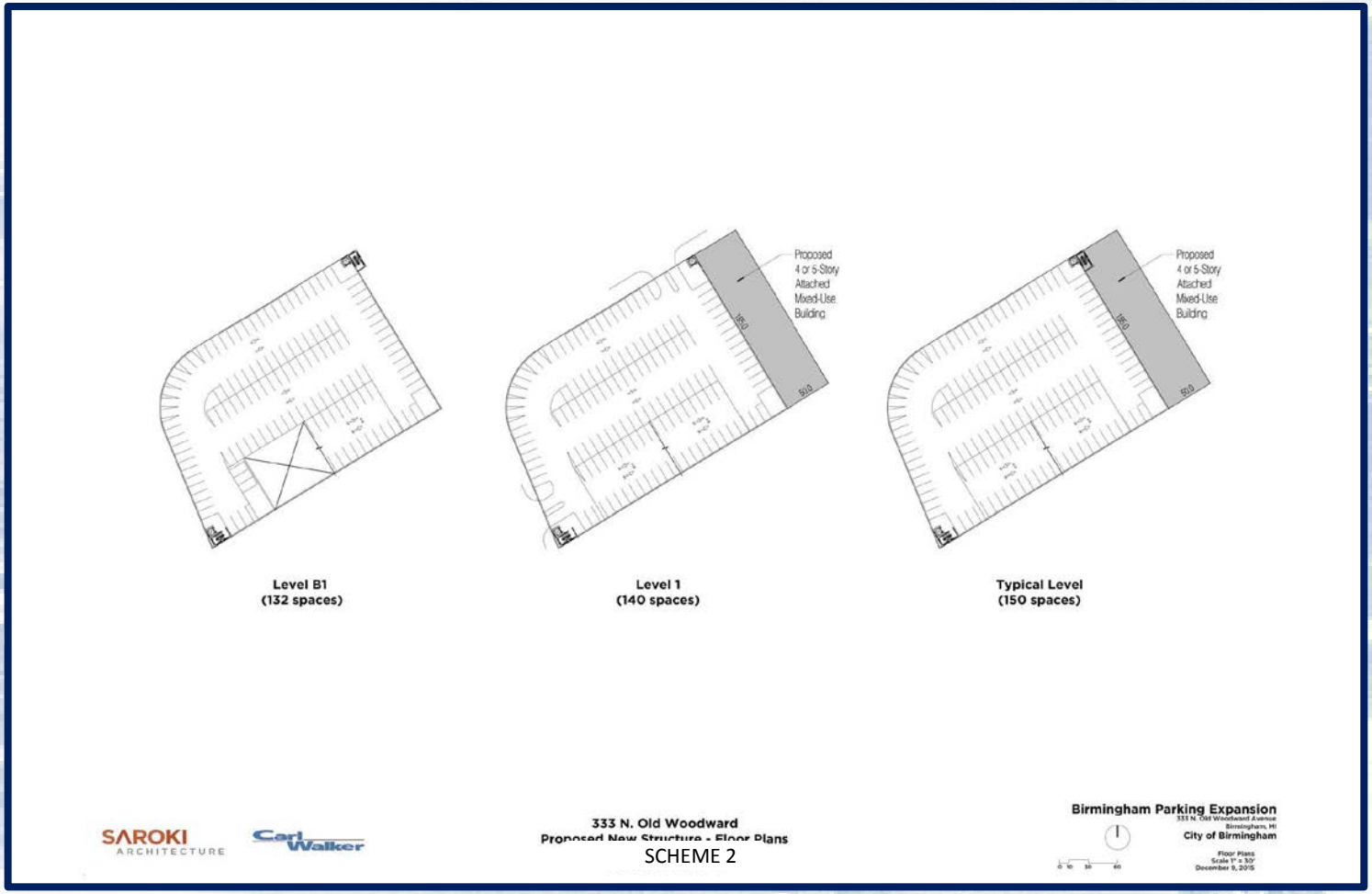
333 N. Old Woodward
Proposed New Structure

SCHEME 2

Birmingham Parking Expansion
333 N. Old Woodward Avenue
Birmingham, MI
City of Birmingham
Scale 1" = 30'
December 9, 2015

WOODWARD STRUCTURE PRELIMINARY WORK:

SCHEME 2- PROPOSED NEW STRUCTURE



SCHEME 2

WOODWARD STRUCTURE PRELIMINARY WORK:

SCHEME 3- PROPOSED NEW STRUCTURE

Key Site Elements:

Bates Street Extension Road - 25' Wide Road
New Parking Structure
New Commerical Building at Woodward
New Mixed Use Building at Willits
(2) New Residential Buildings

Proposed Parking Summary:

Current Total Parking at Existing Site:	745 spaces
Desired Total Site Parking: (desired 278 additional spaces to north half of the central business district)	1023 spaces
Surface Total Spaces:	10 spaces
5 Level Structure Total Spaces:	776 spaces
6 Level Structure Total Spaces	954 spaces
Proposed Combined Total Spaces:	
(With 5 Level Structure)	786 Spaces
(With 6 Level Structure)	964 Spaces
Total Added Parking Spaces over the existing count of 745 spaces:	219 Spaces

Note:
The Commercial Building at N. Woodward Avenue results in a reduction of approximately 72 Parking Spaces. Without this commercial building the total added parking comes to 291 spaces.

SAROKI ARCHITECTURE

Carl Walker

333 N. Old Woodward
Proposed New Structure

SCHEME 3

Birmingham Parking Expansion
333 N. Old Woodward Avenue
Birmingham, MI
City of Birmingham
Scale 1" = 30'
December 9, 2015

QUESTIONS?

Birmingham Shopping District (BSD)

Executive Director: John Heiney

January 16, 2016

Birmingham Shopping District
Mission Statement and Key Operations

We strive to provide leadership in marketing, advertising and promotion of the Birmingham Principal Shopping District.

We actively work to promote a district that is exciting, clean, safe and pedestrian-friendly and ensure that the district continues to serve as a center for business, service, social and community activities.

The BSD supports property owners and business through four operational areas:

1. Marketing/Advertising
2. Special Events
3. Maintenance/Capital Improvements and Beautification
4. Business Recruitment

Birmingham Shopping District
Special Projects – 2017-2020

Over the past several years, the BSD has steadily increased fund balance while keeping the rate flat, and maintaining or improving services.

The additional fund balance provides an opportunity for the BSD to provide additional support to businesses and property owners during the next several years of downtown construction, which is scheduled to begin in 2017 and continue through 2019-20.

The Shopping District Board recently approved a list of proposed measures designed to assist businesses and commercial property owners by providing a combination of capital improvements, marketing, advertising and customer conveniences.

Birmingham Shopping District
Special Projects – 2017-2020

The Shopping District Board and staff monitored major road projects in downtown Rochester and Royal Oak, and gained experience with the Pierce/Merrill construction in 2013.

- Key learnings from Pierce/Merrill project in 2013 include enhancements like signs, lighting and colorful banners.
  - Also, Chamber conducted “cash mob” event, bringing customers into stores during construction.
- Staff visited Rochester in 2013 to learn about how they managed their Main Street Makeover project to minimize impact on businesses, shoppers and residents.
- Staff will contact Royal Oak to learn about their “Love the Barrels” marketing campaign.

Birmingham Shopping District
Special Projects – 2017-2020

Proposed Services

1. Valet Parking -- At strategic locations, six days a week. Servicing shoppers throughout construction periods.

Birmingham Shopping District
Special Projects – 2017-2020

Proposed Services

2. Enhanced temporary store signs and pedestrian barrier displays, plus LED lighting enhancements around construction sidewalk structures.

Birmingham Shopping District
Special Projects – 2017-2020

Proposed Services

3. Marketing campaign during construction. Using a combination of online, social media, print and broadcast advertising and PR to keep Birmingham "top of mind" during road construction.

Birmingham Shopping District
Special Projects – 2017-2020

Proposed Capital Improvements

1. Enhanced Light Pole Installation at Maple and Old Woodward. Specially-engineered light poles to handle additional loads of banners and major holiday light displays.

Birmingham Shopping District
Special Projects – 2017-2020

Proposed Capital Improvements

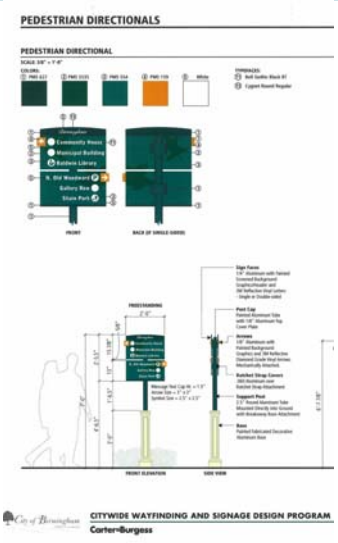
To be implemented during or after construction.

2. Downtown information kiosks. Wifi capable, touch screen searchable. 1-4 installed in central business district. Will feature an interactive directory of stores, salons and restaurants.

Birmingham Shopping District
Special Projects – 2017-2020

Proposed Capital Improvements

3. Enhanced directional signs for shoppers, in addition to City signs.



Birmingham Shopping District
Special Projects – 2017-2020

Estimated Excess Fund Balance Available on 7-1-16 = Approximately $443,931
(assuming cash flow projections and a recommended fund balance of $300,000).

MARKETING AND PROGRAMMING SUPPORT DURING ROAD CONSTRUCTION 2017 (Old Woodward) and 2019 (Maple)

1. Customer Valet Parking -- Two stations and strategic locations, six days a week. Approximately $5,000 per month. Up to $40,000 per season x 3 seasons=$120,000. (could be shared with Parking Fund).
2. Enhanced temporary store signs and pedestrian barrier displays, plus LED lighting enhancements around construction sidewalk structures: $10,000-$18,931.
3. Marketing Campaign During Construction. Combination of online, print and broadcast to keep Birmingham "top of mind" during road construction. Approximate cost $50,000-$75,000 x 2 seasons=$100,00-$150,000.

Total for estimate for all Programming Costs, max cost = $288,931

Birmingham Shopping District
Special Projects – 2017-2020

- **CAPITAL PROJECTS- Installed during or after construction.**
- Downtown information kiosks. Wifi capable, touch screen searchable. 1-4 installed in central business district. $15,000-$60,000.
- Enhanced Light Pole Installation at Maple and Old Woodward. Additional costs for specially-engineered light poles to handle additional loads of banners and holiday displays. Estimated BSD portion would be $25,000-50,000.
- Major holiday light display at Maple and Old Woodward including support poles for lights and possible banners. Est. cost for installation and materials: $25,000.
- Enhanced wayfinding directional signs for shoppers, in addition to City signs. Estimated BSD portion would be $20,000.

- **Total for all proposed capital projects, max cost = $155,000**

Contact Information

Contact the PSD Office for more information:

248- 530-1200

Info@AllINBirmingham.com
www.AllINBirmingham.com

@Birmingham Shopping District

City of Birmingham
A Walkable Community

MEMORANDUM

Planning Division

DATE: December 23, 2015

TO: Joseph A. Valentine, City Manager

FROM: Matthew Baka, Senior Planner

APPROVED: Jana Ecker, Planning Director

SUBJECT: Master Planning Initiatives

The City of Birmingham has a history of implementing master plans and ordinances that are intended to guide and regulate the growth of the City in order to promote the type of development that the citizens and property owners value. Currently, the development of the City's planning and zoning regulations are principally governed by five documents which are currently available on the City website:

- The Birmingham Future Land Use Plan (1980);
- The Downtown Birmingham 2016 Plan (1996);
- The Eton Road Corridor Plan (1999);
- The Triangle District Plan (2007);
- The Alleys and Passages Plan (2012); and
- The Multi-Modal Plan (2013).

The Future Land Use Plan ("the Plan") was the last comprehensive master plan to be adopted by the City (1980). The Plan made specific recommendations throughout the City that are intended to protect residential areas while at the same time made recommendations that would allow the commercial areas to thrive. Since the adoption of the Plan, the City has updated the master plan through the additional subarea plans listed above. Those plans have been implemented through the three overlay zones (Downtown, Triangle and Via Activation) and the rezoning of the rail district to MX (Mixed Used). The Multi-modal plan adopted in 2013 is now the guiding document for the City in regards to transportation infrastructure, major right of way improvements, and user accessibility issues. The cumulative effect of all the sub area plans has essentially updated the Future Land Use Plan in almost all of the commercially zoned areas of Birmingham.

The Downtown Birmingham 2016 Report "DB2016" was received and approved in concept by the City Commission in 1996. The plan and resulting overlay zone has established the standard for which the other subareas plans are measured. Based on an analysis of the implementation section of the plan, the Planning Department observes that the majority of the significant recommendations have been successfully implemented and have played a major part in the continued vibrancy in the downtown area. However, the projected term for the vision and goals contained in the 2016 plan is quickly approaching the conceptualized completion date.

This does not mean that the vision of the plan has expired, however it is clear that having long term goals has been invaluable to the growth and stability of the Central Business District.

In order to maintain a strong vision for future of Birmingham, the City Commission engaged Andres Duany for a return visit to the City during the summer of 2014 to provide input on the implementation of the DB 2016 plan and to address the future of Birmingham. Duany conducted his review in May of 2014. The visit from Duany produced a set of recommendations that are aimed at continuing to foster Birmingham as a strong commercial location with a highly desirable single-family residential base (see attached report). Mr. Duaney's comments provide the City with a unique opportunity to set forth goals for the Downtown and Triangle District, while possibly incorporating them into an updated Master plan for the entire City.

The updating and implementation of master plans and subarea plans are important aspects of maintaining and improving the standard of excellence that is expected in Birmingham. Although there have been the subarea plans listed above established in the City over the past several years, there has not been a comprehensive Master Plan update completed since the 1980 Future Land Use Plan. There are several components of the plan that included demographic data and projections that were based on a twenty year time frame. In addition, many of the land use policies and system analysis may be considered outdated now considering the advancements in technology and lifestyle habits. Accordingly, much of the information provided in the plan was intended to be projections to the year 2000. The following list outlines the information in the plan that is out of date or policies that should be considered for review and updating:

- Future population growth
- Existing land use
- Residential Development
- Multi-family Development
- Retail, Service, and Office Development
- Regional Commercial Development Trends
- Regional Comparison Shopping Facilities
- Central Business District Development Intensity
- Parking Needs Analysis
- Industrial Development
- Transportation System
- Open Space and Recreation
- Land Use Policies
- Future Land Use Plan

Much of this information may just require a simple review to verify that the recommendations and analysis are still relevant. In other instances, there are areas of the plan such as the Transportation System chapter that has been fully updated by the Multi-modal Plan. The City has effectively updated many sections of the Master Plan in recent years and the new subarea plans could be incorporated into a new comprehensive master plan document. In addition, there are many issues prevalent in the planning field today that were likely not considered at the time the current plan was created, such as aging in place, providing a diverse range of housing options, green infrastructure and development options and the use of technology.

If the City Commission is inclined to update the comprehensive Master Plan, then the Planning Division would recommend that a detailed analysis of the Future Land Use Plan be performed by staff to identify the existing deficiencies and needed updates. Once the analysis is complete, this information can then be used to create a scope of services for a future RFP to be used when hiring a consultant to update and consolidate existing documents into the new comprehensive master plan for the City.

BIRMINGHAM
2016 PLAN
ASSESSMENT
OF 2014

Duany Plater-Zyberk & Company

CONTENTS

1. BACKGROUND

In 1996, Andrés Duany of DPZ, with local consultants, prominent among which was Robert Gibbs, held a week-long design charrette to plan Downtown Birmingham to 2016. This served as a strategic guide through the next two decades of its development.

At the request of the City Commission and Planning Board, Andrés Duany returned to Birmingham May 19-22, 2014, to review the plan's implementation and make recommendations. A subcommittee formed by the City Commission prepared an outline of goals for Duany's review. Over the course of two and a half days, Duany held meetings with city authorities, stakeholders, developers, architects, and residents. He listened, responded to concerns, shared observations, made recommendations, emphasizing the importance of the millennial generation.

This following report contains an overview of these meetings and proposes certain very preliminary recommendations toward what must inevitably become a plan for 2026.

2. GENERAL COMMENTARY

The Birmingham 2016 Plan has been as successful as any plan of its vintage. This is partially a result of the work of DPZ, but much more to do with the achievements preceding the 1996 charrette and the reports of those subsequently responsible for the plan's implementation. Among the preceding accomplishments, the greatest inherited asset is the set of parking garages which made possible the infill of the 1996 Plan. Without this prescient investment, very little renovation and construction would have been possible, and downtown Birmingham would consist—as do most American downtowns—of primarily surface parking lots. Since the charrette, the most important development for which DPZ cannot take credit is the establishment of a declension of liquor licenses. This facilitated the opening of the host of new restaurants and that now invigorate downtown.

Among the achievements of the DPZ plan, the most visible has been the transformation of the "central square" from parking lot to an actual square. It was work boldly executed, requiring difficult political decisions. This square needs further tuning. Another achievement of the DPZ plan was the gradual replacement of many open sites downtown with good, strong, urban buildings. This infill process should continue until every underutilized site downtown is built upon.

Birmingham has been on an excellent trajectory before the Plan, subsequent to the Plan until today, and there is nothing to prevent its continuing into the future, as several untapped opportunities remain with elected officials and regulators ready and eager. Some are time-sensitive, and should be engaged soon, before an update of the Plan. The following pages summarize some of what remains to be done.

Andrés Duany
Duany Plater-Zyberk & Company
July 2014

3. REPORT ON THE VISIT

This overview contains a very brief summary of each public meeting, followed by a list of the topics addressed. Recommendations that emerged from these sessions are synthesized in Section 4.

On Streetscape, Infrastructure, and Civic Spaces

Attended by approximately fifteen people expressing their concerns and aspirations. Andres Duany does not necessarily agree that all of these are equally important nor, indeed, feasible:

- Perform transit analysis. Modify the street section to incorporate appropriate transit in each context. Privilege community transit over commuter transit.
- Pay greater attention to pedestrian crossings.
- Review the street network plan. Classify streets according to the quality of the pedestrian experience, including the frontage of buildings. One-third of the streets are likely to be good (A streets) and the rest less so (B streets). Focus on and invest in the quality of the A streets. (N.B. Woodward Avenue is a B street.)
- Calm traffic. Reduce the number of lanes on some streets. Use traffic circles and pair lights to reduce traffic speed.
- Plan a system of bike lanes. Where traffic is violent, provide bike trails. Where traffic is calmed, provide bike lanes or bike paths shared with cars. For example, reduce Maple Road from four to two lanes with bike lanes.
- Experiment on the streets. If you don't like the striping, just add a little tack coat of asphalt to erase, and stripe them a different way. Experimentation is more efficient than discussion.
- Control traffic speed on certain sections on Woodwork for pedestrian safety and accident prevention, focusing on the redesign of intersections at Oak Street and at Maple Road.
- Repair sidewalks and streets. Restore concrete specifications to ca.1980 to provide a more attractive finish. Allow installation of cobblestones around trees to provide the percolation that supports tree growth.
- Provide larger tree wells and invest in bigger and better trees. Plant trees in small clusters to incentivize their faster growth as they compete for sunlight. Do not plant the

same trees everywhere. Trees on Martin Street are suffering.

- In zones with houses, require the provision of porches that link people with their streets and strengthen neighborhoods. They are a great attribute of urban architecture.
- Require that garages be recessed behind houses.
- Establish the inappropriate height of some awnings. Too many are too high to be effective.
- Take advantage of corner sites for outdoor dining areas. Several are underutilized, such as Park Street/Hamilton Row and Willits/North Bates Street.

On Mixed-Use

Attended by retailers, developers, property owners, architects and residents:

- Building Codes. The current ordinance is considered too rigid and it is perceived as a constraint for development.
- More playground equipment is needed in Shain Park.
- More parking is needed.

The Roundtable of the Generals

Attended by fifteen but only one or two youngsters (this is typical of public processes participation and an important problem). Robin Boyle, Chairman of the Planning Commission, expressed his concern about how Birmingham is perceived by young people and how to involve this demographic.

- Affordability. Downtown Birmingham is too expensive for the younger generation. Both housing and restaurants are out of reach.
- Young people are more engaged in social media than they are in the life of the city.
- The East Side may be the site for the next generation to establish their housing and businesses.

Residents Roundtable

Duany attempted to create a space for discussion of controversial issues. The following requests and concerns emerged from the audience:

- How to better connect the Triangle District to the downtown and also to its adjacent residential areas.
- The strip mall east of the Triangle District is not included in the plan; this confuses the planning and limits future development.
- Maple Road ought to be brought into the Multi-Modal Transportation Plan.
- Crossings on North Woodward Avenue are difficult and dangerous.
- Bike trails: The need is clear, but it's unclear where to place them.
- Transitional zoning is required to the residential areas from the commercial areas.
- The farmer's market is a successful initiative that should be continued.
- Homes being remodeled and rebuilt larger are adversely affecting neighbors' light, green and privacy.

The Triangle District

This session touched on the following topics:

- The desperate need for public parking.
- There is a need for pedestrian crossing of Maple and Woodward Avenues.
- The status of strip mall area is unknown. Refusal of owners of the strip mall to be considered in the Plan.
- The regulations from traffic engineers are counter productive.
- Haynes and Worth Streets to be connected.
- There must be land acquisition to ease development.
- Reconsider the exclusion of Adams Street from the Triangle District.

Baldwin Public Library Expansion

Attended principally by staff and committees of the library. Voters had recently refused a $21.5 million proposal for the expansion of Baldwin Public Library. The director of the library explained that there is no current alternative plan. Duany recommended a series of successional plans. This session produced an abundance of very specific improvements for the library, many of which dealt with its interior. The following topics emerged during this session:

- The current entrance of Baldwin Public Library is dark and dated; the library deserves a brighter and more decorous civic presence. The ramp and steps are uncomfortable.
- There is a need for substantial additional space to accommodate the shelves.
- Interior design is sadly out of date and should be freshened up. Desired features include study rooms, a new location for the circulation desk, and updated study rooms and computer stations.
- Neither the 1960 nor the 1981 addition was constructed to current ADA standards.
- The 1981 addition lacks pleasant views outward, especially to the new square.

Stakeholder Interviews

Attended by Duany met with a group of twelve stakeholders.

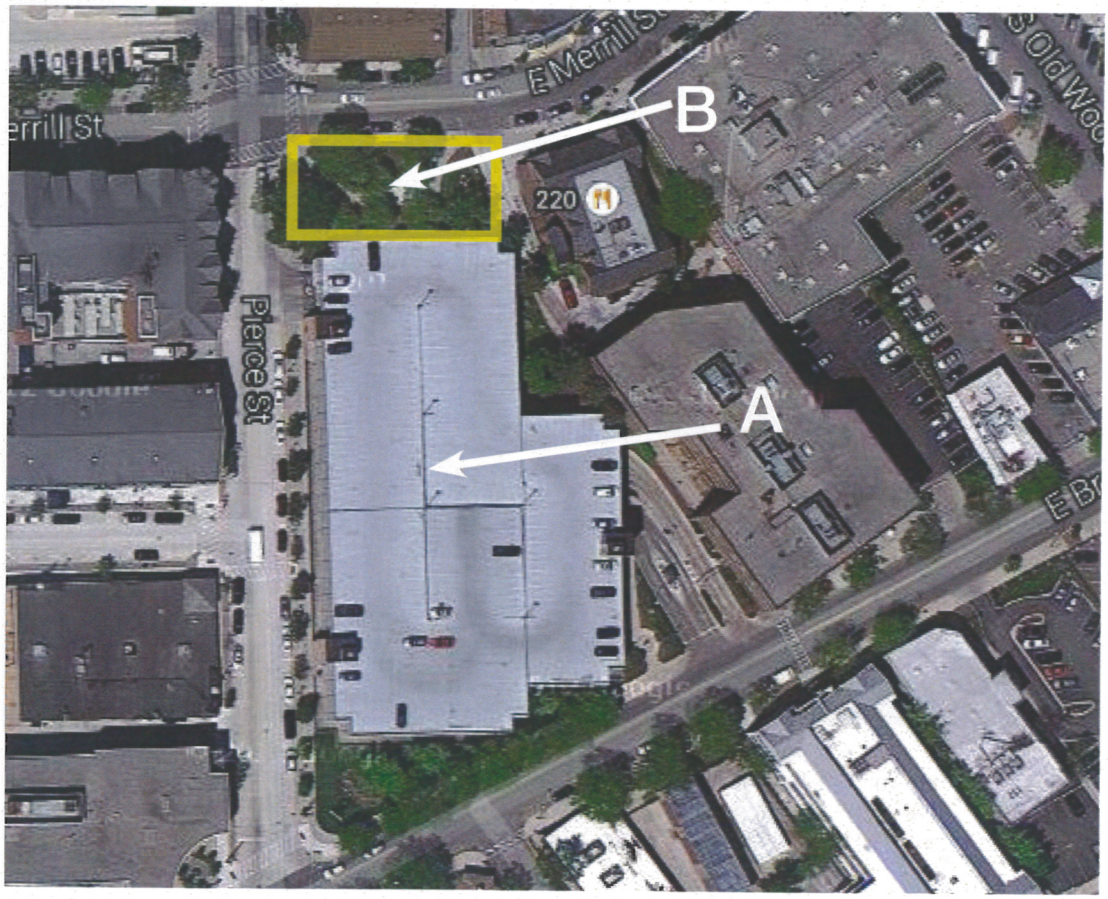
- Parking is scarce.
- High-value residential is needed.
- Taxes are too high to make development work.
- The Triangle District development is constrained by absence of parking.
- Public land restrictions inhibit development.
- The lower rental prices in the Triangle District are promising for startups.
- Adams Square is reluctant to participate in a master plan.

4. RECOMMENDATIONS

Project 1: Pierce Street Garage

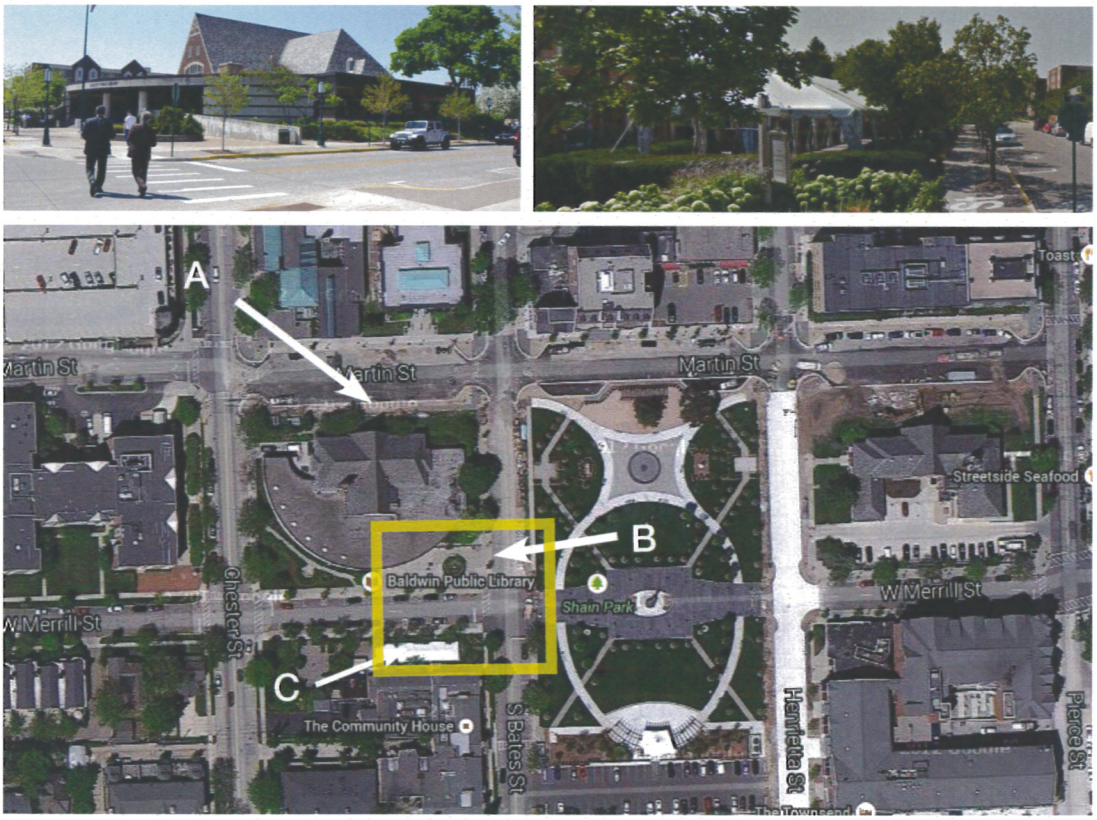
More parking is required. Study the possibility of an additional parking garage or policies that would increase the efficiency of the existing ones.

Add two more stories to the Pierce Street parking garage [A], the construction of which was envisioned. This is an obvious opportunity to help meet parking needs; it is less expensive than creating a new parking structure (with its real estate cost). The cost of this addition may be amortized by allowing a liner building or apartments [B].



Project 2: Library Improvements

The proposal in the 2016 Plan that the Baldwin Public Library entrance be restored to Martin Street [A] is (in retrospect) not a good idea—because the grand space which is the current reading room would then become a mere vestibule full of security tech. [B] Transform the southeast corner into a civic plaza engaged designed in connection with Shain Park and the enfronting Community House. Develop a raised terrace at the intersection of Merrill and Bates, supporting the existing library entrance. Consider a corner café, on the terrace, which would encourage library use and lend energy to Shain Park. Redesign the library, landscape and ramp accordingly, improve signage, and provide a readily accessible exterior book return. [C] Across Merrill Street, convert the tent now being used by the Community House into a permanent structure that relates to the library. This intersection of park, library, and community center should be conceived as a single urban design project.



Clockwise from top left: *The corner of Merrill and Bates, the site of the proposed terrace and civic plaza; the tents of the Community House, which ought to become permanent structures incorporated into the plaza design; aerial image of the site.*

Project 3: Shain Park Activation

A complex project of major importance is the activation of Shain Park. This place, rebuilt is beautiful but not active enough. As public space is activated not just by its internal elements but by the buildings along its perimeter, with buildings whose energy spills over into the park, such as bistros and cafés. The library plaza proposal (Project 2) would provide this activity on the western perimeter. On the north and east perimeters, the open sites, as built should have the ground floors orienting commercial activity towards Shain Park. The sliver of land to the north in particular offers an opportunity for a café abutted to the telephone exchange. To the south, food trucks may be hosted on the paved area near the stage; these would provide affordable and attractive alternatives to the otherwise high-end restaurant scene, particularly for young people and workers. Within Shain Park itself, more and bigger trees might be beneficial planted in clusters.

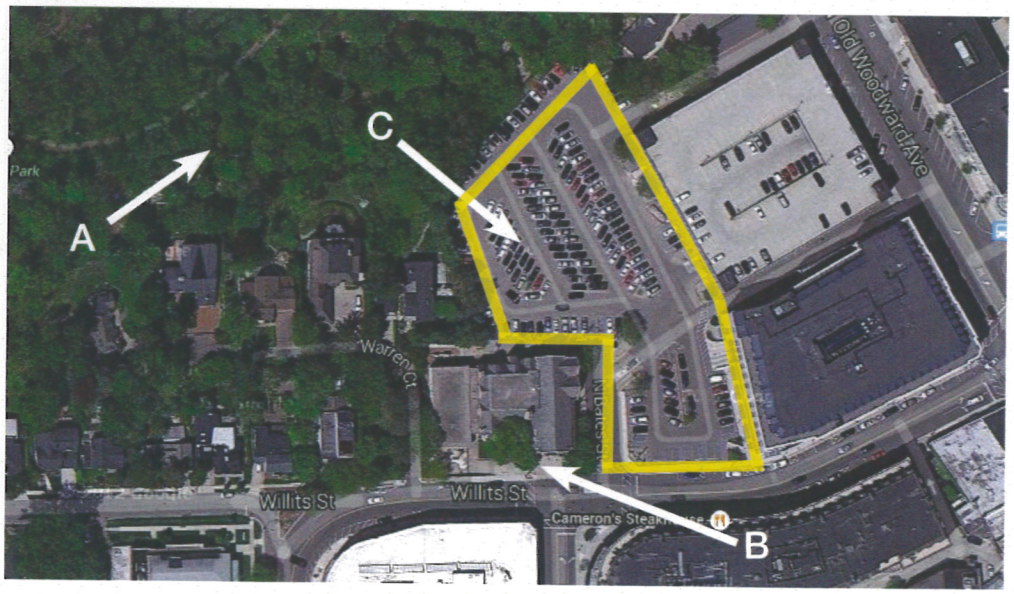
Clockwise from top: *Children enjoy the play structure at Shain Park; a musician practices on the steps; Andrés Duany crosses Bates Street into Shain Park on a walking tour during his visit.*

Project 4: Booth Park Connector

Complete the connection from N. Bates Street to Booth Park [A] with a comprehensive master plan along the east side of First Baptist Church [B]. Line this connection with retail and residential buildings above the surface parking [C], (on which the church depends). Extend the North Woodward parking deck above to accommodate additional cars. Consider extending the urban edge on Willits Street with condo units overlooking the Rouge River. Build a café at Booth Park to further enhance its vitality. If well handled, this connection will effectively incorporate this spectacular greenway to the downtown.

Left: *First Baptist Church terminates Willits Street; to the right lies a potential connection to Booth Park behind, which should be lined with buildings.*

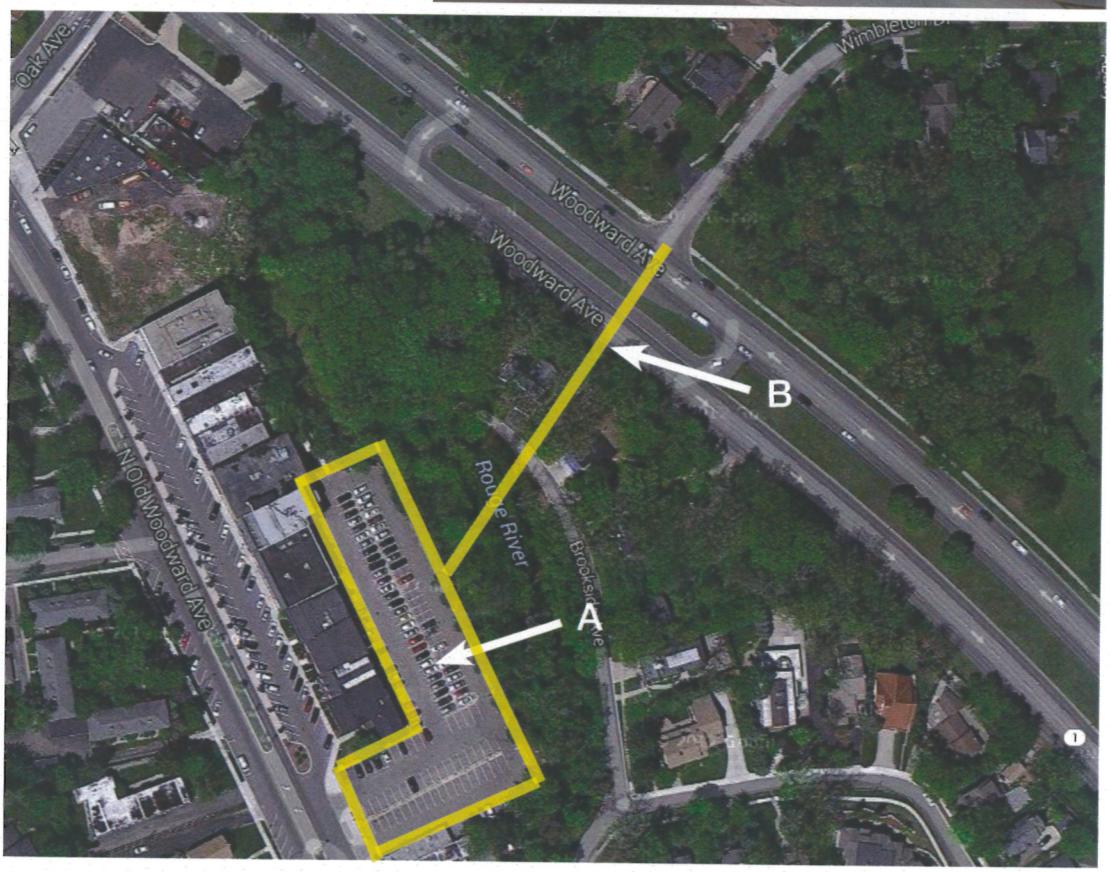
Below: *Note the proximity of Booth Park and the lack of access points to this valuable greenway.*



Project 5: Old Woodward-Wimbleton Connector

Assure connectivity between northeast and northwest Birmingham by introducing a link across Woodward Avenue. Use the site of the open parking lot [A] to receive the pedestrian connection across the highway from Wimbleton Drive [B]. Build on this site to accommodate (1) the successful and growing market that regularly occurs in this lot; (2) a connection across the highway; and (3) a parking garage for the deficiency, which threatens to worsen in the future.

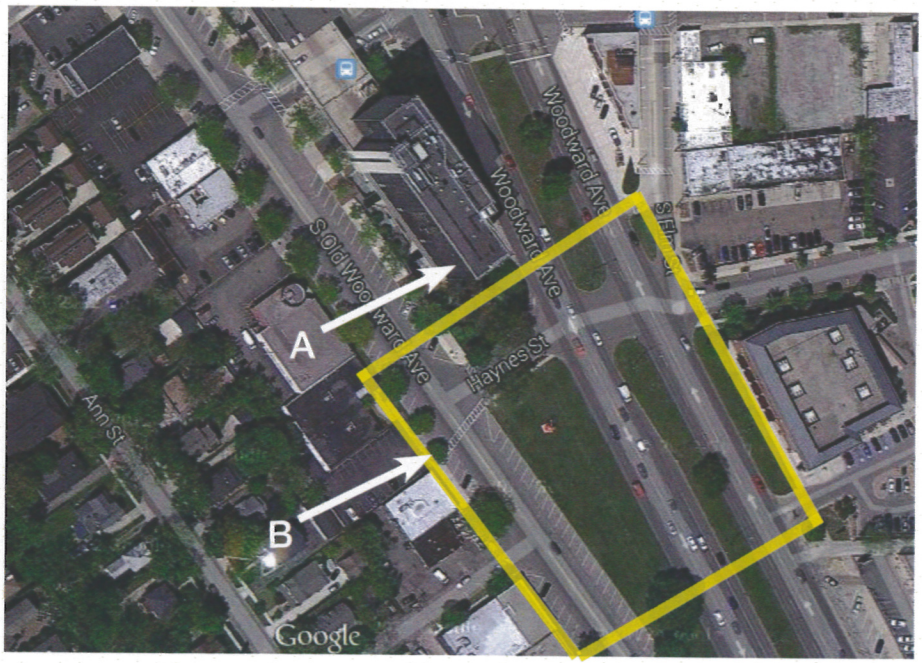
Right: *View of the proposed connector site on Old Woodward.*
Below: *the proposed connection diagrammatically illustrated in red.*



Project 6: Gateway to Birmingham

Downtown Birmingham has an opportunity to signal its presence on Woodward Avenue by transforming the 534 building on the southern end of Old Woodward as a landmark. As part of the proposed renovation, the 555 building [A] should receive an addition that emphasizes its "flatiron" quality. This addition should be heavily glazed, seen as a glowing beacon (winters being dark). The landscaping at its base should span across the complex pattern of leaves as a single coherent entity.

Above: The *555 Building, poised for transformation into a Birmingham landmark.*
Below: *Aerial view showing the site's complex junction of thoroughfares.*



Project 7: The Triangle District

The Triangle District is the next frontier in Birmingham. Its character is and should remain different from the existing downtown. It is to be less expensive, grittier, hipper, and more attractive to the younger generation. Apart from the necessary, less-expensive housing, supporting such a vision should allow entertainment venues providing night-life. Use a contemporary aesthetic that incorporates diversity; welcome small developers by reducing code regulations to attract a new generation of investors and entrepreneurs. However, the Triangle District may remain unattainable until the shopping center on Adams Road is included in the plan [A]. If not the Triangle District's boundaries, redevelopment will not really occur until a parking garage policy commensurate with the old one of the downtown is implemented—and this site is virtually the only feasible one. Anchor the district with a general green at Haynes and Worth. Provide public parking policy immediately.

City of Birmingham
A Walkable Community

MEMORANDUM

Planning Division

DATE: **December 23, 2015**

TO: **Joseph A. Valentine, City Manager**

FROM: **Jana L. Ecker, Planning Director**

SUBJECT: **Regional Collaboration – Woodward Corridor**

Transit-Oriented Development Task Force

In 2010, elected officials from Berkley, Birmingham, Ferndale, Huntington Woods and Royal Oak came together through their involvement with the Woodward Avenue Action Association ("WA3"), to discuss the need for mass transit and their desire to unite southern Oakland County communities on the issue. The Transit-Oriented Development Task Force ("TOD Task Force") was subsequently created by the WA3 Board of Directors. The purpose of the TOD Task Force was to coordinate a review of local land use planning, zoning and development standards along the Woodward Corridor in southern Oakland County.

Since its inception, the TOD Task Force has received two grants. The first grant ($35,000) from MDOT was utilized to fund a comprehensive review of the existing land use planning and zoning regulations in each community along Woodward from Eight Mile Road to Maple Road. LSL Planning was hired to conduct the review and prepare the draft Corridor Overlay Ordinance.

The second grant ($15,000) from the Urban Land Institute funded community outreach and implementation of the TOD Report and Model Overlay Ordinance. The WA3 used this funding to provide copies of the TOD reports and model ordinance to all communities in the project area, and to conduct outreach in each of these communities. Several communities formally adopted the TOD report as an amendment to their master plans as a result of these efforts.

The City Commission accepted the TOD Report on April 9, 2012. Both Downtown Birmingham and the Triangle District are already zoned in accordance with the TOD Report. The City is now working on a South Woodward Gateway Plan to address the Birmingham Future Land Use Plan and TOD Report recommendations along Woodward from 14 Mile Road up to Lincoln.

Woodward Corridor Alternatives Analysis

The five communities involved in the TOD planning discussed above also came together in the summer of 2011 to apply for funding to study a mass transit line into southern Oakland County. Pleasant Ridge also realized the need for mass transit in the region, and joined the collaborative

team to study mass transit options. The City of Birmingham adopted a formal resolution in support of this initiative (attached). Due to the nature of the grant, SEMCOG was listed in their capacity as the municipal planning organization for the metro-Detroit region as the official applicant for the federal grant funds to conduct the study, called an Alternatives Analysis ("AA").

In October 2011, the federal government awarded $2,000,000 in grant funds to SEMCOG as the fiduciary of the six communities to conduct the Central Woodward Corridor Alternatives Analysis study, involving the Woodward corridor from Eight Mile Road to Fifteen Mile Road. This study was almost immediately expanded at the request of the Federal Transit Administration ("FTA") to include the entire Woodward corridor from the Detroit River up to Pontiac. The study must follow a specific process established by the FTA for conducting an AA as described in the attached FTA document. A Steering Committee comprised of local government officials from the eleven municipalities along the entire Woodward corridor and representatives of MDOT, SEMCOG, Beaumont Hospital, the Detroit Zoo and others is guiding the effort.

SEMCOG and the Steering Committee sent out an RFP early in 2012 and the firm of Parsons Brinkerhoff was selected to conduct the AA. Please see attached summary sheet completed by Parsons Brinkerhoff outlining the Woodward corridor AA project. During 2013 and 2014, the consultant team collected all of the relevant data for the corridor. As required by the AA process, the consultant team prepared a Purpose and Need Statement for the project and identified all of the evaluation criteria to be considered against the agreed purpose and need for the corridor. The consultant team also developed several alternatives for the corridor to be studied further. Various transit modes were included, such as light rail and bus rapid transit, and several alternative routes were considered for study. In December 2013, public meetings were held along the Woodward corridor and the consultant team presented the modes and routes under consideration to solicit public feedback. The team also discussed potential station locations and possible street cross sections for each community for selected routes.

In the spring of 2015, the mode choice of bus rapid transit ("BRT") was selected, with both exclusive lane and mixed traffic options. The preferred routes were also selected, and thus the Locally Preferred Alternative ("LPA") alternative for the Woodward corridor was recommended. Please see attached the complete Woodward Corridor Locally Preferred Alternative Report.

It is important to note that during the completion of the LPA report, our region voted to establish a Regional Transit Authority ("RTA"), which is now responsible for the oversight of all regional mass transit projects in metro Detroit. However, RTA has continued to update the original Steering Committee comprised of representatives from each of the Woodward communities, and regularly solicits input from the committee as the project progresses.

All transportation projects that will seek to use federal money for the design and construction process must undergo the full federal planning process. The first step was completed in 2015

with the selection of the LPA. At this time, the project has moved into the environmental review phase, which is the next step in the federal review process. The FTA has determined that a lower level of study called a Categorical Exclusion is permitted for the proposed BRT line on Woodward. As a result, the environmental review phase is shortened significantly from 18 months to 2 years, down to 6 months. This review is estimated to be complete by March 2016, with the final environmental report to be completed at that time. Public meetings will be conducted in January 2016 and again in March 2016 for public input on possible environmental impacts if the BRT line was constructed, such as impacts on historic structures or historic districts, impact on traffic flow, congestion and pollution, as well as impacts on natural and cultural resources along the Woodward corridor.

If the environmental review is completed and approved by the federal government, the LPA will eventually move into the preliminary engineering and construction phase. Detailed engineering and construction plans will not be completed until the federal government has approved all previous steps of the review. Please see www.woodwardanalysis.com for further information.

Woodward as a Complete Street

In addition to our own City-wide effort, the City of Birmingham has also been participating in a multi-jurisdictional Complete Streets project for the entire Woodward corridor from the Detroit River to Pontiac (see attached resolution of the City Commission in support of Complete Streets).

In 2011, the WA3 received a $752,880 Federal Highway Administration discretionary grant to prepare a Woodward Avenue Complete Streets Master Plan. The WA3 acted as the leader in this inter-agency approach, partnering with MDOT, Detroit Department of Transportation ("DDOT"), SMART, SEMCOG, Wayne and Oakland Counties and all 11 municipalities along the Woodward Corridor. The WA3 sought and obtained matching funds for this project. The grant funds were used to develop a multi-jurisdictional framework of shared standards, policies and land use changes that integrate Complete Streets principles in a complete, coordinated plan for the entire Woodward corridor.

In 2011, the WA3 issued a Request for Proposals to complete the Complete Streets project. A team made up of representatives of communities along the Woodward corridor reviewed the proposals received and ultimately selected Parsons Brinkerhoff as the lead consultant. As Parsons was also the lead consultant for the AA project discussed above, the selection team felt that this would encourage collaboration and integration of both projects, resulting in a comprehensive solution for the Woodward corridor.

The consultant team immediately commenced studying the travel and built characteristics of the Woodward corridor, and began formulating ideas to expand multi-modal facilities on the corridor, enhance the usability of the corridor for all users, to enhance the visual impact of the corridor, and to attract and retain economic development along the corridor.

In May 2013, the consultant team lead a three day charrette in Birmingham to solicit public comment on the community's vision for the Woodward corridor. Five charrettes were also held in different locations along the corridor. As a result of the charrette feedback along the corridor, the consultants put together a draft Complete Streets Plan. The WA3 presented the draft plan concepts for Birmingham to both the Multi-Modal Steering Committee and the Planning Board. Both groups expressed excitement over the dramatic changes to the Woodward corridor proposed in the Complete Streets Plan. However, they expressed concern that the proposed cross sections for Birmingham were not acceptable as they did not do enough to alter existing conditions to create the desired character for the corridor. Both groups individually asked the WA3 to revise the Birmingham cross sections, to make them similar to the cross sections provided for Woodward in Ferndale.

The Woodward Avenue Complete Streets Plan was completed and approved by the Woodward Avenue Action Association in October 2015. The entire plan is attached for your review.

WA3 representatives are preparing to present the completed plan to the respective City Councils and Commissions of each of the communities along the corridor early in 2016.

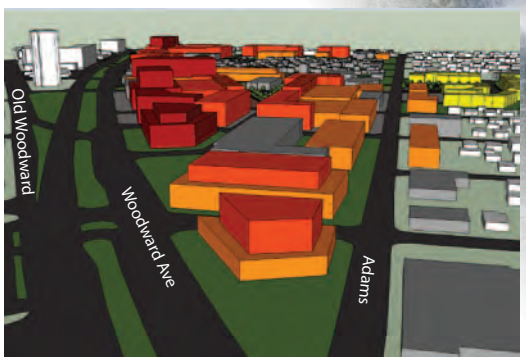
Transform Woodward Campaign – Pulling it all Together

The Michigan Suburbs Alliance, the WA3 and all of the Woodward communities are also working together to provide a robust public relations and engagement program. A project website and a mobile application have been created to drive and manage the public engagement process while providing overall strategic leadership to the larger, Woodward Alternatives Analysis project, and to build the base for future advocacy work on the corridor. The website's aim is to broaden the public's understanding of our region's connectivity, deepen their emotional bond to the Woodward Avenue corridor, and strengthen their ties to their own neighborhoods and related Transit Oriented Development efforts. See www.transformwoodward.com for additional information.

Woodward Avenue

Transit-Oriented Development Corridor Study for South Oakland County

January 1, 2012



LSL Planning, Inc.
Community Planning Consultants

EXECUTIVE SUMMARY

WOODWARD AVENUE TOD CORRIDOR STUDY FOR SOUTH OAKLAND COUNTY

WHAT IS THE PURPOSE OF THE STUDY?

The purpose of this study is to improve planning along the Woodward corridor utilizing Complete Streets methodology and to maximize development associated with potential future transit.

WHAT DOES THE STUDY RECOMMEND?

SAFETY:

- Consistent speed limit of 35 mph along Woodward
- Elimination of unnecessary driveways and improved driveway design
- Adopt multi-modal traffic impact study requirements
- Consider a road diet to create dedicated bus lanes

ZONING OVERLAY DISTRICT:

- Zero lot lines
- Development centered around transit stops
- Building design and placement regulations that will improve walkability

PARKING:

- Implement parking restrictions and/or incentives to encourage more walking/biking and transit use
- Consider city-driven parking programs

TRANSIT FRAMEWORK:

- Locate transit stops each ½ to 1 mile
- Key stop locations at Maple Road, 13 Mile Road, I-696, and 8 Mile
- Improve non-motorized crossings so the pedestrian is more visible and comfortable

FUTURE COORDINATION:

- Consider a Corridor Improvement Authority to leverage funds
- Refine zoning regulations and maps at the city level

WHAT WILL HAPPEN NEXT?

The Woodward Avenue Action Association was awarded a Complete Streets grant from the Federal Highway Administration (FHWA), and has assisted cities secure additional New Starts funding from the Federal Transit Administration (FTA). WA3 will be presenting this document and their goals for the future to the public, City Councils and commissions, and planning staff, and will pursue continued funding to encourage a consistent strategy for the Woodward Corridor that will invigorate businesses, encourage walking, biking and transit use, and improve the quality of life in South Oakland County.

Birmingham

Royal Oak

Berkley

Huntington Woods

Ferndale

Contents

Acknowledgements

Woodward Avenue Action Association

In October 2010, the WA3 convened a task force to create a consensus and plan for advancing transit-oriented development (TOD) along Woodward Avenue in Southern Oakland County prompted by the planning then underway for Woodward Light Rail Transit project from downtown to the State Fairgrounds (near 8 Mile) in Detroit/Wayne County. After a draft of this study was distributed, an announcement was made that federal funding for that light rail will be re-evaluated for regional bus rapid transit. Some light rail transit advocates continue to pursue a shorter rail line along Woodward from downtown to the New Center area.

Key members of the group involved in this study include elected officials from the cities of Berkley, Birmingham, Ferndale, Huntington Woods, and Royal Oak, as well as institutional and business partners, including the Michigan Department of Transportation, the Suburban Mobility Authority for Regional Transportation, the Southeast Michigan Council of Governments, Michigan Suburbs Alliance, the Detroit Zoo and Beaumont Health System. The primary task force mission for this "pre-planning" stage was to identify the land use, zoning, and master plan changes needed to support transit-oriented development in the future.

The Transportation-Oriented Development Corridor Study for South Oakland County was prepared by LSL Planning, Inc. with direction from the Woodward Avenue Action Association Transit Task Force, which includes representatives from the following partners:

Municipal Partners:

- City of Berkley
- City of Birmingham
- City of Ferndale
- City of Huntington Woods
- City of Royal Oak

Private Partners:

- Beaumont Health System
- Detroit Zoological Society

Agency Partners:

- Michigan Suburbs Alliance
- Michigan Department of Transportation
- Suburban Mobility Authority for Regional Transportation
- Southeast Michigan Council of Governments

This Plan was paid for in part by a Michigan Department of Transportation, 2010-11 State Planning and Research Grant.

Introduction

What is Transit-Oriented Development?

Transit-oriented development (TOD) uses land use to encourage use of public transportation sytems through directing certain types of development to transit corridors or nodes and compact site design. It involves pedestrian-friendly development that includes mixed-use land forms and increased accessibility for pedestrians, bicyclists, and transit users. TOD is an attempt to provide compact, walkable communities with a heightened sense of place. TODs typically involve uses that best support transit, transit-friendly site/building design, a mixture of uses clustered around a transit stop or transit corridor, and a walkable environment.

DENSITIES REQUIRED TO SUPPORT TRANSIT

Supports:	Residential (units)	Business (employees)
▸ High Capacity Service ▸ Rail Service	15 to 24+	150+
▸ Local Bus Service	7+	40+
▸ Cars ▸ Carpools ▸ Vanpools	1 to 6	2+

Source: Planning for Transit-Friendly Land Use, USDOT & FTA

TRANSIT OPTIONS

While this project is not evaluating transit alternatives, an understanding of possible future transit options can help recognize why TOD is important for Woodward Avenue. The right mix and design of land uses can help make different types of "premium" transit more feasible. The following are the key transit types being studied to serve South Oakland County's Woodward Avenue communities in the future:

ENHANCED LOCAL BUS SERVICE

SMART currently operates buses along Woodward as part of its regional transit system. This effort will help identify how to improve pedestrian connections to stops and crossing Woodward. Future improvement could include more frequent buses, express buses, park and ride lots and additional bus stop amenities.

BUS RAPID TRANSIT (BRT)

Depending on what occurs south of 8 Mile, a possible mode of transit in Oakland County could be BRT with dedicated bus lanes and express buses with fewer stops. BRT has similar characteristics of light rail transit, including stations, pre-boarding ticketing and level loading. But because BRT does not require rails, routes are more flexible, which typically costs about 50% less than light rail. BRT however, may not generate the same level of economic development as rail.

LIGHT RAIL TRANSIT (LRT)

Light rail service was recently explored south of 8 Mile. At the time this study was being completed, the light rail option was being converted to bus rapid transit, primarily for cost reasons. BRT could later be converted to light rail since the station planning is similar. If light rail were introduced in Detroit, extending the line into Oakland County is one possibility.

History of Woodward Avenue

Woodward Avenue is a main artery in the regional transportation system, and was once designated as the US 10 highway. As one of the five "spokes" planned in Augustus Woodward's 1805 plan for Detroit, Woodward Avenue is a key north/south connector within the region, connecting the City of Detroit at the south end with the City of Pontiac in the north, where Woodward becomes "The Loop."

In 1909, the stretch of Woodward Avenue between Six Mile and Seven Mile Roads became the first mile of road in the world to be paved with concrete. In 1932, the right-of-way was widened from 66 feet to 120 feet, and in 1939, the downtown bypass of Birmingham was opened.

Today, Woodward Avenue is celebrated annually during the Dream Cruise, where thousands of classic car owners from all over the country and the world bring their vehicles for display and enjoyment. The Cruise celebrates the region's automobile history, when youngsters were known to cruise the corridor in the 1950's and 1960's.

For a variety of reasons, including the need to maintain efficient travel operations, provide safe transportation options, reduce fuel emissions, and to serve those who rely on the public system as their primary mode of transport, the corridor is being reviewed for transit service. While Suburban Mobility Authority for Regional Transportation (SMART) busses currently serve communities along the corridor, there is potential to improve the environment in a way that can increase transit ridership and reduce dependency on the automobile. Such is the purpose of this study: to review existing conditions, current regulations and planning documents, and identify ways that each community within the study area can better support transit and TOD design. This may include modifications to local plans, ordinances, and policies, which will be further explored during future project phases.

HISTORIC WOODWARD AVENUE

The world's first mile of paved concrete road was on Woodward Avenue between 6 Mile and 7 Mile Roads in 1909. The entire 27-mile long corridor was paved in 1916.

By 1935, the corridor was alreay carrying traffic from Detroit to Pontiac.

View to north, circa 1935, from downtown Detroit.

Photos: The Detroit News

Why are We Planning for TOD?

TOD development can improve the local economy along Woodward Avenue in South Oakland County and increase transit ridership by making the environment, especially around transit stops, attractive to pedestrians and bicyclists. This typically involves inviting building design, careful interface between public and private land, and thoughtful placement of vehicular parking lots. It often results in more pleasing aesthetic environments and reduced auto-dependency, which then can lead to a host of secondary benefits:

- Safer pedestrian and bicycle environments
- Improved accessibility for those less able
- Increased walk-by traffic for local businesses
- More convenient access to businesses for local residents
- Less congestion and associated fuel emissions
- Creation of a "sense of place" for the community

Woodward Avenue TOD Goals

The Woodward Avenue Action Association (WA3) is a not-for-profit collaboration of public, private, local and regional partners working to enhance and promote Michigan's iconic 27-mile Woodward Avenuel All American Road®, one of the most significant roadways in the country.

The WA3 represents 27 miles from the Detroit River north through the Woodward Loop in Pontiac. The WA3 works closely with the communities of Berkley, Birmingham, Bloomfield Township, Detroit, Ferndale, Highland Park, Huntington Woods, Pontiac, Royal Oak, and Oakland and Wayne counties.

The WA3 works to bring business people, residents, community leaders, elected officials and stakeholders together to identify opportunities to strengthen and enhance Woodward's economic and historic potential.

WA3's VISION FOR WOODWARD:

Woodward Avenue is one of the world's premier business, recreational, entertainment and cultural destinations. This All-American Road is a vital connector among communities, were people identify with its heritage and aspire to maintain its importance into the future. It is globally recognized as 'the place' to experience and enjoy automobile heritage and as a magnet for innovative businesses and creative talent. A vibrant, sustainable and livable corridor, Woodward links thriving downtowns and urban districts which are alive with activity and excitement and serves as a gateway for vibrant neighborhoods.

WA3's Vision will be achieved by:

- A walkable, "complete street" harmoniously shared by transit, bicycles and automobiles.
- Inspiring great architecture, quality streetscaping and beautiful, clean, safe, welcoming public spaces.
- A variety of robust retail and residential uses.
- Increased patronage of businesses, cultural attractions, sporting and entertainment events.
- Recognition as a national model of public/private collaborations and strategic alliances.

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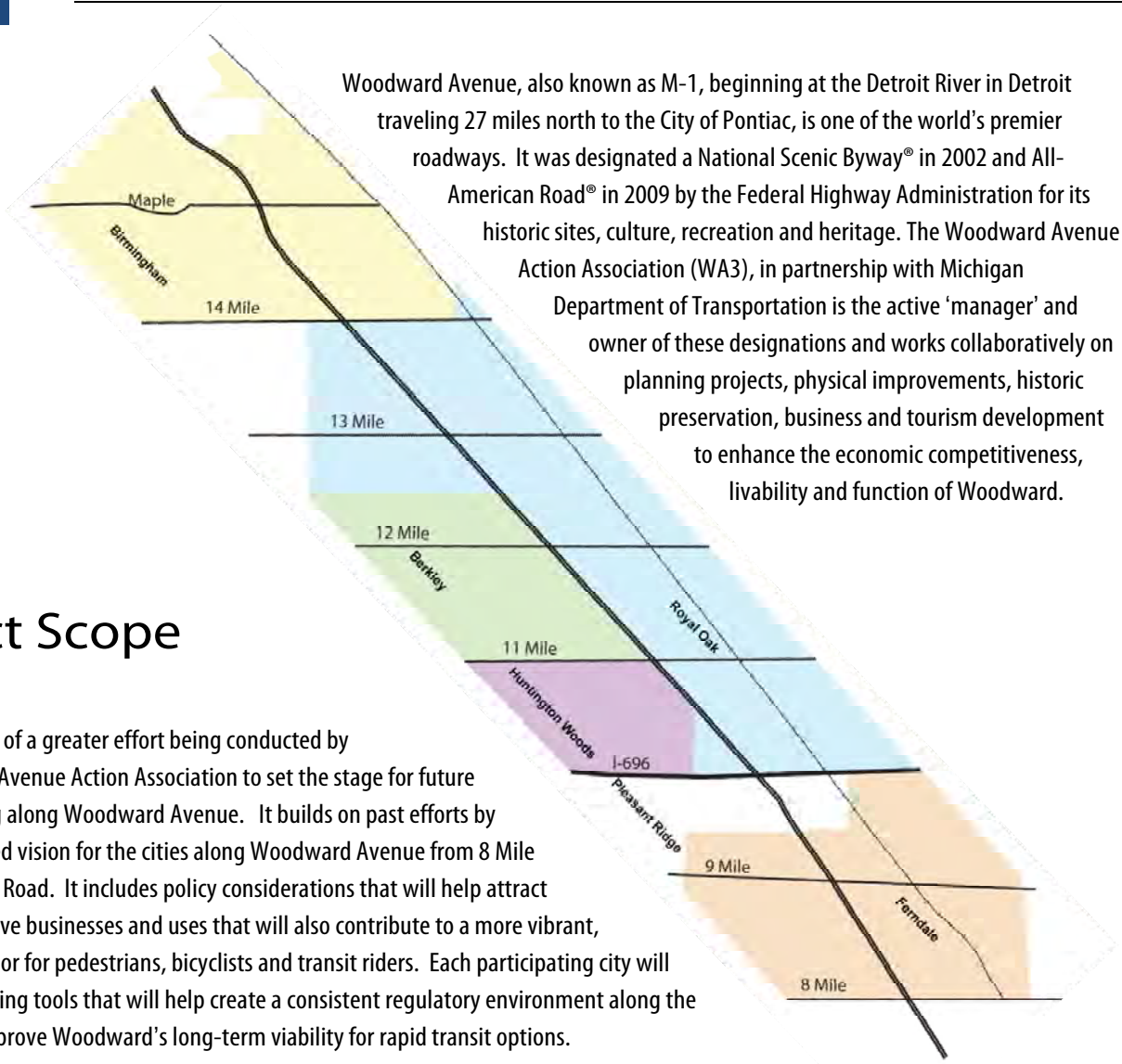
Project Overview



Woodward Avenue, also known as M-1, beginning at the Detroit River in Detroit traveling 27 miles north to the City of Pontiac, is one of the world's premier roadways. It was designated a National Scenic Byway® in 2002 and All-American Road® in 2009 by the Federal Highway Administration for its historic sites, culture, recreation and heritage. The Woodward Avenue Action Association (WA3), in partnership with Michigan Department of Transportation is the active 'manager' and owner of these designations and works collaboratively on planning projects, physical improvements, historic preservation, business and tourism development to enhance the economic competitiveness, livability and function of Woodward.

Project Scope

This plan is part of a greater effort being conducted by the Woodward Avenue Action Association to set the stage for future transit planning along Woodward Avenue. It builds on past efforts by creating a shared vision for the cities along Woodward Avenue from 8 Mile Road to 15 Mile Road. It includes policy considerations that will help attract transit-supportive businesses and uses that will also contribute to a more vibrant, attractive corridor for pedestrians, bicyclists and transit riders. Each participating city will also receive zoning tools that will help create a consistent regulatory environment along the corridor and improve Woodward's long-term viability for rapid transit options.

PATH TO SUCCESS The following suggests the tasks needed to implement the vision for transit:

RESEARCH
- I.D. needed studies
- Build-out analysis
- Transit alternatives analysis

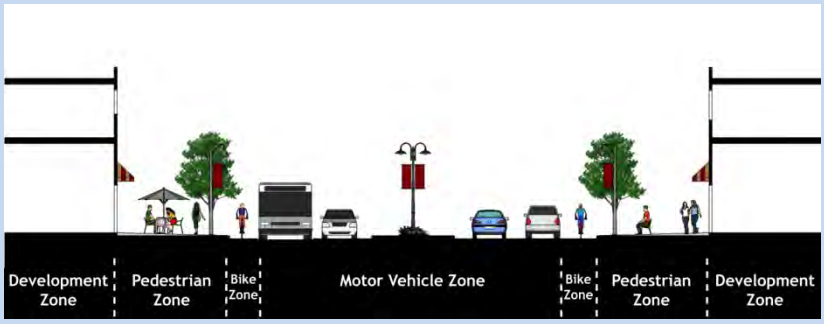
BUILD MOMENTUM
- Build on current efforts
- Educate officials and constituents
- Continue to seek funding

TRANSIT VISIONING
- Transit Framework Plan
- Consistent regulatory framework
- Road Design

IMPLEMENT
- Public/private partnerships
- Regional / Multi-jurisdictional cooperation

Complete Streets

Transportation practices in the past 50 years or so tended to focus on the efficiency and safety of automobile travel. And, while design applications and engineering have made our roadways much safer to travel by vehicle, it has also resulted in designs that increase vehicle speeds while discouraging walking, biking and transit use.



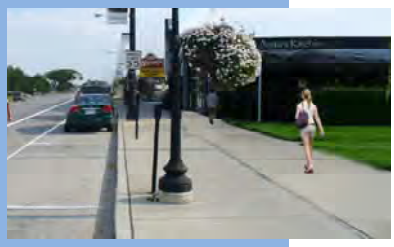
Typical "Complete Streets" include safe, convenient travel options for *all* users

Complete Streets presents a shift in attitude about transportation planning that focuses more on equality for all users of the roadway. Recent legislative changes (the Michigan Planning Enabling Act and Michigan Transportation Fund Act) now lend more weight to road design that considers motorists, pedestrians, bicyclists, transit riders, and users of all ages and ability. Not surprisingly, increasing fuel costs, desires to improve air quality, concerns about community health, coupled with campaigns to end obesity, especially among children and teens, have all contributed to a demand for travel alternatives to the single-occupant vehicle. Complete Streets seeks to meet that demand through policy and regulatory changes at the local, regional, state and federal levels.

The following key principles of Complete Streets should be applied to the Woodward corridor to enhance the road's functionality for all users, and to create an active and dynamic corridor that will support transit:

MAKING WOODWARD A COMPLETE STREET

Wider Sidewalks



Bike Lanes

Crossings

From: Woodward Avenue Non-Motorized Transportaion Master Plan

1. Accommodate all roadway travelers, which includes pedestrians, bicyclists and transit passengers of all ages and abilities, as well as trucks, public transit and automobiles.
2. Emphasize interconnected road and sidewalk networks to create a comprehensive, integrated, connected network for all modes. Such networks are needed to provide shorter, more direct routes that will reduce walking time (including across Woodward). A typical citizen will walk up to five minutes, or a quarter-mile before seeking other travel alternatives.
3. Integrate into all project types, including planning, road and development design, maintenance, traffic signals, and operations for the entire right of way.
4. Integrate best practices for design while recognizing the need for flexibility in balancing user needs.
5. Select designs that will complement the character of the Woodward Avenue district and the context of each different community.
6. Create plans that seek to link transportation and land use planning.
7. Develop realistic expectations for walking and biking, and apply design tools where appropriate along Woodward. This does not mean that every tool must be applied to every block. It may involve creation of alternate bike routes or improvements on side streets to ensure bicycle safety.
8. Develop an implementation plan that includes specific next steps.

TOD Principles

This Plan focuses on incorporating the following key principles in the future development of the Woodward Avenue corridor:

Plan around Transit Stations

- Allow the highest commercial intensity in areas within ¼ mile of locations that seem most suitable for transit stations. Expand maximum building heights, encourage high floor-to-area ratios, or minimize lot coverage limitations to provide greater development potential.
- Consider increased residential densities within ½ mile area from station locations (see page 4 for density suggestions).
- Allow for intensification of uses over time, such as increased building heights or allowing surface parking lots to be gradually replaced by buildings and parking structures.
- Consider revisions to the master plan and zoning map to allow deepening of commercial lots along Woodward Avenue, especially at TOD nodes and where taller buildings are allowed. This may involve rezoning of some residential lots to accommodate redevelopment or additional parking needs. Where such changes will advance the goals of this Plan, they should be carefully considered by each city to ensure proper transitions to the residential areas, screening and other site design elements are included to protect the integrity of nearby neighborhoods.

Birmingham's Triangle District Urban Design Plan is an example of a transit-oriented subarea plan that, when realized, will result in added activity along Woodward, and better transitions into neighborhoods. Elements of the Plan:

- Create a Sense of Enclosure. Use landscaping in the median and along the street edge with taller building heights along Woodward that gradually step down in height closer to neighborhoods.
- Access Management. Eliminate driveways and intersecting streets along Woodward that create conflict points.
- Road Design. Revisions to median crossover locations, right-turn lanes, and travel lanes were recommended to provide safer traffic interactions between motorists, non-motorized and transit systems.
- Road Crossings. Signalization, timing, signage, and pavement treatments are intended to improve the visual character of the area and make pedestrian zones more visible. Recommended shelters and other pedestrian amenities will also improve the transit environment.

Use Regulations

- Encourage transit-supporting uses, especially within ¼ to ½ mile of transit stops. This includes commercial and mixed uses that provide activity throughout the day and into the evening, such as retail, restaurants, personal and business services, high-density residential (including senior housing), universities, civic centers, and upper-story office and residential.
- Discourage uses that will either dilute the concentration of residents or employees, or those which, by nature of the business will create activity likely to disrupt the pedestrian and transit-friendly environment. These include uses such as drive-through facilities, automobile dealerships, regional "big box" retailers, and other uses with large front yard surface parking lots.

Bulk, Setback and Area Controls

- Encourage land to be used for buildings rather than surface parking or expansive yards. This includes reducing the amount of parking allowed or required, and increasing the amount of building that may or must be built.
- Locate buildings close to the street and sidewalk so those on foot, bike or transit can easily reach building entrances.
- Remove maximum lot coverage requirements in core TOD areas.
- Encourage building design that will engage passersby. First floor uses should include active storefronts that attract customers, pedestrian-scale design, with the primary operable pedestrian entrance oriented to Woodward Avenue.

Impact Studies

- Require study of potential development impacts on the entire transportation system. Where already required, modify *Traffic Impact Study* standards into *Transportation Impact Studies* that evaluate development impacts to all modes of travel.
- Shift transportation planning priorities in core and transitional areas from improving the speed and efficiency of automobile travel, to one that emphasizes safety for pedestrians, bikers and transit users.
- Apply access management to minimize the number of driveways that pedestrians must cross using access management techniques.

TRANSPORTATION IMPACT STUDIES

Former Traffic Impact Studies are being expanded to include consideration for all modes of travel (i.e. walking, biking, transit). They key is to match the road design with the desired Levels of Service for all users.

In core TOD areas, Levels of Service for non-motorized modes should be given equal or higher consideration as vehicular modes.

PARKING FUNDS

To support transit, parking programs require a careful balance of supply and demand. Cities should ensure their parking requirements are not excessive, and may also consider the following options to help maintain control over future parking location and design:

- Municipal Programs. Cities can collect one-time cash payments from developers in an amount equal to the cost to construct on-site parking. These funds can then be used to develop Park and Ride and shared municipal parking facilities in the most ideal locations. The cities of Birmingham and Ferndale currently use programs for this purpose, administered through cash payments or special assessment districts.
- Corridor Improvement Authorities. A CIA can use tax increment financing captured from increases in property values over time. Funds collected may be used for any capital improvements located within the district created by the CIA.

Parking Management

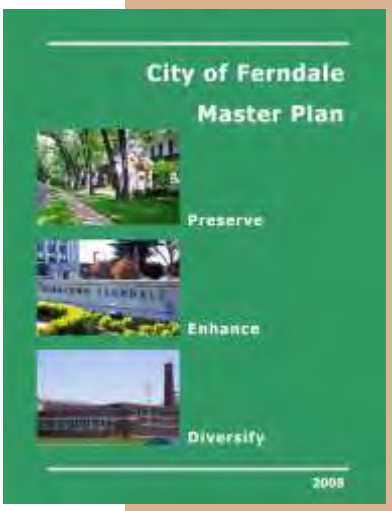
- Implement standards to limit parking in core TOD areas. Regulations like maximum parking standards, parking space reductions, shared parking, payment-in-lieu of parking programs, floor-to-area ratios (or requiring them where they do not exist) can be applied for this purpose.
- Provide incentives in core TOD areas to reduce parking, or encourage structured lots over surface lots.
- Include amenities for bicyclists, pedestrians and transit riders, including wider sidewalks, bike storage facilities, bus shelters, lighting and landscaping in the standards for site plan review.
- Arrange parking in the rear yard (or side only if necessary) to provide safer pedestrian access to store fronts. The Woodward Avenu profile also lends itself to other options, such as on-street or median parking, if allowed by MDOT.
- Recognize the variables contributing to parking demand, and match local policies to individual geographic factors such as density, transit access, income, and household size.

Building on Past Efforts

Local Efforts: Comprehensive Plan Reviews

Ferndale (2008)

Land use along Woodward in Ferndale is primarily commercial in nature, with traditional downtown-style buildings in the Central Business District at 9 Mile Road. The downtown designation promotes storefronts on the first floor with second-story residential or offices. The commercial future land use description recommends reducing auto-related uses for the areas north of downtown along Woodward. South of downtown, commercial uses predominate with the exception of a cemetery between 8 and 9 Mile Roads on Woodward's west side.



The plan vision calls for a diversification of transportation alternatives and land uses, both of which support transit-oriented development in the city. Specific goals for the downtown area, which straddles Woodward Avenue at 9 Mile Road, include improved pedestrian safety, barrier- free access, alleys converted to walkways, increased density of buildings, zero lot line setbacks, and adequate parking facilities. A long-term action from the plan is the investigation into a form-based code for downtown Ferndale to help accomplish some of these goals. The master plan highlights specific transportation goals such as a diverse, multi-modal system, improved public transit, access management, and cooperation among neighbors and Wayne and Oakland counties to develop a regional transit system. The transportation implementation section of the plan strongly endorses regional cooperation towards a multi-modal transportation system. It calls specifically for pedestrian and transit-friendly design standards, a non-motorized system, flexible parking standards, future parking structure, improved transit routes and shelters.

Pleasant Ridge (1999)

While not part of the scope of this study, a review of the Pleasant Ridge Master Plan reveals their planned land uses along Woodward Avenue are also conducive to future transit. Primarily designated as a commercial corridor, Woodward in Pleasant Ridge also has green space buffering adjacent neighborhoods from the busy corridor. The plan also mentions linking the east and west sides of the city across Woodward Avenue through design features such as signage, lighting, and appropriate pedestrian crossings. The commercial buildings currently lining the corridor are suggested in the long-term to convert into more traditional, urban-scale commercial development. The future land use map indicates a blending of residential into commercial at the northernmost section of the city, just south of I-696. This area is identified as having high redevelopment potential for multi-level storefronts with upper level residential.

Huntington Woods (2007)

The Huntington Woods Master Plan strongly endorses transit-oriented development along Woodward Avenue. The city envisions Woodward serving as a "front door" to the community, with redevelopment mixing townhomes/condominiums, green space, offices, and small-scale retail uses. As the city lacks sufficient senior housing, the master plan particularly calls out townhouses/condominiums or second/third story residential above storefronts along Woodward as a proposed solution to that deficiency. While retail and office uses currently front Woodward in Huntington Woods, the plan calls for high quality buildings that fit with the character of the community and are sensitive to the adjacent residential neighborhoods. Another goal of the plan is to incorporate green space along the Woodward frontage as part of mixed-use redevelopment. Notably, the plan calls out the creation of a form-based code as a specific action item for Huntington Woods' Woodward Avenue frontage.

In addition to supporting TOD through land uses, Huntington Woods' plan emphasizes non-motorized connections, especially pedestrian crossings at 11 Mile Road and Lincoln Avenue. A resident survey indicated support for providing pedestrian connections to nearby downtown Royal Oak. Its support of TOD is further emphasized through increased walkability and pedestrian-scale street treatments. Several action items specifically endorse the actions of WA3 and related plans along the corridor and call for cooperation and coordination with neighboring communities.

Royal Oak (1999, updates in progress)

Royal Oak is currently updating its master plan and is working with WA3 to ensure that it incorporates TOD principles. Draft documents suggest that the updated plan will support many of the principles suggested for Woodward, including transit-oriented design, pedestrian-friendly building design, non-motorized linkages, parking strategies, context sensitive road design and complete streets principles. It is also in the process of finalizing its non-motorized plan. The plan contains recommendations on various facilities including: road diets; sidewalks and pedestrian paths; bicycle lanes and routes; signed-shared roadways for bicycles; bicycle parking; barrier-free access; and other non-motorized facilities.

Berkley (2007)

In its Master Plan discussion about transit, Berkley strongly endorses TOD strategies. Recommendations to support transit along Woodward are thorough and include detailed land use strategies and efforts toward a multi-modal transportation system. The plan calls for access management and retrofitting frontage roads to accommodate parallel parking and a landscaped buffer. The intersection of Woodward and 12 Mile is identified as a gateway to the city, and the recent intersection improvements made in the summer of 2011 are a first step to strengthen the connection between Berkley, Woodward, and Royal Oak.

Berkley's Woodward frontage is primarily commercial, with the exception of a cemetery on the west side between 12 and 13 Mile Roads. Although Berkley's "downtown" is planned on 12 Mile Road west of Woodward, the plan also includes strategies to strengthen Berkley's commercial presence near Catalpa. The Future Land Use map shows additional land dedicated for commercial to create greater lot depths, better accommodate expanded commercial redevelopment and complement the stronger businesses in Royal Oak on the east side. The frontage north of this strengthened commercial core is indicated as office/medical uses, intended to complement the Beaumont Health System campus at 13 Mile Road. Berkley's plan discusses the need to buffer between these intensified commercial uses and the abutting residential neighborhoods.

Birmingham
(Triangle District Plan 2007)

Where the Downtown Birmingham Plan (summarized below) gives some recommendations for the Triangle District, the City developed a more recent, updated plan for the district located on the east side of Woodward Avenue bounded by Woodward, Maple, and Adams. The Triangle District Plan and Triangle District Overlay zoning regulations include strategies to improve the physical appearance of the district, encourage mixed-use development, improve the pedestrian environment, link the district with Downtown Birmingham on the west side of the Woodward corridor, and improve access, circulation, and parking, all while preserving existing residential neighborhoods. A detailed development plan includes thorough design guidelines, building height recommendations, wayfinding, parking structures, and public spaces all appropriate for TOD.

The Triangle District Plan calls for specific improvements to the stretch of Woodward between Maple and Adams to facilitate pedestrian movement, improve the character of the corridor, and better relate to the adjacent downtown area. It recommends a slower speed limit (35 mph), access management, improved crosswalks, and a sense of enclosure from taller buildings along Woodward that help contain the large scale of the road. A long-term goal is to reduce the number of lanes on Woodward to three in each direction (there are currently four in each direction) and use the remaining right-of-way for local access to streets, on-street parking, and wider sidewalks.

(Downtown Birmingham Plan 1998)

Birmingham developed a Master Plan for the city in the late 1990s that embody the type of development envisioned in this Plan. It focuses less on detailed data collection and more on visioning and creating places. The Plan challenges many of the then widely-endorsed suburban policies for more urban-oriented development. At the time, Birmingham struggled with identity issues and the dichotomy of a desire to create a beautiful place while protecting individual property rights.

The Downtown Plan gives recommendations for streetscaping, parking, circulation, retail, buildings, processes and special projects in the City. The Downtown Plan suggests strong leadership and an enduring commitment to the established core principles of the plan is needed to create the type of place the City wants to become. The sentiment of the Downtown Plan

can be summarized in a single quote from it: *"Every decision should lead to the creation of sophisticated mixed-use public spaces uncontaminated by suburban standards for parking and traffic."*

Regional Efforts: Corridor-Wide Studies

Woodward Avenue Non-motorized Transportation Master Plan (January 2010)

This document is considered a "working document" of ideas to improve walking and biking conditions along Woodward Avenue from Eight Mile Road to Maple Road. It does not address the interaction with transit along the corridor. Still, the non-motorized recommendations in the Plan were reviewed to avoid duplicative efforts. Major Planning Goals from the document include:

- Enhance/introduce pedestrian and bicycle facilities
- Provide options and a phased approach to implementation
- Identify linkages to Woodward

Specific Recommendations from that Non-Motorized Plan include:

- **Pedestrian Enhancements.** More than simple compliance with minimum standards, 8-10 foot wide sidewalks, improved curb ramps, streetscape scaled to human-size with amenities such as art, transit shelters, and pedestrian lighting, and high quality treatments to surface crossings.
- **Bicycle Enhancements.** Introduce a multi-tiered bicycle route system to include one way bike lanes where it is possible to eliminate one lane per direction, and additional two-way bike paths adjacent to the sidewalks on each side of the street and barrier separated from the roadway. Recommend asphalt for the bike lane surface, and installation of inverted "U", "A", or post and loop racks at destination locations.
- **I-696 Interchange.** Construct 2 way 14' wide bicycle bridges at the outside edges of the auto bridge.
- **Non-motorized Rest Stops.** Utilize the bus drop-off area at the Detroit Zoo for bicycle racks, lockers, and way-finding kiosks. Similar though smaller stops constructed along the corridor at key locations.
- **Road Crossings.** Keep crossing markings consistent in design for bicycle and pedestrian crossing, ADA compliant audible and visual signs and signals, and traffic compliance signage for bicycles.
- **Lanes and Speed.** The Plan suggests a traffic analysis to examine the elimination of the outer most nouthbound and southbound lanes. If reasonable traffic operations could be sustained, the next step proposed is a reduction of the speed limit from 45 mph to 35 mph along the entire corridor.

Woodward Avenue Corridor Management Plan (2006)

The Corridor Management Plan was developed in part to satisfy funding requirements for the Michigan Heritage Route and National Scenic Byway programs. Therefore, the Plan included:

- Identification of the intrinsic resources and attributes on Woodward Avenue that warrant a Heritage Route or America's Byways designation.

- The suggested process and programs to preserve these resources.
- Identification of needed improvements and how they are proposed for implementation.
- Provisions for long-term management and sustainability of the byway for generations to come.

Public Spaces Design Framework Plan (2008)

This document was developed as an amendment to the Corridor Management Plan, and established the Woodward Avenue Action Association as the Heritage Team for Woodward Avenue. As such, WA3 is the group responsible for coordinating and managing the resources along Woodward Avenue. It also included a suggested policy for acceptance by all parties involved in the planning and presrvation of Woodward Avenue resources (see inset for a list of suggested Local Municipality Responsibilities). The Design Framework Plan identified important non-motorized crossings along the corridor, and the various design elements that should be included. These crossing locations are noted in the Transit Framework Map provided later in this Plan.

City Responsibilities:

- Work with the Woodward Avenue Action Association, MDOT, transit agencies, counties and private businesses and property owners along the byway.
- Recognize their contribution to the byway, which serves a purpose beyond local boundaries.
- Implement elements which tie the byway together while establishing distinct character and attributes.
- Inform the Heritage Team of plans, uses, projects, grants and improvements proposed along the byway and seek their recommendation.
- Recognize and commit to higher standards and attention to detail for the byway which will require additional resources.

National Examples: Best Practices for Rapid Transit

Transit in Michigan is likely to evolve into its own character, based on our own cultural, demographic, and social history. Review of other successful transit examples in other similar areas helps to develop ideas and concepts that can be applied to the local system.

- Charlotte, North Carolina

  Bus ridership continues to grow (66% since 1998) as a result of corridor transit planning, pedestrian overlay districts, and transit service improvements, which have created an example of retro-fitting premium transit into an established auto-oriented community.

  The Charlotte Area Transit System (CATS) is the agency responsible for operating mass transit in Charlotte, and Mecklenburg County. CATS operates light rail transit, historical trolleys, express shuttles, and bus service serving Charlotte and its immediate suburbs. The LYNX light rail system comprises a 9.6-mile line north-south line known as the Blue Line. TOD developments along this corridor include a mixed use development at the south end, $1.87 billion in TOD related investment along the South Corridor, and an sharp increase in tax revenue generated along the corridor.

Source: LSL Planning, Inc.

- Grand Rapids, Michigan

The Rapid, Grand Rapid's transit system, serves the cities of E. Grand Rapids, Grandville, Grand Rapids, Kentwood, Walker and Wyoming. The system experienced dynamic growth in ridership, providing over 5.8 million trips in 2003, the highest number in the history of public transportation in the greater Grand Rapids metro area. A significant contribution to the ridership increase came from services provided to Grand Valley State University, as ridership grew 80 percent from March 2003 to March 2004.

Source: http://www.ridetherapid.org/ride

Elements included in the planning guidelines for the BRT system included careful consideration of TOD supportive planning efforts. Density and mix of land uses, design heights, setbacks, lot coverage, connection to the transit network, bicycle and pedestrian access to destination locations, and planned economic development in TOD nodes played a key role in the success of the BRT service.

- Cleveland, Ohio

Cleveland has a bus and rail mass transit system operated by the Greater Cleveland Regional Transit Authority (RTA). The RTA serves an steadily increasing ridership (approximately 200,000 customers on a typical weekday) and a service area covering 1.3 million people in 59 municipalities over 460 square miles. RTA offers four modes of transportation – the heavy-rail Red Line to Cleveland Hopkins International Airport; the light-rail system of Blue, Green and Waterfront lines from downtown to the eastern suburbs; 730 buses, trolleys and Community Circulator vehicles on 90 routes, and Paratransit service-on-demand for the disabled.

Source: LSL Planning, Inc.

In 2007, the American Public Transportation Association named Cleveland's mass transit system the best in North America. RTA improved its service quality and image, broke ground on a premium "New-Starts" BRT Euclid Corridor Project. The BRT runs along the main artery connecting downtown Cleveland with its eastern suburbs. The project rebuilt more than 5.5 miles of Euclid Avenue between Public Square and University Circle and more than 3 miles of additional downtown streets to accommodate bus operations in the center lanes. The redesigned corridor includes well-designed bus stations and shelters in the new center median featuring seating, route information, fare vending, and safety barriers to separate bus riders. Ridership on the route has increased substantially, and in addition to the extensive infrastructure improvements included in the project, more than $4 billion of new outside funding has been invested in the corridor.

- Norfolk, Virginia

The Tide light rail service began operations in August 2011. The light rail is a starter route running along the southern portion of Norfolk, commencing at Newtown Road and passing through stations serving areas such as Norfolk State University and Harbor Park before going through the heart of downtown Norfolk and terminating at Sentara Norfolk General Hospital.

TOD investments and enhancements are occuring at each of these destination locations. Ridership is currently at 4300 trips per day and growing. There are many requests from the public and local businesses along the route to extend and expand service. The Tide has so far created a greater than expected burst of activity along the corridor.

Source: http://www.gohrt.com/services/the-tide/stations/nsu-station/

- Dallas, Texas

Opened in 1996, the DART light rail system now encompasses 45 miles of transit and 35 light rail transit (LRT) stations. Several TOD projects have been constructed locally and continue to increase in property value over time.

Local TODs are successful by embodying the principles of good transit-oriented design, complementing the station area and the surrounding neighborhood, enriching the transit experience for DART riders and the pedestrian experience of those who visit or live in the area, and adding to the municipal tax base.

As development interest in TOD increases over time, existing rail corridors and future rail expansion offer exciting new opportunities for a variety of TOD projects. By 2018, DART will more than double the light rail network to 93 miles, with even more expansion identified in its 2030 Transit System Plan.

Dallas has used TOD light rail stations as a tool for revitalization and to improve property tax revenues. Property values near TOD locations increased at nearly twice the rate of comparable properties in the city that were not located in TOD locations.

Source: http://www.dart.org/about/publicart/images/westendtrainlarge.jpg

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Transit Framework

The Transit Framework Map is a simple map that illustrates potential TOD nodes, infill or redevelopment opportunities, potential transit stations, concepts of how to improve connectivity and convenience of bus stop locations and pedestrian crossings, access management, and parking. This map and the recommendations in this document are intended to be used as a schematic - something that can be built upon in future planning efforts.

The framework map began with a general assessment of the corridor; identifying signal locations, current destinations and development nodes. Next, discussion with local planners identified the following challenges and opportunities:

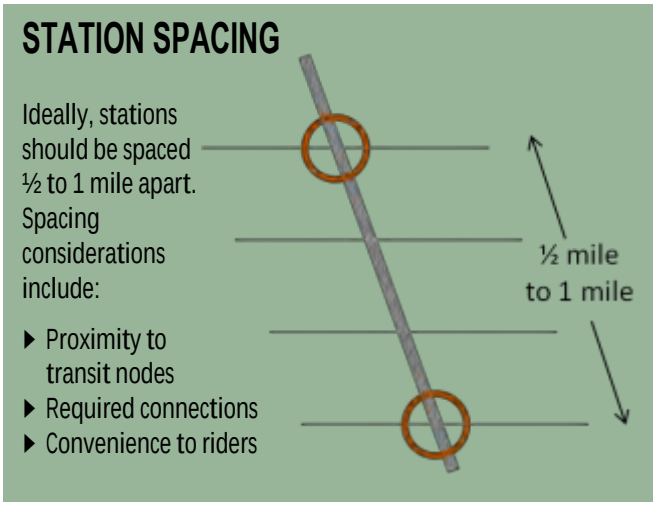
	Challenges	Opportunities
Berkley	▸ Shallow lot depths ▸ Residential concerns over encroachment of commercial into neighborhoods ▸ Berkley's downtown is somewhat detached from Woodward ▸ Deed restricted land limits height at 12 Mile corner ▸ Lack of bus service along 12 Mile between Woodward and Coolidge	▸ Use 12 Mile Road to connect Woodward with Berkley's downtown ▸ Build on the Westborn Market experience; reconfigure parking and expand ▸ Reconfigure development at Oxford intersection ▸ Potential redevelopment at Catalpa intersection
Birmingham	▸ Residential concerns over encroachment of commercial into neighborhoods ▸ SMART bus route diverts from Woodward at Old Woodward	▸ Improve east – west pedestrian and transit connectivity across Woodward to transit center ▸ Segment between 14 Mile and Lincoln is the focus of the city's next subarea plan
Ferndale	▸ Woodward right-of-way parking	▸ Ferndale's thriving downtown at 9 Mile
Huntington Woods	▸ Residential concerns over encroachment of commercial uses and building heights into neighborhoods ▸ Existing development	▸ City's Master Plan calls for new senior and multiple-family residential along Woodward between Lincoln and 11 Mile with transit nodes at both locations
Royal Oak	▸ Shallow lot depths ▸ Residential concerns over commercial encroachment, building height, density, etc. ▸ Woodward right-of-way parking ▸ Lack of open, green spaces	▸ Primary nodes at 696 and 13 Mile ▸ Secondary nodes at 11 Mile and 12 Mile

Potential Station and Stop Nodes

The above analysis resulted in the Framework Map provided on page 24. It includes potential station locations, which consider existing development, identified opportunity locations, signalized crossing locations, typical spacing for bus rapid (ideally no less than ½ mile spacing). This spacing generally would also be appropriate for light rail if the bus rapid transit were converted to light rail at some point. The framework map also illustrates potential connections to local destinations like Amtrak stations and the Detroit Zoo, and the downtowns in Royal Oak and Berkley, which are vibrant areas that rely on the corridor for regional access, and have the potential to add riders to the system. Station locations shown on the Framework Map are described in more detail below.

Spacing Guidelines

Stop and station location should be given careful consideration for the corridor. Stops should be kept to a minimum necessary to support the land-use and accessibility needs. Stop and station structures and amenities should be developed and designed with pedestrian and bike amenities, and should consider auto access, but not so that it dominates the station design. Priority must be given to pedestrians, bicyclists and transit riders, with less emphasis on maintaining higher vehicle speeds or faster auto travel time. Generally speaking, on the Woodward corridor, stops should be between one-half (1/2) to one (1) mile apart for ideal transit service. The quality of the stop should also be designed to accommodate the expected use in the area. Stations could be used at route termini and transfer points with improved amenities at on-route major attractors, and stops with more basic facilities could be used at key TOD points between major destinations.



Connecting Nodes

Several proposed transit node locations have opportunities for connections to nearby downtowns, Amtrak stations, and the future Woodward Light Rail Transit. These are suggested at the Maple, 13 Mile/Beaumont, I-696/Detroit Zoo, and 8 Mile/Fairgrounds intersections. These intersections were identified as ideal locations for nodes due to their proximity to nearby amenities and existing or potential densities to support transit.

Stations at these locations for either bus rapid transit or light rail could be incorporated into new mixed-use buildings with indoor seating and ticketing areas. Since these stations will connect to a different form of transit, indoor facilities will allow a safe place for travelers to wait for their connection.

- **Maple Road.** With its proximity to the adjacent Downtown Birmingham and Triangle District, the Maple Road intersection is a logical location for the future enhanced transit to terminate. The elements of the Triangle District Plan and Overlay District provide ample opportunity for a mixed-use building to house a transit station. A connecting shuttle to the nearby Amtrak station is a possibility for this node.
- **13 Mile/Beaumont Health System.** One of the busiest intersections along the corridor, 13 Mile already had the activity required for a feasible transit station. A station could be located just south of 13 Mile, near Coolidge to provide connecting shuttles to the Beaumont Health System campus and Downtown Berkley. Future redevelopment of the shopping center on the southwest corner of the intersection would be an ideal catalyst to spur future TOD.
- **I-696/Detriot Zoo.** One option is for the existing parking structure at the Detroit Zoo to be used as a future station and park-and-ride lot during weekdays. As the gateway to Royal Oak from the interstate, this node could provide a circulating shuttle to the Detroit Zoo, Downtown Royal Oak or even a parallel transit route that stops at the downtown Amtrak/SMART station in Royal Oak.
- **8 Mile/Fairgrounds.** This location is the planned terminus of the Woodward Light Rail Transit project. Transit from Detroit could end here, continue on northwards, or switch to an alternate mode.

On/Off Nodes

In between the Connecting Nodes, transit will stop at outdoor platforms for boarding/alighting, which are labeled as "On/Off" nodes on the analysis map. These station/stops' platforms would be elevated to raise the travelers to the level of the transit equipment and be covered

shelters to protect users from the elements. For enhanced transit to be most efficient, stops will not be as frequent as traditional fixed-route bus service, but at key locations to collect sufficient passengers from nearby housing and businesses.

The proposed On/Off Nodes include the 14 Mile, Catalpa, and 9 Mile intersections. These On/Off Nodes were identified as being good central locations between the Connecting Nodes where existing development is conducive to TOD or where development could be further intensified to support transit.

- 14 Mile. The area between 14 Mile and Lincoln/Adams in Birmingham has been identified by the City as a future TOD. This location is halfway between the proposed Connecting Nodes at Maple and 13 Mile.
- Catalpa. A stop at Catalpa would split the difference between the 12 Mile and 11 Mile intersections, both of which have institutional uses not conducive to TOD. This area has been identified for strengthened commercial development in the Berkley Master Plan and could collect riders between 12 Mile and 11 Mile.
- Fourth Street/11 Mile. A stop somewhere along this segment could provide the second part of a connecting "loop" to downtown Royal Oak. This would also provide access for the neighborhoods in Huntington Woods on the west side of Woodward. The location of this stop should service the needs of both sides of Woodward. One route option would be to use this stop for non-express or local traffic. Another concept would be for some transit vehicles to travel off Woodward to the transit center at Fourth Street and Washington to link with the multi-modal Amtrak Station and offer more direct service to Royal Oak.
- 9 Mile. As the prime intersection in Downtown Ferndale, 9 Mile has the existing density and potential riders required to host a stop nearby. Ferndale's strong commitment to TOD principles in its master plan will help facilitate the development and amenities required to service a stop near 9 Mile.

TRANSIT AND BICYCLES

If light rail transit is implemented, additional benefits can be achieved for bicyclists because the system design, with platforms built at the same grade as the train, allows for easier and faster transport of bicycles.

Source: www.bikesbelong.org

Pedestrian Crossings

As part of the 2008 amendment to the Public Spaces Design Framework Plan, pedestrian crosswalks along Woodward Ave. were reviewed on site and categorized as one of the three types described below, based on their physical contextual attributes. Those relevant to the study area for this plan are shown on the Framework Map.

Type A: Byway Significant Crosswalks

- Type A1 Crosswalks are the most significant, providing connections between the intrinsic resources of the byway. The only A1 crossing in the study area is at12 Mile Road, improvements for which are currently in the final construction stages.
- Type A2 Crosswalks are also significant, but are more so locally than regionally. Downtown crosswalks provide important connections between buildings on opposite sides of the street, and they provide a gateway or entrance to a downtown area. The crossings at Nine Mile Road and Maple Road are designated at A2 crossings.

Type B: Community/District Connectors

- Type B pedestrian crosswalks are community/district connectors that provide connections for a specific local draw and may be historically significant in the community (and/or state), but not necessarily to the byway. Typically, they would occur at major intersections. Most of the Mile roads along the corridor are considered Type B crossings.

Type C: Remainder

- Type C pedestrian crosswalks are essentially all other crosswalks that do not meet the criteria established for Type A and Type B crosswalks. From a byway and community standpoint, they are less significant than Type A and B and do not occur at major intersections.

CROSSWALK ELEMENT	TYPE A1	TYPE A2	TYPE B	TYPE C
Pedestrian Crosswalk Signalization	**X**	**X**	**X**	**X**
Pedestrian Crosswalk Signalization w/Count Down	**X**	**X**		
Mast Arm Signalization	**X**	**X**		
Crosswalk Designation - Painted			**X**	**X**
Crosswalk Designation - Pavement/Material Change	**X**	**X**	**Optional**	
District Identity Element	**X**	**X**	**Optional**	
Woodward Heritage Identity Element	**X**			
Historical Reference Element	**X**	**X**	**Optional**	
Lighting	**X**	**X**	**X**	
Plantings	**X**	**X**	**X**	
Bump-Outs (if applicable)	**X**	**X**	**X**	
Bollards	**Optional**	**Optional**		

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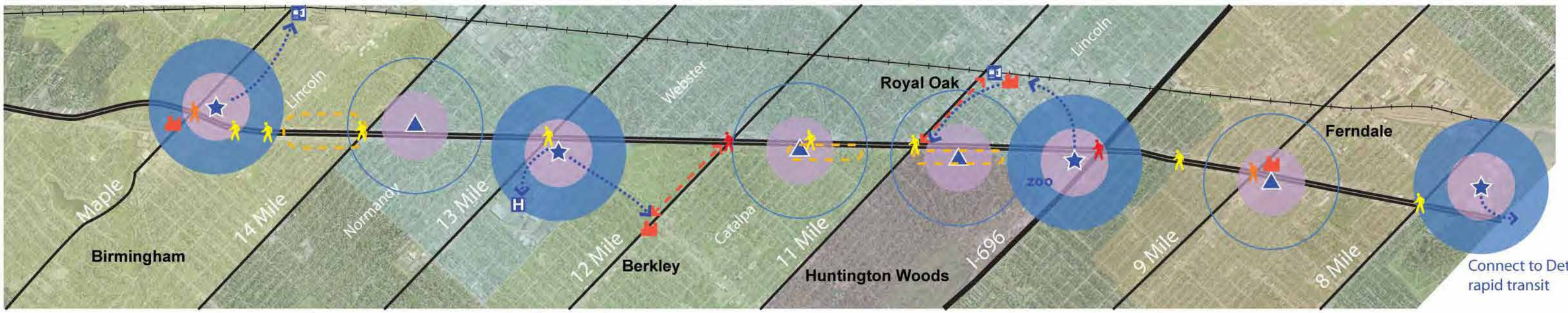
TOD Node Locations

- Downtown Birmingham
- 14 Mile
- 13 Mile/Beaumont
- Catalpa
- I-696/10 Mile
- 9 Mile
- 8 Mile/Fairgrounds

Circulator or local route to Birmingham Amtrak

Circulator or local route to downtown Royal Oak and Amtrak/SMART station



Shuttle to Beaumont and downtown Berkley

Connect to Detroit rapid transit

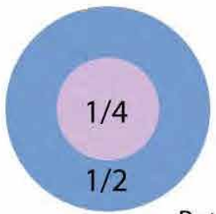
Woodward Corridor

Transit Framework Map

.25 .5 1 mile

LSL Planning, Inc.
Community Planning Consultants

Station and stop locations are preliminary and conceptual to illustrate one scenario of how stops might be spaced. This is not intended to suggest preferred transit stop locations or route alignments. A more detailed feasibility study, ridership projections, cost vs. funding, and analysis of other factors is required.



1/4 mile walking radius
1/2 mile collection area

Potential Station/Stop:
- Connecting
- On/off

- Crosswalk - Type A1
- Crosswalk - Type A2
- Crosswalk - Type B
- Downtown
- Existing Transit/Amtrak Station
- Transit Connections
- TOD/mixed-use opportunity
- Downtown Connections

LSL Planning

Recommendations and Implementation

This TOD study is intended to provide the framework for future planning phases that will evaluate different alternatives (i.e. types of vehicles, route options, etc.), impacts, ridership, costs and funding opportunities. While the availability of some type of "premium" transit will drive development, to some extent, the opposite is also true – development of a certain type and density can be a catalyst for transit. Therefore, a key component of this study was to identify pre-transit planning that can improve the potential for future transit enhancements. The following, more immediate steps to improve the built environment along Woodward, are discussed in further detail below.

1. Parcel and Massing Analysis
2. Economic Development Initiatives
3. Walkability and Transit Guidelines
4. Adoption of TOD Zoning Ordinance
5. Regional Coordination

Parcel and Massing Analysis

- Parcel Analysis. With few exceptions, parcels along Woodward are quite shallow for the type of businesses they attract. Small lot sizes can limit development options and deter real estate investors. One way to identify opportunities is to analyze potential development or redevelopment sites. In some locations, these sites are obviously vacant or obsolete, but in others, opportunities may not be so evident. Analysis of property ownership along the corridor will reveal parcels in common ownership that, if consolidated, could provide more viable redevelopment sites.

- Create a Massing Model. Creation of a two-dimensional or three-dimensional corridor model will help residents and stakeholders visualize how TOD might be implemented in the future. Modeling existing and future development forms will help to locate underutilized sites. When matched with a parcel analysis above, key redevelopment sites will emerge.

3-D models or sketches, such as the one prepared for the Birmingham Triangle District (see right) can help residents and stakeholders visualize how TOD might look along Woodward.

Economic Development Initiatives

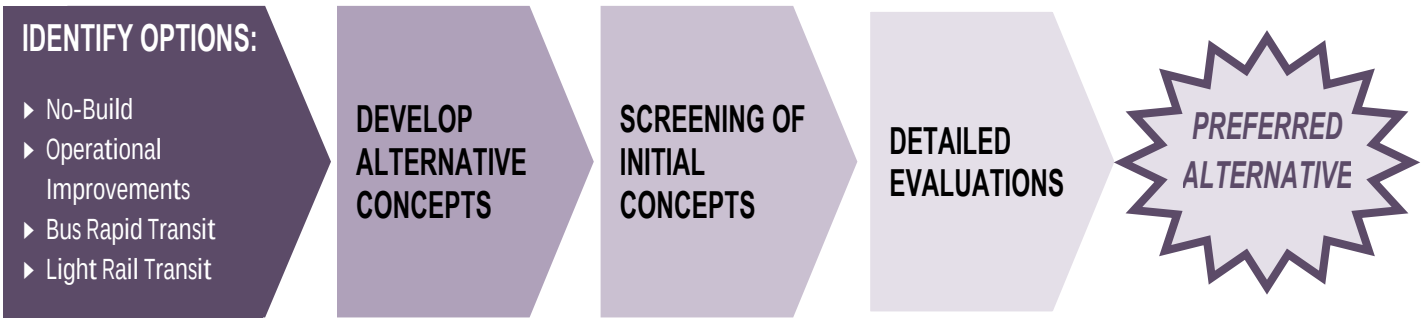
- **Establish a Corridor Improvement Authority.** Pursuant to Act 280, Public Acts of Michigan, 2005 the Corridor Improvement Authority Act, the purpose of a Corridor Improvement Authority (CIA) is to plan for, correct and prevent deterioration in business districts, to encourage historic preservation and to promote economic growth within the district. Unlike some other tax capturing authorities, a CIA may span more than one jurisdiction, and is therefore ideal for Woodward Avenue. If established, taxes from the increase in property values can be captured and re-assigned for capital improvement projects within the district. Such a mechanism could leverage future economic growth on Woodward into physical improvements that will attract even more business, visitors and investment.

  A CIA, or more than one, could be considered for the entire Woodward Avenue corridor, or to select areas which may include the cities involved in this study, or additional communities to the north and south of the study area. The City of Birmingham has developed the framework for a CIA that would include the Triangle District area, and is planning to use tax increment financing (TIF) to fund the long-term development of structured parking. The City envisions constructing a temporary surface parking lot to alleviate immediate parking needs in the district, that is planned to be converted into a parking structure when enough TIF funding is captured.

- **Secure Funding.** The collaboration facilitated by the Woodward Avenue Action Association has yielded positive results already, with grant funding secured for the 12 Mile Road crossing improvements, which were recently constructed. The association has also received a National Scenic Byway Grant, Michigan State Planning and Research Grant, and an Urban Land Institute grant for even more significant transit-planning projects, which are expected to begin in the near future. The nature of the group, which not only represents a multi-jurisdictional effort, but also a public-private partnership, poises it above many others seeking grants, as this spirit of cooperation is given increasing weight with funding groups.

  Alternative Analysis funding has already been secured through the Federal Transit Agency's New Starts program. The purpose of New Starts is to fund major new fixed guideway transit facilities such as light rail transit lines, bus rapid transit, commuter rail or heavy rail transit. It requires a strong local-level planning effort; including an alternatives analysis study. WA3 will continue to advise communities through this process.

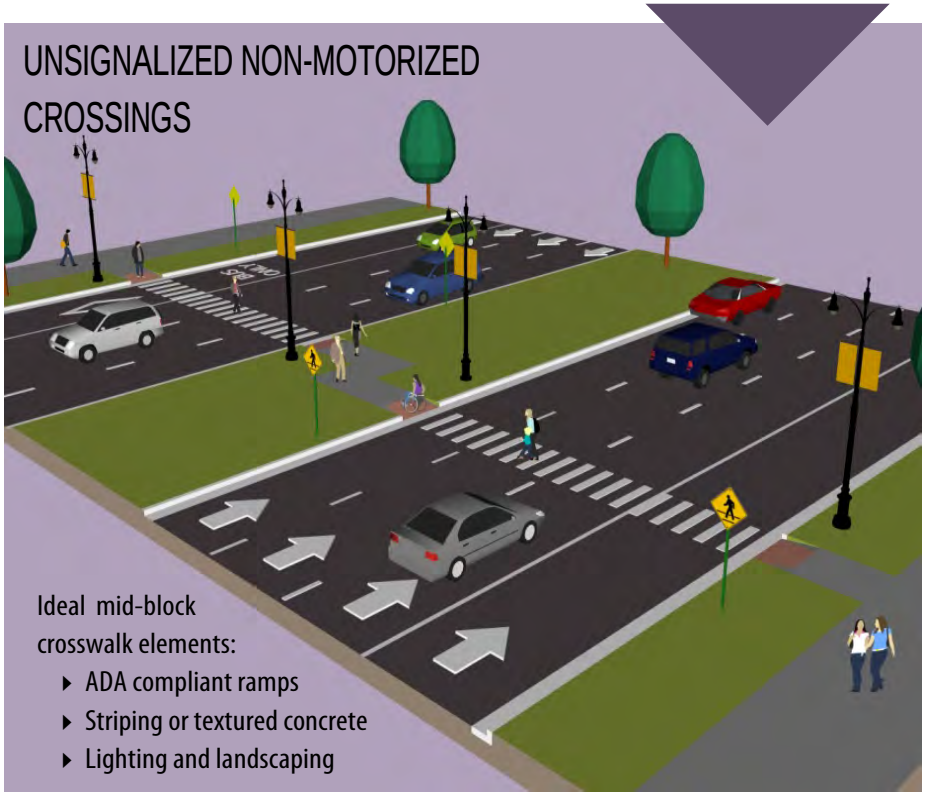
TRANSIT ALTERNATIVES ANALYSIS PROCESS:



Walkability and Transit Guidelines

In many ways, walkability and transit go hand-in-hand. Without a safe, walkable environment, people cannot reach transit facilities, and ridership rates decline. Designing any non-motorized system requires careful planning that considers safety, efficiency, convenience and costs versus benefits. It is important to provide clearly delineated pedestrian areas both along the corridor and connecting to private commercial developments. Non-motorized improvements should focus on providing safe routes for bicyclists and pedestrians, which may require alternative routes or facilities on other roads as well. There are a variety of things that contribute to a walkable environment. In general, when planning for future non-motorized systems, communities should follow the guidelines listed below.

- Unsignalized Non-Motorized Crossings. Past plans have evaluated non-motorized crossings along Woodward. Ideally, crossings will be accommodated at signalized locations, but realistically speaking, pedestrians are likely to cross where it is most convenient. Studies show that people will usually take the most direct route, not necessarily the one designated for them, and are more likely to cross at unsignalized locations when such are spaced farther than ½ mile apart, or where they are not proximate to transit stop locations.

  Where unsignalized crossings are needed, they should be designed so the pedestrian is clearly visible and feels safe, including elements such as lighting, signage, textured pavement treatments and context-sensitive crossing design. Using flashing beacons and reflective road striping can also help improve pedestrian safety.

- Speed of Travel. Currently, portions of Woodward Avenue are posted for maximum speeds of 35 and 45 miles per hour. Vehicles sometimes travel at speeds in excess of these maximums, which increases the potential severity of crashes, especially for pedestrians. Higher vehicle speeds also reduce the perceived safety and comfort for pedestrians and bicyclists, which discourages such travel. Some TOD guidelines suggest a speed limit of 30 to 35 mph provides a balance between vehicle mobility and pedestrian/bicycle safety. The City of Birmingham's Triangle District Urban Design Plan includes a suggested 35 mph for portions of the corridor near Maple Road (15 Mile), where a road diet is suggested. This speed limit is already established in parts of Ferndale. Lower speed limits along the corridor could be pursued in conjunction with other changes, but requires approval from the Michigan State Police, who set speed limits. A reduction in auto speeds could make transit more time competitive, expecially if traffic signal timing was pre-empted

for transit vehicles. Such a reduction in speeds, either alone or as part of a road diet, would require changes to signal timing, and perhaps some traffic modeling to ensure traffic operations will remain at acceptable levels.

- **Road Diet.** A road diet involves replacing travel lanes with bike lanes, exclusive transit lanes and/or wider sidewalks. On Woodward, a road diet could be implemented to provide a dedicated bus lane or bike lane. Careful consideration of the interface between bicyclists, motorists and businesses is required to ensure that these facilities remain safe and attractive to users. The inset illustrates how Woodward could look with a road diet, including fewer vehicle lanes with a dedicated bus lane, plus amenities like wide sidewalks and landscaped buffers for pedestrian comfort. Application of a road diet would require additional traffic modeling of different alternatives for the lanes, intersections, and median crossovers.

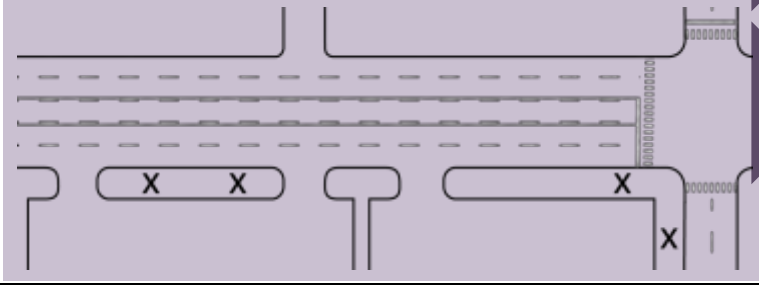
ROAD DIET

Illustration of how Woodward Avenue could look if a road diet was implemented. Travel lanes could be reduced to make room for dedicated transit lanes, or additional non-motorized facilities like wider sidewalks, bike lanes or cycle tracks.

- **Accommodate Bicyclists.** Non-motorized systems must also accommodate bicycle activity. Amenities like bicycle storage, staging areas, and rest spots should be included in community-wide non- motorized systems. In some locations along the corridor, the existing road can be re-striped to include bike lanes without widening the expanse of pavement. Such a "road diet" is recommended in areas where motorized and non-motorized traffic volumes suggest fewer travel lanes and more bicycle facilities are needed. However, in others, on-street bicycle facilities may not be safe or comfortable for riders. In these places, alternate routes, or separate pathways may be needed.

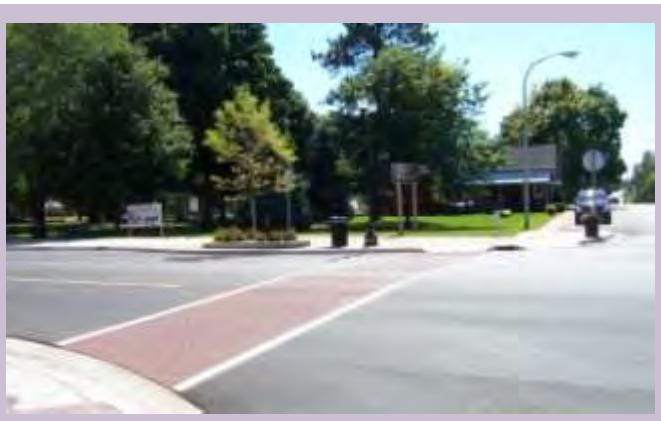
ACCESS MANAGEMENT

Access to private development should be managed to maintain safe and efficient transportation conditions. Safety is improved by limiting the number of driveways that pedestrians and bicycles must cross. In addition, providing well-planned driveway locations helps maintain efficient vehicle operations, which is also needed to maintain reliable transit service.



- **Driveway Design.** The geometric design of access points, including the width, throat, radius, and pavement type, should all include consideration of the interaction with off-street non-motorized users. Excessively wide driveways with little or no separation from off-street parking areas and broad, sweeping driveway curbs provide an unprotected non-motorized environment that lacks clear definition for turning movements and increases the amount of time a pedestrian or bicyclist is exposed to traffic. Driveways should include a clear-vision zone at the entrance, free of visual obstructions like shrubs, signs, utility boxes, or other barriers so oncoming traffic can clearly see pedestrians entering the driveway.

- **Delineate Driveway Crossings.** Sidewalk crossings of driveways should be clearly delineated. For higher volume areas (traffic or pedestrian) the crossing could be striped or constructed of durable contrasting material. Textured or colored concrete are the preferred options for Woodward Avenue since they can withstand vehicular weight and wear while attracting the attention of motorists. Maintenance of crosswalk markings on private land should be made a condition of site plans, just like maintenance of parking lot striping.



Example of how driveway design can draw attention to pedestrians in the crosswalk using color and texture within the pavement surfaces.

Transit-Friendly Zoning

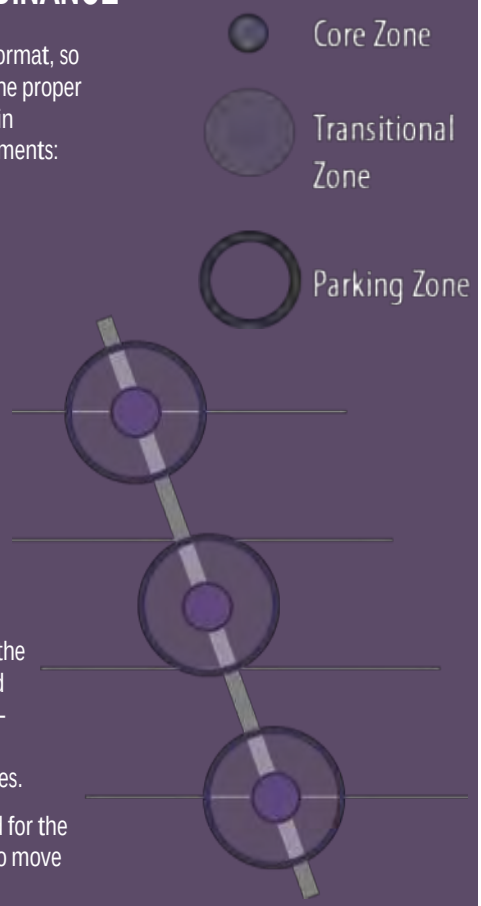
- **Adopt the Corridor TOD Zoning Overlay Zoning Model.** Zoning is an effective way to transform the form of development. Along Woodward, a model TOD overlay zoning district is recommended (see right). The overlay is a "modular" ordinance that includes a basic set of uniform regulations for the entire corridor, along with a set of regulations to apply in core TOD node areas, and another set for the transitional areas around them. The model also includes strategies to assemble land in the core aeras, or where additional depth is needed to accommodate redevelopment or shared parking facilities. The approach presented respects the fact that, while transit-friendly development is desired by most communities, it may take some refining at the local level in order to achieve support.

  The basic standards for development include sidewalk requirements, parking standards, use restrictions, etc. that should apply everwhere in order to promote walking and biking along the corridor. The

TOD OVERLAY ZONING ORDINANCE

Regulations are provided in a "modular" format, so appropriate requirements are applied to the proper locations. The model ordinance provided in Appendix B includes the following key elements:

- **Core Zones** apply to the TOD nodes shown on the Framework Map. Requirements for core zones encourages taller buildings, less parking, and higher pedestrian-oriented building design.
- **Transitional Zones** are expected to surround the Core Zones, and will include similar requirements, but to a less intense standard, in order to facilitate better transitions into the surrounding residential neighborhoods.
- **Parking Zones** are provided for areas at the periphery of the Transitional Zones, and are intended to allow conversion of pre-selected residential sites into TOD developments or shared parking facilities.
- **General Requirements** are recommended for the entire corridor, and include strategies to move parking to the side and rear yards, and encourage sidewalk connectivity.



core TOD node standards are more form-based and focused on creating desirable places for pedestrians, bicyclists and transit riders. The transitional standards will involve some form-based elements, but requires less intense development as a way to slowly step down building intensities and scale as they get farther from the core and closer to residential areas. Standards for areas not designated as Core or Transitional zones could also include incentives to replace commercial uses that should be relocated to the core, with supportive residential or office uses. Such policies will depend on local desires and attitudes, but may provide opportunities for redevelopment of some of the existing underutilized commercial areas for multiple-family or other uses that could be accommodated on some of the shallower development sites not located in the core aeras.

- **Define District Zone Boundaries.** The TOD zoning model provided in Appendix B is intended to apply to all parcels with frontage along Woodward Avenue in South Oakland County. It suggests three additional zones be established: A Core Zone, a Transitional Zone and a Parking Zone. This Plan does not suggest specific boundaries for each zone; however, it is assumed that Core Zones will generally occupy areas within ¼ mile of the center, while Transitional Zones will extend out ½ mile. The Parking Zones are expected to be applied at the periphery of Transitional Zones, as determined necessary to create redevelopment sites of a viable size and shape.

  Two to three story buildings, such as those suggested in the core areas typically require sites with depths of 140 to 160 feet, but that does not account for parking needs. Ideally, parking programs will be implemented at the city or corridor-wide level using one of the approaches discussed in the project overview section, however, in the short-term, some on-site surface parking may be needed. Therefore, cities should plan for parcel depths of up to 250 feet for sites where on-site parking is needed, and to up to 350 feet for areas where parking structures are planned, such as in the core TOD nodes. More specific analysis may be needed to identify the specific property depths needed to achieve the desired building form. Elements such as building height, lot coverage, parking lot location, front yard setbacks, and required buffers from residential areas will all impact the amount of land that is needed for development.

- **Take a Phased Approach.** As discussed in the Analysis section, each local zoning ordinance was reviewed to determine needed changes to promote additional development and growth that will encourage transit ridership. These models should be adopted to help direct future development to desired areas.

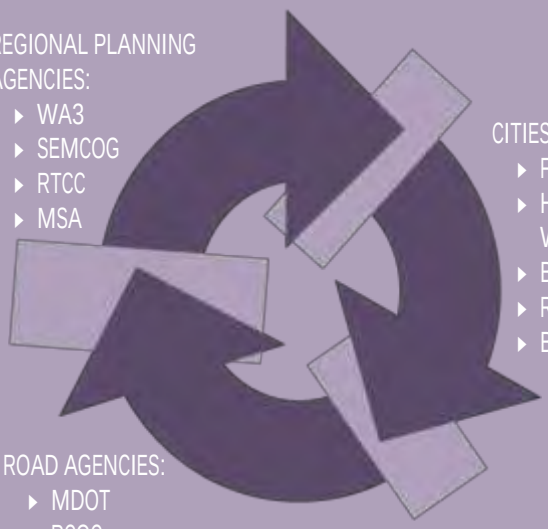
PLANNING FOR TRANSIT

PHASE I:

- Establish TOD district boundaries
- Identify sites for the Core, Transitional and Parking Zones
- Parcel and Massing Analysis
- Adopt interim regulations for land use, parking, setbacks, basic building design that set the stage for density, intensity and infill.

PHASE II:

- Develop specific plans for core TOD nodes (at the city level).
- Conduct housing affordability analysis and feasibility reviews to identify ways to provide housing for a variety of income levels.
- Develop specific regulations based on progress achieved. Additional Transitional or Parking Zones may be added, more aggressive parking strategies implemented, and greater municipal involvement with redevelopment.



Once some success is achieved, cities may choose to take their TOD efforts a step further, by initiating redevelopment projects, increasing densities, and planning for municipal parking.

- Redevelopment of sites along Woodward Avenue may require acquision of additional land to accommodate larger buildings or parking needs. Communities may consider parking zones within the proposed TOD overlay district that would allow certain residential sites to be converted to temporary surface parking lots to support core areas, that can eventually transition into parking structures or mixed-use infill sites.
- Plan parking in areas away from the TOD core to maximize building potential, but consider reasonable replacement locations, or take a phased approach so businesses are still served in the short-term. Consider adoption of local parking programs (see page 11).
- Consider higher residential densities within proximity (1/2 to 1 mile) of Woodward that consider local community conditions.

Regional Coordination

WA3 itself represents a public-private partnership between the communities along Woodward, regional transit and planning agencies, the Detroit Zoo, and Beaumont Health System. The spirit of this public-private collaboration should be expanded to include additional transit-minded businesses, or even residential groups interested in advancing transit. Engaging dynamic, growing or leading businesses, such as the new restaurant at the Vinsetta Garage site, Westborn Market, Northpointe Medical, and Oakland Community College, can further the goals for transit.

The following steps are recommended by the Regional Transit Coordination Council (RTCC) for the evolution of the regional transit organization in Southeast Michigan:

- Build organizational structure and capacity
- Commence implementation planning for Arterial Rapid Transit (ART). ART is intended to facilitate faster transit along key corridors by providing bus stops with more protection and route information; marketing and branding strategies; traffic signal priority for buses; and hybrid low floor buses with bike racks.
- Determine best way to coordinate existing providers
  - Continuity of service
  - Funding streams
  - Accelerate enhancements with regional consistency
- Full implementation
  - Unified agency
  - Coordinated operations under regional guidance

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City of Berkley

N: Means either a) the use is not permitted in the district or b) the principle is not addressed in the ordinance
P: Means the use is Permitted by Right
S: Means the use is Permitted as a Special or Conditional Land Use

TOD Principle	Ref.	Applicable Regulations			
Land Use and Density					
Promotes transit supportive uses	138-472	***LB***	***WB***	***O-1***	***P-1***
▸ Health related and care uses		P	P	P	N
▸ Senior housing		N	N	N	N
▸ Retail, restaurants, personal service		P	P	N	N
▸ Medium to high density residential		P (upper only)	P (upper only)	N	N
▸ Offices/employment uses		P	P	P	N
▸ Colleges, universities		N	N	P	N
▸ Civic uses		N	N	P	N
Limits less transit supportive uses	138-473. Special uses	***LB***	***WB***	***O-1***	***P-1***
▸ Wholesale stores			N	N	N
▸ Car dealerships & service centers			P (no outdoor)	N	N
▸ Drive-through uses		S	S	N	S
Density and transitions	138-527				
▸ Directs highest density allowed within ¼ mile of transit route		R-1D – Single family (4,400 s.f. lots; 9+/ac.) RM – multiple-family (max rooms = site s.f./500)			
▸ Promotes transitions to adjacent neighborhoods (use, density or building height, setbacks)		N			
Site Design					
Building Design					
▸ Direct sidewalk connections to entrances	138-477	Y - front entrance required			
▸ Building design standards encourage "activation" of first floor, through limited office & residential uses on ground level, minimum window area, limited front parking, etc.	138-392	Y - 40-80% window area required; buildings required to be at street edge, but front yard parking can be approved by PC			
Size of Surface Parking Lots					
▸ Sets both minimum and maximum parking standards; or	138-222(c)	N - but allows use of municipal lots within 500 feet			
▸ Allows reduced parking near transit		N			
▸ Allows shared parking	138-218	Y			
▸ Bicycle parking addressed		N			

▸ Lots required to include landscaped walkways		N
▸ PILOT		N
Parking Location		
▸ Required at the periphery and to the rear or sides of buildings		Y - While not a specific requirement, setback requirement for buildings 0 to 10 feet essentially eliminates the possibility of front yard parking
▸ Where necessary, drive-through facilities are designed away from non-motorized activity areas		N
Access Management		
▸ Standards minimize the number of driveways that pedestrians must cross	106-47	Limits width to max 45% of first 200' of frontage + 20 for additional frontage over 200'
▸ Includes standards for driveways that help limit width and provide tight radii	106-47	Y - streets, sidewalks and public places Ordinance requires: ▸ Width: 10' minimum, 25' maximum. ▸ Separation from crosswalks: 5' from any curb cut and crosswalk ▸ Driveway spacing: 25' between non-residential driveways
▸ Includes standards for minimum driveway spacing from signalized intersections		N
Comfort and convenience		
▸ Well-lit – illumination of transit stops, bicycle parking required	138-223	Lighting of parking lot required
▸ Landscaping & shade – street trees required		N
Administration		
Procedures		
▸ Considers impacts to pedestrians during site plan review and traffic impact studies	138-679	Y
▸ Includes standards to gradually improve non-conforming conditions that do not adhere to TOD principles		N
▸ Administrative Reviews	138-678	Y - Façade changes only

Summary of Zoning in the City of Berkley:

Most of the Woodward Avenue frontage in the City of Berkley is zoned commercial or office. Some areas are designated as a Woodward Avenue business district, which gives special consideration to the traffic volumes and special needs along Woodward. The City has rezoned some land behind the frontage parcels for multiple-family and office uses, which provides a nice transition of uses from those more intense along Woodward and the surrounding neighborhoods. Neighborhoods near Woodward at the southern end of the city are relatively high density, with 9+ units per acre permitted in the R-1 D, Single-Family district. Neighborhoods farther north, however, are zoned for larger lots that yield less than 4 units per acre.

City of Birmingham

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P: Means the use is Permitted by Right
S: Means the use is Permitted as a Special or Conditional Land Use

TOD Principle	Ref.	Applicable Regulations				
Land Use and Density						
Promotes transit supportive uses		***O-1***	***O-2***	***B2B***	***B-3***	***B-4***
▸ Health related and care uses		P	P	P		
▸ Senior housing			P	P	P	P
▸ Retail		P – smaller w/ restrictions	P	P	P	P
▸ Restaurants		S	S	P	P	P
▸ Personal service		P	P	P	P	P
▸ Medium to high density residential		P	P	P	P	P
▸ Offices/employment uses		P	P	P	P	P
▸ Colleges, universities		P	P	P	P	P
▸ Civic uses		P	P	P	Bus station	P
Limits less transit supportive uses		***O-1***	***O-2***	***B2B***	***B-3***	***B-4***
▸ Car dealerships & service centers		N	N	P	P	S
▸ Drive-through uses		N	S	S	N	N
Density and transitions						
▸ Directs highest density allowed within ¼ mile of transit route		Y – R7 & R8 (mf districts) surround CBD; R3 (SF) along Woodward				
▸ Promotes transitions to adjacent neighborhoods (use, density or building height, setbacks)		Requires setbacks from residential; zones outside downtown core gradually step building heights and intensity of uses down				
Site Design						
Building Design						
▸ Direct sidewalk connections to entrances		Y – in Downtown and Triangle Overlay Districts				
▸ Building design standards encourage "activation" of first floor, through limited office & residential uses on ground level, minimum window area, limited front parking, etc.		Y – in Downtown and Triangle Overlay Districts				
Size of Surface Parking Lots	4.45					
▸ Sets both minimum and maximum parking standards; or		N				
▸ Allows reduced parking near transit		N				
▸ Allows shared parking	4.45.G.4	Y – allows reduction of up to 50% if parking demand warrants				
▸ Bicycle parking addressed		Y – in Triangle Overlay District				

▸ Lots required to include landscaped walkways		N
▸ PILOT	4.45.G.5	Y – allows exemption for SAD's toward municipal structure
Parking Location		
▸ Required at the periphery and to the rear or sides of buildings		Y – in Downtown and Triangle Overlay Districts
▸ Where necessary, drive-through facilities are designed away from non-motorized activity areas		Y – in Downtown and Triangle Overlay Districts
Access Management		
▸ Standards minimize the number of driveways that pedestrians must cross		N
▸ Includes standards for driveways that help limit width and provide tight radii		Y – in Downtown Overlay District
▸ Includes standards for minimum driveway spacing from signalized intersections		Y – in Downtown and Triangle Overlay Districts
Comfort and convenience		
▸ Well-lit – illumination of transit stops, bicycle parking required	4.21.F	Parking lot lighting required; allows security lighting; bike lighting required in Triangle Overlay District
▸ Landscaping & shade – street trees required		Y – in Downtown and Triangle Overlay Districts
Administration		
Procedures		
▸ Considers impacts to pedestrians during site plan review and traffic impact studies	7.27.B	Y – site plan review
▸ Includes standards to gradually improve non-conforming conditions that do not adhere to TOD principles		Y – in Downtown and Triangle Overlay Districts
▸ Administrative Reviews		Y

Summary of zoning in the City of Birmingham:

The City of Birmingham allows general business and downtown commercial uses along most of its Woodward frontage. Form-based zoning codes have been adopted for both the downtown area and Triangle District, which encompass most of the land at the city's northern end. The city has significant multiple-family and high density residential zoning in areas around the downtown. Neighborhoods are relatively high density, with 9+ units per acre permitted in the R-3, Single-Family district.

City of Ferndale

N: Means either a) the use is not permitted in the district or b) the principle is not addressed in the ordinance
P: Means the use is Permitted by Right
S: Means the use is Permitted as a Special or Conditional Land Use

TOD Principle	Ref.	Applicable Regulations		
Land Use and Density				
Promotes transit supportive uses		***C-2***	***C-3***	***CBD***
▸ Health related and care uses		P - no overnite stay	P - no overnite stay	P - no overnite stay
▸ Senior housing		N	N	N
▸ Retail, restaurants, personal service		P	P (outdoor seating S)	P
▸ Medium to high density residential		Upper-level res.	Upper-level res.	Upper-level res.
▸ Offices/employment uses		P	P	P
▸ Colleges, universities		P - Tech. Schools only	P - Tech Schools only	P - Tech Schools only
▸ Civic uses		N	N	P
Limits less transit supportive uses		***C-2***	***C-3***	***CBD***
▸ Wholesale stores		S	S	N
▸ Car dealerships & service centers		S	S	N
▸ Drive-through uses		S	N	N
Density and transitions				
▸ Directs higher densities to within ¼ mile of transit route		R-2 is predominant (6,000sf lots; 7 du/ac), but is one of the lower density single-family districts (allows duplex units)		
▸ Promotes transitions to adjacent neighborhoods (use, density or building height, setbacks)	4.03b.	Y - Building height step-backs		
Site Design				
Building Design				
▸ Direct sidewalk connections to entrances	4.03g.2.	Y		
▸ Building design standards encourage "activation" of first floor, through limited office & residential uses on ground level, minimum window area, limited front parking, etc.	9.04D.2.	No standards to keep office to 2nd floor only; building design standards require articulation, 50% first floor window area		
Size of Surface Parking Lots				
▸ Sets both minimum and maximum parking standards; or	10.03H.	Y - Max 10% over standard		
▸ Number of spaces required is transit-oriented		N - but CBD is exempt from parking requirement		
▸ Allows reduced parking near transit	10.03G.	Y		
▸ Allows shared parking	10.03F.	Y		

▸ Bicycle parking addressed		N
▸ Lots required to include landscaped walkways		Landscaped islands required but not ped connections
▸ PILOT	10.03K.	Y in CBD
Parking Location		
▸ Required at the periphery and to the rear or sides of buildings		N
▸ Where necessary, drive-through facilities are designed away from non-motorized activity areas	8.06	Not allowed in public streets, walks or alleys
Access Management		
▸ Standards minimize the number of driveways that pedestrians must cross		Maximum 2 driveways allowed
▸ Includes standards for driveways that help limit width and provide tight radii		Width limited to 25 feet
▸ Includes standards for minimum driveway spacing from signalized intersections		N
Comfort and convenience		
▸ Well-lit – illumination of transit stops, bicycle parking required		Required per Environmental Performance Standards Ordinance
▸ Landscaping & shade – street trees required	9.11	Greenbelt trees required
Administration		
Procedures		
▸ Considers impacts to pedestrians during site plan review and traffic impact studies	10.04B; 11.03	Basic standards only; no pedestrian-oriented access standards
▸ Includes standards to gradually improve non-conforming conditions that do not adhere to TOD principles	Article 16	Basic nonconforming only
▸ Administrative Reviews		

Summary of zoning in the City of Ferndale:

Ferndale's Central Business District encompasses land on all four corners of the Woodward and Nine Mile Road intersection. While the focus of the downtown is along Nine Mile, the CBD designation does extend approximately 1/8 of a mile north and south of Nine Mile along Woodward. Outside of the downtown, zoning allows general business and commercial uses. The neighborhoods most proximate to Woodward are generally zoned R-2, which is one of the city's lower density single-family districts, yet it still allows a density of over 7 units per acre.

City of Huntington Woods

N: Means either a) the use is not permitted in the district or b) the principle is not addressed in the ordinance
P: Means the use is Permitted by Right
S: Means the use is Permitted as a Special or Conditional Land Use

TOD Principle	Ref.	Applicable Regulations	
Land Use and Density			
Promotes transit supportive uses	DIV 3 & 4	***2-A Transitional Office***	***3 Business***
▸ Health related and care uses		N	N
▸ Senior housing		P	N
▸ Retail, restaurants, personal service		P	P
▸ Medium to high density residential		P	N
▸ Offices/employment uses		P	P
▸ Colleges, universities		N	N
▸ Civic uses		N	P
Limits less transit supportive uses		***2-A Transitional Office***	***3 Business***
▸ Wholesale stores		N	N
▸ Car dealerships & service centers	40-221	N	S (gas stations only w/ restrictions)
▸ Drive-through uses		N	Y
Density and transitions			
▸ Directs highest density allowed within ¼ mile of transit route		Y – R-1C adjoins rear of frontage sites (7,000; 6.2 du/ac.)	
▸ Promotes transitions to adjacent neighborhoods (use, density or building height, setbacks)	40-179 40-184/218 40-186/393	Requires landscaping in Zone 2-A Setbacks based on building height in 2-A Requires wall between parking lots and residential property	
Site Design			
Building Design			
▸ Direct sidewalk connections to entrances	40-180(2)b	Front of building must face street	
▸ Building design standards encourage "activation" of first floor, through limited office & residential uses on ground level, minimum window area, limited front parking, etc.	40-180(2)	50% window area & defined entryways required; long walls (300+) prohibited	
Size of Surface Parking Lots			
▸ Sets both minimum and maximum parking standards; or		N	
▸ Allows reduced parking near transit		N	
▸ Allows shared parking	40-391 & 40-179(12)	Y	
▸ Bicycle parking addressed	40-180(5)	Y - required in Zone 2-A	

▸ Lots required to include landscaped walkways	40-179(10)	Islands required, but not walkways
Parking Location		
▸ Required at the periphery and to the rear or sides of buildings	40-179(9)	1 row of parking allowed in front yard
▸ Where necessary, drive-through facilities are designed away from non-motorized activity areas		N
Access Management		
▸ Standards minimize the number of driveways that pedestrians must cross		N
▸ Includes standards for driveways that help limit width and provide tight radii		N
▸ Includes standards for minimum driveway spacing from signalized intersections		N
Comfort and convenience		
▸ Well-lit – illumination of transit stops, bicycle parking required	40-179(5) 40-180(5)	Parking lot lighting required in 2-A ornamental streetlights required in 2-A
▸ Landscaping & shade – street trees required	40-180(3)	Street trees & parking islands required in 2-A
Administration		
Procedures		
▸ Considers impacts to pedestrians during site plan review and traffic impact studies		N
▸ Includes standards to gradually improve non-conforming conditions that do not adhere to TOD principles		N
▸ Administrative Reviews		N

Summary of zoning in the City of Huntington Woods:

All of the Woodward frontage in Huntington Woods is zoned for Transitional Office. The Huntington Woods Master Plan envisions multiple-family and senior apartments along Woodward, so this designation could change in the future. However, the current zoning will not create as vibrant a commercial location as some of the zoning in other communities, but the office district does have the potential to contribute employee transit riders to the corridor. Residential neighborhoods behind the office district are moderate in density, allowing over 6 units per acre.

City of Royal Oak

N: Means either a) the use is not permitted in the district or b) the principle is not addressed in the ordinance
P: Means the use is Permitted by Right
S: Means the use is Permitted as a Special or Conditional Land Use

TOD Principle	Ref.	Applicable Regulations			
Land Use and Density					
Promotes transit supportive uses		***Office Service***	***Gen. Business***	***Reg. Business***	***Mixed Use 2***
▸ Health related and care uses		S		S	
▸ Senior housing		N	N	N	P
▸ Retail, restaurants, personal service		P	P	N	P
▸ Medium to high density residential		N	(upper residential)	P	P
▸ Offices/employment uses		P	P	P	P
▸ Colleges, universities		P	P		P
▸ Civic uses		P	P		P
Limits less transit supportive uses		***Office Service***	***Gen. Business***	***Reg. Business***	***Mixed Use 2***
▸ Wholesale stores		N	S	N	
▸ Car dealerships & service centers		N	S	S	
▸ Drive-through uses		S	S	N	
Density and transitions					
▸ Directs highest density allowed within ¼ mile of transit route		N – R-2 single family residential is located along Woodward (6,000 s.f. lots)			
▸ Promotes transitions to adjacent neighborhoods (use, density or building height, setbacks)		Setbacks with buffers required from residential			
Site Design					
Building Design					
▸ Direct sidewalk connections to entrances	770-30	Y			
▸ Building design standards encourage "activation" of first floor, through limited office & residential uses on ground level, minimum window area, limited front parking, etc.		Y			
Size of Surface Parking Lots					
▸ Sets both minimum and maximum parking standards; or		N			
▸ Allows reduced parking near transit	770-106.D	PC can waive up to 10% of requirement based on use			
▸ Allows shared parking	770-106.C	Y			
▸ Bicycle parking addressed		N			
▸ Lots required to include landscaped walkways	770-90				

▸ PILOT		
Parking Location		
▸ Required at the periphery and to the rear or sides of buildings	770-105	Not allowed in front greenbelt, except as allowed by PC
▸ Where necessary, drive-through facilities are designed away from non-motorized activity areas		
Access Management		
▸ Standards minimize the number of driveways that pedestrians must cross		
▸ Includes standards for driveways that help limit width and provide tight radii		
▸ Includes standards for minimum driveway spacing from signalized intersections		
Comfort and convenience		
▸ Well-lit – illumination of transit stops, bicycle parking required	770-109	Y – parking lot lighting required
▸ Landscaping & shade – street trees required	770-90.E	Y – landscaped islands required
Administration		
Procedures		
▸ Considers impacts to pedestrians during site plan review and traffic impact studies		N
▸ Includes standards to gradually improve non-conforming conditions that do not adhere to TOD principles		
▸ Administrative Reviews		Y - for expansions of up to 500 s.f. or 10%

Summary of zoning in the City of Royal Oak:

Land along Woodward is zoned for a variety of commercial, office and mixed uses. The city's downtown is located along Main Street, just east of Woodward, so the commercial zoning along Woodward is more general in nature. Residential districts behind most of the commercial allow densities of over 7 units per acre.

TOD Overlay Zoning District

This ordinance was crafted so it can be incorporated into local ordinances, and as such, it contains several references to general zoning ordinance sections. They are highlighted to draw attention, so local staff can easily find where to insert their specific references, as applicable to their local codes.

Section 1: Purpose

The Transit-Oriented Development Overlay District ("TOD District") is intended to encourage the location of uses that will enhance the street-level experience while providing for a mix of transit-supportive uses within approximately one half-mile of a transit station. The TOD District has been divided into zones, as depicted on the official TOD Overlay District Map. The purpose of each zone is as follows:

a. The Core Zone is expected to contain a mix of employment and residential activity and urban design techniques that promote transit use and the non-motorized facilities needed to support transit, while discouraging low-intensity, auto-oriented uses.
b. The Transitional Zone is intended to facilitate the harmonious transition between the transit-oriented environment created in the Core Zone and the more conventional patterns in the General Zone.
c. The General Zone is intended to accommodate those business and commercial uses already customary to the Woodward Avenue corridor. This Zone is intended to contain uses in support of the Transitional and Core Zones, along with auto-oriented uses that should not locate within the Core and Transitional Zones, but that are still in demand by the community.
d. The Parking Zone is intended as a transition district between single-family residential districts and commercial development fronting on Woodward Avenue. It is also intended to provide a means for expansion of transit-oriented uses within Core Zones, and to a lesser degree, Transitional Zones by allowing strategic and careful conversion of single-family residential sites into commercial parking and expansion. It is intended that parking lots in the Parking Zone will transition into structured parking or additional commercial building sites; so buffering from residential neighborhoods is a key consideration.

Section 2: Applicability ❶

❶ ***THE BOUNDARIES OF EACH ZONE SHALL BE DETERMINED BY THE CITY, AS AN AMENDMENT TO THE ZONING MAP.***

a. **Areas Regulated.** This Transit-Oriented Development Overlay District shall apply over the existing zoning districts containing property with frontage on Woodward Avenue, in addition to any other areas designated on the TOD Overlay District map or the zoning map.
   1. Core Zones are intended to be applied at the key transit centers along Woodward Avenue, generally coinciding with the main nodes along the corridor. Property located within one-quarter mile of a transit station is generally considered for designation as a Core Zone.
   2. Properties located within one-half mile of a transit station shall be eligible for designation as Transitional.

3. Property with frontage on Woodward, that are not designated as Core or Transitional shall be considered a General Zone.
4. The Parking Zone shall generally be located behind the commercial sites fronting Woodward Avenue. Sites shall be classified for this designation where they are determined necessary to provide additional land area needed to create viable development sites, and where additional parking is needed to support transit-oriented uses along the corridor.

❷ ***THE "TRIGGERS" IN THIS MODEL MAY BE REVISED BY EACH CITY. DIFFERENT TRIGGERS MAY ALSO BE DEVELOPED FOR EACH ZONE.***

b. **Activities Regulated.** ❷ Use and development of land within the TOD District shall be regulated as follows:
   1. Where not permitted in this Overlay District, uses established prior to the adoption of this TOD District shall be considered non-conforming and are subject to the requirements of *ARTICLE X NONCONFORMING*.
   2. Where an existing use is proposed to be expanded to occupy an area (including buildings, outdoor areas, on-site parking, etc.) more than 50% of the existing size, the new use shall be subject to the building use standards of the TOD Overlay District to the maximum extent practical, as determined by the Planning Commission.
   3. Expansions to existing buildings of more than 40% of the existing gross floor area shall be subject the requirements of this TOD Overlay District and shall meet all requirements to the maximum extent practical, as determined by the Planning Commission.
      a) Flexibility shall only be granted when it is determined that it will not be contrary to the purpose of the TOD Overlay District, and where it will not be detrimental to the intended vision for the Core and Transitional Zones.
      b) Adherence with the parking and building design standards of this ordinance shall be the priority.
   4. Where a new building is proposed, the use and site shall be subject to the full requirements of the TOD Overlay District.

c. **Other Applicable Regulations.** In addition to the requirements of this TOD Overlay District, development applications shall be subject to the following. Where provisions conflict with requirements contained in this TOD Overlay District, the standards of this Overlay District shall apply:
   1. Site Plan Review as may be required in accordance with *ARTICLE X SITE PLAN REVIEW*.
   2. General provisions in accordance with *ARTICLE X GENERAL PROVISIONS*.
   3. Off-street parking and loading as may be required in accordance with *ARTICLE X OFF-STREET PARKING AND LOADING STANDARDS AND ACCESS DESIGN*.
   4. Landscaping and tree replacement as may be required in accordance with *ARTICLE X LANDSCAPE STANDARDS*.

Section 3: Uses ❸

Uses shall be permitted based upon the zone with each use as listed in the table below. Permitted Uses (indicated by a "P") are uses allowed by right in that zone. Such uses are subject to the general standards of the ordinance. Special Land Uses

❸ ***THE USES PERMITTED IN THIS TABLE REPRESENT THOSE IDEAL FOR TRANSIT. IT IS UNDERSTOOD THAT SOME CITIES WILL WISH TO ADD SOME AUTO-ORIENTED USES, BUT THEY SHOULD BE LIMITED IN SCOPE AND INTENSITY IF POSSIBLE.***

(indicated by an "S") are uses that may be permitted by the City after review according to *ARTICLE X SPECIAL LAND USES*.

USE P = Permitted Uses S = Special Land Uses	CORE ZONE	TRANSITIONAL ZONE	GENERAL ZONE	PARKING ZONE
RESIDENTIAL				
Congregate Housing	S	S	S	-
Dwelling Unit, Above Ground Floor Only	P	P	S	-
Group Homes for the Elderly	-	S	S	-
Multiple-Family (3—6 units)	P	P	S	-
Multiple-Family (7 or more units)	P	S	S	-
One-Family Detached	-	S	S	-
Town Houses (on lots at least 20 feet in width)	P	P	P	-
Two-Family	-	S	S	-
Adult Day Care	P	P	P	-
Permitted Uses in the adjacent Residential District(s)	-	-	-	P
Special Land Uses in the adjacent Residential District(s)	-	-	-	S
RECREATION, CULTURAL, AND ENTERTAINMENT				
Social Clubs and Membership Organizations	S	S	S	-
Art Galleries	P	P	P	-
Commercial Indoor Recreation	P	-	P	-
Commercial Recreation Center	S	S	P	-
Dance Studio	P	P	P	-
Health and Fitness Facility	P	S	P	-
Live Performance Theatres	S	-	P	-
Movie Theatre	S	-	P	-
Assembly Hall	S	S	P	-
INSTITUTIONAL				
Adult Day Care Center	P	S	S	-
Child Day Care Center	S	S	S	-
Colleges and Universities	P	-	S	-
Government Buildings	P	-	P	-
Libraries	P	P	P	-
Museums	P	S	P	-
Religious Institutions	S	S	S	-
Schools, K—12	S	S	S	-
Schools, Professional and Vocational	S	S	S	-
OFFICE				
Financial Institutions	P	P	P	-
Medical Offices	p	P	P	-
Offices	P	P	P	-
Veterinary Office (Without Outdoor	P	P	P	-

Kennels or Runs)				
RETAIL				
Eating and Drinking Establishment	P	P	S	-
Eating Establishment	P	P	P	-
Funeral Home	-	P	P	-
Hotel or Motel	P	-	S	-
Retail Sales and Services Establishments	P	P	P	-
Farmer's Market	P	-	-	-
Plant and Garden Shop (without outdoor display)	P	P	P	-
MISCELLANEOUS				
Communication Towers	S	S	S	-
Commercial Parking Structures	S	P	S	-
Surface Parking Lots	S [1]	S [1]	S	S
Expansion of existing commercial building onto adjacent lot under the same ownership	-	-	-	S
Notes: [1] Requires documentation that parking spaces, in an amount adequate to serve all uses on the property, are ***not*** available within five hundred (500) feet by convenient, pedestrian route.				

Section 4: Site Development Standards

Development standards are designed to create an urban form that results in significant pedestrian activity and increased intensity of uses that support transit ridership. Standards for the General Zone shall be as required in the underlying zoning district, and standards for the Parking Zone shall be as required in *ARTICLE X OFF-STREET PARKING AND LOADING STANDARDS AND ACCESS DESIGN*, unless otherwise specified. The following regulations apply in the Core and Transitional Zones:

Site Layout Requirements (SEE NOTES)			
		Core Zone	**Transitional Zone**
Lot Sizes		There are no minimum or maximum lot sizes.	
Lot Coverage		There are no maximum lot coverage requirements.	
Building Placement			
Façade		Must occupy at least 75% of lot width	Must occupy at least 60% of lot width
		Building must be oriented parallel to the street.	
Entrance	Primary Entrance	Must face Woodward Avenue, or a transit station if located within two hundred fifty (250) feet of the site.	Must face Woodward Avenue or a transit station.
	Usable Doors	One required for every 50 ft. of front building wall.	One required for every 100 ft. of front building wall.
Setbacks / Build-To Line			
Front Yard / Build-To Line		0 ft. or 6 ft., with the following exceptions: 1. Building entrances shall be recessed.	Build-to should be either 6 ft. or 24 ft. as needed to provide compatibility between adjacent sites.

		2. Where a public plaza, courtyard, or outdoor seating area is planned adjacent to the right-of-way, the primary building façade shall be adjacent to such courtyard, plaza, or seating area.	
Rear and Side Yard Setbacks	Adjacent to Core or Transitional Zones	0 ft.	0 ft.
	Abutting Any Other District	3 ft.	10 ft.
Driveways			
Parking		Rear yard only	At least 75% of the parking area must be in the rear yard
Access		Via rear yard or alley. Side yard access may be allowed for corner lots.	Existing front yard access may be maintained, but not expanded
Corner Lot Minimum Setbacks		30 ft. from any road right-of-way or easement	
Building Design Requirements			
Roof Design			
Flat Roofs		A minimum 42 inch tall parapet shall be installed to conceal mechanical equipment visible from the street level	
Building Height			
Maximum		60 ft.	48 ft.
		5 stories	4 stories
		Buildings adjacent to single-family residential districts shall include a fifteen (15) foot building step back a height of thirty-five (35) minimum of fifteen (15) feet at forty-five (45) feet.	
Minimum		30 ft.	20 ft.
		3 stories	2 stories
Maximum Ground Floor Height		10 ft.	10 ft.
Ground Floor Elevation		At grade	At grade
Minimum Floor Area for Residential Units			
Studio Units		400 sq. ft.	400 sq. ft.
1 Bedroom Units		600 sq. ft.	600 sq. ft.
2 Bedroom Units		800 sq. ft.	800 sq. ft.
Façades			
Building Design *(See Section 5)*		Ground floors shall be designed as storefronts with windows, doorways and sign panels that are integrally designed	
		Architectural variation through design, windows, or recesses required every 30 ft.	
Window Area Requirement	Ground Floor:	60% to 75%	Minimum 50%
	Upper Floors:	40% to 60%	Maximum 50%
NOTES: 1. Development in the Transitional Zone containing Residential Uses shall provide usable open space, as required in Section 7.			

Section 5: Building Design Standards

a. **Purpose**
   1. These guidelines are not intended to discourage creative design or individuality; rather they are intended to foster a consistent image along Woodward Avenue, especially within the transit nodes, that will distinguish them as a special place.
   2. The goal of these standards is to encourage buildings to relate to one another, building by building and site by site by incorporating traditional design principles. This term does not define a particular style or period, but is generally understood to embody architectural characteristics and elements of previous periods or styles. They are basic and transferable to all good architecture.

b. **Civic Building Design Standards**
   1. **Intent.** Civic buildings such as religious institutions, schools and municipal buildings often embody a certain character that has been shaped by our culture and experiences. Because of their unique function, character, and role as social and cultural anchors, these buildings are evaluated based on qualitative standards rather than rigid requirements. This allows the proper flexibility in site and building design required to provide for the various types and styles of buildings that fall within this category.
   2. **Standards.** Reasonable flexibility in design shall be permitted for civic buildings that achieve the following:
      a) **Setbacks.** Buildings may be setback farther than prescribed for other buildings, but shall be located to relate to adjacent public squares and the street.
      b) **Mass.** Civic buildings may be massed as required to achieve the desired character. Civic building entrances should be located where they achieve prominence, either at the terminus of a street or vista.
      c) **Height**. Civic building appurtenances may be permitted to exceed the maximum height, pursuant to *SECTION X, BUILDING DESIGN STANDARDS*.
      d) **Architecture.** Building design should embody the grandeur associated with civic buildings. Quality building materials, building relief, and ornamental elements should be incorporated to provide the type of monumental structures desired.

c. **Commercial Building Design Standards**
   1. **Form.** Buildings must be of compatible form, scale, detail, proportion, material, color and texture to the established or desired character, without any one building becoming visually prominent through flamboyance, irregular form or marked differentiation of materials.
   2. **Transitional Architectural Elements**
      a) The ground and upper floors of a two story building should be clearly distinguished from one another, which can be accomplished by a storefront cornice that also contains a consistent band for signage.
      b) The base of a building should be clearly defined by elevating storefront windows. Virtually all storefronts typically contain a base panel below the display windows, which can be constructed of various materials. The base panel provides a strong anchor for the storefront, placing the display area at an effective viewing height and also acts as a kickplate.
   3. **Building Materials.** Durable building materials that provide an attractive, quality appearance should be used on the building exterior, such as brick, decorative masonry

block, wood, cement board siding or a combination thereof. Use of EIFS (synthetic stucco), narrow plank vinyl, and metal siding shall be used only for accent details. Because of issues related to durability and damage, EIFS should only be used well above the ground plane.

Section 6: Parking Standards

a. **Bicycle Parking**
   1. Multiple-family residential uses shall provide bicycle parking at the rate of one bicycle parking space for every twenty (20) required vehicular parking spaces, provided that not more than one hundred (100) bicycle parking spaces shall be required for any single development.
   2. Nonresidential uses required to provide not less than fifteen (15) but not more than forty (40) vehicular parking spaces shall provide a minimum of two (2) bicycle parking spaces.
   3. Nonresidential uses required to provide more than forty (40) vehicular parking spaces shall provide a minimum number of bicycle parking spaces equal to ten (10) percent of the of the number of required vehicular parking spaces, provided that not more than one hundred (100) bicycle parking spaces shall be required for any single development.

b. **Required Vehicular Parking**
   1. **On-street Parking.** On-street parking within five hundred (500) feet from the building entrance may be considered toward fulfilling the parking requirement of a use.
   2. **Number of Spaces Required.** In order to reduce reliance on the personal automobile and foster greater use of public transit and non-motorized travel options, off-street parking shall be required as follows:
      a) **Core Zone.** Parking shall be provided in an amount not less than seventy-five percent (75%) of the amount required by the regulations of *ARTICLE X OFF-STREET PARKING AND LOADING*. In no case may parking exceed one hundred percent (100%) of the amount required.
      b) **Transitional Zone.** Parking shall be provided in an amount not less than ninety percent (90%) of the amount required by the regulations of *ARTICLE X OFF-STREET PARKING AND LOADING*. In no case may parking exceed one hundred ten percent (110%) of the amount required.
      c) **General Zone.** Parking shall be provided as required in *ARTICLE X OFF-STREET PARKING AND LOADING*.
   3. **Reductions for Shared Parking.** Where day/night or weekday/holiday schedules allow parking spaces to be used by more than one building and/or use, parking requirements may be reduced by ten percent (10%) in the Transitional Zone and up to fifty percent (50%) in the Core Zone. The amount of reduction shall be based on a parking analysis provided by the applicant and approved by the Planning Commission.
   4. **Reductions for Contributions to Public Parking.** The City may allow a reduction in open space for sites located within 250 feet of a public parking facility, or for those who contribute to the City's public parking fund, pursuant to Section 8.c.

c. **Surface Parking Lot Design**
   1. **Access Management.** Access to sites along Woodward shall adhere to the following. Where existing conditions prevent compliance, the Planning Commission may grant a modification according to Section 8.d.3.
      a) Adjacent parking lots shall interconnect and curb cuts shall be shared when feasible.

b) New access points shall utilize rear alleys, side streets or shared access where feasible. Direct access to Woodward Avenue shall only be permitted where no other reasonable alternative exists.
c) Access points shall be located outside of the functional area of signalized intersections. Because the functional area can vary by intersection, a separation of one-hundred fifty (150) feet is preferred.
d) Driveway widths shall be the minimum required to provide safe access, as determined by the City Engineer. Width shall consider angle of entry, adjacent parking locations and layout, known pedestrian or bicycle activity, and surrounding road conditions.

2. **Pedestrian Walks.**
a) Dedicated pedestrian walkways shall be provided for parking lots that exceed any of the following:
1) Lots with more than two (2) driveway aisles
2) Lots with an outside dimension (either length or width, as measured by the outermost points of the pavement) of over seventy (70) feet.
3) Lots containing more than thirty (35) parking spaces.
b) Walks shall be at least five (5) feet in width and shall be distinct from driveways, maneuvering lanes and loading zones either through pavement markings, curbing, textured pavement, landscaping or other treatments as approved by the Planning Commission. Design of such walkways shall consider the intensity of use, frequency of traffic, and walking distances.

2. **Location**
a) New surface parking lots shall be located in the rear yard, except where required for access.
b) Side yard parking may be permitted where existing parking currently exists and where the rear yard area cannot accommodate parking behind buildings.
c) In no case may parking be installed, expanded or improved between a building and the right-of-way.

3. **Screening**
a) Surface parking lots, or portions thereof, adjacent to the front yard shall be screened by a minimum thirty-six inch (36") and a maximum fifty-four inch (54") tall street wall or hedge that matches the principal structure.
b) Surface parking lots shall be screened along all streets by a masonry wall or fence four (4) feet in height in order to maintain consistent along the street.
c) Structured parking on sites that abut a street shall have at least fifty (50) percent of the ground floor fronting on any street shall be developed with office, retail, or other pedestrian-oriented uses.

4. **Buffers.** All parking lots abutting residential uses not located in the Core or Transitional Zones shall be buffered by a six (6) foot high masonry wall or by an eight (8) foot wide buffer meeting the following:
a) A buffer shall consist of a solid planting strip of evergreen trees or shrubs which are at least five (5) feet tall at the time of planting or will achieve that height within one (1) full growing season after planting. They shall be planted and maintained in a healthy growing condition.
b) Buffer plantings may include the following:
1) Norway Spruce, Austrian Pine or Scotch Pine.

2) Shrubs may be Arborvitae or upright Junipers that are maintained as a clipped hedge.

d. **Off-street Loading.** For all buildings located within two hundred fifty (250) feet of a transit station, off-street loading is not permitted in any location visible from the right-of-way along which the primary building façade is located.

e. **Required Lighting.**
   1. Off-street parking and bicycle parking areas shall be illuminated in accordance with the following table.
   2. Pedestrian areas of the site shall be illuminated to the minimum required levels.
   3. Lighting levels shall be measured in foot-candles (fc) at two (2) feet above pavement level.

Required Lighting Levels			
Use	Minimum level	Maximum After Dusk	Maximum at Residential property Lines
Low activity *Includes uses listed as "Residential" or "Institutional" in Section 3: Uses*	0.2 fc	5 fc	1.5 fc
Medium activity *Includes uses listed as "Office" or "Recreation, Cultural and Entertainment" in Section 3: Uses*	0.6 fc	5 fc	1.5 fc
High activity *Includes uses listed as "Retail" in Section 3: Uses*	0.9 fc	5 fc	1.5 fc

Section 7: Required Landscaping and Open Space

a. **Street Trees.** In order to provide a safe and comfortable pedestrian environment, the frontage of Woodward Avenue shall be planted with deciduous street trees, either planted within a curbed median island or within a tree grate installed in the public sidewalk, as follows:
   1. Trees shall be planted within ten (10) feet of the front property line.
   2. Trees shall be at least two and a half inches (2.5") caliper in size.
   3. One street tree shall be planted an average spacing of thirty-five (35) feet on-center. Clustering of trees, and spacing adjustments may be allowed by the city if necessary.

b. **Parking Lots.** Parking lots shall provide landscaped buffers as required in Section 6.c.4.

c. **Required Residential Open Space.** ❹ Developments containing residential uses shall provide open space in the amount of ten (10) square feet per dwelling unit. The City may allow a reduction in open space for sites located within two-hundred fifty (250) feet of a public park, or for those who contribute to the City's public parking fund, pursuant to Section 8.c.

❹ ***ITEM c. IS PROVIDED AS OPTIONAL CONSIDERATION FOR COMMUNITIES WHO WISH TO REQUIRE OPEN SPACE FOR RESIDENTIAL DEVELOPMENT. SEE ALSO SECTION 7.d.4***

Section 8: Application Requirements

All applications for a TOD development certificate shall be processed according to the City's regular

process, with the following exceptions:

a. **Preapplication Conference.** Prior to formal application submission, the applicant may request a meeting with City staff to discuss the nature of the project, compliance with ordinance standards, and any additional submission requirements for the specific project.
b. **Content of Application.** In addition to the general application requirements listed in *ARTICLE X, SITE PLAN REVIEW*, applications in the Core and Transitional Zones shall contain the following information:
    1. Detailed site plans, schematic architectural designs, including elevations and sections, and maps or plans indicating the following:
        a) Physical and architectural relationships to surrounding development.
        b) Pedestrian circulation on and near the site, including pedestrian connections between the designated parking, transit stations, and the principal use(s).
        c) Location, amount, character and continuity of any open space and landscaping on the site.
        d) Such other matters as are appropriate to determinations in the specific case.
    2. Projects expected to generate more than 100 additional directional trips during the peak hour of the traffic generator or the peak hour, or over 750 total trips in an average day, shall submit a Transportation Impact Study, as outlined below.
    3. Such other and further information or documentation as deemed necessary or appropriate to a full and proper consideration and disposition of the particular application.
c. **Transportation Impact Studies**
    1. **Purpose.** The purpose of a Transportation Impact Study (TIS) is to determine the potential development impact on local vehicular, pedestrian, bicycle and transit environments. Therefore, review not only of a development's impact on the level of service along Woodward Avenue and intersecting streets, but also the impact on the quality of service provided for pedestrians, bicyclists and transit riders in the community.
    2. **Required Information.** If required, a TIS shall include the following:
        a) Roadway alignment, including any problems with sight distance, number of lanes, lane width and lane configurations;
        b) Existing pedestrian, bicycle and transit facilities, including the presence of bike lanes, sidewalks, multi-use pathways, paved road shoulders exceeding 4 feet in width, bus routes, and other amenities within proximity of the site;
        c) Existing peak-hour weekday traffic volumes (and daily volumes or peak period counts (7-9 a.m. and 4-6 p.m.) to support the selection of the evaluated peak hour (if applicable) on street(s) adjacent to the site. For uses with weekend peak characteristics, the City may require new counts be taken on typical weekend days during the anticipated peak hours of the proposed use. All counts shall be collected using accepted practices and shall not be over two (2) years old;
        d) Existing pedestrian, bicycle or transit activity observed at nearby intersections within 500 feet of the site, or within an area determined during the scoping meeting. As a general guide, activity surpassing more than 15 pedestrians per hour at these locations should be noted, as well as common bicycle movements/routes, transit ridership patterns, and transit fixed-route service within study area.
        e) Established land uses within one quarter mile (1/4) of the subject site.
    3. **Transportation Forecast.** Forecasted trip generation of the proposed use for the a.m. peak hour, the p.m. peak hour and average day shall be provided for the overall project

and each phase. The forecasts shall be based on the data and procedures outlined in the most recent edition of Trip Generation published by the Institute of Transportation Engineers (ITE). The applicant may use other commonly accepted and published sources of data or supplement the standard data with data from at least three (3) similar projects in Michigan, as agreed to by the City.

4. **Trip Reductions.** As an incentive to encourage development, the following trip reductions may be allowed only in the Core Zone. The City may elect to revise the trip reduction rates based on specific knowledge of the subject area or past trends that indicate a different rate should be used.

Trip Reduction Available to Residential and Business Land Uses	
Pedestrian	
Pedestrian facilities on more than 95% of roadways	4%
Pedestrian facilities on 91 to 95% of roadways	3%
Pedestrian facilities on 80 to 90% of roadways	2%
Bicycle	
Bicycle accommodation on 50% or greater of roadways	1%
Transit	
Route has frequency of more than 6 buses per hour, and operates 19-24 hours per day	3%
Route has frequency of 5 to 6 buses per hour, and operates 17-18 hours per day	2%
Route has frequency of 3 to 4 buses per hour, and operates 14-16 hours per day	1%
Trip Reduction Available to Business Land Uses Only	
Transportation Demand Management	
TDM plan includes at least 4 strategies	2%
TDM plan includes at least 3 strategies	1%

Notes:
- To qualify for the trip reduction, the land use must also meet all of the conditions specified in the text.
- The "roadway network" refers only to the portion of the roadway network within the ½ mile radius that is adjacent to developed land uses.
- Bicycle Accommodation is defined as one of the following:
  a. street with a design speed of 25 MPH or less that carries 3,000 vehicles per day or less;
  b. on-street bike lanes;
  c. paved shoulders of roadways that are at least four feet wide;
  d. or exclusive and shared off-street bicycle paths.
- Transit routes considered include those within ¼ mile of the land use.
- TDM strategies may include one of the following:
  a. Parking pricing (employees must pay share of parking expense)
  b. Telecommuting
  c. Compressed/ Flexible Work Schedule
  d. Guaranteed Ride Home
  e. Locker and showers, and place to store bikes
  f. Car-sharing or car-matching services
  g. Free transit pass

Source: PennDOT Policies and Procedures for Transportation Impact Studies

5. **Required Quality of Service**
   a) A multimodal and roadway level of service or "capacity" analysis is required at the proposed access points using the procedures outlined in the most recent edition of the Highway Capacity Manual published by the Transportation Research Board. The capacity analysis should be provided in the appendix of the report.

b) As established using the most recent Highway Capacity Manual guidelines, all modes must operate at a projected Level of Service D or better.
c) Mitigation shall be provided in order to meet the City's required Levels of Service for each mode. Any alternatives or suggested phasing of improvements should be described and illustrated. The mitigation measures may include items such as, but not limited to, roadway widening, change to road intersection alignment or grades, need for bypass lanes or deceleration tapers/lanes, changes to signalization, relocation change in design, or reduction in number of access points, or a reduction in the proposed density of intensity of use.

d. **Review Process**

1. **Staff Review.** City staff shall review the application for compliance with the applicable standards. Staff may consult with other communities, agencies and organizations as deemed necessary to ensure consistent application of the standards or where required to advance the purposes of this ordinance.
2. **Planning Commission Action.** After receiving comments from staff, the Planning Commission shall either approve, approve subject to modification, or deny the TOD development, including the requested waivers. In its disposition, the Planning Commission shall consider all of the following:
   a) Compliance with the intent of officially adopted plans or ordinances of the city;
   b) Intent of the Core or Transitional Zone and the extent to which the application satisfies the purposes and requirements of the Zone;
   c) Use characteristics of the proposed development, including the types of ground-floor active uses and continuity of activity along the street front;
   d) Location and size of off-street parking and loading;
   e) Architectural relationships, both formal and functional, of the proposed development. to both surrounding buildings and the public right-of-way, including building siting, massing, proportion, and scale; and
   f) Suitability of signs, landscape, lighting, and other site or building features in relation to the existing or planned public improvements in the Zone.
3. **Allowed Modifications.** Modifications to the standards in these overlay districts may be granted by the Planning Commission, upon finding that the following are met:
   a) Waivers from the build-to line or building orientation requirements may be granted if the building was already in existence at the time this district was first applied to the property upon which it is located;
   b) The application, while not strictly in accordance with certain development standards, meets public purposes, is not contrary to planning principles contained in the city's Master Plan or other adopted plans, especially as they relate to transit-oriented development, and provides public protection to an equivalent or greater degree;
   c) Given the particular circumstances of the site, strict application of the development standard or standards is not necessary for the accomplishment of public purposes or the provision of public protection.
   d) Reductions to the on-site parking or open space requirements where contributions are made to a Payment-in-Lieu-of program, pursuant to subsection 4 below.

4. **Payments in Lieu of Parking or Open Space** ❺
   a) In lieu of physically providing the parking required in Section 6.b., *Required Vehicular Parking*, or the open space required in Section 7.c. *Required Residential Open Space*, the City Council may permit an applicant to pay a one-time fee into the city's parking fund or open space fund.
   b) In implementing such policy, City Council shall assure that the future needs for parking or open space can be adequately met by such payments in lieu of the physical improvement.
   c) The City shall consider the following factors when determining whether to accept such payments:
      1) The current inventory of public parking or parks
      2) Future parking needs near transit nodes
      3) The specific use, location and design of the subject site, and the applicant's ability to reasonably provide on-site parking.
      4) Proximity of the subject site to existing and planned municipal parking lots.
      5) The amount of cash that will be contributed in lieu of parking, considering the actual cost to construct such parking on the subject site.
      6) Where existing parking spaces are proposed for elimination, the payment shall be calculated using the existing number of parking spaces proposed for removal regardless of the spaces' actual configuration, dimensions or compliance with the parking regulations of the Zoning Ordinance.
      7) The overall benefit to the public and to private owners from the provision of shared municipal parking
   d) The City Council may approve, deny, or approve in part an application to provide payment in lieu of off-street parking or open space.
   e) The City Council shall set the one-time fee, adjusting it from time to time, as needed to reflect the actual cost to provide open space or construct a new parking space, including such factors as land, engineering, financing, and construction of the facility with associated amenities like drainage, landscaping, etc.
   f) Payments and fees collected, plus any accrued interest, shall be used for acquisition, development and maintenance of municipally owned or leased off-street parking facilities intended to further the purposes of the TOD Overlay District.
   g) The city may choose to operate the program through a fund maintained to collect lump sum fees, or through a special assessment district where payments are levied over time as part of the tax bill for the site.

❺ ***PARKING PROGRAMS:***
- ***PAYMENT-IN-LIEU OF PARKING PROGRAMS ARE SUGGESTED BECAUSE THEY GIVE CITIES MORE CONTROL OVER WHERE PARKING LOTS ARE LOCATED.***
- ***HOWEVER, THEY REQUIRE SOME ADMINISTRATIVE WORK; SO EACH CITY MUST FEEL CONFIDENT THAT THEY CAN ADMINISTER SUCH A PROGRAM. SOMETIMES, A SPECIAL ASSESSMENT DISTRICT CAN BE USED MORE EASILY.***
- ***ALTERNATIVELY, A REGIONAL PARKING AUTHORITY, OR CORRIDOR IMPROVEMENT AUTHORITY, COULD BE CREATED TO MANAGE THE FUND.***
- ***CROSS REF: SECTIONS 6.b. AND 7.c.***

Definitions. The following definitions have been developed for this ordinance:

- *Primary building façade*. That portion of the principle building facing the street abutting the front of the property including all walls, doors, windows eaves and foundation elements but not including any front porch or any portions of the building face which are recessed more than two (2) feet from the majority of the building face.
- *Transit Station*. Definition needs to explain this is not a sign in the ground stop, but a special facility constructed for transit purposes.

List of Compiled Data

Community	Master Plan / Area Plan	Zoning Ordinance	Development Agency Plans	Transportation Plans
Ferndale	*City of Ferndale Master Plan:* PDF 2008	Text: PDF, 2010 Map: PDF, 2005		Complete Streets Ordinance, 2010
Pleasant Ridge	*City of Pleasant Ridge Community Master Plan:* scanned PDF, 1999 *Composite FLU Map:* PDF by Oakland County, 2010		*City of Pleasant Ridge Development and TIF Plan:* scanned PDF, 2008	
Royal Oak	*City of Royal Oak Master Plan:* text-only cut/paste from website to PDF, 1999 *Future Land Use Plan Map:* scanned PDF, 1999	Text: PDF municode export, 2011 Map: PDF, 2001	*Royal Oak DDA Development and TIF Plan:* 2-part PDF, 2004	*DRAFT Royal Oak Non-Motorized Transportation Plan:* PDF, 8-31-2011
Huntington Woods	*Huntington Woods Master Plan:* PDF, 2008	Text: PDF municode export, 2011 Map: PDF, 2011		
Berkley	*City of Berkley Master Plan Update:* PDF, 2007	Text: PDF municode export, 2011 Map: scanned PDF, 2007	*Berkley DDA Development and TIF Plan:* PDF, 1999	Complete Streets Resolution, 2010
Birmingham	*Downtown Birmingham 2016:* PDF scan, 1996 *Birmingham Urban Design Plan:* scanned PDF, 1993 *Triangle District Urban Design Plan:* PDF, 2007 Triangle Urban Design presentation: PDF, undated	Text: PDF, 2006 Map: PDF, 2008		Complete Streets Resolution, 2010

BIRMINGHAM RESOLUTION IN SUPPORT OF REGIONAL TRANSPORTATION PLANNING

WHEREAS, existing City of Birmingham plans and policies already support principles that facilitate progress toward developing a network of Complete Streets to promote multi-modal transportation options and accessibility for all users;

WHEREAS, development of multi-modal transportation infrastructure, including accommodations for pedestrian, bicycle, and transit riders, offers long-term cost savings by reducing costly infrastructure retrofits and opportunities to create safe and convenient motorized and non-motorized travel;

WHEREAS, multi-modal regional transportation planning, including a Regional Public Transportation System, is vital to the needs of the metropolitan Detroit Region, including Macomb, Wayne and Oakland Counties ("the Region");

WHEREAS, multi-modal regional transportation planning, including a comprehensive Regional Public Transportation System, is core to a sound economic development strategy for Birmingham and the Region;

WHEREAS, SEMCOG has indicated a good transit system can attract development, businesses, tourism, and conventions, and helps to connect people to jobs, making the Region more economically competitive;

WHEREAS, the economic viability of the Region depends on the ability of workers to get to jobs using a comprehensive Regional Public Transportation System that includes multi-modal transportation alternatives, including the provision of both fixed transit routes and flexible para-transit;

WHEREAS, the basic needs of some residents of the Region can only be met through the provision of multi-modal transportation options, including a Regional Public Transportation System (ie. For travel to medical office visits, grocery shopping etc.);

WHEREAS, increasing active transportation (e.g. walking, bicycling and using public transportation) offers the potential for improved public health, economic development, a cleaner environment, reduced transportation costs, enhanced community connections, social equity, and more livable communities;

WHEREAS, multi-modal regional transportation planning, including a Regional Public Transportation System, will provide mobility options to local residents of all ages and abilities;

WHEREAS, streets that support and invite multiple uses, including safe, active, and ample

space for pedestrians, bicycles, and transit are more conducive to the public life and efficient movement of people than streets designed primarily to move automobiles;

WHEREAS, The City of Birmingham has supported area-wide public transit by being an "opt-in" community in support of SMART since the system was established in 1996;

WHEREAS, the City of Birmingham recently declared its support of Complete Streets policies and directed City staff to develop a set of proposed policies and procedures to implement Complete Streets practices to make the City more accommodating to all modes of travel, including walkers, bicyclists and transit riders, of all ages and abilities;

WHEREAS, Complete Streets are only achieved when transportation agencies routinely plan, design, construct, re-construct, operate, and maintain the transportation network to improve travel conditions for bicyclists, pedestrians, transit, and freight in a manner consistent with, and supportive of, the surrounding communities;

WHEREAS, the City of Birmingham has supported regional planning efforts through its ongoing membership in regional organizations, including SEMCOG and the Woodward Avenue Action Association;

WHEREAS, the communities in South Oakland County along the Woodward corridor have an opportunity to obtain federal grant funding to study the possibility of the future extension of light rail north along Woodward into Oakland County;

NOW, THEREFORE, BE IT RESOLVED that the City of Birmingham is committed to working directly with other local jurisdictions along the Woodward corridor to seek funding opportunities to study the future extension of light rail north along Woodward from the northern terminus of the light rail system currently proposed by the City of Detroit into Oakland County;

IT IS FURTHER RESOLVED that a copy of this resolution be sent electronically to all municipalities in Oakland County along the Woodward corridor, all Oakland County Commissioners, County Executive L. Brooks Patterson, and Mayor David Bing, City of Detroit.

Adopted this 25rd Day of July, 2011.

_____

Gordon J. Rinschler, Mayor

I, Laura Broski, City Clerk of the City of Birmingham, Michigan do hereby certify that the foregoing is a true and correct copy of a Resolution adopted by the Birmingham City Commission at its regular meeting held July 25, 2011.

_____

Laura Broski, City Clerk

FTA Major Capital Transit Investment Fact Sheet

Alternatives Analysis

As defined by law, alternatives analysis (AA) is the first step of the New Starts project development process. AA is the local forum for evaluating the costs, benefits, and impacts of a range of transportation alternatives designed to address mobility problems and other locally-identified objectives in a defined transportation corridor, and for determining which particular investment strategy should be advanced for more focused study and development. For AA studies which may result in the local selection of a project eligible for FTA New Starts or Small Starts funding, the AA further serves as the process for development of the technical information necessary to support a candidate project's into New Starts preliminary engineering. At its core, alternatives analysis – like every step of the New Starts project development process – is about providing the public, local officials, and potential funding partners with sufficient information for the decision-at-hand: that is, "What is the best solution for addressing our problems? What are its benefits? How much is it going to cost? And how are we going to pay for it?"

Guiding Principles of Alternatives Analysis

Planning provides a foundation for effective decisionmaking. Alternatives analysis studies best support local decisionmaking by adhering to the following key principles:

- Early and ongoing participation by a wide range of stakeholders. Alternatives analysis is a local process, but can benefit from the participation of Federal and state resource and funding agencies.
- A clear understanding of the problem in need of solving. The AA should not be about developing solutions in search of a problem.
- Alternatives should be designed – and optimized – to address identified transportation problems and other local goals and objectives.
- The alternatives should share consistent land use, fare, and other assumptions so that their relative costs, benefits and impacts – rather than those of their underlying policy assumptions - are well understood.
- Analysis and evaluation of alternatives at a level of detail necessary to support the decision-at-hand. The AA should produce reliable information that illuminates the trade-offs between alternatives.
- Selection of an LPA based upon full disclosure and understanding of the estimated costs, benefits, and impacts of all alternatives.

For More Information

Advancing Major Transit Investments Through Planning and Project Development

http://www.fta.dot.gov/planning/newstarts/planning_environment_2591.html

Procedures and Technical Methods for Transit Project Planning (AA Technical Guidance)

http://www.fta.dot.gov/planning/newstarts/planning_environment_2396.html

Alternatives analysis begins with a solid understanding of the transportation problems in need of solving – that is, a corridor's purpose and need. Once known, study sponsors – typically transit agencies, metropolitan planning organizations, or state Departments of Transportation – identify and design a number of capital investment strategies to meet its purpose and need. The definition of these alternatives should reflect a range of high and low cost capital improvements, including non-guideway options which can serve as a "baseline" for measuring the merits of higher level investments. Measures for evaluating the relative merits of alternatives are identified, as are technical methodologies for generating the information used to support such measures; these will typically include disciplines such as travel forecasting, capital and operations and maintenance costing, and environmental and land use analyses. Finally, costs, benefits, and impacts of each alternative are developed and evaluated, funding strategies are analyzed, and a locally preferred alternative (LPA) is selected to be advanced for further development.

Because it involves specialized technical analyses and may result in the selection of an LPA requiring New or Small Starts funding, study sponsors are encouraged to involve FTA early in

the study process. Close coordination with FTA, and a commitment to follow FTA guidance for the conduct of the AA study, can improve both the reliability of the information produced and evaluated to better inform local decisionmaking, and facilitate a speedier FTA response to subsequent requests to advance into preliminary engineering.

Woodward Avenue Rapid Transit Alternatives Analysis Locally Preferred Alternative

Prepared for

Southeast Michigan Council of Governments

SEMCOG

2014

Prepared by

Parsons Brinckerhoff

In Association With

HNTB Michigan
LSL Planning, Inc.
Hamilton Anderson Associates
Elnora Austell & Associates
Archive DS

Acknowledgements

Federal Transit Administration

Southeast Michigan Council of Governments

Woodward Avenue Rapid Transit Alternatives Analysis Steering Committee

Municipal Members
City of Detroit
City of Highland Park
City of Pleasant Ridge
City of Ferndale
City of Huntington Woods
City of Royal Oak
City of Berkley
City of Birmingham
Bloomfield Township
City of Bloomfield Hills
City of Pontiac

Local/State Government Agency Members
Michigan Department of Transportation (MDOT)
Suburban Mobility Authority for Regional Transportation (SMART)
Detroit Department of Transportation (DDOT)
Detroit Transportation Corporation (DTC)

Non-Profit Partners
Woodward Avenue Action Association (WA3)
Michigan Suburbs Alliance (MSA)

Table of Contents

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1.0 Introduction

With a history dating back to 1701, Woodward is considered "Detroit's Main Street".

1.1 Overview

In July 2012, the Southeast Michigan Council of Governments (SEMCOG), in collaboration with the Woodward Avenue Rapid Transit Alternatives Analysis (AA) Steering Committee, began a study to identify and evaluate rapid transit alternatives that would improve mobility options and job access, provide better connectivity to major destinations, and increase economic development opportunities along Woodward Avenue, a 27-mile corridor in SE Michigan. The AA study included a multi-tiered screening process that evaluated modal and alignment alternative options resulted in the selection of a locally preferred alternative (LPA). The LPA was recommended to move forward in the next phase of analyses and would lay the foundation for higher level rapid transit service in SE Michigan.

1.2 Purpose of LPA Report

The purpose of the LPA report is to summarize the selection process for the Woodward AA LPA. The document outlines the methods of technical analyses used to evaluate the costs, benefits, and impacts of each alternative, and it describes the qualitative factors considered in the LPA selection such as public input and private and public agency stakeholder feedback.

The LPA is a transit mode and alignment option that results from the AA process. The multi-step evaluation process reviewed multiple options and their abilities to address the transportation needs of the Woodward corridor. The LPA was deemed to be the most appropriate and feasible alternative to meet the purpose and need for the project and represents the best chances for implementation and the most stakeholder support.

1.3 Report Organization

The LPA report is organized as follows:

Chapter 1: Introduction

Chapter 1 provides an overview of the project. It includes background information on the history of transit in SE Michigan, ongoing transit projects in the region, and a summary of local transportation plans. Additionally, this chapter details the study area and the project's Purpose and Need, Goals, and Objectives. A description of the New Starts, Small Starts, and NEPA processes are provided as context for the study regarding necessary future phases of analysis once an LPA is recommended.

Chapter 2: Stakeholder Engagement and Public Outreach

Chapter 2 provides a summary of stakeholder engagement and public outreach throughout the Woodward AA process. Starting with a description of the Woodward AA Steering Committee's involvement, this section also includes one-on-one interaction(s) with project stakeholders as well as public comments with details of how input from these groups was integrated into the process of evaluating alternatives and selecting the LPA.

Chapter 3: Existing Conditions

Chapter 3 offers a snapshot of existing transportation conditions along the Woodward corridor and the I-75 freeway that accommodates the corridor's traffic. The existing conditions described in this section form the basis of the Purpose and Need for the Woodward AA study.

Chapter 4: Evaluation Framework

Chapter 4 details the evaluation framework for the project. The section describes the process undertaken to determine the preferred modal option, and the two-tiered alignment screenings that resulted in the selection of a LPA. A summary of the process for developing the study's evaluation criteria and how public input factored into that decision-making are also included.

Chapter 5: Locally Preferred Alternative Recommendation

Chapter 5 describes the LPA in further detail. The chapter summarizes the alternative's relationship to improving transportation and mobility options and economic opportunities and investment. A snapshot of the LPA's impact on communities and the environment as well as public sentiment concerning the LPA are also offered in this chapter.

Chapter 6: Next Steps

Chapter 6 provides an outline of the next steps following the Woodward AA LPA recommendation through to implementation.

1.4 Proposed Project: Woodward Avenue Rapid Transit Alternatives Analysis (AA)

The Woodward AA explores rapid transit options for the 27-mile long Woodward Avenue corridor from downtown Detroit northwest to the Woodward Loop in Pontiac. The Woodward corridor traverses both Oakland and Wayne Counties, including 11 communities: Detroit, Highland Park, Ferndale, Pleasant Ridge, Huntington Woods, Royal Oak, Berkley, Birmingham, Bloomfield Township, Bloomfield Hills, and Pontiac.

Woodward Avenue is one of the oldest transportation corridors in the country and the main artery of the SE Michigan roadway system. As a cultural and historical asset in the region, it connects two of the state's oldest cities, Detroit and Pontiac. Woodward is one of the five main "spokes" that radiates from Detroit. With a history dating back to 1701, it is considered "Detroit's Main Street." In 1805, Woodward officially connected to the City of Pontiac. Its route followed the route of the Saginaw Trail, a Native American trail that linked Detroit with Pontiac, Flint, Saginaw, and eventually the Straits of Mackinac through the Mackinac Trail. The first automobile was driven on Woodward Avenue on March 3, 1896. In 1909, Woodward became the first concrete paved highway in the world. And in 1913, it became a state trunk-line. Woodward Avenue not only connected two of the largest cities in SE Michigan, but over time, several other cities were established and grew along the corridor. These communities include Highland Park, Ferndale, Pleasant Ridge, Huntington Woods, Royal Oak, Berkley, Birmingham, Bloomfield Hills, and Bloomfield Township. Among Woodward Avenue's many distinctions, the nation's first four-way traffic signal was installed at the intersection of Woodward and Michigan Avenues in Detroit. Woodward Avenue had streetcar operations until 1956.

Woodward is an All-American Road in the National Scenic Byways program and has been designated a Michigan Heritage Route by MDOT.

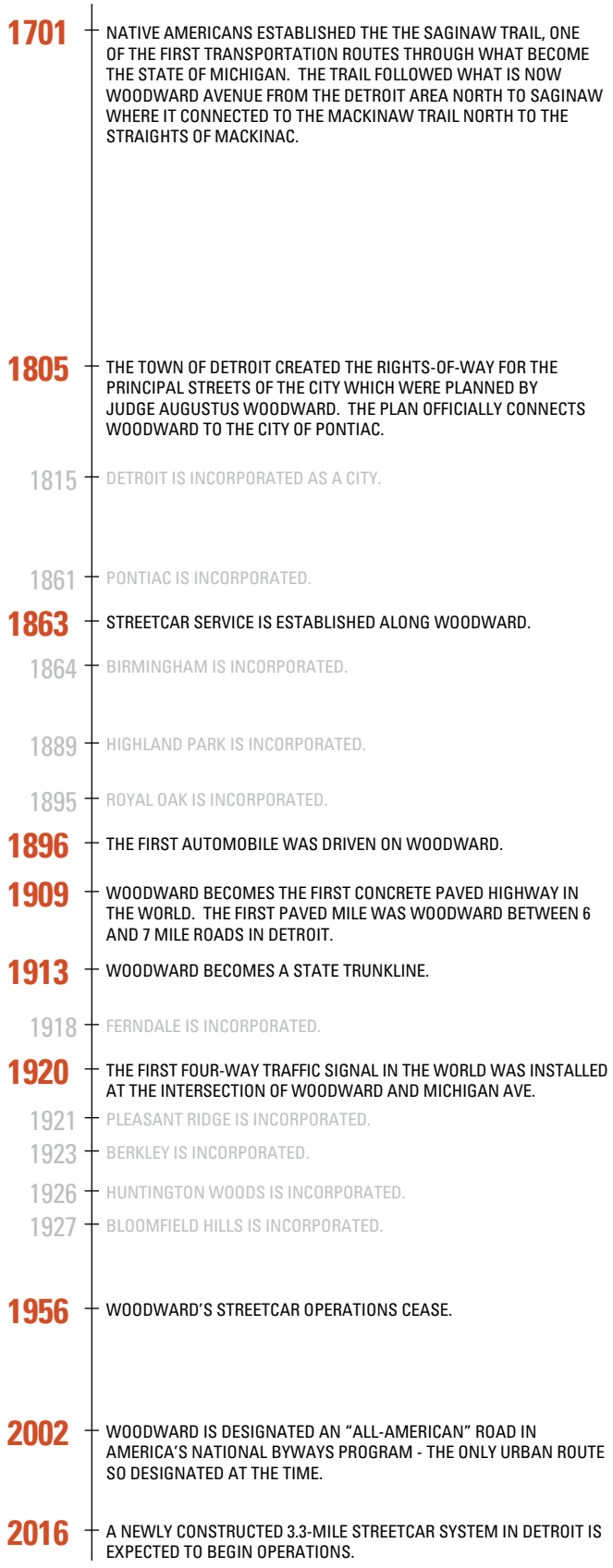


FIGURE 1-1. TIMELINE OF WOODWARD AVENUE
Sources: Michigan.gov, MDOT, M-1 RAIL

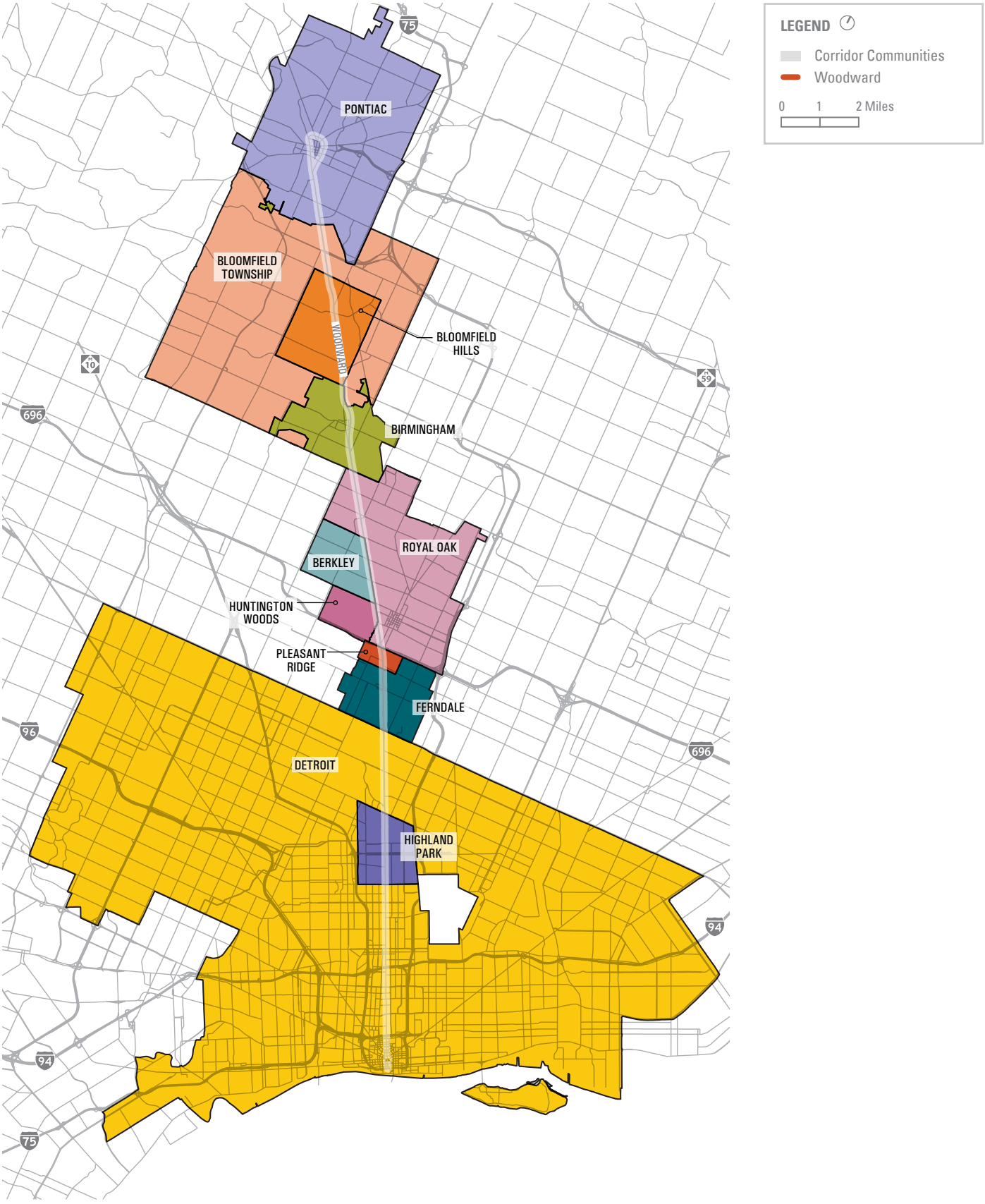


FIGURE 1-2. COMMUNITIES ALONG THE WOODWARD CORRIDOR

1.5 Purpose and Need, Goals, and Objectives

1.5.1 PURPOSE AND NEED STATEMENT

Through regional planning efforts, Woodward Avenue has been identified as the top priority for investment in an effort to improve SE Michigan's regional transit system. Based on review of existing conditions, references to SEMCOG's long-range transportation goals, and consultation with steering committee members and public feedback, the need for transit improvements in the corridor is to:

- Improve mobility options.
- Improve job access.
- Connect people with major destinations along the corridor.
- Encourage economic development opportunities along the corridor.

The Woodward AA examined transit options and recommended the alternative that was determined to best address the following goals and objectives endorsed by the Steering Committee:

- Improve mobility and reliability for the entire corridor.
- Make transit travel times and service reliability competitive with the automobile.
- Provide better connectivity to key origins and destinations.
- Provide better access to major regional employers, including reverse commute services.
- Support increased mode share of trips for transit.
- Support local and regional planning initiatives and land use strategies that aim to strengthen communities, foster economic development, and fulfill long range growth goals.

1.5.2 GOALS AND OBJECTIVES

GOALS	OBJECTIVES
Develop a transit alternative that is competitive with the automobile.	Improve transit travel times and speeds within the study area.
Provide transit capacity needed to meet future travel demand and mobility choices.	Reduce the number of transit trips that require a transfer.
Improve transit service reliability within the study area.	Improve on-time performance.
Develop a transit alternative that enhances mobility for the reverse commute market and transit-dependent populations (specifically in Detroit and Pontiac).	Increase transit accessibility.
Develop a transit system that improves connectivity between origins and key destinations and major regional employers.	Provide convenient and accessible transit service to activity centers.
Develop a transit system that supports local planning initiatives and land use strategies.	Provide transit service that can influence more compact growth patterns. (Corridor communities will vary in this area.)

1.6 Background

1.6.1 HISTORY OF TRANSIT IN SOUTHEAST MICHIGAN

Woodward Avenue has been studied for rapid transit options many times since the 1950's. Some efforts related to overarching goals and policy setting, while others consisted of corridor studies that reviewed transit modes and alignment options. One of these major efforts dates back to 1953 when the Detroit Metropolitan Area Transportation Study was completed, calling for a balanced system of highways and mass transit. In 1956 Metro Detroit streetcar ceased after 93 years of service. The last streetcar ran on the Woodward line in Downtown Detroit. In 1968, the Detroit Rapid Transit Commission published a new plan which called for a regional monorail system. 1987 marked the opening of the People Mover, an automated guide-way transit system circulating in Detroit's Central Business District; however, a comprehensive regional transit system did not materialize, and studies continued to evaluate rapid transit options.

Traditional bus service provided through the Detroit Department of Transportation (DDOT) and the SMART has served Detroit and the surrounding suburban communities in the absence of a regional rapid transit system. DDOT and SMART are the first and second largest transit providers in Michigan, respectively. However, travel times, gaps in service, and reliability make bus service noncompetitive with the automobile.

Recent studies include the Woodward Light Rail Transit (LRT) project in 2011 which did not move forward to implementation, and the M-1 Rail streetcar project, which was awarded federal environmental clearance and funding commitments in 2013 to move forward to implementation.

In December 2012, the SE Michigan Regional Transit Authority (RTA) was established by the Michigan legislature. The RTA identified four corridors for rapid transit improvements: Woodward Avenue, M-59, Michigan Avenue, and Gratiot Avenue. The Woodward Avenue AA, which commenced work prior to RTA enabling legislation, marks the first identified rapid transit project for which the RTA will be responsible for implementation.

1.6.2 ONGOING TRANSIT PROJECTS IN SOUTHEAST MICHIGAN

Ann Arbor to Detroit Commuter Rail

The Ann Arbor to Detroit commuter rail service is a project proposed in the same corridor as the Pontiac-Detroit-Chicago Amtrak line. Using existing infrastructure, the commuter rail connects Downtown Detroit to the City of Ann Arbor. SEMCOG and MDOT are working closely with the Federal Railroad Administration (FRA) and the Federal Transit Administration (FTA) to ensure that the capital improvements for both commuter and Amtrak service are coordinated. Ongoing work includes the identification and agreement with host railroads on key track improvements, refurbishment of passenger cars, acquisition of locomotives, preliminary design of stations and layover facilities, and coordination with Amtrak. The terminal station of this service is the Amtrak station at Woodward Avenue and Grand Boulevard in Detroit. This service will connect to both the proposed M-1 Rail Streetcar and any future rapid transit along Woodward.

Chicago to Detroit High Speed Rail

The Chicago to Detroit/Pontiac High Speed Intercity Passenger Rail project will upgrade 300 miles of track to accommodate trains traveling at a speed of up to 110 mph. The goal is to improve travel times and double the daily round trips between Detroit and Chicago.

M-1 RAIL Woodward Avenue Streetcar Project

The M-1 Rail streetcar is a planned urban, fixed rail circulator system connecting Downtown Detroit to Detroit's New Center area along Woodward Avenue. It would operate in mixed traffic and run from Larned Street in Downtown Detroit north to West Grand Boulevard in New Center. The route is 3.31 miles long and has 20 stations serving 12 locations. The streetcar system is envisioned to follow a side-running alignment through a majority of the corridor with transitions to center-running operations at the north and south ends. M-1 Rail will use modern vehicle technology to link cultural, entertainment, health care, sports, and educational activity centers along the corridor and address unmet higher level transit needs along Woodward.

Link Detroit Project

The Link Detroit project is a Transportation Infrastructure Generating Economic Recovery (TIGER) grant project. It includes infrastructure improvement projects aimed at connecting vibrant destinations, including the Detroit Riverwalk, Eastern Market, Midtown, and Hamtramck.

1.7 Summary of Local Plans

1.7.1 MDOT 2035 LONG-RANGE TRANSPORTATION PLAN

The long-range transportation plan for Michigan is an update to the 2005-2030 MI Transportation Plan: Moving Michigan Forward (2030 MITP.) The plan is a policy document that sets the transportation vision, goals, objectives, and strategies for the state through the 2035 horizon year. Public feedback obtained during the update process in 2012 show that Michiganders' top three transportation priorities are to:

- Maintain and preserve the existing transportation system.
- Improve public transit.
- Recognize the need for intercity rail passenger service.

1.7.2 SEMCOG 2040 LONG-RANGE TRANSPORTATION PLAN & 2008 SEMCOG REGIONAL TRANSPORTATION COORDINATING COUNCIL COMPREHENSIVE REGIONAL TRANSIT SERVICE PLAN

SEMCOG is the Metropolitan Planning Organization for member counties, cities, villages, townships, intermediate school districts, community colleges, and public universities in Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw, and Wayne counties. Woodward Avenue is identified as a regional corridor priority in SEMCOG's *Direction 2040 Long-Range Regional Transportation Plan*, including the pursuit of rapid transit implementation.

In 2013, SEMCOG unveiled the 2040 update to the *Direction 2035 Long-Range Regional Transportation Plan* (RTP). The RTP update has been shaped by looking ahead to 2040 to anticipated 21st century needs and desired outcomes for the region.

SEMCOG's Creating Success initiative lays the groundwork for that broader look, asking how will our transportation investment:

- Lead us to the greatest possible economic prosperity?
- Make our communities more desirable for ourselves and the future workers we will need for that economic prosperity?
- Maintain and enhance fiscally sustainable public services?
- Ensure reliable, quality infrastructure, particularly our transportation infrastructure?
- Preserve and enhance healthy and attractive environmental assets?
- Ensure access to services, jobs, markets, and amenities for all of us individually and the region's businesses?

Achievement of rapid transit service spanning the entire length of Woodward Avenue is viewed as an enhancement to the planned 3.3-mile Woodward Avenue Streetcar project from Downtown to New Center Detroit and aligns with the Regional Transit Coordinating Council (RTCC) 2008 Comprehensive Regional Service Plan recommendation for premium transit service on Woodward. SEMCOG's long-range goals include:

Enhance accessibility and mobility for all people.

Objectives:

- Reduce time spent traveling.
- Increase access to public transportation, consistent with the regional transit plan.
- Increase coordinated development and use of walking/biking facilities.
- Increase connectivity of transportation service across the region, and provide multimodal access to major land uses.

Strategically improve the transportation infrastructure to enhance community and economic vitality.

Objectives:

- Preserve the existing transportation system, prioritizing highway maintenance before highway expansion.
- Focus transportation investment in areas with high concentrations of people and jobs.
- Improve the efficiency and effectiveness of the transportation system.
- Increase public involvement and ensure equal access to participation in transportation decision making.
- Preserve transportation rights-of-way.

Other Regional Goals:

- Attracting and retaining a workforce for the future by linking people to education and jobs;
- Developing transportation assets (such as higher-level transit and walking/biking facilities) perceived by the knowledge-based workforce as fundamental to quality of life;
- Providing a transportation system conducive to aging in place for older adults (the region's fastest growing segment of the population);
- Stabilizing communities and neighborhoods by promoting livability and sensible development/ redevelopment;
- Encouraging land use and housing decisions that foster meaningful transportation choices by providing access to multiple modes of travel for work, school, shopping, recreational, and entertainment;
- Preserving green resources and air and water quality;
- Ensuring the region is safe and secure; and
- Making the region a place where people want to live and visit and where businesses want to invest.

1.7.3 WOODWARD AVENUE COMPLETE STREETS MASTER PLAN

The Woodward Avenue Complete Streets Master Plan initiative was started in August 2011 and has been managed by the Woodward Avenue Action Association (WA3) after receiving a grant from the Federal Highway Administration (FHWA). The Complete Streets Master Plan will ultimately align with the proposed rapid transit on Woodward Avenue by recommending a new, "complete" street design for the entire 27-mile corridor. This design recommendation will complement the existing character of Woodward Avenue while providing an environment that is safer, more livable, and welcoming for pedestrians, bicyclists, and transit users.

1.7.4 OAKLAND COUNTY TRANSPORTATION COMMITTEE

Oakland County believes that the enhancement of multi-modal public transit is an important and essential element of economic development and contributes to the improvement of the quality of life in Oakland County and the surrounding region. Living and working in Oakland County both now and in the future will be greatly enhanced with the development of a multi-modal transit system that meets the needs of all people. In December 2012, the Oakland County Transportation Committee released its Business Roundtable Annual Report which lists transportation issues and identified actions Oakland County can take to mitigate them. The commission made four transit-related recommendations.

Recommendation #1: Support the creation of the Southeast Michigan RTA.

The Southeast Michigan Regional Transit Authority (SMRTA) was established in December 2012. The transit region includes Wayne, Oakland, Macomb, and Washtenaw counties.

Recommendation #2: Create a vision for Regional Transit.

The Oakland County Executive should direct the Oakland County Planning and Economic Development Services Division to work with the Regional Transit Authority (RTA) to determine how Oakland County can best be served by public transportation with the goal to maximize economic development, attract high growth companies and draw a young, talented, and educated workforce in its borders. Short- and long-term strategies to achieve that goal will act as a blueprint for the Oakland County members of the RTA. The plan that emerges should:

- Identify activity centers to be connected by public transit.
- Establish strategies to ensure access to employment and educational opportunities for all county residents.
- Provide special transportation service support to those who need transit. The effort should create a vision that clarifies what kind of transit system Oakland County wants, establish achievable and realistic strategies to achieve this vision, and ensure that the vision supplements and complements the plans developed by the RTA.

Recommendation #3: Support the Woodward AA project.

Oakland County is supportive of the Woodward AA as explicitly listed in December 2012 Oakland County transportation Committee recommendations. Oakland County communities have also expressed support through city council resolutions.

Recommendation #4: Support a full" All-In" (no opt-out) funding model for SMART.

With all Oakland County communities participating in the millage, SMART would see an 80% increase in funding of approximately $13.2 million and have the opportunity to build a truly comprehensive multi-modal regional service program for the residents of Oakland County.

1.7.5 THE GREATER DOWNTOWN TRANSIT-ORIENTED DEVELOPMENT (TOD) STRATEGY

The Greater Downtown TOD Strategy was created in support of the M-1 Rail streetcar project on Woodward Avenue between Jefferson Avenue and Grand Boulevard. The M-1 Rail streetcar provides the opportunity to connect major destinations, employment, educational and medical centers in the Greater Downtown to neighborhoods, improving access to jobs and services for residents along the corridor, and offering a new opportunity to live in a walkable environment. The Greater Downtown TOD Strategy seeks to leverage the transit investment to create a framework to guide future development in support of the creation of more dense, vibrant, and walkable districts and neighborhoods.

The success of the Greater Downtown TOD Strategy is predicated on the collaboration of a diverse range of participants that share the responsibility for shaping the vision for the corridor and in creating a positive community impact in response to transit investment. The process was guided by the Greater Downtown TOD Planning Group, made up of members from the public, private and philanthropic sectors, and led by the Detroit Economic Growth Corporation and Downtown Detroit Partnership/M-1 Rail. Through interviews, workshops, critiques of the work, residents and stakeholders participated in the authorship of the vision, principles, and action plans that will guide investment and development throughout their communities.

1.7.6 SOUTH OAKLAND COUNTY TRANSIT-ORIENTED DEVELOPMENT (TOD) STUDY AND CODE

In anticipation of enhanced bus rapid transit (BRT) service that is planned along Woodward Avenue in Detroit, WA3 developed a land use and redevelopment plan to complement anticipated transit service in southern Oakland County. This "pre-planning" document includes an audit of the comprehensive plans and zoning ordinances of five cities along the corridor in southern Oakland County. These included the cities of Ferndale, Huntington Woods, Berkley, Royal Oak, and Birmingham. The study helped to identify changes needed to achieve a unified vision for transit along the corridor, help improve planning along the Woodward corridor utilizing Complete Streets methodology, and to maximize development associated with potential future transit. The study includes the following key elements:

1. Identification of potential transit nodes and stations that are generally consistent with the LPA recommendations (see Transit Framework Map). Key stop locations were suggested at Maple Road, 13 Mile Road, I-696, and 8 Mile Road.
2. TOD principles to guide participating cities as they update their master plans and zoning ordinances.
3. Complete Streets recommendations to improve walking and biking along the corridor, including suggested pedestrian crossings and design options for the Woodward Avenue right-of-way.
4. An initial framework for transit that will coordinate with the Woodward Complete Streets project and transform the right-of-way to be more supportive of transit, walking, and biking.
5. A model TOD overlay code to provide the participating cities with transit-friendly zoning language to help attract the type of redevelopment desired.

1.7.7 CORRIDOR COMMUNITIES

Detroit

The City of Detroit released the Detroit Future City (DFC) Strategic Framework Plan in 2013 following a multi-year planning effort. The DFC Strategic Framework Plan articulates a shared vision for Detroit's future, recommending specific actions related to economic growth, land/building resources, city systems, land use, neighborhoods, and civic engagement. In 2014, through private, public, and foundation support, the DFC Implementation Office was created to ensure the successful execution of the vision created in the DFC Strategic Framework Plan. Several initiatives under the "city systems" umbrella of the DFC Implementation Office specifically address the critical role of transit within the city and region. The DFC Implementation Office is working toward the development of a transit hierarchy that offers fast, efficient and convenient transportation between neighborhoods and job centers, which align with the other elements of the DFC Strategic Framework Plan.

Highland Park

The City of Highland Park updated its Master Plan in 2010, which places an emphasis on fostering TOD along Woodward Avenue within a quarter-mile of transit stations as planned for during the Woodward Light Rail study. While the recommendations of that study have not been implemented, the LPA aligns with Highland Park's goals for TOD and should provide a similar impact toward the development of those properties. The Master Plan also recommends formal Complete Streets policies and guidelines along Woodward Avenue and other street typologies within the city.

Ferndale

The Ferndale Master Plan calls for enhancement of the existing transportation system to develop a safe and diverse multi-modal system, specifically supporting mass transit, non-motorized transportation, and TOD along Woodward Avenue and 9 Mile Road. Ferndale was very involved in the Woodward Avenue Complete Streets Master Plan. The City endorsed the Master Plan's recommendations to remove one traffic lane in each direction with the space being repurposed for wider sidewalks and a two-way cycle track along both sides of Woodward. Well-defined and more frequent mid-block pedestrian crossings are also recommended. Ferndale has adopted a Complete Streets and Non-Motorized Network Plan. The Plan's guiding principle is for equitable design for all types of transportation users and improved connectivity for all modes of transportation. The Plan promotes a Complete Streets philosophy for the entire Woodward corridor in the city with a series of recommendations to improve pedestrian and bicycle connections to, along and across Woodward Avenue and future transit stations.

Pleasant Ridge

The Pleasant Ridge Master Plan includes planned land uses along Woodward Avenue that are conducive to future transit. The future land use map indicates a blending of residential uses into commercial uses at the northernmost section of the city. This area is identified as having a relatively high redevelopment potential for multi-level storefronts with upper level residential.

Royal Oak

Royal Oak's 2012 Master Plan promotes a pedestrian-friendly environment and encourages TOD principles. The city's plans call for a streetcar or rail system that extends from Woodward to Main Street in Downtown Royal Oak. The Plan promotes public transit and notes its importance to the city's future, especially the downtown. The City of Royal Oak had long planned for transit on Main Street, but understands that an alignment along Washington could be valuable, particularly with a more direct and rapid route off of Woodward Avenue.

Huntington Woods

The Huntington Woods Master Plan endorses TOD along Woodward Avenue. The city envisions Woodward serving as a "front door" to the community, with redevelopment mixing townhomes and condominiums, green space, offices, and small-scale retail uses. One particular deficiency stated in the plan is the lack of senior living, which the city hopes to solve with second and third story residential units above storefronts along Woodward.

Berkley

In its Master Plan, Berkley strongly endorses TOD strategies and transit along Woodward. Although Berkley's downtown area is planned on 12 Mile Road west of Woodward, the Plan also includes strategies to strengthen Berkley's commercial presence near Catalpa Drive, the half-mile road between 11 Mile and 12 Mile Roads.

Birmingham

Although the City of Birmingham does not have a comprehensive land use plan, its Triangle District Plan and Downtown Plan provide a solid foundation for TOD and mixed-use development along Woodward Avenue and in the blocks to the east and west. Both plans, along with a new Multi-Modal Plan, call for improvements to the pedestrian and bicycle infrastructure along Woodward. The city is completing a corridor plan for the city's South Gateway, along Woodward from 14 Mile Road north to Lincoln Street. This plan recommends TOD nodes at 14 Mile and Lincoln to support future transit stations. Redevelopment of the rest of the corridor into denser, walkable places is also proposed.

Bloomfield Hills

The 2009 Bloomfield Hills Master Plan identifies future BRT as a valuable asset. The Master Plan calls for "arterial BRT along Woodward by 2015 with the development of streetcar or light rail transit over the next 25 years." It also voices the City's support of regional transit efforts as the demand is evaluated over time. The Plan notes that if Bloomfield Hills adds SMART service and rapid transit stops, "the need for safety paths or sidewalks in the vicinity should be evaluated to improve convenience and safety for users."

Bloomfield Township

Bloomfield Township considers transit as an important asset to its transportation system. The municipality promotes TOD in their Master Plan to help foster a more livable and walkable community. The Plan states that future land use decisions should consider enhancing the transit-friendly environment through the adoption of TOD standards around business centers and transit locations.

Pontiac

The Pontiac Master Plan identifies the need to enhance walkability in the city through pedestrian-friendly street profiles and standards. The Pontiac Livability Study shows the possibility to convert a one-way loop in downtown into a two-way loop with a vastly improved system for pedestrians and bicyclists, fostering better walkability downtown and connectivity to the BRT system.

1.8 Federal New Starts, Small Starts, and NEPA Processes

1.8.1 NEW STARTS VERSUS SMALL STARTS

The United States Department of Transportation FTA Capital Program (Section 5309) provides funding for new railway or busway projects, the improvement and maintenance of existing rail and other fixed guideway systems that are more than seven years old, and the upgrading of bus systems.

The resulting Woodward LPA will compete with projects from cities across the United States for Section 5309 funding. The LPA will be evaluated to determine the appropriate funding source for which an application should be submitted. There are three sources of funding for transit systems under the FTA Capital Program: News Starts, Small Starts, and Very Small Starts. These funding sources are delineated by the degree of new capital infrastructure and improvements needed to make the system operational. New Starts projects generally require the largest capital investment, Small Starts requires a lesser degree of investment, and Very Small Starts require the least amount of new capital infrastructure and improvements.

1.8.2 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

The National Environmental Policy Act requires federal agencies to consider the impacts of federal actions on both the human and natural environments. Once an LPA is recommended to FTA on behalf of the SE Michigan Transit Authority, further analysis under FTA guidelines will determine the degree of environmental analysis that will be needed to satisfy NEPA requirements.

Typical areas of analysis explored in the NEPA process include air quality, hazardous materials, historic and archaeological resources, environmental justice, and noise and vibration.

2.0 Stakeholder Engagement and Public Outreach

SEMCOG recognizes the importance of optimizing existing community relationships to encourage meaningful public engagement. This section summarizes interactions with key stakeholders and the general public throughout the AA process from July 2012 to December 2013.

2.1 Stakeholder Engagement

Stakeholder engagement included a series of public workshops throughout the AA process. In addition, meetings were held with key stakeholders, such as institutions, major employers, city boards and commissions, transit and road agency staff, and the M-1 Rail team. Monthly Steering Committee meetings were held, including a bus tour of the Cleveland Health Line and a separate tour of the Woodward corridor to better understand the different alignment options. This section describes the stakeholder engagement process, a summary of the input received, and a segment-by-segment review of the input on the LPA by community leaders.

WOODWARD AVENUE RAPID TRANSIT ALTERNATIVES ANALYSIS (AA) STEERING COMMITTEE

The Woodward AA Steering Committee is an advisory body that has guided the AA process towards the development of the LPA that meets the transit needs of the Woodward corridor and improves transit in the SE Michigan region. The Woodward LPA is comprised of a preferred mode and alignment, and preliminary cross sections and station locations that the Steering Committee will recommend to the RTA.

The Committee is comprised of representatives from 11 study area communities, two non-profit organizations, and local, regional, and state transportation agencies. Study area communities include: Detroit, Highland Park, Ferndale, Pleasant Ridge, Huntington Woods, Royal Oak, Berkley, Birmingham, Bloomfield Township, Bloomfield Hills, and Pontiac. SEMCOG (the project sponsor), MDOT, DDOT, SMART and DTC represent the transportation agency representation on the Steering Committee. WA3 and the Michigan Suburbs Alliance are (MSA) are non-profit partners participating on the committee. Throughout the AA process, the Steering Committee convened monthly to review project updates from SEMCOG and provide feedback on technical presentations.

In addition to its role as an advisory body to SEMCOG, a key mission of the Steering Committee was to arm decision makers within corridor communities with information that supports educated decision making on behalf of their constituents. Part of the Committee's educational process centered on the group understanding the benefits of rapid transit. A field trip to the Cleveland, Ohio Health Line BRT system in December 2012 offered committee members a real world rapid transit system experience. The committee attended a presentation by the Greater Cleveland RTA CEO/General Manager, Joseph Calabrese, and the Deputy Manager of Engineering and Project Management, Michael Schipper, and had the experience of riding a BRT vehicle on the 6.8 mile Euclid corridor from downtown to East Cleveland. As a result, the committee developed a keen understanding of rapid transit's benefits and were more equipped to inform their constituents and decision makers about the project.

Given the Committee's enthusiasm for the project, coupled with the group's knowledge of the corridor and community networks, it was determined that the Committee's input into station location development would bring great benefit to the study. As such, the Committee was regularly engaged in exercises that broadened their knowledge of station location development considerations. Exercises included a bus tour of the Woodward corridor, a station location prioritization exercise, and a transit rider profile identification exercise.

MICHIGAN DEPARTMENT OF TRANSPORTATION (MDOT)

MDOT is the owner and operator of Woodward Avenue roadway and median from I-75 in downtown Detroit to the Woodward Loop in Pontiac, MI. Collaboration with MDOT was ongoing throughout the AA process and it will continue as the project moves forward into future phases. The median on Woodward was identified by many corridor municipalities as a symbol of community identity. Though MDOT owns the median, local communities typically maintain it, including investments in landscaping improvements. Per MDOT's recommendation local communities were consulted extensively in an effort to reconcile communities' transportation and cultural needs with the design and operational needs of the rapid transit system proposed along Woodward.

TRANSPORTATION RIDERS UNITED (TRU)

TRU is a non-profit organization committed to promoting transit in the Detroit metropolitan area. TRU recognizes the need for high-quality transit as a critical component to that system. While a formal TRU campaign was not launched for the Woodward AA, the organization's assistance was critical to reaching transit dependent riders in the Detroit metropolitan area with information about the project. TRU included public meeting announcements in their monthly electronic and standard mail newsletters. TRU also activated its network of volunteers to distribute flyers and engage the public regarding the project at targeted locations within the community.

IMAGE 2-1. CLEVELAND BUS TOUR
Source: Parsons Brinckerhoff

IMAGE 2-2. CLEVELAND BUS TOUR
Source: Parsons Brinckerhoff

IMAGE 2-3. CLEVELAND BUS TOUR
Source: Parsons Brinckerhoff

HENRY FORD HOSPITAL

Throughout the AA process, an effort was made to consider the consistency of the project's development with planned land development in the study area, including Henry Ford Hospital's recent $35-million expansion in Detroit. The Henry Ford Hospital Level I Trauma Center in Detroit is the hospital's flagship facility. The hospital is located at the northwest intersection of the M-10 Service Drive and Grand Boulevard. In 2013, meetings with Henry Ford Hospital were conducted to better understand their development visions and to coordinate future rapid transit facilities that support their efforts.

BEAUMONT HOSPITAL

Discussions with stakeholders at Royal Oak Beaumont Hospital, which is located at Woodward and 13 Mile Road, focused on the location of possible transit stations in proximity to the Hospital. The main concern was how transit stops could provide service to both hospital staff and visitors. Beaumont Hospital also owns the Northwood Shopping Center at the southwest corner of Woodward Avenue and 13 Mile Road, which is planned for major redevelopment in the next two to five years. Discussions revolved around the possibility of designing the redevelopment to take advantage of a transit station along Woodward. One particular concern raised was the possibility of private parking structures located on the hospital grounds being used as an informal park-and-ride (P&R) for transit users looking for free parking.

ST. JOSEPH MERCY OAKLAND

St. Joseph Mercy Oakland in Pontiac is completing a major expansion and renovation of its campus. Major projects included a reconstructed entrance, new buildings, new parking structures on Woodward and Martin Luther King Boulevard, a pedestrian bridge over Woodward, and major landscaping enhancements along the Woodward median. Those involved in the discussion noted many of the patients and visitors of St. Joseph Mercy Oakland are transit dependent. A station as close to the entrance of the hospital as possible was preferred to benefit these visitors and the institution's many employees.

BIRMINGHAM AND BLOOMFIELD CHAMBER OF COMMERCE AND PRINCIPAL SHOPPING DISTRICT

Presentations to the Birmingham Chamber of Commerce took place relatively early in the Woodward AA process. The goal of the presentation was to familiarize them with rapid transit and the AA process. Additionally, the presentation provided information about the potential economic benefits rapid transit can provide to businesses near Woodward in the Birmingham and Bloomfield areas. These discussions led to a general consensus of support, with most comments aimed at the process of determining station locations and how businesses along Woodward would be impacted during the construction phase. There were also several comments on the importance of security at the stations and in the vehicles.

ROAD COMMISSION OF OAKLAND COUNTY

A presentation of the LPA was made to staff of the Road Commission of Oakland County. Although the Road Commission showed overwhelming support for the project, a few concerns arose, such as the impact of traffic operations on cross streets in their jurisdiction, changes to Michigan left turns and crossovers, and how the signal system would adapt to reduce conflicts between the rapid transit system and the signals along Woodward.

COMMUNITY BODIES

In November 2013 and May 2014, SEMCOG, in coordination with Woodward AA Steering Committee members, met with planning staff, local legislative bodies, and elected officials to provide project development updates to present and receive feedback on alignments, station locations, and cross sections under consideration. Community input was integrated into presentation materials that were shared with the public at the December 2013 series of public meetings, and was ultimately considered as part of the LPA.

Based on the meetings with community leaders, key issues by segment are listed below. These issues ranged from comments on alignment, station locations, cross sections, and topics to be addressed in the upcoming Environmental Assessment (EA) and engineering phase.

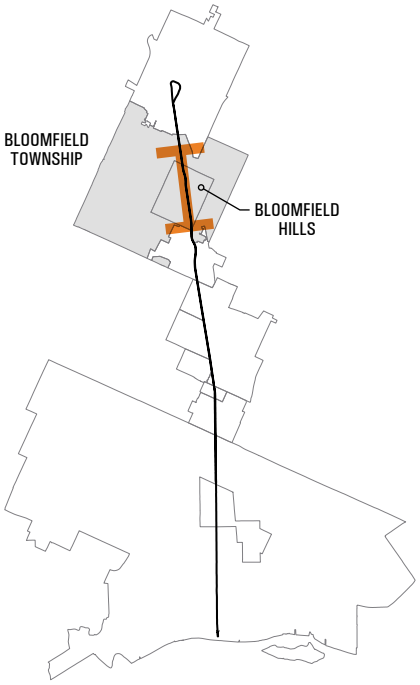
NORTH OF SQUARE LAKE TO DOWNTOWN PONTIAC

ALIGNMENT	The LPA alignment runs up Woodward Avenue to the downtown and then loops through the downtown. Two options are shown. The first alignment option goes north along Woodward Avenue, heading west a Water Street and then north on Saginaw Street to Lawrence Street. The route then heads west on Lawrence Street until connecting with southbound Woodward Avenue. The second alignment option goes north along northbound Woodward Avenue before heading west on Pike Street connecting directly with southbound Woodward Avenue after stopping at the downtown Pontiac station.
STATIONS	Three potential stations are shown for this segment • St. Joseph Mercy Oakland Hospital: Representatives noted many of the patients and visitors of Pontiac St. Joseph Mercy are transit dependent. A station as close to the entrance of the hospital as possible would be a huge benefit to those visitors dependent upon transit. • Downtown Pontiac: A downtown station is integral to the revitalization of downtown Pontiac. • Pontiac Amtrak Station: This station is within walking distance of the downtown, but a separate station may be desirable. In addition, there is a considerable amount of land on the west side of Woodward Avenue just north of the station that could be used for a P&R.
CROSS SECTION	The cross section for Pontiac includes a shared BRT lane on both sides of the median from Square Lake Road to South Boulevard. North of South Boulevard to the Pontiac Loop, the BRT has a dedicated lane on each side of the median. The Loop portion of the route has a dedicated BRT lane to the left of one way traffic. As previously mentioned, the one way traffic along the Pontiac Loop may change to incorporate pedestrian and bicycle friendly infrastructure.
KEY TOPICS TO BE ADDRESSED IN THE EA	• Strong desire that rapid transit extends to downtown Pontiac and does not stop to the south • Consideration that the rapid transit in downtown Pontiac will take into account the redesign of the loop around downtown Pontiac.

Pontiac representatives view the BRT as an important catalyst for downtown revitalization, and one of the main ingredients to their revitalization plan. There was strong preference that BRT must extend into Pontiac and not end south of the city.

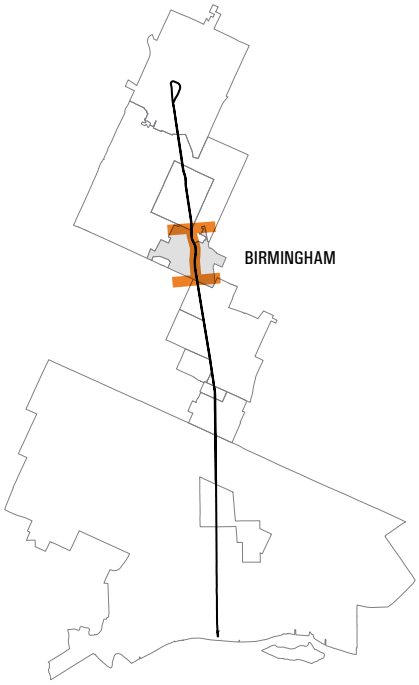
QUARTON ROAD TO SQUARE LAKE ROAD (BLOOMFIELD HILLS AND BLOOMFIELD TOWNSHIP)

ALIGNMENT	The only alignment considered was the "mainline" (all Woodward) option.
STATIONS	Two stations are shown in the LPA for this segment, Long Lake Road and Square Lake Road. Other potential locations were also mentioned by residents and the city's many institutions along Woodward. For example, some church leaders were curious about the possibility of a small Sunday morning only stop near the churches at the corner of Woodward and Cranbrook Road. There was some interest by the Cranbrook Academy (see **Section 4.3.3** for a description of the potential station) either for a future stop or a shuttle to the most convenient stop for students, visitors, and staff. • Long Lake Road: Representatives of the City of Bloomfield Hills were open to discussing a station near Long Lake Road, with the understanding that some pedestrian improvements immediately around the station area may be necessary to improve access. Additionally, this station would serve as the connecting station to a potential Cranbrook Academy shuttle. • Square Lake Road: A station is shown at the north side of Square Lake Road. This area lacks much TOD density, but there are some opportunities to develop some vacant sites and underutilized parking lots and older one-story shopping centers with new, denser TOD scale development. Square Lake also directly connects with heavy traveled I-75. Ridership forecasts showed a strong demand for a P&R at this location. A combination of more TOD development and P&R facilities could significantly increase transit ridership. The established low density single family neighborhoods can be expected to scrutinize the design aspects to ensure the township benefits.
CROSS SECTION	Both communities and the Road Commission for Oakland County understood that one reason to show the BRT would not have an exclusive lane is because reduction on Woodward would lead to major backups on cross streets.
KEY TOPICS TO BE ADDRESSED IN THE EA	• Impact of rapid transit on the traffic operations along Woodward Avenue at major crossing streets • Potential P&R size and locations along Woodward Avenue • Preservation of median, green space, and landscaping • Impacts of any sidewalks to serve transit • Design of transit stops and locations along Woodward Avenue



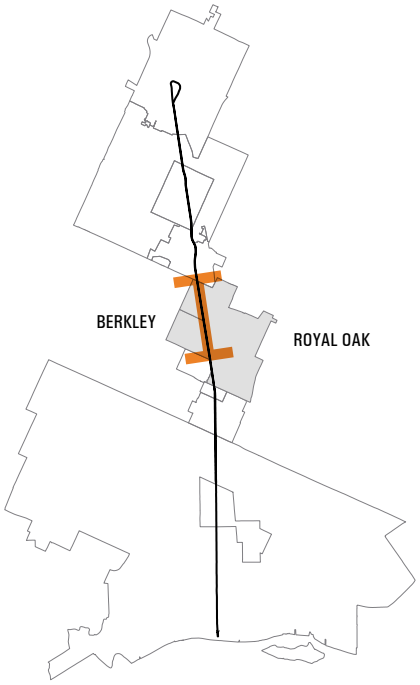
Both communities generally supported rapid transit along Woodward Avenue. A main comment was the accessibility to stations and crossing Woodward for pedestrians and bicyclists. Bloomfield Township representatives were particularly interested in discussing potential pedestrian crossings. Bloomfield Township representatives also discussed the potential of a P&R and TOD on several unused parcels at the northwest corner of Square Lake and Woodward.

14 MILE ROAD TO QUARTON ROAD (BIRMINGHAM)



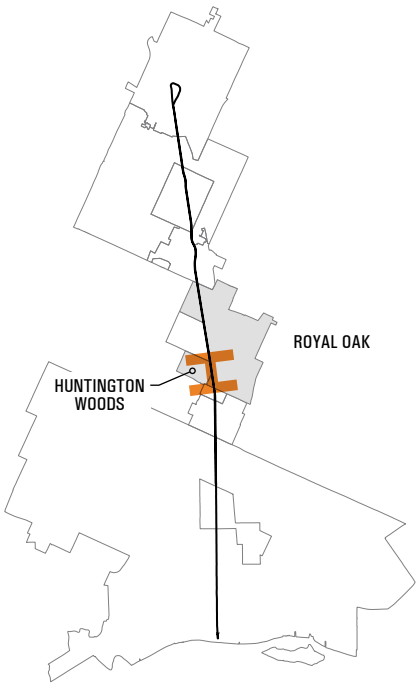
ALIGNMENT	In Birmingham, the only alignment studied was the "mainline" (all Woodward) option. The public inquired about serving the Troy/ Birmingham Transit center either directly (too far away) or with shuttles, and some suggested routing through downtown but that was not moved forward.
STATIONS	The drawings show a station at Maple (within a few blocks and likely south of Maple but north of Bowers), with potential stations at Oak (or Oak to Quarton) and near 14 Mile Road. The Oak and 14 Mile Road stations are somewhat dependent upon additional ridership forecasts during the next phase of the project (EA). Similarly, there may be some potential for that 14 Mile station to be shifted north to Lincoln Street (14.5 Mile), or a separate station added there in the future if there is significant new TOD. (Please see **Section 4.3.3**)
CROSS SECTION	Sentiment from the public, business representatives, and city officials was mixed on the cross section. Many preferred that the rapid transit run down the center of the existing median to minimize conflicts with traffic using the Michigan U-turns (**see illustration on page 24**). That cross section also would retain the number of traffic lanes that many felt are needed to accommodate the traffic volumes along Woodward and the major cross streets. Others felt the green space and landscaping provided by the median is very important and preferred a conversion of the current vehicle lane adjacent to the median be converted to an exclusive transit lane (no change in the median width but one less traffic lane). There were also opinions similar to those in Ferndale, Berkley and Royal Oak that a median center running cross section would be preferred if some of the lost green space was "restored' by converting the traffic lane adjacent to the median into a wider median along the rapid transit lanes (as shown in the sketch). Others in the city also endorsed the median center option but preferred that the outer vehicle lane in each direction be absorbed into more space for sidewalks and a bikeway along the outer edge of the Woodward right-of-way (as also shown for Ferndale). Either cross section is likely to require some consolidation and redesign of the median crossovers and signal system. The preferred cross section south of Birmingham is median center running. The preferred design north of Birmingham in Bloomfield Township/Bloomfield Hills shows the rapid transit running in the existing lane next to the median, mixed with traffic. Therefore, somewhere in Birmingham there would likely be a transition from center median to median edge. This design will be evaluated in more detail during the more refined traffic engineering during the EA process. So at this point, it might be best if Birmingham supports both cross section options moving forward, with the issues on green space and traffic noted, and that the point of transition can be studied further.
KEY TOPICS TO BE ADDRESSED IN THE EA	• Need for more consistent overhead lighting including pedestrian crossings • Access across Woodward for pedestrians to the stations and at other points • Restoration of green space and landscaping if the median width is reduced • Accommodation of bikes in the right-of-way per the city's multi-modal plan and the Woodward Complete Streets • When and how a center running rapid transit would transition to a median edge running rapid transit north of the city

11 MILE ROAD TO 14 MILE ROAD (BERKLEY, ROYAL OAK)



ALIGNMENT	Two routes were considered: • Berkley Route 1. The first option deviated west of Woodward along Coolidge Highway to the northeast corner of Berkley. The route then reconnected with Woodward along 12 mile. • Berkley Route 2. The second option deviated west of Woodward along Coolidge Highway through downtown Berkley, reconnecting with Woodward along 11 mile. Initially, some Berkley representatives requested an analysis of realignment of the proposed BRT line off of Woodward to serve downtown Berkley. Based on the agreed upon alignment evaluation criteria and reaction during a bus tour of the alignment options, the Steering Committee dismissed Berkley Route 2 through part of the downtown, reconnecting with Woodward along 11 Mile. The significant increase in travel time and modest projected ridership gained v lost riders due to the extra travel time proved to be the determining factors. After further evaluation and meetings Route 1 along 12 Mile Road was dismissed due to similar findings.
STATIONS	Once the "all Woodward" alignment in Berkley was agreed upon, discussions focused on potential station locations and cross sections. It was important to local officials to have a station in Berkley. Stations were discussed near 12 Mile Road, which is a regional east-west arterial, close to Catalpa Street (half mile road) or north of 11 Mile Road. The location would probably be south of that intersection where future TOD scale development has more potential. There is also some potential for a small P&R using one of the parking lots of a church or redevelopment of some less intensely used properties. For a more specific description of station locations in this segment, see **Section 4.3.3**.
CROSS SECTION	The preferred cross section alignment places the BRT in the center of the median. Since the median is seen as an important green space, the preference was to convert existing travel lanes adjacent to the median as "restored" green spaces, at least where acceptable traffic operations will not require four travel lanes in each direction. This wider median along the sides of the BRT lanes would also serve as a pedestrian refuge area, allow more room for stations and accommodate temporary snow storage.
KEY TOPICS TO BE ADDRESSED IN THE EA	• Potential transit link to downtown Berkley • Location of the station • Pedestrian crossings • Mitigation of the lost green space • Preservation of median adjacent to rapid transit lanes • Beaumont Hospital concerned with informal P&R at their existing parking structures and impact on current patients and visitors

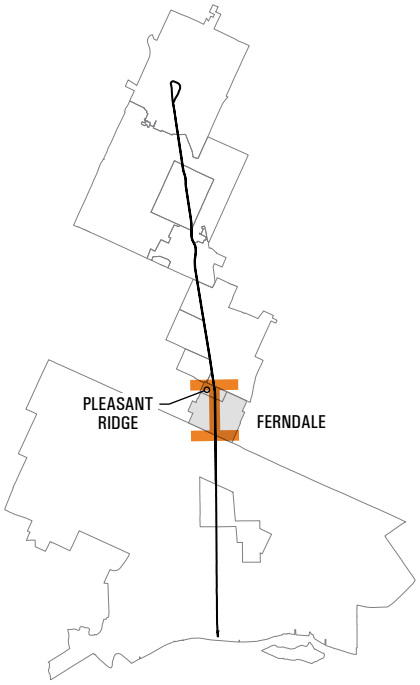
I-696 TO 11 MILE ROAD (ROYAL OAK, HUNTINGTON WOODS)



ALIGNMENT	Alignment options in this segment spurred the most debate aside from the Detroit options. Downtown Royal Oak lies approximately 0.6 miles east of Woodward Avenue. Royal Oak has a vibrant and walkable downtown with countless restaurants, condominiums, a campus of Oakland Community College, theaters, parking structures, and major transit hub for Amtrak, taxis, and buses. Representatives of Royal Oak and other communities preferred that rapid transit directly serve Downtown Royal Oak as the area provides ample transit generators with the exception of Huntington Woods representatives, who preferred an all-Woodward alignment to provide better service to their residents. The LPA includes two potential alignments along this segment. The preference is that the rapid transit would have (1) alternating service with some vehicles staying on Woodward Avenue and (2) and others going into Downtown Royal Oak Several alignments into Downtown Royal Oak were considered. The preferred Downtown Royal Oak alignment runs north along Washington Street to Lincoln, west on Lincoln, north on Lafayette, west on Sherman to 11 Mile Road, and north to return to Woodward. This was preferred to the all-Washington to 11 Mile Road alignment option due to the concerns over traffic congestion along Washington Ave. in certain places, conflicts with angled parking north of Lincoln Street, and the frequent blockage of Washington due to the railroad crossing near the corner of Fourth St. and Washington Ave. Lafayette was also selected due to its low traffic volume and connectivity to publicly owned parking structures, which could serve as a potential P&R location. Potentially two lanes along 11 Mile Road could be dedicated to transit only.
STATIONS	Three different stations are proposed along this segment: one at 11 Mile Road, one near either the Royal Oak Transit Center or the Oakland County Community College campus, and one near the Detroit Zoo. General issues arose about station locations along Woodward between Huntington Woods and Royal Oak. • 11 Mile: A station along 11 Mile Road would allow for connectivity with the current SMART bus system. • Royal Oak Transit Center: This station would serve as the main Downtown Royal Oak station. • Detroit Zoo: The area just north of I–696, to the east of Woodward is public property owned partially by both MDOT and the Royal Oak DDA. This site is prime for redevelopment and a possible P&R station. The issue with this particular location is connectivity problems, created by the underpass near 10 Mile, to the Detroit Zoo and Huntington Woods. A station directly next to the zoo would be difficult to design.
CROSS SECTION	The preferred cross section is the BRT in the center of median.
KEY TOPICS TO BE ADDRESSED IN THE EA	• Difficulty for pedestrians crossing Woodward north of I-696. The road may need a redesign. • The City of Royal Oak strongly prefers a station in downtown Royal Oak to bypass the possibility for visitors to walk through the stable neighborhoods surrounding downtown Royal Oak. • Huntington Woods officials concerned with traffic operations along Woodward if a lane was removed for rapid transit or another purpose. • Use of Royal Oak as terminal for some trips and Pontiac for others, allowing for greater service frequency in southern half of corridor.

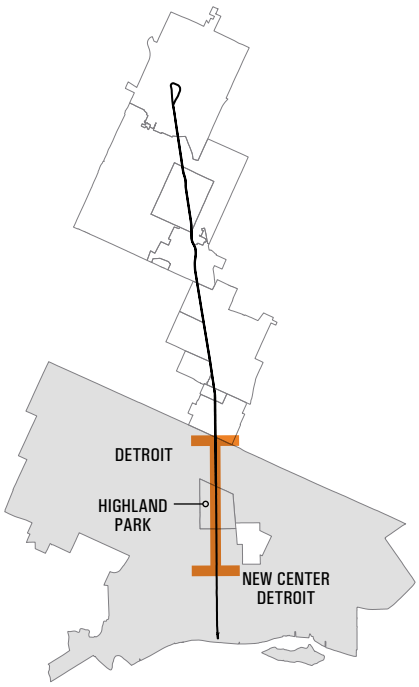
8 MILE TO I-696 (FERNDALE AND PLEASANT RIDGE)

ALIGNMENT	No off-Woodward options were identified. There was some discussion on whether the rapid transit would go under I-696 ("The Ditch"), but there was agreement that it would use the at-grade crossing.
STATIONS	The two communities agreed that one station near 9 Mile Road in this segment was preferred in terms of travel time, but there was also sentiment that another station close to Pleasant Ridge and on the north side of the 8 Mile Road overpass were desired in terms of convenient access for residents. There was a general compromise for a station on the north side of 9 Mile Road. Ferndale representatives accepted a location to the north of 9 Mile Road, but prefer that station placement be as near to 9 Mile Road as possible as it is the economic and cultural center of Ferndale's business district. Additionally, Ferndale's Master Plan identifies this intersection as a prime location for future TOD. Ferndale representatives inquired about the location of a potential station on the north side of 8 Mile Road due to the inability for residents to connect to the station proposed at the south side of 8 Mile Road because of the nature of the 8 Mile Road Bridge.
CROSS SECTION	Representatives of both Ferndale and Pleasant Ridge desire to preserve green space and the hundreds of trees and landscape investment within the Woodward Avenue median. There was a desire that any green space or landscaping lost due to BRT lanes should be mitigated. Additionally, Ferndale representatives stressed that the preservation of on-street parking along Woodward was ideal. Both communities noted that the underpass along Woodward cuts off Pleasant Ridge and Ferndale from communities and stations to the north.
KEY TOPICS TO BE ADDRESSED IN THE EA	• Lack of pedestrian connections across the I-696 interchange • Pedestrian connection issues crossing the 8 Mile Bridge • Ferndale and Pleasant Ridge concerns about any loss of landscaping to median • Replacement of any lost landscaping • Traffic operations on Woodward and the I-696 interchange • Where transition from center median running rapid transit to median edge running rapid transit to cross I-696 efficiently would occur



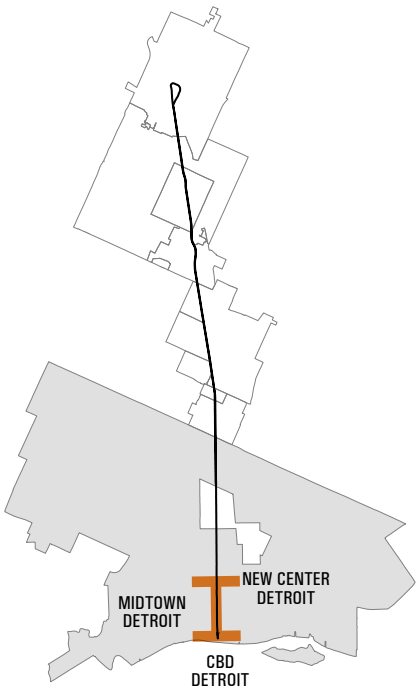
GRAND BOULEVARD TO 8 MILE ROAD (DETROIT AND HIGHLAND PARK)

ALIGNMENT	No off-Woodward alignment alternatives were identified for this segment. There was some discussion on how rapid transit vehicles would traverse the 8 Mile bridge. These discussions and ongoing technical analysis revealed that maintaining exclusive transit lanes at the innermost edge of the bridge would provide the best transition between at-grade operations.
STATIONS	Detroit and Highland Park representatives provided input on station locations based on local knowledge of ridership patterns within their respective communities. It was determined that 1-mile station spacing to maintain rapid service was a key consideration, as long as stations were located strategically at key destinations (e.g. Manchester Street, 8 Mile Road, etc.).
CROSS SECTION	Detroit and Highland Park representatives agreed that center-median operations provide the travel time advantage and a premium level of transit within this segment. The group acknowledged that further analysis of the segment between Grand Boulevard and McNichols would be necessary based on the narrow ROW and the design challenges represented by that condition. Detroit representatives agreed that the expansive median from McNichols to 8 Mile Road would be utilized more appropriately with center-median rapid transit, which would still allow this segment to maintain the existing number of travel lanes and allow ample space for planned non-motorized facilities.
KEY TOPICS TO BE ADDRESSED IN THE EA	• Cross section design through narrow (100') ROW between Grand Boulevard and McNichols Road • Station design and operations within narrow (100') ROW between Grand Boulevard and McNichols Road • Transition between at-grade operations and operations on the 8 Mile bridge



ROSA PARKS TRANSIT CENTER TO GRAND BOULEVARD (DETROIT)

ALIGNMENT	The mainline and off-Woodward alignment alternatives for this segment were presented to representatives from the City of Detroit and other area stakeholders. The discussion focused on maintaining rapid service, providing service to major downtown destinations, and limiting operational interactions with M-1 Rail streetcar. Representatives agreed that the mainline alternative would be preferred in absence of the M-1 Rail streetcar, but considering it an "existing condition", Alternative #4 was preferred by Detroit representatives.
STATIONS	Detroit representatives and area stakeholders agreed that the southern terminus of the project should be located at the Rosa Parks Transit Center due to the multi-modal connections provided at the facility. The group also recognized the desire for rapid service throughout the corridor, but agreed that the more frequent station spacing represented in this segment was necessary due to the projected ridership and the importance of providing direct access to major destinations within the Greater Downtown area.
CROSS SECTION	Detroit representatives and area stakeholders agreed that providing rapid transit service is highly dependent on the vehicles operating in exclusive lanes. It was agreed upon that exclusive lanes were possible on John R. Street, but that additional on-street parking impact analysis would be necessary to determine if exclusive lanes would be possible on Cass Avenue. The group also recognized the probability of transit vehicles operating mixed in traffic while diverting to/from Woodward Avenue on Grand Boulevard and the I-75 service drive.
KEY TOPICS TO BE ADDRESSED IN THE EA	• Quantitative on-street parking impacts on Cass Avenue and John R Street • Pedestrian and bicycle safety impacts • Downtown Loop alternatives and potential station locations • Mitigation of operating conflicts with M-1 Rail streetcar



Preliminary analysis of both median-edge and median-center cross sections provides an illustration of how the BRT vehicles would function with indirect left turns on Woodward Avenue. To limit conflicts between automobiles and the BRT vehicles, indirect left turns would be signalized in both median-edge and median-center conditions.

INDIRECT LEFT TURNS WITH MEDIAN-EDGE BRT:

A median-edge cross section would require vehicles to merge across the BRT lane into the turn lane. Vehicles would then wait at a signal - which would be activated using the same transit signal priority as conventional intersections - before crossing the second BRT lane.

INDIRECT LEFT TURNS WITH MEDIAN-CENTER BRT:

A median-center cross section would require vehicles to merge into the turn lane before waiting at a signal. Once both BRT lanes are clear, the signal would change, allowing vehicles to cross both BRT lanes and complete the indirect left turn.

2.2 Public Input

Throughout the AA process, several series of public meetings were held to engage residents of corridor communities. The primary goals of the public meetings were to 1) inform as many members of the public as possible about the project and 2) to obtain targeted public feedback on project elements such as evaluation criteria, modes, alignments, station locations, and cross sections under consideration.

PUBLIC MEETINGS

Three series of public meetings were held in December 2012, April 2013, and December 2013 in support of these goals. A combination open house/presentation format was utilized at meetings to encourage one-on-one engagement between members of the public and the project team. The open house format portion occurred during the first 30 minutes of the meeting with exhibits positioned around the perimeter of each meeting room. Attending project team members were available to answer questions. The presentation portion of the meeting occurred following the 30 minutes of engagement with project team members. Q & A sessions occurred after the formal presentation.

In total, 18 public meetings were hosted at various venues along the corridor, such as community centers, hospitals, libraries, and local churches. Approximately 800 attendees participated in the public meeting series.

OUTREACH

In order to promote the public meetings held in December 2012, April 2013, and December 2013, an intensive public relations effort was undertaken to inform the maximum number of people about the Woodward AA study. Outreach efforts for each of the three series of meetings included:

Flyer Distribution

Flyers were distributed at key locations throughout communities along the corridor in anticipation of public meetings. Churches, coffee shops, community centers, transit centers, libraries, senior housing, and civic buildings are examples of locations used for flyer distribution.

Postcard Mailing

Save-the-date postcards were mailed to approximately 800 members of the public in Detroit and Highland Park who had previously attended meetings for the Woodward Avenue Light Rail Transit project. This effort aimed to reach transit dependent and low income populations in those communities.

IMAGE 2-4. PUBLIC MEETING IN BERKLEY
Source: Parsons Brinckerhoff

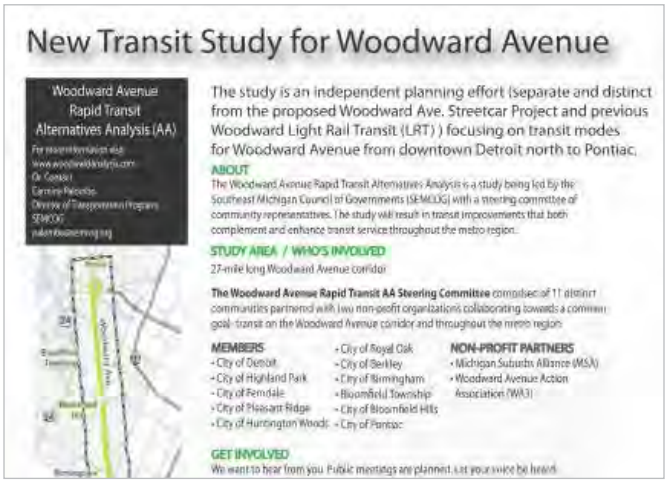


IMAGE 2-5. FLYER FOR PUBLIC MEETING
Source: Parsons Brinckerhoff

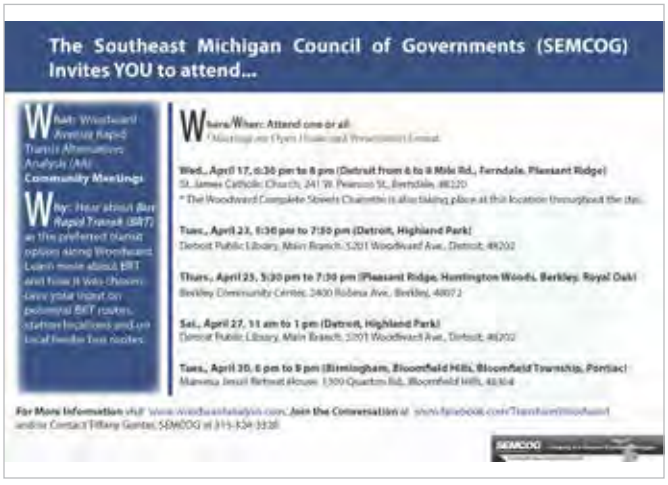


IMAGE 2-6. POSTCARD FOR PUBLIC MEETING
Source: Parsons Brinckerhoff

Public Service Announcement

A public service announcement (PSA) was produced for the December 2013 series of public meetings in a targeted effort to reach low income and transit dependent populations. The PSA detailed upcoming public meetings and offered an introduction to BRT, its characteristics and benefits. Airings of the PSA were confirmed on public access channels in the cities of Detroit and Pontiac, the communities with the largest transit dependent populations along the Woodward corridor. The PSA was distributed to public access channels in all corridor communities.

Press Release

SEMCOG issued formal press releases for all public meetings.

Print Media

Interviews, articles, and calendar listings were used to promote public meetings through the use of 15+ print media outlets.

News Media

SEMCOG participated in interviews with multiple news and radio stations throughout the Detroit metro area in anticipation of public meetings.

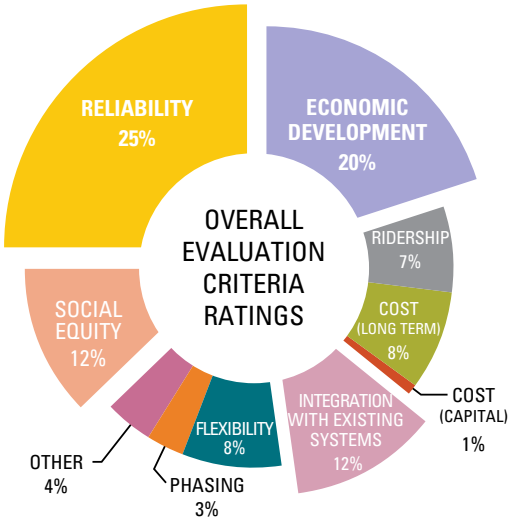
PUBLIC COMMENTS

SEMCOG collected project related public comments through various avenues. Comment cards were available at all 18 public meetings for participants to submit their thoughts and concerns. Additionally, public meeting Q & A sessions provided an opportunity for attendees to publicly voice their concerns to SEMCOG as well as other meeting participants.

Beyond meeting venues, SEMCOG received public comments through online submissions at the project website (www.woodwardanalysis.com) and the project social media page (www.facebook.transformwoodward.com). The SEMCOG project manager's contact information was advertised on all flyers and press releases distributed for the study. As a result, SEMCOG also received phone calls and emails with comment and question submissions.

Public comments in the Woodward AA were used to balance technical outputs with real world experiences of the public, Woodward's everyday users. Public comments were especially important in considerations for preliminary station location placement, off-Woodward alignment options, and cross sections detailing the physical placement of BRT, automobiles, parking, and bicyclists within Woodward right-of-way.

FIGURE 2-1. EVALUATION CRITERIA RATINGS BY PUBLIC INPUT IN DECEMBER 2012 MEETINGS



PARTICIPANT COMMENTS FROM PUBLIC MEETINGS

3.0 Existing Conditions

Detroit is the only major city in the United States without a rapid transit system in its metropolitan area.

3.1 Demographics

3.1.1 POPULATION

The study area corridor is generally bound by a one-mile buffer on either side of Woodward Avenue. According to the 2010 Census, the combined population for study area corridor is 266,793. **Figure 3-1** shows residential population in the corridor per community.

FIGURE 3-1. POPULATION IN THE CORRIDOR BY COMMUNITY, 2010

Source: 2010 Census

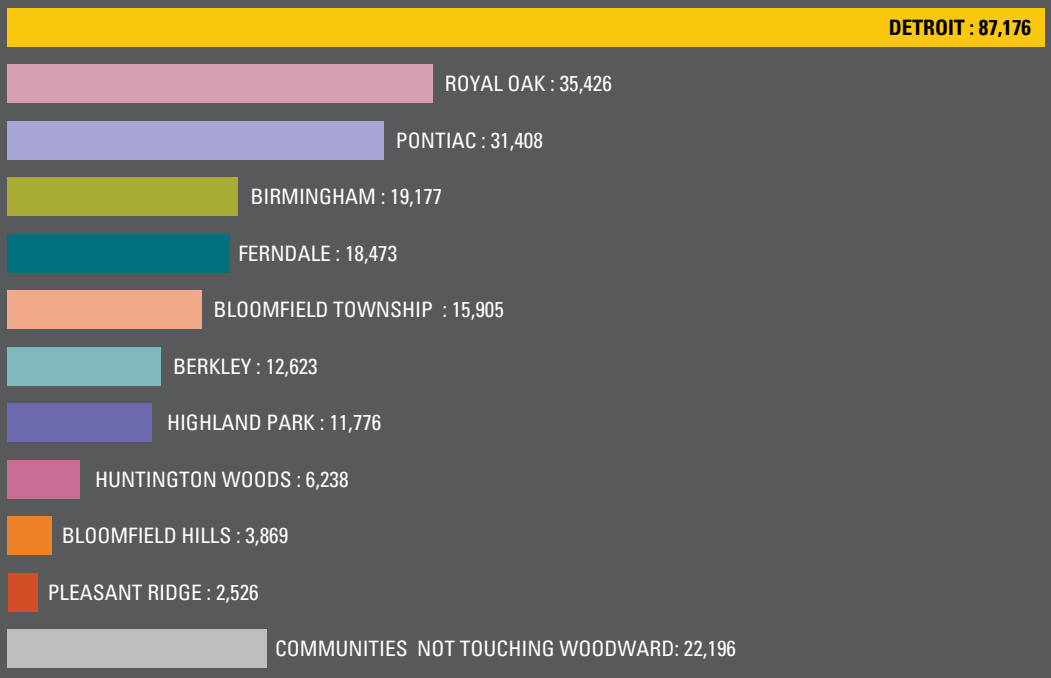


Figure 3-2 shows residential population density per square mile. The highest concentrations of residents along the corridor are in Detroit's three core districts – the Central Business District (CBD) (19,690 people/sq. mi.), Midtown (16,452 people/sq. mi.), and New Center (14,796 people/sq. mi.) – which are considered part of the Greater Downtown area. The population density in the Greater Downtown can be greatly attributed to the presence of major anchor institutions, cultural attractions, and a fast rate of recent development. While the City of Detroit experienced a 25 percent population loss between 2000 and 2010, the Greater Downtown population declined at only half that rate, with some areas experiencing population gain.

A high population density also exists in Downtown Royal Oak (9,961 people/sq. mi.) as well as moderate density levels near Downtown Ferndale, Downtown Birmingham, and Downtown Pontiac.

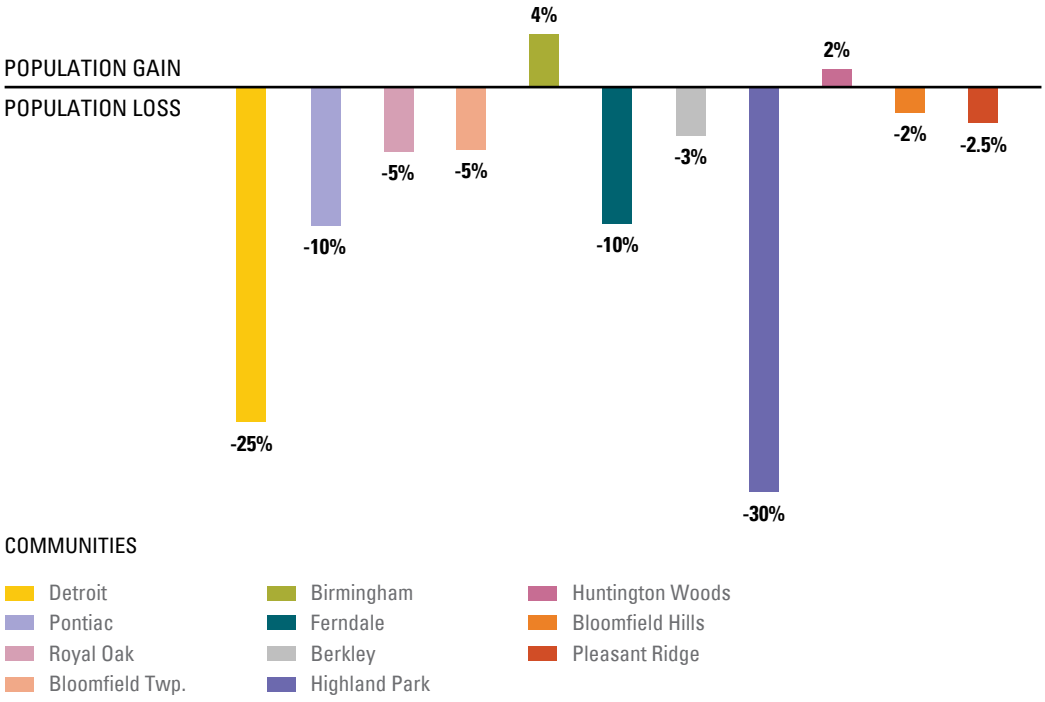
FIGURE 3-2. RESIDENTIAL POPULATION DENSITY

Source: 2010 Census

A comparison of Census 2000 and 2010 data offers insight into the population loss experienced by corridor communities over the ten year period. Detroit and Highland Park encountered the most acute population loss at 25 and 30 percent, respectively. Both Ferndale and Pontiac lost 10 percent of their populations, while Huntington Woods and Birmingham gained population. As a community that experienced population loss, the City of Detroit has responded positively to this challenge by refocusing resources in ways that support a brighter future for the city. For example, the city initiated the *Detroit Future City Strategic Framework Plan*[X] effort in 2010 through the Detroit Works Project. Detroit Future City is a living long-range planning document intended to guide decision-making for Detroit's future. It offers innovative strategies to achieve an efficient and sustainable city and improve the quality of both life and business in Detroit. Local businesses and philanthropic institutions have come together in providing support for the revitalization of Detroit and its surrounding areas. As of January 2013, the Kresge Foundation has committed $150 million to assist in the implementation of the *Detroit Future City Strategic Framework Plan*.

[3] The Detroit Future City framework plan, implementation projects, and priorities can be viewed at www.detroitfuturecity.com.

FIGURE 3-3. POPULATION CHANGE 2000-2010 BY COMMUNITY



Source: 2000 & 2010 Census, Parsons Brinckerhoff 2012

3.1.2 SERVICE TO TRANSIT-DEPENDENT AND TRANSIT-SENSITIVE POPULATIONS

An analysis of the corridor's transit dependent populations was conducted using census information, which is available from the 2010 Census and the 2012 American Community Survey 5-Year Estimates. Transit-dependent populations include those without private transportation (i.e., zero-car households), youth (17 years of age and under) and elderly (65 years and older), and persons below the poverty level. The transit-sensitive population includes those with limited transportation (i.e., one-car households). Figures 3-4 through 3-9 on the following pages show the distribution of transit-dependent and transit-sensitive populations along the corridor.

Zero-Car Households

There are 23,361 zero-car households in the Woodward corridor, 75 percent of which are located in Detroit and Highland Park. In these two communities along the corridor, almost 40 percent of households do not have access to private automobile transportation.

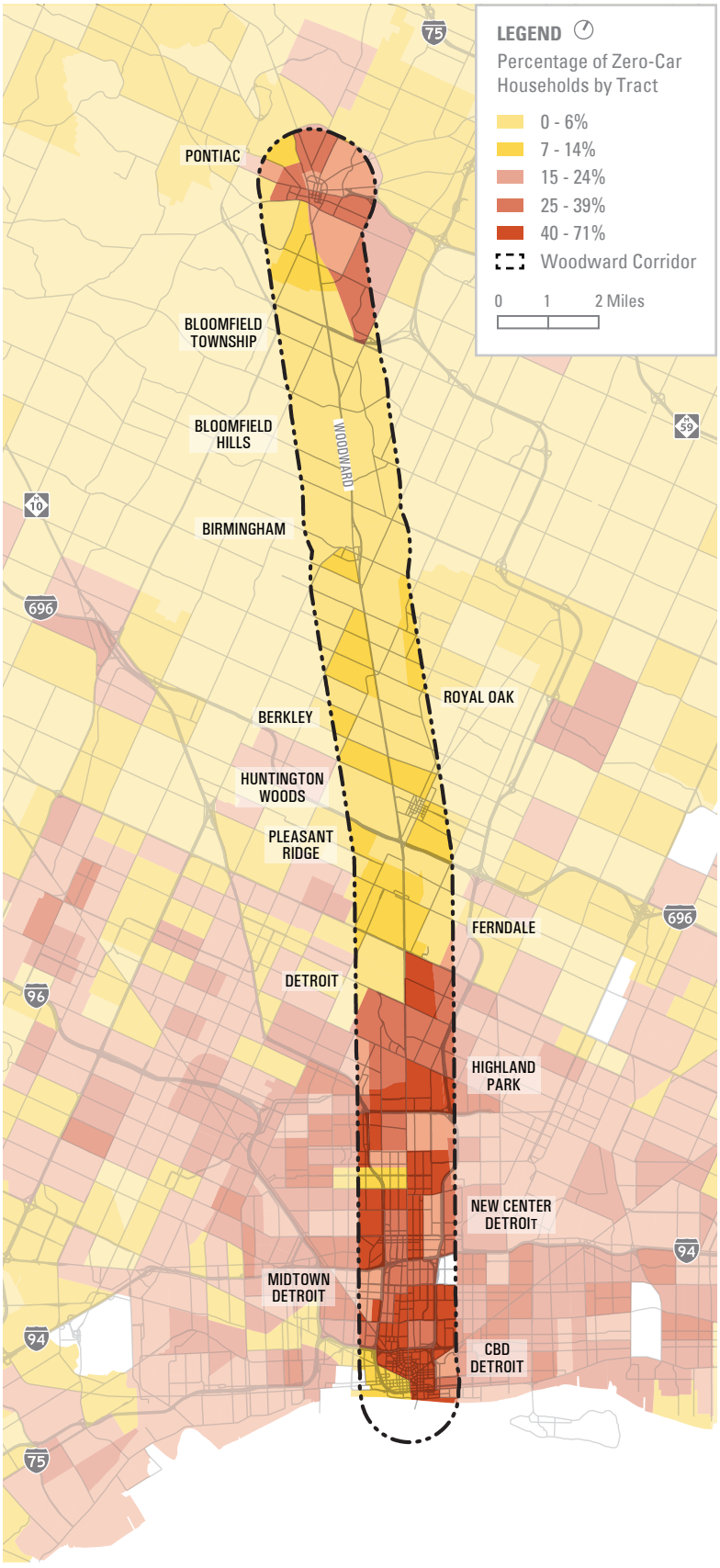


FIGURE 3-4. ZERO-CAR HOUSEHOLDS

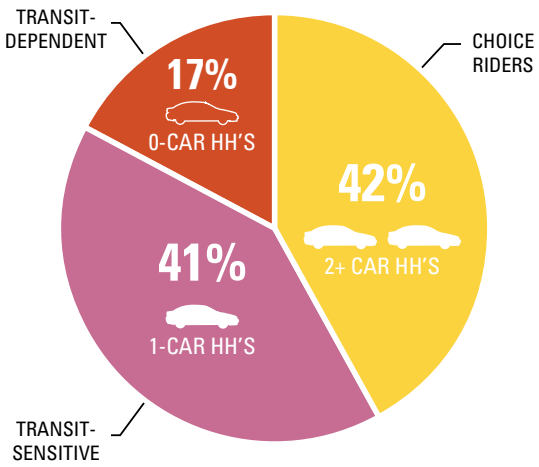
Source: ACS 2012 5-Year Estimate

One-Car Households

There are 57,567 one-car households in the corridor, which represent the transit-sensitive population. These households are distributed more evenly throughout the entire corridor than zero-car households and represent 41 percent of the households in the corridor. **Figure 3-5** shows the composition of transit-dependent, transit-sensitive, and choice rider populations throughout the corridor based on vehicles available.

FIGURE 3-5. HOUSEHOLD TYPES BY VEHICLES AVAILABLE

Source: ACS 2012 5-Year Estimate



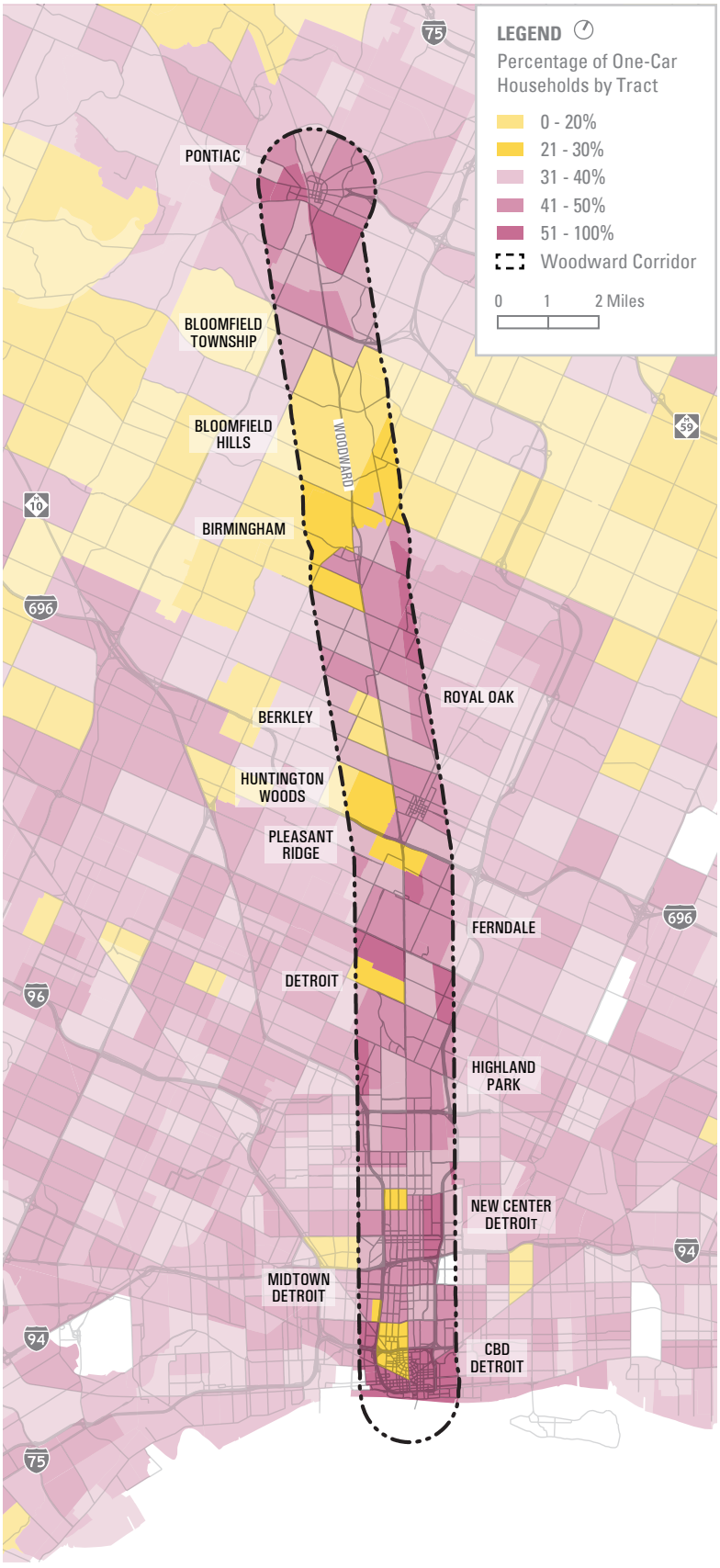


FIGURE 3-6. ONE-CAR HOUSEHOLDS

Source: ACS 2012 5-Year Estimate

Persons in Poverty

There are 75,979 people below the poverty level within the Woodward corridor, representing 24 percent of the corridor's total population. The highest concentrations of persons in poverty are in Detroit, Highland Park, and Pontiac.

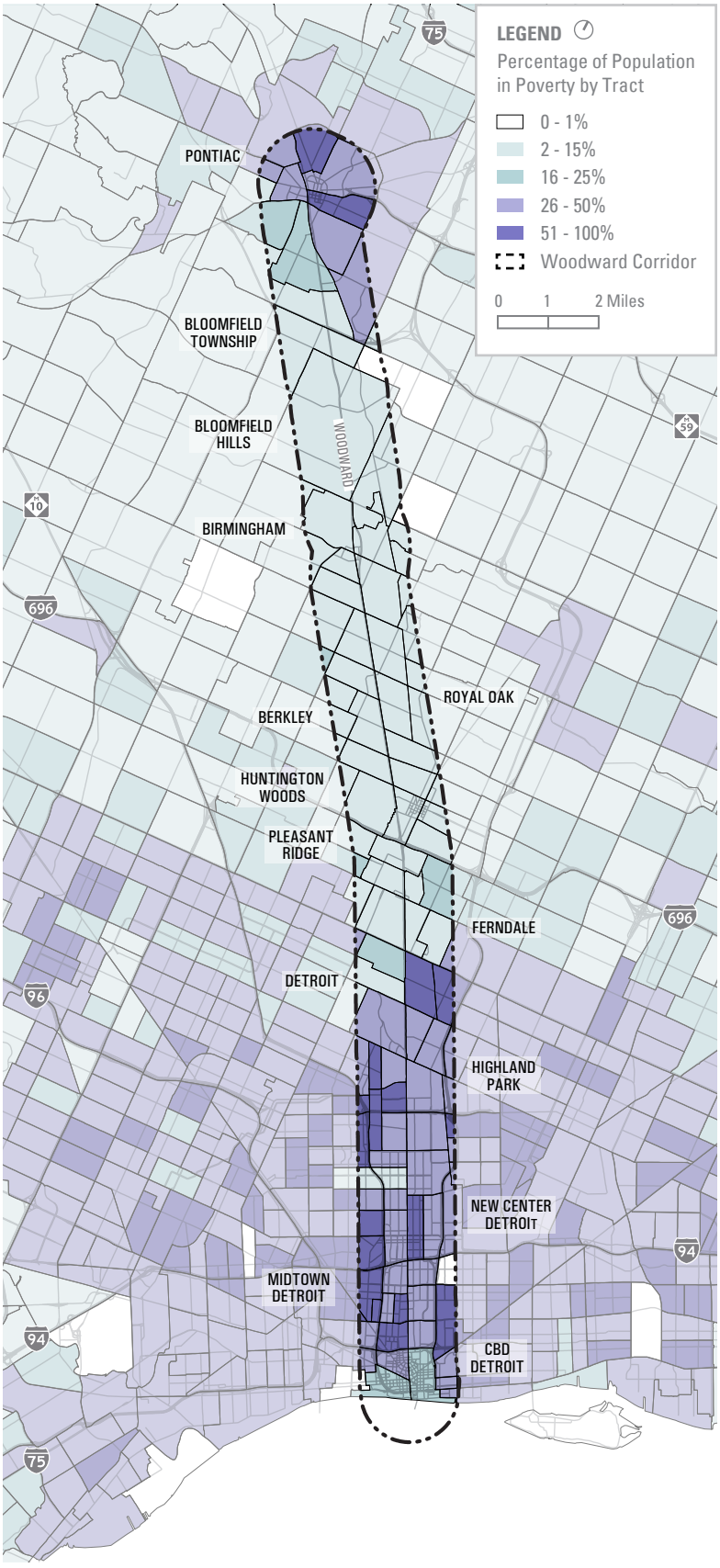


FIGURE 3-7. POPULATION IN POVERTY

Source: ACS 2012 5-Year Estimate

Age-Based Populations

The age-based transit-dependent population is characterized by persons who are 17 years of age and under and 65 years of age or older. These two groups make up 40 percent of the population (91,182 persons) along the corridor with 55,858 persons who are 17 years and younger and 35,324 persons who are 65 years and older.

The lowest concentrations of youth occur in the urbanized areas of Detroit's CBD, Detroit's Midtown District, Downtown Ferndale, and Downtown Royal Oak, while higher concentrations of youth are distributed relatively evenly among the rest of the communities.

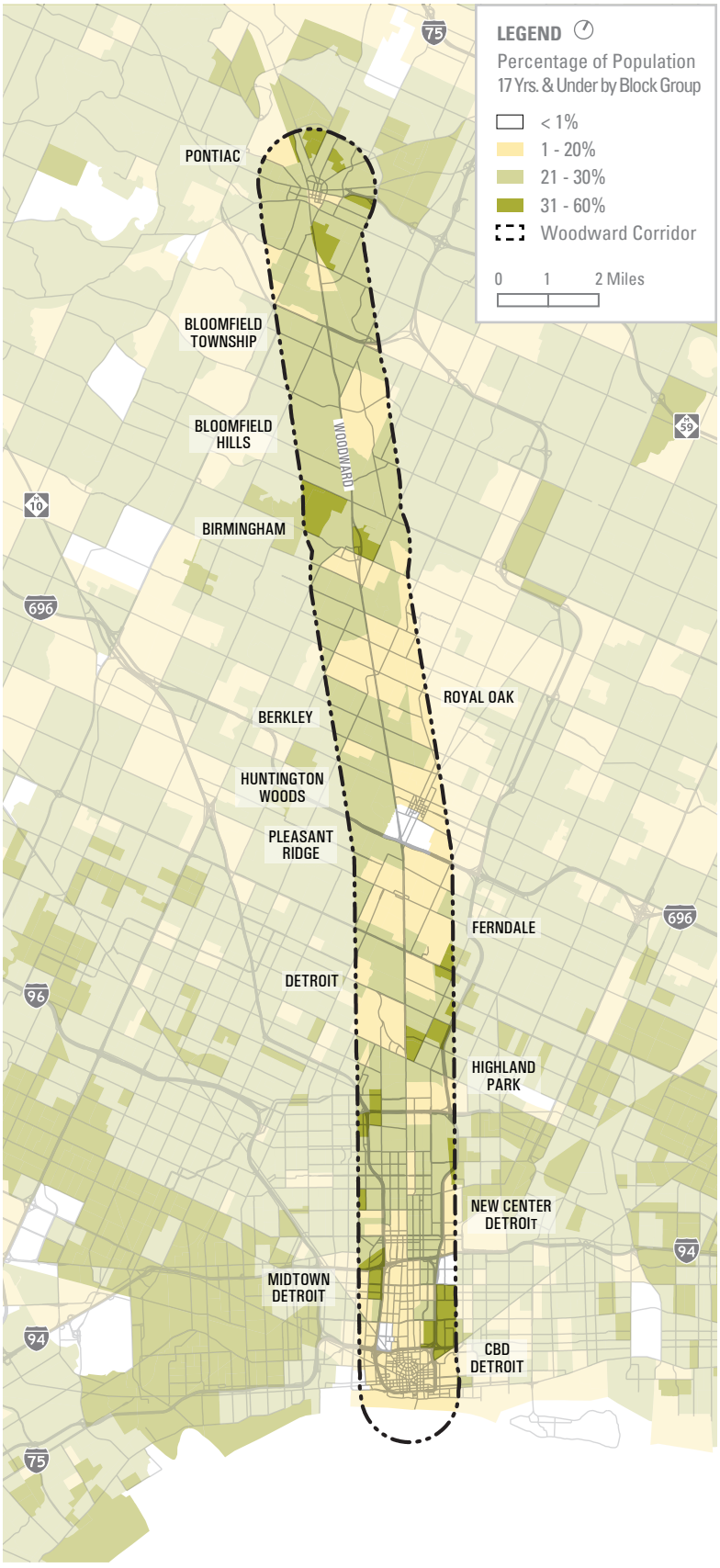


FIGURE 3-8. POPULATION AGE 17 YEARS AND YOUNGER

Source: 2010 Census

Concentrations of elderly persons occur in small areas throughout the corridor with the highest concentrations occurring in Bloomfield Hills and Bloomfield Township. With the number of senior citizens expected to double by 2030[3], transit options will become even more important to allowing older non-drivers to be mobile, be interdependent, have access to services and amenities, and have social and educational opportunities.

[3] National Institute of Aging, AARP

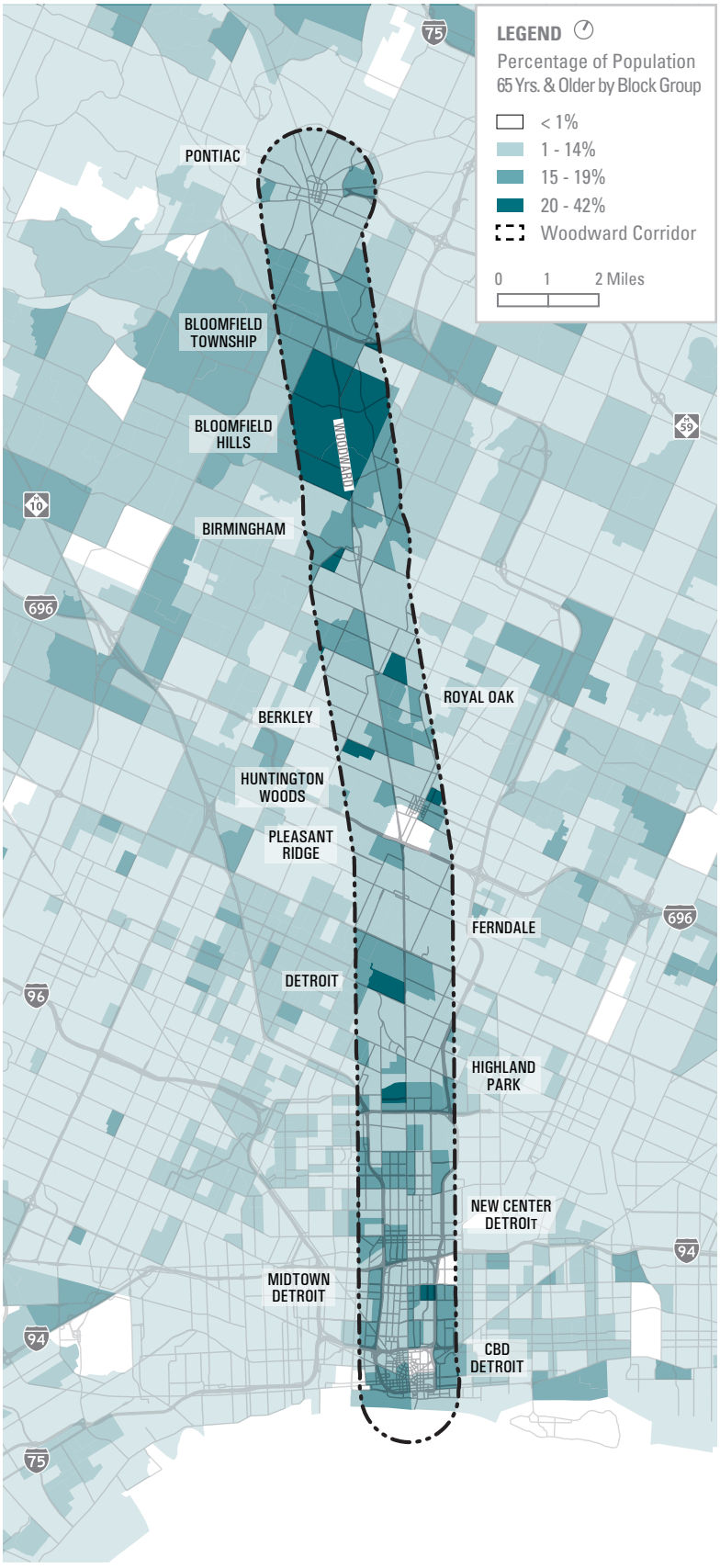


FIGURE 3-9. POPULATION AGE 65 YEARS AND OLDER

Source: 2010 Census

3.1.3 EMPLOYMENT

There are 232,563 jobs along the entire Woodward corridor with the highest concentration of jobs being in Detroit's Central Business District (CBD) and Midtown District. Figure 3-10 shows the major employers along the corridor. All but two of the corridor's major employers are located in Detroit with high density employment nodes occurring in the CBD near Campus Martius and the Renaissance Center. The Detroit Medical Center (DMC), located in Detroit's Midtown District, is the largest employer in the corridor with approximately 11,497 employees. The DMC is also the largest healthcare provider in SE Michigan.

As illustrated in **Figure 3-10,** the region contains particular areas of specialization, which can be identified by industry clusters, or concentrations of interdependent firms in related industries. Industry clusters share common resources and technologies, depend on similar labor pools and institutions, and achieve a productive advantage in geographically congregating near each other. The largest among these is the cluster of firms involved in Education and Medical, which includes three hospitals, one university, and one public school system. Furthermore, SEMCOG's 2010-2040 projections suggest that the Education and Medical industry cluster will have the fastest growing job sectors by 2040, adding 45,490 jobs in Wayne County and 50,837 jobs in Oakland County. The next largest industry clusters within the corridor are Public Administration and Other Non-Private, Digital and Creative, Business and Finance, and Hospitality and Tourism, respectively.

TOP FIVE EMPLOYERS IN THE CORRIDOR

- 11,491 DETROIT MEDICAL CENTER
- 9,591 CITY OF DETROIT
- 9,192 QUICKEN LOANS INC.
- 8,807 HENRY FORD HOSPITAL
- 7,812 BEAUMONT HOSPITAL

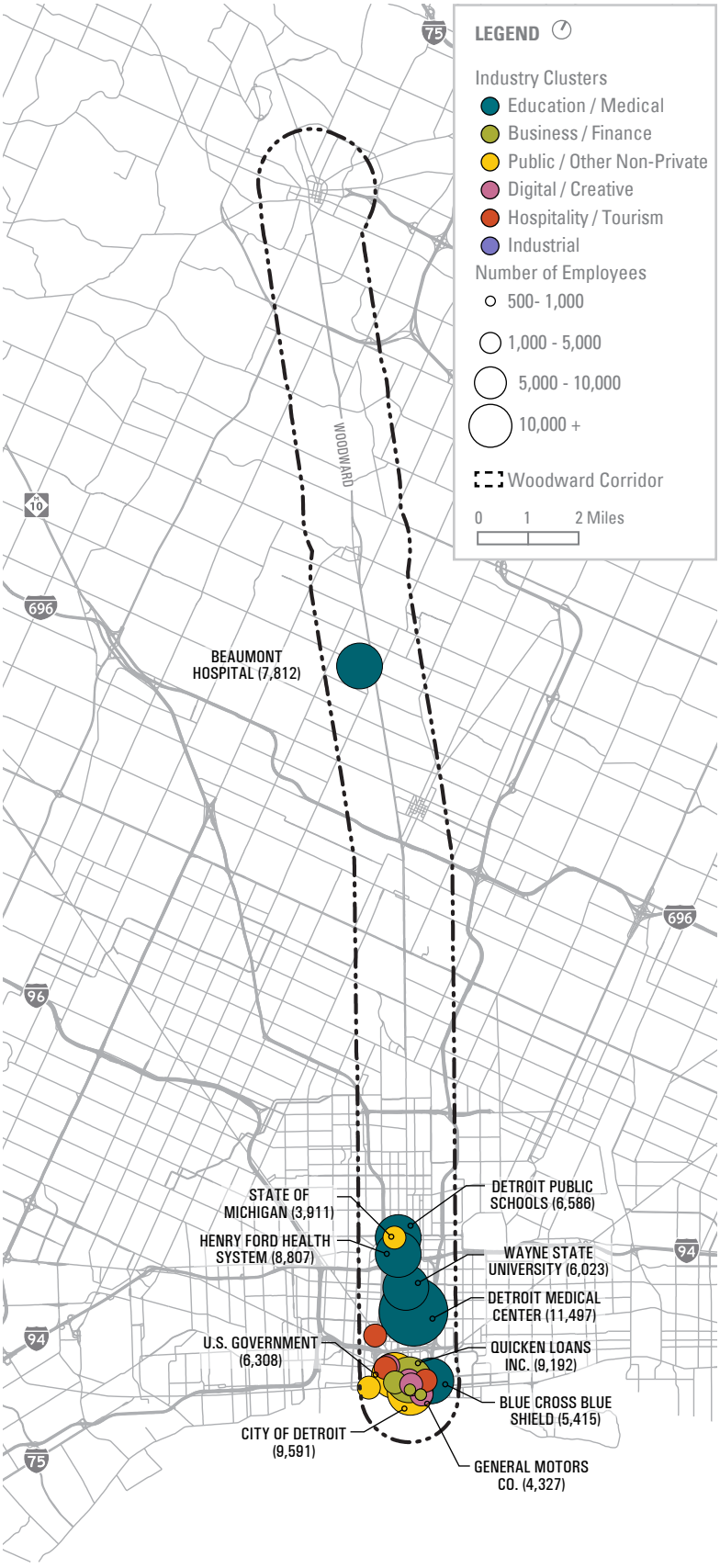


FIGURE 3-10. MAJOR EMPLOYERS IN THE CORRIDOR

Source: Crain's Detroit Business 2014 Book of Lists, CMS

3.1.3 COMMUNITY AND PUBLIC SERVICE FACILITIES

Figure 3-11 illustrates the community facilities that exist within the Woodward Avenue corridor. These facilities have the ability to generate substantial transit ridership and often employ a significant number of residents. While community facilities are present throughout the entire corridor, the most significant concentrations occur in Greater Downtown Detroit, Highland Park, the Ferndale/Royal Oak area, and Pontiac.

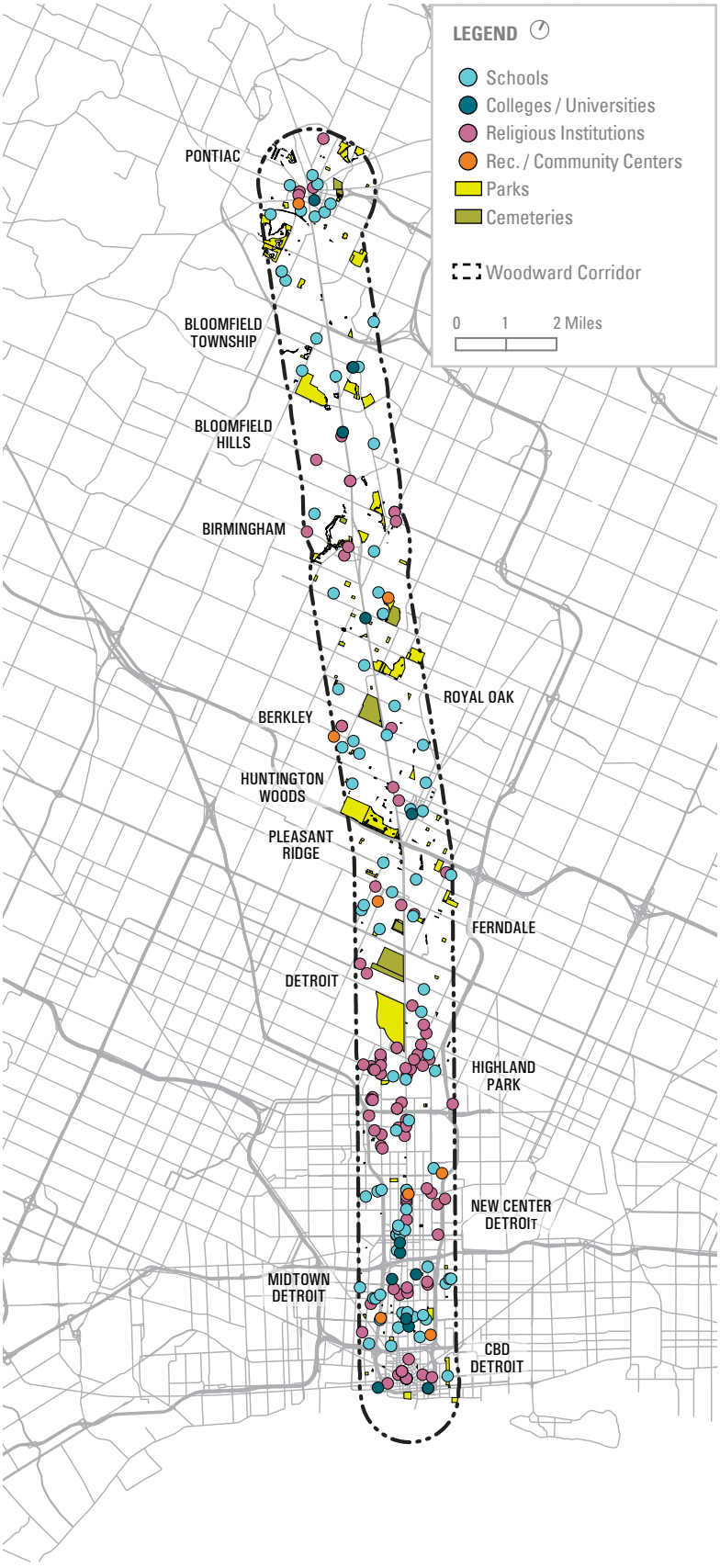


FIGURE 3-11. COMMUNITY FACILITIES

Source: Oakland County, City of Detroit, SEMCOG

Figure 3-12 illustrates the public service facilities that exist within the Woodward Avenue corridor. These facilities represent a concentration of potential "choice" riders that could utilize a rapid transit system along Woodward Avenue for their daily commute. While public service facilities are present within each community along the corridor, the most significant concentrations occur in Greater Downtown Detroit and the Ferndale/ Royal Oak area.

FIGURE 3-12. PUBLIC SERVICE FACILITIES

Source: Oakland County, City of Detroit, SEMCOG

3.2 Transportation

The purpose of this section is to provide a brief overview the transportation network and the existing and future conditions and any deficiencies within and surrounding the corridor. More detail of the analysis can be found in the Transportation Report for this project. Much of the existing information was presented in the Purpose and Need document.

3.2.1 ROADWAY PERFORMANCE

Existing Conditions

The laneage of Woodward Avenue varies throughout the corridor into seven general cross sections:

- Jefferson Avenue to Campus Martius: A boulevard with three lanes in each direction, left-turns are allowed at the intersections
- Campus Martius: Three lanes surrounding a circular park in the middle of Woodward Avenue
- Campus Martius to Park Street/Witherell Street: Two lanes in each direction, left-turns are shared with through traffic lanes
- Park Street/Witherell Street to Grand Boulevard: Four lanes in each direction with a center left turn lane, parking is utilized in the outside lanes
- Grand Boulevard to McNichols Road: Three lanes in each direction with a center left-turn lane, on-street parking is utilized in the outside lanes
- McNichols Road to Downtown Pontiac: A boulevard with four lanes in each direction, left-turns are all indirect at median
- Downtown Pontiac: A circular one-way roadway system around downtown Pontiac, laneage varies from three lanes to six lanes

The jurisdiction of Woodward Avenue south of Adams Street is the City of Detroit; north of Adams Street is MDOT. Regionally, Woodward Avenue is used by commuters to Downtown Detroit as an alternative to I-75 or M-10; however, locally, Woodward is also used to access other destinations for those living and working in the corridor. There is a mixture of long distance and short distance travel.

On-street parking is allowed in the following areas along Woodward Avenue:

- South of Adams Street (Detroit): Pocket parking with meters
- I-75 Service Drive (Detroit) to Grand Boulevard (Detroit): On-street parking in outside with a mix of metered and unmetered parking. This section will be rebuilt with the M-1 Rail streetcar and will allow on-street parking in the southbound direction only.
- Grand Boulevard (Detroit) to McNichols Road (Detroit): On-street parking in outside lane, some peak hour restrictions
- McNichols Road (Detroit) to 8 Mile Road (Detroit): On-street parking in outside northbound lane
- 8 Mile Road (Ferndale) to I-696 (Pleasant Ridge): Pocket on-street parking with some metered and some unmetered
- I-696 (Pleasant Ridge) to Quarton Road (Birmingham): Some service drives in the Woodward Avenue ROW with angle and parallel parking

A preliminary crash analysis was conducted along the corridor to determine if there are any locations that have any crash patterns. There were five intersections along Woodward Avenue that are considered critical crash locations. These are summarized below in **Table 3-1**.

TABLE 3-1. CRITICAL CRASH INTERSECTIONS

Source: Parsons Brinckerhoff

INTERSECTION	2010	2011	2012	AVERAGE CRASH FREQUENCY	AVERAGE DAILY TRAFFIC (ADT)	AVERAGE CRASH RATE
Woodward at MLK/Mack Ave.	27	26	33	29	32,750	2.40
Woodward at 8 Mile Road	29	39	13	27	24,700	2.99
Woodward at 10 Mile Road	59	45	42	49	47,400	2.81
Woodward at Maple Road	41	40	30	37	81,500	1.24
Woodward at Square Lake Rd.	59	51	34	48	89,300	1.47

Average daily traffic (ADT) volumes vary along Woodward Avenue. Generally, daily traffic volumes south of 8 Mile Road are less 25,000 vehicles per day and increase to 60,000 vehicles per day in Royal Oak. The daily traffic volumes decrease to less than 25,000 vehicles per day north of Square Lake Road.

Cass Avenue and John R Street are similar and both have lower traffic volumes with daily traffic volumes at or less than 8,000 vehicles per day. **Figure 3-13** illustrates the daily traffic volumes along Woodward Avenue, Cass Avenue, and John R Street.

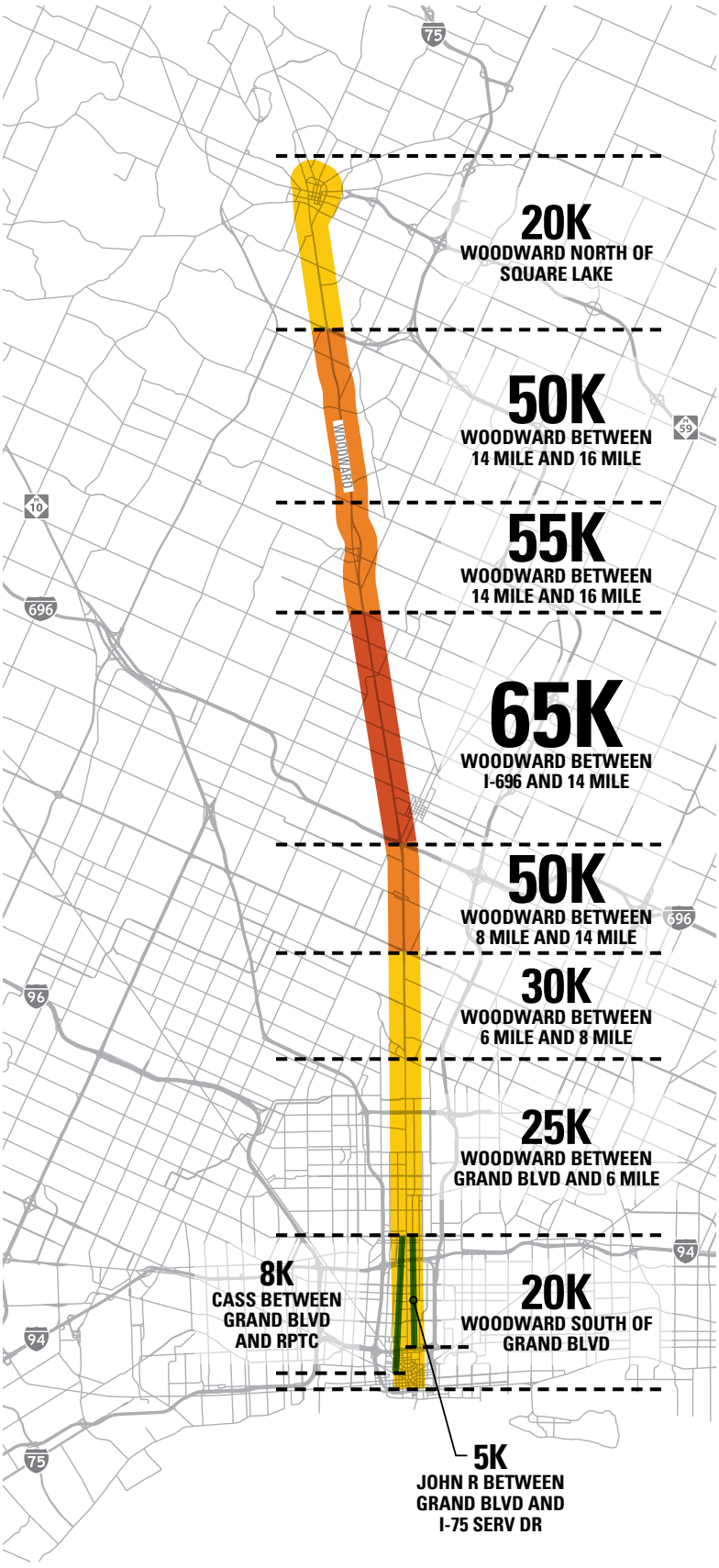


FIGURE 3-13. DAILY TRAFFIC VOLUMES: WOODWARD, CASS, AND JOHN R Source: SEMCOG

To determine intersection congestion levels, Synchro models were developed for all of the signalized intersections along Woodward Avenue. Within the last ten years, the City of Detroit and MDOT collected vehicular turning movement counts and approach counts for many of the signalized intersections along the corridor. Parts of the corridor had counts that were taken in excess of five years, specifically between 8 Mile Road and Long Lake Road. As a result, several new counts were taken within this section of the corridor to update the counts. The counts, number of lanes, and signal timings were input into Synchro to determine the level of congestion at each of the intersections for the morning and evening peak hours.

Synchro theoretically determines the control delay and level of service by movement, approach, and for an entire intersection. The level of service (LOS) is based on the amount of delay experienced by drivers traveling along the roadway through an intersection. The LOS criteria for signalized intersections used by Synchro are provided in the 2010 Highway Capacity Manual and are summarized below. More information on the analysis can be found in the Transportation Technical Report for this project.

LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS[1]

LEVEL OF SERVICE (LOS)	DESCRIPTION	AVERAGE CONTROL DELAY PER VEHICLE (SECONDS)
A	Operations with very low control delay occurring with favorable progression and/or short cycle lengths.	≤ 10.0
B	Operations with low control delay occurring with good progression and/or short cycle lengths.	> 10.0 and ≤ 20.0
C	Operations with average control delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20.0 and ≤ 35.0
D	Operations with longer control delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35.0 and ≤ 55.0
E	Operations with high control delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	> 55.0 and ≤ 80.0
F	Operation with control delays unacceptable to most drivers occurring due to oversaturation, poor progression, or very long cycle lengths.	> 80.0

There were 134 signalized intersections and two unsignalized intersections reviewed as part of the analysis. Based on the analysis, most intersections in the study corridor are currently operating at acceptable LOS (LOS D or better) during the AM and PM peak hours. The Transportation Report summarizes the AM and PM peak-hour LOS and delay for all intersection analyzed in the study corridor. **Table 3-3** on the following page summarizes the seven intersections along the corridor that have one or more approach operating at LOS E or LOS F under existing conditions.

TABLE 3-2. INTERSECTIONS WITH ONE OR MORE APPROACH AT LOS E OR F, EXISTING CONDITIONS

Source: Parsons Brinckerhoff

	AM PEAK HOUR					PM PEAK HOUR				
INTERSECTION	NB	SB	EB	WB	TOTAL	NB	SB	EB	WB	TOTAL
Woodward & Bethune	A	A	D	D	**A**	A	A	D	E	**B**
Woodward & Merrill Plaisance	-	A	F	-	**B**	-	A	D	-	**B**
Woodward & Grixdale	A	A	D	F	**A**	A	A	F	D	**A**
Woodward & 7 Mile Road	A	A	E	D	**B**	A	A	D	D	**B**
Woodward & State Fair	A	A	-	D	**A**	A	A	-	E	**B**
Woodward & State Fair Entry Gate #5	A	A	-	F	**D**	A	A	-	D	**A**
Woodward & Quarton	A	C	D	C	**C**	B	B	F	C	**C**

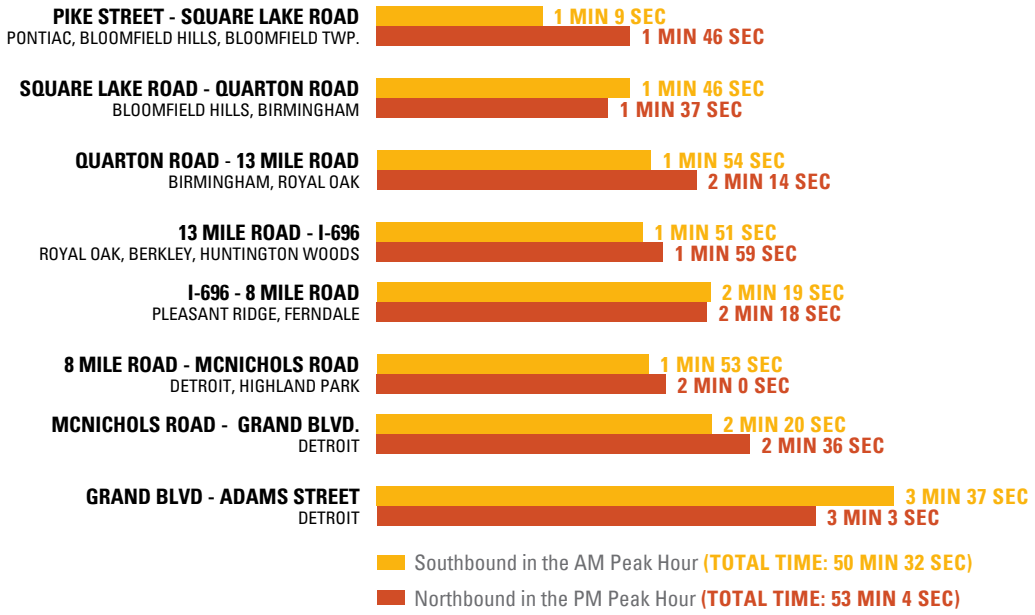
NB = Northbound SB = Southbound EB = Eastbound WB = Westbound

Most of the approaches in the figure shown above are a result of very little green time given to the side street and a low volume, resulting in poor levels of service. A change in the signal timing would likely reduce the congestion levels for these approaches. The exception is eastbound Quarton Road at Woodward Avenue which has high traffic volumes in the eastbound and northbound directions. Reducing the green time from Woodward Avenue to give to Quarton Road would result in added delay to northbound Woodward Avenue. One of the only options at this intersection is to add lanes for eastbound traffic.

Existing travel times were estimated using the Synchro model, which takes into account the speed limit and the amount of congestion expected at each signalized intersection. **Figure 3-14** on the following page illustrates the travel time along Woodward Avenue between Downtown Pontiac (Pike Street) and Downtown Detroit (Adams Street) for southbound in the AM peak hour and northbound in the PM peak hour. Traffic volumes are typically heavier going southbound in the morning and the opposite (northbound) for the afternoon rush hour.

FIGURE 3-14. TRAVEL TIME PER MILE BY SEGMENT, EXISTING CONDITIONS

Source: Parsons Brinckerhoff



Highway Level of Service

Two freeways parallel Woodward Avenue within the southern portion of the study area; M-10 to the west and I-75 to the east. These freeways are approximately one-half to one mile on either side of Woodward Avenue from Downtown Detroit to Highland Park. M-10, also known as the Lodge Freeway, terminates in Downtown Detroit on the western side, and I-75 has a spur (I-375) that terminates in Downtown Detroit on the eastern side. North of Highland Park, M-10 curves to the west; it is eight miles west of Woodward Avenue at its northern terminus in Farmington Hills. I-75 continues to parallel Woodward Avenue closely (within two miles) until I-696. North of I-696, I-75 remains within five miles of Woodward Avenue until Pontiac.

Daily recurrent congestion along I-75 and M-10 does occur, typically in the following areas:

- Southbound I-75 between 12 Mile Road and 8 Mile Road in the morning
- Southbound M-10 between the McNichols Road and the Davison Freeway in the morning
- Northbound I-75 between the Davison Freeway and 12 Mile Road in the evening
- Southbound I-75 between 14 Mile Road and I-696 in the evening
- Northbound M-10 between I-94 and the Davidson Freeway in the evening

At times, Woodward Avenue can experience some additional congestion that is mainly due to incidents that may occur along I-75 or M-10. When incidents do occur, drivers often shift from adjacent freeways to local roadways including Woodward Avenue.

Over the next 25 years (to the year 2040), traffic volumes along I-75 and M-10 are expected to increase at a higher percentage than the percentage along Woodward Avenue at approximately eight to 10 percent.

Future Conditions With No Changes to Laneage

Utilizing the SEMCOG Travel Demand Forecasting model, it was estimated that there would be a six percent increase in traffic volumes for the next 25 years for the corridor. Much of the area is built out with little room for land use changes or growth along the corridor. Some of the areas that may experience growth are the cities of Detroit and Pontiac. Over the next 25 years it is expected that I-75 will be widened from three lanes in each direction to four lanes between Square Lake Road and 8 Mile Road. As a result, the model predicts higher traffic growth along I-75, thereby reducing some of the growth along Woodward Avenue.

The existing year Synchro models were used to develop the future year (2040) models to determine the amount of congestion at each of the signalized intersections. A six-percent growth rate was added to the existing year volumes and traffic signals were adjusted in areas of increased congestion. **Table 3-3** below summarizes the intersection of Woodward and Quarton Road which may have one or more approach operating at LOS E or LOS F under future conditions.

TABLE 3-3. INTERSECTIONS WITH ONE OR MORE APPROACH AT LOS E OR F, FUTURE CONDITIONS WITH NO CHANGES TO LANEAGE

Source: Parsons Brinckerhoff

	AM PEAK HOUR					PM PEAK HOUR				
INTERSECTION	NB	SB	EB	WB	TOTAL	NB	SB	EB	WB	TOTAL
Woodward & Quarton	A	C	C	C	**B**	D	A	F	C	**D**

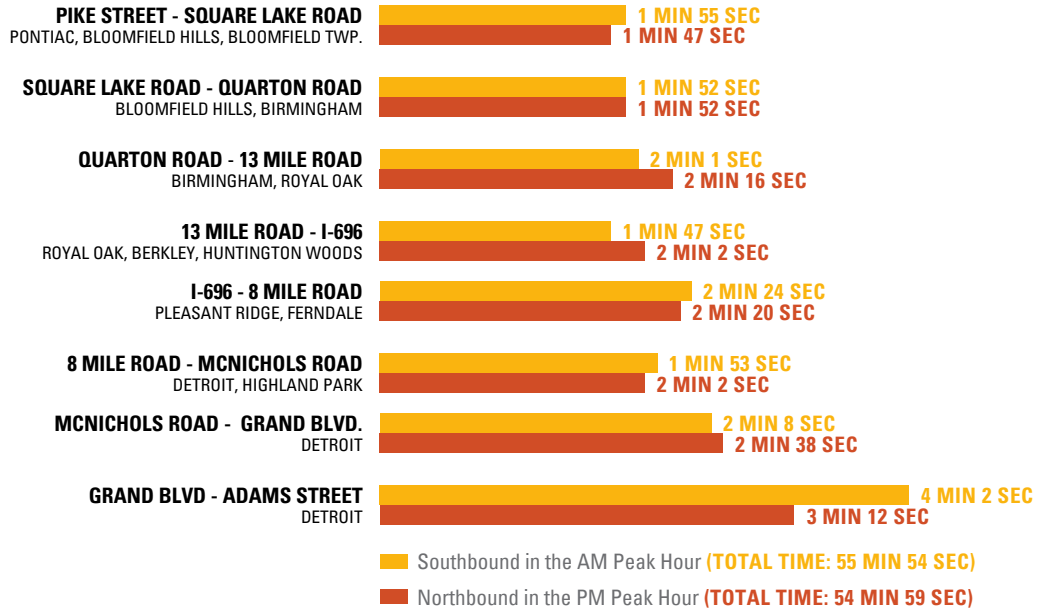
NB = Northbound SB = Southbound EB = Eastbound WB = Westbound

As shown in **Table 3-3**, eastbound Quarton Road at Woodward Avenue is still expected to operate at a LOS F during the PM peak hour. Reducing any green time along Woodward Avenue any more than what is in the model would result in a LOS E for northbound Woodward Avenue. The only option to reduce congestion is to add lanes for eastbound Quarton Road at Woodward Avenue.

Future travel times along Woodward were estimated using the Synchro model. **Figure 3-13** illustrates the travel time along Woodward Avenue between Downtown Pontiac (Pike Street) and Downtown Detroit (Adams Street) for southbound in the AM peak hour and northbound in the PM peak hour. Traffic volumes are typically heavier going southbound in the morning and the opposite (northbound) for the afternoon rush hour.

FIGURE 3-15. TRAVEL TIME PER MILE BY SEGMENT, FUTURE CONDITIONS: NO CHANGES TO LANEAGE

Source: Parsons Brinckerhoff



As shown in **Figure 3-15**, northbound in the PM peak hour take longer than southbound in the AM peak hour, which is due to increased traffic volumes in the PM peak hour compared to the AM peak hour. The section south of McNichols Road experiences higher delay in the PM peak hour than in the AM peak hour.

Future Conditions with Removal of a Lane

One of the options discussed is the removal of a travel lane in each direction along Woodward Avenue and John R Street for an exclusive BRT lane. Synchro was utilized in determining the impact to the signalized and the two unsignalized intersections with the removal of a travel lane in each direction. Similar to the existing conditions analysis, the model for this future conditions analysis assumed a six percent increase in traffic volumes for the next 25 years. Typically, with a removal of a travel lane in each direction, a diversion of traffic may occur, especially if there is congestion along part of the corridor. However, for this analysis, it was assumed that there would not be a diversion in any of the traffic. The SEMCOG model was run with a reduction of a traffic lane along Woodward Avenue, which determined a six percent reduction in traffic may occur. Some of this traffic may divert to other roadways while others may switch modes from automobile to transit.

A traffic lane was removed in each direction along the following roadways:

- Woodward Avenue between Bethune Street (Detroit) to Pike Street (Pontiac)
- John R Street between I-75 Service Drive and Warren Avenue
- Cass Avenue between Michigan Avenue and the I-75 Service Drive

Cass Avenue remained with one lane in each direction north of the I-75 Service Drive and no center left-turn lanes at the signalized intersections, the following exceptions were made to maintain a LOS D or better:

- Left-turn lanes at both the north and south I-75 Service Drives (the current bridge can accommodate)
- Southbound right-turn lane at the north I-75 Service Drive (may require additional right-of-way)
- Left-turn lanes at Temple Street (to accommodate future arena traffic)

John R Street between Warren Avenue and Grand Boulevard was converted to a two-way roadway with a lane removed in each direction, resulting in one lane in each direction with a center left-turn lane at the signalized intersections south of the viaduct. North of the viaduct, there are only three lanes of traffic, so there would not be a center left-turn lane at the signalized intersections. Traffic volumes for the northbound movements were made to be the same as the southbound movements. The unsignalized intersections at John R and the I-75 Service Drives were also signalized for this analysis. It was assumed that transit signal priority would be installed at all the signalized intersection to improve reliability of service.

The future year Synchro models were used to determine the level of congestion at each of the signalized intersections with a lane removed. The traffic signal timings were adjusted in the areas of increased congestion. **Table 3-4** below summarizes the five intersections along the corridor that have one or more approach operating at LOS E or LOS F under future conditions.

TABLE 3-4. INTERSECTIONS WITH ONE OR MORE APPROACH AT LOS E OR F, FUTURE CONDITIONS WITH REMOVAL OF ONE LANE

Source: Parsons Brinckerhoff

	AM PEAK HOUR					PM PEAK HOUR				
INTERSECTION	NB	SB	EB	WB	TOTAL	NB	SB	EB	WB	TOTAL
Woodward & Catalpa	A	A	D	D	**B**	B	D	F	C	**D**
Woodward & Adams	E	-	-	D**	**E**	D	-	-	D**	**D**
Woodward & Quarton	A	F	F	C	**E**	B	D	F	E	**D**
Woodward & Long Lake Road	A	F	D	D	**E**	C	B	D	E	**C**
Woodward & Square Lake Road	B	D	D	D	**D**	F	E	D	C	**E**

NB = Northbound SB = Southbound EB = Eastbound WB = Westbound

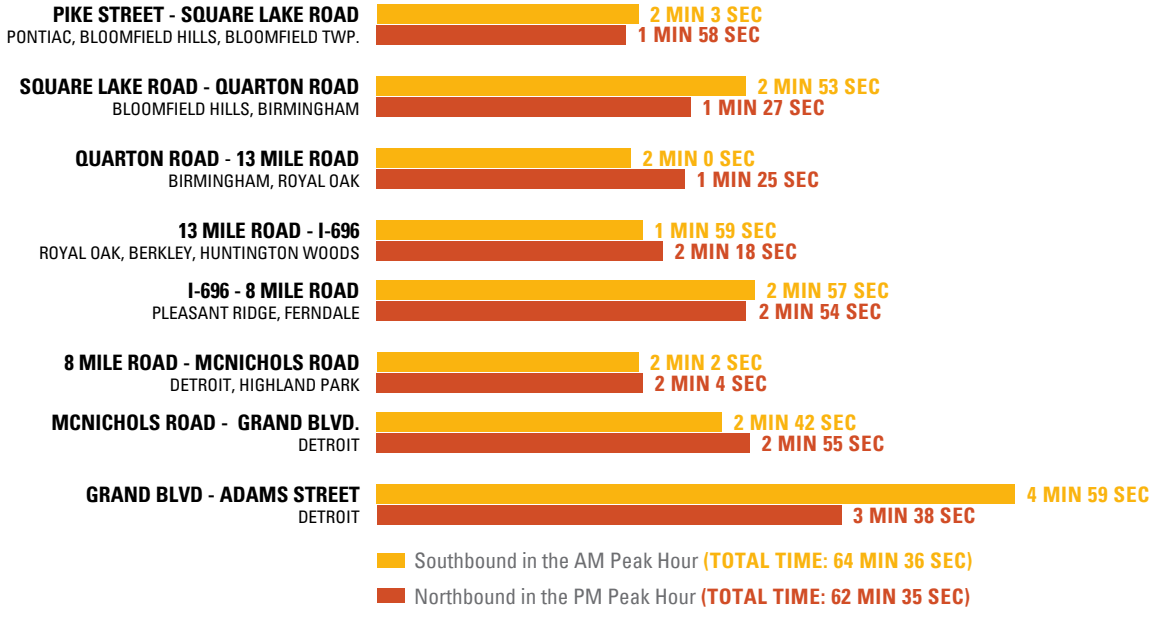
*WB Adams is actually SB Adams

There are several approaches or intersections that are expected to fail with a lane removed along Woodward Avenue, all of these intersections are in Oakland County north of I-696, most in areas with the highest traffic volumes along the corridor. Eastbound Catalpa Road currently has high eastbound traffic volumes in the evening rush hour, with a six-percent increase in the future, the approach is a LOS F. Removing any time from Woodward Avenue to give to Catalpa Road would degrade southbound Woodward Avenue to a LOS E. In the interest of keeping Woodward Avenue at a better LOS due to higher traffic volumes, eastbound Catalpa Road has the worse LOS. Northbound Woodward Avenue is expected to experience a LOS E with Southbound Adams Road in the AM peak hour. Additional time cannot be taken away from Southbound Adams Road because it is already at its minimum green time. Quarton Road and Woodward Avenue are already bad today, so the additional traffic plus the removal of the lane on Woodward Avenue decreased levels of service for some of the approaches. In order to alleviate this, additional lanes would have to be added for some approach. Woodward Avenue at Square Lake Road would also experience failing levels of service during the evening rush hour. Again, green time from Square Lake Road cannot be given to Woodward Avenue because Square Lake Road is already at its minimum times.

Travel times were also estimated using the Synchro model. **Figure 3-16** illustrates the travel time along Woodward Avenue between Downtown Pontiac (Pike Street) and Downtown Detroit (Adams Street) for southbound in the AM peak hour and northbound in the PM peak hour. Traffic volumes are typically heavier going southbound in the morning and the opposite (northbound) for the afternoon rush hour.

FIGURE 3-16. TRAVEL TIME PER MILE BY SEGMENT, FUTURE CONDITIONS: REMOVAL OF A LANE

Source: Parsons Brinckerhoff



In the morning, travel times are expected to increase for southbound, specifically due to delays between Square Lake Road and Quarton Road. Otherwise most sections would experience a one to two-minute increase in travel time. In the evening, some segments are expected to stay around the same or have a slight increase, while other areas may end up decreasing in travel times. This is due to the change in signal timing allowing more green time along Woodward Avenue. Given a reduction of lanes on Woodward Avenue, it actually allows more green time to Woodward Avenue than the side streets. This is because the pedestrian crossing time across Woodward Avenue can be decreased. Most of the side streets along Woodward Avenue are controlled by the pedestrian crossing times and not vehicular demand. Reducing the laneage along Woodward Avenue actually increases the allotted green time to Woodward Avenue, improving progression.

Mitigation

Improvements to the above intersections could improve level of service. Utilizing Synchro, it was found that the following roadway improvements would improve the overall intersection LOS to a D, with some of the approaches still experiencing a LOS E:

- Construct an eastbound through lane for eastbound Catalpa Road at Woodward
- Construct a northbound right-turn only lane for northbound Woodward at Adams Road
- Construct an eastbound right-turn only lane for Quarton Road at Woodward
- Construct an eastbound right-turn only lane for Long Lake Road at Woodward
- Construct a westbound through lane for Long Lake Road at Woodward
- Add dedicated dual right-turn lanes for each direction at Square Lake Road and Woodward

With these improvements, the intersection level of service and travel time would improve and is shown in **Table 3-5** and **Figure 3-17**, respectively.

TABLE 3-5. INTERSECTIONS WITH ONE OR MORE APPROACH AT LOS E OR F, FUTURE CONDITIONS: REMOVAL OF ONE LANE WITH ROADWAY IMPROVEMENTS

Source: Parsons Brinckerhoff

	AM PEAK HOUR					PM PEAK HOUR				
INTERSECTION	NB	SB	EB	WB	TOTAL	NB	SB	EB	WB	TOTAL
Woodward & Catalpa	A	A	C	D	B	B	D	C	C	C
Woodward & Adams	A	-	-	D**	B	B	-	-	D**	B
Woodward & Quarton	A	D	E	D	D	C	E	C	E	D
Woodward & Long Lake Road	B	D	D	D	D	C	B	C	D	C
Woodward & Square Lake Road	A	C	C	C	C	D	C	D	D	D

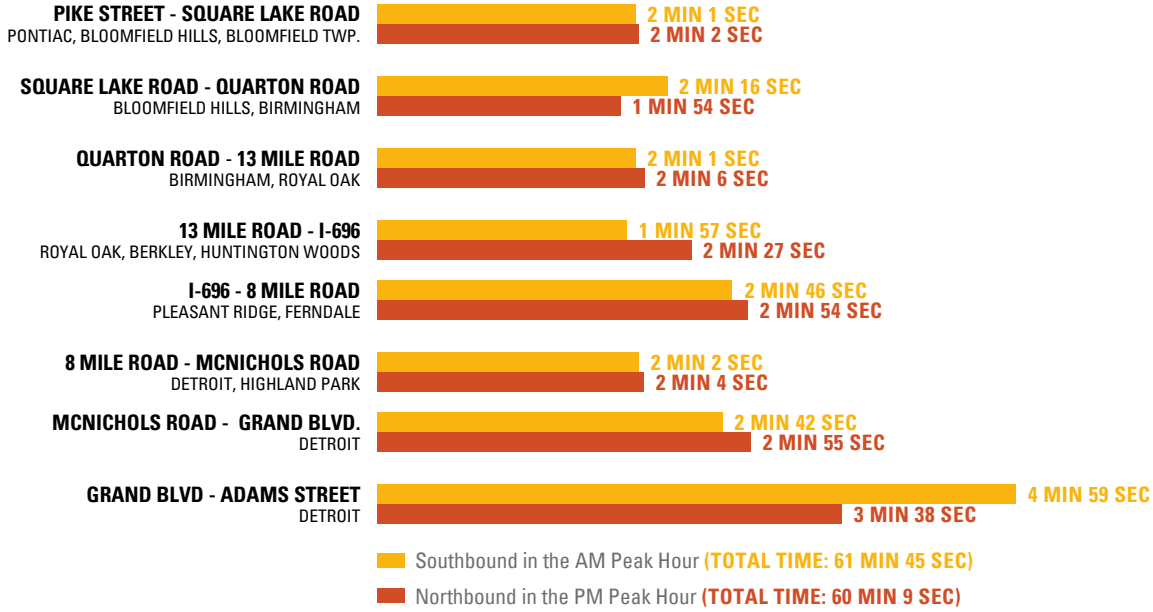
NB = Northbound SB = Southbound EB = Eastbound WB = Westbound

*WB Adams is actually SB Adams

As shown in the table above, with the improvements listed above, most approaches are a LOS D or better. However, the intersection of Quarton Road at Woodward Avenue is still expected to experience a LOS E for some of the approaches in the AM and PM peak hours. In order to mitigate this, additional lanes would be necessary either along Quarton Road or Woodward Avenue. Given that the overall intersection is a LOS D, it was deemed that additional improvements would not be needed.

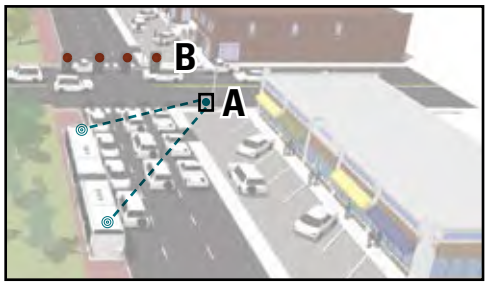
FIGURE 3-17. TRAVEL TIME PER MILE BY SEGMENT, FUTURE CONDITIONS: REMOVAL OF A LANE WITH ROADWAY IMPROVEMENTS

Source: Parsons Brinckerhoff



With the following improvements along the corridor, the travel time improved by giving additional time to Woodward Avenue as well as a reduction in congestion at some of the intersections within Oakland County. With the implementation of Transit Signal Priority along the corridor as shown below, the travel time of the BRT as well as the vehicular traffic along the corridor will be less than what is shown above.

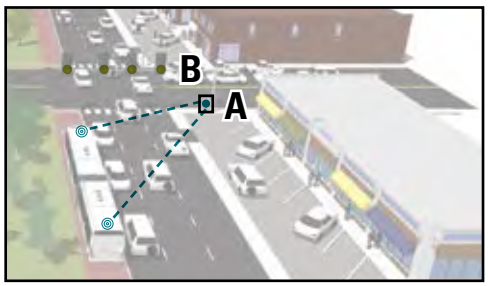
WHEN A BRT VEHICLE APPROACHES A RED LIGHT:



Signal controller detects the BRT vehicle (A), ends green light on cross-street early (B).

Woodward signal will turn green (A), BRT vehicle proceeds through intersection.

WHEN A BRT VEHICLE APPROACHES A GREEN LIGHT:



Signal controller detects the BRT vehicle (A), extends green light on Woodward (B).

BRT vehicle proceeds through intersection on extended green light (A).

3.2.2 TRANSIT SYSTEM PERFORMANCE

Four major transit service providers operate along the Woodward Avenue corridor. The alignments of transit services in the corridor are shown in **Figure 3-18**. This section summarizes transit service and facilities along the Woodward corridor.

Detroit Department of Transportation

DDOT has provided public transportation service in Detroit for approximately 90 years. In its first 30 years of service, the agency offered streetcar service. In 1937, bus service was established. By 1956, streetcar service was discontinued and bus service remained as the sole transit mode.

DDOT is the major bus transit provider in SE Michigan and is also the state's largest transit carrier. The agency serves an area of 144 square miles and 951,270 people with more than 40 fixed routes (2010). Average weekday ridership totals 121,000 trips, occurring in Detroit and 22 neighboring communities. Annual ridership totals 36.6 million (fixed route and demand response combined). The department provides demand response service through its Detroit Metrolift service, which completed 101,000 trips in 2010.

Downtown Detroit to New Center has the largest and most dense ridership concentration, totaling 126,119 trips. This area also includes several major destinations (see **Figure 3-19**) within the corridor, making it a focal point for transit services.

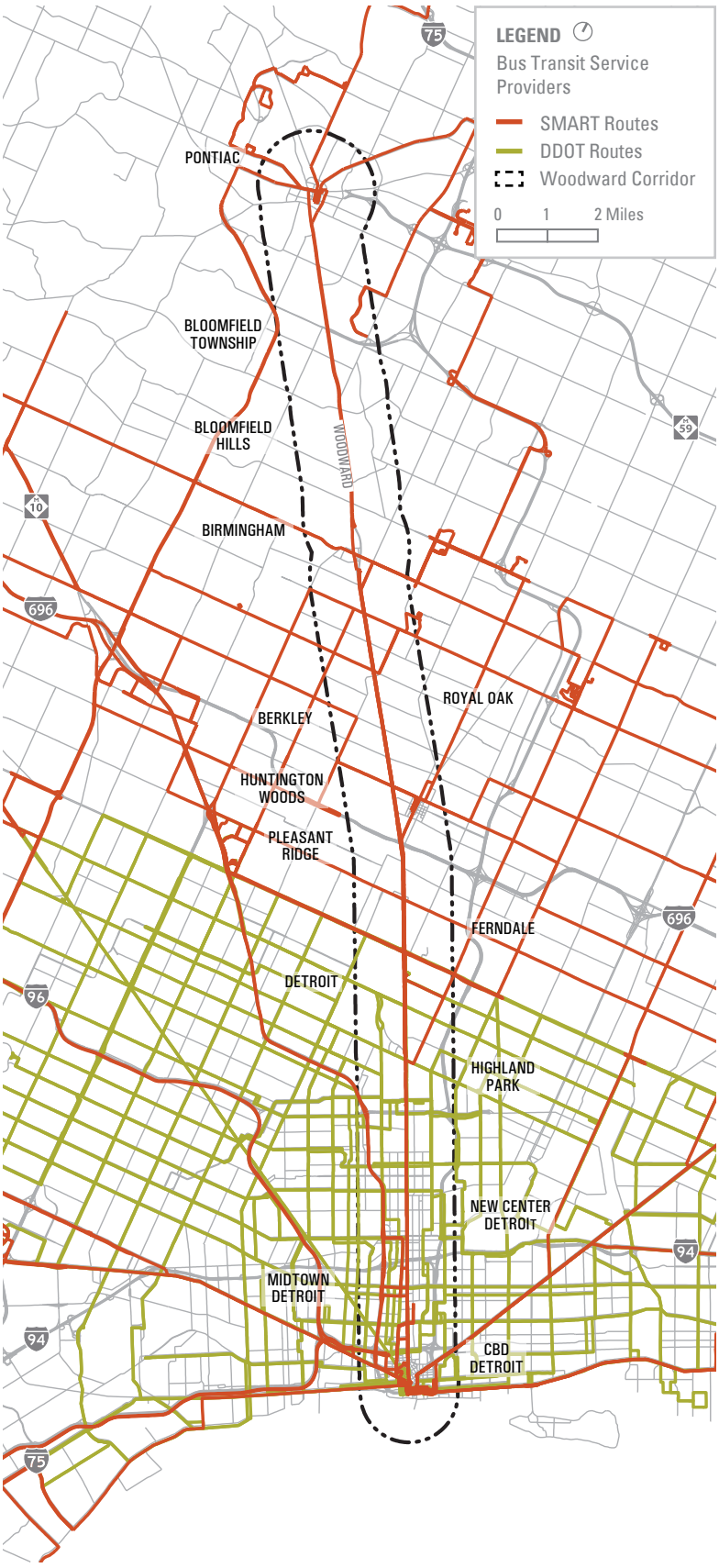


FIGURE 3-18. EXISTING TRANSIT SERVICE

Source: 2010 Census

Route 53 is the primary route on Woodward Avenue, a local bus route operating from the State Fairgrounds Transit Center just south of Eight Mile Road to the Rosa Parks Transit Center in Downtown Detroit, and serves virtually the entire alignment of Woodward Avenue within Detroit. Route 53 operates daily from 4:00 AM to midnight. During most of the day, the route's end-to end running time is about 50 minutes.

DDOT ROUTE 53 SCHEDULE

DAYS OF OPERATION	TIME	HEADWAY (MINUTES)
Monday - Friday	4am - 5am	30
	5am - 6 am	15
	6am - 2pm	10
	2pm - 6pm	8
	6pm - 9pm	15
	9pm - 12am	30
Saturday	4am - 6am	30
	6am - 6pm	10
	6pm - 8pm	20
	8pm - 12am	30
Sunday	4am - 6am	40
	6am - 8pm	20
	8pm - 12am	30

Route 53 has an annual ridership of 3.7 million (2011), which represents 10 percent of DDOT's 2011 annual ridership. Ridership is the highest in Downtown Detroit and in the segment of the route south of I-94, although ridership is relatively high throughout the length of the route. In addition to Route 53, eight routes (7, 16, 18, 23, 25, 31, 36 and 78) travel on a portion of Woodward Avenue near downtown, many of them on their way to/from connections at the Rosa Parks Transit Center. In addition, four routes (12, 17, 30 and 54) use a short segment of Woodward south of Eight Mile Road to access the State Fairgrounds Transit Center. Fifty percent of DDOT's bus routes travel to Downtown from outlying neighborhoods. DDOT's 19 other bus routes run east-west or north-south, connecting neighborhoods and feeding riders to Downtown routes.

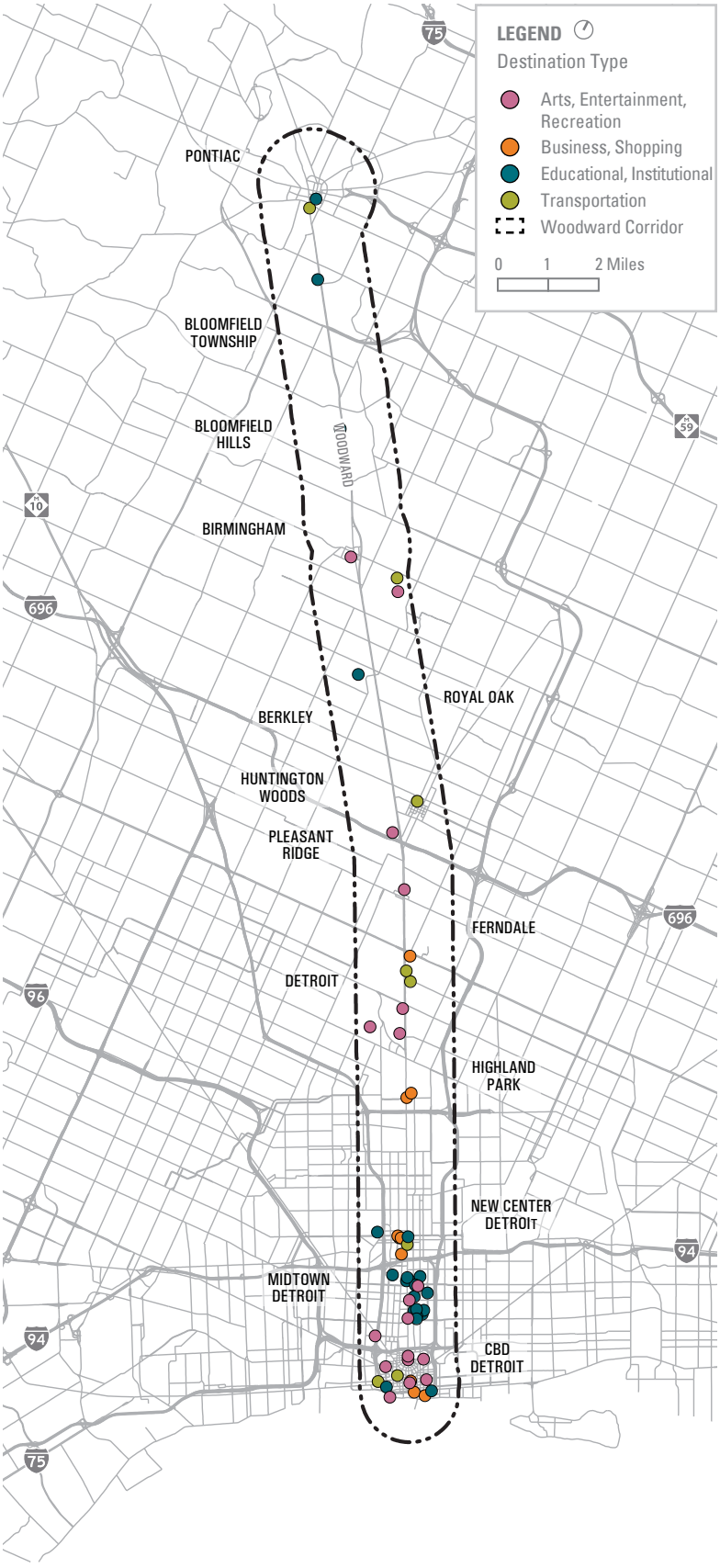


FIGURE 3-19. MAJOR DESTINATIONS WITHIN THE CORRIDOR Source: 2010 Census

Suburban Mobility Authority for Regional Transportation

With annual ridership at 12.1 million trips (demand response and fixed route) and average weekday ridership at 41,000 trips (2010), the SMART is the second largest transit provider in Michigan. SMART was formed as SE Michigan's regional bus system and has coverage of 1,074 miles with a population of 3,167,075 in more than 75 communities throughout Macomb, Oakland, and Wayne Counties. SMART operates five routes primarily on Woodward Avenue:

SMART ROUTES ON WOODWARD

ROUTE	STOP DESIGNATION	SERVICE DESCRIPTION
450	Local	Operates from the Phoenix Center in Pontiac to the State Fairgrounds Transit Center just south of 8 Mile Road in Detroit, with weekday peak period service to the SMART Transit Center in Downtown Detroit, located at the Buhl Building.
460	Local	Operates from the Somerset Collection Transit Center in Troy to the State Fairgrounds Transit Center just south of 8 Mile Road in Detroit, with weekday peak period service to the SMART Transit Center in Downtown Detroit. The route essentially operates as a short turn route paralleling Route 450 from Troy south to Detroit.
445	Limited	A commuter-oriented route (southbound in the morning, northbound in the evening) that originates at Telegraph Road and Maple in Birmingham, joins the Woodward Avenue alignment at Maple and continues to the SMART Transit Center in Downtown Detroit
465	Limited	A reverse commute route (northbound in the morning, southbound in the evening) that originates at the General Motors Truck and Bus plant in Pontiac and serves a number of other industrial sites in Auburn Hills before joining the Woodward Avenue alignment just south of Maple near the Amtrak Station in Birmingham and continuing to the SMART Transit Center in Downtown Detroit.
475	Limited	A commuter-oriented route that originates at the Troy Civic Center Park-and-Ride in Troy and enters the Woodward Avenue alignment just south of Maple near the Amtrak Station in Birmingham before continuing to the SMART Transit Center in Downtown Detroit.

Regardless of their local or limited stop designation, the stopping pattern on SMART bus routes effectively precludes them from providing bus service for trips that both begin and end within the City of Detroit. On weekdays, Routes 450 and 460 operate from 5:00 AM to 2:00 AM on a combined 15-minute headway during most of the day, over the combined segments of the routes from Woodward and Daines to Woodward and the State Fairground Transit Center, where passengers can take DDOT route 53 to complete their trip into Detroit (the route operates to the SMART transit center in downtown Detroit during the peak periods), with each separate route operating at a 30 minute headway. Headways are calculated from the Detroit end of the trip (arrival times on the southbound trips, departure times on northbound trips); headways are irregular on the other ends of the trips.

Travel times during the off-peak period on Route 450 (with the northern terminus at Phoenix Center in Pontiac) to Woodward and State Fairground average around 45-50 minutes. Travel times to Downtown Detroit during peak periods average around 70-75 minutes during the morning peak and around 85-90 minutes during the afternoon peak. Travel times on Route 460 (with the northern terminus at Somerset Collection in Troy) to Woodward and State Fairground range from around 40 to 50 minutes. Travel times on Route 460 to Downtown Detroit during the peak periods range from around 70 minutes during the morning peak to around 80 minutes during the afternoon peak. On Saturdays and Sundays the route operates only as far south as Woodward and the State Fairgrounds. Saturday service is from 5:00 AM to 2:00 AM, and the two routes operate on an irregular combined headway ranging from 15 to 25 minutes during most of the day (hourly after 10:00 PM). Sunday service operates from 6:00 AM to Midnight, with the two routes operating a combined irregular 15-25 minute headway.

Route 445 operates three trips each morning between 6:28 and 7:28 AM from Telegraph and Maple in Birmingham to downtown Detroit. Running time is 62 minutes. In the afternoon, the route operates four trips northbound between 4:05 and 5:35 PM, with a running time of 61-63 minutes.

Route 465, the reverse commute route, operates five morning northbound trips between 4:08 and 6:40 AM, from downtown Detroit to Big Beaver and Crooks in Auburn Hills. Running time is 56-58 minutes. Six trips operate in the afternoon between 2:42 and 5:09 PM, with a running time of 79-85 minutes. Route 475 operates four morning trips southbound between 6:10 and 7:38 AM, from Troy Civic Center P&R to downtown Detroit. Running time is 65-67 minutes. The route operates four afternoon trips northbound between 4:20 and 6:13 PM, with a running time of 65-69 minutes. Routes 445, 465 and 475 operate no early morning, mid-day, evening, night, weekend or Holiday service. Boardings along the route are fairly dispersed, with higher ridership stops in the terminal areas (Detroit, Pontiac, and the Amtrak station), at key activity centers and bus transfer points along the route, both in Detroit and in the suburban areas. Ridership on the express routes is much more uniform across the limited stops on those routes, and is only large at the terminal points.

Detroit Transportation Corporation

The Detroit Transportation Corporation (DTC) operates the Detroit People Mover (DPM) service, connecting major activity centers in Downtown via an elevated, fully automated guideway system and 13 stations. Eight computer-controlled driverless vehicles travel along a 2.9-mile single-track, one-way, clock-wise loop. In 2009, approximately 5,500 daily passengers used the DPM, with a total annual ridership of 2.1 million passengers. DPM's ridership for special events is estimated at 10,000 to 15,000 passengers. Originally planned as a downtown circulator, the DPM never realized its true potential in the absence of a broader regional rapid transit system. It serves a much needed circulation function within Downtown, with connections to Cobo Hall (convention center), Joe Louis Arena (hockey/entertainment arena), the Renaissance Center (General Motors international headquarters), various employers in Downtown's Financial District, Greektown Casino and entertainment district, Comerica Park (baseball/entertainment stadium), Ford Field (football/entertainment stadium), the Theatre District on Broadway, and connections to the Rosa Parks Transit Center on Washington Boulevard and Michigan Avenue.

Transit Windsor

Transit Windsor is Windsor, Ontario, Canada's transit service provider that operates one bus route that shuttles passengers between Downtown Detroit and Windsor, Ontario, via the Detroit-Windsor Tunnel. The bus circulates through Downtown and has one stop along Woodward Avenue at Larned Street. It also stops at the Rosa Parks Transit Center. This route had an annual ridership of about 200,000 in 2009.

Capacity

Decreased availability of revenue sources from the gas tax, vehicle registration fees, and alternate revenue streams have challenged transit providers' ability to maintain capital equipment and service operations throughout Michigan. Despite these challenges, MDOT notes in its *2035 State Long-Range Transportation Plan*:

> "Public transit ridership [in Michigan] increased by about 15.5 percent from FY 2005 to FY 2010, while miles of service increased by about 7.5 percent. The public's demand for more transit choices has not wavered…Michigan transit agencies were able to achieve a net increase in miles of service during a period when state operating assistance per year stayed the same."

Detroit (15 percent) and Highland Park (eight percent) have the highest proportion of zero-car households along the corridor. This demand is ever-present in the capacity issues faced by transit providers operating within the corridor, particularly during peak service hours. Similarly, during the peak service hours, the Transit Windsor route between Detroit and Windsor, Ontario, operates at capacity. On an average weekday, the DPM has available capacity all day, but operates over capacity during large events in Downtown Detroit.

Despite demand, funding cuts have impacted the level of service that transit providers offer customers. Particularly in the cases of DDOT and SMART, funding cuts have had a marked impact on service offerings through increased reliability and reduced coverage. Since January 2012, DDOT has undergone three rounds of service cuts that have reduced and stabilized wait times on some routes, increased wait times on others, eliminated some routes, but overall improved the service reliability of the system. In December 2011, SMART instituted a reduction in service to forestall a $7,000,000 budget deficit. This resulted in an 18 percent reduction of weekday service, a 29 percent reduction of Saturday service, and a 31 percent reduction of Sunday service. These service reductions were achieved by shortening the Main Corridor (arterial) routes into the City of Detroit and eliminating lower productivity routes in each of the three counties SMART serves: Wayne, Oakland, and Macomb. In determining which routes would be affected, SMART worked to maintain a balance between funds received and service provided. After reductions, the income-to-service balance was achieved. Through the reductions in service, SMART has maintained an on-time performance of 87 percent system-wide and continues to monitor reliability through route surveys, automatic vehicle location data, and bus operator input. Service reductions have allowed SMART to meet budgetary requirements in FY2012 and FY2013 without further reductions.

MDOT has responded to increased transit service demand and Michiganders' desire for improved transportation options with increased support for transit projects. Along the Woodward Avenue corridor, demand has been slowly building for transit facilities and services since 2006, when the City of Detroit hosted Super Bowl XL. Emphasis on transit has accelerated between 2011 and 2013, in which projects with transit components were initiated within study area communities as shown in **Table 3-6** below.

TABLE 3-6. STUDY AREA TRANSIT PROJECTS, 2011-2013

		TRANSIT-RELATED PROJECTS
YEAR COMPLETED	2011	Pontiac Transportation Center
	2011	Woodward Avenue Light Rail Transit Project
	2012	Woodward Avenue Streetcar Project
	2012	Woodward Avenue Rapid Transit Alternatives Analysis
	2013	Woodward Avenue Complete Streets Master Plan
	2013	Troy Multi-Modal Transit Center
	2013	Birmingham Multi-Modal Transportation Plan
	2013	Ferndale Multi-Modal Transportation Plan

Travel Time Comparison Between Roadway and Transit Systems

Trips extending the entire length between Downtown Pontiac and Downtown Detroit are typically made by automobile via I-75. Woodward Avenue serves local commuters and is also used as an alternate to avoid peak hour congestion on I-75. While the distance between Downtown Pontiac and Downtown Detroit is longer when using I-75 (31 miles compared to 27 miles along Woodward), the higher speed limits and lack of signalized intersections reduces the travel time.

On a typical off-peak day, the average travel time from Downtown Pontiac to Downtown Detroit via automobile is 52 minutes and 110 minutes via transit. Travel by transit during the peak hours between Pontiac and Detroit is done via SMART Route 450; however, during off-peak periods, SMART service stops at the City of Detroit limits, forcing passengers to transfer to DDOT Route 53. This additional transfer adds time onto travel times, causing longer off-peak trip travel times than the peak period trips. **Tables 3-7 and 3-8** below show the differences between automobile and proposed BRT travel times.

TABLE 3-7. AUTOMOBILE VERSUS PROPOSED TRANSIT TRAVEL TIME, SOUTHBOUND AM

Source: Parsons Brinckerhoff

		AUTO TRAVEL TIME KEEPING ALL LANES	AUTO TRAVEL TIME REMOVING ONE LANE FOR BRT	BRT
SEGMENT	Adams to Grand	4 - 5	5 - 6	5 - 6
	Grand to McNichols	7 - 8	11 - 12	6 - 7
	McNichols to 8 Mile	7 - 8	7 - 8	7 - 8
	8 Mile to I-696	6 - 7	7 - 8	7 - 8
	I-696 to 13 Mile	5 - 6	6 - 7	6 - 7
	13 Mile to Quarton	5 - 6	4 - 5	4 - 5
	Quarton to Square Lake	8 - 9	9 - 10	11 - 12
	Square Lake to Pike	8 - 9	9 - 10	13 - 14
	Total	51 - 56 minutes	58 - 62 minutes	61 - 63 minutes

TABLE 3-8. AUTOMOBILE VERSUS PROPOSED TRANSIT TRAVEL TIME, NORTHBOUND PM

Source: Parsons Brinckerhoff

		AUTO TRAVEL TIME KEEPING ALL LANES	AUTO TRAVEL TIME REMOVING ONE LANE FOR BRT	BRT
SEGMENT	Adams to Grand	12 - 13	11 - 12	13 - 14
	Grand to McNichols	11 - 12	10 - 11	11 - 12
	McNichols to 8 Mile	6 - 7	4 - 5	4 - 5
	8 Mile to I-696	5 - 6	6 - 7	6 - 7
	I-696 to 13 Mile	8 - 9	8 - 9	7 - 8
	13 Mile to Quarton	7 - 8	8 - 9	7 - 8
	Quarton to Square Lake	7 - 8	8 - 9	6 - 7
	Square Lake to Pike	8 - 9	9 - 10	5 - 6
	Total	66 - 70 minutes	66 - 70 minutes	61 - 63 minutes

Ongoing Project: Ann Arbor to Detroit

The Ann Arbor and Detroit commuter rail service is a segment of the Pontiac-Detroit-Chicago Amtrak corridor. Using existing infrastructure the commuter rail connects downtown Detroit to City of Ann Arbor. In addition, the recent announcement of over a half billion dollars in FRA High Speed Rail (HSR) funds is good news for both the Amtrak trains and the Ann Arbor-Detroit Commuter service as many of the necessary improvements will benefit both of the projects. SEMCOG and MDOT are working closely with FRA and FTA to ensure that the capital improvements for both commuter and Amtrak service are coordinated.

Ongoing work includes the identification and agreement with host railroads on key track improvements, refurbishment of passenger cars, acquiring the necessary locomotives, preliminary design of stations and layover facilities, and coordination with Amtrak. One major capital improvement, the West Detroit connecting track, is expected to be under construction this spring. The terminal station of this service is at the Amtrak station in Detroit, which will connect to both the proposed M-1 RAIL and any future rapid transit along Woodward.

Ongoing Project: M-1 Rail Streetcar

The M-1 Rail streetcar will be an urban fixed rail at-grade circulator system connecting Downtown Detroit to the New Center area along Woodward Avenue. It would operate in mixed traffic and run from Larned Street in Downtown Detroit north to Chandler Street/Delaware Street in New Center. The route is 3.31 miles long with 20 station stops at 12 locations. The streetcar system is envisioned to follow a side-running alignment through a majority of the corridor, with transitions to median-running operations at the north and south ends. M-1 RAIL will use modern vehicle technology to link cultural, entertainment, health care, sports, and educational activity centers along the corridor to address unmet higher level transit needs along Woodward.

Ongoing Project: Greater Downtown TOD Strategy

The Greater Downtown TOD Strategy was created in support of the M-1 Rail streetcar project on Woodward Avenue between Jefferson Avenue and Grand Boulevard. The M-1 Rail streetcar provides the opportunity to connect major destinations, employment, educational and medical centers in the Greater Downtown to neighborhoods, improving access to jobs and services for residents along the corridor, and offering a new opportunity to live in a walkable environment. The Greater Downtown TOD Strategy seeks to leverage the transit investment to create a framework to guide future development in support of the creation of more dense, vibrant, and walkable districts and neighborhoods.

The success of the Greater Downtown TOD Strategy is predicated on the collaborative cooperation of a diverse range of participants that share the responsibility for shaping the vision for the corridor and in creating a positive community impact in response to the light rail investment. The process was guided by the Greater Downtown TOD Planning Group, made up of members from the public, private and philanthropic sectors, lead by the Detroit Economic Growth Corporation and Downtown Detroit Partnership/M-1 Rail. Through interviews, workshops and critiques of the work, residents and stakeholders participated in the authorship of the vision, principles and action plans that will guide investment and development throughout their communities.

Ongoing Project: Detroit Future City (Detroit Strategic Framework Plan)

Detroit Future City articulates a shared vision for Detroit's future, and recommends specific actions for reaching that future. The vision resulted from a 24-month-long public process that drew upon interactions among Detroit residents and civic leaders from both the nonprofit and for-profit sectors, who together formed a broad-based group of community experts. From the results of this citywide public engagement effort, in turn, a team of technical experts crafted and refined the vision, rendered specific strategies for reaching it, shared their work publicly at key points, and shaped it in response to changing information and community feedback throughout the process.

Detroit Future City establishes a set of policy directions and actions designed to achieve a more desirable and sustainable Detroit in the near term and for future generations. The Strategic Framework is organized into Five Planning Elements and a civic engagement chapter. These Five Elements include: Economic Growth, Land Use, City Systems, Neighborhoods, and Public Land and Buildings. These Elements outline a detailed approach to addressing the realities and imperatives that will enable Detroit to move toward a more prosperous and sustainable future. The Detroit Strategic Framework City Systems Element specifically addresses the critical role of transit in shaping both the future city and region. Today, 163,500 metro Detroiters enter the city for employment while 111,400 Detroit residents leave the city to access employment. This massive inflow and outflow of residents and employees points to the critical need for a regional transit system. To this end, the Detroit Strategic Framework advocates for a tiered regional transit hierarchy that offers fast, efficient and convenient transportation between neighborhoods and job centers. Woodward is a critical corridor to facilitate these transit connections. The Detroit Strategic Framework recommends a combination of BRT and light rail along the Woodward corridor.

3.2.3 BIKE AND PEDESTRIAN FACILITIES

The metro Detroit region has been in a process to develop a comprehensive 'greenway' network to promote cycling and walking with connections to existing and future transit systems. An analysis of the inventory of non-motorized facilities shows six communities along the corridor have non-motorized plans (Detroit, Ferndale, Royal Oak, Berkley, Birmingham, and Pontiac), three communities have Complete Streets policies (Ferndale, Berkley, and Birmingham), and Oakland County has a non-motorized plan. Huntington Woods is in the process of updating its Master Plan to include a Complete Streets policy. Currently, SEMCOG is teaming up with MDOT to create a comprehensive regional non-motorized plan to be part of SEMCOG's Regional Transportation Plan; this process will collect all non-motorized plans for the region and conduct a gap analysis.

Figure 3-20 on the following page shows non-motorized transportation projects to date. The existing off-road recreation trails in and around the corridor contribute to the economy and quality of life in the metro area, but improvements to non-motorized networks that directly connect people to destinations are needed to enhance mobility. The facilities that do exist are disjointed and less valuable than if they were connected in a single network. The proposed projects and those in process aim to fill in these gaps; however, a regional non-motorized plan will create the resources necessary to facilitate coordinated non-motorized planning across jurisdictions.

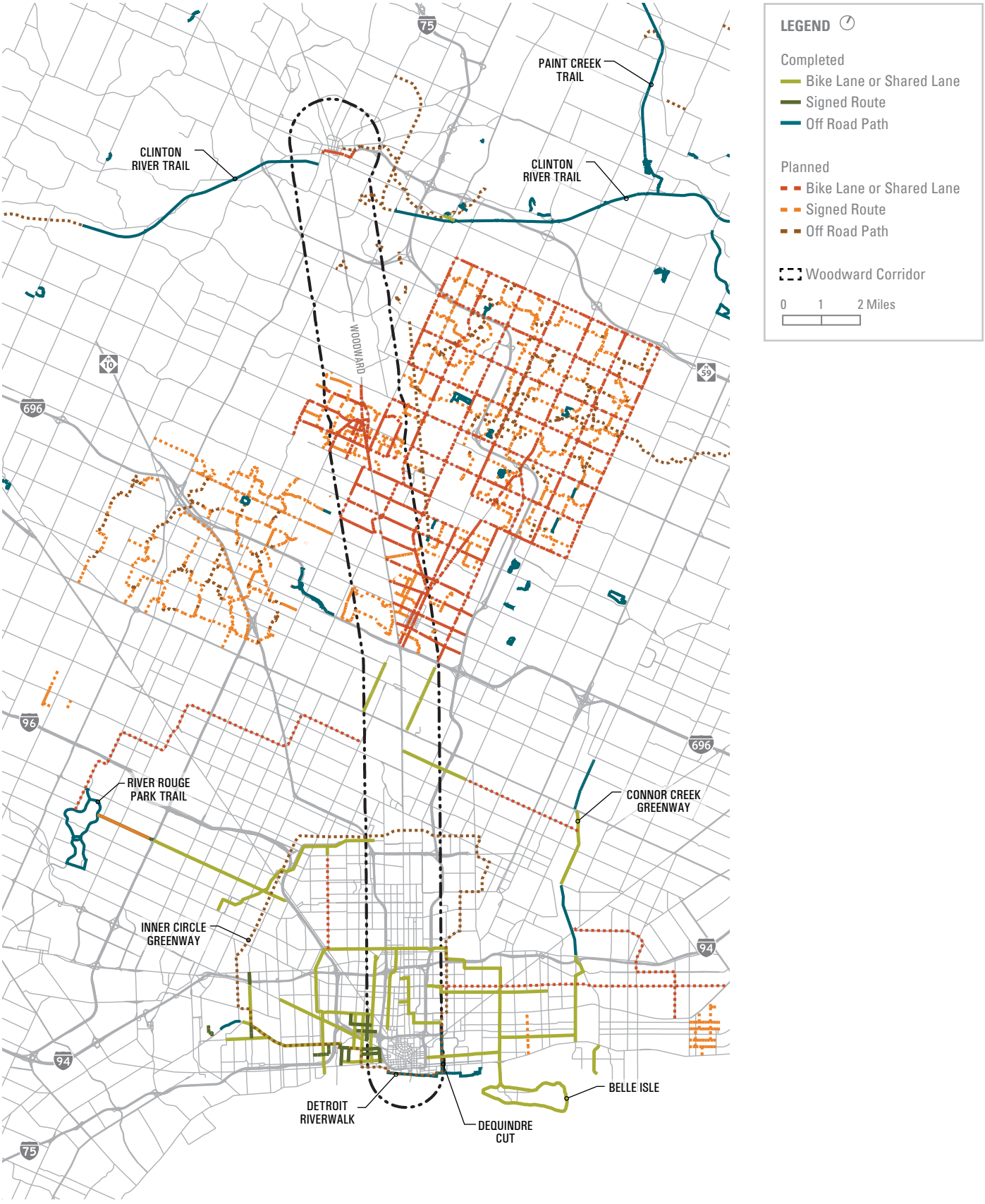


FIGURE 3-20. NON-MOTORIZED TRANSPORTATION PROJECTS

Source: SEMCOG, City of Detroit, SEMCOG

Sidewalks

There are continuous sidewalks northbound and southbound along Woodward Avenue between Jefferson Avenue in Detroit and Lincoln Street in Birmingham, providing another common transit-supportive amenity that promotes use of transit; however, sidewalks in Royal Oak, Berkley, and Birmingham in this segment run adjacent to buildings rather than adjacent to the road edge, which is not conducive to bicyclists. Gaps in sidewalk availability begin to appear at Lincoln Street in Birmingham. There are no sidewalks northbound or southbound along Woodward in Bloomfield Hills for three miles (between Quarton Road and Hickory Grove Road). Sidewalks or multi-use "safety paths" are inconsistent north of Hickory Grove Road through Bloomfield Township. Sidewalk continuity on both sides of the roadway reemerges at South Boulevard to the Woodward Avenue Loop in Pontiac.

Crossings

As of 2013, all 11 communities along the corridor are working to update all pedestrian ramps at signalized and non-signalized intersections to be in compliance with Americans with Disabilities Act (ADA) requirements. These updates typically occur with roadway reconstruction or signal modernization and are ongoing.

All traffic signals along the study corridor have pedestrian crossing signals, except for single-direction crossover signals associated with a larger cross-street and the following intersections:

- Oak Avenue (Birmingham)
- Big Beaver Road (Bloomfield Township)
- Long Lake Road (Bloomfield Hills)

In addition to the presence of sidewalks along the corridor, the distance that pedestrians have to cross Woodward Avenue factors into the quality of the non-motorized environment and the experience of a transit user once they have alighted from the vehicle and are traveling on foot. The distance required for a pedestrian to use a signalized marked crosswalk was calculated for each segment of the corridor. On Woodward Avenue from Downtown Detroit to McNichols Road, the crossings are all less than a ten-minute walk from one side of Woodward Avenue to the other side when using a signalized marked crosswalk. The maximum distance for pedestrians crossing Woodward Avenue at a signalized intersection in Detroit and Highland Park occurs north of McNichols Road. This area includes a boulevard with signals spaced every 0.33 miles to 0.5 miles.

Between 8 Mile Road and Quarton Road, signal spacing is further apart than in Detroit, resulting in longer distances to cross. Crossing times range between four minutes and 22 minutes. Between Quarton Road and Hickory Grove Road, there are six traffic signals without pedestrian crossings. In order to cross at a signalized marked crosswalk, the maximum time a pedestrian would hypothetically be required to walk would be over an hour (67 minutes). Between Hickory Grove and the start of the Woodward Loop in Pontiac, crossing times range between 12 and 30 minutes. In Pontiac, the signals are more closely spaced, with an average crossing time of five minutes.

Existing Activity and Planned Improvements

Pedestrian activity information was collected at various locations along the corridor. It was found that there is a high amount of pedestrian activity within the city of Detroit, especially near transit stops. Pedestrian activity starts to diminish north of 8 Mile Road, with more pedestrian activity near major activity centers and the downtowns of Ferndale, Birmingham, and Pontiac. There are currently no bicycle lanes on Woodward Avenue, Cass Avenue, John R Road, Grand Boulevard, Washington Avenue, or 11 Mile Road. Bicycle lanes are scheduled to be constructed on Cass Avenue in 2014.

Most communities in the study area have recommended improvements to non-motorized facilities as part of their recent planning efforts. The City of Detroit Non-Motorized Urban Transportation Master Plan (2006) defines locations and types of non-motorized facilities, which it recommends for the entire City, and proposes a strategy to implement the recommended improvements. Guidelines for bicycle lane standards were also developed as part of the plan by the City of Detroit Traffic Engineering Division. The plan outlines additional strategies related to future maintenance and growth of the non-motorized system. The City of Highland Park's Master Plan (2010) notes that Woodward Avenue should be striped and signed for bicycle lanes as well. Ferndale, Royal Oak, Birmingham, and Bloomfield Township have also recently completed plans specific to non-motorized and multi-modal transportation. Pleasant Ridge, Huntington Woods, Bloomfield Hills, and Pontiac do not have any plans that directly address non-motorized transportation.

As part of the Woodward Complete Streets Master Plan, bicycle counts were collected at various locations along the corridor during the AM and PM peak periods. It was found that areas near major activity centers have more bicycle activity than in areas with lower density areas. At most, there were 46 bicyclists at a location during the four hour peak period, which was located on Cass Avenue south of Warren Avenue. Within the Midtown Detroit area, there were more bicyclists along Cass Avenue than on Woodward Avenue and John R Street. North of 8 Mile, bicycle use was higher near 9 Mile Road, with 28 bicyclists in an eight hour period and tapered to 13 bicyclists near 13 Mile Road. Information was not collected north of 13 Mile Road.

3.2.4 ALTERNATIVE COMMUTING OPTIONS

In addition to analyzing rapid transit alternatives for the Woodward corridor, this project initiated the review of strategies, programs, and policies that were recommended as part of SE Michigan's Transportation Demand Management (TDM) Strategy, which was completed in 2013 and identifies alternative commuting options that align closely with rapid transit service. Strategies that were identified as part of this project include:

Information and Outreach

SE Michigan's TDM Strategy recommends that information-based programs be the first of many initiatives designed to encourage alternative commuting habits. A localized multimodal travel planning app accessible to all travelers within SE Michigan could be developed to increase the knowledge of alternative travel options and the benefits of each mode. In conjunction with the travel planning app, SE Michigan could develop a TDM marketing campaign to increase awareness of alternative travel options. In some cases, short-term increases in transit ridership of up to 50% have occurred as a result of targeted TDM marketing campaigns.

Employer-Based Programs

Establishing public-private partnerships through the development of employer-based programs is another key component of SE Michigan's TDM Strategy. Because the Woodward Avenue corridor is home to so many major employers, their participation in employer-based TDM programs can have a major impact on the travel patterns on Woodward Avenue. Employer-based TDM programs can include a variety of different initiatives; telecommuting and flexible scheduling can decrease the number of employees traveling during peak hours, while bicycle and transit benefits can encourage employees to use alternate travel modes through various employer-offered incentives. Furthermore, SE Michigan can develop a Commute Trip Reduction (CRT) program that requires (in some cases by law) employers of a certain size to develop policies to reduce single-occupant vehicle (SOV) trips.

Transit Programs and Services

As the RTA of SE Michigan establishes forthcoming transit initiatives, there are several TDM programs that can further support the capital investments of the organization. One such program that has already been identified by the RTA is the creation of an EcoPass that provides unlimited transit service across a number of transit systems. Fare integration, which expedites purchases, transfers, and boarding, could be developed in conjunction with an EcoPass system. Another initiative that could act as a catalyst to increase transit ridership is the distribution of EcoPasses during major road construction, providing commuters with a free alternative and promoting the existing transit systems.

Project Development Practices

The application of TDM strategies can also be initiated through a more regional, project development perspective. Aligning capital improvement projects to follow the development of transit systems can ensure that alternative commute options are in place before additional strain is placed on constrained detour routes during construction. Concurrently, modification of Michigan law to allow high-occupancy vehicle (HOV) lanes in construction zones can further reduce the strain and increase throughput during construction. As part of any TDM strategy that is initiated for the region, SE Michigan must maintain updated travel survey information to ensure that the policies and programs are meeting the needs of local commuters.

3.2.5 PLANNED TRANSPORTATION INFRASTRUCTURE IMPROVEMENTS WITHIN STUDY AREA

The Southeast Michigan Council of Governments (SEMCOG) is the Metropolitan Planning Organization (MPO) for the southeastern Michigan area. SEMCOG maintains the short-range Transportation Improvement Program (TIP) for the region, which lists all transportation projects between 2014 and 2017 that are receiving federal funding. SEMCOG also maintains the long-range Regional Transportation Plan (RTP), which lists project in the long-range vision. The following lists are projects related to Woodward Avenue that are either listed in the TIP or the RTP.

Transportation Improvement Program Projects

- **Woodward Avenue Streetcar:** Construction of a Streetcar system along Woodward Avenue between Larned Street in Downtown Detroit to Bethune Avenue in New Center Detroit, approximately 3.3 miles in length. The project will reconstruct parts or all of Woodward Avenue. Project owner is M-1 Rail.
- **I-75 between Canfield to Piquette:** Rehabilitate roadway surface of I-75 between Canfield Street to Piquette Street in Detroit, approximately 0.5 miles in length. Project owner is MDOT.
- **9 Mile Road between Woodward Avenue and western Ferndale city limits:** Rehabilitate roadway, approximately 1.1 miles in length. Project owner is the City of Ferndale.
- **Old Woodward Avenue between Brown Street and Landon Avenue:** Add in center left-turn lane, approximately 0.4 miles in length. Project owner is the City of Birmingham.
- **Saginaw Street between Woodward Avenue to Montcalm Street:** Reconstruct roadway, approximately 0.9 miles in length. Project owner is the City of Pontiac.

Regional Transportation Plan Projects

- **I-94 between I-96 to Connor Avenue:** Widen freeway to 4 lanes in both directions, reconstruct I-75 and M-10 interchanges, approximately 13 miles in length. Project owner is MDOT.
- **I-75 between 8 Mile Road to Square Lake Road:** Widen freeway to 4 lanes in both directions, reconstruct interchanges, approximately 18 miles in length. Project owner is MDOT.

4.0 Evaluation Framework

The Woodward AA began with a streamlined list of modal alternatives in consideration of previous rapid transit studies completed for the corridor.

The evaluation framework for the AA involves a technical process with quantitative and qualitative evaluation measures and a broader public involvement process from which public feedback is considered in alternatives evaluation. FTA guidance recommends a tiered approach to evaluating alternatives that traditionally consists of:

FTA TIERED APPROACH TO EVALUATING ALTERNATIVES	
INITIAL SCREENING	A long list of modal and alignment alternatives is developed and then examined for their alignment with the project Purpose and Need.
TIER 1 SCREENING	The long list of alignment alternatives is refined with testing against quantitative and qualitative evaluation criteria.
TIER 2 SCREENING	A comprehensive set of evaluation criteria, typically an expanded list from the Tier I Screening criteria, are used for a detailed evaluation of the refined alignment alternatives and modal alternatives from the Initial Screening. Agency, stakeholder, and public feedback are considered within this screening level.
LPA SELECTION	Based on the detailed evaluation performed in the Tier II Screening, a Locally Preferred Alternative (LPA) is selected.

The Woodward AA began with a streamlined rather than long list of modal alternatives in consideration of previous rapid transit studies completed for the Woodward corridor. Accordingly, this AA adopts an adjusted FTA evaluation approach, with the preferred modal option selected at the Initial Screening level of analysis rather than the Tier 2 Screening and LPA Selection levels. The comprehensive evaluation approach for this AA is as follows:

WOODWARD AA ADJUSTED APPROACH TO EVALUATING ALTERNATIVES	
MODAL SCREENING	A modal screening is conducted to select the preferred modal alternative that will move forward for further evaluation. Previous rapid transit studies have enabled an early decision on the preferred mode in the case of this AA.
TIER 1 SCREENING	A long list of the most promising alignment alternatives is developed. The long list is refined through examination of alternatives against the project Purpose and Need. Alternative advancing into the Tier 2 Screening are listed.
TIER 2 SCREENING	A comprehensive set of evaluation criteria, typically an expanded list from the Tier I Screening criteria, are used for a detailed evaluation of the refined alignment alternatives and modal alternatives from the Initial Screening. Agency, stakeholder, and public feedback are considered within this screening level.
LPA SELECTION	Based on the detailed evaluation performed in the Tier II Screening, a Locally Preferred Alternative (LPA) is selected.

The Tier 2 Screening and the LPA selection processes take into consideration public, stakeholder, and Steering Committee feedback regarding evaluation criteria and alternatives evaluated in this document. The details of the public involvement process are outlined in Chapter 2 of this report.

4.1 Modal Pre-Screening

A modal pre-screening was conducted as the first step of the alternatives evaluation. This process considered a long list of modal alternatives for Woodward Avenue, eliminated modes due to their history within the study area, considered other factors such as major right-of-way impacts or costs, and selected BRT as the preferred modal option for Woodward.

This section provides a description of modes evaluated as well as the evaluation criteria and process for examining the modal options against each other.

4.1.1 MODES CONSIDERED

Commuter Rail

In recognition of commuter rail's past history within the study area, the lack of continuous rail tracks, and the absence of a ridership level required to sustain commuter rail, this modal option was eliminated early in the evaluation process and was not considered further.

Commuter rail is a mode that carries longer distance trips from suburban areas into a central city. It operates along railroad corridors, characteristically using tracks owned by private railroad companies and shared with freight operations. Trains can be as long as 10 cars, ranging from 1,700 to 2,300 feet, with the individual vehicle length ranging from 170 to 230 feet. Commuter rail cars can be either single-level or bi-level (such as in Seattle, Washington) and, to date, have been high-floor vehicles. Traditionally, commuter rail trains are powered by diesel or electric locomotives, usually in a "push-pull" configuration. In recent years, the use of diesel multiple unit (DMU) vehicles for commuter rail have become more common. Commuter rail is characterized by stations spaced two to six miles apart, with P&R facilities at outlying stations. Stations tend to have an extended shelter or canopy running the extent of the platform, matching the length of trains. Grade separated crossings of the tracks for pedestrians are often provided. High level platforms can allow level boarding and optimal access for persons with disabilities. Service levels in many systems focus on weekday peak period service, with all-day service provided in larger metropolitan areas.

Commuter rail once existed between Pontiac and downtown Detroit and was operated by SEMTA (Southeast Michigan Transit Authority). The service was discontinued in the 1980s due to low ridership. Currently, the track between Highland Park and downtown Detroit has been abandoned and parts have been converted to a non-motorized route.

Light Rail Transit

This mode was previously considered for a 9.3 mile portion of the corridor between downtown Detroit to 8 Mile Road. The Woodward Light Rail project failed to advance into preliminary engineering after securing environmental clearance in August 2011. Cost of implementation was one of the primary factors in this determination. Recent history and the corridor's 27-mile length from Downtown Detroit to Downtown Pontiac were considered in this mode's evaluation. However, LRT was not initially eliminated because public feedback suggested that there remained public support for this option despite its inability to move forward to implementation in Detroit. LRT was evaluated in the screening process.

Light rail transit (LRT) has similar features to a modern streetcar system, except that it is characterized by larger vehicles and multi-car trains. Train length depends on passenger demand, service frequency, and block length (where operated on streets). "Light" denotes more flexibility in operation than heavy rail systems, such as subways and automated guideway systems, which are completely grade-separated. LRT operates in its own right-of-way, either along an exclusive guideway such as a former rail right-of-way, or along urban streets. Exclusive guideways on urban streets often involve the median of a roadway or a separate travelway next to a roadway. It may also share lanes with other vehicles. In downtown areas, LRT tends to operate on-street but in segregated lanes (such as those in Phoenix, Arizona, shown above) and does not mix with general traffic as streetcars do. With operation in a separate transitway along a street, LRT requires limitations to local property access, such as driveways and parking garages, to avoid conflicts between general traffic and LRT vehicles. This includes restricting local access to right-in, right-out access with median treatments, and full local access restriction if operating alongside a roadway.

Bus Rapid Transit

BRT can operate in a variety of service strategies, including line-haul service along an entire corridor with limited stops, branching of service, and circulation into local neighborhoods at the end of a route. One of the key features of BRT is the flexibility it offers in serving dispersed land uses. This mode is successful as the first level of rapid transit to help build ridership and density and to support other forms of rapid transit. BRT's flexibility and success in serving metro areas with dispersed land uses similar to SE Michigan contributed to the inclusion of this mode in the screening process.

The main elements of BRT vary from place to place. These elements can include stations, passenger information, off-board fare collection, new low-floor buses, unique branding, and bus priority signalization improvements. BRT lines may also include pavement striping, overhead signage designating BRT lanes, or exclusive lanes where possible to enhance operations. Implementation of BRT expands upon existing local bus service provided by SMART or DDOT.

Passenger stations may include amenities such as a canopy or shelter, benches, lighting, art, landscaping, off-board fare collection, real-time "next bus" information using intelligent transportation systems (ITS) technology, and information kiosks. These elements have a uniform design throughout the line. BRT stations can utilize bus bulbs/platforms that extend from the curb and are level with the vehicle doorways. Some BRT systems use guidance and docking systems to minimize the space between the platform and the vehicle, minimizing the need for ramps or bridgeplates and allowing for fast boarding and alighting for all riders, including persons with disabilities.

BRT vehicles are painted with a distinctive color and graphics scheme that distinguish them from other fixed route buses in the system. BRT vehicles may be similar in size to a standard 40-foot bus with multiple entry/exit doors to facilitate passenger loading and unloading, or a longer 60-foot articulated bus may be used where passenger demand warrants. BRT vehicles are generally 12'-0" high and approximately 8'-6" wide.

Streetcar

Due to the length of the Woodward Avenue corridor (27 miles), the urban to suburban setting with varying densities and the different markets the rapid transit system will serve, the streetcar is not being considered as one of the modes for the AA. Streetcar is planned for Woodward Avenue between Grand Boulevard and Downtown Detroit. This 3.3-mile long corridor will serve the Woodward Avenue Streetcar project being implemented by M-1 Rail.

Streetcars are the modern technological descendent of the historic streetcar or trolley. A distinctive feature of streetcars is that the vehicles draw power from an overhead wire, or catenary, which is a system that allows the vehicles to operate in mixed traffic and pedestrian areas.

Streetcars provide the same level of flexibility and have similar operating characteristics as the larger light rail systems. The main streetcar system elements include stations/stops, low-floor vehicles, and amenities similar to those described for BRT. The stations typically consist of a platform level with the streetcar to facilitate passenger boarding and alignment, a canopy or shelter, benches, fare collection equipment, lighting, and information kiosks that are of uniform design along the alignment.

In addition to the stations, other fixed facilities include the tracks, the overhead catenary system, substations (located approximately one mile apart), and signal and communication systems. The fixed guideway would consist of tracks formed of continuously welded rails and embedded at-grade in a concrete slab. The streetcar would be either single or double-tracked. It could have dedicated space within the roadway or located within traffic lanes shared with other traffic.

A vehicle maintenance and storage facility would be required to accommodate a new streetcar fleet. The facility would have to be located on-site adjacent to or close to the line; and connected by a lead track. Streetcars are generally 65' to 70' long and 8'-1" to 8'-6" wide. Smaller than a LRT vehicle, the streetcar vehicle size enables them to operate in a number of urbanized settings and make sharper turns. Operator cabs at both ends of the vehicle allow bi-directional operation. Streetcars can operate either as a single or two car train and either in exclusive or mixed in with traffic.

4.1.2 MODE EVALUATION CRITERIA

The following evaluation criteria were developed for the AA based on Woodward AA Steering Committee input and the Purpose and Need of the project. Within the AA process, evaluation criteria are developed to assist in selecting a mode and alignment combination that most objectively meets the purpose and need. The weights assigned to the variables of the criteria are added to reflect the emphasis given to each of the factors. Weighting of evaluation factors was developed in consideration of public feedback obtained at December 2012 public meetings and FTA norms for criteria weighting.

Phasing

This criterion evaluates how the preferred alternative may or may not be implemented for the 27-mile Woodward corridor. This evaluation factor acknowledges that the ability to implement a transit option by segment is valuable. As the cost to implement an alternative increases so does the likelihood that phasing may be necessary. Factors considered in phasing include the mode that is selected as well as the effort necessary to construct the alternative. This criterion also considers logical termini, such as the beginning and ending of a phase and the ridership that is required for a phase.

Flexibility

This evaluation criterion recognizes that a transit system that can more easily divert from Woodward Avenue to reach major destinations offers an added benefit since several major destinations in the study corridor, including commercial downtowns, are not located directly on Woodward Avenue. This criterion also examines the ease with which future route changes could be made in if additional development occurs along or close to the corridor.

Integration with Existing Transit System

The use of existing transit infrastructure is crucial to the success of any new transit option along Woodward Avenue. This criterion evaluates how existing routes along the corridor, or that intersect with the corridor can be integrated in any new alternative. This ranges from being able to transfer easily from one transit system to another transit system or the ability to share resources such as stations or dedicated lanes. The ability of an option to work with exiting transit systems is beneficial.

Capital Cost

Capital cost entails the initial investment needed to get a new transit system up and running. The cost factor weighs heavily in the ability of the region to implement the system. Capital costs include designing the system and building infrastructure to support the system. Depending on the type of mode chosen, the capital cost can include the stations, overhead catenary systems, vehicle storage and maintenance facilities, vehicles, new traffic signals, right-of-way acquisition among other items. Capital cost is higher with those involving rail compared to those without rail.

Operations and Maintenance Cost

The long-term cost of the transit system entails the continual investment needed to maintain infrastructure and the cost for operation of the system after the capital cost investment has been made. This cost considers such items as maintaining the stations, the vehicles, operators for the system and the vehicles, roadway or trackway maintenance, station security, as well as others. The cost to maintain a fixed rail system is higher than other modes due to overhead catenary systems and the vehicle storage and maintenance facility. However, streetcar and LRT vehicles can last longer than BRT vehicles. Newer technologies are more equipped in bridging the gaps between life cycle costs between rail and BRT.

Ridership

Ridership involves the expected level of use the transit system will experience. This use is quantified in the number of trips being made. Traditionally, it was thought that LRT systems have higher ridership than BRT systems. However, more BRT systems are being built to mimic LRT systems, and ridership between the two modes is increasingly narrowing as BRT systems mimic rail-like features. Computer-based models have been built to evaluate various modes and the expected ridership. These models are based on surveys that have been conducted within SE Michigan and throughout the United States.

Economic Development

This criterion captures the potential economic development growth along the corridor related to the transit investment. It should be noted that economic development benefits are not calculated the same way within every transit system; therefore, economic growth can be difficult to accurately attribute to a project. It has been found that economic development around LRT systems is often greater than BRT systems; however, with the addition of more BRT systems that are mimicking rail features and addressing the issue of being permanent, studies are showing that the differential is being narrowed and that development around BRT stations may even rival those around LRT.

The Cleveland BRT system has reported $3 billion in economic development along the Euclid Avenue BRT corridor. The economic development along the corridor was largely a result and by-product of many transit supportive land use policies and local campaigns. The Cleveland example serves a model for economic development generated by BRT systems.

Reliability

This criterion recognizes that a system with a predictable on-time performance has a substantial benefit. Reliability often depends on the level of congestion along the corridor and its impact to the transit schedule. In order to bypass congestion that a mixed-in transit system currently has, exclusive guideways are often the solution to achieve reliability. Another factor that can also improve reliability outside of exclusive guideways are bypass lanes at signalized intersections or signalization that adjusts when a transit vehicle is approaching. Reliability also considered the level at which users understand where the system will travel – this is often achieved by either fixed guideway systems or exclusive guideways where passengers can see where the vehicle is traveling.

Social Equity

Social equity assumes all individuals should be afforded equal access to transportation infrastructure. This criterion recognizes that options supportive of equal access are beneficial to all potential users. Social equity evaluates the location of the alignment and stations along the corridor to ensure that the alternative does not unfairly favor one group while causing disservice to another group. Along Woodward Avenue, there is great diversity in transit users in terms of demographic backgrounds that can benefit from all types of transit. This criterion will evaluate where the route is proposed along the Corridor and also where the potential stations will be located. As part of this analysis, all routes and stations are the same, causing all to be evaluated in the same way. The next phase of the project will have more definition based on generalized station locations and populations served as part of the evaluation of this criterion.

4.2 Tier 1 Screening

Following the selection of BRT as the preferred rapid transit mode, preliminary alignment and station location alternatives were developed to determine which would be advanced into to the Tier 2 screening for further analysis. This process considered a comprehensive series of alignment alternatives and station locations, evaluating each combination through discussions with the Steering Committee. Several engagement sessions were initiated to allow Steering Committee members to provide input on alternatives that would be favored in each community.

Rider Profile Group Exercise

In May 2013, the Steering Committee took part in an exercise that provided exposure to the variety of potential riders that may utilize rapid transit service on Woodward. The differing transportation needs of riders were emphasized; the need of traditional and reverse commuters for speedy service, flexible hours of operation for transit dependent populations, and the need for seamless transfers between BRT and local bus service were some of the topics discussed as part of the exercise. Steering Committee members developed an understanding of the importance of station locations in both their local communities, but also in the broader context of the corridor.

Station Location Exercise

In June 2013, the Steering Committee participated in an exercise that allowed them to provide focused input on each preliminary station location. Maps of the study area and preliminary station locations were distributed to each Steering Committee member, who evaluated each by ranking the station locations into three tiers based on their priority. The Steering Committee was also asked to elaborate on their ratings with comments, which were helpful in uncovering insight about who might be the most prominent users at each stop, what changes might need to happen for the stop to be more successful, and if certain stations required closer analysis in the upcoming bus tour and ongoing technical analysis.

While the two groups only agreed on the classification tier of 14 of the 44 total potential locations, a discussion following the exercise resulted in more consensuses. To expand on the tiers provided, the Steering Committee added a fourth tier that reflected stations that should not be considered in further technical analysis. Many Steering Committee members requested additional information regarding travel times and proposed solutions from the concurrent Woodward Avenue Complete Streets project. This exercise, in conjunction with ongoing technical analysis, revealed the station locations that should be evaluated as part of the Tier 2 screening.

The ratings and comments are summarized on the following pages in **Table 4-1**.

TABLE 4-1. STATION LOCATION EXERCISE SUMMARY

Type 1 = "No Brainer" Type 2 - "Maybe If..." Type 3 - "Potential Future" Type 4 - "Definitely No" (category created by Group A)

	GROUP A		GROUP B	
POTENTIAL STOP	RATING	COMMENTS	RATING	COMMENTS
Downtown Pontiac	1		1	
Pontiac Transit Center	2	"Prefer to relocate Transit Center to Downtown Pontiac"	2	"If they fix the circle" "Implementation of livability study"
St. Joseph's Hospital	1		1	
Square Lake Rd	1		2	
Long Lake Rd	1		-	
Between Long Lake Rd & Cranbrook	-		2	
Cranbrook	2	"Cranbrook needs to provide shuttle"	-	
Quarton / 16 Mile Rd	4	"No"	2	"Issue is the desire of the city whether to have a stop"
Maple / 15 Mile Rd	1		1	
Lincoln St	4	"No"	2	
14 Mile Rd	1		1	
Normandy Rd	4		3	
13 Mile Rd & Coolidge Hwy	1	"Huge employment center"	1	
12 Mile Rd & Coolidge Hwy	-	"Get outvoted on downtown" "Want to know time difference between all-Woodward and stopping downtown"	2	"Would like this alternate route to be studied, but would defer to keeping the spine healthy"
11 Mile Rd & Coolidge Hwy	-		2	"Concern with impact on residential areas of running vehicles on 11 Mile"
12 Mile Rd	3	"Deed restrictions"	1	
Catalpa Dr	-		2	
11 Mile Rd	1		1	
Royal Oak Transit Center / Sherman Ave	-	"What is the time difference between serving downtown RO and downtown Berkley versus express service on BRT?"	2	"Stopping in Downtown RO is not 'rapid'"
Lincoln Ave	2	"OCC can be served by Detroit Zoo"	3	"Less walkable to downtown than other stops" "Disturbs residential area" "Not 'rapid'"
Detroit Zoo	1	"Align with times of use" "Park and ride" "Needs to be more pedestrian friendly" "Bridge to be redone" "Woodward in ditch a problem"	1	"Work on pedestrian crossings over Woodward and 696"

TABLE 4-1. STATION LOCATION EXERCISE SUMMARY (CONT.)

Type 1 = "No Brainer" Type 2 - "Maybe If..." Type 3 - "Potential Future" Type 4 - "Definitely No" (category created by Group A)

	GROUP A		GROUP B	
POTENTIAL STOP	RATING	COMMENTS	RATING	COMMENTS
Oakland Park Blvd / Sylvan Ave	4	"No"	2	"Change to Woodward Heights" "Needed if there is no pedestrian crossing solution to I-696"
9 Mile Rd	1		1	
8 Mile Rd	2	"If the bridge is removed"	1	"Stop somewhere in 8 Mile / State Fair area"
State Fair Transit Center	1	"If budget stays" "New multi-modal hub at Gateway Shopping Center"	2	"Dependent on future development of State Fair, on potential future rapid tansit connection on 8 Mile, on ability to manage DDOT/ SMART transfer point"
7 Mile Rd	1		1	
6 Mile Rd / McNichols	1		1	
Manchester St (Model T Plaza)	1	"Future TOD" "Large amount of riders, but the development is currently ugly" "Vehicle maintenance?"	1	
Glendale St / McClean St	4		2	
Tuxedo St / Tennyson St	2	"Girls high school. Maybe time specific stops"	3	
Calvert St / Trowbridge St	4		1	"Would help serve Hamtramck"
Chicago Blvd / Arden Park Blvd	3	"Need development on Woodward"	3	
Hazelwood St / Holbrook St	1	"High school" "Good crosstown route DDOT"	2	
Grand Blvd	1	(dot location neither at Grand or Amtrak but in between)	1	
Detroit Amtrak Station	1		-	
Palmer Ave / Ferry Ave	4		-	
Warren Ave	1		1	
Canfield St	4		1	"Currently the most traffic generation"
MLK / Mack Ave	1		2	"Lots of TOD potential"
Temple St (Future Arena)	2		-	
Montcalm St	4		1	
Grand Circus Park	1		-	
Rosa Parks Transit Center	1		1	
Larned St	1		-	

Woodward Avenue Bus Tour

In July 2013, the Steering Committee participated in a bus tour that extended the entire 27-mile corridor from Downtown Pontiac to Downtown Detroit. This bus tour provided a "user" experience in conjunction with guided commentary from the project team. At multiple locations along the route, the tour was halted to allow for discussion amongst the Steering Committee and team members. This tour provided input on what alignment options should be evaluated as part of the Tier 2 screening.

Community Representative Meetings

In addition to the input received during Summer 2013, meetings were held with each of the nine communities within the Woodward Avenue corridor to further evaluate and discuss potential station locations. These one-on-one stakeholder meetings were held in November 2013, in advance of the December 2013 public meeting. These meetings resulted in further refinements to station locations, including eliminating some Type 2/3 stations, adding some Type 3 stations (especially at potential P&R locations), and shifting the location of Type 1 stations to better serve the communities.

4.3 Tier 2 Screening

Following the initial evaluation of BRT alignment alternatives as part of the Tier 1 screening, several alternatives were advanced to the Tier 2 screening for further analysis. This process considered a series of alignment alternatives, station location alternatives, and cross section alternatives, evaluating each combination against a comprehensive collection of criteria.

This section provides a description of the alternatives evaluated, as well as the evaluation criteria and process for examining the alternatives against each other.

4.3.1 ALIGNMENT ALTERNATIVES CONSIDERED

The Tier 2 screening consisted of a comprehensive evaluation of alignment alternatives, using an "all-Woodward" Mainline Alternative as a base while evaluating several different "off-Woodward" alignments throughout Oakland County and the City of Detroit.

Mainline Alternative

The Mainline Alternative acted as the "base" alternative that all other alternatives were evaluated against. The Mainline Alternative consists of a northern terminus in Downtown Pontiac and a southern terminus at the Rosa Parks Transit Center in Downtown Detroit. The alignment maintains service on Woodward Avenue throughout the entire 27-mile study area with the exception of two diversions at the northern and southern termini: on Water and Pike Streets in Downtown Pontiac to provide access the Pontiac Transit Center and on Adams Street in Downtown Detroit to provide access the Rosa Parks Transit Center.

Pontiac Alternative

A secondary alternative was developed for Downtown Pontiac that would exclusively use Pike Street as the east-west access to Downtown Pontiac and Pontiac Transit Center stations. This alternative provides more direct access to the proposed station near Lot 9 and reduces the additional turning movement associated with the Mainline Alternative.

FIGURE 4-1. PONTIAC MAINLINE ALTERNATIVE

FIGURE 4-2. PONTIAC ALTERNATIVE

Berkley Alternatives

Preliminary alternative testing and discussions with area stakeholders initiated the development of an alternative that would serve both Royal Oak Beaumont Hospital and Downtown Berkley, which could potentially provide better access to Beaumont Hospital, Berkley's primary business district, destinations in Downtown Berkley, and adjacent neighborhoods. This alternative consists of an off-Woodward diversion that accesses Downtown Berkley via Coolidge Highway. Options for reconnecting to Woodward included both 12 Mile and 11 Mile; as such, stations were evaluated at the 12 Mile and 11 Mile intersections with Coolidge Highway.

Royal Oak Alternatives

Preliminary alternative testing and discussions with area stakeholders initiated the development of alternatives that would serve Downtown Royal Oak, which could potentially provide better access to the Royal Oak Transit Center, Oakland County Community College, Royal Oak's shopping district, and adjacent neighborhoods. This alternative consists of an off-Woodward diversion that accesses Downtown Royal Oak via 11 Mile Road, Lafayette Street, and Washington Avenue. A second Royal Oak alternative consisted of an off-Woodward diversion that accesses Downtown Royal Oak via Lincoln Avenue.

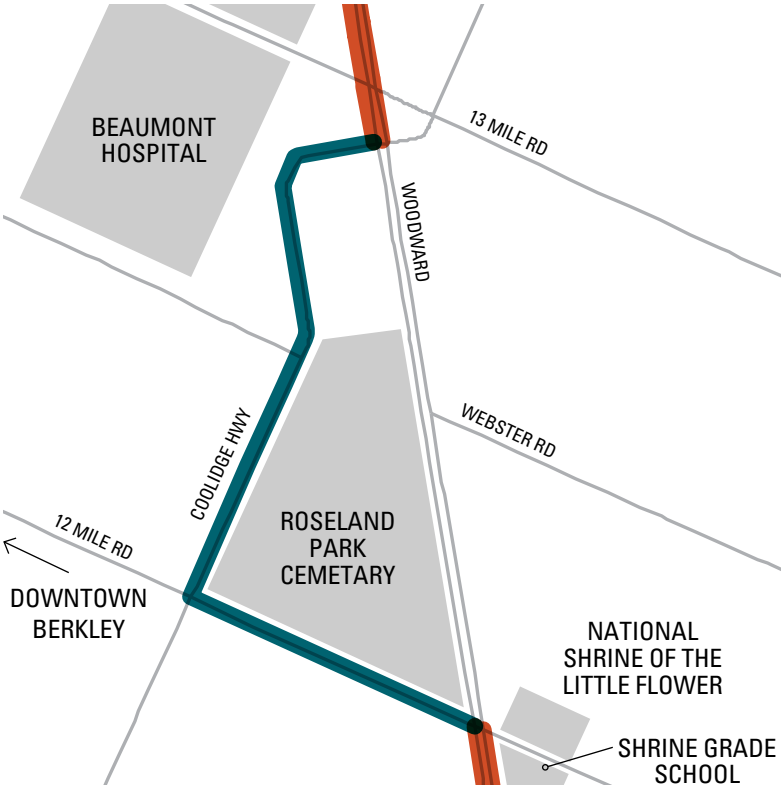


FIGURE 4-3. BERKLEY ALIGNMENT ALTERNATIVE

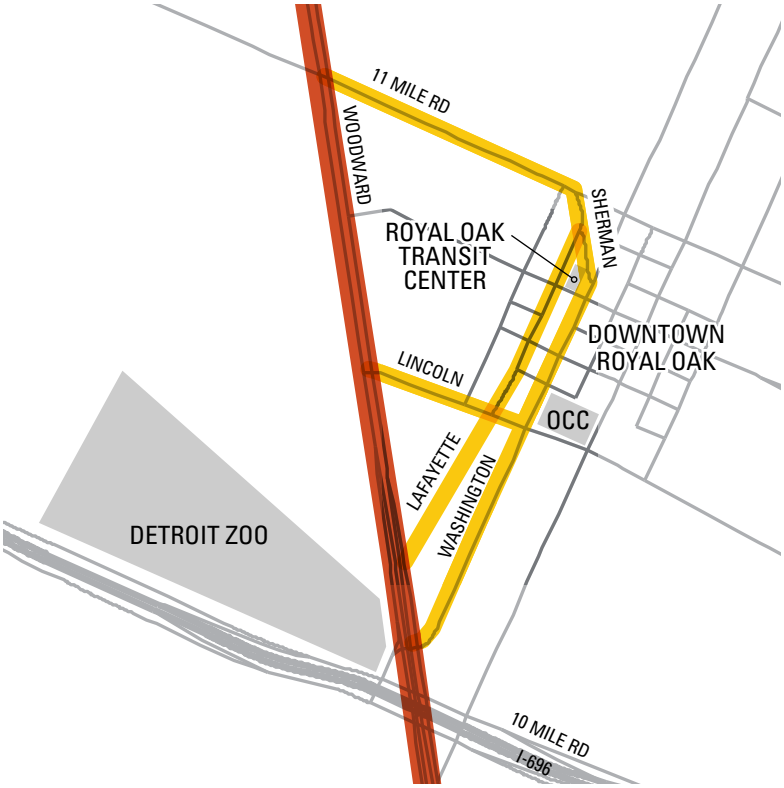


FIGURE 4-4. ROYAL OAK ALIGNMENT ALTERNATIVE

Detroit Alternative #1

Due to the development of the M-1 Rail Streetcar on Woodward, several alternatives were developed to provide alternate routing south of Grand Boulevard. This alternative is an off-Woodward diversion to Cass Avenue beginning at Grand Boulevard. Cass Avenue provides a direct north/south connection to the southern terminus of the alignment, the Rosa Parks Transit Center. This alternative would not require BRT vehicles to interact with the M-1 Rail Streetcar.

Detroit Alternative #2

This alternative is an off-Woodward diversion to Cass Avenue beginning at Warren Avenue. Between Grand Boulevard and Warren Avenue, the BRT vehicle would be mixed in traffic before diverting west to Cass Avenue. Cass Avenue provides a direct north/south connection to the southern terminus of the alignment, the Rosa Parks Transit Center. This alternative would require minimal interaction between BRT vehicles and the M-1 Rail Streetcar.

FIGURE 4-5. DETROIT ALTERNATIVE #1

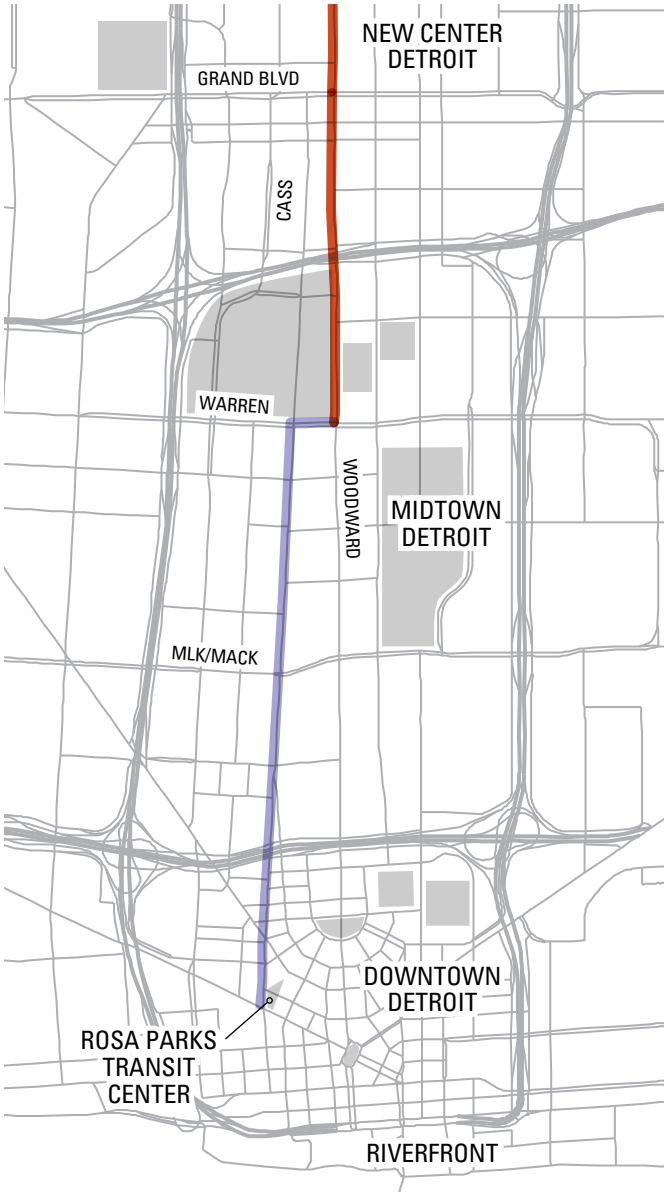


FIGURE 4-6. DETROIT ALTERNATIVE #2

Detroit Alternative #3

This alternative consists of an off-Woodward diversion using Cass Avenue and John R Street as a north/south one-way loop. The BRT vehicle would utilize the I-75 service drive to connect from Cass Avenue to John R Street. The southbound loop on Cass Avenue would divert from Woodward at Grand Boulevard, while the northbound loop on John R Street would divert back to Woodward at Warren Avenue. Between Warren Avenue and Grand Boulevard on the northbound loop, the BRT vehicle would be mixed in traffic. The diversion back to Woodward at Warren Avenue was considered due to the one-way southbound configuration of John R Street north of Warren Avenue. This alternative would require minimal interaction between BRT vehicles and the M-1 Rail Streetcar.

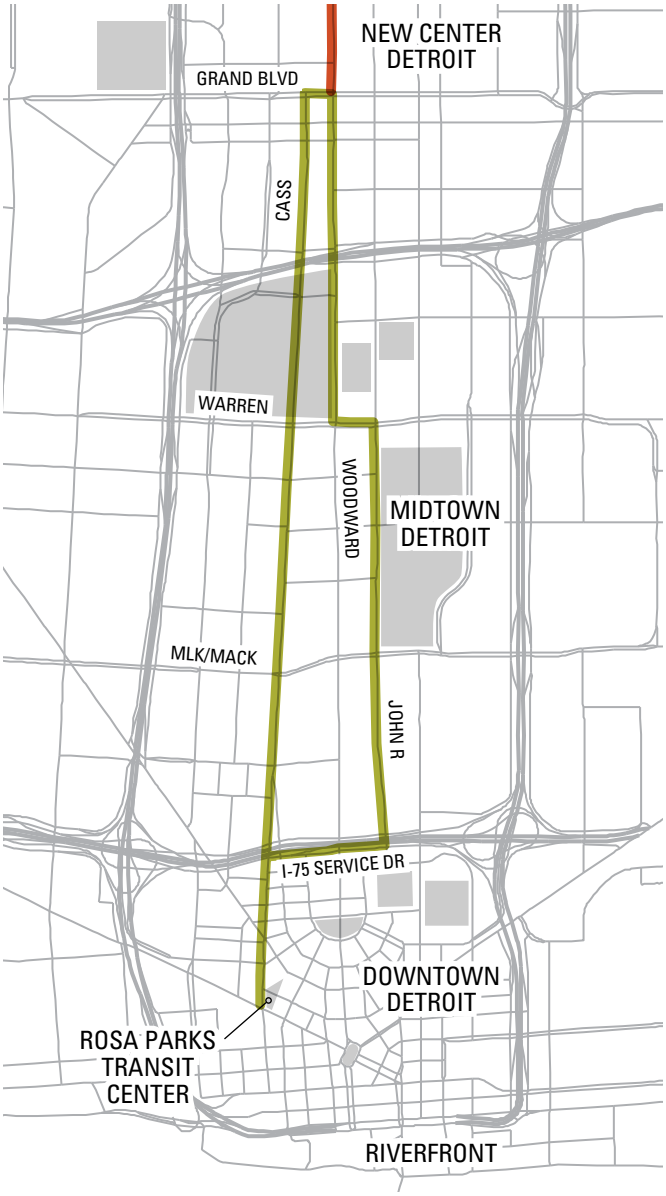


FIGURE 4-7. DETROIT ALTERNATIVE #3

Detroit Alternative #4

Similar to Detroit Alternative #3, this alternative consists of an off-Woodward diversion using Cass Avenue and John R Street as a north/south one-way loop. The BRT vehicle would utilize the I-75 service drive to connect from Cass Avenue to John R Street. Both northbound and southbound loops would divert to and from Woodward at Grand Boulevard. Due to the one-way southbound configuration of John R Street north of Warren Avenue, this alternative would require conversion of this segment to accommodate two-way traffic. Additionally, the John R Street bridge over I-94 would need to be maintained as part of the ongoing I-94 expansion. This alternative would not require BRT vehicles to interact with the M-1 Rail Streetcar.

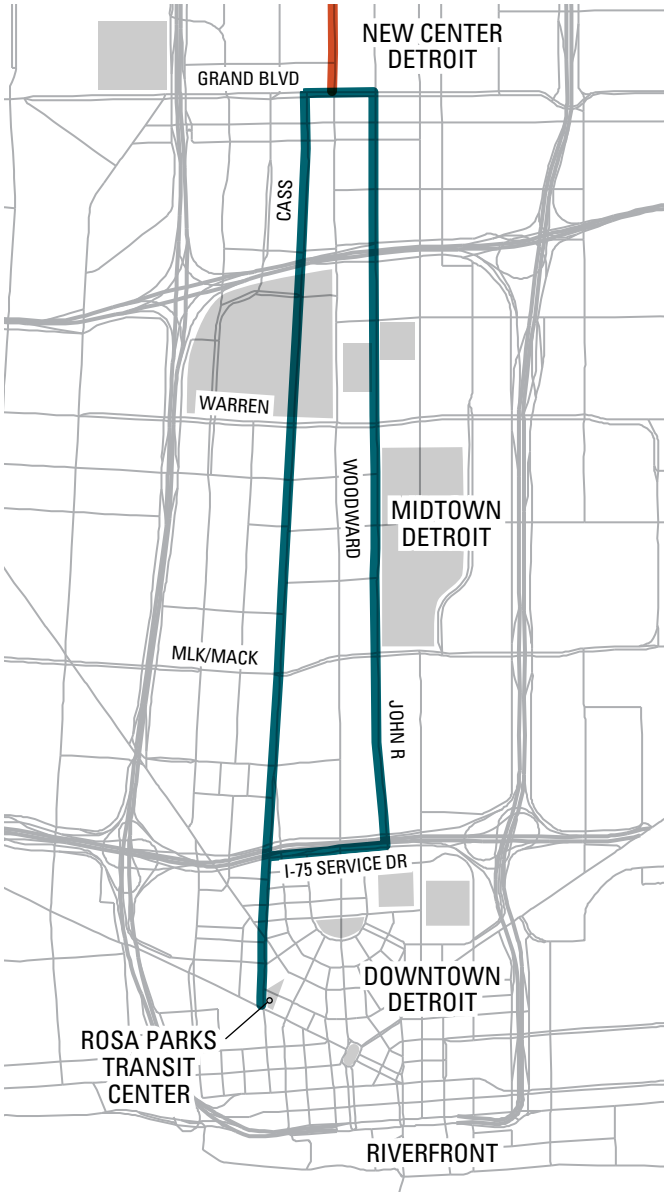


FIGURE 4-8. DETROIT ALTERNATIVE #4

4.3.2 ALIGNMENT ALTERNATIVES EVALUATION CRITERIA

The following evaluation criteria were developed for the Tier 2 Screening of alignment alternatives based on Woodward AA Steering Committee input and the Purpose and Need for the project. Within the AA process, evaluation criteria are developed to assist in selecting an alignment that most objectively meets the purpose and need. The weights assigned to the variables of the criteria are added to reflect the emphasis given to each of the factors. Weighting of evaluation factors was developed in consideration of public feedback obtained at December 2013 public meetings, and FTA norms for criteria weighting.

Transit Travel Time

Transit travel time evaluates the amount of travel time for each of the BRT alignment routes. This criterion compares the variation in travel time between the routes, with those alignment options that have the lowest travel time scoring better than those with the higher travel times. The preliminary travel times were based on the speed limit of the roadway, whether the alignment option could have dedicated transitways, the number of signals, and the number of turns that the route would take. Additional turns and signals add additional time to the transit travel time. It was assumed that most of corridor could be in dedicated transitways, the exceptions being along Woodward Avenue south of Grand Boulevard and along 11 Mile Road and 12 Mile Road in Oakland County.

Travel time was determined for each of the alternatives based on prevailing speed limits along the corridor as well as the number of signals, number of stations, and number of turns. If the BRT was considered in an exclusive lane, then the BRT travel at the posted speed limit and there was five (5) seconds of delay at each of the traffic signals. If the BRT was shared in with traffic, then there was 15 seconds of delay at each of the traffic signals. It was assumed that each station had 20 seconds of dwell time and there was also acceleration and deceleration time of approximately 20 seconds added. For each turn, there was approximately 20 seconds of acceleration and deceleration time added.

For each of the alternatives, the alignment was considered exclusive along most of the corridor. The exceptions are as follows:

- Woodward Avenue south of Grand Boulevard
- Cass Avenue between Grand Boulevard and I-75 when service was 2-way (Detroit Options 1 and 2)
- Washington Boulevard north of Lincoln Avenue
- 11 Mile Road between Sherman Drive and Woodward Avenue
- 12 Mile Road between Woodward Avenue and Coolidge Highway
- Coolidge Highway between Woodward Avenue and 12 Mile Road

Table 4-2 on the following page summarizes the travel time for each of the alternatives. This information was utilized as an input into the forecasting model.

TABLE 4-2. TRAVEL TIME SUMMARY BY ALTERNATIVE

Source: Parsons Brinckerhoff

ALTERNATIVE	AVERAGE TRAVEL TIME (ONE WAY)	AVERAGE DISTANCE (ONE-WAY IN MILES)	NUMBER OF STATIONS	NUMBER OF TURNS	NUMBER OF SIGNALS
All Woodward	1 hr 8 min	25.4	24	5	72
Pontiac 2	1 hr 7 min	25.3	24	3	71
Berkley	1 hr 12 min	25.9	25	9	72
Royal Oak 1	1 hr 12 min	25.5	25	10	76
Royal Oak 2	1 hr 13 min	25.9	25	11	77
Detroit 1	1 hr 7 min	25.2	23	5	65
Detroit 2	1 hr 6 min	25.3	23	5	67
Detroit 3	1 hr 7 min	25.4	23	5	65
Detroit 4	1 hr 6 min	25.4	23	5	65

Connectivity to Major Destinations

Major destinations are locations that attract customers, visitors, and employees that live both near and far from the destination. Alignment options that connect riders to goods, services, and job opportunities at these destinations provide a greater benefit than options offering limited or no access to these key destinations.

Transfer Opportunities and Intermodal Connections

The use of existing transit infrastructure is crucial to the success of any new transit service along Woodward Avenue. This criterion evaluates how existing routes that run along or intersect with the alignment option, including DDOT and SMART bus services, the DPM, and the M-1 RAIL streetcar, can be integrated in any new alternative. This ranges from being able to transfer easily from one transit system to another transit system or the ability to share resources (stations or dedicated lanes). In addition, this criterion evaluates how the alignment option connects to other intermodal facilities within the study area, including the Pontiac Transportation Center, the Royal Oak Transit Center, the Detroit Amtrak Station and the Rosa Parks Transit Center. The ability of an option to work together with exiting transit systems is beneficial. Those alignments that have more connections to multi-modal centers would score higher than those that have fewer connections.

Transit Ridership

Ridership involves the expected level of use the transit system will experience. This use is quantified in the number of trips being made. Computer based models have been built to evaluate various modes and the expected ridership. These models are based on surveys that have been conducted within SE Michigan and throughout the United States. The higher the ridership, the more successful the transit system. This evaluation criterion reviews the amount of transit ridership that each alignment would have and the ease of transfer from one mode to another to increase ridership along the alignment. This criterion looks at the amount of riders along the corridor, within the transit system, and also the user benefits (both positive and negative) of each alternative. Typically, those alignments that have higher transit ridership would score higher than those that have lower transit ridership.

As part of the Tier 2 Alternatives evaluation, ridership forecasts were developed for each of the alternatives considered. A technical memo describing the development of the ridership forecasts can be found as an appendix to this report. The ridership forecasted utilized an incremental logit (Ilogit) mode choice model. The Ilogit model was developed utilizing a transit on-board survey that was conducted by SEMCOG in 2010. FTA allows for three methods to determine ridership for projects that may enter into project development, this data driven method is one of those approaches. The first step in the development of the Ilogit mode choice model was to refine the on-board survey to determine calibration target values to calibrate the Ilogit model.

Typically, an on-board survey asks those individuals riding a bus questions relating to the origin, destination, and purpose of their trip. The number of questionnaires for each route is based on the current ridership of each route. A sample of riders for each route is conducted based on the ridership. The higher the ridership, the higher the number of responses. Surveys were taken on all bus providers within the SEMCOG area including DDOT, DPM, SMART, Ann Arbor Area Transportation Authority (AAATA), University of Michigan (UM), Blue Water Area Transit (BWAT), and Lake Erie Transit (LET). From the on-board survey, a trip matrix was created and assigned to the transit network. Through the assignment, it was found that some adjustments had to be made to the network including limiting SMART stops within the City of Detroit as well as an adjustment to an assignment parameter. **Table 4-3** is a summary of ridership for each of the seven service providers as well as the results of the on-board survey assignment:

TABLE 4-3. SERVICE PROVIDERS AND RIDERSHIP

Source: Parsons Brinckerhoff

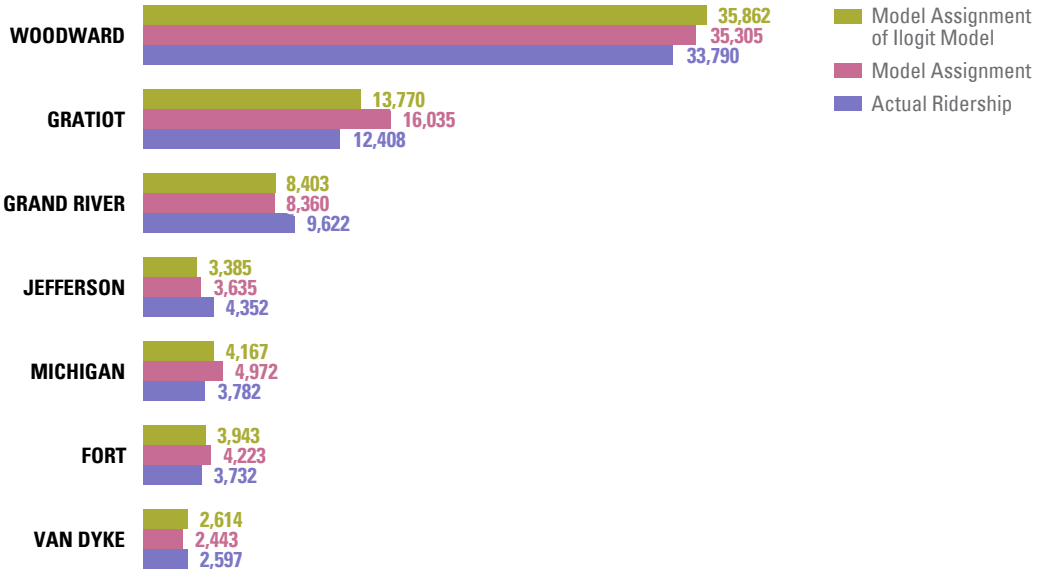
SERVICE PROVIDER	ACTUAL RIDERSHIP	MODEL ASSIGNMENT	MODEL ASSIGNMENT OF ILOGIT MODEL
Detroit Department of Transportation (DDOT)	124,532	121,483	122,120
Detroit People Mover (DPM)	4,011	2,078	2,738
Suburban Mobility Authority for Regional Transportation (SMART)	34,010	43,319	38,766
Ann Arbor Area Transportation Authority (AAATA)	21,886	23,667	24,067
University of Michigan (UM)	34,303	36,377	36,413
Blue Water Area Transit (BWAT)	2,661	1,849	1,914
Lake Erie Transit (LET)	887	378	424
Total	**222,280**	**229,151**	**226,444**

Given that the service areas of DDOT, DPM, and SMART overlap as well as the service area of AAATA and UM, combining the ridership of those providers actually show that the actual versus assigned ridership is close overall. For example, there are 162,553 trips for DDOT, DPM and SMART and the assignment had a total of 166,880 trips (within three percent).

Overall ridership for each of the service providers is important; however, this project is along a key corridor within Southeast Michigan. Along the Woodward Avenue corridor, there are 12 routes that are either along Woodward Avenue or run closely parallel. There are also several other corridors within SE Michigan which are critical, including Gratiot Avenue, Michigan Avenue, and Grand River Avenue. **Figure 4-9** on the following page summarizes the ridership along those routes and the model assignment.

FIGURE 4-9. RIDERSHIP BY CORRIDOR

Source:



As shown in **Table 4-3** on the previous page and **Figure 4-9** above, the assignment of the on-board survey and that of the Ilogit model results are fairly close along the Woodward Avenue corridor (within five percent).

The Ilogit model was developed utilizing the on-board survey as well as factors from other Ilogit models from around the country. There were three key modes within the Ilogit model: bus, streetcar, and BRT. The streetcar mode was added due to the construction of the M1-RAIL streetcar that is expected to be built along Woodward Avenue within the next several years. The Ilogit model was calibrated utilizing a base year trip table from the on board survey. This ensured that the Ilogit model was calibrated for the Detroit area. The figures above summarize the ridership for each of the providers as well as the corridors from the Ilogit model. In addition to ensuring that the Ilogit model accurately predicted the current ridership, the new streetcar and BRT modes were also added. In order to predict the amount of ridership on those new modes, unincluded attribute values were added to the model which make these modes more "attractive" than the current bus modes. These values were determined based on other systems within the United States and the proposed M1-RAIL system and the BRT system within Southeast Michigan. Service attributes not part of travel demand models include "its visibility, reliability, span of service hours, comfort, protection from the weather, the chances of finding a seat, and passenger amenities." These values are detailed within the technical memo.

The Ilogit model considered the following types of trips within the decision making process:

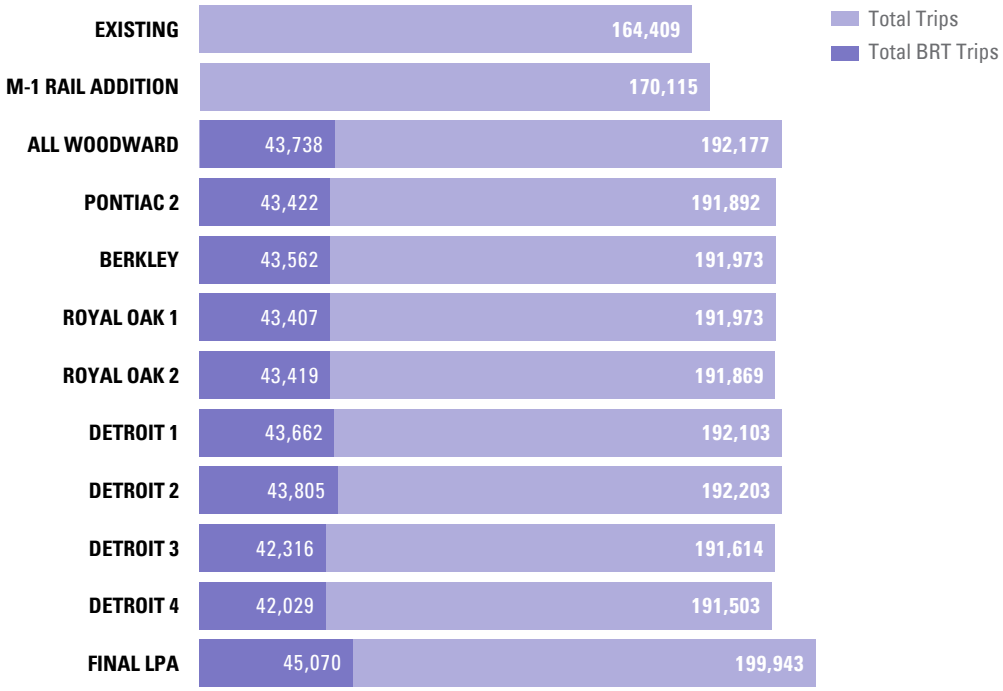
- Drive to any mode of transit (bus, streetcar, and BRT)
- Walk to local bus only
- Walk to streetcar only
- Walk to BRT only
- Walk to local bus and streetcar
- Walk to local bus and BRT

Once the Ilogit model was calibrated, a baseline alternative was tested to determine if the model is predicting trips for each type of mode within the model (bus, streetcar, and BRT). This baseline alternatives was the "All-Woodward" alternative and was mixed in with general purpose traffic (i.e. no travel time advantage). Through this evaluation it was found that the Ilogit model was predicting transit trips for the existing and proposed modes. The transit trips were then assigned to the transit network and compared with the existing ridership.

Once the Ilogit model was deemed acceptable, each of the alternatives that were developed as part of the Tier 1 analysis was evaluated. Park/Kiss and Ride was considered at all stations, meaning that all trips could access the stations via automobile. During this analysis there was not a station at 12 Mile Road and Woodward Avenue. The feeder bus system was changed for all the alternatives and a detail of these changes can be found within the Technical Memorandum. **Figure 4-10** below summarizes the number of trips for each of the alternatives.

FIGURE 4-10. NUMBER OF TRIPS BY ALTERNATIVE

Source:



It was found that ridership did not vary much between the alignment alternatives. This is because the alignments are all within one-quarter mile of each other and the zonal sizes within the SEMCOG model are too large to show an appreciable difference. However, in comparing small variations in the ridership, it was found that the Berkley alternative had a lower ridership than the Royal Oak alternatives.

The increase in trips associated with the Final LPA is due to servicing both Woodward Avenue and downtown Royal Oak and the additional station at 12 Mile Road. There was a reduction in park/kiss and ride due to the reduction in park and ride locations along the route. A more detailed analysis will be conducted in the next phase of the project which will determine user costs and detailed station by station boardings and alightings and ridership between stations.

Once it was determined that the LPA would include a route into Royal Oak and utilize the Detroit 4 option, the final alternative was run within the llogit model. A station was added at 12 Mile Road and Park/Kiss and Ride was only allowed at the following stations:

- Downtown Pontiac (Pontiac)
- Square Lake Road (Bloomfield Township)
- Old Woodward Avenue (Birmingham)
- 12 Mile Road (Royal Oak)
- 10 Mile Road (Royal Oak)
- 8 Mile Road (Detroit)
- Temple Street (Detroit)
- Rosa Parks Transit Center (Detroit)

Figure 4-11 illustrates the ridership along the LPA alignment at each station as well as the percentage of Park and Ride patrons at each station.

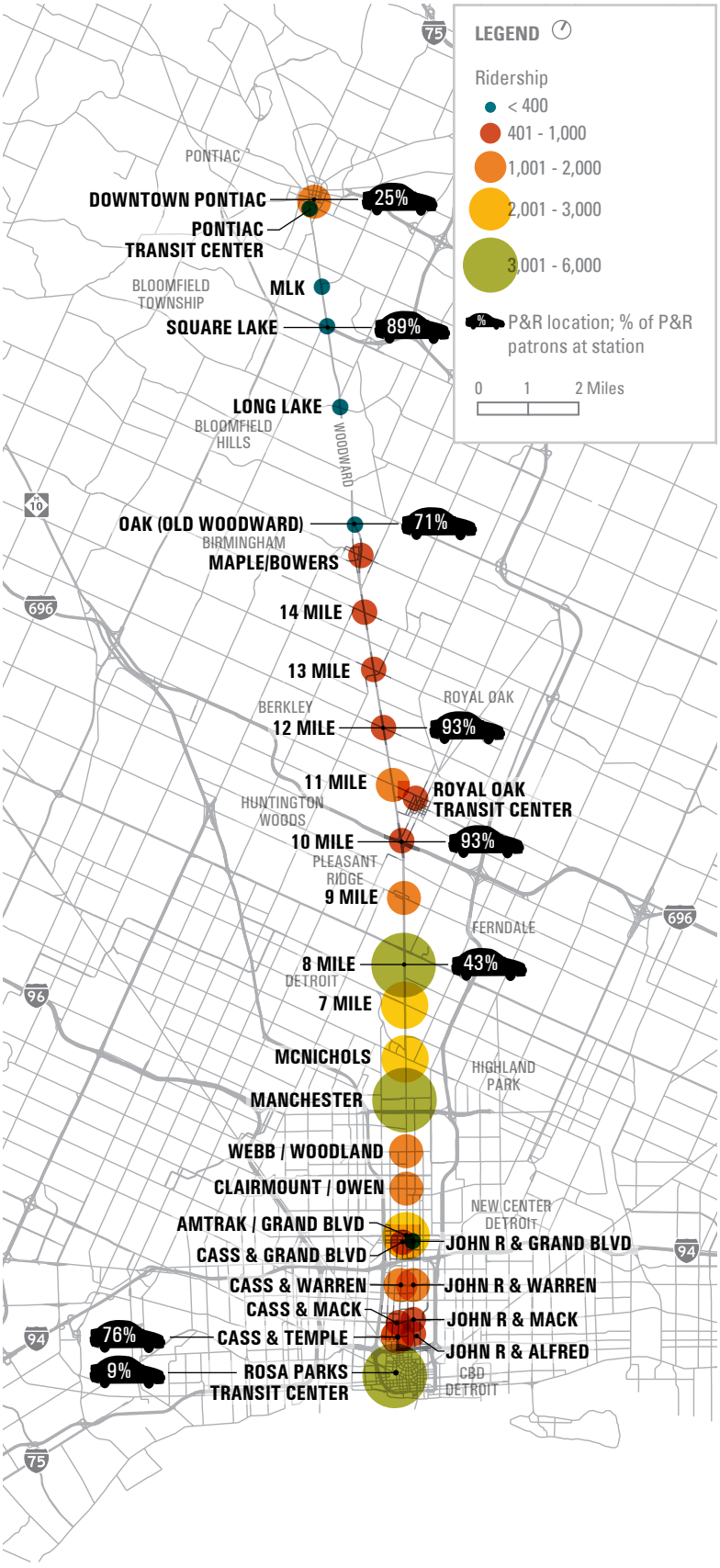


FIGURE 4-11. RIDERSHIP AND PARK-AND-RIDE PATRONS, LPA ALIGNMENT Source: Parsons Brinckerhoff

Legibility

This evaluation criterion reviews how the alignment is servicing the corridor and how easily transit riders would access the service. In particular, this criterion reviews if the alignment option stays on one roadway, thereby reducing the amount of confusion on where the service is located, or moves to different roadways. In addition, this criterion also evaluates whether the alignment option stays on the same roadway in both the northbound and southbound direction. Those options that stay on the same roadway (i.e. Woodward Avenue) would score higher than those that go off of Woodward Avenue. In addition, options that stay on the same roadway both northbound and southbound would score higher than those that utilize one roadway southbound and another roadway northbound.

Service to Transit Dependent Populations

This evaluation criterion recognizes that alignment options supporting broad transit access benefit all potential users. Along Woodward Avenue, there is great diversity among transit users in terms of economic, cultural and racial backgrounds that can benefit from transit. Alignment options that serve a greater cross section of users, especially those from zero-car and low-income households and limited English proficient populations, provide a greater benefit than those that offer limited access to these groups.

Accommodation of Exclusive and Shared Bicycle Lanes

This evaluation criterion evaluates whether the alignment would allow for exclusive bicycle lanes, shared bicycle lanes (consistent with the Woodward Complete Streets Master Plan), or would negatively impact the potential for the planned dedicated bicycle facilities along the route. Those alignments that could allow for planned dedicated bicycle facilities would score higher than those that would not accommodate dedicated facilities.

Auto Accessibility

The conversion of roadways from one-way to two-way travel can often improve auto accessibility within an area. Conversely, the conversion of a two-way roadway to a one-way roadway can reduce auto accessibility, but can also improve safety along the corridor. This criterion evaluates whether the alternative would require the conversion of a roadway from one-way operation to two-way operation. The conversion from one-way to two-way would improve accessibility and therefore score higher than conversion from a two-way to a one-way (which none of the alternatives are recommending).

Streetcar Operational Impacts

The M-1 Rail streetcar project on Woodward Avenue between downtown Detroit and the New Center area will be in place before the BRT service begins operation. This criterion evaluates the impact of streetcar operations on BRT alignment options. Those options that avoid impacts from streetcar operations would score higher than options that potentially increase BRT or streetcar travel time or delay.

Jobs Access

The ability of transit riders to access job opportunities is central to the purpose and need of the Woodward AA as it relates to creating mobility options in the Woodward corridor.

Downtown Viability

Some downtowns are directly accessed from Woodward Avenue, including Detroit, Ferndale, Birmingham, and Pontiac. However, several other downtowns are not directly served by Woodward Avenue, including Royal Oak and Berkley. These downtowns have the potential to generate more ridership than the land uses along Woodward Avenue in each segment. Therefore, this evaluation factor recognizes that a transit system that can more easily divert from Woodward Avenue to reach nearby downtowns and major destinations has an added benefit. This evaluation criterion also evaluates how easily the route could be changed in the future if there are additional developments along or close to the corridor.

On-Street Parking

This criterion will evaluate the impact that the alignment option would have to on-street parking along the corridor. The reduction of on-street parking can be seen as a negative impact to business owners along the corridor. However, the introduction of BRT along the corridor can often overcome the loss of parking and provide greater economic impact to the businesses. This criterion evaluates how much of the on-street parking may be impacted. Alignment options that have no impact to parking would score higher than options that remove on-street parking.

TOD Opportunities

This criterion evaluates the potential economic development growth along the corridor related to the transit investment by factoring in four variables within ¼-mile radius of the stops along each route alternative: available vacant or underutilized land, investment in future TOD, proximity to a major destination, and proximity to a downtown or district center. These variables were analyzed using the Woodward AA Land Use & Multi-Modal Analysis.

Capital Cost

Capital cost is the initial investment needed to get a new transit system up and running. Capital costs include designing the system and building infrastructure to support the system, including the stations, vehicle storage and maintenance facilities, vehicles, new traffic signals, right-of-way acquisition, as well as other items. This important criterion relates to the ability of the region to implement the system. Those options that have lower capital costs would score higher than options with higher costs.

Operations and Maintenance Cost

Operations and maintenance cost is the continual investment needed to operate of the system and maintain infrastructure after the capital cost investment has been made. This cost includes labor for operating the vehicles, maintaining the vehicles and stations, collecting fares, providing station security, as well as parts and materials needed for maintenance, insurance, and administrative costs. This important criterion relates to the ability of the region to sustain the long-term cost of the transit system. Those options that have lower operations and maintenance costs would score higher than options with higher costs.

Implementation

This criterion evaluates how the preferred alternative may or may not be implemented for the 27-mile Woodward corridor. This evaluation factor acknowledges that the ability to phase/implement a transit option by segment is valuable. The more expensive the alternative, the greater the likelihood that it may need to be implemented in phases. Factors considered in phasing include the type of mode that is chosen as well as the effort necessary to construct the alternative. This criterion also considers logical termini, such as the beginning and ending of a phase and the ridership that is required for a phase.

See **Figure A-1** in Appendix A for the Alignment Alternatives Evaluation Results.

4.3.3 STATION LOCATIONS CONSIDERED

The Tier 2 screening consisted of a comprehensive evaluation of station locations, using a tiered approach to determine stations that would be included in the LPA and those that would require additional analysis during the EA phase.

Several station locations for each segment of the corridor were considered based on a variety of factors, including initial ridership projections and community preferences. The initial station locations were then evaluated based on the criteria below, resulting in 26 stations recommended as part of the LPA.

Figure 4-12 illustrates the station locations selected in the LPA.

Additional Evaluation Needed

Several stations locations that were considered but did not score high enough against the evaluation criteria are listed below. These station locations will be evaluated in more detail during the EA phase.

Cranbrook Educational Community

This potential location is situated at the intersection of Woodward Avenue and Tamarack Way, which represents the main entrance to the Cranbrook Educational Community off of Woodward Avenue. Initial evaluation of this location determined that minimal development density exists in the area and that ridership forecasts did not project enough to warrant a station. Additionally, a significant distance exists between Woodward Avenue and Cranbrook's facilities, further reducing the viability of this station. After discussions with community leaders, it was determined that this station location did not meet enough of the evaluation thresholds to advance for further analysis.

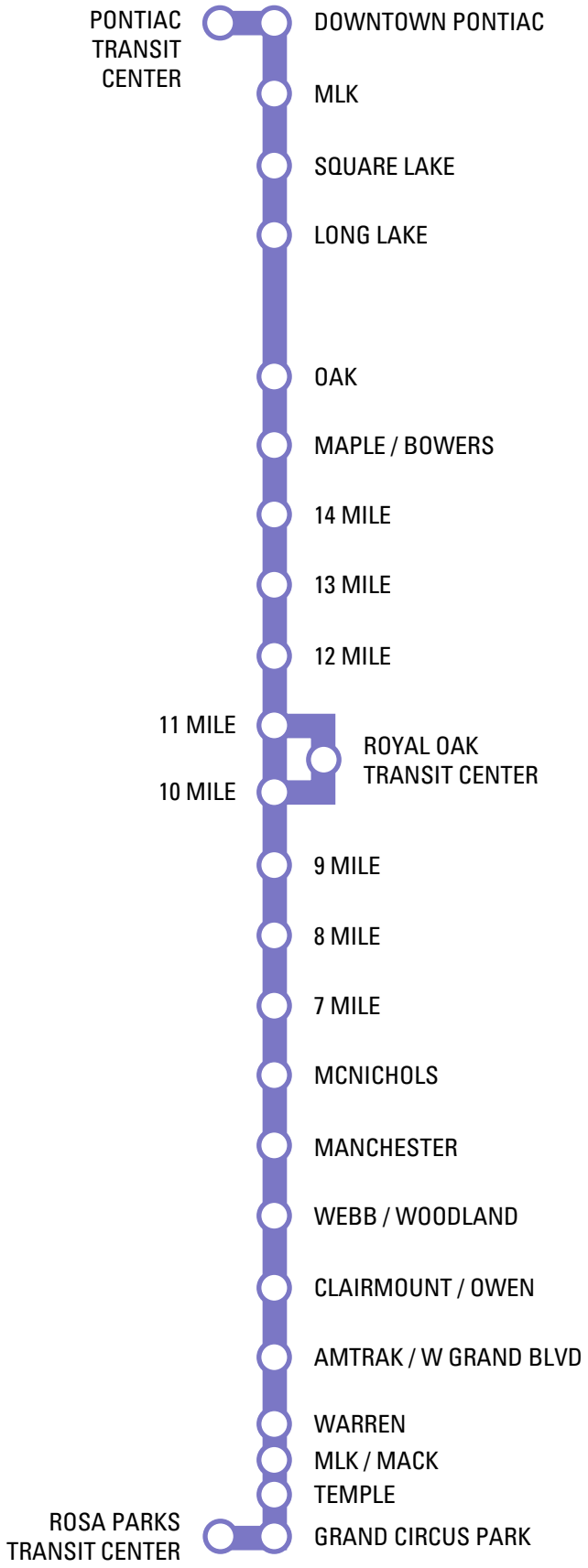


FIGURE 4-12. LPA STATION LOCATIONS

Quarton Road

This potential station location is situated at the intersection of Woodward Avenue and Quarton Road/ Big Beaver Road, representing the border between Birmingham and Bloomfield Hills, and was evaluated based on the project goal of providing one mile spacing between stations. Initial evaluation of this location determined that minimal development density exists in the area and that ridership forecasts did not project enough to warrant a station. After discussions with community leaders, it was determined that this station could be located further south near Oak Street, which would serve the northern portion of Downtown Birmingham and could potentially accommodate a P&R facility.

Lincoln Street

This potential station location is situated in Birmingham between Maple Road and 14 Mile Road, and was evaluated based on input received from local stakeholders. Initial evaluation of this location determined that it deviated from the primary project goal of providing "rapid" transit service, due to its half mile spacing from both the 14 Mile Road and Maple Road stations, which are preferred by community stakeholders and scored higher during the initial evaluation. Additionally, the evaluation determined that a station in this location could potentially dilute ridership at the aforementioned stations.

12 Mile Road/Coolidge Highway

This potential station location is situated in Downtown Berkley, and was evaluated based on input received from local stakeholders as part of the two off-Woodward alignment alternatives that would serve Downtown Berkley by using Coolidge Highway. Initial evaluation of this location determined that minimal development density and potential in the area would limit the viability of a station and that ridership forecasts did not project enough to warrant a station. Additionally, the increased travel time (approximately five to 10 minutes) resulting from an off-Woodward alignment in Downtown Berkley would significantly impact the ability for the overall system to remain "rapid".

11 Mile Road/Coolidge Highway

This potential station location is situated at the southern end of Downtown Berkley, and was evaluated based on input received from local stakeholders as part of the second off-Woodward alignment alternative that would serve Downtown Berkley by using Coolidge Highway and diverting back to Woodward Avenue on 11 Mile Road. Initial evaluation of this location determined that minimal development density and potential in the area would limit the viability of a station and that ridership forecasts did no project enough to warrant a station. Additionally, the increased travel time (approximately five to 10 minutes) resulting from an off-Woodward alignment using 11 Mile Road to divert back to Woodward Avenue would significantly impact the ability for the overall system to remain "rapid".

Catalpa Drive

This potential station location is situated between 12 Mile Road and 11 Mile Road, and was evaluated based on input received from local stakeholders. Initial evaluation of this location determined that, if recommended in conjunction with stations at 12 Mile Road and 11 Mile Road, it deviated from the primary project goal of providing "rapid" transit service, due to its half mile spacing from both of the aforementioned stations. Additionally, this station was evaluated as an alternative to an 11 Mile Road station, but ridership forecast did not project enough to warrant such a shift due to the intermodal connections provided at 11 Mile Road. This station location also does not provide a feasible connection to Downtown Berkley, due to the one-mile distance between Woodward Avenue and Coolidge Highway along Catalpa Drive.

Lincoln Avenue

This potential station location is situated between 11 Mile Road and 10 Mile Road, and was evaluated based on input received from local stakeholders to provide a more direct connection to the Oakland Community College campus in Downtown Royal Oak and as part of the second off-Woodward alignment alternative that would serve Downtown Royal Oak by using Lincoln Avenue to divert to/from Woodward Avenue. Initial evaluation of this location determined that, if recommended in conjunction with stations at 11 Mile Road and 10 Mile Road, it deviated from the primary project goal of providing "rapid" transit service, due to its half-mile spacing from both of the aforementioned stations. Additionally, ridership forecasts did not project enough to warrant a station and that a station in this location could potentially dilute ridership at the aforementioned stations. Based on additional stakeholder input, it was determined that the use of Lincoln Avenue as either a transit corridor or non-motorized connection was not preferred, due to the residential nature of the street.

4.3.4 STATION LOCATION EVALUATION CRITERIA

In consideration of Woodward AA Steering Committee input and the creation of the Purpose and Need for the project, the following evaluation criteria were developed for the Tier 2 Screening of station locations. Within the AA process, evaluation criteria are developed to assist in selecting general station locations that most objectively meets the purpose and need. The weights assigned to the variables of the criteria are added to reflect the emphasis given to each of the factors. Weighting of evaluation factors was developed in consideration of public feedback obtained at December 2013 public meetings, and FTA norms for criteria weighting.

Connections to Destinations

This criterion evaluates each station based on its proximity to major destinations. Major destinations were defined in the AA process as locations that attract a significant number of customers, visitors, and employees that live both near and far from the destination. Within the context of the Woodward Avenue corridor, major destinations include sports stadia, hospitals, museums, and universities. Stations that connect riders to goods, services, job opportunities, and events at these destinations provide a greater benefit than stations that offer limited or no access to such destinations. To quantify this criterion, each station location was evaluated on whether it was within (3) ¼ mile, (2) ½ mile, or (1) over ½ mile from a major destination.

Connection to Downtowns

This criterion evaluates each station based on its proximity to downtown districts of corridor communities. Downtowns were defined in the AA process as areas that attract a significant number of customers, visitors, and employees that live both near and far from the area. Within the context of the Woodward Avenue corridor, downtowns include Detroit, Highland Park, Ferndale, Royal Oak, Berkley, Birmingham, and Pontiac. Stations that connect riders to goods, services, and job opportunities within these downtowns provide a greater benefit than stations that offer limited or no access to these areas. To quantify this criterion, each station location was evaluated on whether it was within (3) ¼ mile, (2) ½ mile, or (1) over ½ mile from a community's "downtown" area.

Station Spacing

This criterion evaluates each station based on its spacing from adjacent stations that were considered as part of the Tier 2 Screening. Based on Woodward AA Steering Committee input, one of the primary goals of this project was to recommend a truly "rapid" transit system. Preliminary discussions and analysis concluded that the factor that most significantly impacts the speed of the system would be station spacing, and that to achieve the travel time advantage goals of this project, stations should be spaced primarily 1 mile apart. To quantify this criterion, each station was evaluated on whether it was located at least (3) one mile, (2) ½ mile mile, or (1) ¼ mile from adjacent stations, in order to maintain "rapid" service.

TOD Opportunities

This criterion evaluates each station based on its proximity to "opportunity sites" that could be redeveloped with TOD uses that would support the rapid transit system. Opportunity sites were defined in the AA process as vacant and/or underutilized land of 20,000 square feet or more that are identified by local land use and zoning regulations for TOD or other favorable uses (e.g. mixed-use, commercial, multi-family residential). To quantify this criterion, each station was evaluated on whether it was within (3) ¼ mile, (2) ½ mile, or (1) over ½ mile from an "opportunity site" and whether or not local regulations identify the site (3) for TOD, (2) for favorable uses, or (1) for non-TOD uses.

Connection to crosstown routes

This criterion evaluates each station based on its proximity to crosstown SMART and/or DDOT bus routes. Based on Woodward AA Steering Committee input, one of the primary goals of this project was to recommend a system that would provide transfer opportunities with local bus routes. To quantify this criterion, each station was evaluated on whether its location would allow it to be directly linked with (3) multiple crosstown SMART/DDOT routes, (2) 1 crosstown SMART/DDOT route, or (1) no crosstown SMART/DDOT routes. As part of the EA phase, feeder network recommendations could include modifications to existing routes if considerable transfer potential exists or is currently underutilized.

Connection to transit centers

This criterion evaluates each station based on its proximity to existing transit centers that provide connections to multiple local and regional systems, including SMART/DDOT bus service and Amtrak rail service. To quantify this criterion, each station was evaluated on whether it was within (3) ¼ mile, (2) ½ mile, or (1) over ½ mile from a transit center.

Community support

This criterion evaluates each station based on the input received from the Woodward AA Steering Committee, key stakeholders, and the community from the project's ongoing engagement process. A variety of exercises and discussions were held to allow these groups to provide their input on each potential station location. To quantify this criterion, each station was evaluated based on scoring and comments from these focused engagement sessions to determine whether it received (3) strong, (2) moderate, (1) weak support from the Steering Committee, stakeholders, and the community.

Potential Park & Ride Locations

This criterion evaluates each station based on its proximity to a site that could be repurposed or redeveloped into a P&R facility. Potential P&R locations were defined as sites that included existing parking lots and/or decks that could become "shared use" facilities as well as vacant sites that could accommodate construction of new P&R facilities. To quantify this criterion, each station was evaluated based on whether it was within (3) ¼ mile, (2) ½ mile, or (1) over ½ mile from a potential Park & Ride site.

See **Figure A-2** in Appendix A for the Station Location Evaluation Results.

5.0 Locally Preferred Alternative Recommendation

5.1 Transportation and Mobility

The Locally Preferred Alternative (LPA) is summarized in this chapter. It includes all alignments, station locations, and cross sections that have been evaluated through technical analysis, stakeholder input, and community engagement. All items described in this chapter are recommended for additional analysis as part of the Environmental Assessment (EA) and engineering phases of this project.

5.1.1 PONTIAC LOOP

This segment represents the northern terminus of the project, including the one-way loop that encompasses Downtown Pontiac. There are two alignment alternatives in this segment that are recommended for further analysis.

Water Street Alignment

This alignment alternative utilizes the one-way loop to enter Downtown Pontiac from the south, accessing a station at Pike Street/Saginaw Street by traveling west on Water Street and north on Saginaw Street. The transit vehicle would complete the loop by traveling west on Pike Street and south on Woodward Avenue to access the Pontiac Transit Center.

Pike Street Alignment

This alignment alternative utilizes the one-way loop to enter Downtown Pontiac from the south, accessing a station at Pike Street/Saginaw Street by traveling west on Pike Street. The transit vehicle would complete the loop by continuing west on Pike Street and south on Woodward Avenue to access the Pontiac Transit Center.

Station Locations

1. **Downtown Pontiac Station (Tier 2)**

A station is recommended at the intersection of Pike Street and Saginaw Street to directly serve Downtown Pontiac. This station could be integrated into the currently vacant Lot 9 parcel, located in the southwest quadrant of this intersection. This is a Tier 2 station due to moderate ridership projections and moderate intermodal connections.

2. **Pontiac Transit Center Station (Tier 1)**

A station is recommended at the Pontiac Transit Center to provide direct intermodal connections with SMART bus service and Amtrak rail service. This station could be integrated into the design of the existing transit center. This is a Tier 1 station due to higher ridership projections and higher intermodal connections.

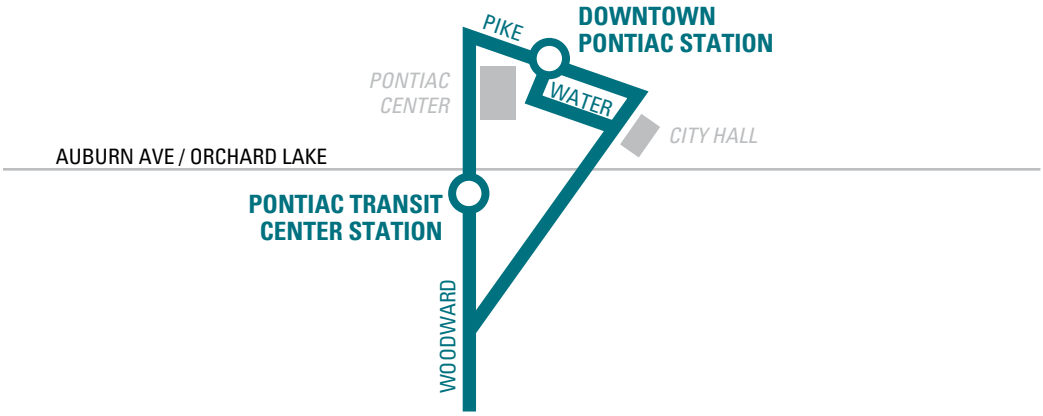


FIGURE 5-1. ALIGNMENT AND STATIONS, PONTIAC LOOP

Cross section

The recommended cross section for this segment consists of an exclusive, edge running, one-way transit lane. No road reconstruction would be required to accommodate the exclusive transit lane, although re-striping of existing general purpose lanes and parking lanes would be required. The transit lane will be delineated from general purpose lanes by a solid white line, red paint, and standard BUS ONLY pavement markings (MUTCD 3D-01).

FIGURE 5-2. CROSS SECTION, PONTIAC LOOP

5.1.2 PONTIAC LOOP TO QUARTON ROAD

This segment represents the southern portion of Pontiac, Bloomfield Township, and Bloomfield Hills that are located along the Woodward Avenue corridor.

Mainline alignment

This alignment alternative maintains service along Woodward Avenue throughout this entire segment.

Station Locations

3. **Martin Luther King Blvd. Station (Tier 2)**

A station is recommended north of Martin Luther King Boulevard to directly serve St. Joseph Mercy Hospital and the southern portion of Pontiac. This station could be constructed within the center of the median to serve both NB and SB median-edge transit lanes. This is a Tier 2 station due to moderate ridership projections and direct access to St. Joseph Mercy Hospital.

4. **Square Lake Road Station (Tier 3)**

A station is recommended north of Square Lake Road to directly serve Bloomfield Township neighborhoods and existing development at the intersection of Square Lake Road and Woodward Avenue. This station could be constructed within the center of the median to serve both NB and SB median-edge transit lanes. Additionally, surface parking lots located in the northwest quadrant of the intersection could be integrated into the system with signalized mid-block pedestrian crossings to designate this location as a P&R station. This is a Tier 3 station due to lower ridership projections, lower development potential, and lower pedestrian connections.

5. **Long Lake Road Station (Tier 3)**

A station is recommended either north or south of Long Lake Road to directly serve the Bloomfield Hills Town Center. This station could be constructed within the center of the median to serve both NB and SB median-edge transit lanes. This is a Tier 3 station due to lower ridership projections, lower development potential, and lower pedestrian connections.

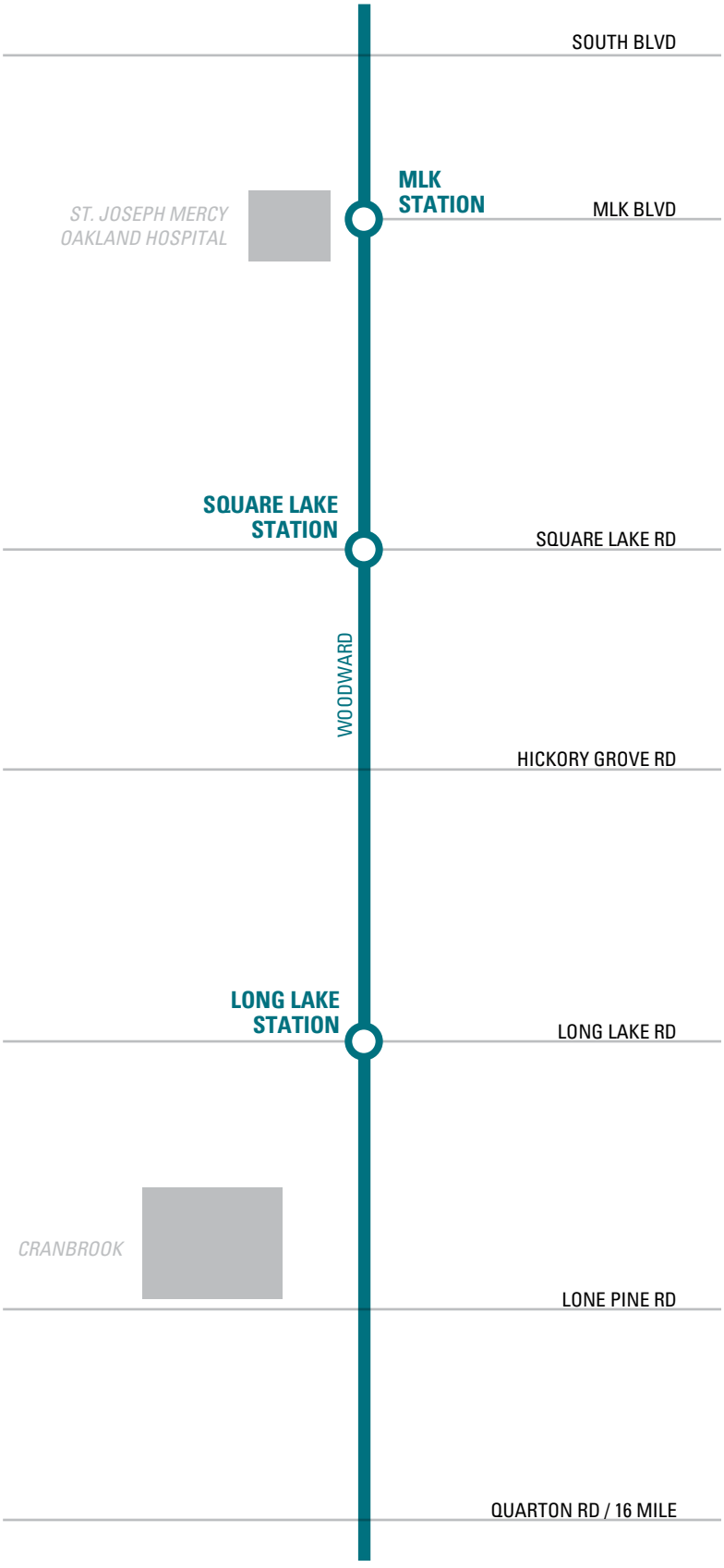


FIGURE 5-3. ALIGNMENT AND STATIONS, PONTIAC LOOP TO QUARTON ROAD

Cross section

The recommended cross section for this segment consists of median-edge running transit lanes. Existing median-edge general purpose lanes would be converted to transit lanes. No alteration or reconstruction of the median is recommended. From the Pontiac Loop to South Boulevard, the transit lanes will be exclusive and will be delineated from general purpose lanes by a solid white line, red paint, and standard BUS ONLY pavement markings (MUTCD 3D-01). From South Boulevard to Quarton Road, the transit lanes will be shared with automobile traffic.

FIGURE 5-4. CROSS SECTION, PONTIAC LOOP TO SOUTH BOULEVARD

FIGURE 5-5. CROSS SECTION, SOUTH BOULEVARD TO QUARTON

5.1.3 QUARTON ROAD TO 14 MILE ROAD

This segment represents the portion of Birmingham that is located along the Woodward Avenue corridor.

Mainline alignment

This alignment alternative maintains service along Woodward Avenue throughout this entire segment.

Station Locations

6. Oak Avenue Station (Tier 3)

A station is recommended north or south of Oak Avenue to directly serve the northern portion of Downtown Birmingham and adjacent neighborhoods. This station could be constructed within the center of the median to serve both NB and SB median-edge transit lanes. Additionally, adjacent land between Woodward Avenue and Old Woodward Avenue could be redeveloped as surface or structured parking to and integrated into the system with signalized mid-block pedestrian crossings to designate this location as a P&R station. This is a Tier 3 station due to lower ridership projections and lower development potential.

7. Maple Road Station (Tier 2)

A station is recommended south of Maple Road to directly serve the Downtown Birmingham core and Triangle District. This station could be constructed within the center of the median to serve both NB and SB median-edge transit lanes. This is a Tier 2 station due to moderate ridership projections and direct access to Downtown Birmingham.

8. 14 Mile Road Station (Tier 3)

A station is recommended north of 14 Mile Road to directly serve Birmingham's South Gateway and adjacent neighborhoods. This station could be constructed within the center of the median to serve both NB and SB median-edge transit lanes. This is a Tier 3 station due to lower ridership projections and lower development potential.

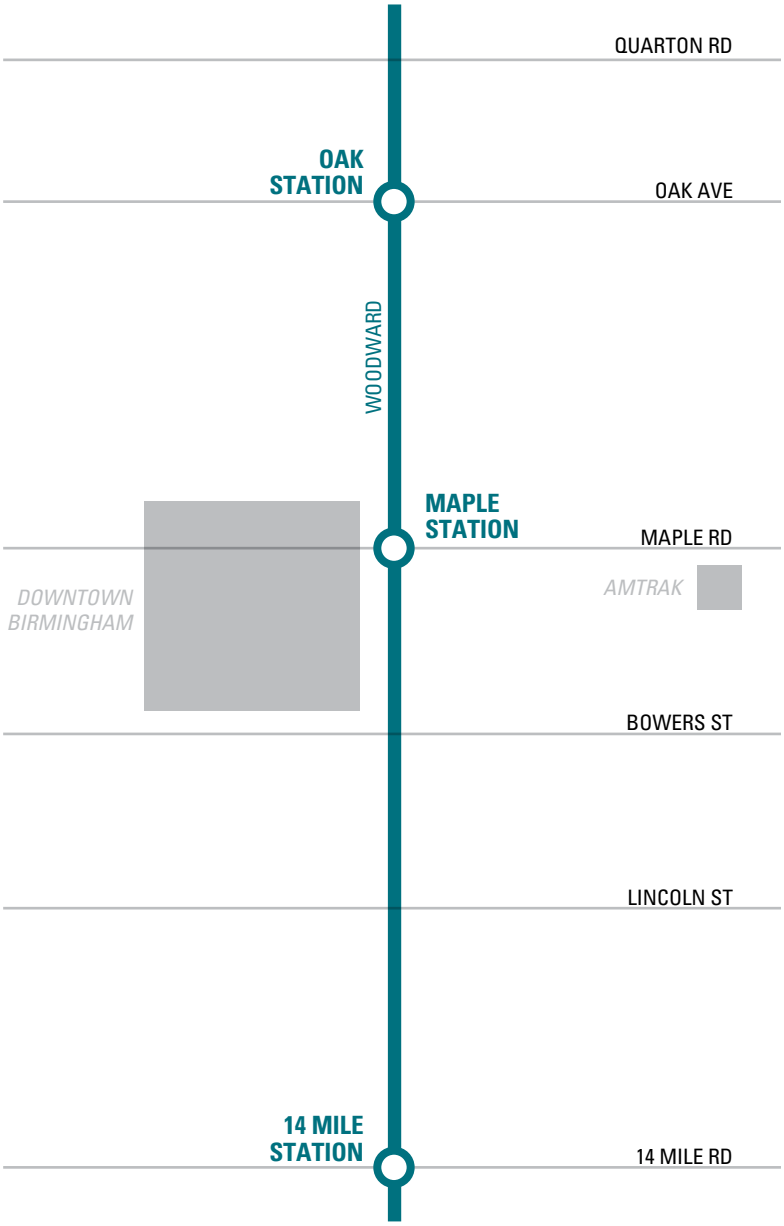


FIGURE 5-6. ALIGNMENT AND STATIONS, QUARTON ROAD TO 14 MILE ROAD

Cross section

The recommended cross section for this segment consists of exclusive, median-edge running transit lanes. Existing median-edge general purpose lanes would be converted to transit lanes. No alteration or reconstruction of the median is recommended. Transit lanes will be delineated from general purpose lanes by a solid white line, red paint, and standard BUS ONLY pavement markings (MUTCD 3D-01). See **Figure 5.7** below.

FIGURE 5-7. CROSS SECTION, QUARTON ROAD TO 14 MILE ROAD

5.1.4 14 MILE ROAD TO 10 MILE ROAD

This segment represents the portions of Berkley, Royal Oak, and Huntington Woods that are located along the Woodward Avenue corridor. There are two alignment alternatives for this segment that are recommended for further analysis.

Mainline alignment

This alignment alternative maintains service along Woodward Avenue throughout this entire segment.

Royal Oak alignment

This alignment alternative represents a potential "local" service that could be integrated directly with "express" service provided by the mainline alignment. This alignment would provide direct access to Downtown Royal Oak by traveling east/west on 11 Mile Road and north/south on Lafayette and Washington Avenues.

Station Locations

9. 13 Mile Road Station (Tier 2)

A station is recommended south of 13 Mile Road to directly serve Beaumont Hospital. This station could be constructed within the center of the median to serve both NB and SB median-center transit lanes (which would require the transit lanes to veer slightly to access the station), or separate stations could be constructed within the edges of the median to serve the NB and SB median-center transit lanes separately. This is a Tier 2 station due to moderate ridership projections and direct access to Beaumont Hospital.

10. 12 Mile Road Station (Tier 3)

A station is recommended north or south of 12 Mile Road to directly serve Downtown Berkley and adjacent neighborhoods. This station could be constructed within the center of the median to serve both NB and SB median-center transit lanes (which would require the transit lanes to veer slightly to access the station), or separate stations could be constructed within the edges of the median to serve the NB and SB median-center transit lanes separately. This is a Tier 3 station due to lower ridership projections, lower development potential, and moderate access to Downtown Berkley.

11. 11 Mile Road Station (Tier 2)

A station is recommended north of 11 Mile Road to directly serve adjacent neighborhoods and provide connections to local bus routes. This station could be constructed within the center of the median to serve both NB and SB median-center transit lanes (which would require the transit lanes to veer slightly to access the station), or separate stations could be constructed within the edges of the median to serve the NB and SB median-center transit lanes separately. This is a Tier 2 station due to higher ridership projections, lower development potential, and higher intermodal connections.

12. Royal Oak Transit Center Station (Tier 1)

A station is recommended at the Royal Oak Transit Center to provide direct intermodal connections with SMART bus service and Amtrak rail service. This station could be integrated into the design of the existing transit center. This is a Tier 1 station due to higher ridership projections, higher intermodal connections, and direct access to Downtown Royal Oak.

13. 10 Mile Road Station (Tier 1)

A station is recommended north of 10 Mile Road to directly serve the Detroit Zoo, the southern portion of Downtown Royal Oak, and adjacent neighborhoods. This station could be constructed within the center of the median to serve both NB and SB median-center transit lanes (which would require the transit lanes to veer slightly to access the station), or separate stations could be constructed within the edges of the median to serve the NB and SB median-center transit lanes separately. Due to the existing configuration of Woodward Avenue in this area, further analysis is required to determine the viability of constructing a "cap" over the I-696 tunnel to accommodate this station and provide enhanced east/west pedestrian access. This is a Tier 1 station due to higher ridership projections, higher development potential (including potential P&R in the northeast quadrant), and direct access to the Detroit Zoo.

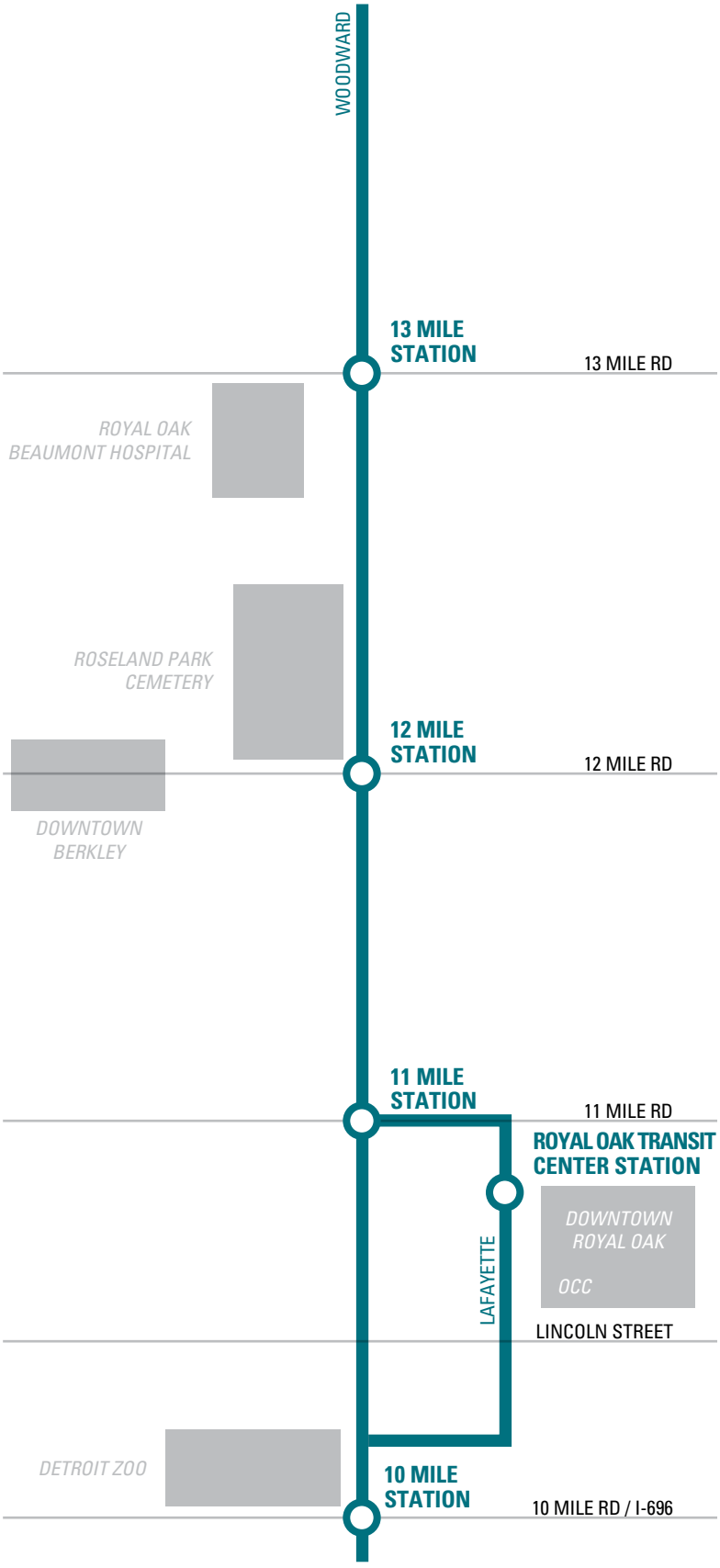


FIGURE 5-8. ALIGNMENT AND STATIONS, 14 MILE ROAD TO 10 MILE ROAD

Cross section

The recommended cross section for the Mainline alignment consists of exclusive, median-center running transit lanes. The median would be reconstructed to accommodate the exclusive transit lanes and expanded into the existing median-edge general purpose lanes. Transit lanes will be delineated from general purpose lanes by the physical barrier of the median, red paint, and standard BUS ONLY pavement markings (MUTCD 3D-01). **Figure 5.9** below illustrates the proposed conditions for all segments from 14 Mile Road south to McNichols Road.

The recommended cross section for the Royal Oak alignment consists of exclusive, edge running transit lanes. No road reconstruction would be required to accommodate the exclusive transit lanes, although re-striping of existing general purpose lanes and parking lanes would be required. The transit lane will be delineated from general purpose lanes by a solid white line, red paint, and standard BUS ONLY pavement markings (MUTCD 3D-01).

FIGURE 5-9. CROSS SECTION, 14 MILE ROAD TO MCNICHOLS ROAD

5.1.5 10 MILE ROAD TO 8 MILE ROAD

This segment represents the portions of Pleasant Ridge and Ferndale that are located along the Woodward Avenue corridor.

Mainline alignment

This alignment alternative maintains service along Woodward Avenue throughout this entire segment.

Station Locations

14. 9 Mile Road Station (Tier 2)

A station is recommended north of 9 Mile Road to directly serve Downtown Ferndale, the southern portion of Pleasant Ridge, and adjacent neighborhoods. This station could be constructed within the center of the median to serve both NB and SB median-center transit lanes (which would require the transit lanes to veer slightly to access the station), or separate stations could be constructed within the edges of the median to serve the NB and SB median-center transit lanes separately. This is a Tier 2 station due to higher ridership projections but lower development potential.

15. 8 Mile Road Station (Tier 1)

A station is recommended south of 8 Mile Road to directly serve existing and future development at the Michigan State Fairgrounds site, adjacent neighborhoods, and to provide intermodal connections with DDOT and SMART bus service. This station could be integrated into the design of the existing State Fairgrounds Transit Center. This is a Tier 1 station due to higher ridership projections, higher intermodal connections, and direct access to the State Fairgrounds site.

Cross section

The recommended cross section for this segment consists of exclusive, median-center running transit lanes. The median would be reconstructed to accommodate the exclusive transit lanes. Transit lanes will be delineated from general purpose lanes by the physical barrier of the median, red paint, and standard BUS ONLY pavement markings (MUTCD 3D-01). South of the I-696 bridge, the transit lanes would transition to the inside lane in order to travel north into Royal Oak. See **Figure 5-9**.

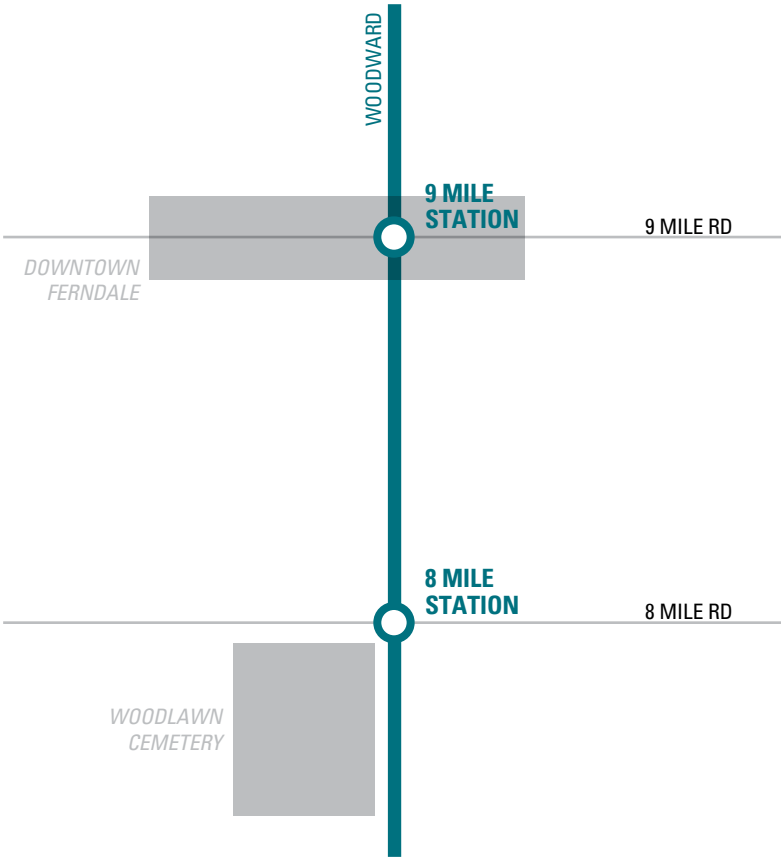


FIGURE 5-10. ALIGNMENT AND STATIONS, 10 MILE ROAD TO 8 MILE ROAD

5.1.6 8 MILE ROAD TO GRAND BOULEVARD

This segment represents the northern portion of Detroit and Highland Park that are located along the Woodward Avenue corridor.

Mainline alignment

This alignment alternative maintains service along Woodward Avenue throughout this entire segment.

Station Locations

16. 7 Mile Road Station (Tier 3)

A station is recommended north or south of 7 Mile Road to directly serve adjacent neighborhoods. This station could be constructed within the center of the median to serve both NB and SB median-center transit lanes (which would require the transit lanes to veer slightly to access the station), or separate stations could be constructed within the edges of the median to serve the NB and SB median-center transit lanes separately. This is a Tier 3 station due to higher ridership projections but lower development potential.

17. McNichols Road Station (Tier 3)

A station is recommended north or south of McNichols Road to directly serve adjacent neighborhoods. This station could be constructed within the center of the median to serve both NB and SB median-center transit lanes (which would require the transit lanes to veer slightly to access the station), or separate stations could be constructed within the edges of the median to serve the NB and SB median-center transit lanes separately. This is a Tier 3 station due to higher ridership projections but lower development potential.

18. Manchester Street Station (Tier 2)

A station is recommended north or south of Manchester Street to directly serve Downtown Highland Park and adjacent neighborhoods. This station could be constructed within the center of the roadway. Due to the narrow ROW within this segment, a single station would be constructed adjacent to a single bypass transit lane that both NB and SB transit vehicles would share to access the station. This is a Tier 2 station due to moderate ridership projections and moderate development potential.

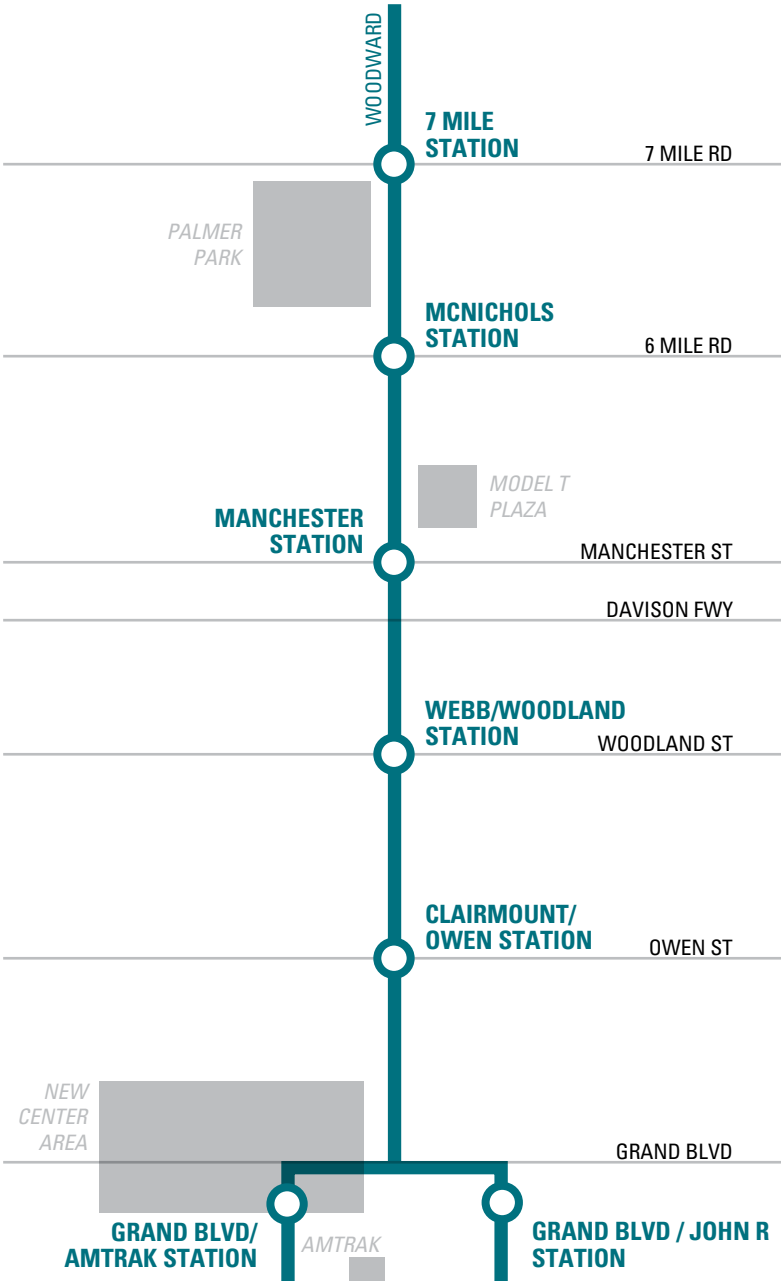


FIGURE 5-11. ALIGNMENT AND STATIONS, 8 MILE ROAD TO GRAND BOULEVARD

19. Webb Street/Woodland Street Station (Tier 3)

A station is recommended north or south of Webb/Woodland Streets to directly serve adjacent neighborhoods. This station could be constructed within the center of the roadway. Due to the narrow ROW within this segment, a single station would be constructed adjacent to a single bypass transit lane that both NB and SB transit vehicles would share to access the station. This is a Tier 3 station due to higher ridership projections but lower development potential.

20. Clairmount Street/Owen Street Station (Tier 3)

A station is recommended north or south of Clairmount/Owen Streets to directly serve adjacent neighborhoods. This station could be constructed within the center of the roadway. Due to the narrow ROW within this segment, a single station would be constructed adjacent to a single bypass transit lane that both NB and SB transit vehicles would share to access the station. This is a Tier 3 station due to higher ridership projections but lower development potential.

21. Grand Boulevard/Amtrak Station (Tier 1)

A station is recommended at the Detroit Amtrak Station to directly serve the New Center area and provide direct intermodal connections with Amtrak rail service. This station could be integrated into the design of the existing transit center. This is a Tier 1 station due to higher ridership projections, higher intermodal connections, and direct access to the New Center Area.

Cross section

The recommended cross section for this segment consists of exclusive, median-center running transit lanes. From 8 Mile Road to McNichols Road, the median would be reconstructed to accommodate the exclusive transit lanes. See **Figure 5-9**.

From McNichols Road to Grand Boulevard (where the ROW is between 100'-120'), a 4' concrete/vegetated barrier would be constructed to physically separate the exclusive transit lanes from general purpose lanes. Transit lanes will be delineated from general purpose lanes by the physical barrier of the median/barrier, red paint, and standard BUS ONLY pavement markings (MUTCD 3D-01).

FIGURE 5-12. CROSS SECTION, MCNICHOLS ROAD TO GRAND BOULEVARD

5.1.7 GRAND BOULEVARD TO ROSA PARKS TRANSIT CENTER

This segment represents the southern terminus of the project, from Grand Boulevard to the Rosa Parks Transit Center. There are two alignment alternatives in this segment that are recommended for further analysis.

Mainline alignment

This alignment alternative maintains service along Woodward Avenue throughout this entire segment. Further analysis of operational impacts related to the M-1 Rail streetcar is required for this alignment alternative.

Detroit #4 alignment

This alignment alternative utilizes both Cass Avenue and John R. Street to create a one-way transit loop to directly access the Rosa Parks Transit Center, Detroit's Central Business District (CBD), Wayne State University, Detroit Medical Center, adjacent neighborhoods, and limit operational conflicts with the M-1 Rail streetcar. SB transit vehicles would divert off-Woodward to Cass Avenue using Grand Boulevard, and travel south on Cass Avenue before terminating at the Rosa Parks Transit Center. NB transit vehicles would travel north on Cass Avenue, divert to John R. Street using the I-75 service drive, and travel north on John R. Street before diverting back to Woodward Avenue using Grand Boulevard.

Station Locations

22. Warren Avenue Station (Tier 2)

A station is recommended north or south of Warren Avenue for both the Mainline alignment and Detroit #4 alignment to directly serve Wayne State University, Detroit Medical Center, and adjacent neighborhoods. For the Mainline alignment, NB and SB transit vehicles could share planned curbside stations with the M-1 Rail streetcar. For the Detroit #4 alignment, curbside stations on Cass Avenue and John R. Street could be constructed to serve the one-way transit vehicles. This is a Tier 2 station due to moderate ridership projections, but higher development potential, and direct access to Wayne State University and Detroit Medical Center.

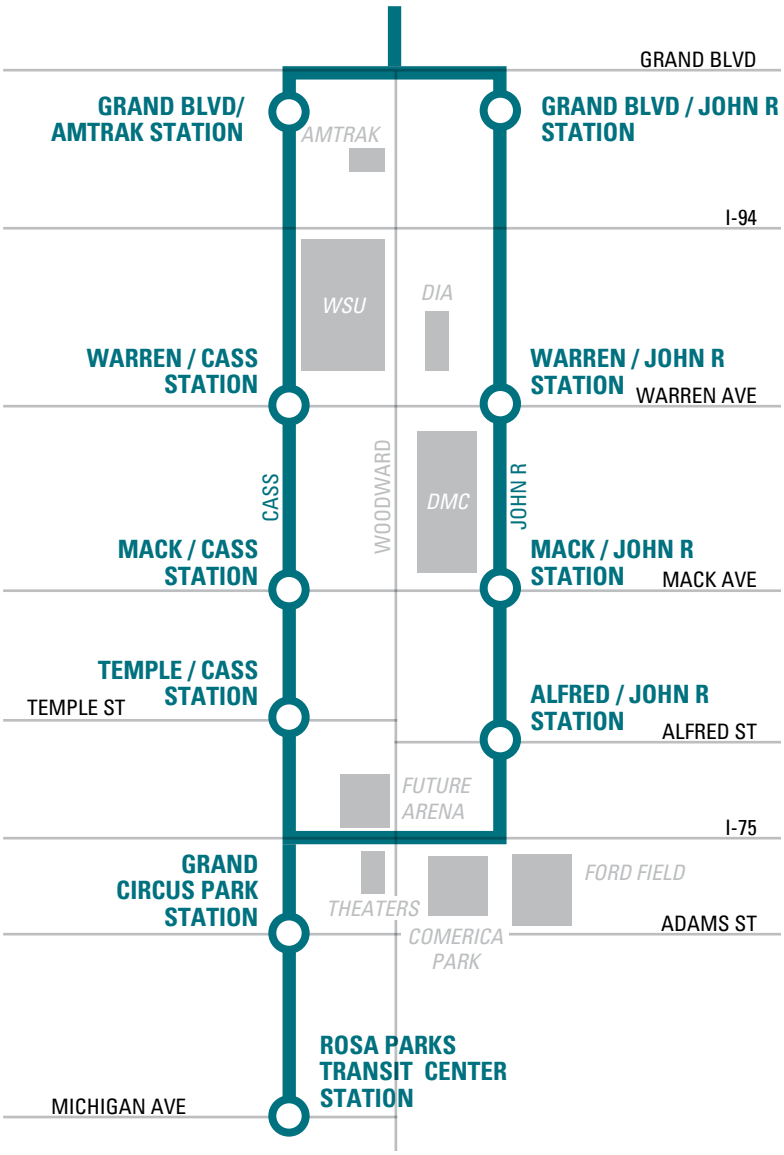


FIGURE 5-13. ALIGNMENT AND STATIONS, GRAND BOULEVARD TO ROSA PARKS TRANSIT CENTER

23. Martin Luther King Boulevard/Mack Avenue Station (Tier 2)

A station is recommended north or south of Martin Luther King Boulevard/Mack Avenue for both the Mainline alignment and Detroit #4 alignment to directly serve Detroit Medical Center, and adjacent neighborhoods. For the Mainline alignment, NB and SB transit vehicles could share planned curbside stations with the M-1 Rail streetcar. For the Detroit #4 alignment, curbside stations on Cass Avenue and John R. Street could be constructed to serve the one-way transit vehicles. This is a Tier 2 station due to moderate ridership projections, but higher development potential, and direct access to Detroit Medical Center.

24. Temple Street Station (Tier 3)

A station is recommended north or south of Temple Street for both the Mainline alignment and Detroit #4 alignment to directly serve Detroit Medical Center, and adjacent neighborhoods. For the Mainline alignment, NB and SB transit vehicles could share planned curbside stations with the M-1 Rail streetcar. For the Detroit #4 alignment, curbside stations on Cass Avenue and John R. Street could be constructed to serve the one-way transit vehicles. This is a Tier 3 station due to lower ridership projections.

25. Grand Circus Park Station (Tier 2)

A station is recommended north or south of Adams Street for both the Mainline alignment and Detroit #4 alignment to directly serve Detroit's CBD. For the Mainline alignment, NB and SB transit vehicles could share planned curbside stations with the M-1 Rail streetcar adjacent to Grand Circus Park. For the Detroit #4 alignment, curbside stations on Cass Avenue could be constructed north or south of Adams Street. This is a Tier 2 station due to higher ridership projections but moderate development potential.

26. Rosa Parks Transit Center Station (Tier 1)

A station is recommended at the Rosa Parks Transit Center to directly serve Detroit's CBD and provide direct intermodal connections with SMART and DDOT bus service. This station could be integrated into the design of the existing transit center. This is a Tier 1 station due to higher ridership projections, higher intermodal connections, and direct access to the Detroit's CBD.

Cross section

The recommended cross section for the Mainline alignment consists of shared, edge-running transit lanes that would accommodate both rapid transit vehicles and streetcars. No road reconstruction would be required to accommodate the shared transit lanes, although significant analysis would be required to coordinate service between the two systems.

The recommended cross section for the Detroit #4 alignment on Cass Avenue consists of a shared, edge running, one-way transit lane. No road reconstruction would be required to accommodate the shared transit lane, although re-striping of existing general purpose lanes and parking lanes would be required. The shared transit lane will be delineated from general purpose lanes by a solid white line.

FIGURE 5-14. CROSS SECTION, CASS AVENUE

The recommended cross section for the Detroit #4 alignment on John R. Street consists of an exclusive, edge running, one-way transit lane. No road reconstruction would be required to accommodate the exclusive transit lane, although re-striping of existing general purpose lanes and parking lanes would be required. The transit lane will be delineated from general purpose lanes by a solid white line, red paint, and standard BUS ONLY pavement markings (MUTCD 3D-01).

FIGURE 5-15. CROSS SECTION, JOHN R STREET

6.0 Next Steps

The selection of a local preferred alternative (LPA) represents the conclusion of the Woodward Avenue Rapid Transit Alternatives Analysis, but is only the first step of a long process towards project implementation and operation. This section outlines the next steps for advancing the LPA through a series of activities including a) Federal environmental review; b) the Federal Transit Administration's (FTA) Capital Investment Grant (CIG) program project development process; and c) the maturation of the Southeast Michigan Regional Transit Authority (RTA) and establishment of a dedicated revenue source to provide local match to Federal capital funding and ensure a reliable stream of revenue to operate and maintain (O&M) the proposed BRT system on Woodward Avenue.

6.1 Federal Environmental Review

Pursuant to the National Environmental Policy Act of 1969 (NEPA), all Federally-funded capital infrastructure projects must be subject to a review of their impacts on the human, natural, and physical environment. Because it is expected that Federal funding will be pursued to partially fund the capital cost of a new BRT line on Woodward Avenue, the LPA is therefore subject to NEPA. NEPA is intended to ensure that Federal agencies incorporate environmental values into their decisions and actions. NEPA further provides for a formal process for the public review and comment of anticipated impacts as an input for determining local political support for the proposed project as well as a Federal decision to fund or take any other necessary actions for it.

Transportation project effects on the environment can vary from very minor to very significant. To account for the variability of project impacts, three "classes of action" have been established to determine how compliance with NEPA is carried out and documented. An Environmental Impact Statement (EIS) is required for projects where it is known that the action will have a significant effect on the environment. An Environmental Assessment (EA) may be prepared for actions in which the degree of environmental impacts is not clearly established, but is not expected to be significant. Finally, Categorical Exclusions (CE) are those actions that do not individually or cumulatively have a significant effect on the environment. The Federal lead agency for NEPA analysis and documentation determines the most appropriate class of action. FTA will serve as the lead Federal agency for the environmental review of the Woodward Avenue BRT LPA, and it is expected that an EA will be the appropriate class of action for the project.

The RTA is expected to serve as the lead local agency for the subsequent EA. Other Federal, state, and local agencies with relevant jurisdiction will also be involved, and community groups and the general public will be provided an opportunity to participate in the review. The EA will examine a wide range of anticipated impacts to the environment of the LPA, including its effects on transportation, land use, adjacent neighborhoods and community facilities, cultural and historical assets, air and water quality, and several other natural and community resources. If and where negative impacts are identified, mitigation measures will be explored. The EA will also lead to further refinement of the project's design, capital cost estimate, and operating plan, and, if warranted by the financial analysis described later in this section, will evaluate the potential environmental impacts which would be generated if the LPA was implemented in two or more phases.

Should the environmental analysis and interagency review during the EA process find that the project has no significant impacts on the quality of the environment, FTA will issue a Finding of No Significant Impact (FONSI), thus completing the NEPA process. The EA for the BRT LPA is expected to take 12 to 24 months to complete.

For the purposes of technical preparation for the environmental review for the Woodward BRT, an Environmental Assessment (EA) was assumed pending formal guidance from FTA. The EA was deemed suitable due to the nature of the mode being BRT that would be within in the existing Right of Way (ROW) of the Woodward Avenue. Additional assumptions include that Cultural Resources Review would incorporate the exhaustive Section 106 work that was performed for the Woodward Light Rail Environmental Impact Statement (EIS that received a Record of Decision (ROD) in July 2011).

6.2 Capital Investment Grant Program Project Development

NEPA applies to all Federally-funded public transportation capital projects. When FTA discretionary Capital Investment Grant (CIG) program funding is being contemplated as a specific Federal revenue source – as it is for the Woodward Avenue BRT LPA - additional requirements apply. These requirements include a series of FTA approvals based upon the level of development of a proposed project and its "rating" against a set of statutory criteria intended to measure the merits of the project and the strength of the local financial commitment to match Federal funds for its construction and its ongoing O&M. Since the CIG program is intensely competitive and over-subscribed, these ratings help FTA to distinguish the most worthy projects for Federal investment.

CIG funding is eligible to fund up to 80 percent of a candidate projects' capital costs. However, due to the demand for funding, it is rare when FTA provides more than 50 percent of a project's cost through the program.

The specific project development requirements associated with CIG funding is established by the Moving Ahead for Progress in the 21st Century Act (MAP-21), which authorizes FTA programs. Although MAP-21 expired on September 30, 2014, it has been temporarily extended until a new Federal surface transportation authorization is passed by Congress and signed into law by the President. The process described here therefore reflects current MAP-21 CIG requirements. This process is not expected to change significantly under a future Federal authorization.

The Capital Investment Grant program features three categories of eligibility:

- New Starts: "Fixed guideway" projects such as heavy rail transit (HRT), light rail transit (LRT), commuter rail, BRT and streetcars costing more than $250 million or requesting greater than $75 million in CIG funding.
- Small Starts: Projects costing less than $250 million and requesting less than $75 million in CIG funding. In addition to the transit modes identified above, Small Starts funding may be used for "corridor-based bus rapid transit" projects that do not operate in a dedicated right-of-way.
- Core Capacity: Capital investment projects of any cost and funding amount that add capacity to existing rail or BRT systems.

The 27-mile Woodward Avenue BRT LPA is expected to qualify as a New Starts project. However, if the RTA decides to phase the implementation of the LPA, it is possible that each individual phase may qualify as a Small Start.

6.2.1 PROJECT DEVELOPMENT

The first step in the CIG process for both New Starts and Small Starts projects is FTA approval into the Project Development (PD) phase. Application to PD may occur simultaneous with, or anytime after, the initiation of the NEPA process. To be approved into PD, a project sponsor must demonstrate that sufficient funding has been committed to complete NEPA and associated design work and to develop the New Starts/Small Starts criteria for the project that FTA will use to evaluate and rate it for future approvals. The PD request must also feature a reasonable project schedule and must clarify the roles and responsibilities of stakeholder agencies in the development and funding of the project.

PD approval comes with pre-award authority, meaning that any local funding expended on project development activities can be counted as local match towards a future Capital Investment Grant.

6.2.2 PROJECT EVALUATION AND RATING

Proposed New Starts and Small Starts investments must be evaluated and rated according to project justification and local financial commitment criteria set forth in MAP-21. MAP-21's project justification criteria include the following:

- Mobility Improvements,
- Cost Effectiveness,
- Congestion Relief,
- Environmental Benefits,
- Economic Development, and
- Land Use.

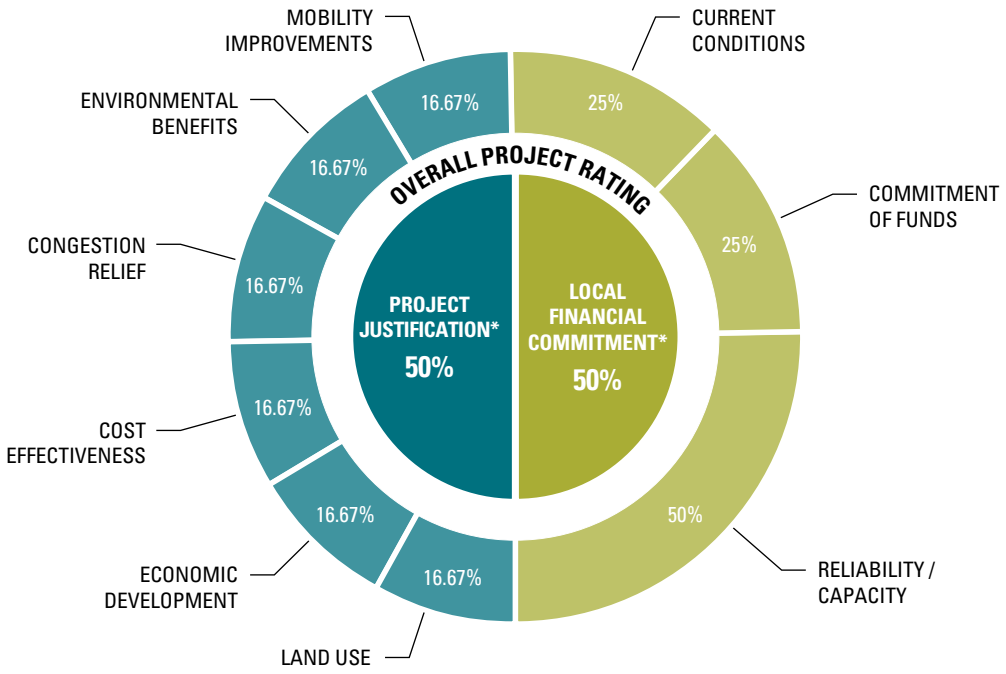
MAP-21 also requires FTA to examine the following when evaluating and rating local financial commitment:

- Current Financial Condition (of the project sponsor);
- Commitment of Capital and Operating Funding; and
- Reliability and Reasonability of the Project's Financial Plan (including the availability of local resources to recapitalize, maintain, and operate the overall existing and proposed public transportation system without requiring a reduction in existing services).

Each criterion is rated on a five-point scale, from Low to High. Summary project justification and local financial commitment ratings are prepared and combined to arrive at an overall project rating. For a New Starts project to advance into Engineering (as described in the following page), or for either a New Starts or Small Starts project to receive a Capital Investment Grant, it must achieve an overall project rating of at least Medium, as well as receive at least Medium summary ratings for both project justification and local financial commitment. **Figure 6.1** below presents FTA's New Starts and Small Starts evaluation framework.

FIGURE 6-1. NEW AND SMALL STARTS PROJECT EVALUATION AND RATING UNDER MAP-21

Source: FTA New and Small Starts Evaluation and Rating Process Final Policy Guidance. August 2013.



*Must be at least "Medium" for project to get "Medium" or better Overall Rating

FTA must evaluate and rate candidate New Starts projects for the purpose of approving their entry into Engineering, which is the second phase of the CIG process. Engineering approval occurs after completion of NEPA. In addition to a project's evaluation and rating against the MAP-21 project justification and local financial commitment criteria, FTA also reviews each project sponsor's technical capacity to effectively manage the design and construction of their proposed capital investment. The project's design and financial plan are expected to be refined during Engineering, resulting in a final project scope, schedule, and budget, as well as a 20-year capital and operating plan for its construction and operation.

6.2.3 CIG FUNDING

Small Starts projects do not have to apply for nor receive approval for Engineering. However, like New Starts projects, Small Starts must also be subject to all Federal environmental requirements, further design, and the development of a robust financial plan and project justification criteria in order to be considered for a Federal Capital Investment Grant. In fact – for both candidate New Starts and Small Starts investments – FTA will execute a Capital Investment Grant only when sufficient funding remains available within the program for obligation and the project achieves the following milestones:

- The project's scope, schedule, and budget is defined well enough to mitigate major design and construction risks and be determined by FTA to be reliable and ready for a capital grant;
- The project's financial plan demonstrates the local financial commitment of all but CIG funding to cover the project's capital cost; in other words, 50 percent of project costs. The financial plan must also demonstrate healthy financial contingencies should project costs increase or CIG funding does not materialize at the level or schedule assumed by the sponsor. Finally, the financial plan must demonstrate sufficient funding to operate the proposed investment while at the same time maintaining (if not enhancing) the current level of transit service throughout the service area of the project sponsor;
- The project sponsor is deemed by FTA to possess the technical capacity to construct and operate the proposed project; and
- The project receives a rating of at least Medium against the MAP-21 project justification and local financial commitment criteria.

6.3.0 FURTHER ESTABLISHMENT OF THE RTA AND DEDICATED REVENUE SOURCE

Section 6.2 described the requirements for receiving Federal discretionary funding to implement the BRT LPA and showed that in order to receive Federal discretionary transit funding the RTA will need to secure both the technical capacity to manage the construction and operation of the project and a dedicated and reliable source of revenue to match New Starts (or Small Starts) funding. Achieving both will require an unprecedented level of regional commitment to the improvement of transit on Woodward Avenue, as well as in future corridors of regional significance (Gratiot and Michigan Avenues, M-59, and others as determined by the RTA).

It is expected that as the Woodward Avenue BRT LPA progresses through NEPA, the RTA will in parallel evaluate staffing plans and budgets necessary to manage the subsequent design, construction, and operation of the project. As importantly, it will further analyze the cost to build and operate the project (as well as transit improvements in other regional corridors) and evaluate multiple revenue scenarios to meet cost requirements. These scenarios may include the identification of two or more operable segments within the scope of the BRT LPA and the generation of local revenue requirements necessary to implement these segments sequentially, rather than at once. It is anticipated that these collective analyses will ultimately inform the development of a long range RTA regional transit plan and the structure of a region-wide referendum which would provide voters in Macomb, Oakland, Washtenaw, and Wayne Counties with the opportunity to approve a new dedicated revenue source to cover the long-term administrative (including BRT project management staffing) costs of the RTA as well as a defined portion of the RTA plan.

It is anticipated that the RTA referendum might be held as early as November 2016. If successful, and if the revenues generated are sufficient to meet FTA requirements for a Capital Investment Grant, it is possible that the Woodward Avenue BRT LPA – or an initial segment of it – could be built and in operation by 2020.

Appendix A

FIGURE A-1. ALIGNMENT ALTERNATIVES EVALUATION RESULTS

BETTER ◎ ◒ ● WORSE

	ALIGNMENT ALTERNATIVES										
	DETROIT					SOUTH OAKLAND				NORTH OAKLAND	
CATEGORY	MAINLINE	1	2	3	4	MAINLINE	ROYAL OAK 1	ROYAL OAK 2	BERKLEY 1	PONTIAC 1	PONTIAC 2
1. MOBILITY											
1A. Transit Travel Time	●	◒	◒	◒	◎	◎	◒	●	◒	◒	◒
1B. Connectivity to Major Destinations	◎	●	◒	◎	◎	●	◎	◎	◒	◒	◒
1C. Transfer Opportunities and Intermodal Connections	◎	●	◒	◒	◎	◒	◎	◎	●	◎	◒
1D. Transit Ridership	◎	◎	◎	◒	◎	◒	◎	◎	●	◎	◒
1E. Legibility (ease of users' understanding of a route)	◎	◒	◒	●	◒	◎	●	◒	●	◒	◎
1F. Service to Transit Dependent Populations Within 1/2-Mile of Station Locations	●	◒	◒	◎	◎	●	◎	◎	◒	◎	◎
2. TRAFFIC AND SAFETY											
2A. Accommodation of Bicycle Lanes [1]	◎	●	●	◒	◒	N/A	N/A	N/A	N/A	◎	◒
2b. Auto Accessibility [2]	◒	◒	◒	◒	◎	N/A	N/A	N/A	N/A	◒	◎
2c. Streetcar Operational Impacts [3]	●	◎	◒	◒	◎	N/A	N/A	N/A	N/A	N/A	N/A
3. ECONOMIC DEVELOPMENT											
3A. Jobs Access	◎	◒	◒	◎	◎	◒	◎	◎	●	◒	◒
3B. Downtown Viability	◎	◒	◒	●	●	●	◎	◎	◒	◒	◎
3C. On-Street Parking	◎	●	◒	◒	◒	◎	●	●	◎	◒	●
3D. TOD Opportunities	◒	◒	◒	◎	◒	◒	◎	◎	◒	◒	◒
4. COST											
4A. Capital Cost	●	◎	◎	◒	◒	◎	●	●	◒	◒	◒
4B. Operating and Maintenance Cost [4]	◒	◒	◒	◒	◒	◒	◒	◒	◒	◒	◒
5. EASE OF IMPLEMENTATION											
5A. Implementation	●	◎	◎	◒	◒	◎	◒	◒	●	◒	◎
5B. Community Acceptance	●	◎	◒	◒	◎	◎	◎	●	◒	◒	◒

[1] Bicycle lanes were currently present within these alignment alternatives.
[2] This criterion relates to any conversion of one-way street to two-way. No conversions are anticipated within South Oakland County.
[3] This criterion relates to impacts with the M-1 Rail streetcar in Detroit. No impacts exist north of Grand Boulevard.
[4] Initial cost estimates showed no significant difference in operating costs for any alignment alternatives.

FIGURE A-2. STATION LOCATION EVALUATION RESULTS

BETTER ◉ ◒ ● WORSE

CRITERIA	STATION LOCATIONS														
	Rosa Parks Transit Center	Grand Circus Park	Temple	MLK/Mack	Warren	Amtrak	West Grand	Clairmount/ Owen	Webb/ Woodland	Manchester	McNichols	7 Mile	8 Mile	9 Mile	Pleasant Ridge
Ridership	◉	◒	◉	◒	◉	◒	◉	◉	◉	◉	◉	◉	◉	◒	●
Connection to destinations	◉	◉	◉	◉	◉	◉	◉	●	●	◒	●	●	●	●	●
Connection to downtowns	◉	◉	◒	◒	◉	◉	◉	●	●	◉	●	●	●	◉	●
Station spacing	◉	◒	◒	◒	◒	◒	◒	◉	◉	◉	◉	◉	◉	◉	◒
TOD opportunities	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	◉	●	◉	◒	●
Connection to crosstown routes	◉	◒	●	◉	◉	◒	◉	◉	◉	◉	◉	◉	◉	◉	◒
Connection to transit centers	◉	◒	●	●	◒	◉	◉	●	●	●	●	●	◉	●	●
Community support	◉	◉	◒	◉	◉	◉	◉	◒	◒	◉	◉	◉	◉	◉	◉
Potential park-and-ride locations	◒	●	◉	●	●	●	●	●	●	◉	●	●	◉	●	●
Ease of pedestrian access	To be further evaluated in next phase														
ROW availability	To be further evaluated in next phase														
OVERALL SCORE	◉	◉	◒	◉	◉	◉	◉	◒	◒	◉	◉	◒	◉	◉	●

CRITERIA	STATION LOCATIONS														
	10 Mile	Royal Oak Transit Center	11 Mile	11 Mile/ Coolidge	12 Mile/ Coolidge	12 Mile	13 Mile	14 Mile/ Lincoln	Maple/ Bowers	Oak/ Quarton	Long Lake/ Cranbrook	Square Lake	MLK	Downtown Pontiac	Pontiac Transit Center
Ridership	◒	◉	◉	●	●	●	◒	●	◒	●	●	●	●	◒	●
Connection to destinations	◉	◉	●	●	●	●	◉	●	●	●	●	●	◉	●	●
Connection to downtowns	◒	◉	●	◒	◉	◒	●	●	◉	◉	◉	●	●	◉	●
Station spacing	◉	◉	◉	●	●	◉	◉	◉	◉	◉	◉	◉	◉	◉	◒
TOD opportunities	◉	◒	◒	●	●	●	◉	◒	◉	◒	●	◒	◉	◉	◉
Connection to crosstown routes	◉	◉	◉	◉	◉	◒	◉	◉	◉	●	●	●	●	◉	◒
Connection to transit centers	●	◉	●	●	●	●	●	●	◒	●	●	●	●	●	◉
Community support	◉	◉	◉	◒	◒	◉	◉	◒	◉	◒	●	●	◉	◉	◉
Potential park-and-ride locations	◒	◉	●	●	◒	●	◒	●	◉	◒	●	◒	◉	◒	◉
Ease of pedestrian access	To be further evaluated in next phase														
ROW availability	To be further evaluated in next phase														
OVERALL SCORE	◉	◉	◒	●	◒	◒	◉	◒	◉	◒	●	●	◒	◉	◉

Woodward Avenue Rapid Transit Alternatives Analysis

Locally Preferred Alternative

Southeast Michigan Council of Governments

SEMCOG

RESOLUTION OF SUPPORT for COMPLETE STREETS
Birmingham, MI

WHEREAS, Complete Streets are defined as a design framework that enables safe and convenient access for all users, including pedestrians, bicyclists, transit riders, and drivers of all ages and abilities: and

WHEREAS, the Michigan Legislature adopted Public Acts 134 and 135 of 2010 to enact Complete Streets legislation that requires the Michigan Department of Transportation to consider all users in transportation related projects; and

WHEREAS, Complete Streets are achieved when transportation agencies routinely plan, design, construct, re-construct, operate, and maintain the transportation network to improve travel conditions for bicyclists, pedestrians, transit, and freight in a manner consistent with, and supportive of, the surrounding community; and

WHEREAS, development of multi-modal transportation infrastructure, including accommodations for pedestrian, bicycle, and transit riders, offers long-term cost savings by reducing costly infrastructure retrofits and opportunities to create safe and convenient non-motorized travel; and

WHEREAS, streets that support and invite multiple uses, including safe, active, and ample space for pedestrians, bicycles, and transit are more conducive to the public life and efficient movement of people than streets designed primarily to move automobiles; and

WHEREAS, increasing active transportation (e.g. walking, bicycling and using public transportation) offers the potential for improved public health, economic development, a cleaner environment, reduced transportation costs, enhanced community connections, social equity, and more livable communities; and

WHEREAS, existing City of Birmingham plans and policies already support principles that facilitate progress toward developing a network of Complete Streets consistent with the objectives of the Michigan Complete Streets legislation and with the practices promoted by the National Complete Streets Coalition; and

WHEREAS, Complete Streets principles have been and continue to be adopted nation-wide at state, county, MPO, and city levels in the interest of proactive planning and adherence to federal directives that guide transportation planning organizations to promote multi-modal transportation options and accessibility for all users; and

WHEREAS, the adoption of this Complete Streets Proclamation allows the City of Birmingham to remain competitive in the pursuit of future state transportation project funding.

NOW, THEREFORE, BE IT RESOLVED, that the City of Birmingham City Commission hereby declares its support of Complete Streets policies and further directs City staff to develop a set of proposed policies and procedures to implement Complete Streets practices to make the City more accommodating to all modes of travel, including walkers, bicyclists and transit riders, of all ages and abilities.

Woodward Avenue
COMPLETE STREETS

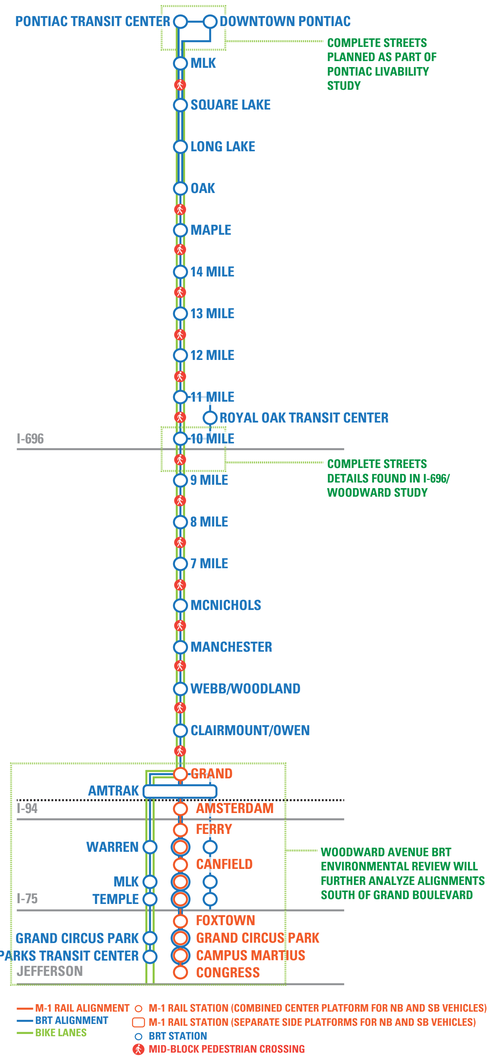
VISION
Woodward Avenue will be a complete street that provides safe and efficient means of travel for all users; creates excellent quality of place that benefits local residents; builds value for property; and inspires visitors to return.

MISSION
All stakeholders shall work together to create a cohesive corridor plan that balances the needs and benefits of all users, neighborhoods, and communities that is significantly completed by 2025.

WOODWARD AT A GLANCE...

Woodward Avenue is an iconic urban scenic byway and the spine of the Detroit metropolitan region that traverses eleven communities from Downtown Detroit to the City of Pontiac. Woodward Avenue is perhaps the most critical corridor in the region and state as 1 in 10 Michiganders live along Woodward Avenue. It also represents the "Main Street" of many corridor communities, including Detroit, Highland Park, Ferndale, and Pontiac.

The future Woodward Avenue vision paints a picture of a livable, walkable, pedestrian, and transit-friendly multi-modal corridor. Building upon the future rapid transit, it aims to create a different future for Woodward Avenue that focuses on being a safe, secure, stable, well-linked, and economically stimulated place for its communities.



COMPLETE STREETS RECOMMENDED ELEMENTS FOR WOODWARD AVENUE

Street Trees
A consistent layout of street planting will bring order to Woodward Avenue and create spaces that will improve each neighborhood's identity. The proper design of irrigation and establishment of landscape maintenance protocols will help street trees to reach maturity. Mature plantings in ordered, urban streetscapes exude a sense of calm and stability. Street trees will also provide environmental benefits and assist in calming traffic.

Pedestrian Zone
Providing ample space within the pedestrian zone will synthesize a variety of activities, including the movement of pedestrians and outdoor dining/retail operations. Enhanced pedestrian crossings with curb extensions and pedestrian refuge islands (where feasible) at mid-block locations and major intersections will improve connectivity and safety for pedestrians throughout the corridor.

On-Street Parking
Maintaining on-street parking spaces (where feasible) will increase the viability of business along the corridor and will have a traffic calming effect on adjacent general purpose lanes.

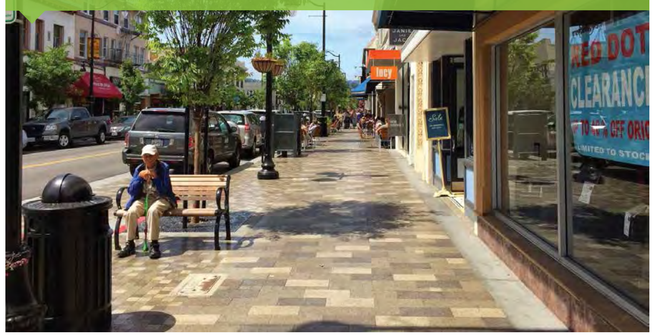
Branding
Building on the brand established by the Woodward Avenue Action Association (WA3) will provide consistency and recognition throughout the corridor, further enhancing its sense of place. This brand can be applied to signage, wayfinding, kiosks, and many other elements.

Cycle Tracks
Raised cycle tracks will be constructed adjacent to sidewalks but will be delineated from pedestrian zones by unique paving colors or materials. Raised bicycle facilities will foster a greater sense of safety for less advanced cyclists and also reduce maintenance challenges

Stormwater Management
Streetscape vegetation will be designed and programmed to filter stormwater from impervious surfaces. These elements improve the aesthetics of the street and will act as buffers between different modes of travel.

Mixed-Use Development
Complete streets will produce greater volumes of all types of travel, providing the foundation for intensified private development that combines uses. Ground floor retail with a high percentage of windows can help activate the street.

Furnishing
Streetscape elements, such as lighting, benches, trash receptacles, informational kiosks, bike share facilities, and many others, will have a powerful effect on the identity of the corridor if designed as a unified brand.



Rapid Transit
Two rapid transit systems, M-1 Rail (in construction) and Woodward Avenue bus rapid transit (BRT) (planned), will provide premium transit service throughout the corridor and are projected to serve over 40,000 users each day.

Woodward Avenue

COMPLETE STREETS

JEFFERSON AVE. TO GRAND BOULEVARD

EXISTING CONDITIONS

The width and character of Woodward Avenue is fairly consistent within this segment of the corridor. Within Downtown Detroit (south of Park Avenue), wider sidewalks have been implemented that include the use of higher quality materials, planters, street trees, and furnishings. Vehicle travel lanes within this segment have been reduced from seven (7) to four (4). Continental crosswalk design (12" bars perpendicular to the path of travel) is used within this segment at most intersections and mid-block locations. On-street parking is provided in select locations throughout this segment.

Extending from the northern portion of Downtown Detroit (north of Park Avenue) and into Midtown and New Center, nine (9) vehicle travel lanes including a center-turn lane and narrower sidewalks make up the 110' right-of-way. Throughout most of this segment, some street trees and lighting are provided within the sidewalk. Transverse crosswalk design (12" parallel lines to delineate the edge of the crosswalk) is used within this segment at most intersections and mid-block locations. On-street parking is provided throughout the entire segment.

SEGMENT COMMUNITY

Detroit

RECOMMENDATIONS

Between Jefferson and Grand Boulevard, vehicle travel lanes will be impacted by the construction of the M-1 Rail streetcar lines, which will primarily operate in curbside lanes until just before Grand Boulevard when the streetcar transitions to center-running operations. The existing nine (9) vehicle travel lanes will be reduced to seven (7), two (2) of which will share space with the streetcar. This reduction allows for wider sidewalks, the inclusion of on-street parking along the eastern edge of the street, and a median within the center turn-lane.

Planned bicycle facilities on Cass Avenue (one block west of Woodward Avenue) will serve the corridor. Cass Avenue was chosen to accomodate bicycle facilities due to concerns over bicycle safety associated with the streeetcar tracks and will still allow space for future bus rapid transit (BRT) along Cass Avenue.

The pedestrian zone within this segment is recommended to include sidewalks on each side of the street at least 14' in width. Sidewalks will be constructed with enhanced finishes and materials consistent with the overall design of the corridor, although unique patterns and colors can be used to identify this segment. Continental crosswalk design will be used for all crosswalks (12" bars perpendicular to the path of travel), and may be further accented with colored paint.

Vegetation within this segment will consist of mature street trees planted no more than 40' apart to provide a consistent canopy. The trees can be planted in designated tree grates or within vegetated planters (located both at the edge of the sidewalk and in the median), which will use a combination of soils, mulch, and plants that help filter stormwater.

Furnishing within this segment will be consistent with the design of the corridor, although unique patterns and colors can be used to identify this segment. Furnishing elements may include seating, trash receptacles, bicycle parking, wayfinding, and lighting. Branding established by WA3 will be incorporated within wayfinding elements and permanent/seasonal banners.

RAPID TRANSIT
Shared streetcar-vehicle lanes will provide premium transit in this segment

PEDESTRIAN ZONE
Wide sidewalks, enhanced pedestrian crossings with curb extensions, and pedestrian refuge islands

ON-STREET PARKING
On-street, parallel parking accomodated on the east edge of the street

FURNISHING
Amenities consistent with Woodward corridor, including space for outdoor dining, bike share facilities, and M-1 Rail stations

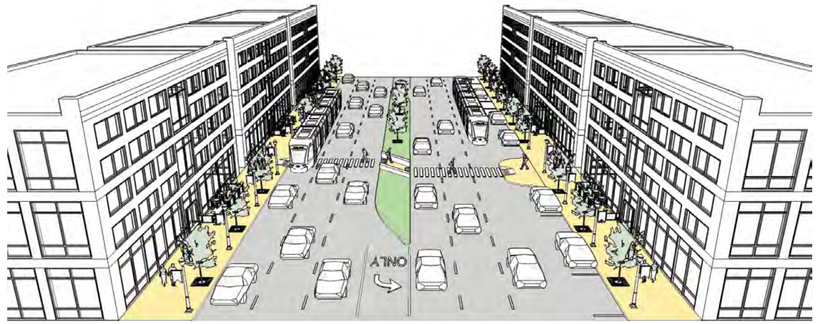
STREET TREES
Mature street trees in planters and/or grates spaced 40' apart

STORMWATER MANAGEMENT
Permeable paving materials for all sidewalks and filtration planters 40' apart

BRANDING
Signage, wayfinding, colors, and materials consistent with Woodward brand

VISION
Woodward Avenue will be a complete street that provides safe and efficient means of travel for all users; creates excellent quality of place that benefits local residents; builds value for property; and inspires visitors to return.

MISSION
All stakeholders shall work together to create a cohesive corridor plan that balances the needs and benefits of all users, neighborhoods, and communities that is significantly completed by 2025.



TYPICAL CROSS SECTION: JEFFERSON TO GRAND
RIGHT-OF-WAY = 120'

Woodward Avenue

COMPLETE STREETS

GRAND BOULEVARD TO MCNICHOLS RD.

EXISTING CONDITIONS

This segment, between Grand Boulevard and McNichols Road, represents the narrowest right-of-way along the entire Woodward Avenue corridor. The right-of-way is 100', consisting of seven (7) vehicle travel lanes including a center turn-lane and 14' sidewalks on both sides of the street. Throughout most of this segment, some street trees and lighting are provided within the sidewalk. On-street parking is not specifically delineated in this segment, but the outside lane is generally used for this purpose. Transverse crosswalk design (12" parallel lines to delineate the edge of the crosswalk) is used within this segment at most intersections and mid-block locations.

SEGMENT COMMUNITIES

Detroit and Highland Park

RECOMMENDATIONS

Between Grand Boulevard and McNichols Road, the existing seven (7) vehicle travel lanes will be reduced to four (4). This reduction allows for dedicated transit lanes physically separated from vehicle travel lanes and two-way raised cycle tracks on each side of the street.

The two-way raised cycle tracks will be 8' in total width and will be accommodated within space from the existing sidewalk. The cycle tracks will include two 4' bicycle only lanes, delineated from the sidewalk by unique paving colors or materials and bicycle lane word, symbol and arrow markings (MUTCD Figure 9C-3). A 1' buffer and curb will separate cycle tracks from vehicular traffic. The cycle tracks will begin north of Grand Boulevard and be linked directly to planned bicycle facilities on Cass Avenue.

The remaining space from the existing sidewalk will accommodate the pedestrian-only zone. Sidewalks will be constructed with enhanced finishes and materials consistent with the overall design of the corridor, although unique patterns and colors can be used to identify this segment. Continental crosswalk design will be used for all crosswalks (12" bars perpendicular to the path of travel) and may be further accented with colored paint.

Furnishing within this segment will be consistent with the design of the corridor, although unique patterns and colors can be used to identify this segment. Furnishing elements may include seating, trash receptacles, bicycle parking, wayfinding, and lighting. Branding established by WA3 will be incorporated within wayfinding elements and permanent/seasonal banners.

RAPID TRANSIT
Dedicated bus rapid transit lanes will provide premium transit in this segment

CYCLE TRACKS
Two-way raised cycle tracks (NB + SB) adjacent to sidewalk with 1' buffer and curb will separate cycle tracks from vehicular traffic

PEDESTRIAN ZONE
Reconstructed sidewalks and enhanced pedestrian crossings

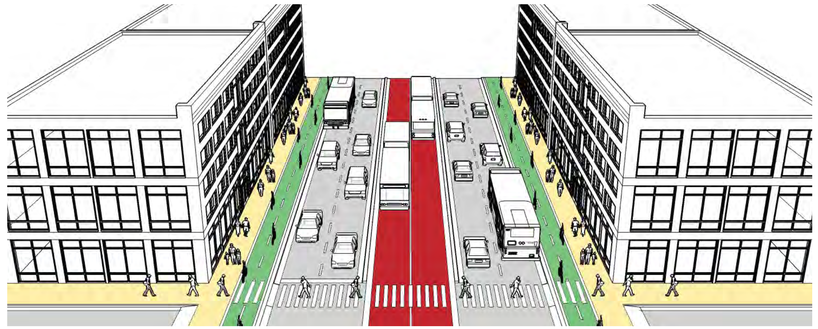
FURNISHING
Amenities consistent with Woodward corridor

STORMWATER MANAGEMENT
Permeable paving materials for all sidewalks and filtration planters 40' apart

BRANDING
Signage, wayfinding, colors, and materials consistent with Woodward brand

VISION
Woodward Avenue will be a complete street that provides safe and efficient means of travel for all users; creates excellent quality of place that benefits local residents; builds value for property; and inspires visitors to return.

MISSION
All stakeholders shall work together to create a cohesive corridor plan that balances the needs and benefits of all users, neighborhoods, and communities that is significantly completed by 2025.



TYPICAL CROSS SECTION: GRAND TO MCNICHOLS
RIGHT-OF-WAY = 100'

Woodward Avenue

COMPLETE STREETS

MCNICHOLS ROAD TO 8 MILE ROAD

EXISTING CONDITIONS

This segment, between McNichols Road and 8 Mile Road, represents the beginning of the widest right-of-way along the Woodward Avenue corridor. The right-of-way is 200', consisting of ten (10) vehicle travel lanes, a wide median, and 6' sidewalks on both sides of the street. Throughout most of this segment, some street trees and lighting are provided within the sidewalk. On-street parking is provided in select locations throughout this segment along the east edge of the street. Transverse crosswalk design (12" parallel lines to delineate the edge of the crosswalk) is used within this segment at most intersections and mid-block locations.

SEGMENT COMMUNITY

Detroit

RECOMMENDATIONS

Between McNichols Road and 8 Mile Road, the existing ten (10) vehicle travel lanes will be reduced to six (6). This reduction allows for this segment to be redesigned as a multiway boulevard that will include dedicated transit lanes physically separated from vehicle travel lanes, an enhanced pedestrian zone, two-way raised cycle tracks on each side of the street, and on-street parking on both sides of the street separated from traffic by an 8' landscaped median.

The two-way raised cycle tracks will be 8' in total width and will be accommodated adjacent to the sidewalk. The cycle tracks will include two 4' bicycle only lanes, delineated from the sidewalk by unique paving colors or materials and bicycle lane word, symbol, and arrow markings (MUTCD Figure 9C-3). A 3' buffer and curb will separate the cycle tracks from on-street parking.

The remaining 10' will accommodate the pedestrian-only zone. Sidewalks will be constructed with enhanced finishes and materials consistent with the overall design of the corridor, although unique patterns and colors can be used to identify this segment. Continental crosswalk design will be used for all crosswalks (12" bars perpendicular to the path of travel) and may be further accented with colored paint.

Vegetation within this segment will consist of mature street trees planted no more than 40' apart to provide a consistent canopy. The trees can be planted in designated tree grates or within vegetated planters (located both at the edge of the sidewalk and in the median), which will use a combination of soils, mulch, and plants that help filter stormwater.

Furnishing within this segment will be consistent with the design of the corridor, although unique patterns and colors can be used to identify this segment. Furnishing elements may include seating, trash receptacles, bicycle parking, wayfinding, and lighting. Branding established by WA3 will be incorporated within wayfinding elements and permanent/seasonal banners.

RAPID TRANSIT
Dedicated bus rapid transit lanes will provide premium transit in this segment

CYCLE TRACKS
Two-way raised cycle tracks (NB + SB) adjacent to sidewalk with 3' buffer from on-street parking

PEDESTRIAN ZONE
Reconstructed sidewalks, enhanced pedestrian crossings with curb extensions, and pedestrian refuge islands

FURNISHING
Amenities consistent with Woodward corridor, including space for outdoor dining and bike share facilities

STREET TREES
Mature street trees in planters and/or grates spaced 40' apart

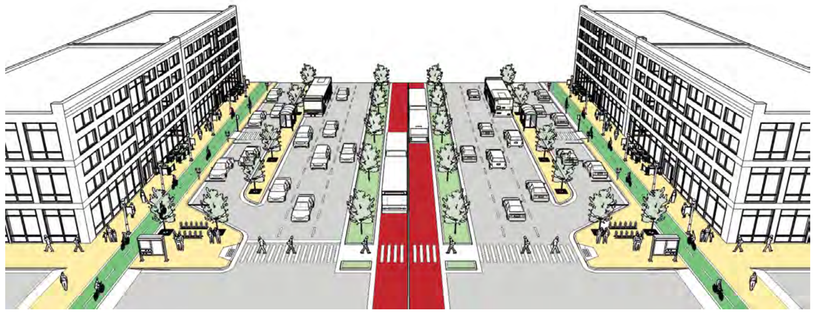
STORMWATER MANAGEMENT
Permeable paving materials for all sidewalks and filtration planters 40' apart

BRANDING
Signage, wayfinding, colors, and materials consistent with Woodward brand

ON-STREET PARKING
On-street, parallel parking accomodated within multiway boulevard

VISION
Woodward Avenue will be a complete street that provides safe and efficient means of travel for all users; creates excellent quality of place that benefits local residents; builds value for property; and inspires visitors to return.

MISSION
All stakeholders shall work together to create a cohesive corridor plan that balances the needs and benefits of all users, neighborhoods, and communities that is significantly completed by 2025.



TYPICAL CROSS SECTION: MCNICHOLS TO 8 MILE
RIGHT-OF-WAY = 200'

Woodward Avenue

COMPLETE STREETS

8 MILE ROAD TO OAKRIDGE AVENUE

EXISTING CONDITIONS

This segment, between 8 Mile Road and Oakridge Avenue, is the first segment within Oakland County, extending through the City of Ferndale from its southern border with Detroit and its northern border with Pleasant Ridge. The Woodward Avenue / 9 Mile intersection represents the center of Downtown Ferndale, which produces higher levels of pedestrian activity extending to downtown businesss in each direction. The right-of-way is 200', consisting of eight (8) vehicle travel lanes, a wide median, and 6' sidewalks on both sides of the street, although frequent curb extensions into the parking areas (primarily at crosswalks) expand the sidewalk to 14'. Street trees and lighting are present within the sidewalk and median for the entire segment. On-street parking is provided throughout this segment along both edges of the street. Transverse crosswalk design (12" parallel lines to delineate the edge of the crosswalk) is used within this segment at most intersections and mid-block locations, while colored paint is used to delineate crosswalks at more prominent intersections (i.e. 9 Mile, Fielding Street).

SEGMENT COMMUNITY

Ferndale

RECOMMENDATIONS

Between 8 Mile Road and Oakridge Avenue, the existing eight (8) vehicle travel lanes will be reduced to six (6). This reduction allows for this segment to be redesigned as a multiway boulevard that will include dedicated transit lanes physically separated from vehicle travel lanes, an enhanced pedestrian zone, two-way raised cycle tracks on each side of the street, and on-street parking on both sides of the street separated from traffic by an 8' landscaped median.

The two-way raised cycle tracks will be 8' in total width and will be accommodated adjacent to the sidewalk. The cycle tracks will include two 4' bicycle only lanes, delineated from the sidewalk by unique paving colors or materials and bicycle lane word, symbol, and arrow markings (MUTCD Figure 9C-3). A 3' buffer and curb will separate the cycle tracks from on-street parking.

The remaining 10' will accommodate the pedestrian-only zone. Sidewalks will be constructed with enhanced finishes and materials consistent with the overall design of the corridor, although unique patterns and colors can be used to identify this segment. Continental crosswalk design will be used for all crosswalks (12" bars perpendicular to the path of travel) and may be further accented with colored paint.

Vegetation within this segment will consist of mature street trees planted no more than 40' apart to provide a consistent canopy. The trees can be planted in designated tree grates or within vegetated planters (located both at the edge of the sidewalk and in the median), which will use a combination of soils, mulch, and plants that help filter stormwater.

Furnishing within this segment will be consistent with the design of the corridor, although unique patterns and colors can be used to identify this segment. Furnishing elements may include seating, trash receptacles, bicycle parking, wayfinding, and lighting. Branding established by WA3 will be incorporated within wayfinding elements and permanent/seasonal banners.

RAPID TRANSIT
Dedicated bus rapid transit lanes will provide premium transit in this segment

CYCLE TRACKS
Two-way raised cycle tracks (NB + SB) adjacent to sidewalk with 3' buffer from on-street parking

PEDESTRIAN ZONE
Reconstructed sidewalks, enhanced pedestrian crossings with curb extensions, and pedestrian refuge islands

FURNISHING
Amenities consistent with Woodward corridor, including space for outdoor dining and bike share facilities

STREET TREES
Mature street trees in planters and/or grates spaced 40' apart

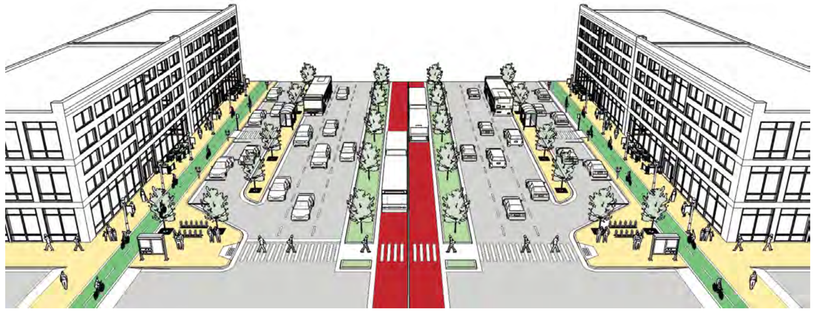
STORMWATER MANAGEMENT
Permeable paving materials for all sidewalks and filtration planters 40' apart

BRANDING
Signage, wayfinding, colors, and materials consistent with Woodward brand

ON-STREET PARKING
On-street, parallel parking accomodated within multiway boulevard

VISION
Woodward Avenue will be a complete street that provides safe and efficient means of travel for all users; creates excellent quality of place that benefits local residents; builds value for property; and inspires visitors to return.

MISSION
All stakeholders shall work together to create a cohesive corridor plan that balances the needs and benefits of all users, neighborhoods, and communities that is significantly completed by 2025.



TYPICAL CROSS SECTION: 8 MILE TO OAKRIDGE
RIGHT-OF-WAY = 200'

Woodward Avenue

COMPLETE STREETS

OAKRIDGE AVE. TO WASHINGTON AVE.

EXISTING CONDITIONS

This segment, between Oakridge Avenue and the area north of I-696 represents the segment that extends through the City of Pleasant Ridge from its southern border with Ferndale to its northern border with Royal Oak. The right-of-way is 200', consisting of eight (8) vehicle travel lanes, a wide median, and 6' sidewalks on both sides of the street. Street trees and lighting are present within the sidewalk and median for the entire segment. On-street parking is provided in select locations throughout this segment along the east edge of the street. Transverse crosswalk design (12" parallel lines to delineate the edge of the crosswalk) is used within this segment at most intersections and mid-block locations.

This segment includes the I-696/Woodward Avenue interchange, which presents a unique set of conditions for consideration. Please reference the I-696 Interchange Study for a detailed complete streets strategy for this area.

SEGMENT COMMUNITY

Pleasant Ridge

RECOMMENDATIONS

Between Oakridge Avenue and the area north of I-696, the existing eight (8) vehicle travel lanes will be reduced to six (6). This reduction allows for this segment to be redesigned as a multiway boulevard that will include dedicated transit lanes physically separated from vehicle travel lanes, an enhanced pedestrian zone, two-way raised cycle tracks on each side of the street, and on-street parking on both sides of the street separated from traffic by an 8' landscaped median.

The two-way raised cycle tracks will be 8' in total width and will be accommodated adjacent to the sidewalk. The cycle tracks will include two 4' bicycle only lanes, delineated from the sidewalk by unique paving colors or materials and bicycle lane word, symbol, and arrow markings (MUTCD Figure 9C-3). A 3' buffer and curb will separate the cycle tracks from on-street parking.

The remaining 10' will accommodate the pedestrian-only zone. Sidewalks will be constructed with enhanced finishes and materials consistent with the overall design of the corridor, although unique patterns and colors can be used to identify this segment. Continental crosswalk design will be used for all crosswalks (12" bars perpendicular to the path of travel), and may be further accented with colored paint.

Vegetation within this segment will consist of mature street trees planted no more than 40' apart to provide a consistent canopy. The trees can be planted in designated tree grates or within vegetated planters (located both at the edge of the sidewalk and in the median), which will use a combination of soils, mulch, and plants that help filter stormwater.

Furnishing within this segment will be consistent with the design of the corridor, although unique patterns and colors can be used to identify this segment. Furnishing elements may include seating, trash receptacles, bicycle parking, wayfinding, and lighting. Branding established by WA3 will be incorporated within wayfinding elements and permanent/seasonal banners.

RAPID TRANSIT
Dedicated bus rapid transit lanes will provide premium transit in this segment

CYCLE TRACKS
Two-way raised cycle tracks (NB + SB) adjacent to sidewalk with 3' buffer from on-street parking

PEDESTRIAN ZONE
Reconstructed sidewalks, enhanced pedestrian crossings with curb extensions, and pedestrian refuge islands

FURNISHING
Amenities consistent with Woodward corridor, including space for outdoor dining and bike share facilities

STREET TREES
Mature street trees in planters and/or grates spaced 40' apart

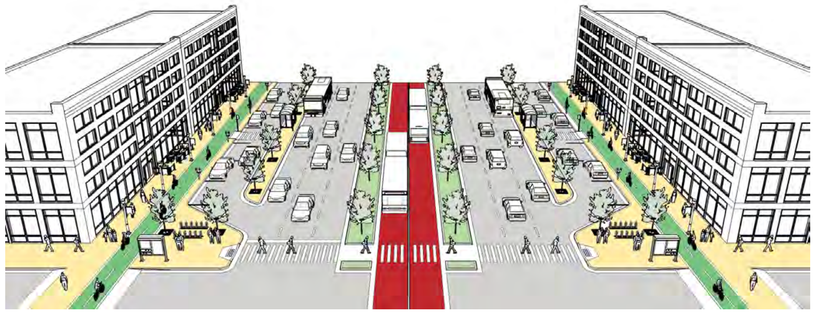
STORMWATER MANAGEMENT
Permeable paving materials for all sidewalks and filtration planters 40' apart

BRANDING
Signage, wayfinding, colors, and materials consistent with Woodward brand

ON-STREET PARKING
On-street, parallel parking accomodated within multiway boulevard

VISION
Woodward Avenue will be a complete street that provides safe and efficient means of travel for all users; creates excellent quality of place that benefits local residents; builds value for property; and inspires visitors to return.

MISSION
All stakeholders shall work together to create a cohesive corridor plan that balances the needs and benefits of all users, neighborhoods, and communities that is significantly completed by 2025.



TYPICAL CROSS SECTION: OAKRIDGE TO I-696
RIGHT-OF-WAY = 200'

Woodward Avenue

COMPLETE STREETS

WASHINGTON AVENUE TO 11 MILE ROAD

EXISTING CONDITIONS

This segment, between the area north of I-696 and 11 Mile, extends through the southern portion of Royal Oak and Huntington Woods. The right-of-way is 200', consisting of eight (8) vehicle travel lanes, a wide median, and 6' sidewalks on both sides of the street. Street trees and lighting are present within the sidewalk and median in select locations throughout this segment. The space between the sidewalk and vehicle travel lanes varies from block to block, including a variety of conditions e.g. grass lawns, slip roads with parallel parking, and slip roads with angled parking. Transverse crosswalk design (12" parallel lines to delineate the edge of the crosswalk) is used within this segment at most intersections and mid-block locations.

SEGMENT COMMUNITIES

Huntington Woods and Royal Oak

RECOMMENDATIONS

Between the area north of I-696 and 11 Mile Road, the existing eight (8) vehicle travel lanes will be reduced to six (6). This reduction allows for this segment to be redesigned as a multiway boulevard that will include dedicated transit lanes physically separated from vehicle travel lanes, an enhanced pedestrian zone, two-way raised cycle tracks on each side of the street, and on-street parking on both sides of the street separated from traffic by an 8' landscaped median.

The two-way raised cycle tracks will be 8' in total width and will be accommodated adjacent to the sidewalk. The cycle tracks will include two 4' bicycle only lanes, delineated from the sidewalk by unique paving colors or materials and bicycle lane word, symbol, and arrow markings (MUTCD Figure 9C-3). A 3' buffer and curb will separate the cycle tracks from on-street parking.

The remaining 10' will accommodate the pedestrian-only zone. Sidewalks will be constructed with enhanced finishes and materials consistent with the overall design of the corridor, although unique patterns and colors can be used to identify this segment. Continental crosswalk design will be used for all crosswalks (12" bars perpendicular to the path of travel) and may be further accented with colored paint.

Vegetation within this segment will consist of mature street trees planted no more than 40' apart to provide a consistent canopy. The trees can be planted in designated tree grates or within vegetated planters (located both at the edge of the sidewalk and in the median), which will use a combination of soils, mulch, and plants that help filter stormwater.

Furnishing within this segment will be consistent with the design of the corridor, although unique patterns and colors can be used to identify this segment. Furnishing elements may include seating, trash receptacles, bicycle parking, wayfinding, and lighting. Branding established by WA3 will be incorporated within wayfinding elements and permanent/seasonal banners.

RAPID TRANSIT
Dedicated bus rapid transit lanes will provide premium transit in this segment

CYCLE TRACKS
Two-way raised cycle tracks (NB + SB) adjacent to sidewalk with 3' buffer from on-street parking

PEDESTRIAN ZONE
Reconstructed sidewalks, enhanced pedestrian crossings with curb extensions, and pedestrian refuge islands

FURNISHING
Amenities consistent with Woodward corridor, including space for outdoor dining and bike share facilities

STREET TREES
Mature street trees in planters and/or grates spaced 40' apart

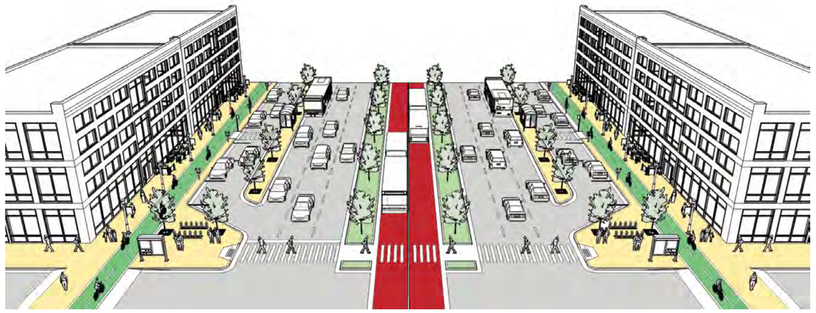
STORMWATER MANAGEMENT
Permeable paving materials for all sidewalks and filtration planters 40' apart

BRANDING
Signage, wayfinding, colors, and materials consistent with Woodward brand

ON-STREET PARKING
On-street, parallel parking accomodated within multiway boulevard

VISION
Woodward Avenue will be a complete street that provides safe and efficient means of travel for all users; creates excellent quality of place that benefits local residents; builds value for property; and inspires visitors to return.

MISSION
All stakeholders shall work together to create a cohesive corridor plan that balances the needs and benefits of all users, neighborhoods, and communities that is significantly completed by 2025.



TYPICAL CROSS SECTION: I-696 TO 11 MILE
RIGHT-OF-WAY = 200'

Woodward Avenue

COMPLETE STREETS

11 MILE ROAD TO 14 MILE ROAD

EXISTING CONDITIONS

This segment, between the area north of I-696 and 11 Mile, extends through the southern portion of Royal Oak and Huntington Woods. The right-of-way is 200', consisting of eight (8) vehicle travel lanes, a wide median, and 6' sidewalks on both sides of the street. Street trees and lighting are present within the sidewalk and median in select locations throughout this segment. The space between the sidewalk and vehicle travel lanes varies from block to block, including a variety of conditions e.g. grass lawns, slip roads with parallel parking, and slip roads with angled parking. Transverse crosswalk design (12" parallel lines to delineate the edge of the crosswalk) is used within this segment at most intersections and mid-block locations.

SEGMENT COMMUNITIES

Berkley and Royal Oak

RECOMMENDATIONS

Between 11 Mile Road and 14 Mile Road, the existing eight (8) vehicle travel lanes will be reduced to six (6). This reduction allows for this segment to be redesigned as a multiway boulevard that will include dedicated transit lanes physically separated from vehicle travel lanes, an enhanced pedestrian zone, two-way raised cycle tracks on each side of the street, and on-street parking on both sides of the street separated from traffic by an 8' landscaped median.

The two-way raised cycle tracks will be 8' in total width and will be accommodated adjacent to the sidewalk. The cycle tracks will include two 4' bicycle only lanes, delineated from the sidewalk by unique paving colors or materials and bicycle lane word, symbol, and arrow markings (MUTCD Figure 9C-3). A 3' buffer and curb will separate the cycle tracks from on-street parking.

The remaining 10' will accommodate the pedestrian-only zone. Sidewalks will be constructed with enhanced finishes and materials consistent with the overall design of the corridor, although unique patterns and colors can be used to identify this segment. Continental crosswalk design will be used for all crosswalks (12" bars perpendicular to the path of travel) and may be further accented with colored paint.

Vegetation within this segment will consist of mature street trees planted no more than 40' apart to provide a consistent canopy. The trees can be planted in designated tree grates or within vegetated planters (located both at the edge of the sidewalk and in the median), which will use a combination of soils, mulch, and plants that help filter stormwater.

Furnishing within this segment will be consistent with the design of the corridor, although unique patterns and colors can be used to identify this segment. Furnishing elements may include seating, trash receptacles, bicycle parking, wayfinding, and lighting. Branding established by WA3 will be incorporated within wayfinding elements and permanent/seasonal banners.

RAPID TRANSIT
Dedicated bus rapid transit lanes will provide premium transit in this segment

CYCLE TRACKS
Two-way raised cycle tracks (NB + SB) adjacent to sidewalk with 3' buffer from on-street parking

PEDESTRIAN ZONE
Reconstructed sidewalks, enhanced pedestrian crossings with curb extensions, and pedestrian refuge islands

FURNISHING
Amenities consistent with Woodward corridor, including space for outdoor dining and bike share facilities

STREET TREES
Mature street trees in planters and/or grates spaced 40' apart

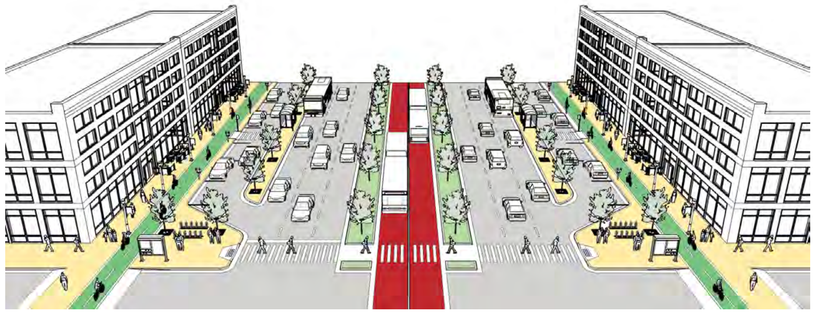
STORMWATER MANAGEMENT
Permeable paving materials for all sidewalks and filtration planters 40' apart

BRANDING
Signage, wayfinding, colors, and materials consistent with Woodward brand

ON-STREET PARKING
On-street, parallel parking accomodated within multiway boulevard

VISION
Woodward Avenue will be a complete street that provides safe and efficient means of travel for all users; creates excellent quality of place that benefits local residents; builds value for property; and inspires visitors to return.

MISSION
All stakeholders shall work together to create a cohesive corridor plan that balances the needs and benefits of all users, neighborhoods, and communities that is significantly completed by 2025.



TYPICAL CROSS SECTION: 11 MILE TO 14 MILE
RIGHT-OF-WAY = 200'

Woodward Avenue

COMPLETE STREETS

14 MILE ROAD TO QUARTON ROAD

EXISTING CONDITIONS

This segment, between 14 Mile Road and Quarton Road, extends through the City of Birmingham and a portion of Bloomfield Township. The right-of-way is 200', consisting of eight (8) vehicle travel lanes, a wide median, and 6' sidewalks on both sides of the street. Street trees and lighting are present within the sidewalk and median in select locations throughout this segment. The space between the sidewalk and vehicle travel lanes varies from block to block, including a variety of conditions e.g. grass lawns, slip roads with parallel parking, and slip roads with angled parking. Transverse crosswalk design (12" parallel lines to delineate the edge of the crosswalk) is used within this segment at most intersections and mid-block locations.

SEGMENT COMMUNITIES

Birmingham and Bloomfield Township

RECOMMENDATIONS

Between 14 Mile Road and Quarton, the existing eight (8) vehicle travel lanes will be reduced to six (6). This reduction allows for this segment to be redesigned as a multiway boulevard that will include dedicated transit lanes physically separated from vehicle travel lanes, an enhanced pedestrian zone, two-way raised cycle tracks on each side of the street, and on-street parking on both sides of the street separated from traffic by an 8' landscaped median.

The two-way raised cycle tracks will be 8' in total width and will be accommodated adjacent to the sidewalk. The cycle tracks will include two 4' bicycle only lanes, delineated from the sidewalk by unique paving colors or materials and bicycle lane word, symbol, and arrow markings (MUTCD Figure 9C-3). A 3' buffer and curb will separate the cycle tracks from on-street parking.

The remaining 10' will accommodate the pedestrian-only zone. Sidewalks will be constructed with enhanced finishes and materials consistent with the overall design of the corridor, although unique patterns and colors can be used to identify this segment. Continental crosswalk design will be used for all crosswalks (12" bars perpendicular to the path of travel) and may be further accented with colored paint.

Vegetation within this segment will consist of mature street trees planted no more than 40' apart to provide a consistent canopy. The trees can be planted in designated tree grates or within vegetated planters (located both at the edge of the sidewalk and in the median), which will use a combination of soils, mulch, and plants that help filter stormwater.

Furnishing within this segment will be consistent with the design of the corridor, although unique patterns and colors can be used to identify this segment. Furnishing elements may include seating, trash receptacles, bicycle parking, wayfinding, and lighting. Branding established by WA3 will be incorporated within wayfinding elements and permanent/seasonal banners.

RAPID TRANSIT
Dedicated bus rapid transit lanes will provide premium transit in this segment

CYCLE TRACKS
Two-way raised cycle tracks (NB + SB) adjacent to sidewalk with 3' buffer from on-street parking

PEDESTRIAN ZONE
Reconstructed sidewalks, enhanced pedestrian crossings with curb extensions, and pedestrian refuge islands

FURNISHING
Amenities consistent with Woodward corridor, including space for outdoor dining and bike share facilities

STREET TREES
Mature street trees in planters and/or grates spaced 40' apart

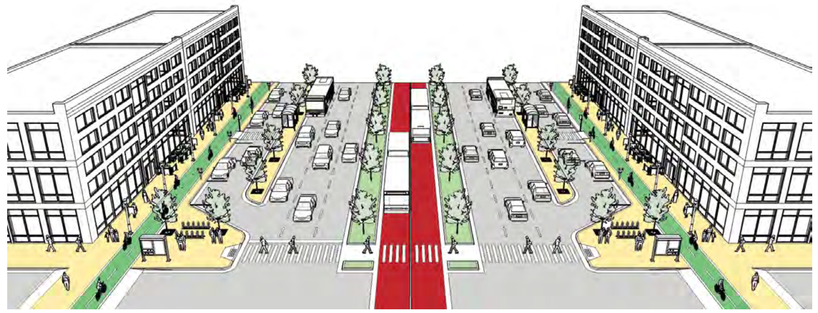
STORMWATER MANAGEMENT
Permeable paving materials for all sidewalks and filtration planters 40' apart

BRANDING
Signage, wayfinding, colors, and materials consistent with Woodward brand

ON-STREET PARKING
On-street, parallel parking accomodated within multiway boulevard

VISION
Woodward Avenue will be a complete street that provides safe and efficient means of travel for all users; creates excellent quality of place that benefits local residents; builds value for property; and inspires visitors to return.

MISSION
All stakeholders shall work together to create a cohesive corridor plan that balances the needs and benefits of all users, neighborhoods, and communities that is significantly completed by 2025.



TYPICAL CROSS SECTION: 14 MILE TO QUARTON
RIGHT-OF-WAY = 200'

Woodward Avenue

COMPLETE STREETS

QUARTON ROAD TO SOUTH BOULEVARD

EXISTING CONDITIONS

This segment, between Quarton Road and South Boulevard, extends through the City of Bloomfield Hills and Bloomfield Township. The right-of-way is 200', consisting of eight (8) vehicle travel lanes and a wide median. Sidewalks are only present in select locations within Bloomfield Township, north of Hickory Grove Road. Street trees and lighting are present within the sidewalk and median in select locations throughout this segment. The space between the edge of the right-of-way and vehicle travel lanes varies from block to block, including a variety of conditions e.g. grass lawns, driveways, and surface parking access. Transverse crosswalk design (12" parallel lines to delineate the edge of the crosswalk) is used within this segment at most intersections.

SEGMENT COMMUNITIES

Bloomfield Hills, Bloomfield Township, and Pontiac

RECOMMENDATIONS

Between Quarton Road and South Boulevard, the existing eight (8) vehicle travel lanes will be maintained, although one (1) lane in each direction will be converted to a shared transit-vehicle lane adjacent to the median.

Two-way raised cycle tracks will be 8' in total width and will be accommodated within space between the existing curb and newly constructed sidewalks. The cycle tracks will include two 4' bicycle only lanes, delineated from the sidewalk by unique paving colors or materials and bicycle lane word, symbol and arrow markings (MUTCD Figure 9C-3). A 1' buffer and curb will separate the cycle tracks from vehicular traffic.

The sidewalks will be constructed with enhanced finishes and materials consistent with the overall design of the corridor, although unique patterns and colors can be used to identify this segment. Continental crosswalk design will be used for all crosswalks (12" bars perpendicular to the path of travel) and may be further accented with colored paint.

Vegetation within this segment will consist of mature street trees planted no more than 40' apart to provide a consistent canopy. The trees can be planted in designated tree grates or within vegetated planters (located both at the edge of the sidewalk, in the landscaped buffer, and in the median), which will use a combination of soils, mulch, and plants that help to filter stormwater.

Furnishing within this segment will be consistent with the design of the corridor, although unique patterns and colors can be used to identify this segment. Furnishing elements may include seating, trash receptacles, bicycle parking, wayfinding, and lighting. Branding established by WA3 will be incorporated within wayfinding elements and permanent/seasonal banners.

RAPID TRANSIT
Mixed traffic bus rapid transit lanes will provide premium transit in this segment

CYCLE TRACK
Two-way raised cycle tracks (NB + SB) adjacent to sidewalk with 1' buffer and curb will separate the cycle tracks from vehicular traffic

PEDESTRIAN ZONE
Connect to shared-use path (6') on both sides of the street in Bloomfield Township. Addition of sidewalks in the remaining section with enhanced pedestrian crossings and curb extensions

STREET TREES
Mature street trees in planters and/or grates spaced 40' apart

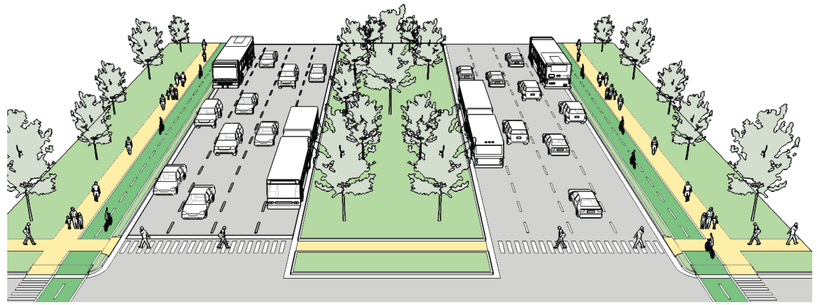
FURNISHING
Amenities consistent with Woodward corridor, including space for bike share facilities

STORMWATER MANAGEMENT
Permeable paving materials for all sidewalks and filtration planters 40' apart

BRANDING
Signage, wayfinding, colors, and materials consistent with Woodward brand

VISION
Woodward Avenue will be a complete street that provides safe and efficient means of travel for all users; creates excellent quality of place that benefits local residents; builds value for property; and inspires visitors to return.

MISSION
All stakeholders shall work together to create a cohesive corridor plan that balances the needs and benefits of all users, neighborhoods, and communities that is significantly completed by 2025.



TYPICAL CROSS SECTION: QUARTON TO SOUTH
RIGHT-OF-WAY = 200'

Woodward Avenue

COMPLETE STREETS

SOUTH BOULEVARD TO PONTIAC LOOP

EXISTING CONDITIONS

This segment, between South Boulevard and the Pontiac Loop, extends through the City of Pontiac from its southern border with Bloomfield Township to the southern edge of its downtown. The right-of-way is 120', consisting of six (6) vehicle travel lanes, a narrow median, and 6' sidewalks on both sides of the street. Street trees and lighting are present within the sidewalk and median in select locations throughout this segment. The space between the sidewalk primarily consists of grass lawns and driveways. Transverse crosswalk design (12" parallel lines to delineate the edge of the crosswalk) is used within this segment at most intersections and mid-block locations.

SEGMENT COMMUNITY

Pontiac

RECOMMENDATIONS

Between South Boulevard to the Pontiac Loop, the existing six (6) vehicle travel lanes will be reduced to four (4). This reduction allows for dedicated transit lanes and two-way raised cycle tracks on each side of the street.

The two-way raised cycle tracks will be 8' in total width and will be accommodated within space from the existing sidewalk. The cycle tracks will include two 4' bicycle only lanes, delineated from the sidewalk by unique paving colors or materials and bicycle lane word, symbol, and arrow markings (MUTCD Figure 9C-3). A 1' buffer and curb will separate the cycle tracks from vehicular traffic.

The remaining space will accommodate the pedestrian-only zone. Sidewalks will be constructed with enhanced finishes and materials consistent with the overall design of the corridor, although unique patterns and colors can be used to identify this segment. Continental crosswalk design will be used for all crosswalks (12" bars perpendicular to the path of travel) and may be further accented with colored paint.

Furnishing within this segment will be consistent with the design of the corridor, although unique patterns and colors can be used to identify this segment. Furnishing elements may include seating, trash receptacles, bicycle parking, wayfinding, and lighting. Branding established by WA3 will be incorporated within wayfinding elements and permanent/seasonal banners.

RAPID TRANSIT
Dedicated bus rapid transit lanes will provide premium transit in this segment

CYCLE TRACK
Two-way raised cycle tracks (NB + SB) adjacent to sidewalk with 1' buffer and curb will separate the cycle tracks from vehicular traffic

PEDESTRIAN ZONE
Reconstructed sidewalks, enhanced pedestrian crossings with curb extensions, and pedestrian refuge islands

FURNISHING
Amenities consistent with Woodward corridor, including space for outdoor dining and bike share facilities

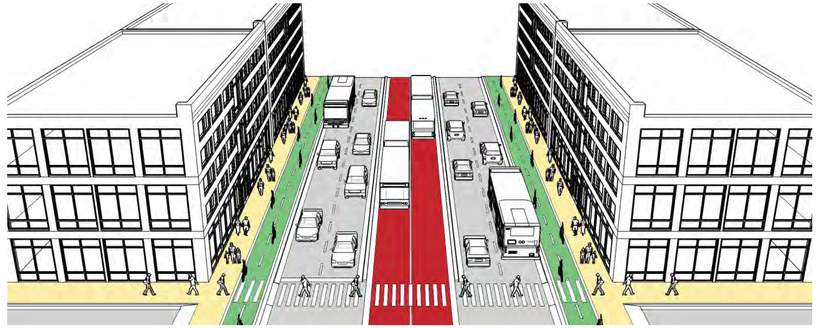
STREET TREES
Mature street trees in planters and/or grates spaced 40' apart

STORMWATER MANAGEMENT
Permeable paving materials for all sidewalks and filtration planters 40' apart

BRANDING
Signage, wayfinding, colors, and materials consistent with Woodward brand

VISION
Woodward Avenue will be a complete street that provides safe and efficient means of travel for all users; creates excellent quality of place that benefits local residents; builds value for property; and inspires visitors to return.

MISSION
All stakeholders shall work together to create a cohesive corridor plan that balances the needs and benefits of all users, neighborhoods, and communities that is significantly completed by 2025.



TYPICAL CROSS SECTION: SOUTH TO PONTIAC LOOP
RIGHT-OF-WAY = 120'

Woodward Avenue

COMPLETE STREETS

PONTIAC LOOP

EXISTING CONDITIONS

This segment includes the entire Pontiac Loop that encompasses Downtown Pontiac. The right-of-way is 90', consisting of four (4) to five (5) northbound travel lanes and 5' to 10' sidewalks that are set 5' to 10' back from the roadway.

The "loop" segregates Downtown Pontiac from surrounding communities, hindering economic growth, cutting off businesses from surrounding neighborhoods, and leaving small residential pockets isolated from community context and amenities.

The right-of-way is a physical barrier to pedestrian access and activity in Downtown Pontiac, while the one-way direction of traffic promotes high speeds and in several areas makes it difficult and confusing for people to access the downtown.

SEGMENT COMMUNITY

Pontiac

RECOMMENDATIONS

The Recommended Alternative of the Downtown Pontiac Transportation Assessment is a balanced improvement that consists of:

1. Two-way conversion of the entire Woodward Loop
- Four (4) to five (5) lane cross section on the west side serving as a through route,
- Two (2) to three (3) lane cross section on the east side serving as a local street

The local street fits both the downtown and neighborhood context and functions as a local street with an on-road cycle track and some on-street parking.

2. Enhanced bicycle and pedestrian amenities
- Completion of the sidewalk network
- Two-way on-road cycle track on the east side
- Two-way shared use path on the west side
- Addition of a narrow landscaped median
- Rerouting the Clinton River Trail through downtown Pontiac using Pike Street

3. Connection of Wesson Street across Woodward Avenue

4. Creation of a "Gateway" at the southern end of the Woodward Loop

RAPID TRANSIT
Dedicated bus rapid transit lanes will provide premium transit in this segment

CYCLE TRACK
Two-way cycle tracks (east) and a two-way shared use path (west)

PEDESTRIAN ZONE
Reconstructed sidewalks, enhanced pedestrian crossings with curb extensions, and pedestrian refuge islands

FURNISHING
Amenities consistent with Woodward corridor, including space for outdoor dining and bike share facilities

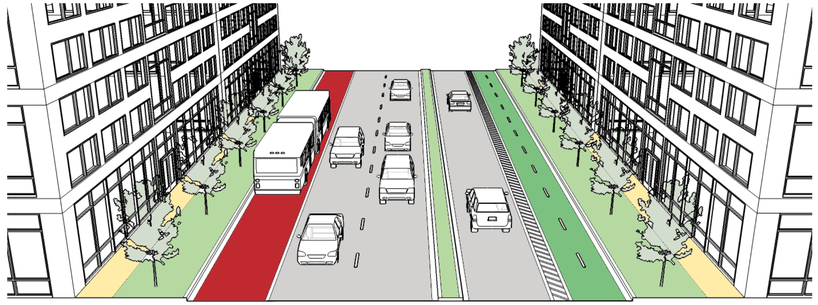
STREET TREES
Mature street trees in planters and/or grates spaced 40' apart

STORMWATER MANAGEMENT
Permeable paving materials for all sidewalks and filtration planters 40' apart

BRANDING
Signage, wayfinding, colors, and materials consistent with Woodward brand

VISION
Woodward Avenue will be a complete street that provides safe and efficient means of travel for all users; creates excellent quality of place that benefits local residents; builds value for property; and inspires visitors to return.

MISSION
All stakeholders shall work together to create a cohesive corridor plan that balances the needs and benefits of all users, neighborhoods, and communities that is significantly completed by 2025.



TYPICAL CROSS SECTION: PONTIAC LOOP
RIGHT-OF-WAY = 90'

City of Birmingham
A Walkable Community

MEMORANDUM

Planning Division

DATE: December 23, 2015

TO: Joseph A. Valentine, City Manager

FROM: Jana L. Ecker, Planning Director

SUBJECT: Status of Bistro Program

The intent of the bistro program is to encourage smaller, eclectic restaurants to open in Downtown Birmingham, and to activate the street with the addition of outdoor dining and activity in the storefront windows.

Article 9, section 9.02 of the Zoning Ordinance defines a bistro as a "restaurant with a full service kitchen with interior seating for no more than 65 people and additional seating for outdoor dining." With the requirement for mandatory outdoor dining, much more life has been infused into the streets during the warmer months. Bistros are permitted with a Special Land Use Permit (SLUP) with the following conditions:

a. No direct connect additional bar permit is allowed and the maximum seating at a bar cannot exceed 10 seats;
b. Alcohol is served only to seated patrons, except those standing in a defined bar area;
c. No dance area is provided;
d. Only low key entertainment is permitted;
e. Bistros must have tables located in the storefront space lining any street, or pedestrian passage;
f. A minimum of 70% glazing must be provided along building facades facing a street or pedestrian passage between 1 foot and 8 feet in height;
g. All bistro owners must execute a contract with the City outlining the details of the operation of the bistro; and
h. Outdoor dining must be provided, weather permitting, along an adjacent street or passage during the months of May through October each year. Outdoor dining is not permitted past 12:00 a.m. If there is not sufficient space to permit such dining on the sidewalk adjacent to the bistro, an elevated, ADA compliant, enclosed platform must be erected on the street adjacent to the bistro to create an outdoor dining area if the Engineering Department determines there is sufficient space available for this purpose given parking and traffic conditions.

Timeline

In spring of 2007, the City Commission approved amendments to the City Code to allow for the creation of bistros in downtown Birmingham and the Triangle District. The table below provides a summary of all bistros approved by the City Commission since 2007.

Year	# Of Licenses Granted	Name of Bistro	District	Type of Food	Status
2007	6	Bistro Joe's	Triangle	American Cuisine	Open
		Café Via	Downtown	New American Cuisine	Open
		Cosi	Downtown	Eclectic	Open
		Elie's Mediterranean Grill	Downtown	Mediterranean	Open
		Forest Grill	Downtown	New American	Open
		Salvatore Scallopini	Downtown	Italian	Open
2008	1	Toast	Downtown	Eclectic	Open
2009	2	Luxe Bar & Grill	Downtown	New American	Open
		Tallulah Wine Bar & Bistro	Downtown	Seasonal American	Open
2010	1	Bella Piatti	Downtown	Italian	Open
2011	2	Churchill's	Downtown	Eclectic	Open
		Townhouse	Downtown	New American	Open
2012	2	Market North End	Downtown	New American	Open
		Social Kitchen	Downtown	New American	Open
2013	2	Birmingham Sushi	Downtown	Sushi Bar/Japanese	Open
		What Crêpe?	Downtown	French Crêperie	Closed
2014	1	Mad Hatter	Downtown	New American	Open
2015	1	La Strada	Downtown	European Style Coffee Shop	Open
Total	**18**				

Please see attached spreadsheet for more details on approved bistros and other restaurants in the City, and see attached map of bistro locations.

In accordance with the bistro ordinance amendments adopted in 2007, the City Commission established a requirement for an annual review of the previously approved bistro licenses and

their impact on the City. Chapter 10, Alcoholic Liquors, of the City Code, Division 4 – Bistro Licenses, Section 10-82, states:

> (a) Annual review of need. **Every year for the first three years after the passage of this amendment, and every three calendar years thereafter**, the city commission shall perform a review of the previously approved Bistro license(s), if any, and the impact of those decisions on the city. A time for public comment shall be provided. Based on the city commission review and comment by the public, the city commission shall determine whether they will consider applications for license transfers for existing establishments and/or new establishments, up to the maximum in each category.

Accordingly, the City Commission was required to conduct an annual review of the seven bistros approved over the first three years of the bistro program (2007 – 2010), and the impact, if any, of these on the City. A time for public comment was also required pursuant to chapter 10-82, Division 4 – Bistros, of the City Code. This annual review was conducted by the City Commission in 2008, 2009, 2010 as required by the City Code, and was conducted each year since as a part of the annual liquor license review. On October 13, 2014, a comprehensive review of the bistro program was conducted, which included a review of the bistro selection process, a map of existing bistros, previous tenant information for bistro locations, a spreadsheet with details of all restaurants in Birmingham, and a detailed market analysis on the downtown tenant mix. A copy of the City Commission report and all attachments is included for your review, along with an updated spreadsheet and bistro map for 2015.

Since the last review conducted in early 2015, the City Commission approved La Strada's SLUP to permit a bistro on September 21, 2015. While inspections for 2015 have been conducted for all other bistros, La Strada will have to undergo one by the Planning Division and Police Department in 2016.

Market North End was found in violation of the SLUP on December 12, 2015 after the Police Department found more than 10 stools at the bar. At this time, there were 12 stools. The owner has since removed them. All other establishments have been found to be in conformance to their respective SLUPs.

Program Summary

In summary, the bistro program has yielded a total of 17 bistros; ten of which were new establishments at the time of bistro license approval and seven of which were established prior bistro license approval. In 2014, What Crêpe? closed its operation after one year as a bistro. An overwhelming majority of the bistros are located downtown, as opposed to the Triangle and Rail Districts. Similarly, a majority of the establishments serve American/New American cuisine.

Moving forward, the City may wish to encourage a more diverse selection of food establishments, and encourage any new bistros to locate in the Triangle and Rail Districts.

City of Birmingham
A Walkable Community

MEMORANDUM

Community Development Department

DATE: October 8, 2014

TO: Joseph A. Valentine, City Manager

FROM: Jana L. Ecker, Planning Director

SUBJECT: Bistro Program

As requested by the City Manager, please find attached the following documents that provide detailed information on the bistro program, licensed established in the City and the mix of uses in Downtown Birmingham for comparison purposes:

- Resolution Outlining Procedure for Bistro Selection;
- Map of Existing Bistro Locations;
- Previous Tenant Information on Existing Bistro Locations;
- 2014 List of all Birmingham Restaurants; and
- Market Analysis on Downtown Tenant Mix (2006 and 2012).

RESOLUTION TO ESTABLISH BISTRO APPLICATION DEADLINES AND REVIEW PROCEDURES SEPTEMBER 26, 2011

WHEREAS, the City Commission established a definition for bistros in Chapter 126, Zoning, of the City Code;

WHEREAS, the operation of bistros is permitted with a valid Special Land Use Permit within defined areas of the City in accordance with Chapter 126, Zoning, of the City Code,

WHEREAS, the Birmingham City Commission further approved amendments to Chapter 10, Alcoholic Liquors, to establish a policy and conditions to allow the City Commission the ability to approve a request to transfer a liquor license into the City in excess of the city's quota licenses if an applicant is establishing a bistro,

WHEREAS, the amendments to Chapter 10, Alcoholic Liquors, established criteria for selecting qualified bistro applicants, and provided limitations on the influx of new bistro liquor licenses,

NOW, THEREFORE, BE IT RESOLVED, The Birmingham City Commission adopts the following review process and schedule for future bistro applications:

1. All bistro applications for the upcoming calendar year must be submitted for initial review on or before October 1st of the preceding year.
2. Beginning January 1, 2012, all bistro applications submitted for initial review must contain only the following information in 5 pages or less:
    - A brief description of the bistro concept proposed, including type of food to be served, price point, ambience of bistro, unique characteristics of the operation, if any, and an explanation of how this concept will enhance the current mix of commercial uses in Birmingham;
    - Proposed location, hours of operation and date of opening;
    - Name of owner/operator and outline of previous restaurant experience; and
    - Evidence of financial ability to construct and operate the proposed bistro.
3. All bistro applications received by the deadline will be reviewed by the City Commission within 30 days of the deadline for prioritization based on the proposed bistro concept, proposed location within the City, potential impact on the City, and the capability of the proposed owner/operator. Each applicant will be given a time limit to present their concepts to the City Commission.

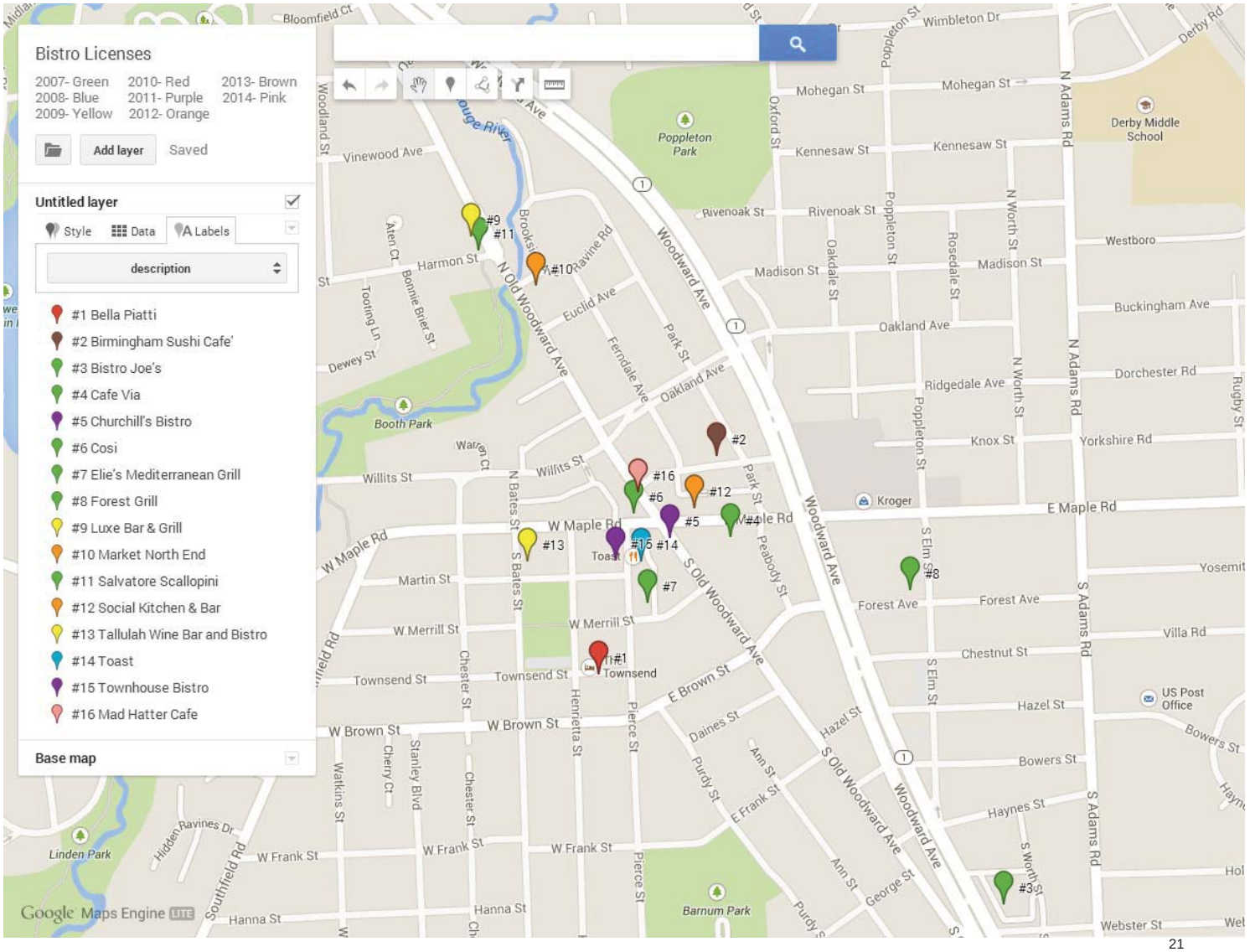
4. The City Commission will prioritize all initial applications received, and will direct the top applications to the Planning Board for a detailed site plan and design review and Special Land Use Permit review.
5. All bistro applications forwarded to the Planning Board for detailed review must be supplemented with additional information as required for site plan and design review, including a site plan, elevation drawings, floor plan, landscaping plan, photometric plan and material samples. Additional information as required for review of the bistro as a SLUP includes sample menus, interior design details, evidence of financial capability, as well as any other information requested by the Planning Board.
6. All detailed applications directed to the Planning Board from the City Commission must be received within 90 days of the City Commission's initial review. All detailed applications will then be reviewed during public hearings conducted during a single Planning Board meeting.
7. All bistro applications will be evaluated by the Planning Board based on the criteria set forth in Chapter 10, Alcoholic Liquors, Division 4, Selection Criteria, and up to two applications will be recommended for approval to the City Commission. All applications will be assigned a priority ranking by the Planning Board.
8. All bistro applications reviewed by the Planning Board will be forwarded to the City Commission for a detailed review and approval/denial in the order of the ranking assigned by the Planning Board.
9. The City Commission will conduct public hearings to review the selected bistro applications and determine which, if any, bistros to approve for the calendar year, up to a maximum of two approvals.
10. In the event that two bistro approvals are not granted as a result of the fall review period, the City will accept additional bistro applications for the current calendar year on or before **April 1st**.
11. All bistro applications received in this second round will be reviewed and ranked by the Planning Board using the same review process noted in steps 2 through 9 above.

BE IT FURTHER RESOLVED, Except as herein specifically provided, all bistro applicants and their heirs, successors and assigns shall be bound by all ordinances of the City of Birmingham in effect at the time of the issuance of this resolution, and as they may be subsequently amended.

I, Laura Broski, City Clerk of the City of Birmingham, Michigan, do hereby certify that the foregoing is a true and, correct copy of the resolution adopted by the Birmingham City Commission at its regular meeting held on September 26, 2011.

_____

Laura Broski, City Clerk


Bistro Licenses
2007- Green
2008- Blue
2009- Yellow
2010- Red
2011- Purple
2012- Orange
2013- Brown
2014- Pink
Add layer
Saved
Untitled layer
Style
Data
A Labels
description
#1 Bella Piatti
#2 Birmingham Sushi Cafe'
#3 Bistro Joe's
#4 Cafe Via
#5 Churchill's Bistro
#6 Cosi
#7 Elie's Mediterranean Grill
#8 Forest Grill
#9 Luxe Bar & Grill
#10 Market North End
#11 Salvatore Scallopini
#12 Social Kitchen & Bar
#13 Tallulah Wine Bar and Bistro
#14 Toast
#15 Townhouse Bistro
#16 Mad Hatter Cafe
Base map
Google Maps Engine LITE
Bloomfield Ct
Wimbleton Dr
Derby Rd
Mohegan St
Derby Middle School
Poppleton Park
Kennesaw St
Vinewood Ave
Rivenoak St
Westboro
Madison St
Buckingham Ave
Oakland Ave
Dorchester Rd
Ridgedale Ave
Knox St
Yorkshire Rd
Rugby St
Kroger
E Maple Rd
W Maple Rd
Willits St
Martin St
W Merrill St
Townsend St
Forest Ave
Chestnut St
Villa Rd
Hazel St
US Post Office
Bowers St
Haynes St
W Brown St
E Brown St
Daines St
W Frank St
Hanna St
Webster St
Linden Park
Booth Park
Barnum Park
Hidden Ravines Dr
Southfield Rd
Woodland St
Aten Ct
Tooting Ln
Bonnie Brier St
Dewey St
Harmon St
Euclid Ave
Ferndale Ave
Park St
Oxford St
Oakdale St
Rosedale St
N Worth St
N Adams Rd
S Adams Rd
N Old Woodward Ave
Woodward Ave
S Old Woodward Ave
Peabody St
N Bates St
S Bates St
Chester St
Henrietta St
Pierce St
Purdy St
Ann St
E Frank St
George St
S Elm St
S Worth St
Warren Ct
Stanley Blvd
Cherry Ct
Watkins St
Rouge River
#1 Townsend
#2
#3
#4
#5
#6
#7
#8
#9
#10
#11
#12
#13
#14
#15
#16
Toast

Birmingham Bistros

City SLUP Year	MLCC Issue Date	DBA Name	Address	Neighborhood	Previous Occupant	Previous Use	Current Status
2007	03/21/08	Townhouse	180 Pierce St	Downtown Birmingham	Simply Wine (closed 2011)	Retail/Packaged Wine	Open
2007		Luxe Bar and Grill	525 N Old Woodward Ave	Downtown Birmingham	Aunt Olive's Good Food 2 Go (retail/food closed 2008)	Retail/Packaged foods	Open
2007		Bella Piatti	167 Townsend St	Downtown Birmingham	Cameron Scott Gallery (closed 2010)	Retail/Gallery	Open- New Owner
2007		Churchill's Bistro/Cigar Bar	116 S Old Woodward Ave	Downtown Birmingham	Jennifer Convertibles (closed 2010)	Retail/Furniture	Open
2007	08/04/08	Cosi	101 N Old Woodward Ave	Downtown Birmingham	Gap (closed in 2003)	Retail	Open
2007	02/05/09	Toast	203 Pierce St	Downtown Birmingham	Gerich's Grazziella Ltd. (retail closed 2008)	Retail	Open
2008	10/17/08	Tallulah Wine Bar & Bistro	155 S Bates St	Downtown Birmingham	Kaput Kapot (retail closed 2004)	Retail	Open
2009	02/19/10	Market	474 N Old Woodward Ave	Downtown Birmingham	Root and Sprout (retail closed 2011)	Retail	Open
2009	08/09/10	Birmingham Sushi Café	377 Hamilton Row	Downtown Birmingham	Festivities (closed 2010)	Retail	Incomplete
2010	09/26/11	Debonair	825 Bowers St.	Triangle District	Shore Mortgage, prior to this Bakers Square	office	Incomplete
2010	N/A	Bistro Joe's	34244 Woodward Ave	Triangle District	New Construction	N/A	Open
2011	08/05/11	Forest Avenue Bistro	735 Forest Ave	Triangle District	New Construction	N/A	Open
2011	06/21/12	Café Via	310 E Maple Rd	Downtown Birmingham	New Construction	N/A	Open
2012	06/13/12	Cole Street Kitchen	2010 Cole St	Rail District	N/A	N/A	Open
2012		Elie's	263 Pierce St	Downtown Birmingham	Elie's	food or drink establishment	Incomplete
2013		Salvatore Scallopini	505 N Old Woodward Ave	Downtown Birmingham	Previously non-liquor license establishment	food or drink establishment	Closed 2/14
2013		Social Kitchen and Bar	225 E Maple Rd	Downtown Birmingham	Tokyo Sushi (closed 2012)	food or drink establishment	Incomplete
2014		What Crepe?	172 N Old Woodward Ave	Downtown Birmingham	Sandella's Flatbread Café (closed 2011)	food or drink establishment	Incomplete-Closed
		Mad Hatter	185 N Old Woodward	Downtown Birmingham	Quizno's (closed 2013)	food or drink establishment	Open

3 Properties were new construction
5 properties were previously food or drink establishments
9 Properties have converted from Retail to Bistro

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Restaurant Name**	**Address**	**Liquor License**	**Size Sq Ft.**	**Seats for dining**	**Total Occupancy**	**Seats for Outdoor Dining on Public Sidewalk**	**Seats for Outdoor Dining on Platform**	**Outdoor Dining Seats on Private Property**	**Total Outdoor Dining Seats for Establishment**	**Eisenglass**	**Rooftop Seating / Dining**
2	Bella Piatti	167 Townsend Street	Bistro LL	1,598	55	70	8	20		28	N	N
3	Birmingham Sushi Cafe'	377 Hamilton Row	Bistro LL			65		24		24	N	N
4	Bistro Joe's	34244 Woodward Avenue	Bistro LL	1,798	55	65			60	60	Y	N
5	Cafe` Via	310 East Maple Road	Bistro LL	1,700	56	65			55	55	Y	N
6	Churchill's Bistro & Cigar Bar	116 South Old Woodward Avenue	Bistro LL	2466	55	65	12			12	N	N
7	Cosi	101 North Old Woodward Avenue	Bistro LL	2,336	61	65	12			**	N	N
8	Elie's Mediterranean Grill/Bar	263 Pierce Street	Bistro LL	1,724	56	65		26		26	N	N
9	Forest Grill	735 Forest Avenue	Bistro LL	3,038	55	80	42			42	N	N
10	Luxe Bar & Grill	525 North Old Woodward Avenue	Bistro LL	1,590	40	50	12			12	N	N
11	Market North End	474 North Old Woodward Avenue	Bistro LL		55	65			44	44	Y	N
12	Salvatore Scallopini	505 North Old Woodward Avenue	Bistro LL	2,880	58	75		38		38	N	N
13	Social Kitchen & Bar	225 East Maple Road	Bistro LL		54	64	56			Alleyway 56	Y	29
14	Tallulah Wine Bar and Bistro	155 South Bates Street	Bistro LL	2,600	65	75		40		40	N	N
15	Toast	203 Pierce Street	Bistro LL	3,300	55	65	24			24	N	N
16	Townhouse Bistro	180 Pierce Street	Bistro LL	1,166	44	65		70		70	N	N
17	**Closed before Bistro License was used**											
18	What Crepe	172 North Old Woodward	Bistro LL		42	65	8	8		16	N	N
19	**Licenses Approved but not yet in use**											
20	Mad Hatter Café	185 North Old Woodward	Bistro LL		60	65		22		22	N	N
21	220 Restaurant	220 East Merrill Street	Quota LL	6,107	170	170			68	68	N	N
22	Cameron's Steakhouse	115 Willits Street	Quota LL*	6,692	214	230				None		N
23	Corner Bar	100 Townsend Street	Quota LL				18			18	N	N
24	Dick O' Dow's	160 West Maple Road	Quota LL	5,575	180	170		22		22	N	N
25	Fleming's Prime Steakhouse & Wine Bar	323 North Old Woodward Avenue	Quota LL	8,399	222	332				None	N	N
26	Hyde Park Prime Steakhouse	201 South Old Woodward Avenue	Quota LL				12			12, 2 Sofas	N	
27	Mitchell's Fish Market	117 Willits Street	Quota LL*	7,832	250	300				None	N	N
28	Peabody's Dining & Spirits	34965 Woodward Avenue	Quota LL	5,560	275	331				None	N	N
29	Phoenicia	588 South Old Woodward Avenue	Quota LL	3,153	90	96	10			10	N	N
30	Rojo Mexican Bistro	250 East Merrill Street	Quota LL		156	166			24	24	N	N
31	Streetside Seafood	273 Pierce Street	Quota LL	1,350	50	70		18		18	N	N
32	The Bird and the Bread	210 South Old Woodward	Quota LL		155	175			42	42	Y	N
33	The Community House Cafe`	380 South Bates Street	Quota LL								Y	N
34	The Rugby Grille	100 Townsend Street	Quota LL		137	138	22			22	N	N
35	**Outside PSD**											
36	Big Rock (outside PSD)	245 S Eton	Quota LL	6,000	340	397			97	97	N	N
37												
38	Griffin Claw	575 S. Eton	Brewer						104	104	N	N
39	**Licenses Not In Use**											
40	Buca Di Beppo	270 North Old Woodward	Quota LL									
41	Chen Chow	260 North Old Woodward	Quota LL									
42	Barrio	203 Hamilton Row	Quota LL									
43	* = Mitchell's and Camerons are sharing one license. The other license is being held by the company.											
44												

	A	B	C	D	E	F	G	H	I	J	K	L
45	Economic Development Licenses											
46	The Stand Gastro Bistro	34977 Woodward Avenue	Development LL		207	218				None	N	N
47	Triple Nickel/555	555 South Old Woodward	Development LL		125	142	28		80	108	Y	N
48												
49	**Non-Liquor Establishment**											
50	Beyond Juice	270 West Maple Road	n				4			4	N	N
51	Brooklyn Pizza	111 Henrietta Street	n				39			39	N	N
52	Commonwealth Cafe	300 Hamilton Row	n					20		20	N	N
53	Cucina Medoro	768 North Old Woodward Avenue	n							None	N	N
54	Cupcake Station	136 North Old Woodward	n				18			18	N	N
55	Einstein Bros. Bagels	176 South Old Woodward Avenue	n							None	N	N
56	Greek Islands Coney Restaurant	221 Hamilton Row	n							None	N	N
57	Hunter House Hamburgers	35075 Woodward Avenue	n							None	N	N
58	Leo's Coney Island	154 South Old Woodward Avenue	n							None	N	N
59	Liquid Lunch Cafe` (Inside Be Well)	750 South Old Woodward Avenue	n							None	N	N
60	Mountain King Chinese Restaurant	469 South Old Woodward Avenue	n							None	N	N
61	New Bangkok Thai Bistro	183 North Old Woodward Avenue	n							None	N	N
62	Panera Bread	100 North Old Woodward Avenue	n				17			17	N	N
63	Pita Cafe	239 North Old Woodward Avenue	n							None	N	N
64	Primo's Pizza	996 South Adams Road	n							None	N	N
65	Qdoba	795 East Maple Road	n						60	60	N	N
66	Sanders	167 North Old Woodward	n				6			6	N	N
67	Shish Kabob Express	34186 Woodward Avenue	n							None	N	N
68	Stacked Deli	233 North Old Woodward Avenue	n							None	N	N
69	Starbucks	135 South Old Woodward	n				8			8	N	N
70	Subway	126 South Old Woodward Avenue	n							None	N	N
71	Succo Fresco Café	600 North Old Woodward	n							None	N	N
72	Sweet Earth	141 W. Maple	n				4			4	N	N
73	Sy Thai Cafe'	315 Hamilton Row	n							None	N	N
74	Toss-Ups	34623 Woodward Avenue	n							None	N	N
75	Touch of India Cuisine	297 East Maple Road	n							None	N	N
76	Try it Raw	213 East Maple Road	n							None	N	N
77												
78	** Did not renew Outdoor Dining License in 2014											

most prevalent are Food Services and Drinking Places at 13.5% and Miscellaneous Store Retailers at 11.9% of the total establishments.

RETAIL BUSINESS MIX

We have classified Downtown Birmingham retail establishments within the following broad categories:

- Shopping Goods
- Food/Liquor/Services/Restaurants
- Food/Grocery/Convenience
- Drug & HBA (Health and Beauty Aids)
- Personal Services
- Entertainment
- Other (Motor Vehicle Parts, Gasoline Stations, Building Materials & Supplies Dealers, Rental and Repair, etc.).

The most frequently found retail categories in the Birmingham Downtown District are Shopping Goods at 37.4%, Personal Services at 22.9%, Other Retail at 17.2%, and Food/Liquor Services/Restaurants at 16.8%.

RETAIL BUSINESS MIX
NUMBER OF ESTABLISHMENTS

Retail Category	Downtown Birmingham
Shopping Goods	37.4%
Food/Liquor/Services/Restaurants	16.8%
Food/Grocery/Convenience	3.7%
Drug & HBA	0.7%
Personal Services	22.9%
Entertainment	1.3%
Other Retail	17.2%
Total	**100.0%**
Number of Retail Establishments	**297**

Source: The Strategic Edge, Inc., Birmingham PSD.

		Retail, Food Services, & Personal Services		
	% Retail, Food Services, & Personal Services	% Retail Trade	% Food Services & Drinking Places	% Personal & Laundry Services
Birmingham MI - Directory	**76%**	**51%**	**20%**	**5%**
Birmingham MI – Directory - 2012	***76%***	***49%***	***23%***	***3%***
Birmingham MI – PSD/The Strategic Edge	**67%**	**37%**	**14%**	**17%**
Birmingham MI – PSD/The Strategic Edge -2012	***69%***	***38%***	***16%***	***15%***
Greenwich CT	86%	67%	14%	6%
Hinsdale IL	80%	50%	18%	12%
Minneapolis France Ave.	84%	54%	19%	11%
Naperville IL	90%	47%	36%	7%
Royal Oak MI	85%	39%	37%	8%
Winnetka Hubbard Woods	77%	56%	14%	8%
Average – Directory Numbers Only	83%	52%	23%	8%

Sources: Directory of Retail Shopping Districts, Birmingham PSD, The Strategic Edge

In order to focus on the retail tenant mix exclusive of the non-retail establishments, The Strategic Edge recalibrated the above table to include only retail, food services, and personal services. So, the mix below considers those tenants to be 100%.

		Retail, Food Services, & Personal Services		
	% Retail, Food Services, & Personal Services	% Retail Trade	% Food Services & Drinking Places	% Personal & Laundry Services
Birmingham MI - Directory	**100%**	**68%**	**26%**	**6%**
Birmingham MI – Directory - 2012	***100%***	***65%***	***31%***	***4%***
Birmingham MI – PSD/The Strategic Edge	**100%**	**55%**	**20%**	**25%**
Birmingham MI – PSD/The Strategic Edge -2012	***100%***	***55%***	***23%***	***22%***
Greenwich CT	100%	77%	16%	7%
Hinsdale IL	100%	63%	22%	15%
Minneapolis France Ave.	100%	64%	23%	14%
Naperville IL	100%	53%	40%	8%
Royal Oak MI	100%	46%	44%	10%
Winnetka Hubbard Woods	100%	72%	18%	10%
Average – Directory Numbers Only	100%	63%	27%	10%

Sources: Directory of Retail Shopping Districts, Birmingham PSD, The Strategic Edge

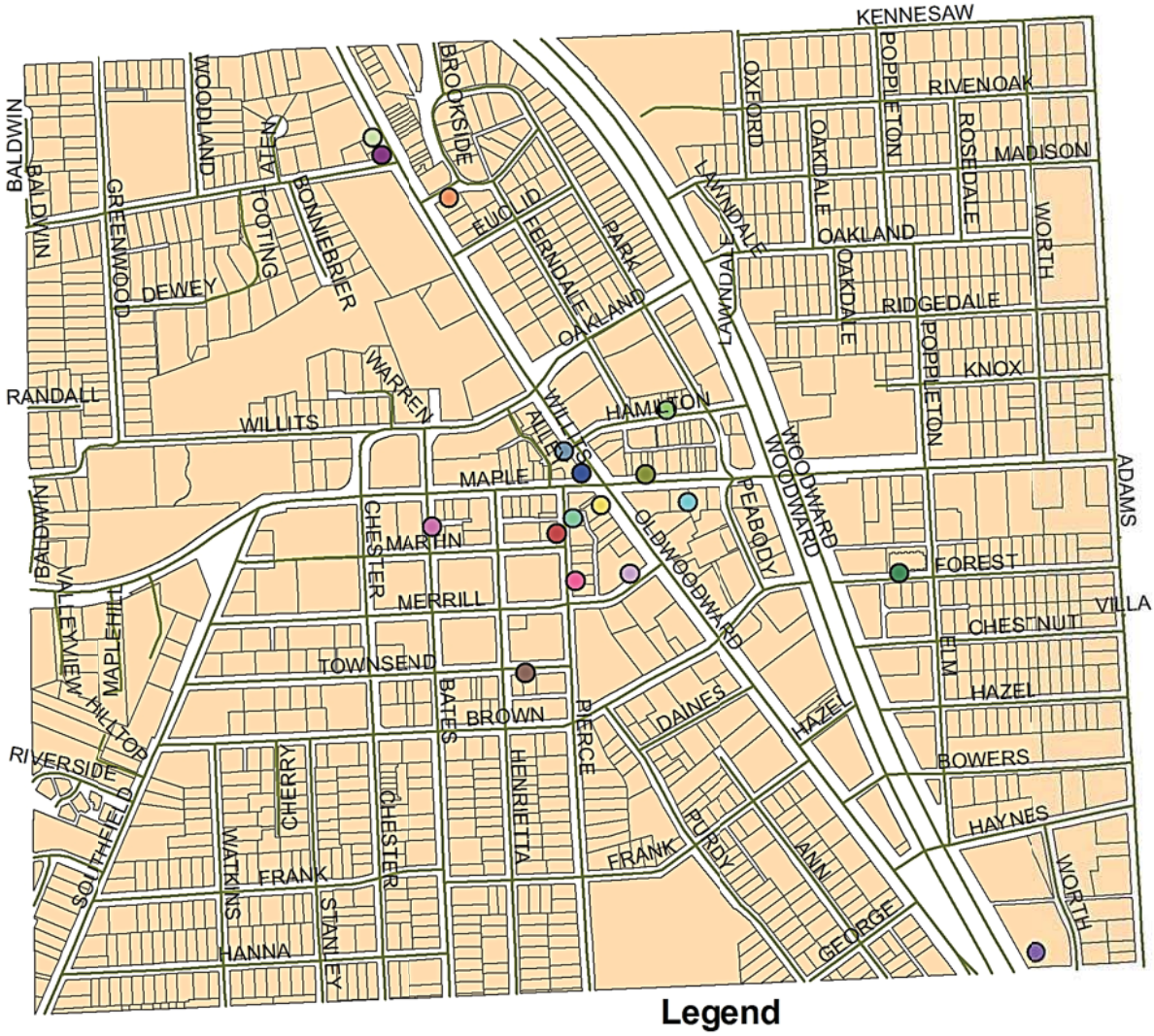
	A	B	C	D	E	F	G	H	I	J	K	L
1	**Restaurant Name**	**Address**	**Liquor License**	**Size Sq Ft.**	**Seats for dining**	**Total Occupancy**	**Seats for Outdoor Dining on Public Sidewalk**	**Seats for Outdoor Dining on Platform**	**Outdoor Dining Seats on Private Property**	**Total Outdoor Dining Seats for Establishment**	**Total Seating for Establishment**	**Eisenglass**
2	Bella Piatti	167 Townsend Street	Bistro LL	1,598	55	70	8	20		28	83	N
3	Birmingham Sushi Café	377 Hamilton Row	Bistro LL		65	95		24		24	89	N
4	Bistro Joe's	34244 Woodward Avenue	Bistro LL	1,798	55	65			60	60	115	Y
5	Cafe` Via	310 East Maple Road	Bistro LL	1,700	56	65			55	55	111	Y
6	Churchill's Bistro & Cigar Bar	116 South Old Woodward Avenue	Bistro LL	2466	55	65	12			12	67	N
7	Cosi	101 North Old Woodward Avenue	Bistro LL	2,336	61	65	12		**	12	61	N
8	Elie's Mediterranean Grill/Bar	263 Pierce Street	Bistro LL	1,724	56	65		26		26	82	N
9	Forest Grill	735 Forest Avenue	Bistro LL	3,038	55	80	42			42	97	N
10	La Strada Caffe	243 E. Merrill Street	Bistro LL		52	70	10	0		10	62	N
11	Luxe Bar & Grill	525 North Old Woodward Avenue	Bistro LL	1,590	40	50	12			12	52	N
12	Mad Hatter Café	185 North Old Woodward	Bistro LL		60	65		22		22	82	N
13	Market North End	474 North Old Woodward Avenue	Bistro LL		55	65			44	44	99	Y
14	Salvatore Scallopini	505 North Old Woodward Avenue	Bistro LL	2,880	58	75		38		38	96	N
15	Social Kitchen & Bar	225 East Maple Road	Bistro LL		54	64	24		30	54	108	Y
16	Tallulah Wine Bar and Bistro	155 South Bates Street	Bistro LL	2,600	65	75		40		40	105	N
17	Toast	203 Pierce Street	Bistro LL	3,300	55	65	28			28	83	N
18	Townhouse	180 Pierce Street	Bistro LL		54	60		76		76	130	N
19	**Closed before Bistro License was used**											
20	What Crepe?	172 North Old Woodward	Bistro LL		42	65	8	8		16	58	N
21	**Quota licenses**											
22	220 Restaurant	220 East Merrill Street	Quota LL	6,107	170	170			68	68	238	N
23	Au Cochon	260 N. Old Woodward	Quota LL		90	101	6	0	0	33	123	N
24	Arthur Avenue	270 N. Old Woodward	Quota LL		172	190	6	0	0	33	205	N
25	The Bird and the Bread	210 South Old Woodward	Bistro LL		175	325			36	36	211	Y
26	Cameron's Steakhouse	115 Willits Street	Quota LL*	6,692	214	230			None		214	
27	Corner Bar	100 Townsend Street	Quota LL				18			18	18	N
28	Community House	380 S. Bates									0	
29	Dick O' Dow's	160 West Maple Road	Quota LL	5,575	180	170		22		22	202	N
30	Emagine Theatre & Ironwood Grill	250 N. Old Woodward	Quota LL	31,000	198	788	0	0	0	0	198	N
31	Fleming's Prime Steakhouse & Wine Bar	323 North Old Woodward Avenue	Quota LL	8,399	222	332			None		222	
32	Hyde Park Prime Steakhouse	201 South Old Woodward Avenue	Quota LL				12		12, 2 Sofas		0	N
33	Mitchell's Fish Market	117 Willits Street	Quota LL*	7,832	250	300			None		250	
34	Peabody's Dining & Spirits	34965 Woodward Avenue	Quota LL	5,560	275	331			None		275	
35	Phoenicia	588 South Old Woodward Avenue	Quota LL	3,153	90	96	10			10	100	N
36	Rojo Mexican Bistro	250 East Merrill Street	Quota LL		156	166			24	24	180	N
37	Sidecar Slider Bar	280 Merrill	Quota LL		75		16			16	91	N
38	Springdale Golf Course	316 Strathmore	Quota LL								0	
39	Streetside Seafood	273 Pierce Street	Quota LL	1,350	50	70		18		18	68	N
40	The Community House Cafe`	380 South Bates Street	Quota LL								0	
41	The Rugby Grille	100 Townsend Street	Quota LL		137	138	22			22	159	N
42	**Outside PSD**											
43	Big Rock	245 S Eton	Quota LL	6,000	340	397			97	97	437	N
44	Springdale Golf Course	316 Strathmore	Development LL								0	
45	Lincoln Hills Golf Course	2666 West 14 Mile Road	Quota LL								0	
46	Griffin Claw	575 S. Eton	Brewer		261	234	0	0	104	104	365	N
47	**Licenses Not In Use**											
48	Palladium (Barrio)	201 Hamilton Row	Quota LL								0	
49	RHG Fish Market	115 Willits	Quota LL								0	
50	* = Mitchell's and Camerons are sharing one license. The other license is being held by the company.										0	
51	Economic Development Licenses											
52	All Seasons	111 Elm	Development LL		189	281				None	189	N
53	The Stand Gastro Bistro	34977 Woodward Avenue	Development LL		207	218				None	207	N

	A	B	C	D	E	F	G	H	I	J	K	L
54	Triple Nickel	555 South Old Woodward	Development LL		125	142	28		80	108	233	Y
55												
56												
57	**Non-Liquor Establishment**											
58	Beyond Juice	270 West Maple Road	n				4			4	4	N
59	Brooklyn Pizza	111 Henrietta Street	n				39			39	39	N
60	Commonwealth Cafe	300 Hamilton Row	n					20		20	20	N
61	Cucina Medoro	768 North Old Woodward Avenue	n						None		0	
62	Cupcake Station	136 North Old Woodward	n				18			18	18	N
63	Einstein Bros. Bagels	176 South Old Woodward Avenue	n						None		0	N
64	Greek Islands Coney Restaurant	221 Hamilton Row	n						None		0	
65	Hunter House Hamburgers	35075 Woodward Avenue	n						None		0	
66	Leo's Coney Island	154 South Old Woodward Avenue	n						None		0	
67	Liquid Lunch Cafe` (Inside Be Well)	750 South Old Woodward Avenue	n						None		0	
68	Mountain King Chinese Restaurant	469 South Old Woodward Avenue	n						None		0	
69	New Bangkok Thai Bistro	183 North Old Woodward Avenue	n						None		0	
70	Panera Bread	100 North Old Woodward Avenue	n				17			17	17	N
71	Pita Cafe	239 North Old Woodward Avenue	n						None		0	
72	Primo's Pizza	996 South Adams Road	n						None		0	
73	Qdoba	795 East Maple Road	n						60	60	60	N
74	Sanders	167 North Old Woodward	n				6			6	6	N
75	Shish Kabob Express	34186 Woodward Avenue	n						None		0	
76	Stacked Deli	233 North Old Woodward Avenue	n						None		0	
77	Starbucks	135 South Old Woodward	n				8			8	8	N
78	Subway	126 South Old Woodward Avenue	n						None		0	
79	Succo Fresco Café	600 North Old Woodward	n			18	18			16	34	N
80	Sweet Earth	141 W. Maple	n				4			4	4	N
81	Sy Thai Cafe'	315 Hamilton Row	n						None		0	
82	Toss-Ups	34623 Woodward Avenue	n						None		0	
83	Touch of India Cuisine	297 East Maple Road	n						None		0	N
84	Try it Raw	213 East Maple Road	n						None		0	N
85												
86	** Did not renew Outdoor Dining License in 2014											
87												
88												
89												
90												
91												
92												
93												
94												

Legend

- Bistro License
- Quota License
- License not in use
- Economic Development License
- Non-Liquor Establishment

Birmingham
Bistro Map



Legend

Bistros

- Bella Piatti
- Birmingham Sushi Café
- Bistro Joe's
- Cafe` Via
- Churchill's Bistro & Cigar Bar
- Cosi
- Elie's Mediterranean Grill/Bar
- Forest Grill
- La Strada Caffe
- Luxe Bar & Grill
- Mad Hatter Café
- Market North End
- Salvatore Scallopini
- Social Kitchen & Bar
- Tallulah Wine Bar and Bistro
- Toast
- Townhouse

City of Birmingham
A Walkable Community

0 250 500 1,000 1,500 2,000 Feet

N

Coordinate System: State Plane Coordinate System Michigan South Zone 2113 Projection: Lambert Conformal Conic, Units: International Feet, Datum: NAD83
Data Sources: Oakland County GIS Utility, City of Birmingham
Updated: December 1, 2015

City of Birmingham
A Walkable Community

MEMORANDUM

Department of Public Services

DATE: December 17, 2015

TO: Joseph A. Valentine, City Manager

FROM: Lauren A. Wood, Director of Public Services

SUBJECT: City Parks – Current and Future Project Overview

Various recreational assets are reviewed regularly to determine potential opportunities for long-term improvements. City parks and properties are evaluated based on routine maintenance needs up to and including an assessment for future development opportunities. Items to be accomplished are established by priorities which are contingent upon public input, the Parks and Recreation Master Plan, Parks and Recreation Board and City Commission. All such project requests are reviewed along with establishing timelines which ultimately assist with budgeting and with preparing action plans in order to address such matters over the upcoming years. Money is available in the 2015-2016 budget for various conceptual site plans for parks targeted by the City Commission and Parks and Recreation Board. The following items serve as an update on various ongoing park projects with the Department of Public Services.

Woodward Avenue – Enhanced Islands

Woodward Avenue Median between Oakland Avenue and Brown Street was enhanced as a beautification project in 2002. Over the past few years, the landscape plant material has grown tired and we have tried several maintenance solutions to overcome the old outdated look of the "beautified" area.

The time has certainly come for a fresh new landscape plan to be created, and we have asked Michael J. Dul and Associates to provide a concept plan. They will provide a striking design that will integrate the ground plane and the existing trees with proposed flowers, perennials and shrubs. We are hoping to have a concept plan within the next month or so. The goal would be to have the project take place during the fall of 2016.

Rouge River Trail Master Plan

In 2006, the City Commission accepted the Rouge River Corridor Trail Master Plan. To implement all features of this plan was an estimated $2.4 million in 2006. Various aspects of the trail plan have been budgeted over the years, but other projects took priority using the Recreation Bond dollars. Since such time, improvements have focused on annual maintenance and reduce/eliminate wet areas and add porous pave material in key zones.

The Rouge River Corridor Trail Master Plan points out myriad of possible improvements from enhancing connectivity and navigability; plus the addition of bridges including signage both again aiding with connectivity and also interpretation. Trail entry columns, mile markers, benches and litter receptacles are all integral parts in this plan. The main objective is to connect neighborhoods, parks and the downtown business district. Furnishings and lookout areas would be a lesser priority and can be done as future projects.

Improvements to the trail thus far include drainage improvements, correcting washout areas and the extension of the trail in areas to improve connectivity. A washout area in Booth Park trail has been corrected by adding porous pave surface and drainage has been improved throughout the trail system by adding drain tile in various locations. Extension of the chip trail in Fairway Park to curbside at Fairway Drive has improved connectivity, users now can follow the trail right from the neighborhood though the park, into the trail system. An upcoming improvement is to do another extension of the trail located between Maple Road and Linden Park. This will be adding approximately 130 feet of porous pave from the sidewalk that runs along the South side of West Maple Rd to the foot bridge where the chip trail begins currently that runs to Linden Park. We hope to accomplish this project in the spring/summer of 2016.

Annually, we review of the Rouge River Trail Corridor Master Plan to create priority project lists for overall trail improvements. One such priority is to begin bridge design/plans for access bridges in various locations along the trail system. There are five bridges called out in the Master Plan.

We have hired a consultant, M. C. Smith Associates to serve as the facilitator with the bridge concept design competition for potential locations along the trail system, based on the Rouge River Corridor Trail Master Plan. They prepared the Rouge River Trail Corridor Master Plan and have extensive work experience throughout the State with bridge design and installation. Part of this scope of work will be to develop a general framework for the basis of construction of these bridges. Parameters will be established for which to use for the individuals interested in partaking in the design competition. Aspects and details of the competition still need to be worked out. The process needs to be developed still for the community design competition.

This will provide a design or an end product which will assist in determining a location, development cost projections and potential funding mechanisms for planning, budgeting and bidding purposes.

Poppleton Park

This is a 17.21 acre Community Park located off of Woodward Avenue. We have a proposal for an initial concept park site plan necessary to layout all options and alternatives for potential additional parking, alternate entrance and site amenities based on community need. M. C. Smith Associates will be preparing a park site concept plan and cost estimates as part of the review of the existing park layout and uses along with examining the potential for enhancing outdoor space at Poppleton Park.

The scope of work will include the review of opportunities for additional recreational space on site, to include soccer field(s), parking lot enhancements, playground addition, possible change to traffic ingress and egress, etc. Such focus areas will be to evaluate additional parking options and alternate entrance to relieve neighborhood impacts and accommodate potential baseball/soccer users. It may also warrant a traffic study to be performed for vehicle counts along Madison and Lawndale. This project will involve public meetings for community input for site enhancements, at a minimum include, but not be limited to, the following features:

- Additional Recreational Space
- Playground Improvements and Additions/Universal Accessibility
- Soccer Fields
- Walking Paths/Neighborhood Connections
- Vehicular Access Improvements
- Parking Enhancements
- Others as they evolve

Adams Park

We requested a proposal from Michael J. Dul & Associates, Inc. to assist the City with a site plan or concept design for Adams Park, adjacent to Roeper School on Adams Road. The property is about 1.45 acres and is considered a shared space during the school year with Roeper School. Michael J. Dul & Associates will provide ideas in the form of a concept site plan for site grading and drainage, fencing, arrangement of use areas such as hard surface play and landscape. All trees and site elements will be incorporated into a base plan.

A Landscape Development Plan will illustrate the proposed design for treatment of the ground plane and the arrangement of site elements including hard surface play area, play equipment, benches, fencing, retaining walls, irrigation, landscape beds, shrubs, perennials and ornamental grasses. A preliminary cost estimate will be prepared.

The basis for the site plan is to prepare some mock renderings to aesthetically make improvements where feasible on the City property. Many of the uses will remain as is, but determining various options of the site amenities, landscaping additions and proper site layout is vital. This project will also involve conversations with the neighborhood groups and with Roeper School to coordinate all efforts for potential future improvements.

Preliminary coordination with the neighborhood groups have occurred in the past, including on and off conversations with Roeper School regarding park plan ideas. These meetings will now launch more formally as the result of working on a concept site plan during 2016.

Kenning Park

The parking lot improvement project necessitated the need to develop a master plan for Kenning Park. So, in 2013 the City hired The Johnson Hill Land Ethics Studio (JHLE) to prepare a park master plan as well as assist with the parking lot improvement project. During 2014 the parking lot reconstruction project was awarded in the amount of $1.1 million dollars and the work was completed in 2015.

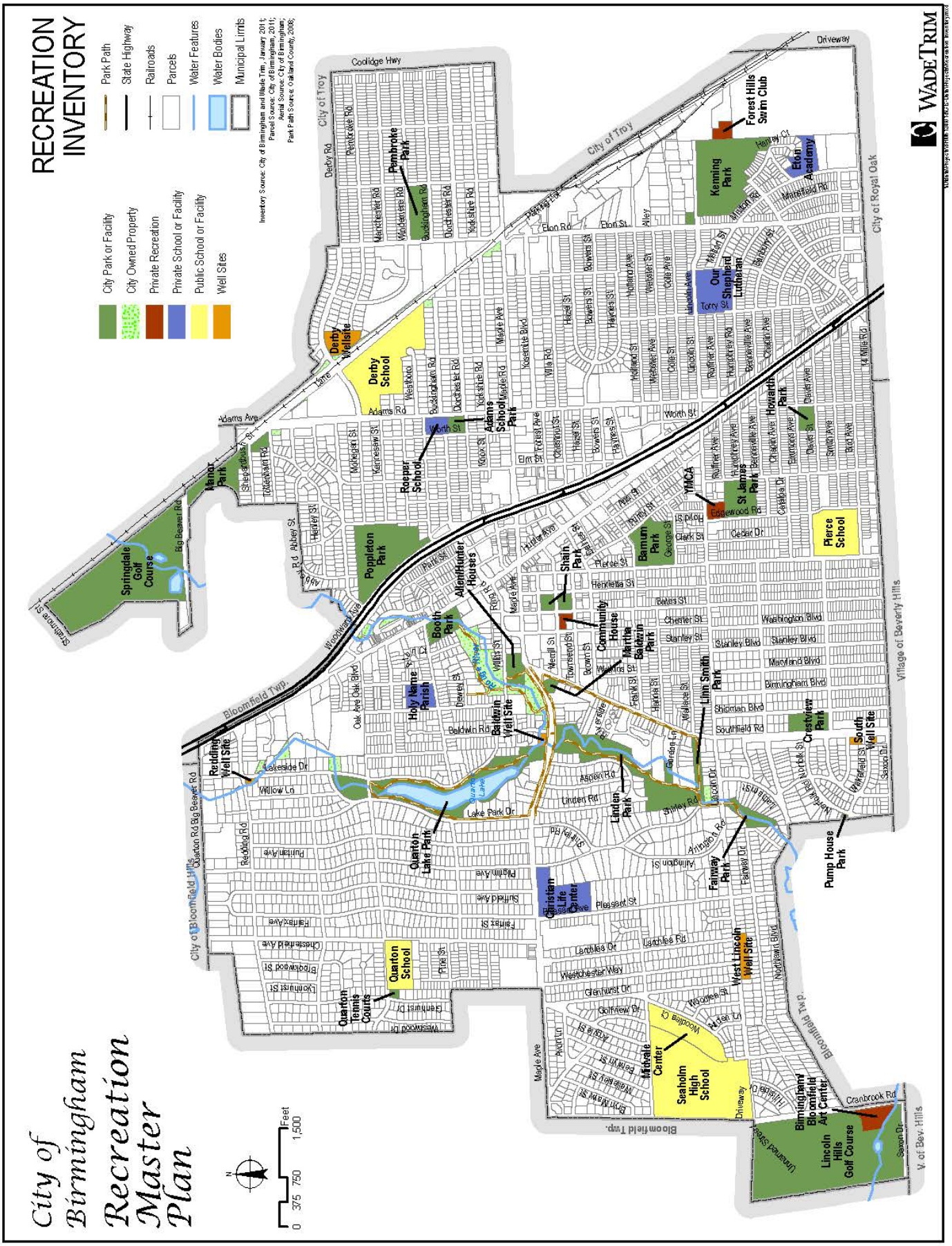
The master plan at a preliminary construction costs of $1.7 million dollars included everything from streetscape improvements, site landscaping, new parking lot, field improvements, site amenities and structures and a walking path. Earlier this year there were talks with potential donor partners for field improvements, initial development may include two fields and walking pathway throughout park. The City heard nothing further from such possible donor for this project. Money was budgeted this year for walkway improvements, but only as part of this proposed partnership.

Barnum Park

The Barnum Park Master Plan was created in 2008 and the estimated construction cost for all elements was $1.5 million dollars. Cost estimates for future improvements and donation opportunities amounted to $1.1 million dollars; these included such features as a conservatory/greenhouse, a formal garden area, entry features and art/sculpture items.

Total expenditures for the building demolition and Phase 1 were about $1.6 million dollars. Phase 2 improvements included additional landscaping, playground improvements, heart of the park enhancements and sanctuary garden elements. While not all of these items have been implemented to date, the cost estimate for the entire Phase 2 was approximately $335,000. The various improvements were to be cost shared between the City and funds from the donations. To date, the Community for Barnum Park has fundraised over $150,000.

During the long range planning session a PowerPoint presentation will be presented to provide an overview of these current and upcoming park projects.


RECREATION INVENTORY
City Park or Facility
City Owned Property
Private Recreation
Private School or Facility
Public School or Facility
Well Sites
Park Path
State Highway
Railroads
Parcels
Water Features
Water Bodies
Municipal Limits
City of Birmingham Recreation Master Plan
WADE TRIM
Springdale Golf Course
Manor Park
Derby Wellsite
Derby School
Pembroke Park
Adams School Park
Roeper School
Poppleton Park
Allen/Hunter Houses
Booth Park
Holy Name Parish
Baldwin Well Site
Redding Well Site
Quarton Lake Park
Quarton School
Quarton Tennis Courts
Christian Life Center
Seaholm High School
Middle School
West Lincoln Well Site
Lincoln Hills Golf Course
Birmingham Bloomfield Art Center
Pump House Park
Fairway Park
Linden Park
Lincoln Park
Crestview Park
South Well Site
Linn Smith Park
Community House
Martha Baldwin Park
Shain Park
Barnum Park
St. James Park
YMCA
Howarth Park
Pierce School
Kenning Park
Forest Hills Swim Club
Eton Academy
Our Shepherd Lutheran
Coolidge Hwy
City of Troy
City of Royal Oak
Village of Beverly Hills
Bloomfield Twp.
City of Bloomfield Hills
Feet
0 375 750 1,500


TENNIS COURTS
LINCOLN AVENUE
3/4 MILE EXERCISE PATH
POLICE PISTOL RANGE
SKATEBOARD PARK
CONCESSION AREA/
RESTROOM ACCESS
KIOSK
TENNIS DOME
TENNIS DOME
SNOWMELT AREA
ICE ARENA
PLAY AREA
SHELTER
LITTLE LEAGUE DIAMOND
200' OUTFIELD
RESTROOMS
PAVILION
PICNIC AREA
OPEN SPACE
150' X 300'
SHELTER
PROTECTIVE SCREEN
SOFTBALL DIAMOND
280' OUTFIELD
LITTLE LEAGUE DIAMOND
200' OUTFIELD
LITTLE LEAGUE DIAMOND
180' OUTFIELD
0 30 60 120
NORTH
KENNING PARK
MASTER PLAN
January 2014
The Johnson Hill Land Ethics Studio

THE BARNUM PROJECT
MASTER PLAN
BIRMINGHAM, MICHIGAN

0' 15' 30' 60' 90' 120'
SCALE: 1" = 30'

NORTH

M.C. SMITH ASSOCIATES AND ARCHITECTURAL GROUP, INC.
Landscape Architecture • Park & Recreation Planning • Architecture
Downtown Planning • Interior Design • Sports Facility Planning
328 Greenwood Avenue N.E. • East Grand Rapids, MI 49506
616.451.2410 • FAX: 616.451.2404 • EMAIL: lstinson@mcsmith.com

NATURAL AREAS WITH NATIVE PLANTINGS
CRUSHED STONE PATH
ENTRANCE - ARBOR WITH FLORAL PLANTINGS
PARALLEL PARKING FOR (22) CARS
EXISTING TREES
GIRLS' SOFTBALL FIELD- 180' OUTFIELD TO BACKSTOP AND 4' HIGH SIDE FENCES
FOCAL POINT FEATURE
CURVING PERIMETER WALK
CRUSHED STONE PROMENADE
SCULPTURE
BLACK VINYL CLAD FENCE
2 SOCCER FIELDS 40x70 YARDS
ENTRANCE - ARBOR WITH FLORAL PLANTINGS
BENCHES
LOW BRICK WALLS WITH SALVAGED BRICK
ENTRANCE - ARBOR WITH FLORAL PLANTINGS

RETAIN SMOKE STACKS
RETAIN BUILDING ENTRY
FORMAL GARDEN AREAS
FLORAL PLANTING BEDS
GREENHOUSE/ CONSERVATORY WITH RESTROOMS
OPEN PAVILION
SITE LIGHTING (LED)
CHILDREN'S PLAY AREA
CRUSHED STONE WALK
SOCIAL SPACE WITH TREES
OPEN MEADOW
PAVED WALKWAY AROUND PARK
NEW DECIDUOUS TREES
GARDEN SANCTUARY
NEW EVERGREEN TREES
GRASS PAVER PARKING FOR 33 CARS
PAVED PARKING DRIVE

City of Birmingham
A Walkable Community

MEMORANDUM

Building Department

DATE: December 23, 2015

TO: Joseph A. Valentine, City Manager

FROM: Bruce R. Johnson, Building Official

SUBJECT: Long Range Planning Meeting
Online Inspection Scheduling/Permitting

Construction activity has dramatically increased over the past several years and the number of permits issued in the current fiscal year may exceed our record set back in 2004-2005. The increasing number of construction related permits substantially increases the number of inspections we must perform on them. While we are adding resources to help manage the increased workload, we are also seeking ways to utilize our computer software to improve our service to our customers. One area we are focusing on to do this is to streamline the inspection scheduling procedure. Every permit issued has several required inspections that must be conducted during the course of the construction project, and the number of inspections scheduled each day is impressive and difficult to manage.

Inspections must be scheduled, performed, resulted and recorded. Permit holders currently need to call our inspection line leaving the details of the inspection requested. They must request the inspection by 4:00 PM for it to be scheduled for the following day. Support staff must retrieve the messages and manually schedule the inspections throughout the day. This procedure alone is time consuming for permit holders and staff alike.

A new suite of computer software applications was implemented in 2011 across several departments from the software vendor BS&A. In June of that year, the building department went live with the Building Department application (BD.Net). The department has utilized this software to improve several of its processes including streamlined project tracking, efficient bond refund procedures, and code enforcement complaint processing. The software program will allow more improvements as time allows, including our next step in implementing online inspection scheduling and permitting.

BS&A, has a service called Access My Gov (AMG) which allows permit holders to schedule inspections online, apply for permits online, and in some cases the permits can be issued online. AMG will allow permit holders the convenience of scheduling inspections from a computer, tablet, or smartphone, whichever works best for them. They will be able to schedule inspections right up until 6am for the day the inspection is desired. They will be able to see future dates available for inspections and schedule them well in advance. Another great feature of this service is its notification capabilities. Permit holders will be notified either by text or email of the results of their inspection as soon as our inspector completes the inspection. Instead of going to the site or calling the inspector at the end of the day to find out what happed, they will

instantly receive the results along with a list of any deficiencies that need to be corrected. The applicant may designate several individuals to receive the inspection results. It is up to them, but instant sharing of this data will have many benefits.

The department will move forward with the online permit application feature after implementation of the online inspection scheduling. Unlike inspection scheduling which can be implemented relatively soon, online permit applications will be a more gradual process. It is anticipated that routine applications for permits that do not require construction documents will be utilized first. As our customers become more familiar with the system and realize the its benefits, its utilization will increase.

The implementation of AMG for online inspections and permitting will require substantial work on our end, however, we are anticipating going live with inspection scheduling in early Spring 2016. Online permit applications will follow later in the year.

The City's long-term goals include developing innovative and responsive methods for services it provides to the community. The building department continues to seek new approaches to improve the effectiveness and efficiency in providing our services. Adding the Access My Gov service to our current BD.nt application opens the door for the building department to take a new approach in scheduling inspections and processing permits that will effectively increase our efficiency by providing these services to our customers. Furthermore, our customers will be able to increase their own productivity utilizing this innovation.

City of Birmingham
A Walkable Community

MEMORANDUM

Police Department

DATE: **December 18, 2015**

TO: **Joseph A. Valentine, City Manager**

FROM: **Donald A. Studt, Police Chief**

SUBJECT: **Long Range Planning Session**

Following is an outline of areas I will discuss with the City Commission at the Long Range planning meeting for 2016.

--Police Department Organization

A total of 64 full time and part time employees, including 31 sworn officers and 12 police/fire/EMS dispatchers and 16 volunteer police auxiliary officers.

--2016 Organizational changes.

Patrol Division will now split into 4 teams, each working a 12-hour day, a change from the current 3 teams working an 8 hour day.

This will:
--increase in the number of patrol officers on duty at any given time, providing at least 1 additional patrol car available for service at all times

Number of Officers Assigned:

2016		2015	
Day shift (7A-7P)			
Team A 5	min 4	Day Shift (8A-4P)	minimum 3
B 5	4	Afternoon Shift (4P-12)	4
Night shift (7P-7A)		Night Shift (12-8A)	3
Team C 6	min 5		
D 6	5		

--provide a ranking officer (Lieutenant or Sergeant) will be on duty at all times
--reduce both overtime (30%) and sick leave
--facilitate training, school and conference scheduling

Elimination of position of Deputy Chief in favor of 3 Commanders responsible for Operations, Investigation and Support Services.

--Staff Training

All command staff have completed 16-week Northwestern University Police Staff and Command program or the FBI National Academy.

Officers are regularly scheduled for 'expertise' training such as firearms instructor, evidence technician, fraud, computer crime, homicide/sexual assault, at local police academies or national programs.

Numerous multi-jurisdiction scenario training in specialized and tactical areas.

Monthly firearms and tactics training held in-house.

--Interagency Cooperation and Agreements

CLEMIS (Court and Law Enforcement Management Information Systems) currently 103 local and 6 state/federal agencies. Records management, dispatch, data base records. Governed by advisory board made of member representatives, administered by Oakland County.

PSAP (Public Safety Answering Point) 21 different 9-1-1 call centers through the county. We have shared operating agreement with Beverly Hills.

MCAT (Major Case Assistance Team) 8 agencies Experienced detectives available for major and complex criminal investigations. Governed by committee made from representative members.

NET (Narcotics Enforcement Team) 14 agencies conducting narcotics investigations throughout the area. Administered by Oakland County Sheriff's Department. Governed by advisory board made of representative members.

SIU (Special Investigations Unit) 5 agencies available for undercover operations, surveillance on known suspects and warrant apprehensions. Administered by Troy PD. Governed by advisory board made of member representatives.

OAKTAC (Oakland County Tactical Unit) 24 agencies, available with specialized equipment and trained officers for active shooter/hostage or other tactical situations. Governed by Advisory Board made up of representative members.

Unique operations

21 special events city wide each year which require street closings and additional police presence

Downtown foot patrol

Traffic speed/volume data base

Patrol cars equipped with 'noptic' (thermal imagining) cameras

Central business district camera monitors at dispatch desk

The future

Continue to explore and evaluate inter-agency cooperative investigation initiatives
--fraud/computer crime group in conjunction with FBI or Secret Service and local agencies
--fatal traffic accident investigation team with other local agencies

Maintain first class equipment and technology
--increase in training budget for advanced and specialized schools, both local and regional
--patrol division: in car video system upgrade, replacement of individual body armor due to age
--dispatch hardware and software 9-1-1 system upgrades
--wireless camera upgrade/replacement
--parking enforcement computer system replacement

To: Joe Valentine, Birmingham City Manager

From: Doug Koschik, Baldwin Public Library Director

Subject: Long-Range Planning Session on January 16, 2016

Date: December 28, 2016

At the long-range planning session on January 16, 2016, I will deliver an update from the Baldwin Public Library Board of Directors to the City Commission on two topics: the proposed renovation of the Adult Services section of the Library and the Library's long-range building vision. Both of these projects are intended to help the Baldwin Library better serve Birmingham residents.

Proposed Adult Services Renovation Project

At its October 12 meeting, the Birmingham City Commission approved the conceptual and schematic designs by Luckenbach|Ziegelman|Gardner Architects (LZG) for the renovation of Baldwin Public Library's Adult Services area. At that meeting, the Commission also asked the Library and the City of Birmingham to develop a Request for Proposals (RFP) for design development, construction drawings, bidding assistance, and construction administration for the proposed renovation. The Baldwin Public Library Board of Directors approved the RFP on November 16, and the Birmingham City Commission approved it on December 7. The RFP was duly issued on December 8. Bids are due on January 6, 2016. On January 14, the Baldwin Public Library Board of Directors will review the bids and select its preferred architectural firm. At the January 16 long-range planning session, I will announce the Library Board's recommendation. The recommendation will then go to the City Commission for a vote at the Commission's January 25 meeting.

Baldwin Public Library's Long-Range Building Vision

At its October 12 meeting, the Birmingham City Commission asked the Baldwin Public Library Board of Directors to develop a long-range vision for the Library's building, which would supplement the proposed Adult Services renovation that the Library Board has been discussing for a year. The purpose was threefold:

1. To describe in conceptual terms the types of changes that the Library envisioned beyond the Adult Services renovation.
2. To ensure that the work contemplated for the proposed Adult Services renovation did not compromise building modifications envisioned in further phases.
3. To develop cost estimates for future work on the Library building.

This kind of long-range building vision would be highly conceptual. It would consider the nature and extent of future building modifications, but not provide details. The cost estimates would be based on a square-footage charge for similar projects.

The Library Board turned to LZG for assistance on this project. The Board had worked fruitfully with LZG on the conceptual and schematic stages of the proposed Adult Services renovation project and felt that LZG would be able to perform this additional project well and within a tight time frame. LZG provided a quote for the work, which the Library Board accepted. The selection of LZG to carry out the long-range building vision does not preclude any other firm from doing conceptual/schematic/design development/construction drawings on future Library building phases, should the City of Birmingham ultimately decide to move forward with those phases.

In working on this long-range building vision, the Library was able to draw from knowledge it gathered between 2011 and 2013, when it developed a comprehensive plan for a building renovation and expansion. At that time, the Library conducted a survey, held focus groups and community forums, benchmarked the Baldwin Library building against the buildings of other comparable libraries, and surveyed the literature on the "library of the future."

The Library was also able to draw on the lessons learned from the May 2014 vote on the comprehensive Library building plan. The defeat of that proposal showed that Birmingham residents wanted a more modest, less expensive upgrade of the Library building, one that did not call for the demolition of existing space.

Library Administration sought input from the Heads of Youth Services and Circulation, the two departments that would be most affected by future building upgrades, and developed a list of needs and wants. The Library's Building Committee also met to discuss priorities. Input from both sources went into a scope of work which called for two possible future building phases—one centering on the Youth Room and the other centering on the Circulation Department and front entrance. These are considered Phases 2 and 3 of the overall building plan, with Phase 1 being the proposed Adult Services renovation that the Library Board has already shared with the City Commission and the public.

The scope of work for Phases 2 and 3 ***excludes*** several features of the 2014 comprehensive plan:

- Renovation of the Grand Hall, including restoration of such architectural elements as the east bay window
- Renovation of the second floor
- Improvement of the staff entrance
- Major increases in square footage other than in the Youth Room and front entry. (The new plan calls for an approximate 9% increase in gross square footage, as opposed the 2014 plan's 40% increase.)
- Replacement of the 1960 and 1981 additions with a more modern, cost-efficient building

The Library intends to pay for furniture, paint, and carpet upgrades in the Grand Hall and second floor out of its operating budgets in future years. The Library will also pay for new technology equipment (computers, peripherals, etc.) out of its operating budgets.

The long-range building vision that LZG developed in concert with Library Administration and the Building Committee is based on the following principles:

- The Library building's role as part of Birmingham's civic center needs to be considered when building modifications are considered.

- The architectural integrity of the Birkerts Addition should be respected by maintaining the curve along the west and south of the building.
- The original 1927 building needs to be better honored by restoring its brick to the original color and highlighting where that building meets the 1960 and 1981 additions.
- The building deserves to be suffused with light, which will improve both aesthetics and functionality.
- The layout of the building needs to be rationalized, leading to better "wayfinding." In other words, the building needs to be laid out in such a way that patrons will be able to navigate it more easily than they are now able to. In order to accomplish this, the Library envisions a "main street" running through the Birkerts Addition to the Youth Room, as well as a "commons" area in the core of the building, close to where all three parts of the building—the original 1927 building plus the 1960 and 1981 additions—meet.
- Aesthetic and functional improvements are long overdue. By upgrading the lighting, the Library will achieve energy savings.
- Birmingham's aging population, as well as its young families using strollers, need a street-level entrance.
- ADA guidelines must be respected through the building.
- There will continue to be increased demand for study and collaboration space--including a café—with an adequate technological infrastructure in all areas.
- The Circulation Department needs to be laid out more logically and slightly more space is needed for the automated book sorting machine.
- The one area of the Library earmarked for a significant expansion is the Youth Room. The benchmarking study conducted in 2012 by the Joint Library Building Committee showed that the Youth Room is where Baldwin is most notably falling behind the public library facilities of other comparable communities. Despite space limitations, Baldwin's Youth Services Department provides strong services and garners more program attendance per capita than nearly any other public library in Michigan. An expansion in the Youth Room would allow Baldwin to serve the educational needs of its youngest patrons even more effectively than it currently does. The gross square footage increase in the Youth Room would be approximately 40%--or 2,000 gross square feet—considerably less than the approximately 70% increase proposed in 2014, but still significant. This increase would allow the Youth Room to maintain the current size of its physical collection, which is overcrowded—and located on shelving divided by aisles whose widths don't even meet ADA standards. Unlike in Adult Services, Youth materials are not being superseded so quickly by electronic resources. It is important to keep the physical collection at its present size and arranged in a way that allows people with disabilities to access it. This expansion would also allow an increase in the size of the small children's activity room, where the Library's popular story times take place.

The Library's long-range building vision is divided into three phases.

Phase 1

Phase 1 is the proposed Adult Services renovation, which has been discussed previously. It has already gone through fairly detailed conceptual and schematic design work. The cost is estimated at $2,218,172 in 2016 dollars, based on detailed work done by LZG, Frank Rewold and Son (construction), and Library

Design Associates (furniture and fixtures). The part of the Library affected by Phase 1 is shown in Appendix A, under "Space Plan – Phase 1."

Phase 2

Phase 2 would consist of the following elements:

- Renovation of the existing Youth Room, including public, staff, and storage spaces.
- Expansion of the Youth Room, adding approximately 40%--or approximately 2,000 gross square feet. This expansion would carry the Library building out to the sidewalk along Bates Street.
- Widening of the hallway leading from the entrance toward the Youth Room. This will help circulation flow and succeed in connecting the Youth Room better to Adult Services. In effect, it would be a continuation of the "main street" proposed for Adult Services.
- Upgrade of the public restrooms on the main floor.
- Re-use of existing shelving, wherever possible.
- New furniture and fixtures.

The part of the Library affected by Phase 2 is shown in Appendix A, under "Space Plan – Phase 2." The estimated cost of Phase 2, in 2016 dollars, is $1,882,157, as shown in Appendix B, with additional details provided in Appendix C.

Phase 3

Phase 3 would consist of the following elements:

- Renovation of the Commons/Circulation area.
- Development of a new entry and a possible relocation of the Circulation area. This would require the enclosure of some square footage currently outside and exposed to the elements, an area lying underneath the Birkerts curve, consisting now of a concrete patio and wide steps. The enclosure would probably be glass. The steps to the main floor, five feet above ground level, would be redone and reduced in scope. An elevator would be installed to transport people who need assistance from street level to the main floor. The automated book sorter would need to be moved to another location in order to be adjacent to an outside book drop. The gross square footage affected by all of this work would be approximately 2,000 square feet.
- Upgrade of the outdoor space next to the new enclosed entry. All of the construction involved in Phases 1, 2, and 3 would take a toll on the existing outdoor space, and enclosing the area under the Birkerts curve would transform the setting. Therefore, an upgrade to the outdoor space would be necessary. The Library believes the replacement of concrete with aggregate pavement, as well as improvements to the hardscape, landscape, and lighting, should be made.
- Installation of skylights around the exterior of the 1927 building, along the line where the 1927 building meets the 1960 and 1981 additions. The skylights would allow natural light to flood into the interior of the building. LED lighting, installed during Phases 1 and 2, would continue to be used to highlight the brick walls of the 1927 building when natural light is not present.

The part of the Library affected by Phase 3 is shown in Appendix A, under "Space Plan – Phase 3." The estimated cost of Phase 2, in 2016 dollars, is $1,643,922, as shown in Appendix B, with additional details provided in Appendix C.

All 3 Phases Together

The parts of the Library affected by Phases 1, 2, and 3 are shown in Appendix A, under "Space Plan – Phases 1, 2, 3." The three phases are independent of each other. Construction work done for Phase 1 would not need to be redone in later phases, except for relatively minor projects, like freshening up the current lobby area after all the parts of the vision have been accomplished. In other words, there would be extremely minimal work and cost duplication during the course of the three phases.

Process

Baldwin intends to proceed with the design of Phases 2 and 3 in the same way it did with Phase 1. When the City Commission signals its approval to move ahead with each phase, the Library and City would issue an RFP and select an architect in a manner approved by the City. The architect would work with the Library Board and Library Administration—and, wherever appropriate, with City government—to develop a conceptual/schematic design. The Library would solicit input from Library staff and the public. It would also consult various City boards and committees, especially to the extent that the design affects the exterior look of the building. The City Commission would have the final decision on approving the designs.

Each phase of the project is independent of the other. Committing to Phase 1 would not lead inevitably to Phase 2 or Phase 3. The decision on whether to proceed with each phase would depend on the political and financial realities of the day. It may be best to conduct the conceptual and schematic architectural work for Phases 2 and 3 together, but that decision would be made at the time when it is decided whether or not to proceed with planning Phase 2.

It also needs to be stressed that the precise features to be included in Phases 2 and 3 would be decided at the conceptual/schematic stages. The features described in this document are the most accurate ideas possible at this stage in the process.

Timeline

Assuming that the public is willing and financing is available, the Library Board would prefer to proceed with the construction of Phase 1 in 2016, with the construction of Phase 2 in 2019, and with the construction of Phase 3 in 2022. While such a schedule spreads out the work over a number of years, it would minimize disruption to the public at any given time and would allow the public to evaluate each phase after its completion and decide whether to proceed with the next one. Note that once the beginning construction date of a particular phase has been chosen, the start of the design process (architect selection, conceptual design, schematic design, design development, construction drawings, and bidding) would need to begin approximately 18 months in advance.

Costs

The costs of the three phases are listed in Appendix B—first in 2016 dollars and then in 2016, 2019, and 2022 dollars, based on the year in which the Library Board would ideally like to see the construction of each phase begins. In calculating 2019 and 2022 construction costs, the Library has used a 4% annual cost escalator, which is the estimate that the construction firm Frank Rewold and Son has provided.

In 2016 dollars, the three phases would cost a total of $5,744,251:

Phase 1:	$2,218,172
Phase 2:	1,882,157
Phase 3:	1,643,922
Total:	**$5,744,251**

If the costs are adjusted to 2019 dollars for Phase 2 and to 2022 dollars for Phase 3, the total cost would be $6,415,428:

Phase 1 (2016 dollars):	$2,218,172
Phase 2 (2019 dollars):	2,117,170
Phase 3 (2022 dollars):	2,080,086
Total:	**$6,415,428**

LZG calculated estimated costs by determining the cost per square foot of similar projects, such as Baldwin's Phase 1, and multiplying that by the square footage that would be involved in the various phases and sub-phases of the project. These per-square-foot costs include general conditions, architectural services, engineering services, consultants, construction phasing, construction, furniture and fixtures, a contractor's contingency of 10%, and the construction management fee. A calculation of these fees can be found in Appendix C-Conceptual Budget Summary. Note that, on top of the per-square-foot charges, LZG has added costs for supplemental engineering fees, in case the HVAC system requires additional work (which studies have so far shown that it won't), and for a possible library consultant.

Square Footage

In Phases 2 and 3, combined, the Library is proposing an increase of about 3600 gross square feet or 9%. The Library is currently slightly over 40,000 gross square feet. If Phases 2 and 3 are implemented as envisioned, the Library, would end up at slightly under 44,000 gross square feet.

Are Any Building-Related Projects Not Included in This Cost Estimate?

Chapter XVI, Section 3 of the City Charter states that "The city commission shall provide for the maintenance of the grounds and building [of the library] in a safe and presentable condition and shall pay the expense thereof from the general funds of the city." In keeping with this provision, the City of Birmingham has, over the years, carried out repairs on the Library building. In 2015, for example, the City installed a new freight elevator in the Library because the previous one had ceased functioning.

1. The Library's public elevator is over 30 years old and showing signs of wear, resulting in an increased number of service calls. Sometime within the next several years the elevator will

need to be replaced in order to be compliant with standards. The new elevator will occupy the same shaft as the current elevator. The Library has asked the City to add this project to its list of future capital projects for the Library.

2. The roof over the Birkerts Addition is over 30 years old. The City has been maintaining it, and so far, leaks in this roof have been limited to the points where the flat roof of the Birkerts Addition meets the peaked roof of the 1927 building. Nevertheless, the roof will need to be replaced in the foreseeable future. The Library has asked the City to add this project to its list of future capital projects for the Library. The logical time for the City to carry out this project might well be when skylights are added around the perimeter of the 1927 building, which is currently called for in Phase 3, but conditions might end up requiring an earlier replacement date.
3. When Martin Street was widened several years ago, the landscaping between Martin Street and the Library building was not upgraded. Since the long-range building vision does not call for any changes to the Martin Street façade of the Library building, and since the current landscaping is dated, the Library has asked the City to add a Martin Street landscape upgrade to its list of future capital projects.
4. The Library's long-range building vision calls for an upgrade of the outdoor space by the front entry. If the City wishes to go a step further, however, and make this area emulate the quality of Shain Park (say, with granite pavers), the estimated cost of that particular project rises from approximately $150,000 to $600,000. That extra cost is currently not included in any budgets. This is an idea that the City might wish to consider for the future.

Earlier, I mentioned that the Library will pay for furniture, paint, and carpet upgrades to the Grand Hall and second floor out of its operating budgets. It will also pay for technology equipment (computers, peripherals, etc.) out of its operating budgets, although technological infrastructure (wiring, etc.) will come out of project costs. The costs of furniture, paint, carpet, and computers are tenant-related—rather than landlord-related—which is why the Library will cover them.

Funding

Funding strategies for Phases 1, 2, and 3 are currently being explored and will be presented at the budget hearing in April.

Conclusion

The Baldwin Public Library Board of Directors is pleased to present the Birmingham City Commission with the long-range Library building vision it requested in October. The vision calls for significant building improvements over the course of the next seven years, although the work envisioned is more modest in scope and cost than what the 2014 comprehensive Library building plan would have accomplished, if it had been implemented.

The plan calls for three phases. Phase 1 would renovate the Adult Services section of the Library. Phase 2 would renovate and expand the Youth Room. Phase 3 would renovate the Circulation Department and main entry, provide for a street-level entrance to the building, and enclose a modest amount of usable space by the main entry.

The work contemplated for Phase 1 would not compromise the building modifications envisioned in Phases 2 and 3. Indeed, this proposed long-range building vision, which we believe is quite cost-effective, calls for three phases with minimal duplication of work.

The total cost of the three phases of the project would be $5,744,251 in 2016 dollars—or if costs for future phases are estimated at future values, the cost of the three phases would be $6,415,428.

Credits

I would like to thank all of the following people for their contributions to the development of the three phases of the Library's long-range building vision:

Library Board:

Sheila Brice, President

Frank Pisano, Vice President and member of Building Committee

Jim Suhay, Secretary and member of Building Committee

Ashley Aidenbaum

Bob Tera

David Underdown, member of Building Committee

Staff:

Rebekah Craft, Associate Director

Stephanie Klimmek, Head of Youth Services Department

Kristen Tait, Head of Circulation Department

Maria Williams, Head of Adult Services Department

Staffs of the Adult Services, Circulation, and Youth Services Departments

Luckenbach|Ziegelman|Gardner Architects LLP:

Robert Ziegelman, Principal and Designer in Charge

John Gardner, Project Architect

Karen Swanson, Interior Designer

Many members of the public

Appendix A

Baldwin Library's Long-Range Building Vision

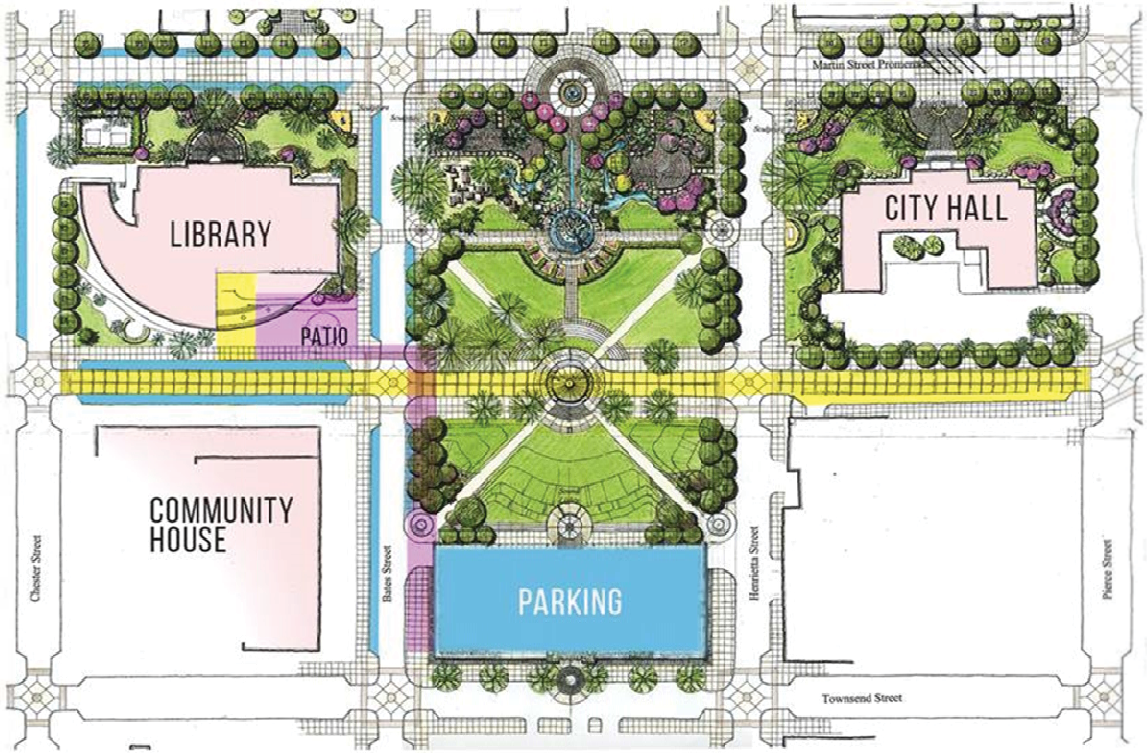
Design Approach and Space Plans for Phases 1, 2, and 3

The designs on the following eight pages were developed jointly by Luckenbach|Ziegelman|Gardner Architects LLG and the Baldwin Public Library Board of Directors and Library Staff.

DESIGN APPROACH

CONTEXT

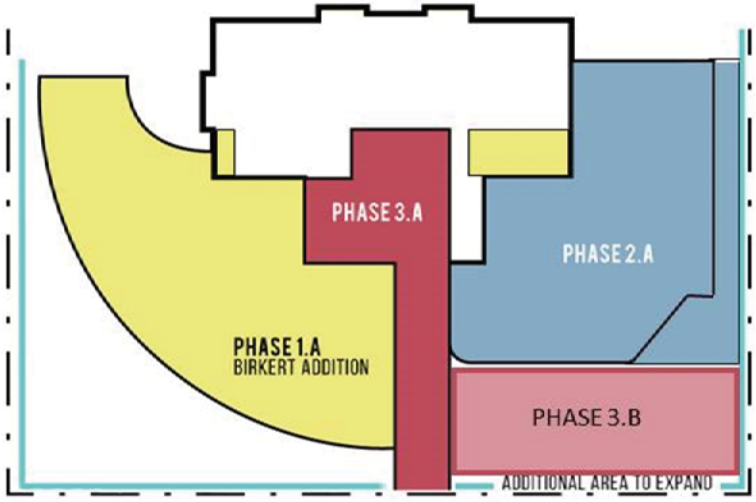
CIVIC CENTER

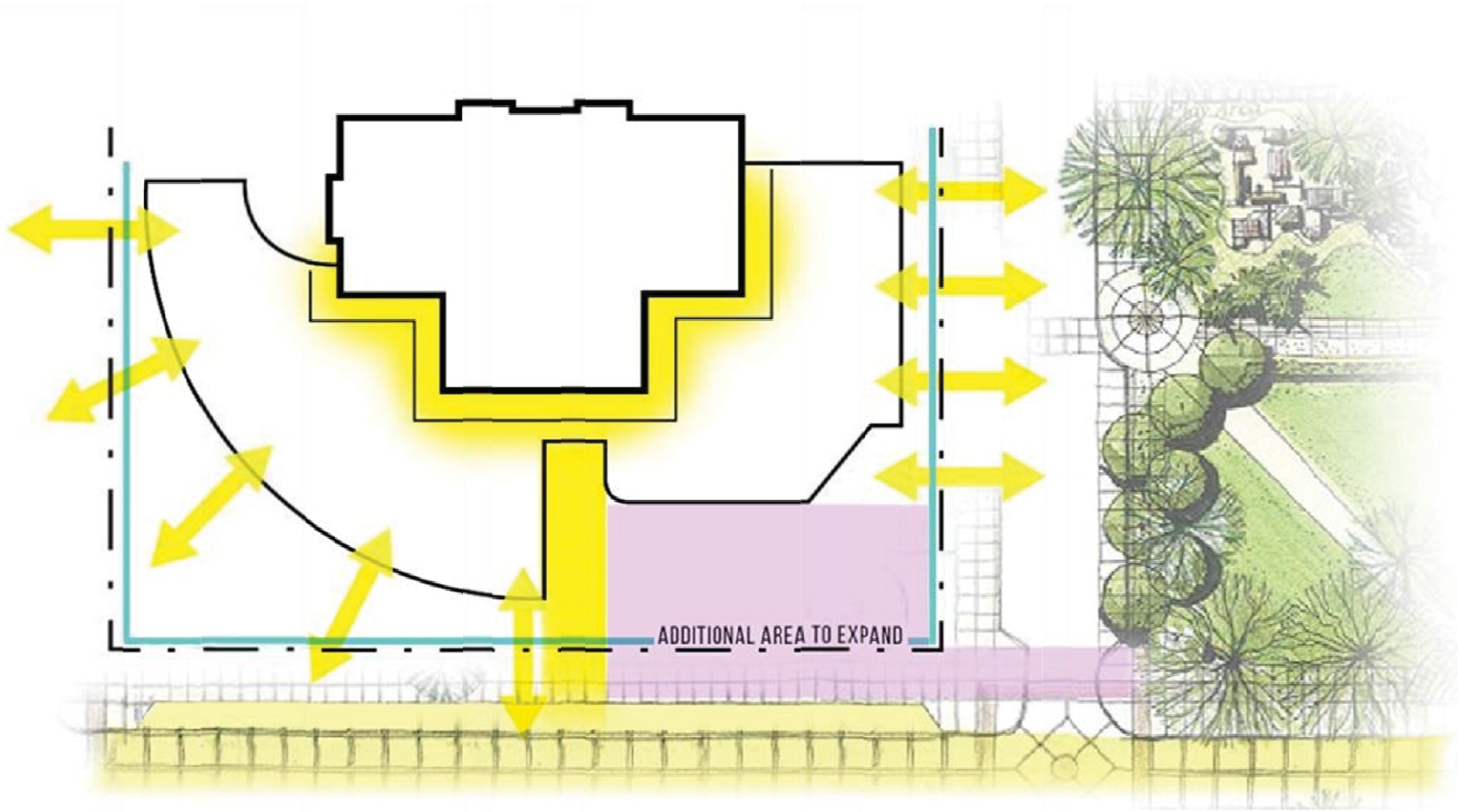


DESIGN APPROACH

CONTEXT

- Phase 1:A – Renovation of Adult Services section of the Library, concentrating on main floor of the Birkert Addition
- Phase 2:A – Renovation and expansion of Youth Room
- Phase 3:A, B – Renovation and expansion of public entrance, lobby, and Circulation Department; renovation of patio

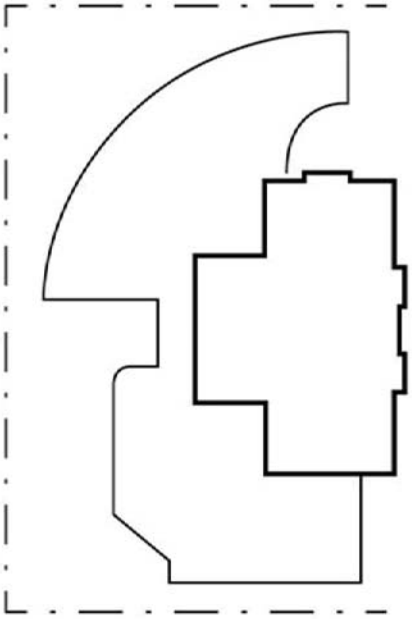



ADDITIONAL AREA TO EXPAND

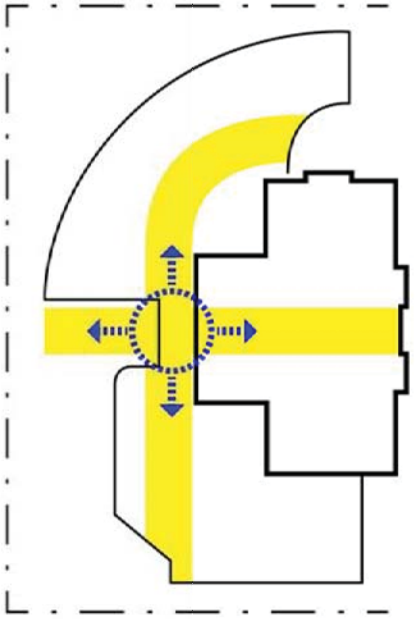
DESIGN APPROACH

FUNCTIONAL DESIGN

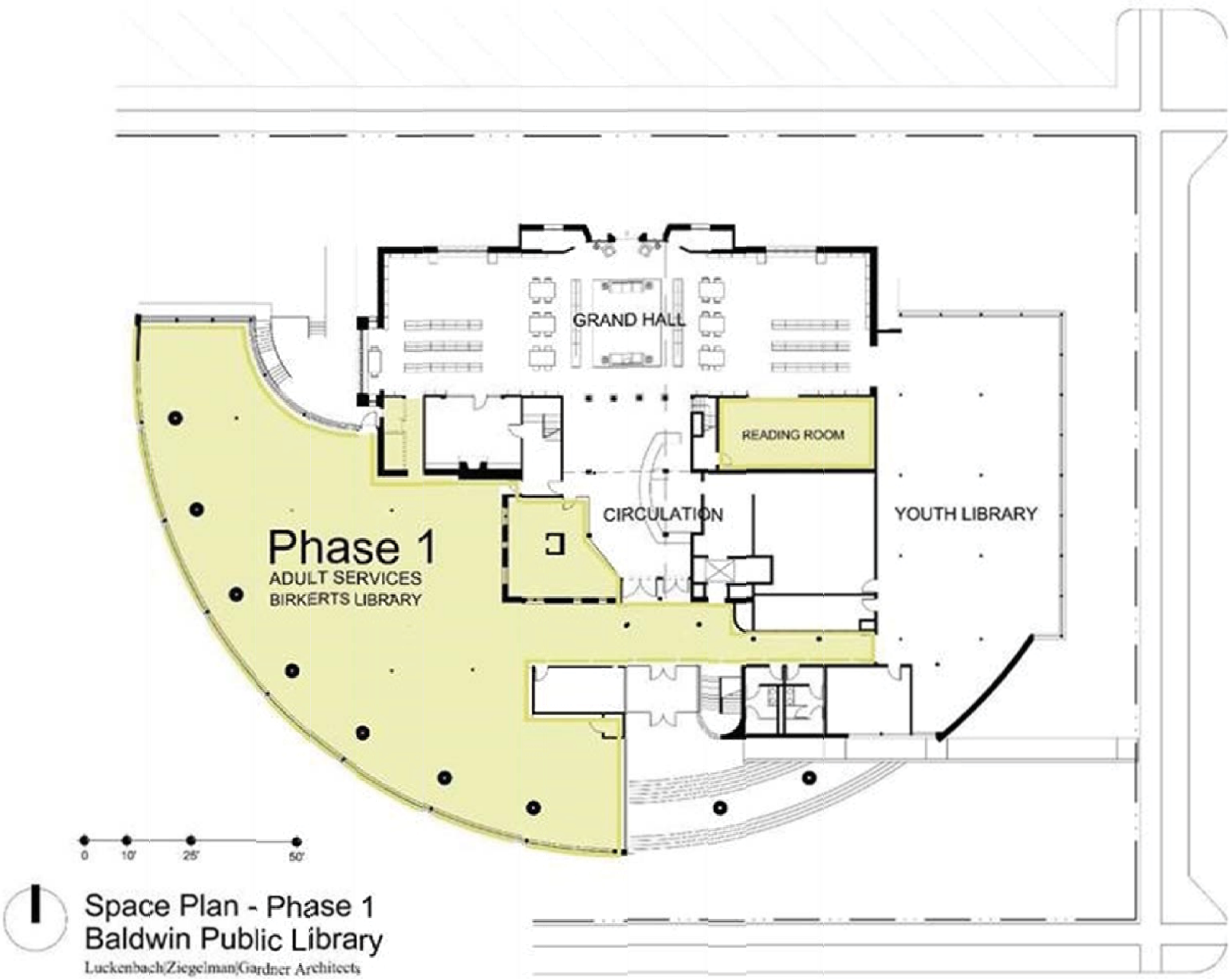
Entry & Exit Circulation



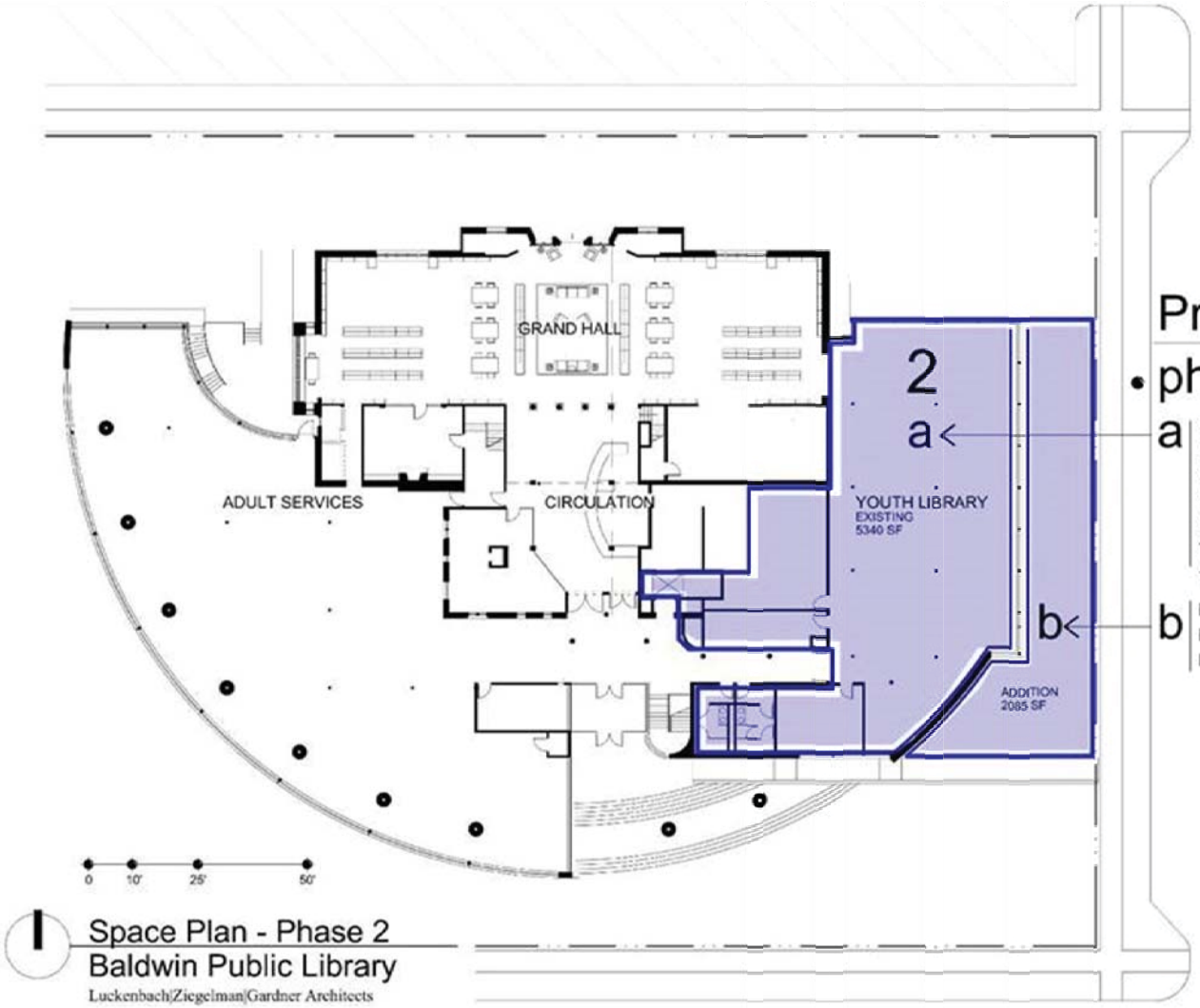
Circulation & Commons



Luckenbach|Ziegelman|Gardner Architects



Space Plan - Phase 1
Baldwin Public Library
Luckenbach|Ziegelman|Gardner Architects



Space Plan - Phase 2
Baldwin Public Library
Luckenbach|Ziegelman|Gardner Architects

Project Scope

- phase 2

a RENOVATION OF EXISTING SPACE:
Lighting/furniture/fixtures, carpeting
Reorganize Youth Department offices
New lighting, furniture, fixtures, carpet
Extend "Main Street" for wayfinding
Toilet room renovation: Tile, partitions & fixtures

b New one level addition
New lighting, furniture, fixtures, carpet
Extend existing HVAC into addition

Space Plan - Phase 3
Baldwin Public Library

Project Scope

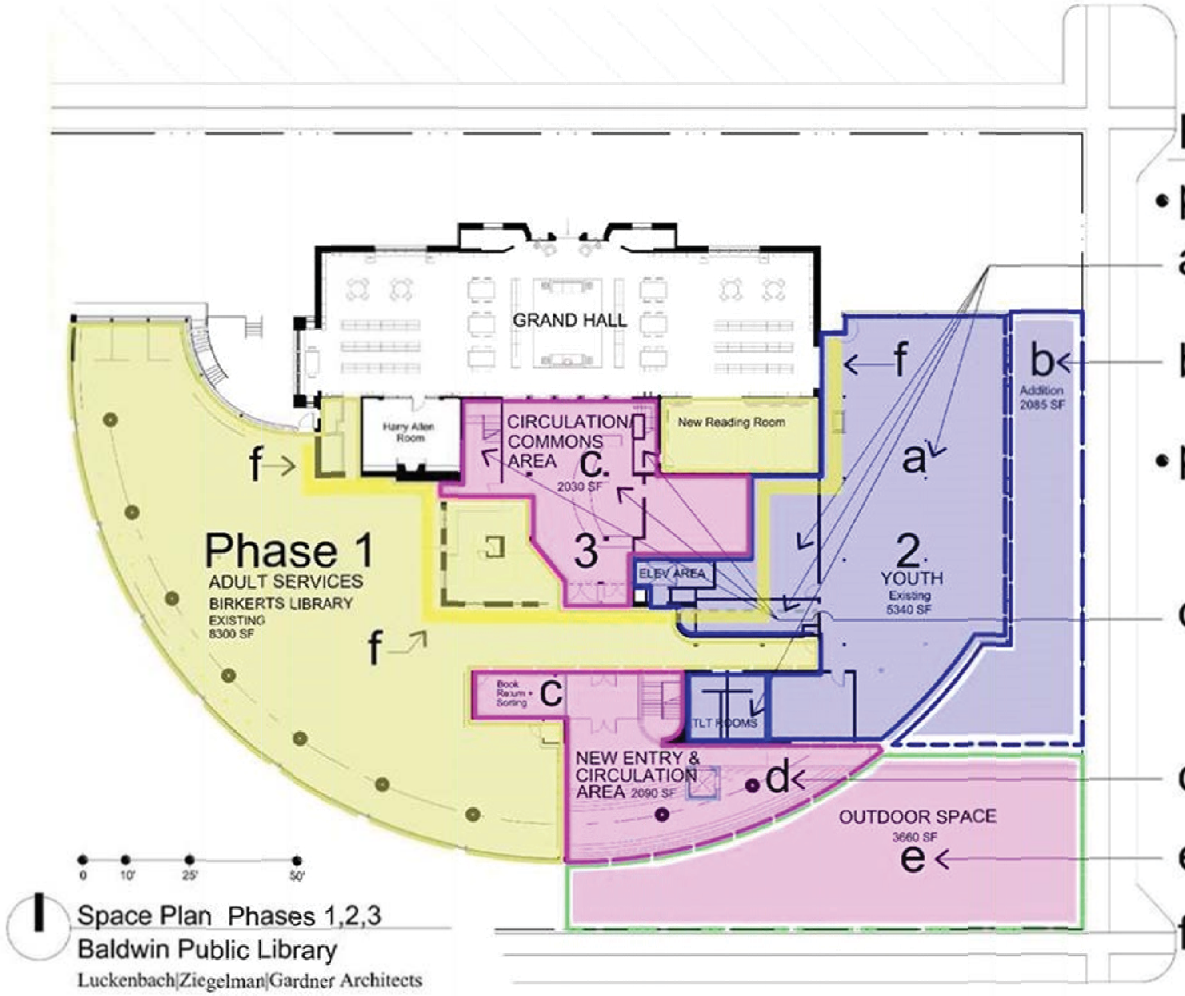
phase 3

c
- Remove existing drop ceiling
- Expose/Restore existing concrete coffer ceiling
- New lighting to match Grand Hall
- New furniture & carpet
- Stairwell renovation: paint, flooring & woodwork
- New cafe

d
- Remove concrete steps
- New stairs up to Level 1 from grade
- New glass elevator
- Remove roof/new skylights
- New glass storefront enclosure
- New circulation desk
- Possible relocation of book return & sorter
- New lighting, HVAC & internet technology

e
- Remove existing concrete walks/slabs
- New pavers (aggregate finish), lighting, landscaping

f
- New skylights between 1927 Library & Birkerts and Youth additions



Space Plan Phases 1,2,3
Baldwin Public Library
Luckenbach|Ziegelman|Gardner Architects

Project Scope

• phase 2

a
- Renovation: Lighting/furniture/carpet (Costs based on Adult Services Phase I)
- Reorganize Youth Dept. Offices/Lighting
- Extend "Main Street"
- Toilet Rooms Renovation: Tile/partitions/fixtures

b
- New one level addition to tie into existing Youth Room
- New modular furniture/new carpet
- HVAC

• phase 3

c
- Remove existing drop ceiling
- Expose existing structural concrete coffer ceiling
- New lighting to match Grand Hall
- New modular furniture/new carpet
- Stairwell renovation: Paint/flooring/woodwork
- Possible relocation of book return & sorter
- New cafe

d
- Remove concrete steps/new steps up to Level 1 from grade & flooring
- New elevator (glass)
- Remove existing roof/add new skylights
- New glass "storefront" enclosure & entry (new ftgs. below)
- Possible relocation of book return & sorter
- New circulation desk
- New electrical/lighting/HVAC/internet technology

e
- Remove existing concrete walks/slabs
- New pavers (aggregate finish)
- New exterior lighting/landscaping/landscape lighting

f
- Skylights between 1927 Building, Birkerts Addition & Smith Addition

Appendix B

Costs of Long-Range Building Vision – Phases 1, 2, and 3

	In 2016 Dollars	In 2016-2022 Dollars
Phase 1: Construction begins in 2016	$2,218,172	$2,218,172
Phase 2: Construction begins in 2019*	1,882,157	2,117,170
Phase 3: Construction begins in 2022*	1,643,922	2,080,086
Total	**$5,744,251**	**$6,415,428**

* Assumes 4% annual cost escalator

Phase 2 is valued in 2019 dollars

Phase 3 is valued in 2022 dollars

Costs of Long-Range Building Vision – Phases 2 and 3 Alone

	In 2016 Dollars	In 2016-2022 Dollars
Phase 2: Construction begins in 2019*	$1,882,157	$2,117,170
Phase 3: Construction begins in 2022*	1,643,922	2,080,086
Total	**$3,526,079**	**$4,197,256**

* Assumes 4% annual cost escalator

Phase 2 is valued in 2019 dollars

Phase 3 is valued in 2022 dollars

Appendix C

Long-Range Building Vision

Conceptual Budget Summary for Phases 2 and 3

Conceptual Budget Summary

project **Baldwin Public Library - Phases 2 & 3**
date **December 15, 2015**

Project Scope

Phase 2*

Scope	Name	SF	$/SF	Budget Cost
A	Children's Library Existing	5,340	192.00	$ 1,025,280
B	Children's Library Addition	2,085	350.00	729,750
Phase 2 Subtotal		7,425		$ 1,755,030

Phase 3*

Scope	Name	SF	$/SF	Budget Cost
C	Circulation/Commons Area	2,030	141.00	$ 286,230
D	New Entry/Circulation Area	2,090	465.00	971,850
Phase 3 Building Subtotal		4,120		$ 1,258,080
E	Outdoor Space**	3,660	41.00	150,060
Phase 3 Building & Outdoor Space Subtotal		7,780		$ 1,408,140
Building Renovation/Addition Total		11,545		$ 3,013,110
Outdoor Space		3,660		150,060
Total		15,205		$ 3,163,170

*Budget cost $/SF provided by Frank Rewold & Son (FR&S), General Contractors, Rochester, Michigan. Included in this construction estimate are general conditions, architectural services, engineering services, consultants, and construction phasing based on Phase 1 cost estimate for Phase 1 scope, furniture and fixtures, contractor's contingency of 10%, and construction management fee.

** Estimate for demo, hardscaping, and landscaping, including use of aggregate finish. If granite pavers are desired in order to make the area emulate the quality of Shain Park, the cost rises to $165/SF, or $603,900 total.

(Continued on next page)

Conceptual Costs Estimate Adjustments and Commentary

Scope	Comments	Budget Cost
Phases 2&3	FR&S estimate based on square footage costs for Phase1 & recent similar work for construction scope and types similar to those as described by LZG. *See note above regarding FR&S conceptual estimate of budget cost inclusions	$ 3,163,170
Supplemental Engineering Services/fees	Basic engineering costs are included in FR&S estimate above. Supplemental fees may be incurred for the building additions in Phase 2 and the building enclosure in Phase 3D (new entry), which will require more structural engineering analysis / work, mechanical engineering analysis / work for HVAC & electrical & lighting systems. This adds to budget for engineering fees	45,000
Skylights	Add	120,000
Lib Consultant	Add	30,000
Subtotal		$ 3,358,170
Owner's Contingency	Add 5% (Note: This is on top of the 10% contractor's contingency included above.)	167,909
Total		**$ 3,526,079**

City of Birmingham
A Walkable Community

MEMORANDUM

Fire Department

DATE: **January 16, 2016**

TO: **Joseph A. Valentine, City Manager**

FROM: **John Connaughton, Fire Chief**

SUBJECT: **2016 Long Range Planning – Chesterfield Fire Station**

The Chesterfield Fire Station was built in 1955 and has been in operation for the past sixty years. Through years of degradation of building materials due to weather and age along with building support/utility systems such as heating/cooling, electrical and plumbing performing beyond their intended functional lifespan it has become imperative that a replacement fire station be built.

The building has had to have extensive roof repairs to stop leaks, a steel column was installed on the apparatus bay to support a sagging ceiling, cement support columns on the front of the building have been wrapped to prevent falling debris. The bay doors were not designed to support the newer, larger fire trucks; exiting trucks have only inches on both sides. An Aerial truck cannot be housed at the station due to the apparatus bay being too small.

Funds have been budgeted over the past several years to cover the cost of a new fire station; no additional funds would be required. Once the station is closed for demolition, response personnel from Chesterfield Station would be temporarily relocated to the Adams Fire Station. Chesterfield personnel will respond from Adams Station to incidents in the Chesterfield response district. Our goal is to move them back into Chesterfield Station as soon as possible.

In July, 2015 a Request for Proposal (RFP) was submitted to Michigan Inter-Governmental Trade Network (MITN) accepting sealed bid proposals from qualified professional firms to provide full architectural design services. In late July we conducted a mandatory pre-bid meeting at the Chesterfield Fire Station, 17 firms attended. In August, all sealed bids were opened, and an evaluation committee reviewed and rated six proposals. The two top rated firms were brought in for additional questions, and Sidock Group Inc. were awarded the contract. We have been working with the Architectural Review Committee and the Planning Board to design a floor plan that meets the operational needs of the fire department and has an exterior design that meets the high standards expected in the City of Birmingham.

The Fire Department will be presenting a brief Power Point presentation during the 2016 Long Range Planning meeting. The presentation will offer an opportunity for the Commissioners to ask questions.

2016 LONG RANGE PLANNING

CHESTERFIELD FIRE STATION

OPERATIONAL NEEDS ASSESSMENT

- Larger Apparatus Bay
- Men/Women bathrooms
- Men/Women Locker Rooms
- Communication/Work Room
- Initially housing two Firefighters, with opportunity for future growth

ANTICIPATED PROJECT SCHEDULE

- Award Architectural Service Agreement August,2015
- Presentation of Site Plan to Planning Board Review October, 2015
- Presentation of Site Plan to Architectural Review Committee December,2015
- Presentation of Site Plan to Planning Board Review January, 2016
- Presentation of Site Plan to City Commission January, 2016

ANTICIPATED PROJECT SCHEDULE – NEXT STEPS

- Construction Document Completion
- Bid Station Demolition/Construction
- Award Demolition/Construction Contract
- Construction Completion Goal August, 2017

QUESTIONS

City of Birmingham
A Walkable Community

MEMORANDUM

Birmingham Historical Museum & Park

DATE: **December 23, 2015**

TO: **Joe Valentine, City Manager**

FROM: **Leslie Pielack, Museum Director**

SUBJECT: **Museum Long Range Planning Report**

Since 2013, the Museum has been implementing a three year (2013-2016) Strategic Plan that was developed to help re-position the Museum to enhance its service to the community and improve its long term sustainability. During this period, museums in general have been undergoing change, driven by dramatic advances in technology, economic pressure and new audiences with different expectations.

We are pleased that the Plan's implementation has led to successful outcomes in this regard. We have increased and broadened our audience, improved our collections storage and received historically valuable materials, such as our rare CREEM Magazine collection. We have strengthened our support and collaboration with other cultural institutions and with the Baldwin Public Library. We have successfully raised private donations and have been the recipient of grant funding to help preserve and integrate historical artifacts in the community, such as with the Hill School Bell Preservation Project.

During 2016, the Museum will be implementing the objectives of the final year of the current plan, with particular emphasis on the following key areas:

- Continuing an exploration of re-branding and effective marketing strategies
- Utilizing opportunities for making the park area more user-friendly
- Exploring the integration of technology for enhanced service and to provide educational content and interpretation, both in the park and in the buildings
- Consolidating and increasing efficiency with collections maintenance and storage
- Broadening use of site and online resources to reach a wider audience more efficiently
- Continuing meaningful integration of programming with schools and youth
- Exploring opportunities for innovative collaboration with other cultural institutions to bring engaging content to the public

This coming year, the Museum will also be reviewing and revising the existing Strategic Plan to prepare for 2017-2020. As the Plan develops for the next three year period, we will continue to keep you advised.

Respectfully submitted,

Leslie Pielack
Museum Director

City of Birmingham

Birmingham Historical Museum & Park

2013-2016 Strategic Plan

2013-2016 STRATEGIC PLAN

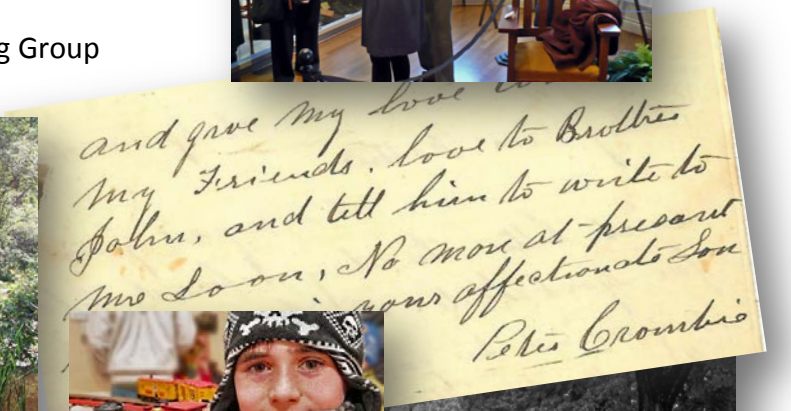
APPROVALS

Museum Board: February 9, 2013
City Commission: April 22, 2013

CONTRIBUTORS

Museum Director: Leslie Pielack
Museum Assistant: Connie Locker
Museum Board Members: Russell Dixon, Marty Logue, Gretchen Maricak, Andrew McMechan, George Stern, Jeff Wilmot
Museum Friends Board and President, Catherine Tuczek
Strategic Planning Consultant, Marilyn Opdyke, Opdyke Consulting Group









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EXECUTIVE SUMMARY

BACKGROUND AND PROCESS: In 2008, the Birmingham Historical Museum & Park adopted a strategic plan for the period of 2008-2013. It was created as a reflection of the prevailing favorable economic conditions, museum needs, and focus group input. However, during the past five year period, a challenging economy resulted in significant changes to the museum's funding and operations. In addition, an in-depth study was undertaken to assess the museum's collection stewardship (the American Alliance of Museums/Institute of Museum & Library Services Museum Assessment Program, or MAP) and to make recommendations for enhanced collections care. A complete report was provided to the museum in July of 2012.

Accordingly, a comprehensive review and revision of the expiring strategic plan was deemed necessary, and the target time period for the new plan was shortened from five to three years. The Museum Board engaged a consultant to help guide the museum through the process to assure the most efficient and complete bottom-up approach, and to integrate a wide variety of input in the new plan. These included an electronic survey, facilitated focus groups (local cultural organizations, commercial/retail business interests, and schools, families and churches), an open public meeting, and a two-part retreat of major stakeholders composed of city officials, the Museum Board, museum staff, Friends of the Birmingham Historical Museum & Park, and the Baldwin Public Library director.

The resulting 2013-2016 Birmingham Historical Museum & Park Strategic Plan represents this broad effort to respond to community expectations, professional museum standards, the current and anticipated economic climate, and the museum's organizational needs now and in the future.

MISSION AND VALUE: The Birmingham Historical Museum and Park is a unique cultural asset that connects us to our past and brings value to our present and future. Its mission is to foster a greater appreciation and understanding of the Birmingham area's unique heritage by collecting, preserving, cataloguing and exhibiting cultural material relevant to Birmingham's story, and by providing engaging and entertaining educational experiences that promote this story to visitors of all ages.

GOALS: The goals of the strategic plan as identified by planning participants fall into two groups, as follows:

Mission-Related Goals

- Enhance community access, appeal, and engagement, resulting in increased utilization of BHMP and broader appreciation for its cultural contribution to the region (Goal I, p. 6).
- Provide stewardship and management of the museum's collection of artifacts, archives, and buildings, in accordance with established professional museum practice (Goal II, p. 9).

Infrastructure/ Support Goals

- Assure financial stability and sustainability and increase the capacity of BHMP to serve its mission through enhanced fundraising, board development, leveraging relationships and volunteers (Goal III, p.12).
- Define a unified message and marketing plan by using a variety of marketing media to further develop the museum's brand and to increase awareness, interest, and attendance (Goal IV, p. 14).

The Museum Board has the role and responsibility of planning, implementing, and providing oversight of the Birmingham Historical Museum & Park's Strategic Plan.

DEFINITIONS: The following definitions apply to this outline.

Goals: Goals in this plan state where the organization will focus its energies over a defined time frame. They can be short or long term in nature, depending on the decision of the group. Goals are not necessarily directly measurable but provide a broad view or concept of the priorities established by the organization.

Objectives: Objectives in this plan are shorter-term milestones that support the individual goals. Each goal should have at least two objectives that will tangibly move the organization toward reaching that goal. Objectives are concrete, measurable and focused on results.

Strategies: Strategies in this plan are specific actions or steps that lead to the accomplishment of the objectives. They are action-oriented, short-term, and include the specific "what, by when and by whom," components.

Team Leaders: Those individuals or small teams charged with a coordinating role, keeping the focus of a particular goal on track.

Goal I: Enhance community access, appeal, and engagement, resulting in increased utilization of BHMP and broader appreciation for its cultural contribution to the region.

- More actively engage the community through programs, events, and other activities
- Create a sense of "place" through experiences, amenities and utilization of the grounds
- Enhance utilization of the buildings and the collection
- Enhance utilization of the park and outdoor space

Goal Team Leaders: Leslie Pielack, Museum Director; Catherine Tuczek, Museum Friends Board

OPPORTUNTIES

Currently,

- BHMP is viewed as a well kept secret
- The museum has limited appeal to our target audiences

We believe we can improve the appeal to current audiences, engage new audiences and increase visitation and participation in the experiences we offer.

THREATS

- Our current vague image in the community
- Limitations in funding, staffing and open hours
- The challenges presented by our location and signage limitations
- The perception that we are not exciting or visitor friendly

If we do not improve our engagement with the community, we run the risk of becoming irrelevant and losing the opportunity to enrich the quality of life in this region. **Our successful attainment of this goal will be evidenced by** an increase in awareness of the museum's role; an increase in attendance at the museum buildings, park, events, and online; and increased collaboration with local cultural institutions and the business community.

Goal I (con't):

Objective A: Develop and implement strategies and programs that actively engage the community and make history and heritage more relevant in their lives

A.1 Coordinate annual on site local-history based school tours to meet current school objectives through the Birmingham Public Schools Curriculum Coordinator
A.2. Meet quarterly with other cultural organizations to share ideas, develop a cultural calendar for Birmingham and to partner on events and programs
A.3 Enhance our web presence and utilize technology to engage more actively with visitors
A.4 Explore the possibility of taking interpretive exhibits to the schools/out to the public
A.5 Develop an annual "signature event" that draws people to the museum
A.6 Develop at least one partnership event with the Principal Shopping District each year
A.7 Explore collaborative approaches with Baldwin Library to document and interpret its historic artifacts

Objective B: Establish the museum and park as a valued destination and place to encourage community connectivity

B.1 Explore the feasibility of opening the buildings for public and private events or meetings on a restricted basis
B.2 Make Wi-Fi available in the park and buildings

Objective C: Develop an interpretive plan for both buildings. Enhance utilization of the collection by engaging in dynamic and changing events, activities, programs and exhibits that keep an historical context but draw in more people and encourage returning visitation.

C.1 Better define our core products at the buildings
C.2 Clarify our key target audiences
C.3 For each target audience brainstorm and develop at least one new event, exhibit or program (on site at the museum, or that can be taken to the audience at their location)
C.4 Enhance exhibits through use of technology and hands-on/dynamic interactive opportunities
C.5 Enhance signage and exterior appeal

Goal I (con't):

Objective D: Develop and implement an interpretive plan for the park. Better utilize the park to share local heritage, engage visitors, connect them to the museum site, and keep them coming back.

- **D.1** Better define our "products" for the park, in conjunction with Parks Dept. staff
- **D.2** Enhance the outdoor space and grounds; improve seating and add Wi-Fi
- **D.3** Connect to the Rouge River Trail with a resting stop and interpretive information
- **D.4** Provide information in the park that increases awareness of the museum buildings and site
- **D.5** Explore the feasibility of utilizing the park as an event or music venue

Goal II: Provide stewardship and management of the museum's collection of artifacts, archives, and buildings, in accordance with established professional museum practice.

This goal is necessary to preserve the tangible objects in the museum collection for the future and make them more available through exhibits and other forms of access by the community. It will enable more comprehensive and engaging opportunities to connect to Birmingham with its history.

Goal Team Leaders: Leslie Pielack, Museum Director; Connie Locker, Museum Assistant; Catherine Tuczek, Museum Friends Board

OPPORTUNITIES

These issues were identified as top priorities in the Museum Assessment Program (MAP) report shared with the Museum Board in July, 2012. **Currently**, the museum is challenged by the following:

- Inadequate staffing and supplies; lack of effective and appropriate storage for artifacts and archives (e.g., cataloguing an individual item takes 2.5 hours on average; storage is not archival grade or leaves materials vulnerable to risk)
- Incomplete or absent written policies and procedures and ineffective climate and environmental control for the collection
- Incomplete/inaccurate collection records, incomplete digitization, and ineffective organization of the collection that limit utilization and access by staff, researchers, and the general public
- The presence of inappropriate or unnecessary objects in the collection that do not support the mission require professional care but drain needed resources that are needed for the rest of the collection.

We believe that with increased resources, we can improve the overall care of our artifacts through improving our records, storage, and organization, while simultaneously digitizing the collection, making it easier to use and access. Proper safe storage and implementation of protective policies will help ensure the collection will be preserved for the future.

THREATS

- Limited funding for paid professional personnel and museum-grade equipment
- The needs of the collection are not well understood outside the museum staff

If we do not implement changes, the collection will continue to be at risk of environmental damage and irreversible deterioration, misplacement, inaccessibility, or will be rendered otherwise unusable, resulting in the irreplaceable loss of the museum's most valuable assets. **Our successful attainment of this goal will be evidenced by** the reduction of lost, damaged, misplaced, or inaccessible items; an increase in the number of collection items that are safely and properly stored; and improved documentation permitting wider physical and digital access.

Goal II (con't):

Objective A: Improve storage organization and environmental controls

A.1 Create a storage organization plan based on assessment of the current collection's needs and the available space and storage furniture/supplies
A.2 Assess environmental conditions and develop a plan to improve or correct deficits

Objective B: Improve efficiency, accuracy, and accessibility of object records and documentation

B.1 Develop and implement a plan for correction, completion, and updating of existing object records and objects waiting for accession (the formal process to accept objects into a museum collection)
B.2 Create digital and hard files of object records and develop/enhance finding aids
B.3 De-accession inappropriate or unnecessary objects in accordance with museum standards and revised museum accession policy and procedures
B.4 Create digital images of collection items for purposes of documentation and access

Objective C: Develop and implement collections-related policies and procedures for collections management, future acquisitions, de-accessioning, disaster preparedness, the museum's hands-on/use collection, building maintenance, and other collections-related policies and procedures in accordance with accepted museum standards

C.1 Create appropriate written policies and procedures manuals
C.2 Integrate policies and procedures with other relevant city departments
C.3 Develop methods for orienting staff and volunteers to pertinent policies and procedures
C.4 Review policies and procedures on an annual basis and revise as needed

Objective D: Provide increased digital access through exploring online or other virtual exhibit/access options

D.1 Develop a virtual exhibit and digital access plan that reflects current museum practices and standards, and reflects the needs of the museum collection and its users and visitors
D.2 Explore and implement web and other information technology options for improved access

Goal II (con't):

Objective E: Seek professional training opportunities for museum staff to provide ongoing collection management skills development and effectiveness

E.1 Identify training opportunities for paid and unpaid staff to enhance collections care
E.2 Provide opportunities for paid and unpaid staff to attend up to two professional programs per year

Goal III: Assure financial stability and sustainability and increase the capacity of BHMP to serve its mission through enhanced fundraising, board development, leveraging relationships and volunteers.

Goal Team Leaders: Leslie Pielack, Museum Executive Director; Connie Locker, Museum Assistant; George Stern, Museum Board Member; Catherine Tuczek, Museum Friends Board Chair

OPPORTUNITIES

Currently,

- BHMP receives approximately 70% of its funding from the city and 30% from donations, grants and other revenue sources, largely made possibly by the work of the Friends of the Birmingham Historical Museum & Park
- City funding has decreased each year since 2009
- Staffing has been reduced from 1 full time Director and 2 part time professionals with paid summer professional interns to 1 part time Director and 1 part time professional

We believe we can increase our fundraising efforts and better leverage our board members, volunteers and partner organizations to increase our ability to serve our mission.

THREATS

- Lack of staff to effectively supervise/ manage volunteers
- Lack of stable/sustainable funding sources
- Continued limited city funding
- Volunteer attrition

If we do not take action on this goal, we severely limit our ability to effectively manage the collection and further engage the public in meaningful ways. It will also impact the number and frequency of exhibits and programs we can offer and limit our ability to implement this strategic plan. **Successful attainment of this goal will be evidenced by** a manageable budget combining both city and outside funding sources; an increase in donations and bequests to the Friends of the Birmingham Historical Museum & Park; an increase in donations to the museum's endowment; and an effective and sustainable board development and volunteer program.

Goal III (con't):

Objective A: As a collaborative effort of the Museum Board and Museum Friends develop a comprehensive fundraising plan for the BHMP (including a "case statement" clarifying the what and why of giving) that increases contributions to both operations and the endowment fund

A.1 Develop and implement a strategy for increasing planned giving and bequests
A.2 Develop and implement a strategy for attracting large/major donor contributions
A.3 Host at least one major fundraising event per year
A.4 Develop and implement strategies for increasing membership in the Friends to broaden the base from which to enhance annual giving

Objective B: Engage in Board Development by clarifying expectations and further developing the skills of the Museum Board and seeking new members with complementary skills

B.1 Develop position descriptions and clarify expectations, responsibilities, and authorities
B.2 Evaluate needed skills, identify opportunities, and develop a plan for identifying appropriate potential Museum Board candidates
B.3 Create a board development plan including workshops, training programs, etc., for skills refinement including fund raising and effectively leveraging relationships
B.4 Collaborate and delineate the respective roles of the Friends and the Museum Board

Objective C: Increase the personnel capacity of the organization by increasing professional staffing, leveraging volunteers, and utilizing partner organizations to help staff specific events, exhibits or programs

C.1 Evaluate skills, expertise, and specific roles needed for effective and efficient operations
C.2 Increase paid professional staff and hours as appropriate
C.3 Develop a comprehensive volunteer program that incorporates job descriptions, organizational structure, recruiting and training plans and on-going management of volunteers

Objective D: Initiate a grant-writing effort in conjunction with the Friends to identify key opportunities for collaboration, and develop an account to provide potential matching funds for increased leverage

Goal IV: Define a unified message and marketing plan by using a variety of marketing media to further develop the museum's brand and to increase awareness, interest, and attendance.

Goal Team Leaders: Russ Dixon, Museum Board; Connie Locker, Museum Assistant

OPPORTUNITIES

Currently, BHMP faces several challenges that limit its ability to locate and connect with its audiences, such as:

- lacking a unified message and a recognizable brand
- being under-marketed
- having limited staff resources to build and maintain the museum's presence in the community
- having poor signage that contributes to confusion regarding the museum's location and hours of operation
- not having on-site parking

We believe we can improve the current environment by developing and clarifying our message and to increase awareness of the museum and its services to a wider audience.

THREATS

- lack of expertise and financial resources
- competition with other local organizations for patronage of events and programs
- lack of a local central advertising mechanism to get the word out to the community

If we do not take action on these issues, our exhibits, events, and programs will continue to be under attended, and the community will be unable to take full advantage of everything the museum has to offer to enhance quality of life. Important opportunities for community engagement will be missed. Without proactive change, the disconnection between the greater community and the Museum will increase over time, making improvement even more difficult in the future. **Successful attainment of this goal will be evidenced by** a clearly recognized brand for Birmingham Historical Museum & Park; improved image; increased media and communications coverage; increased attendance at the museum, online, at events, and in the park; and an increased understanding of Birmingham's history and heritage.

Goal IV (con't):

Objective A: Identify and utilize free and low-cost marketing resources maintained by specific target audiences, such as city publications, local schools, senior groups, and other community organizations.

Objective B: Identify our key audiences and explore and enhance the image the museum presents to the public through independent and collaborative projects and partnerships that strengthen our ties to the community

Objective C: Develop a Marketing Plan to clarify the museum's message and brand, utilizing survey data, innovative marketing strategies, low cost resources and micro-marketing concepts.

STRATEGIC PLAN TRACKING

This instrument is a tool to aid in the development and tracking of the strategies needed to assure effective and timely achievement of the strategic goals and objectives at the Birmingham Historical Museum and Park. It documents those goals and objectives and the specific strategies to be carried out to achieve each objective. In some cases the strategy may have additional activities or tasks identified and assigned. The combination of the strategies identified under each objective should create a comprehensive approach to achieving that objective.

The goals and objectives documented in this Strategic Plan were identified by key stakeholders and staff and are divided into Mission-Related Goals – those that directly support the mission - and Infrastructure or Support Goals – those that are necessary to assure the viability of the organization and the support of the program goals and activities.

The tracking tool can be used to guide activities as well as to evaluate the effectiveness of the Strategic Plan. Strategic planning is meant to be fluid and dynamic, and ongoing review of the Strategic Plan helps ensure that it accurately reflects the changing needs of the organization.

Goal I: *Enhance community access, appeal, and engagement, resulting in increased utilization of BHMP and broader appreciation for its cultural contribution to the region.*

Objective A: Develop and implement strategies and programs that actively engage the community and make history and heritage more relevant in their lives

A.1 Coordinate annual on site local-history based school tours with current school objectives with Birmingham Public Schools.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
A.1.a Coordinate curriculum goals to meet planned exhibit(s) and collection, in cooperation with Birmingham Public Schools Curriculum Coordinator.	Museum Staff	Annually in March for May-June tours	Provide content consistent with 50% or more of required local history/social studies components	Personnel; standard curriculum requirements	BPS Curriculum Coordinator	**Complete**
A.1.b Develop annual tour schedule, policies and procedures and coordinate with Birmingham Public Schools Curriculum Coordinator.	Museum Staff	Annually in March for May-June tours	Scheduling complete and approved by BPS	Personnel	BPS Curriculum Coordinator/ school personnel	**Complete**
A.1.c Develop staffing pattern, provide training/orientation and acquire needed supplies/objects/displays.	Museum Staff	Annually, prior to May	Completion	Personnel; funds for supplies	n/a	**Ongoing**

<u>Goal I:</u> *Enhance community access, appeal, and engagement, resulting in increased utilization of BHMP and broader appreciation for its cultural contribution to the region.*

Objective A: Develop and implement strategies and programs that actively engage the community and make history and heritage more relevant in their lives.

A.2 Meet quarterly with other cultural organizations to share ideas, partner on events and programs, and explore development of a cultural calendar for the Birmingham community.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
A.2.a Identify potential partners in local cultural organizations/service clubs; contact and explore meeting opportunities.	Museum Staff	12 mos.	Completion	Personnel; meeting space	Other local cultural organizations	**Ongoing**
A.2.b Identify potential events, focusing on mission and/or museum collection, for partnership **(see also Goal III, Objective.D.3).**	Museum Staff	Year 2; 2014/15, ongoing	Hold 1 event per year with another local cultural organization.	Personnel	Other local cultural organizations	**Ongoing**
A.2.c Explore contributing to and/or participating in a cultural calendar for the Birmingham community.	Museum Staff	Year 2; 2014/15, ongoing		Personnel	Other local cultural organizations	**Ongoing**

Goal I: *Enhance community access, appeal, and engagement, resulting in increased utilization of BHMP and broader appreciation for its cultural contribution to the region.*

Objective A: Develop and implement strategies and programs that actively engage the community and make history and heritage more relevant in their lives.

A.3 Enhance our web presence and utilize technology to engage more actively with visitors.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
A.3.a Analyze/assess web needs and explore options in conjunction with Strategic Plan objectives and current museum web products and applications.	Museum Staff	Year 2; 2014/15	Data collected and analyzed	Personnel	City IT Dept Staff	**Ongoing**
A.3.b Explore technology opportunities for visitor appeal and develop plan.	Museum Staff	Year 2; 2014/15	Plan complete and approved by Museum Board	Personnel; possible museum web/technology consultant	City IT Dept Staff	**Ongoing**
A.3.c Implement plan and collect data for evaluation of effectiveness.	Museum Staff	Year 2; 2014/15; ongoing	Completion; maintain data collection for evaluation	Personnel; possible museum web/technology consultant	City IT Dept Staff	**Ongoing**

Goal I: *Enhance community access, appeal, and engagement, resulting in increased utilization of BHMP and broader appreciation for its cultural contribution to the region.*

Objective A: Develop and implement strategies and programs that actively engage the community and make history and heritage more relevant in their lives.

A.4 Explore the possibility of taking interpretive exhibits to the schools/out to the public.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
A.4.a Explore and assess applicable school curriculum and identify educational objectives for elementary and secondary students in conjunction with Birmingham Public Schools Curriculum Coordinator; develop plan for portable exhibits in accordance with museum standards and collection.	Museum Staff	Year 3; 2015/16	Completion and Museum Board approval	Personnel; TBD	TBD	**75% Complete**
A.4.b Explore and assess feasibility of off-site, temporary/portable exhibits for the general public; develop plan in accordance with museum standards and collection.	Museum Staff	Year 3; 2015/16	Completion and Museum Board approval	Personnel; TBD	TBD	**50% Complete**

<u>Goal I:</u> *Enhance community access, appeal, and engagement, resulting in increased utilization of BHMP and broader appreciation for its cultural contribution to the region.*

Objective A: Develop and implement strategies and programs that actively engage the community and make history and heritage more relevant in their lives.

A.5 Develop an annual "signature event" that draws people to the museum.
A.6 Develop at least one partnership event with the Principal Shopping District each year.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
A.5.a Explore feasibility for an annual on site "signature event" that enhances museum's role and appeal.	Museum Staff	12 mos.;	Completion	Personnel, comparative data/information on other local events	Museum Board, Friends	**Ongoing**
A.6.a Meet with Principal Shopping District staff to explore collaborative event options that enhance museum's role and appeal.	Museum Staff	12 mos.; ongoing	Completion	Personnel	TBD	**Ongoing**
A.5.b/A.6.b Develop event plan, including staffing & promotion components.	Museum Staff	Year 2; 2014/15	Completion; Museum Board approval	Personnel	TBD	**Ongoing**
A.5.c/A.6.c Hold event and collect data on effectiveness for future planning.	Museum Staff	Year 3; 2015/16	Survey data and event review.	Personnel	TBD	**Ongoing**

<u>Goal I:</u> *Enhance community access, appeal, and engagement, resulting in increased utilization of BHMP and broader appreciation for its cultural contribution to the region.*

Objective A: Develop and implement strategies and programs that actively engage the community and make history and heritage more relevant in their lives.

A.7 Explore collaborative approaches with Baldwin Library to document and interpret its historic artifacts.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
A.7.a Meet with library staff to determine needs and develop appropriate approach.	Museum Staff	Year 2; 2014/15	Completion	Personnel	Library staff	**Ongoing**
A.7.b Devise plan for inventory and documentation and information sharing.	Museum Staff	Year 2; 2014/15	Completion and appropriate approvals within each organization	TBD	Library staff	**Deferred**
A.7.c Develop interpretive plan in collaboration with library staff and needs.	Museum Staff	Year 2; 2014/15	Completion and appropriate approvals within each organization	TBD	Library staff	**Deferred**
A.7.d Explore funding possibilities for plan **(see Goal III.D.3).**	Museum Staff	Year 3; 2015/16	Completion and appropriate approvals within each organization	TBD	Library staff	**Deferred**

Goal I: *Enhance community access, appeal, and engagement, resulting in increased utilization of BHMP and broader appreciation for its cultural contribution to the region.*

Objective B: Establish the museum and park as a valued destination and place to encourage community connectivity

B.1 Explore the feasibility of opening the buildings for public and private events or meetings on a restricted basis.
B.2 Make Wi-Fi available in the park and buildings.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
B.1.a Create/review/explore procedures and policies for Park & Allen/Hunter Houses for public/private use for meetings and events; develop plan **(see I.D.2.e).**	Museum Staff	12 mos.	Completion and Museum Board approval	Personnel	Park staff	**Complete**
B.2.a Expand/develop capacity for Wi-Fi access in buildings and park in conjunction with City IT Dept.	Museum Staff/City IT staff	12 mos./ TBD	Completion	Personnel; funding resources to expand capacity, supplies, equipment	IT/City staff	**75% Complete**
B.1.b Provide information/promote new services to public.	Museum Staff/City	TBD	Hold minimum 1 private & 2 public events/meetings per year	Personnel; funding for banquet supplies, furnishings, & advertising	City staff , local media	**Complete**
B. 2.c Provide for public lobby access & seating at Allen House.	Museum Staff	TBD	Completion	Personnel; funding for furnishings	n/a	**Deferred**

Goal I: *Enhance community access, appeal, and engagement, resulting in increased utilization of BHMP and broader appreciation for its cultural contribution to the region.*

Objective C: Develop an interpretive plan for both buildings. Enhance utilization of the collection by engaging in dynamic and changing events, activities, programs and exhibits that keep an historical context but draw in more people and encourage return visitation.

C.1 Better define our core products at the buildings and develop an interpretive plan.
C.2 Clarify our key target audiences.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
C.1.a /C.2 Develop survey for ongoing collection of data on multiple dimensions-audience, programs, and events.	Museum Staff	6-12 mos.; ongoing	Completion; collection and analysis of data	Personnel	n/a	**50% Complete**
C.1.b Assess/research historical assets-collection, buildings & site; identify interpretive priorities in conjunction with Strategic Plan & museum standards.	Museum Staff	6-12 mos.	Completion	Personnel; museum standards and best practices	n/a	**Ongoing**
C.1.c Develop interpretive plan for permanent exhibits, buildings, and exhibit schedule with priority emphasis.	Museum Staff	12 mos.; ongoing	Completion and Museum Board approval	Personnel; museum standards and best practices	n/a	**Ongoing**
C.1.d/ Develop promotion plan in conjunction with general marketing plan **(IV.C).**	TBD	Year 2, 2014/15	Completion and Museum Board approval	Personnel; funding for possible consultant	TBD	**Deferred**

Goal I: *Enhance community access, appeal, and engagement, resulting in increased utilization of BHMP and broader appreciation for its cultural contribution to the region.*

Objective C: Develop an interpretive plan for both buildings. Enhance utilization of the collection by engaging in dynamic and changing events, activities, programs and exhibits that keep an historical context but draw in more people and encourage return visitation.

C.3 For each target audience brainstorm and develop at least one new event, exhibit or program (on-site at the museum, or that can be taken to the audience at their location).

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
C.3.a Identify primary audiences and explore options and best means for focused approach to exhibits, events or programming, with a prioritized use of collection objects **(see also C.1.a/C.2).**	Museum Staff	Year 2; 2014/15	Completion	Personnel; Survey data; MAP Report; museum standards and best practices	TBD	**Ongoing**
C.3.b Hold meetings with representatives of primary audiences to explore/develop program or event.	Museum Staff	Year 2; 2014/15	Completion; develop at least one special program for each primary audience.	TBD	TBD	**Ongoing**
C.3.c Hold event and gather data for review and future development/revision.	Museum Staff	Year 2; 2014/15; ongoing	Hold at least one special program for each primary audience per year.	TBD	TBD	**Ongoing**

Goal I: *Enhance community access, appeal, and engagement, resulting in increased utilization of BHMP and broader appreciation for its cultural contribution to the region.*

Objective C: Develop an interpretive plan for both buildings. Enhance utilization of the collection by engaging in dynamic and changing events, activities, programs and exhibits that keep an historical context but draw in more people and encourage return visitation.

C.4 Enhance exhibits through use of technology and hands-on/dynamic interactive opportunities.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
C.4.a Explore hands-on & technology-based interactive applications and introduce into changing and permanent exhibits **(See I.A.3).**	Museum Staff	Year 2, 2014/15; ongoing	Include interactive components in changing and permanent exhibits as feasible	Personnel; museum standards and best practices	n/a	**Ongoing**
C.4.b Collect data to use in evaluation and review of interactive strategies.	Museum Staff	Year 2, 2014/15; ongoing	Completion; collect and analyze data	Personnel; TBD	n/a	**Ongoing**

Goal I: *Enhance community access, appeal, and engagement, resulting in increased utilization of BHMP and broader appreciation for its cultural contribution to the region.*

Objective C: Develop an interpretive plan for both buildings. Enhance utilization of the collection by engaging in dynamic and changing events, activities, programs and exhibits that keep an historical context but draw in more people and encourage return visitation.

C.5 Enhance signage and exterior appeal.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
C.5.a Explore various means of using signage and improving exterior appeal, including comparative data from local sites and other resources, site conditions and local ordinances.	Museum Staff/ Museum Board/ Special Committee	12 mos.	Gather data and analyze	Personnel; museum best standards and practices; applicable city ordinance/s	City staff	**Ongoing**
C.5.b Develop and implement plan in conjunction with marketing plan **(see Goal IV.A.B.C.).**	Museum Staff/ Museum Board/ Special Committee	Year 2, 2014/15	Completion and plan approved by Museum Board	Personnel; funds for possible consultant; funds for signage, equipment, etc.	n/a	**Deferred**
C.5.c Evaluate effectiveness and modify as appropriate.	Museum Staff/ Museum Board/ Special Committee	Year 2, 2014/15; ongoing	Completion; review data on ongoing basis	Personnel	n/a	**Deferred**

Goal I: *Enhance community access, appeal, and engagement, resulting in increased utilization of BHMP and broader appreciation for its cultural contribution to the region.*

Objective D: Develop and implement an interpretive plan for the park. Better utilize the park to share local heritage, engage visitors, connect them to the museum site, and encourage return visitation.

D.1 Better define our "products" for the park, in conjunction with Parks Dept. staff.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
D.1.a Develop survey for ongoing collection of data on image, use, and primary audience for park.	Museum Staff	6-12 mos.; ongoing	Completion; collection and analysis of data	Personnel	n/a	**Ongoing**
D.1.b Assess/research park assets (including historic information) & identify interpretive priorities in accordance with museum standards **(See I.C.1.b).**	Museum Staff	Year 2, 2014/15	Completion	Personnel; museum standards and best practices	n/a	**50% Complete**
D.1.c. Develop interpretive plan for park with Parks staff, as appropriate.	Museum Staff	Year 2, 2014/15	Completion and Museum Board approval	Personnel; museum standards and best practices	n/a	**Deferred**
D.1.d/ Develop promotion plan in conjunction with general marketing plan **(IV.C)**.	TBD	Year 2, 2014/15	Completion and Museum Board approval	Personnel; funding for possible consultant	TBD	**Deferred**

Goal I: *Enhance community access, appeal, and engagement, resulting in increased utilization of BHMP and broader appreciation for its cultural contribution to the region.*

Objective D: Develop and implement an interpretive plan for the park. Better utilize the park to share local heritage, engage visitors, connect them to the museum site, and encourage return visitation.

D.2 Enhance the outdoor space and grounds; improve seating and add Wi-FI.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
D.2.a Improve outdoor appeal by adding shaded seating on plaza and Wi-Fi **(see I.B.2).**	Museum Staff	1-3 mos.	Completion	Personnel; funding for furnishings	n/a	**Complete**
D.2.b Develop maintenance program with Parks staff, including control of invasives.	Museum Staff	6-12 mos.	Completion	Personnel	n/a	**Complete**
D.2.c Complete construction of ADA ramp and back porch improvements.	Museum Staff/City Staff	3-6 mos.	Completion	Personnel	n/a	**Complete**
D.2.d Complete design phase for Hill School Bell outdoor protective structure in plaza, including bid process.	Museum Staff/City Staff	3-6 mos.	Architectural drawings complete	Completed concept plan (Russ Dixon).	n/a	**Complete**
D.2.e Develop fund raising plan to complete construction of Hill School Bell structure **(see III.A.1.c).**	Museum Board/ Friends/Special Committee	Year 2, 2014/15	Completion and Museum Board approval	Personnel; TBD	TBD	**Complete**

<u>Goal I:</u> *Enhance community access, appeal, and engagement, resulting in increased utilization of BHMP and broader appreciation for its cultural contribution to the region.*

Objective D: Develop and implement an interpretive plan for the park. Better utilize the park to share local heritage, engage visitors, connect them to the museum site, and encourage return visitation.

D.3 Connect to the Rouge River Trail with a resting stop and interpretive information.
D.4 Provide information in the park that increases awareness of the museum buildings and site.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
D.3.a/D.4.a Develop plan for enhancing park connection to Rouge trail in accordance with park interpretive plan and Parks staff, as appropriate **(See D.1.c).**	Museum Staff/Parks Staff	Year 3, 2015/16	Completion and Museum Board approval	Personnel; Rouge trail plan	n/a	**50% Complete**
D.3.b/D.4.b. Explore, develop & implement plan for providing low-impact access to trail interpretive information, including use of technology, in keeping with museum standards and best practices.	Museum Staff	Year 3, 2015/16	Completion and Museum Board approval	Personnel ; TBD	n/a	**50% Complete**
D.3.c Create visitor seating area and integrate into general park maintenance plan.	Museum Staff/Parks Staff	Year 3, 2015/16	Completion	Personnel; TBD	n/a	**50% Complete**

<u>Goal I:</u> *Enhance community access, appeal, and engagement, resulting in increased utilization of BHMP and broader appreciation for its cultural contribution to the region.*

Objective D: Develop and implement an interpretive plan for the park. Better utilize the park to share local heritage, engage visitors, connect them to the museum site, and encourage return visitation.

D.5 Explore the feasibility of utilizing the park as an event or music venue.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
D.5.a Explore feasibility for use of park/site as a music venue, including research, collecting survey data, and identification of possible collaborative opportunities.	Museum Staff/ Museum Board	Year 2, 2014/15	Completion	Personnel; TBD	Parks Staff, TBD	**Deferred**
D.5.b Develop plan in accordance with other relevant components of Strategic Plan, and in accordance with museum standards as applicable, including policies and procedures. Ensure park assets are protected.	Museum Staff/ Museum Board	Year 2, 2014/15	Completion and approval by Museum Board	Personnel; TBD	TBD	**Deferred**

Goal II: *Provide stewardship and management of the museum's collection of artifacts, archives, and buildings, in accordance with established professional museum practice.*

Objective A: Improve storage organization and environmental controls.

A.1 Create a storage organization plan based on assessment of the current collection's needs and the available space and storage furniture/supplies.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
A.1.a Assess current storage space and needs at Allen and Hunter Houses.	Museum Staff	3-6 mos.	Data on space, needs, and current conditions collected & recorded for analysis	Personnel, measuring tools, camera	Volunteer staff	75% Complete
A.1.b Create a plan for artifact, archives, prop, and supplies storage.	Museum Staff	3-6 mos.	Plan completed and approved by Museum Board	Personnel, data from A.1.a; MAP Report; museum standards & benchmarks	n/a	75% Complete
A.1.c Re-locate/re-arrange storage units, objects, and files based on plan and update all affected Past Perfect (cataloguing software) documents accordingly, including creating finding aids.	Museum Staff	12 mos.	Physical re-location complete; documents updated; finding aids created	Personnel-including museum staff, volunteers, Dept Public Service assistance, equipment/tools	Integrate activity with DPS/Facilities personnel.	50% Complete

Goal II: *Provide stewardship and management of the museum's collection of artifacts, archives, and buildings, in accordance with established professional museum practice.*

Objective A: Improve storage organization and environmental controls.

A.2 Assess environmental conditions and develop a plan to improve or correct deficits.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
A.2.a Assess current environmental conditions at the Allen and Hunter Houses.	Museum Staff	6-9 mos.	Data collected and recorded for analysis.	Personnel; MAP Report, standards & benchmarks; pest control data; Funding for tools (hygro-meter, light meter, thermometer); pH tester, camera	n/a	**Ongoing**
A.2.b Create a plan for reducing environmental risk and ameliorating existing conditions.	Museum Staff	9-12 mos.	Plan completed and approved by Museum Board	Personnel, data from A.2.a; MAP Report; museum standards & benchmarks	Consult with Facilities Dept personnel	**Deferred**
A.2.c Purchase supplies and introduce systems for maintaining adjusted/corrected environmental conditions.	Museum Staff	9-12 mos.	Implementation of plan-systems in place and supplies in use	Personnel; funding for supplies	Consult with Facilities Dept personnel	**Deferred**

Goal II: *Provide stewardship and management of the museum's collection of artifacts, archives, and buildings, in accordance with established professional museum practice.*

Objective B: Improve efficiency, accuracy, and accessibility of object records and documentation.

B.1 Develop and implement a plan for correction, completion, and updating of existing object records and objects waiting for accession (the formal process to accept objects into a museum collection).
B.2 Create digital and hard files of object records and develop/enhance finding aids.
B.4 Create digital images of collection items for purposes of documentation and access.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
B.1.a Develop plan in conjunction with relevant policies and procedures **(see C.1).**	Museum Staff	1-3 mos.	Plan complete and approved by Museum Board	Personnel; MAP Report, museum standards & benchmarks, Past Perfect 5.0 Software Manual	n/a	**Complete**
B.1.b Implement plan- physical management and research (verification, object marking, assessment, & photography).	Museum Staff	1.5 - 2.0 hrs/object; ongoing	100% of collection is complete and accurate on audit	Personnel (additional funding), some trained volunteers; camera, tools, archival supplies	n/a	**Ongoing**
B.2.a Implement plan- data management & digitization (data entry, digitization of records, legal verification, hard files, & finding aids.)	Museum Staff	.5 - 1.0 hrs/object; ongoing	100% of collection is complete and accurate on audit	Personnel (additional funding); Past Perfect 5.0 Software, archival printing and filing supplies	n/a	**Ongoing**
B. 4.a Create documentary images, upload, and backup file for off-site storage.	Museum Staff	.5 hrs/object; ongoing	100% of collection is complete and accurate on audit	Personnel, camera, Image & Past Perfect 5.0 software; digital storage media, backup harddrive	IT Dept	**Ongoing**

Goal II: *Provide stewardship and management of the museum's collection of artifacts, archives, and buildings, in accordance with established professional museum practice.*

Objective B: Improve efficiency, accuracy, and accessibility of object records and documentation

B.3 De-accession inappropriate or unnecessary objects in accordance with museum standards and revised museum accession policy and procedures

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
B.3.a Create location for temporary storage of potential de-accessions.	Museum Staff	1-3 mos.; ongoing	Location identified and prepared	Personnel; secure temporary location	n/a	**Deferred**
B.3.b Develop priority list of objects for de-accession consideration in conjunction with approved policies and procedures **(See C.1).**	Museum Staff	3-6 mos.; ongoing	Presentation of list to Museum Board for approval	Personnel; MAP Report, museum standards; completion and Museum Board approval of appropriate policies and procedures	n/a	**Deferred**
B.3.c Resolve/address any donor or legal issues.	Museum Staff	3-6 mos.; ongoing	Completion of task	Personnel; MAP report, museum standards.	n/a	**25% Complete**
B.3.d Complete de-accession process for priority list and create records according to approved policies and procedures **(See C.1).**	Museum Staff	Within 3 mos. of Museum Board approval	Process completed and records created	Archival office supplies, file storage, printing supplies.	n/a	**Deferred**

Goal II: *Provide stewardship and management of the museum's collection of artifacts, archives, and buildings, in accordance with established professional museum practice.*

Objective C: Develop and implement collections-related policies and procedures for collections management, future acquisitions, de-accessioning, disaster preparedness, the museum's hands-on/use collection, building maintenance, and other collections-related policies and procedures in accordance with accepted museum standards.

C.1 Create appropriate written policies and procedures manuals.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
C.1.a Develop collections-related policy and procedures that address collections management, future acquisitions, de-accessions, and hands on/use collection.	Museum Staff	6-12 mos.	Plan complete and approved by Museum Board	Personnel; MAP Report; museum standards and benchmarks	n/a	**75% Complete**
C.1.b Develop Disaster Preparedness Plan.	Museum Staff	6-12 mos.	Plan complete and approved by Museum Board	Personnel; MAP Report; museum standards and benchmarks; D-Plan	n/a	**75% Complete**
C.1.c Develop Historic Building Maintenance Plan.	Museum Staff	6-12 mos.	Plan complete and approved by Museum Board	Personnel; historic structures guidelines and standards; National Park Service/Secretary of Interior Standards, State Historic Preservation Office guidelines, Historic Structure Report, other relevant documents	Personnel from Facilities Dept & Planning Dept	**25% Complete**

Goal II: *Provide stewardship and management of the museum's collection of artifacts, archives, and buildings, in accordance with established professional museum practice.*

Objective C: Develop and implement collections-related policies and procedures for collections management, future acquisitions, de-accessioning, disaster preparedness, the museum's hands-on/use collection, building maintenance, and other collections-related policies and procedures in accordance with accepted museum standards.

C.2 Integrate policies and procedures with other relevant city departments.
C.3 Develop methods for orienting staff and volunteers to pertinent policies and procedures.
C.4 Review policies and procedures on an annual basis and revise as needed.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
C.2 Meet with appropriate city personnel to share Disaster Preparedness Plan.	Museum Staff	1-3 mos. after plan approval	Completion	Personnel	City admin, Police, Fire & Facilities Depts	Deferred
C.3 Hold orientation meetings with boards and staff.	Museum Staff	1-3 mos. after plan approval	Completion	Personnel; meeting space; meeting supplies	Museum & Friends Boards, Volunteers	Deferred
C.4 Review policies and procedures on annual basis and revise as needed.	Museum Staff/Museum Board	Annually	Annual review and approval by Museum Board	Personnel	n/a	Deferred

Goal II: *Provide stewardship and management of the museum's collection of artifacts, archives, and buildings, in accordance with established professional museum practice.*

Objective D: Provide increased digital access through exploring online or other virtual exhibit/access options.

D.1 Develop a virtual exhibit and digital access plan that reflects current museum practices and standards, and reflects the needs of the museum collection and its users and visitors.

D.2 Explore and implement web and other information technology options for improved access.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
D.1.a /D.2.a Explore & evaluate current museum standards & methods for digital collections.	Museum Staff	Year 2- (2014-15)	TBD	Personnel; data/information from other museums	Other museum professionals	**Complete**
D.1.b/D.2.b Collect survey data.	Museum Staff	12 mos. after D.1a & D.2.a	TBD	Funding for professional consultant	TBD	**Ongoing**
D.1.c /D.2.c Develop plan.	Museum Staff	6-12 mos. after survey	TBD	TBD	TBD	**75% Complete**
D.1.d/D.2.d. Implement plan.	Museum Staff	Year 3- (2015-16)	TBD	TBD	TBD	**Deferred**

Goal II: *Provide stewardship and management of the museum's collection of artifacts, archives, and buildings, in accordance with established professional museum practice.*

Objective E: Seek professional training opportunities for museum staff to provide ongoing collection management skills development and effectiveness.

E.1 Identify training opportunities for paid and unpaid staff to enhance collections care.
E.2 Provide opportunities for paid and unpaid staff to attend up to two professional programs per year.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
E.1.a /E.2.a Explore/review available opportunities in collections care training.	Museum Staff	ongoing	Create list of appropriate opportunities	Personnel	n/a	**Ongoing**
E.1.b/E.2.b Identify and communicate recommended training opportunities.	Museum Staff	ongoing	Regularly communicate through email and announcements	Personnel, email, Friends newsletter notices	n/a	**Ongoing**
E.1.c/E.2.c Facilitate participation by paid and unpaid staff.	Museum Staff	ongoing	Minimum of 1 training experience/yr for paid museum staff and 1 training experience/yr for unpaid museum staff	Funding assistance, meeting space as needed, car pooling, etc.	n/a	**Ongoing**

Goal III: *Assure financial stability and sustainability and increase the capacity of BHMP to serve its mission through enhanced fundraising, board development, leveraging relationships and volunteers.*

Objective A: As a collaborative effort of the Museum Board and Museum Friends, develop a comprehensive fundraising plan for the BHMP (including a "case statement" clarifying the what and why of giving) that increases contributions to both operations and the endowment fund.

A.1 Develop and implement a strategy for increasing planned giving and bequests.
A.2 Develop and implement a strategy for attracting large/major donor contributions.
A.4 Develop and implement strategies for increasing membership in the Friends to broaden the base from which to enhance annual giving.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
A.1.a/A.2.a Develop case statement that clarifies message and establishes prioritized target funding in the areas of annual operating funds, exhibits, special projects, capital improvements, and increasing the endowment.	Museum Staff; Museum & Friends Boards	3-6 mos.	Case Statement developed and approved by Museum Board and Friends Board	Personnel; joint meeting with account representative from Community Foundation of Southeast Michigan (Endowment); funding for development consultant-TBD	n/a	**Complete**
A.1.b/A.2.b Identify prospective funding resources based upon case statement and funding priorities, including major donors, corporate sponsors, and other funding partners. *(con't on next page)*	Museum & Friends Boards	6-12 mos.	Completion	Personnel; funding for development consultant-TBD	n/a	**50% Complete**

Goal III: *Assure financial stability and sustainability and increase the capacity of BHMP to serve its mission through enhanced fundraising, board development, leveraging relationships and volunteers.*

Objective A: As a collaborative effort of the Museum Board and Museum Friends, develop a comprehensive fundraising plan for the BHMP (including a "case statement" clarifying the what and why of giving) that increases contributions to both operations and the endowment fund.

A.1 **(con't)** Develop and implement a strategy for increasing planned giving and bequests.
A.2 **(con't)** Develop and implement a strategy for attracting large/major donor contributions.
A.4 **(con't)** Develop and implement strategies for increasing membership in the Friends to broaden the base from which to enhance annual giving.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
A.1.c/A.2.c Develop comprehensive multi-year, multi-component plan for fundraising campaign.	Museum & Friends Boards	Year 2: 2014/15	Plan completed & approved by both boards.	Personnel; funding for development consultant-TBD	n/a	**25% Complete**
A.4.a Assist Friends in developing strategies for increasing membership in the organization, including identifying new members, developing incentives, and promotion.	Museum & Friends Boards	6-12 mos.; ongoing	Membership increases by at least 20%	Personnel; funding for development consultant-TBD	n/a	**75% Complete**
A.4.b Assist Friends in developing planned/annual giving program to build endowment.	Museum & Friends Boards	6-12 mos.; ongoing	Meet or exceed annual endowment funding target	Personnel; joint meeting with account representative from Community Foundation of Southeast Michigan (Endowment)	n/a	**75% Complete**

Goal III: *Assure financial stability and sustainability and increase the capacity of BHMP to serve its mission through enhanced fundraising, board development, leveraging relationships and volunteers.*

Objective A: As a collaborative effort of the Museum Board and Museum Friends develop a comprehensive fundraising plan for the BHMP (including a "case statement" clarifying the "what and why" of giving) that increases contributions to both operations and the endowment fund.

A.3 Host at least one major fundraising event per year.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
A.3.a Develop joint plan for major fund-raising event to be held each year with specific funding goals, in accordance with fund raising plan.	Museum & Friends Boards/ Special Committee	6-12 mos.	Completion of plan and approval by both boards, as appropriate	Personnel; data on past fund raising events	Outside parties on planning committee	75% Complete
A.3.b Develop event plan, including all aspects of event, event promotion and possible co-sponsors.	Museum & Friends Boards/ Special Committee	Year 2: 2014/15; annually there-after	Completion of plan and approval by both boards, as appropriate	Personnel; funding for advertisement/promo-tion; event sponsors	Outside parties on planning committee	75% Complete
A.3.c Hold event annually and use outcome measures to plan next year's event.	Museum & Friends Boards/ Special Committee	Year 2: 2014/15; annually there-after	Identify/develop method for collecting participant data and success measures, including percentage of target funds raised and media exposure	Personnel; survey method	Outside parties on planning committee	75% Complete

Goal III: *Assure financial stability and sustainability and increase the capacity of BHMP to serve its mission through enhanced fundraising, board development, leveraging relationships and volunteers.*

Objective B: Engage in Board Development by clarifying expectations and further developing the skills of the Museum Board and seeking new members with complementary skills.

B.1 Develop position descriptions and clarify expectations, responsibilities, and authorities.
B.2 Evaluate needed skills, identify opportunities, and develop a plan for identifying appropriate potential Museum Board candidates.
B.3 Create a board development plan including workshops, training programs, etc., for skills refinement including fund raising and effectively leveraging relationships.
B.4 Collaborate and delineate the respective roles of the Friends and the Museum Board.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
B.1/B.4 Develop position descriptions and delineate the respective roles of the Museum and Friends Boards.	Museum & Friends Boards/ Special Committee	3 mos.	Position descriptions complete role delineation approved by each board for its respective components	Personnel; MAP/Museum standards & ethics; non-profit board standards; city ordinance & other applicable documents	n/a	**Complete**
B.2.a/B.3.a Evaluate needed skills and develop a plan for board development and training in collaboration with Friends Board.	Museum & Friends Boards/ Special Committee	6 mos.	Position descriptions complete role delineation approved by each board for its respective components	Personnel; funds for board development consultant; MAP/Museum standards & ethics, non-profit standards	n/a	**Complete**
B.2.b/B.3.b Identify potential future board candidates for both boards.	Museum & Friends Boards/ Special Committee	6 mos.	Completion	Personnel	n/a	**75% Complete**

Goal III: *Assure financial stability and sustainability and increase the capacity of BHMP to serve its mission through enhanced fundraising, board development, leveraging relationships and volunteers.*

Objective C: Increase the personnel capacity of the organization by increasing professional staffing, leveraging volunteers, and utilizing partner organizations to help staff specific events, exhibits or programs.

C.1 Evaluate skills, expertise, and specific roles needed for effective and efficient operations.
C.2 Increase paid professional staff as appropriate.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
C.1.a Assess and identify personnel/staffing roles and functions for all aspects of museum operation, including collections, programming, and administration/operations, in accordance with strategic plan objectives.	Museum Staff	3-6 mos.	Completion	Personnel	n/a	Complete
C.1.b/C.2 Gather comparative data on similar institutions to determine context for efficiency and place the museum in proper context.	Museum Staff	3-6 mos.	Data reviewed and analyzed	Personnel; national museum survey data & reports; data from local museums	Area museums	Complete
C.1.c/C.2 Develop staffing plan and associated budget proposal in conjunction with City Manager and Human Resources Director.	Museum Staff	3-6 mos.; reviewed annually	Plan complete and approved by Museum Board; proposal submitted and approved.	Personnel; funding	City administra-tion/Human Resources	75% Complete

Goal III: *Assure financial stability and sustainability and increase the capacity of BHMP to serve its mission through enhanced fundraising, board development, leveraging relationships and volunteers.*

Objective C: Increase the personnel capacity of the organization by increasing professional staffing, leveraging volunteers, and utilizing partner organizations to help staff specific events, exhibits or programs.

C.3 Develop a comprehensive volunteer program that incorporates job descriptions, organizational structure, recruiting and training plans and ongoing management of volunteers.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
C.3.a Based on III.C.1, develop a volunteer/unpaid staff program with organizational structure/oversight, staffing categories/levels, and position descriptions to support paid staff, museum operations, special projects, and events.	Museum Staff	6-12 mos.	Completion and approval by Museum Board	Personnel; MAP Report, museum standards and ethics; Bureau of Labor guidelines	n/a	**Complete**
C.3.b Develop written policies and procedures for unpaid staff in collaboration with City Human Resources Director.	Museum Staff	6-12 mos.	Completion	Personnel; MAP Report, museum standards and ethics; Bureau of Labor guidelines	n/a	**75% Complete**
C.3.c Develop and implement a recruiting plan, including partner organizations and academic institutions, as appropriate. *(con't on next page)*	Museum Staff/ Museum & Friends Boards	Year 2: 2014/15; ongoing	Staffing levels at 80% or above; continued participation in Volunteer Network of Southeast Michigan.	Personnel; Data from local volunteer resources; funding for volunteer staff coordinator	Partner/ academic organizations -TBD	**Ongoing**

Goal III: *Assure financial stability and sustainability and increase the capacity of BHMP to serve its mission through enhanced fundraising, board development, leveraging relationships and volunteers.*

Objective C: Increase the personnel capacity of the organization by increasing professional staffing, leveraging volunteers, and utilizing partner organizations to help staff specific events, exhibits or programs.

C.3 (con't) Develop a comprehensive volunteer program that incorporates job descriptions, organizational structure, recruiting and training plans and on-going management of volunteers.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
C.3.d Develop volunteer training and orientation program for identified roles and functions, including incentives for retention.	Museum Staff/ Museum & Friends Boards	Year 2: 2014/15; ongoing	Collect data on effectiveness of training, satisfaction, and retention	Personnel; funding for volunteer staff coordinator	TBD	**Ongoing**

Goal III: *Assure financial stability and sustainability and increase the capacity of BHMP to serve its mission through enhanced fundraising, board development, leveraging relationships and volunteers.*

Objective D: Initiate a grant-writing effort in conjunction with the Friends to identify key opportunities for collaboration, and develop an account to provide potential matching funds for increased leverage.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED-	STATUS/ CHALLENGES
D.1 Complete Cultural Data Project application.	Museum Staff	6-12 mos.	CDP Completion	Personnel	n/a	Deferred
D.2 Identify appropriate grant-eligible projects and costs based on planned exhibits, special projects, events, and collections needs.	Museum Staff	12 mos.	Create list of potential grants	Personnel; matched funding; 501c3 status of Friends for application	Friends	Ongoing
D.3 Identify and evaluate collaborative partners, grant resources, timetable & administration for specified projects; develop narrative.	Museum Staff	Year 2: 2014/15	Identify 1-2 possible projects and partners; Museum Board approval	Personnel; matched funding; 501c3 status of Friends for application	Friends	Ongoing
D.4 Coordinate with specified partner, write and submit grant application.	Museum Staff	Year 2: 2014/15	Completion and application submission	Personnel; matched funding; 501c3 status of Friends for application	Friends; partner org TBD	Ongoing
D.5 If awarded, complete project and accountability reporting.	Museum Staff	Year 2-3: 2014/15	Project completion and fulfillment of grant requirements	Personnel	TBD	Ongoing

Goal IV: *Define a unified message and marketing plan by using a variety of marketing media to further develop the museum's brand and to increase awareness, interest, and attendance.*

Objective A: Identify and utilize free and low-cost marketing resources maintained by specific target audiences, such as city publications, local schools, senior groups, and other community organizations.

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED- INDIVIDUAL OR GROUP	STATUS/ CHALLENGES
A.1. Identify comprehensive list of potential resources	Museum Board Special Committee	1-3 mos.	Completion	Personnel	Volunteers, Friends, Staff	75% Complete
A.2 Make contact with each organization, get copies of their publications, & develop list of publication dates	Museum Board Special Committee	1-3 mos.	Completion	Personnel	Staff	75% Complete
A.3 Develop plan for advertising	Museum Board Special Committee	3-6 mos.	Plan completed and approved by Museum Board	Possible consultant (see IV.B.2.b/B.3.b)	Staff	50% Complete
A.4 Utilize list of resources to advertise events, exhibits, & happenings at Museum	Museum Staff/ Museum Board Special Committee	Ongoing (once list complete)	At least 5 new free marketing resources utilized; survey data analysis	Personnel; survey data (see IV. B.1)	Friends	50% Complete

Goal IV: *Define a unified message and marketing plan by using a variety of marketing media to further develop the museum's brand and to increase awareness, interest, and attendance.*

Objective B: Identify our key audiences and explore and enhance the image the museum presents to the public through independent and collaborative projects and partnerships that strengthen our ties to the community

STRATEGIES	RESPONSIBILITY	TIMING TO COMPLETE	HOW DO WE MEASURE SUCCESS?	RESOURCES NEEDED	OTHERS INVOLVED- INDIVIDUAL OR GROUP	STATUS/ CHALLENGES
B.1. Develop survey	Museum Board Special Committee	Year 2, 2014/15	Survey completed & distributed online, on-site, off-site	Personnel; Funding for possible consultant	TBD	Ongoing
B.2 Utilize survey results to identify primary audiences	Museum Staff/ Museum Board	Year 2, 2014/15	Completion & Museum Board approval	Personnel; survey results	N/A	Ongoing
B.3 Explore partnerships with organizations involved with primary audiences	Museum Staff/ Museum Board	Year 2, 2014/15; ongoing	Exploration and/or development of at least 2 partnerships	Personnel	TBD	Ongoing
B.4 Develop and implement independent & collaborative projects reflecting primary audiences	Museum Staff/ Museum Board	Year 2, 2014/15; ongoing	At least 1 independent & 2 collaborative projects developed & implemented	Personnel;	TBD	Ongoing

Goal IV: *Define a unified message and marketing plan by using a variety of marketing media to further develop the museum's brand and to increase awareness, interest, and attendance.*						
Objective C: Develop a Marketing Plan to clarify the museum's message and brand, utilizing survey data, innovative marketing strategies, low cost resources and micro-marketing concepts.						
STRATEGIES	**RESPONSIBILITY**	**TIMING TO COMPLETE**	**HOW DO WE MEASURE SUCCESS?**	**RESOURCES NEEDED**	**OTHERS INVOLVED- INDIVIDUAL OR GROUP**	**STATUS/ CHALLENGES**
C.1 Explore and assess museum brand & marketing needs and identify qualified consultants to provide proposals in accordance with City requirements	Museum Board/ Museum Staff/Special Committee	Year 2, 2014/15	Completion and Museum Board approval	Personnel; funding for consultant; survey data/analysis	City staff	**50% Complete**
C.2 Work with consultant to develop comprehensive marketing plan that reflects findings and Strategic Plan	Museum Board/Special Committee	Year 3, 2015/16	Plan completed and approved by Museum Board	Personnel; funding for consultant; survey data/analysis	TBD	**Deferred**
C.3 Implement marketing plan and assess effectiveness	Museum Board/Special Committee	Year 3, 2015/16; Ongoing	TBD by marketing plan	Personnel; funding (TBD); survey data/analysis	TBD	**Deferred**

City of Birmingham
A Walkable Community

MEMORANDUM

Office of the City Manager

DATE: December 17, 2015

TO: Joseph A. Valentine, City Manager

FROM: Joellen L. Haines, Assistant to the City Manager

SUBJECT: Citizens Academy proposal for the City of Birmingham

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A Citizens Academy is a program offered by a municipality to increase understanding about how local governments operate. Citizen Academies are offered throughout the country and locally in Novi and in Midland.

This proposal is to design a Citizens Academy which will be offered by the City of Birmingham. It will be a series of informative and interactive sessions presented by City staff and designed to give citizens an in-depth understanding about how our city government functions. The program will be administered through the City Manager's Office and coordinated with the various city departments that are involved. Through this series of 7 two-hour sessions, residents will learn about the responsibilities of City departments and the services they provide to the community. Presentations and facility tours will give participants a better understanding of the role Birmingham government plays in the providing these services to the community. The program has three goals:

To improve understanding of how the city of Birmingham operates
To inform citizens about the city departments and the services provided
To increase awareness of the roles citizens have in government

Each department will develop curriculum that will share creative and engaging content focused on the above goals. The Birmingham Citizens Academy will be offered in the evening, and is limited to 20 residents. The academy will begin in either the Spring or Fall of 2016. It is offered free to residents, and registration will be done on a first come, first serve basis. Graduates of the academy will be awarded a certificate acknowledging their participation in the program. The estimated cost of materials for the program is $500 for the 7-week academy. Below is a brief sample outline of the seven sessions:

Session One: The Structure and Roles of City Government
Commission, City Manager & City Clerk

Session Two: Police Department Services
Police Department

Session Three: Fire Department Services
Fire Department

Session Four: The Building and Development Process
Planning, Engineering and Building

Session Five: Parks and Public Services
Department of Public Services

Session six: Budgeting and Finances
Finance and Treasury

Session Seven: Graduation ceremony

Due to the City's busy calendar, it is proposed that this program be offered once a year, and reevaluated after the pilot academy had been offered.

City of Birmingham
A Walkable Community

MEMORANDUM

City Manager's Office

DATE: December 23, 2015

TO: Joseph A. Valentine, City Manager

FROM: Joellen Haines, Assistant to the City Manager

SUBJECT: Request to send out RFP for Birmingham Brand Development

At the City Commission meeting of May 11, 2015, it was suggested the City review its branding and image in regards to updating its logo. The Commission agreed that the City should move forward with a review of the branding and image of the City.

The City logo has been in place for almost 20 years, and it was felt a fresh logo may better represent the City. Other communities such as Ferndale and Royal Oak have recently updated their logos, and the Birmingham Shopping District (BSD) just completed a new branding initiative with a new logo. The Birmingham Historical Museum and Park is currently developing a new logo and brand image.

The process by which this review will take place will be to solicit firms with an RFP for Birmingham Brand Development to create suggestions for a new logo which will reflect the City's current image. To assist in developing these ideas, the firm selected will conduct stakeholder meetings to get a feel for the image of Birmingham. A committee will be set up comprised of stakeholders in the City including representatives from the Commission, business community, and residents. They will be asked for input during branding discovery sessions led by a moderator from the company selected. Furthermore, the concepts will be reviewed by this committee to make recommendations to submit to the Commission for final approval.

The cost estimate to change the logo is approximately $30,000, covering DPS signage, letterhead, envelopes, business cards, and other City materials affected by the logo change.

Once the Commission has completed its Goal Setting Session, it would be an opportune time to introduce the rebranding initiative at an upcoming Commission meeting. The RFP is intended to be brought before the Commission during the next couple of months.