

Draft Environmental Impact Statement

WOODWARD AVENUE LIGHT RAIL TRANSIT PROJECT

Detroit, Michigan
January 2011



U.S. Department
of Transportation
**Federal Transit
Administration**



City of Detroit
Department of Transportation



**WOODWARD AVENUE LIGHT RAIL TRANSIT PROJECT
CITY OF DETROIT, WAYNE COUNTY, MICHIGAN**

DRAFT ENVIRONMENTAL IMPACT STATEMENT

PREPARED PURSUANT TO:

National Environmental Policy Act of 1969 (42 USC §4332); Federal Transit Laws (49 USC §5301(e), §5323(b) and §5324 (b)); 49 USC §303 (formerly Department of Transportation Act of 1966, §4(f)); National Historic Preservation Act of 1966, §106 (16 USC §470f); Executive Order 12898 (Environmental Justice)

By the

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL TRANSIT ADMINISTRATION

and the

CITY OF DETROIT, MICHIGAN

in cooperation with the

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

MICHIGAN DEPARTMENT OF TRANSPORTATION



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1-6-2011

Date of Approval



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1-7-11

Date of Approval

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Introduction and Abstract

Responsible Agencies

The lead Federal agency for the project is the U.S. Department of Transportation, Federal Transit Administration (FTA). The Project Sponsor is the City of Detroit. The Cooperating Agencies are the U.S. Department of Transportation, Federal Highway Administration; U.S. Department of the Interior, National Park Service; and the Michigan Department of Transportation.

Comments on the DEIS

A 45-day period has been established for submittal of comments on the DEIS, which begins on January 28, 2011, and ends on March 14, 2011. Comments may be submitted in writing on or before March 14, 2011, to Ms. Tricia Harr at the address below or may be made orally at the public hearings. Comments may also be submitted on the project website at <http://www.woodwardlightrail.com>. Information on the public hearings is provided in the NOA and will be published in local and regional newspapers and on the project website. This document will be available at local public libraries and may also be found on the project website.

Project Contacts

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Abstract

The Federal Transit Administration (FTA), as the lead Federal agency, and the City of Detroit, as the project sponsor, have jointly prepared this Draft Environmental Impact Statement (DEIS) consistent with the requirements of the National Environmental Policy Act to evaluate and assess potentially substantial and adverse impacts to the human and natural environment that may result from construction and operation of the Locally Preferred Alternative (LPA) for the Woodward Avenue Light Rail Transit (LRT) Project.

The purpose of the proposed project is to: improve public transit service and provide greater mobility options for the Woodward Avenue corridor; improve transportation equity among all travelers; improve transit capacity in the corridor; improve linkages to major activity centers in the corridor; and support the City's economic development goals and encourage reinvestment in Detroit's urban core.

The need for the proposed project is based on: strong existing bus ridership and large potential ridership; a heavily transit-dependent population along the corridor; overcrowding, reliability issues, and lack of rapid transit alternatives with the current bus system; air quality issues due to

the region's nonattainment status; and focus of local policy on transit improvements as part of a more balanced and sustainable approach to future growth.

The study area is located in Wayne County, Michigan. It comprises the Woodward Avenue corridor extending 9.3 miles from Downtown Detroit (Downtown), near the Detroit River, north to the State Fairground near 8 Mile Road. The study area extends approximately one-half mile to the east and west of Woodward Avenue, the area within which project impacts may occur.

Two alternatives are evaluated in this DEIS: the No Build Alternative and the LPA. The LPA is an at-grade LRT system entirely within existing rights-of-way on Woodward Avenue from Downtown to 8 Mile Road; it would be fully functional as a stand-alone project but would be designed to accommodate possible future extensions. Two mainline operating options (Options A and B) and three Downtown design options are evaluated in this document. Combining the two mainline alignment operating options and the three Downtown design options, three variations of the LPA were defined for evaluation in this DEIS: median - running Alternative A1 with 15 LRT stations and curb-running Alternatives B2 and B3 with 21 and 18 LRT stations, respectively. Ancillary facilities associated with the LPA include a vehicle storage maintenance facility (VSMF), a park and ride lot, and traction power substations (eight with Alternatives A1 and B2, seven with Alternative B3).

Potential impacts of the alternatives on key resources of the natural and human environment are evaluated in this DEIS. The legal and regulatory context, analysis methodology, existing conditions, long-term effects, short-term construction effects, and mitigation measures for unavoidable impacts are summarized for each resource. Technical Reports supporting the DEIS are included with this document and are incorporated by reference. A [draft Section 4\(f\) Evaluation](#) is included with this DEIS, which documents impacts to Section 4(f) resources.

Following a formal public hearing and receipt of comments, an FEIS would be circulated, which identifies a preferred alternative. A Record of Decision would follow the FEIS to document FTA's decision to proceed with an approved alternative and mitigation commitments.

List of Acronyms and Abbreviations

ADA	Americans with Disabilities Act	NAAQS	National Ambient Air Quality Standards
ACHP	Advisory Council on Historic Preservation	NHPA	National Historic Preservation Act
APE	Area of Potential Effect	NEPA	National Environmental Policy Act
BRT	Bus Rapid Transit	NOI	Notice of Intent
CAA	Clean Air Act	NPS	National Park Service
CBD	Central Business District	NREPA	Natural Resources and Environmental Protection Act
CEQ	Council on Environmental Quality	NRHP	National Register of Historic Places
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act	NRCS	Natural Resources Conservation Service
CFR	Code of Federal Regulations	OCS	Overhead Catenary System
CR	Consolidated Rail Corporation	OSA	Office of the State Archaeologist
dBA	Decibels (A-weighting)	PA	Programmatic Agreement
DDOT	Detroit Department of Transportation	PM _{2.5}	Particulate Matter less than 2.5 micrometers in diameter
DEGC	Detroit Economic Growth Corporation	PM ₁₀	Particulate Matter less than 10 micrometers in diameter
DEIS	Draft Environmental Impact Statement	PDD	Detroit Planning and Development Department
DTOGS	Detroit Transit Options for Growth Study	RCRA	Resource Conservation and Recovery Act
DPM	Detroit People Mover	RTP	Regional Transportation Plan
DTC	Detroit Transportation Corporation	SEMCOG	Southeast Michigan Council of Governments
EIS	Environmental Impact Statement	SF3	Summary File 3
EJ	Environmental Justice	SHPO	State Historic Preservation Office
EO	Executive Order	SMART	Suburban Mobility Authority for Regional Transportation
ESA	Environmental Site Assessment	ISTEA	Intermodal Surface Transportation Efficiency Act
FEIS	Final Environmental Impact Statement	TIP	Transportation Improvement Program
FHWA	Federal Highway Administration	TOD	Transit-Oriented Development
FTA	Federal Transit Administration	TSM	Transportation System Management
Ldn	Day-Night Noise Level	TPSS	Traction Power Substation
LEP	Limited English Proficiency	USC	United States Code
Leq	Equivalent Noise Level	USDOT	United States Department of Transportation
LOS	Level of Service	USEPA	US Environmental Protection Agency
LPA	Locally Preferred Alternative	VdB	Vibration Level
LRT	Light Rail Transit	VMT	Vehicle Miles Traveled
LRTP	Long Range Transportation Plan	VSMF	Vehicle Storage and Maintenance Facility
LWCF	Land and Water Conservation Funds		
MDOT	Michigan Department of Transportation		
MOA	Memorandum of Agreement		
MDNRE	Michigan Department of Natural Resources and Environment		
MPO	Metropolitan Planning Organization		
MSA	Metropolitan Statistical Area		
MSAT	Mobile Source Air Toxics		

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Executive Summary

ES.1 Introduction

The Federal Transit Administration (FTA), as the lead Federal agency, and the City of Detroit, as the project sponsor, have jointly prepared this Draft Environmental Impact Statement (DEIS) consistent with the requirements of the National Environmental Policy Act (NEPA) to evaluate and assess potentially substantial and adverse impacts to the human and natural environment that may result from the construction and operation of the Locally Preferred Alternative (LPA) of the Woodward Avenue Light Rail Transit (LRT) Project in the City of Detroit, Wayne County, Michigan.

The Federal Highway Administration, the National Park Service, and the Michigan Department of Transportation are cooperating agencies.

The LPA would be an at-grade LRT system entirely within existing roadway rights-of-way that would provide improved transit capacity, service and mobility for travelers, and improved linkages to major activity centers, in the Woodward Avenue corridor. It represents a major step to promote improved regional and local transit mobility in Southeast Michigan.

This DEIS evaluates the No Build and three LPA Alternatives. The LPA Alternatives differ in the following aspects: mainline alignments, alignments in Downtown Detroit, and respective numbers and conceptual design of LRT stations.

This Executive Summary presents the major elements and findings of the evaluation of potential impacts of the No Build and LPA Alternatives. It also includes a [preliminary Section 4\(f\) Evaluation](#); a comparative evaluation of the alternatives; and a summary of the public involvement, agency coordination, and consultation activities conducted during the preparation of this DEIS.

ES.2 Purpose of this Draft Environmental Impact Statement

This DEIS evaluates the potential environmental impacts and benefits of the No Build and LPA Alternatives. It summarizes and documents detailed information and data in Technical Reports and incorporates that information by reference. This DEIS provides information necessary to make an informed decision, including comments received during the formal public and agency comment period on this DEIS, to select a preferred alternative for the Woodward Avenue LRT Project.

A CD containing the supporting Technical Reports, including methodologies and assumptions that provided the basis for the technical analyses and findings summarized in this DEIS, is attached to the printed version of the DEIS document. Both the DEIS and the Technical Reports are available on the project website <http://www.woodwardlightrail.com/> under the NEPA Compliance tab.

ES.3 Purpose and Need for the Proposed Project

The purpose of the proposed LRT project is to:

- Improve public transit service and provide greater mobility options for the Woodward Avenue Corridor;
- Improve transportation equity among all travelers;

- Improve transit capacity along the Corridor;
- Improve linkages to major activity centers along the Corridor; and
- Support the City’s economic development goals and encourage reinvestment in Detroit’s urban core.

The need for the proposed LRT project is based on the following considerations:

- Strong existing bus ridership and large potential ridership due to major activity centers along the Corridor;
- A heavily transit-dependent population along the Corridor;
- Overcrowding, reliability issues, and lack of rapid transit alternatives with the current bus system;
- Air quality issues due to the region’s nonattainment status; and
- Focus of local policy on transit improvements rather than roadway improvements as part of a more balanced and sustainable approach to future growth.

ES.4 Woodward Avenue Study Area

The study area is located in Wayne County, Michigan. It comprises the Woodward Avenue Corridor extending 9.3 miles from Downtown Detroit (Downtown), near the Detroit River, north to the State Fairground near 8 Mile Road. Most of the study area lies within the City of Detroit, while approximately two miles (from Webb Street to McNichols (6 Mile) Road) is within the City of Highland Park. The study area boundary extends approximately one-half mile to the east and west of Woodward Avenue, the area within which project impacts may occur ([Figure ES-1](#)).

From south to north, the study area includes the densely developed Downtown Central Business District (CBD) and many of the City’s prominent historical sites, civic buildings, sports venues and cultural attractions; medical, higher education, and additional cultural institutions north of the CBD; and residential areas and the Michigan State Fairgrounds.

ES.5 Description of Alternatives

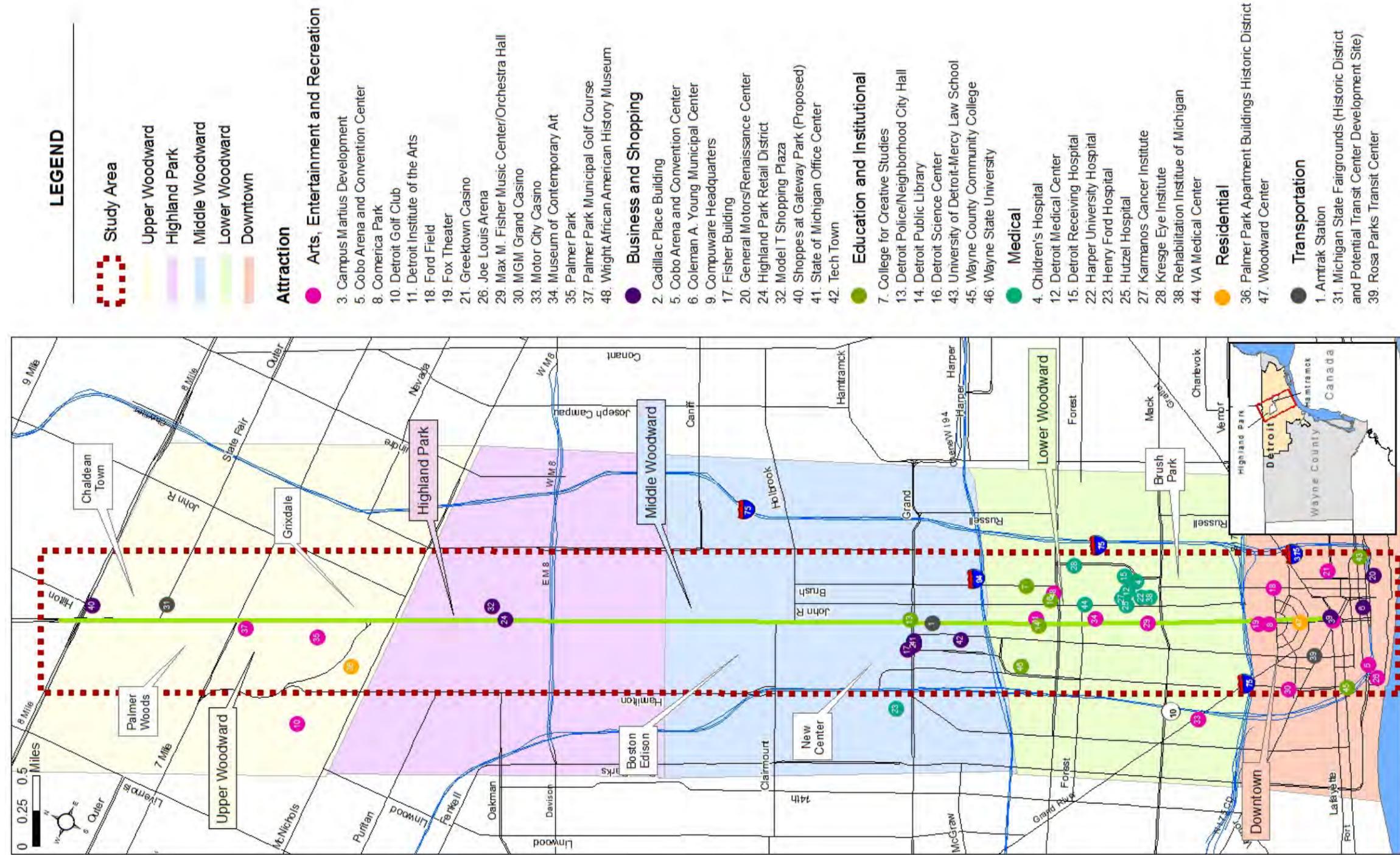
ES.5.1 No Build Alternative

The No Build Alternative includes increased bus service frequencies on DDOT’s Route 53 Woodward and reorganization of feeder bus routes to optimize travel times. It also includes all capacity-related transportation system projects listed in the Southeast Michigan Council of Government’s (SEMCOG) Transportation Improvement Program for the Detroit-Warren-Livonia Metropolitan Statistical Area for fiscal years 2008 through 2011 and in the financially constrained Regional Transportation Plan for the corridor.

ES.5.2 Locally Preferred Alternative

The LPA is based on the Detroit Transit Options for Growth Study (DTOGS), prepared by the Detroit Department of Transportation (DDOT) and its planning partners, including the City of Detroit, neighboring cities, SEMCOG, Wayne County, the State of Michigan, and regional and federal agencies. Following FTA guidelines for conducting an Alternatives Analysis, DTOGS identified a wide range of potential transit improvements in a study area encompassing the cities of Detroit, Dearborn, Hamtramck and Highland Park. DTOGS used a systematic process to narrow the number of alternatives, ultimately resulting in the selection of LRT on Woodward Avenue between Downtown and the Michigan State Fairgrounds near 8 Mile Road as the LPA.

Figure ES-1. Study Area Boundary and Major Destinations

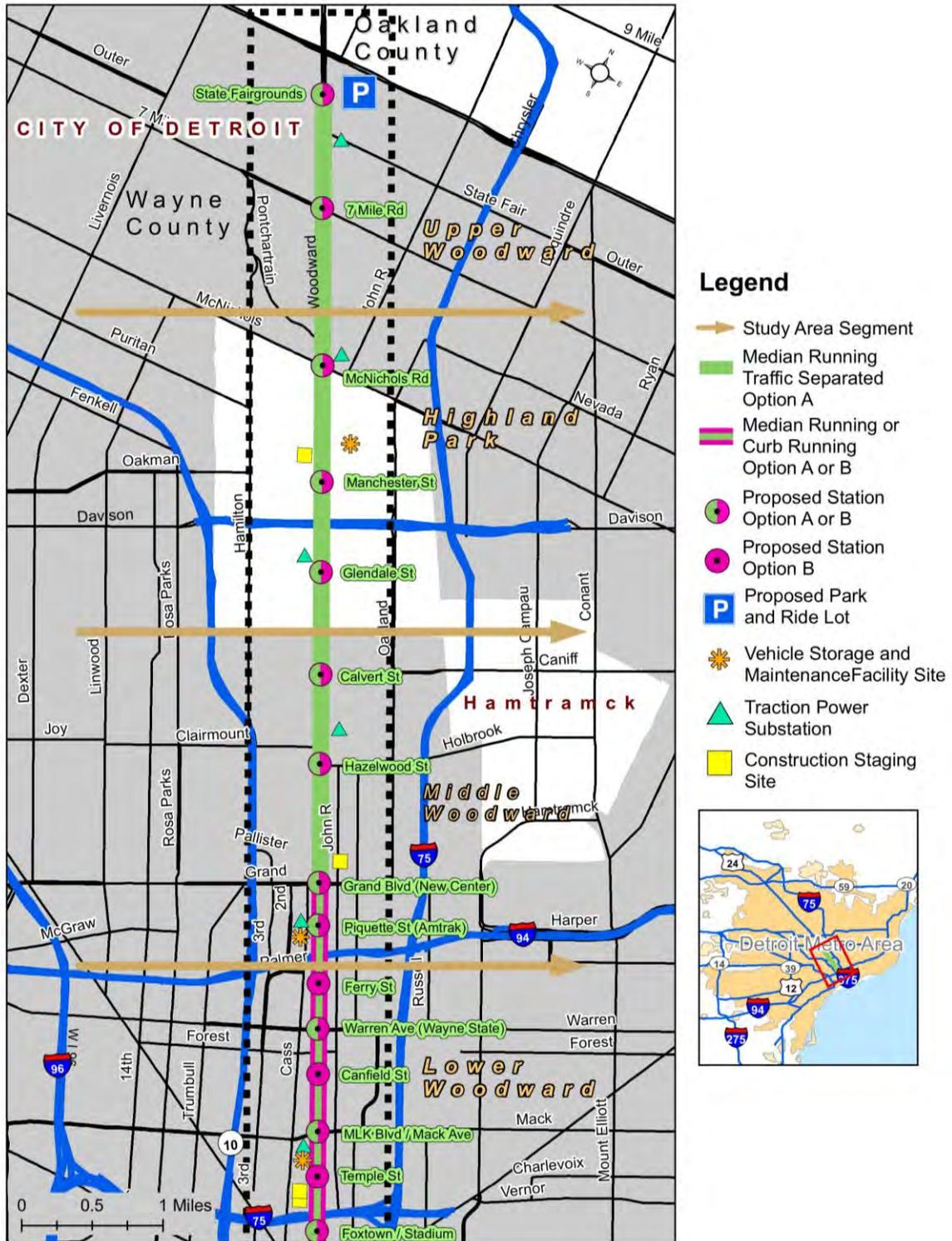


LEGEND

- Study Area**
- Upper Woodward
- Highland Park
- Middle Woodward
- Lower Woodward
- Downtown
- Attraction**
- Arts, Entertainment and Recreation**
- 3. Campus Martius Development
- 5. Cobo Arena and Convention Center
- 8. Comerica Park
- 10. Detroit Golf Club
- 11. Detroit Institute of the Arts
- 18. Ford Field
- 19. Fox Theater
- 21. Greektown Casino
- 26. Joe Louis Arena
- 29. Max M. Fisher Music Center/Orchestra Hall
- 30. MGM Grand Casino
- 33. Motor City Casino
- 34. Museum of Contemporary Art
- 35. Palmer Park
- 37. Palmer Park Municipal Golf Course
- 48. Wright African American History Museum
- Business and Shopping**
- 2. Cadillac Place Building
- 5. Cobo Arena and Convention Center
- 6. Coleman A. Young Municipal Center
- 9. Computware Headquarters
- 17. Fisher Building
- 20. General Motors/Renaissance Center
- 24. Highland Park Retail District
- 32. Model T Shopping Plaza
- 40. Shoppes at Gateway Park (Proposed)
- 41. State of Michigan Office Center
- 42. Tech Town
- Education and Institutional**
- 7. College for Creative Studies
- 13. Detroit Police/Neighborhood City Hall
- 14. Detroit Public Library
- 16. Detroit Science Center
- 43. University of Detroit-Mercy Law School
- 45. Wayne County Community College
- 46. Wayne State University
- Medical**
- 4. Children's Hospital
- 12. Detroit Medical Center
- 15. Detroit Receiving Hospital
- 22. Harper University Hospital
- 23. Henry Ford Hospital
- 25. Hutzel Hospital
- 27. Karmanos Cancer Institute
- 28. Kresge Eye Institute
- 38. Rehabilitation Institute of Michigan
- 44. VA Medical Center
- Residential**
- 36. Palmer Park Apartment Buildings Historic District
- 47. Woodward Center
- Transportation**
- 1. Amtrak Station
- 31. Michigan State Fairgrounds (Historic District and Potential Transit Center Development Site)
- 39. Rosa Parks Transit Center

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Figure ES-2. Mainline Design Options and Locations of LRT Stations and Ancillary Facilities



Source: Parsons Brinckerhoff, 2010

Two mainline operating options were identified for the LPA: median-running and separated from vehicular traffic and curb-running operating in mixed traffic (Figure ES-2). Three Downtown design options were also identified (Figure ES-3). Combining the mainline and Downtown options, three variations of the LPA were defined for evaluation in this DEIS (Appendix D):

- Alternative A1 - median-running with Downtown design option 1 and 15 LRT stations;
- Alternative B2 - curb-running with Downtown design option 2 and 21 LRT stations; and
- Alternative B3 - curb-running with Downtown design option 3 and 18 LRT stations.

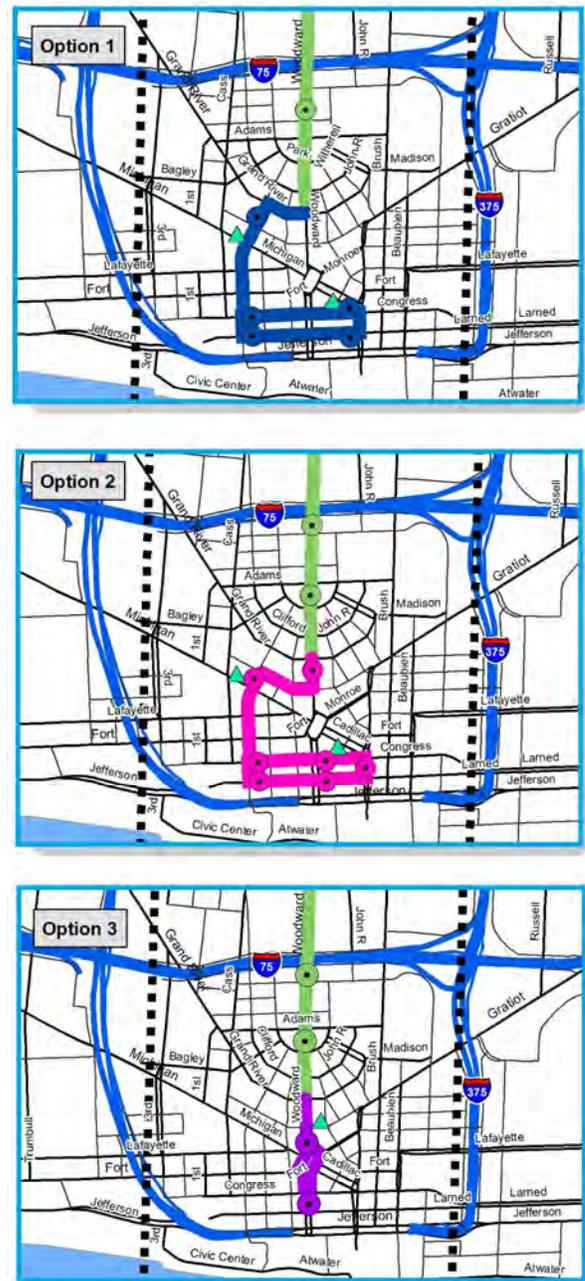
Stations with Alternative A1 would have a conventional canopy over a platform; stations with Alternatives B2 and B3 may include a roof-mounted square billboard structure extending ten feet above the canopy.

The LPA would also include a vehicle storage and maintenance facility, for which three potential sites are evaluated; a park and ride lot to be located near the proposed Shoppes at Gateway site at the southeast corner of 8 Mile Road and Woodward Avenue; and seven or eight traction power substations (depending on the LPA Alternative), dispersed along the length of the LPA. Construction staging areas have been preliminarily identified (Figure ES-2) and are also evaluated.

ES.6 Potential Impacts and Mitigation

All transportation projects have the potential to cause direct, indirect, or cumulative impacts to natural and human environments. The LPA is anticipated to have beneficial impacts related to increased mobility and improved access to activity centers in the Woodward Avenue corridor, and limited adverse impacts, related primarily to historic resources, noise and vibration, and disturbance of hazardous materials. Findings of the impacts analysis are summarized in Table ES-1.

Figure ES-3. Downtown Design Options



Legend

- Interstate
- Major Road
- Minor Road
- Options
- Proposed Station
- Traction Power Substation



Source: Parsons Brinckerhoff, 2010

Table ES-1. Summary of Evaluation of Alternatives

Evaluation Measures		No Build Alt.	Locally Preferred Alternative		
			A1	B2	B3
ENVIRONMENTAL CONSEQUENCES					
Air Quality impact		No impact	No impact		
Hazardous Materials impact		No impact	Potential hazardous materials present on each of the three potential VSMF sites; One or more known or suspected contaminated sites near almost all LRT stations and at two railroad underpasses		
Historic Resources impact	<i>Adverse Effect</i>	0	13 resources	18 resources	15 resources
	<i>No Adverse Effect</i>	0	33 resources	29 resources	26 resources
	<i>No Effect</i>	0	45 resources	44 resources	50 resources
Archaeological Resources impact		No impact	Potential impact to archaeological sites associated with 18 th -century Detroit south of Lafayette Boulevard and west of Randolph Street.	Potential impact to archaeological sites associated with 18 th -century Detroit south of Lafayette Boulevard and west of Randolph Street, and with Capitol Park north of State Street.	Potential impact to archaeological sites associated with 18 th -century Detroit south of Lafayette Boulevard and west of Randolph Street.
Environmental Justice impact		No impact	Impact from VSMF at MLK Boulevard site (24-hour light and noise source) to nearby residences		
Noise impact		No change	5 sites	6 sites	5 sites
Vibration impact		No impact	1 site	2 sites (including Fox Theater)	1 site (Fox Theater)
Ground-borne vibration-related noise impact		No impact	4 sites	5 sites	4 sites
Land Use, Zoning, Public Policy impact		No impact	VSMF at MLK Boulevard site incompatible with nearby multi-family and senior-housing; Temporary construction-phase noise impact to residential and other noise-sensitive land uses		
Neighborhood Character impact		No impact	Temporary construction-phase disruption of traffic and pedestrian travel patterns		
Community Facilities and Services impact		No impact	Temporary construction-phase disruption of direct access to community facilities		
Parkland impact		No impact	Temporary construction-phase disruption of vehicular and pedestrian access to parklands		

Table ES-1. Summary of Evaluation of Alternatives

Evaluation Measures	No Build Alt.	Locally Preferred Alternative		
		A1	B2	B3
Visual and Aesthetic Conditions impact	No impact	Minor impact	Impact to visual continuity in some neighborhoods from curbside LRT stations' vertical elements	
Utilities impact	No impact	Temporary service disruptions and traffic detours during required utility relocations.		
Energy impact	Likely increase in energy use	Likely decrease in overall energy use with LRT operation; Temporary increase in energy use for LPA construction.		
Parking impact	No impact	Impact to business parking in two locations along Woodward Avenue	Overall increase in number of parking spaces	No net change in number of parking spaces
Roadways and Levels of Service (LOS) impact	LOS D or better	All major signalized intersections would operate at LOS D or better. Traffic re-routings and detours would be required along discrete alignment segments during construction.		
Storm Water Management impact	No impact	No impact		
Indirect impact	No impact	Would encourage new development near LRT stations. May encourage infill redevelopment of underutilized or vacant parcels.		
Cumulative impact	No impact	Would enhance economic development opportunities in northern part of study area.		
Section 4(f) Use	No impact	7 <i>de minimis</i> impacts ¹	1 direct use 6 <i>de minimis</i> impacts ¹	6 <i>de minimis</i> impacts ¹
TRANSPORTATION BENEFITS AND IMPACTS				
Encourages transit ridership by providing linkages to existing transit.	No impact	Moderate positive impact		Minor positive impact
Provides transportation options (modal choices).	No impact	Would provide LRT as an additional transit option.		
Provides transit access to schools, shopping, events, healthcare and other services and cultural attractions in the corridor. ²	No impact	48 attractions		43 attractions
Transit travel time: range during peak hours for the given Alternative's entire route	46 – 51 minutes	37 - 41 minutes	40 – 43 minutes	33 – 36 minutes
Transit travel time reliability	Depends on traffic volume/ conditions	Travel time would be predictable	South of Grand Boulevard, travel time would be dependent on traffic volume and conditions.	

Table ES-1. Summary of Evaluation of Alternatives

Evaluation Measures	No Build Alt.	Locally Preferred Alternative		
		A1	B2	B3
Vehicular travel time: range during peak hours between State Fair Avenue and Adams Street	15-17 minutes	24 - 26 minutes	24 - 25 minutes	
Corridor capacity and traffic operations ³	LOS D or better	LOS D or better	LOS D or better	LOS D or better
Motor vehicle safety ³	No impact	Minor positive impact	Minor negative impact	Minor negative impact
Pedestrian safety	No impact	Minor negative impact	No impact	No impact
Bicycle safety	No impact	Minor positive impact	Negative impact	Negative impact
TRANSPORTATION EQUITY AND ENVIRONMENTAL JUSTICE				
Improves public transit service and provides greater mobility options along Woodward Avenue	No impact	Yes		
Transit-dependent households served ⁴ (% of total households served)	No change	5,500 (83%)	7,100 (85%)	6,900 (85%)
Minority population served ⁴ (% of total population served)	No impact	11,500 (83%)	14,200 (83%)	14,200 (83%)
Low-Income population served ⁴ (% of total population served)	No impact	5,000 (36%)	6,300 (37%)	6,300 (37%)
SUPPORT ECONOMIC AND COMMUNITY DEVELOPMENT GOALS				
Consistent with City of Detroit Master Plan	No	Yes		
Provides transit connections to existing and planned economic development areas	No impact	Yes		
Potential for future transit-supportive and new economic development	Minor positive impact	Moderate positive impact		Minor positive impact

Source: Parsons Brinckerhoff, 2010

¹ The Section 106 adverse effect of the LPA Alternative on the historic properties would preclude the possibility of a Section 4(f) *de minimis* impact determination (and a prudent and feasible avoidance alternative would have to be selected). However, with context-sensitive design and siting of the proposed facility (LRT station, VSMF) in relation to its surroundings, the LPA Alternative may have no adverse effect on the historic district and the resulting *de minimis* impact determination would make this LPA Alternative viable.

² Attractions directly served by alternative calculated within 1/4 mile of LRT stations.

³ Information on potential traffic operations and safety impacts is preliminary, based on the best available information assembled to date by the project team. The FEIS will contain a more detailed analysis and discussion of potential operational and safety impacts and mitigation associated with the LPA Alternatives.

⁴ US Census 2000 SF3, population and households within 1/4 mile of LRT stations.

There would be no residential or business displacements required for any LPA Alternative. For the traction power substations, use of approximately 0.5 acre of properties adjoining the LPA right-of-way may be required, depending on the final locations and configuration of the substations, which will be determined during project design.

Given the significant number of historic properties in the study area, LPA Alternatives A1, B2 and B3 would result in an adverse effect to 13, 18, and 15 historic properties, respectively. The magnitude of each adverse effect varies by property and the nature of the adverse effect. Continued consideration of historic properties through the ongoing consultation process, in accordance with Section 106 of the National Historic Preservation Act and potential modifications to LRT station locations and other LPA details, may result in refinement of the effects conclusions. Any changes in the extent of impacts to historic properties will be taken into account during selection of a preferred alternative and will be reported in the Final Environmental Impact Statement (FEIS).

Mitigation of impacts to historic resources is feasible, in some cases through refinement of LPA elements, such as LRT station locations and/or design. For adverse effects to historic resources, FTA, in consultation with the Michigan State Historic Preservation Office (SHPO) and other Section 106 consulting parties, will develop measures and responsibilities to minimize or mitigate adverse effects. These mitigation measures will be documented in a Memorandum of Agreement or a Programmatic Agreement and will be provided in the FEIS.

LPA Alternatives A1, B2 and B3 would result in noise impacts on five, six and five noise-sensitive properties, respectively. Such noise impacts would be mitigated with the use of custom-designed LRT vehicle wheel skirts. Alternatives A1, B2 and B3 would result in a vibration impact at one, two and one properties, respectively. While all three LPA Alternatives would result in a ground-borne noise impact at the Fox Theater and several other properties, such noise would be inaudible as predicted airborne-noise levels would exceed noise caused by ground-borne vibration of the affected structures.

Preliminary Phase I Environmental Site Assessment (ESA) investigations show that Recognized Environmental Conditions (REC), indicating the presence of hazardous materials, are associated with each of the three potential vehicle storage and maintenance facility sites. Adverse long-term effects include purchasing contaminated property and having potential environmental cleanup liability and associated due diligence consequences. Due diligence includes updating the Phase I ESA and performing Phase II testing to help establish whether contamination is present and, if present, to determine its nature and extent. Mitigation measures would be needed only where construction activities encounter known or suspected contamination.

While each of the LPA Alternatives would result in some adverse environmental impacts, none would pose disproportionately high and adverse human health or environmental impacts to environmental justice (i.e., minority and low-income) populations in the study area.

ES.7 Section 4(f) Evaluation

The study area's historic resources that would be adversely affected by the LPA, as determined through the Section 106 consultation process, were evaluated to determine whether the LPA Alternatives would result in a Section 4(f) impact. A Section 106 adverse effect of the LPA on historic properties would preclude the possibility of a Section 4(f) *de minimis* impact determination (and a prudent and feasible avoidance alternative would have to be selected). For several historic properties, a provisional *de minimis* impact determination has been made. This assumes that further consultation with the SHPO regarding context-sensitive design and siting of

the LPA facilities (LRT station or VSMFs) may result in a Section 106 no adverse effect finding and a Section 4(f) *de minimis* impact determination.

All three LPA Alternatives would have a *de minimis* impact on six historic districts. Alternative A1 would additionally have a *de minimis* impact on the Washington Boulevard Historic District, while Alternative B2 would result in a direct use, as it would require relocation of the Macomb Monument. Alternatives A1 and B3, which would not result in a direct use, present reasonable and prudent alternatives to Alternative B2. Any changes to the Section 106 determinations of effect through the ongoing Section 106 consultation process, and potential modifications to LRT station locations and other LPA details, will be taken into account to refine the Section 4(f) evaluation and select the preferred alternative, and will be documented in the FEIS.

ES.8 Evaluation of Alternatives

The evaluation of alternatives considers the extent to which each alternative would satisfy the purpose and need for the proposed transportation improvement. Therefore, the evaluation measures used to compare alternatives reflect the project purpose and need.

As the LPA Alternatives' alignments would follow existing roadway rights-of-way, their potential environmental impacts would be relatively minor in type and degree for a project of this size (Table ES-1).

While the LPA Alternatives' transportation benefits would vary somewhat, each would provide transit improvements that would not occur with the No Build Alternative. Each of the LPA Alternatives would have positive impact on transit ridership by improving access to existing and planned attractions and development in the study area. LPA Alternative B3 would provide improved transit access to slightly fewer attractions along Woodward Avenue than would LPA Alternatives A1 and B2.

The LPA Alternatives would provide an additional transportation option compared to the No Build Alternative. Their relative attractiveness to transit markets and resulting transit-user benefits would be a function primarily of differences in transit travel time improvement compared to the No Build Alternative and their service reliability. LPA Alternative B3 would provide the most improved travel time, but as the LRT vehicles would operate in mixed traffic, travel time would depend on traffic volume and conditions. Conversely, Alternative A1, while having slightly longer travel time, is the only LPA Alternative for which travel time would be predictable, as its median-running LRT vehicles would be separated from vehicular traffic.

The LPA Alternatives would each be consistent with and support development plans and Woodward Avenue-focused redevelopment initiatives of the cities of Detroit and Highland Park.

Environmental justice and transit-dependent populations, which are heavily represented in the study area, would benefit from the transit service improvements. Environmental justice populations would also benefit from the indirect impact of enhanced economic development potential, particularly near LRT stations, that would result from the LPA Alternatives, but not with the No Build Alternative.

ES.9 Public Participation and Agency Coordination

Public participation strategies and activities have been used during preparation of this DEIS to disseminate project information and solicit and receive public input and comment on project-related issues, concerns, and potential environmental impacts of the LPA.

The Notice of Intent (NOI) to prepare an environmental impact statement for the proposed Woodward Avenue LRT Project was issued in the *Federal Register* by the Federal Transit Administration (FTA) on July 30, 2010. Two public scoping meetings were held on August 14, 2010, at the Considine Little Rock Family Life Center (Auditorium) in Detroit, located at 8904 Woodward Avenue in a central part of the project corridor. More than 120 individuals attended the public scoping meetings and a total of 260 comments were received.

The project website (<http://www.woodwardlightrail.com/>) provides project information and a means for the public to provide comments. Since July 2010, the site has registered 30,841 page hits.

The following agencies were represented at an Interagency Scoping meeting on August 17, 2010, in addition to the FTA and the City of Detroit (which was represented by several departments):

- Federal Highway Administration (FHWA)
- Michigan Department of Transportation (MDOT)
- City of Detroit, Planning Commission, Detroit Historic Commission
- Southeast Michigan Council of Governments (SEMCOG)
- Detroit Economic Growth Corporation (DEGC)
- Suburban Mobility Authority for Regional Transportation (SMART)
- M-1 Rail
- Wayne County
- Detroit Transportation Corporation (DTC)

ES.10 Next Steps in the NEPA Environmental Review Process

Key next steps in the project's environmental review process are listed below:

- Circulate this DEIS/Draft Section 4(f) Evaluation for public and agency review and comment;
- Hold public hearings during the 45-day public comment period;
- Prepare and circulate the FEIS/Final Section 4(f) Evaluation, which will: 1) identify FTA's and the City of Detroit's preferred alternative, based on the information contained in this DEIS, available funding, and public comments received during the DEIS comment period; 2) present any project refinements and/or additional analyses; and 3) include responses to comments received on the DEIS; and

Issue a Record of Decision to conclude the NEPA process and present FTA's decision to proceed with an approved alternative and mitigation commitments.

1.0 Purpose and Need

1.1 Introduction

The Federal Transit Administration (FTA), as the lead federal agency, and the City of Detroit, as the project sponsor, have jointly prepared this Draft Environmental Impact Statement (DEIS) to evaluate and assess potential impacts to the human and natural environment that may result with construction and operation of the Locally Preferred Alternative (LPA) of the Woodward Avenue Light Rail Transit (LRT) project.

This chapter summarizes previous planning and the transportation system context for the LPA and identifies the need for light rail transit in the study area and the purpose that it is intended to serve.

1.2 Summary of Purpose and Need

The purpose of the LRT project is to:

- Improve public transit service and provide greater mobility options for the Woodward Avenue Corridor;
- Improve transportation equity among all travelers;
- Improve transit capacity along the Corridor;
- Improve linkages to major activity centers along the Corridor; and
- Support the City's economic development goals and encourage reinvestment in Detroit's urban core.

The need for the project is based on the following considerations:

- Strong existing bus ridership and large potential ridership due to major activity centers along the Corridor;
- A heavily transit-dependent population along the Corridor;
- Overcrowding, reliability issues, and lack of rapid transit alternatives with the current bus system;
- Air quality issues due to the region's nonattainment status; and
- Focus of local policy on transit improvements rather than roadway improvements as part of a more balanced and sustainable approach to future growth.

The proposed LRT system represents a major step to promote regional and local rapid transit improvements in Southeast Michigan.

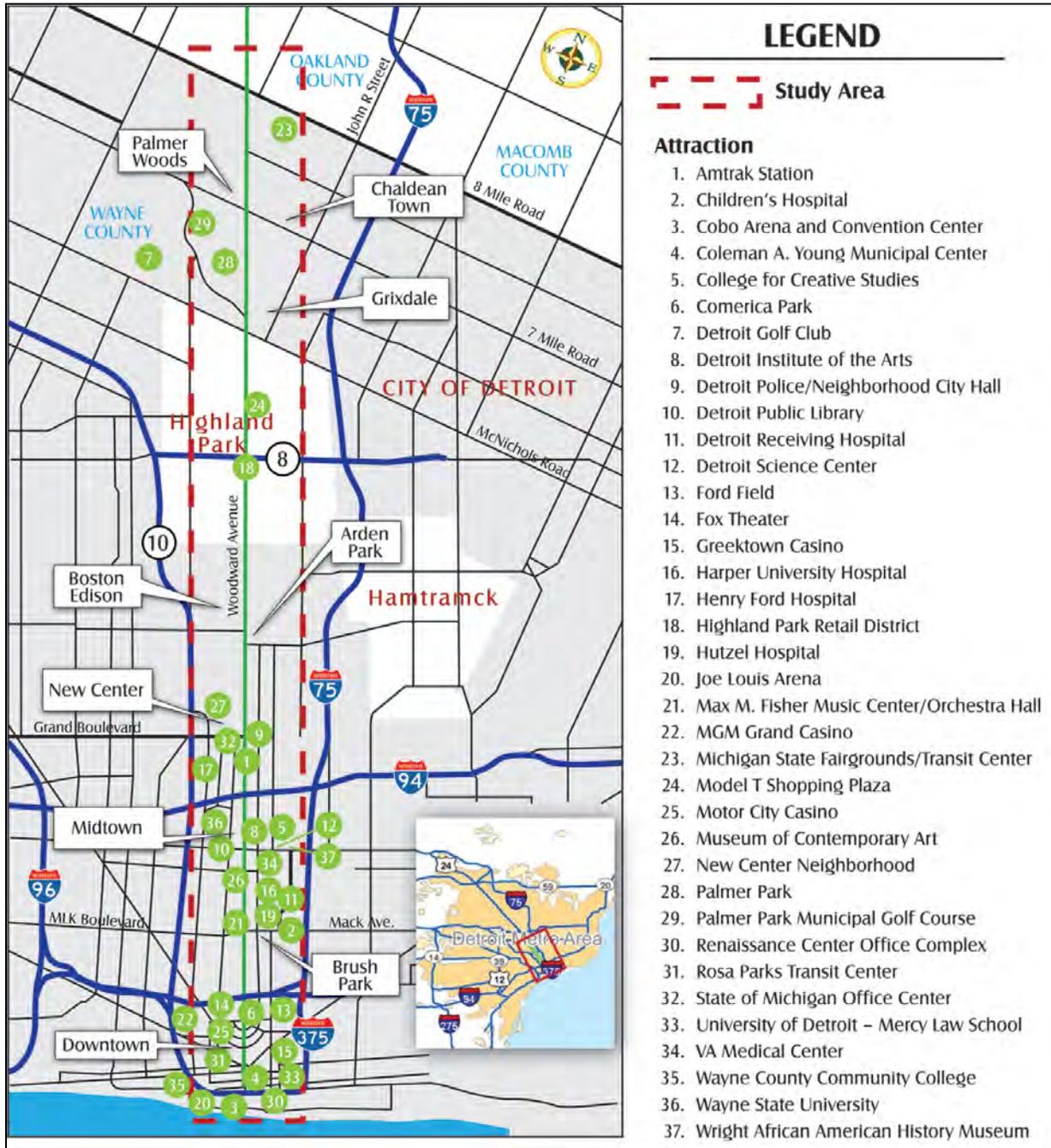
1.3 Study Area Description and MPO Planning Background

1.3.1 Study Area Description

The study area ([Figure 1-1](#)) is located in Wayne County, Michigan. It comprises the Woodward Avenue Corridor extending 9.3 miles from Downtown Detroit (Downtown), near the Detroit River, north to the State Fairground near 8 Mile Road. The majority of the study area lies within the City of Detroit, while approximately two miles (from Webb to McNichols (6 Mile) streets) is within the City of Highland Park. The study area boundary extends approximately one-half mile to the east and west of Woodward Avenue, the area within which project impacts may occur.

From south to north, the study area includes the densely developed Downtown Central Business District (CBD) and many of the City’s prominent historical sites, civic buildings, sports venues and cultural attractions; medical, higher education, and additional cultural institutions north of the CBD; and residential areas and the Michigan State Fairgrounds.

Figure 1-1. Study Area Boundary and Major Destinations



1.3.2 MPO Planning Background

The LPA is included in the financially constrained 2035 *Regional Transportation Plan* of the Southeast Michigan Council of Governments (SEMCOG), the Metropolitan Planning Organization (MPO). It is consistent with local land use and transportation plans and is

supported by a series of local, regional and State plans that have expressed the need to expand transit options and quality in the Detroit region. The Detroit Transit Options for Growth Study (DTOGS), an alternatives analysis prepared by the Detroit Department of Transportation (DDOT), identified the Woodward Avenue corridor as best suited for rapid transit; selected the LPA that is evaluated in this DEIS; and initiated FTA's New Starts planning process. The DTOGS goals, developed in collaboration with project stakeholders, focused on transportation and mobility, economic opportunity and investment, communities and environment, and public involvement.

1.4 Transportation Facilities and Services

1.4.1 Transit

Transit ridership in the study area is currently over 22,000 trips per weekday. Three primary carriers provide transit service in the study area:

- DDOT, the major transit provider in Southeastern Michigan, operates slightly more than half of its 40 bus routes to Downtown from outlying neighborhoods, and 20 other routes operate east-west or north-south connecting neighborhoods; ten of DDOT's Downtown-oriented routes run at least partially along Woodward Avenue, including Route 53, which runs the entire length from Downtown to 8 Mile Road and had an average weekday ridership of 12,600 in 2008;
- Suburban Mobility Authority for Regional Transportation (SMART), the second largest transit provider in Michigan, with six routes along Woodward Avenue within the study area with a combined daily ridership over 10,000 in 2008; and
- Detroit Transportation Corporation People Mover, providing connections among major activity nodes in Downtown via 13 stations on a fully automated, elevated rail system, with approximately 5,600 daily passengers in 2008.

In addition to the above, Transit Windsor of Ontario, Canada, operates one route that provides service to Detroit via the Detroit-Windsor Tunnel and circulates through Downtown, including along Woodward Avenue. Two transit centers are located at the southern and northern ends of the study area, the Rosa Parks Transit Center and the State Fair Transit Center, respectively. The former provides connections to 21 DDOT bus routes, the SMART suburban bus system, Transit Windsor and the People Mover, while the latter is served by six bus routes and provides park-and-ride service at the northern end of the study area. Finally, Wayne State University and Detroit Medical Center, each with facilities in the study area, operate shuttle services between parking facilities and campus and hospital buildings, respectively, along fixed routes. The University's two shuttle routes are free for faculty and students; the Medical Center's shuttle is free for patients, employees, and visitors.

In addition to maintaining the existing bus system, SEMCOG's 2035 *Long Range Transportation Plan* (LRTP) includes the addition of three rapid transit lines: Ann Arbor-Detroit Regional Rail, Washtenaw-Livingston Commuter Rail Service, and the LPA along Woodward Avenue. The LRTP proposes continued expansion of the rapid transit system to other major roadways, including M-59, Gratiot, and Woodward north of 8 Mile Road, as funding becomes available.

1.4.2 Passenger Rail

The Detroit-Chicago corridor is a federally designated High Speed Rail corridor and part of the Midwest Regional Rail system. Amtrak's Wolverine line provides intercity passenger rail service to Detroit, with its station located at Woodward Avenue and West Baltimore Street. In 2009,

nearly 60,000 passengers boarded and alighted at the Detroit Amtrak station. The planned Ann Arbor-Detroit Regional Rail would also use this station, with service scheduled to begin in 2013.

1.4.3 Roadway System

Woodward Avenue, a State highway north of Adams Street, is located in an area with significant access to several State and US highways and the interstate system (Figure 1-1). Two freeways, M-10 and I-75, parallel Woodward Avenue in the study area to the west and east, respectively. These freeways are typically used for access to major destinations in the study area, with principal side streets serving as connectors. Woodward Avenue is used principally as a connector to Downtown or to destinations along the Avenue for residents within and north of the study area.

Per Michigan Department of Transportation (MDOT) statistics, Woodward Avenue carried between 20,000 and 25,000 vehicles on an average weekday in 2009. During the morning and evening peak hours, signalized intersections operate at generally acceptable levels of delay. Average auto travel time from Downtown to State Fair Avenue is about 15 minutes.

1.5 Travel Patterns and Markets

Woodward Avenue is a primary transportation corridor in the region with multiple activity nodes along its length, including local and regional attractors. Approximately ten percent of trips within the study area both start and end within the study area; the majority of trips start or end outside of the study area (Table 1-1). This reflects the number and range of cultural, entertainment, government, recreational and other non-work-related destinations along Woodward Avenue (Figure 1-1).

Table 1-1. Average Daily Work and Non-Work Trips To and From the Study Area (2005)

Type of Trip	Starting and Ending Within Study Area		Starting or Ending Outside of Study Area		Total Study Area Trips	
	Number	Percent	Number	Percent	Number	Percent
Work-Related	18,570	23%	232,088	33%	250,658	32%
Shopping	4,460	6%	52,534	8%	56,994	7%
K-12 School	1,702	2%	32,057	4%	33,759	5%
University	11,648	14%	41,948	6%	53,596	7%
Other	35,360	55%	339,118	49%	383,478	49%
Total	71,740		697,745		778,485	

Source: SEMCOG Travel Demand Model

In 2005, approximately 32 percent of all trips within the study area were work-related. The majority of the trips within the study area are non-work related, representing diverse trip types including shopping, school and university, recreational and cultural, and other trips that occur in the study area.

The study area is a heavily used transit corridor due to its density, the number and variety of destinations, and the high number of transit-dependent persons living and/or working in and visiting the study area on a daily basis. The socioeconomic indicators correlated to transit-dependence shown in Table 1-2 on the next page illustrate the significance of this population as a market for the existing transit services in the study area and for any future transit options.

The study area has experienced some economic redevelopment activity since 2000, most notably in Downtown and New Center (Figure 1-1). Several public and private initiatives focused on redevelopment of the Woodward Avenue corridor have been undertaken to sustain and strengthen its revitalization, including in both Detroit and Highland Park. The Detroit Strategic Framework Plan (Framework Plan) and the Woodward Avenue Transit-Oriented Development (TOD) Strategy are two of the key ongoing economic development initiatives, which promote sustainable development, transit-supportive and targeted growth, and would likely expand the travel market for future transit expansion.

Table 1-2. Socioeconomic Indicators Correlated to Transit Dependence

Characteristic	Study Area		City of Detroit		Wayne County		7-County Region	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total Population	74,922		952,717		2,061,162		4,833,493	
Persons Age 65+	8,680	11.6%	99,854	10.5%	249,881	12.1%	567,361	11.7%
Persons Age 17 and Younger	17,874	23.9%	295,917	31.1%	577,032	28.0%	1,266,307	26.2%
Disabled Persons (Ages 5+)	18,256	27.0%	214,821	24.9%	366,751	19.4%	714,897	16.0%
Persons Living in Poverty	24,262	34.0%	243,240	26.0%	332,598	16.4%	503,599	11.0%
Households with income < \$40,000	22,759	72.4%	210,401	62.4%	377,073	49.1%	742,720	40.2%
Zero-Car Households	11,987	38.2%	73,714	21.9%	106,146	13.8%	165,676	9.0%
1-Car Households	12,883	41.1%	148,532	44.1%	299,601	39.0%	3645,005	35.0%

Source: 2000 Census, SEMCOG Travel Demand Model Traffic Analysis Zone database

Notes: Percents are specific to each characteristic in each geographic area, and not related to the total population in each geographic area.

The seven-county SEMCOG region includes Livingston, Macomb, Monroe, Oakland, St. Clair, Washtenaw and Wayne counties.

1.6 Performance of the System

Woodward Avenue carries between 20,000 and 25,000 vehicles per day, on average, and serves as the local bus system's busiest corridor. Additionally, suburban SMART routes on 8-Mile Road and Gratiot, Michigan, Grand River and Jefferson avenues converge in the Detroit CBD within the Woodward Avenue study area. Even outside the CBD, Woodward serves as an important transit corridor for suburban riders, with six bus routes serving the State Fair Transit Center. Performance of this transit system, comprising local, suburban and Downtown People Mover services, would be improved with better connectivity among the services, such as would be provided by the LPA.

Currently, transit service in the study area suffers from three principal deficiencies: overcrowding, slow travel speeds, particularly compared to travel by auto, and on-time performance. Despite round-the-clock local bus service (DDOT Route 53) on Woodward Avenue, and eight-minute service headways during peak hours, transit demand exceeds the supply; the route is crowded and, on average, runs one-third over seated capacity during

weekday peak times. During morning peak travel times, scheduled bus travel time on Route 53 along Woodward Avenue is about 33 minutes, compared to about 15 minutes to travel the distance by auto. With future traffic growth, and without transportation improvements in the study area, transit travel time will likely lengthen as speeds decrease. Finally, recent (April 2009) statistics show that on DDOT Route 53, the principal bus service along Woodward Avenue, nearly one-quarter of buses were early, late or no-shows due to operational issues, peak-hour traffic congestion, and extended dwell times at stops due to overcrowding.

The Detroit-Ann Arbor region is non-attainment for particulate matter ($PM_{2.5}$) and a maintenance area for carbon monoxide, indicators of the area's reliance on auto travel and bus transit. SEMCOG forecasts show that traffic congestion will worsen in the region, absent travel options that would divert trips from autos, with consequent impacts on air quality, as well as mobility.

2.0 Alternatives Considered

2.1 Introduction

The Locally Preferred Alternative (LPA) evaluated in this DEIS was based on the Detroit Transit Options for Growth Study (DTOGS), prepared by the Detroit Department of Transportation (DDOT) and its planning partners, including the City of Detroit, neighboring cities, the Southeast Michigan Council of Governments (SEMCOG), Wayne County, the State of Michigan, and regional and federal agencies. This chapter summarizes the LPA alternatives analysis and describes the reasonable alternatives, including the No Build Alternative and the LPA, which are evaluated in this DEIS.

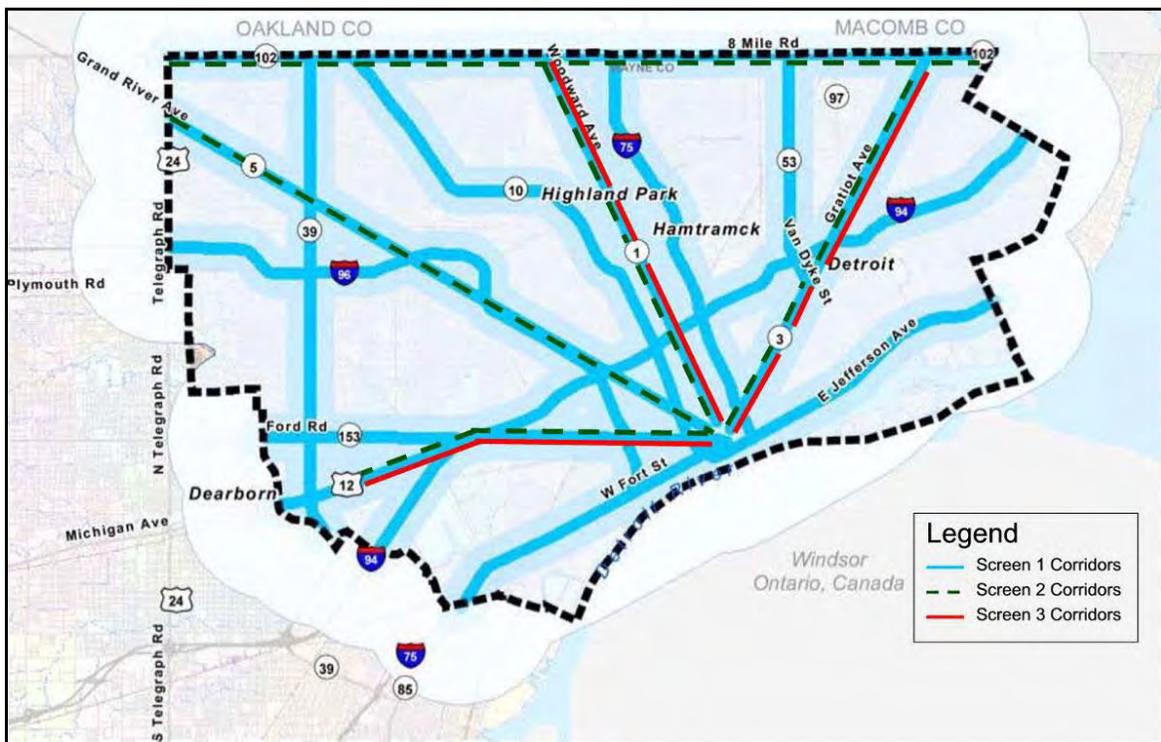
2.2 Alternatives Screening and Selection Process

2.2.1 Corridor and Transit Technology Alternatives

Following FTA guidelines for conducting an Alternatives Analysis, DTOGS identified a wide range of potential transit improvements in a study area encompassing the City of Detroit and the cities of Dearborn, Hamtramck and Highland Park. Fourteen transit corridors identified in the SEMCOG Regional Transportation Plan (Figure 2-1), including adjacent primary roadways within a two-mile buffer area, and 13 transit technologies were initially identified for evaluation.

DTOGS used a systematic process to narrow the number of alternatives, ultimately resulting in selection of the LPA: light rail transit (LRT) on Woodward Avenue between Downtown Detroit and the Michigan State Fairgrounds near 8 Mile Road.

Figure 2-1. Map of DTOGS Corridors



Source: *Detroit Transit Options for Growth Study: Locally Preferred Alternative Report*, Final Draft: June 2008, Expanded Version: April 2009; Detroit Department of Transportation

The alternatives evaluation process comprised:

- Screen 1 – A fatal flaw analysis using socioeconomic, transportation, social equity, conceptual engineering, and community goals and objectives criteria was employed to select five of the initial 14 corridors to advance to Screen 2 (Table 2-1).
- Screen 2 - Individual alignments within each of the remaining five corridors were evaluated for their suitability for rapid transit, using criteria addressing transportation and mobility; land use and development opportunities; communities and the environment; and cost and engineering considerations. In addition, input was received from residents, neighborhoods and the business community at four DTOGS project public open house-style meetings in March 2007, via the project website and a project survey about the initial 14 corridors.

Thirteen initial transit technologies were also evaluated to determine their consistency with project goals and their suitability for the remaining five corridors, using criteria addressing capital and operating and maintenance costs; right-of-way requirements; passenger-carrying capacity; and trip length. Eight technologies eliminated from further consideration were found to not sufficiently address study goals; were not well suited to the remaining corridors; and/or were cost prohibitive. The remaining technologies were then evaluated based on technical feasibility, ability to meet study goals and objectives, right-of-way opportunities and constraints, and public input obtained at the March 2007 open house meetings.

On the basis of Screen 2 and public input, three rapid transit alignments and three transit technologies were advanced for detailed evaluation:

Alignments

1. Gratiot Avenue – on Gratiot Avenue generally between 8 Mile Road and Downtown Detroit, and on Woodward Avenue between Downtown and New Center;
2. Michigan Avenue – on Michigan Avenue generally between Evergreen Road and Downtown, and on Woodward Avenue between Downtown and New Center; and
3. Woodward Avenue – on Woodward Avenue generally between Downtown and 8 Mile Road.

Technologies

1. Conventional bus (i.e., the service currently operated by DDOT);
 2. Bus rapid transit (BRT); and
 3. LRT
- Detailed Definition and Analysis - The three alignments and three transit technologies advanced from Screen 2 were paired into six BRT and LRT alternatives that were further refined, including development of conceptual design and operating details, ridership forecasts, and general capital and operating and maintenance costs. A No Build and a Transportation System Management (TSM) alternative were also defined for each of the three alignments, consistent with FTA guidance. These alternatives were evaluated based on criteria addressing transportation and mobility, economic opportunity and investment, communities and the

Table 2-1. DTOGS Alternatives Screening Evaluation: Screen 1 Fatal Flaw

Evaluation Criteria	West Subsector				Northwest Subsector			Northeast Subsector		North Subsector			East Subsector	
	Fort Corridor	US 12 (Michigan) Corridor	M-153 (Ford) Corridor	I-94 Corridor	M-39 Corridor	Grand River Corridor	I-96 Corridor	Van Dyke Corridor	Gratiot Corridor	Woodward Corridor	I-75 Corridor	M-10 (Lodge Freeway) Corridor	Jefferson Corridor	M-102 (8 Mile) Corridor
Socio-Economic Criteria														
Total Population	○	●	○	●	●	●	●	○	○	○	○	●	○	●
Population Density (persons/square mile)	○	●	●	●	●	●	●	●	●	●	●	●	○	●
Total Employment	●	●	○	●	○	●	○	○	○	●	●	●	●	○
Employment Density (jobs/square miles)	●	●	○	○	○	○	○	○	●	●	●	●	●	○
Social Equity Criteria														
Zero Car Households	○	○	○	○	○	●	●	○	○	○	○	○	○	○
Population Below Poverty Level	○	○	○	●	○	●	●	○	○	○	●	○	○	○
Population Over 65	○	○	○	●	○	○	○	○	○	○	●	○	○	●
Community Goals and Objectives Criteria														
Consistency with Corridor Plans	●	●	○	○	○	●	○	●	●	●	○	○	○	●
Consistency with SEMCOG plans and City of Detroit Master Plan	●	●	○	○	○	●	○	●	●	●	○	○	●	●
Conceptual Engineering Criteria														
Potential Capital Cost Estimate	●	●	○	○	○	●	○	○	●	●	○	○	●	●
Potential Right-of-way availability	○	●	○	○	○	●	○	●	●	●	○	○	●	●
Transportation Criteria														
Number of Major Trip Generators	○	●	○	●	○	●	●	○	○	○	○	●	○	●
Average Daily Traffic on Major Roadways Serving Corridor	○	●	●	NA	NA	○	○	○	●	●	○	○	○	○
Average Daily Ridership on Transit Routes Serving Corridor	○	○	○	○	○	●	○	○	●	●	○	○	○	○
Other Factors Criteria														
Public Perception	○	●	○	○	○	●	○	○	●	●	○	○	●	○
Total Screen 1 Rating	61	78	50	61	50	86	60	60	81	83	60	67	70	78
Screen 1 Recommendation	-	+	-	-	-	+	-	-	+	+	-	-	-	+

Source: Adapted from *DTOGS: LPA Report*, Final Draft: June 2008, Expanded Version: April 2009; DDOT
 ● = Very Good (5 points); ● = Good (4 points); ○ = Fair (3 points); ○ = Poor (2 points); ○ = Very Poor (1 point)
 (+) = recommended for further evaluation; (-) = eliminated from further evaluation

environment, cost-effectiveness per FTA's New Starts¹ index for rating projects, and public input.

Based on technical evaluations and strong public preference stated for LRT, LRT in the Woodward Avenue corridor from Downtown Detroit to the Michigan State Fairgrounds near 8 Mile Road was selected as the LPA. For more information, please see the DTOGS report located on the project website at <http://www.woodwardlightrail.com>.

2.2.2 Downtown Alignment Alternatives

Following selection of the LPA, two stakeholder workshops were held to develop and evaluate six potential LRT alignments in the Downtown section of the corridor. Based on stakeholder input at the workshops, two Downtown alignments were recommended for further study:

- Alternative D-2 - Dual tracks south on Woodward Avenue to Grand River Avenue, south on Washington Boulevard to Larned Street, followed by a single-track one-way loop east on Larned Street to Randolph Street, then west on Congress Street back to Washington Boulevard; and
- Alternative F – South on Woodward Avenue, shifting to Washington Boulevard, south from Grand River Avenue as a single-track one-way loop, east along Larned Street north on Randolph Street, continuing north along Broadway, and then returning back to Woodward Avenue via Witherell Street. This alternative was subsequently dismissed due to lower projected ridership than other alternatives and redundancy with the existing Detroit People Mover.

Subsequently, project stakeholders retained Alternative D-2, and identified two additional Downtown alignment alternatives, as follows:

- Modified Alternative D-2 - Dual tracks south on Woodward Avenue to State Street, then proceeding along the same D-2 Alignment, until returning via State Street to Woodward Avenue
- Woodward Avenue - An alignment proceeding entirely along Woodward Avenue and terminating between Congress Street and Larned Street

These three Downtown alignment alternatives – D-2, Modified D-2, and Woodward Avenue -- were advanced for further evaluation in this DEIS, and are described below in [Section 2.3.2](#), respectively, as Downtown Design Options 1, 2 and 3.

2.3 Alternatives Evaluated in This DEIS

2.3.1 No Build Alternative

The No Build Alternative includes the following transit, roadway and non-motorized elements.

Transit

The No Build Alternative includes increased service frequencies on DDOT Route 53 (Woodward Avenue) and reorganization of feeder bus routes to optimize travel times. Route 53 would continue to use 40-foot buses, as for current services, and would operate on ten-minute headways all day. There would also be an express route with 30-minute headways but only in the peak direction and peak period. Schedules of some cross routes would be adjusted to coincide with

¹ FTA's discretionary New Starts program is the federal government's primary financial resource for supporting locally planned, implemented, and operated fixed transit guideway systems and extensions (49 USC Section 5309).

Route 53 service to accommodate transfers. The No Build Alternative does not include any new bus routes. Also, the No Build Alternative assumes bus services on existing roads in mixed traffic; it does not assume any change in future (2030) bus travel speeds or travel times on Routes 53. The No Build Alternative assumes DDOT's existing fare and transfer structure.

The Ann Arbor to Detroit Commuter Rail project, which is currently listed in SEMCOG's Transportation Improvement Program (TIP) for the Detroit-Warren-Livonia Metropolitan Statistical Area (MSA) for fiscal years 2008 through 2011, is also included in the No Build Alternative.

Roadway

The No Build Alternative includes all capacity-related transportation system projects listed in SEMCOG's Transportation Improvement Program (TIP) for the Detroit-Warren-Livonia Metropolitan Statistical Area (MSA) for fiscal years 2008 through 2011. In addition to the TIP projects, the No Build Alternative also includes capacity-related transportation projects listed in SEMCOG's financially constrained Regional Transportation Plan (RTP) for the corridor.

Non-Motorized

A shared-use path for pedestrians and bicycles is currently being constructed along Kirby Street on either side of Woodward Avenue. There are plans to also construct a share-use path along Canfield Street on either side of Woodward Avenue within the next few years. There are no other plans to improve or construct any other non-motorized facilities within the study area.

2.3.2 Locally Preferred Alternative

The LPA is LRT (Figure 2-2) on Woodward Avenue from Downtown Detroit to 8 Mile Road (Figure 2-3), with two mainline design options (Figure 2-4 and Figure 2-5) and three Downtown design options (Figure 2-6), which are still under consideration. The mainline design options along Woodward Avenue are median-running and separated from traffic (Option A) and curb-running in mixed traffic (Option B). Additional maps showing the alignments are located on the project website at <http://www.woodwardlightrail.com/NEPA.html>, Appendix D and in the Transportation Technical Report.

LRT has been defined as an at-grade system entirely within existing rights-of-way. It would be fully functional as a stand-alone project, but would be designed to accommodate possible future extensions.

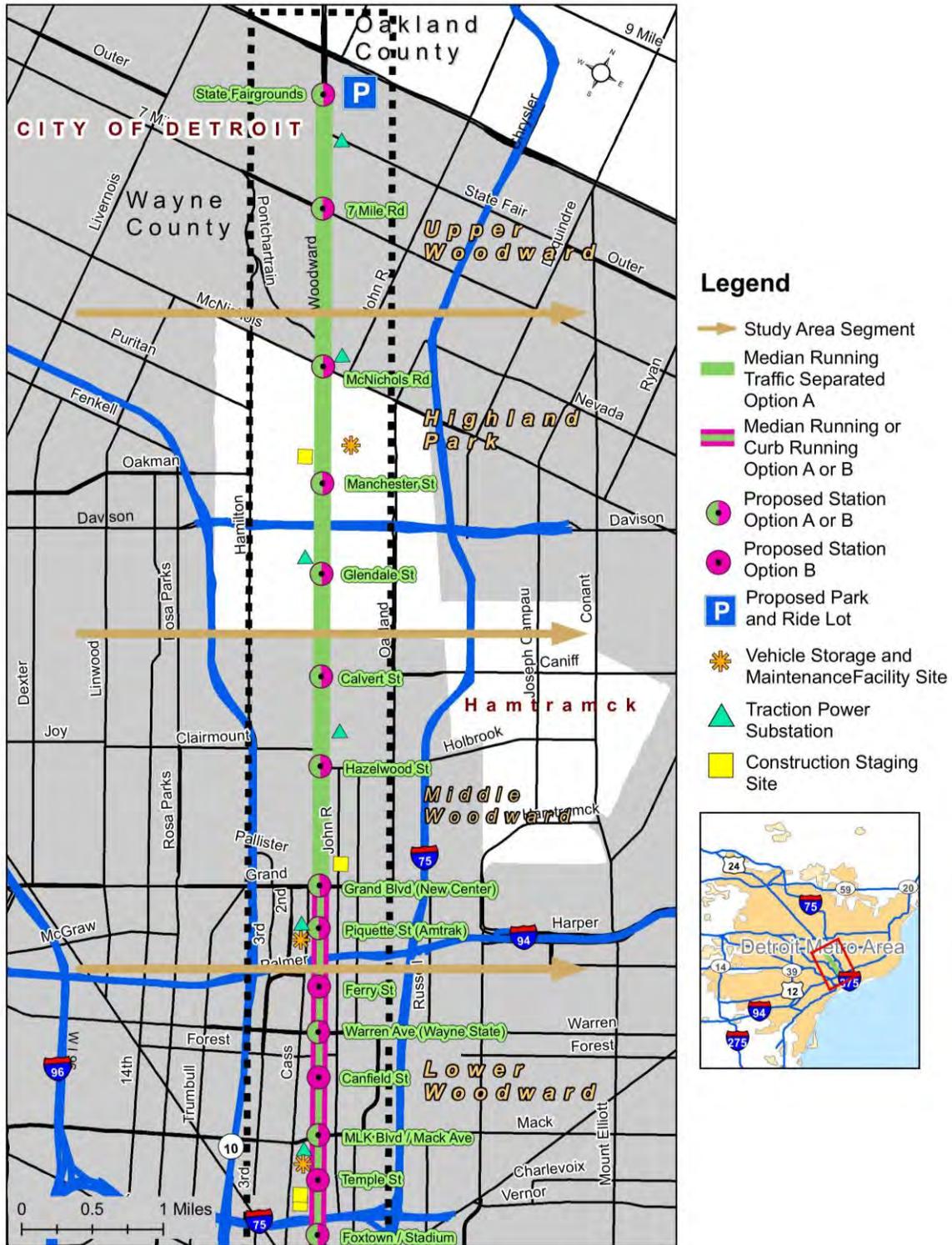
LRT uses electric rail vehicles and may operate with just one vehicle or two that are joined; if the latter, the LRT would not be expected to be longer than 180 feet. However, some City blocks in Downtown are shorter than 180 feet; therefore, LRT vehicles would be given priority at traffic signals to avoid blocking intersections and crosswalks by stopped LRT vehicles. LRT vehicles are powered via overhead electric wire (catenary); therefore, there are not the safety issues as there would be with a live third rail at ground level.

Figure 2-2. LRT Example



Source: Wikipedia, 2010

Figure 2-3. Mainline Design Options and Locations of LRT Stations and Ancillary Facilities



Source: Parsons Brinckerhoff, 2010

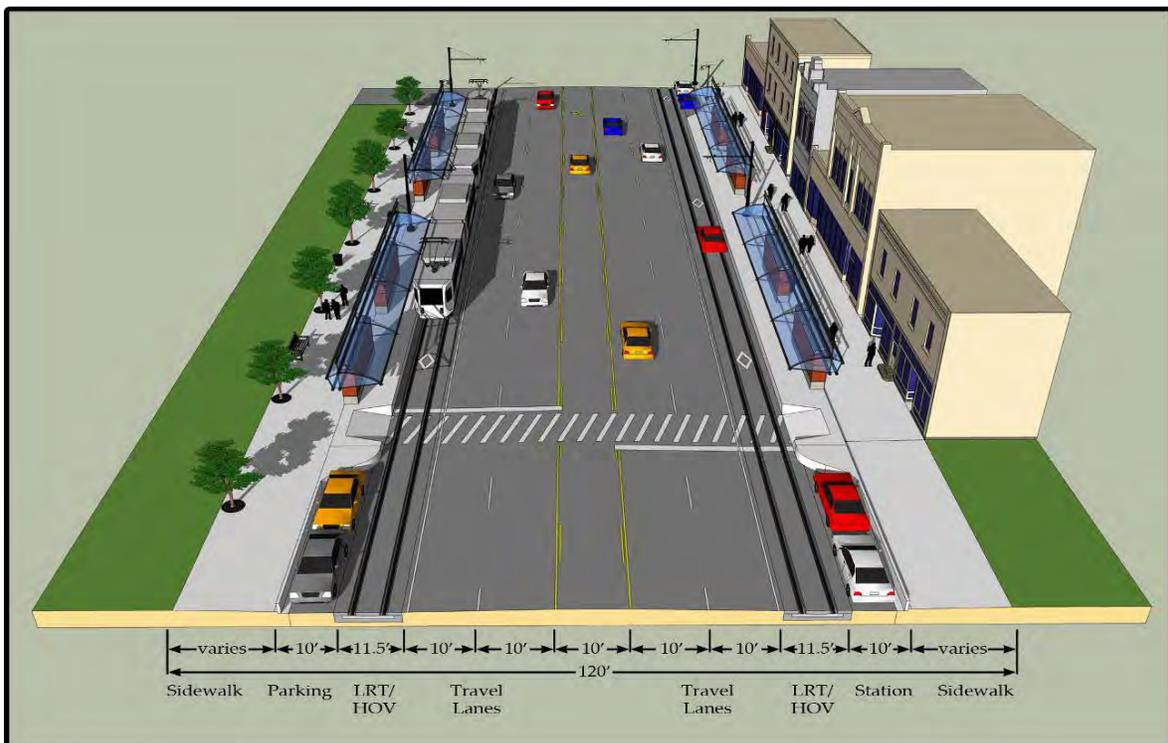
Figure 2-4. Cross-Section of Operating Option A: Median-Running/Traffic Separated



Source: Parsons Brinckerhoff, 2010

The dimensions shown are subject to change following selection of a Preferred Alternative and further engineering studies.

Figure 2-5. Cross-Section of Operating Option B: Curb-Running/Mixed Traffic



Source: Parsons Brinckerhoff, 2010

The dimensions shown are subject to change following selection of a Preferred Alternative and further engineering studies.

Existing road rights-of-way vary considerably in project corridor. In Downtown, it ranges from 78 feet along Washington Boulevard to 109 feet along Woodward Avenue south of Adams Street. North of Adams Street the right-of-way widens along Woodward Avenue to 120 feet until reaching Grand Boulevard. The narrowest section of Woodward Avenue – at 100 feet – is found north of Grand Boulevard to Manchester Parkway, where the right-of-way then returns to 120 feet. The widest section of right-of-way is found north of McNichols Road where it widens to 204 feet.

Operating Options on Woodward Avenue

The two operating options on Woodward Avenue are as follows:

Operating Option A: Median-Running/Traffic Separated (Figure 2-4)

The LRT would operate in the center median of Woodward Avenue from north of Adams Street to the Michigan State Fairgrounds. Within this section, the LRT would be running separate from vehicular traffic. Stations with center platforms would be located in the median. There would be 12 stations north of Adams Street. This option includes one Downtown Design option, Downtown Option 1 (described below), and was originally identified as part of the DTOGS project.

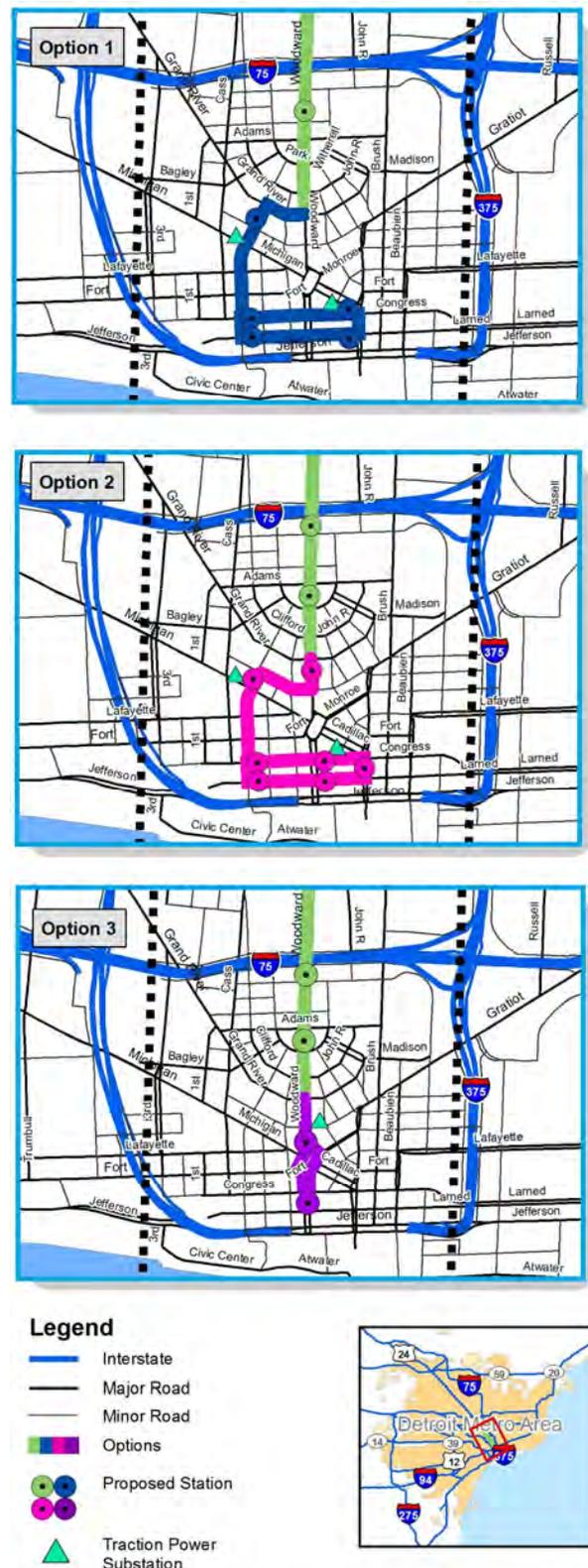
Operating Option B: Curb-Running (Figure 2-5)

The LRT would operate in the right-most travel lane of Woodward Avenue from Adams Street to just north of Grand Boulevard. From north of Grand Boulevard to the Michigan State Fairgrounds, the LRT would operate in the median, as described above. Within the curb-running/mixed traffic section, the LRT would be running with vehicular traffic. There would be 15 stations. This option includes two Downtown Design options, Downtown Options 2 and 3 (described below), and were identified during more recent stakeholder meetings.

Downtown Design Options

Three Downtown design options for the LPA are as described (Figure 2-6):

Figure 2-6. Downtown Design Options



Source: Parsons Brinckerhoff, 2010

Downtown Option 1: Woodward, Grand River, Washington, Larned, Randolph, Congress
Median-running dual tracks south on Woodward Avenue to Grand River Avenue. On Grand River Avenue, the LRT would run westbound against vehicle traffic in an exclusive right-of-way. It would then travel south in the median on Washington Boulevard to Larned Street, at which point it would transition to a single-track, curb-running, one-way loop east on Larned Street to Randolph Street, then west on Congress Street back to Washington Boulevard, and then east with vehicular traffic on Grand River Avenue back to Woodward Avenue. This option has four stations and would be implemented with Woodward Avenue Operating Option A.

Downtown Option 2: Woodward, State, Washington, Larned, Randolph, Congress
Curb-running single tracks south on Woodward Avenue to State Street, then south on the west side of Washington Boulevard to Larned Street, at which point it would transition to a single-track, curb-running, one-way loop east on Larned Street to Randolph Street, west on Congress Street back to the east side of Washington Boulevard, and east against vehicular traffic on State Street in an exclusive right-of-way, back to northbound Woodward Avenue. This option has seven stations and would be implemented with Woodward Avenue Operating Option B.

Downtown Option 3: Woodward Avenue
Curb-running single tracks south on Woodward Avenue to Campus Martius, clockwise travel around Campus Martius with vehicular traffic, and then continuing south on Woodward Avenue to a stop on Woodward Avenue between Congress and Larned streets. It would then reverse direction to travel north on Woodward Avenue, clockwise around Campus Martius with vehicular traffic and then continue north. This option has four stations and would be implemented with Woodward Avenue Operating Option B.

All three downtown design options would lie entirely within existing available right-of-way.

LPA Variations

Combining the operating and Downtown design options, three variations of the LPA were defined for evaluation in this DEIS.

- Alternative A1 – median-running (Figure 2-4) with Downtown design option 1; 15 stations;
- Alternative B2 – curb-running (Figure 2-5) with Downtown design option 2; 21 stations; and
- Alternative B3 – curb-running with Downtown design option 3; 18 stations.

2.3.3 Stations

The LRT stations (Table 2-2) would be designed to include a number of components essential for safety and security, as well as amenities for passenger comfort and convenience and compliance with the Americans with Disabilities Act (ADA). Primary elements include platform, shelter, wheelchair ramps and station amenities such as lighting, benches, security systems and informational displays. The platforms would be compatible with low-floor LRT vehicles, typically requiring a 14-inch station platform height. Platform length would likely range from 140 to 180 feet, based on LRT vehicle length, space available for each transit station, and whether the alignment is median- or curb-running. Platform width would typically range from 18 to 24 feet for double-sided platforms, and 10.5 to 12 feet for single-sided platforms. Some accommodation would need to be made for loading space at the ramp ends and access ramps. Station shelters would be designed to protect passengers from the elements and to fit visually within each station's setting. Shelter design for stations with the median-running/traffic-separated alternative (A1) would have a conventional canopy (Figure 2-7), while canopy height for stations with the curb-running/mixed-traffic alternatives (B2 and B3) may include a roof-

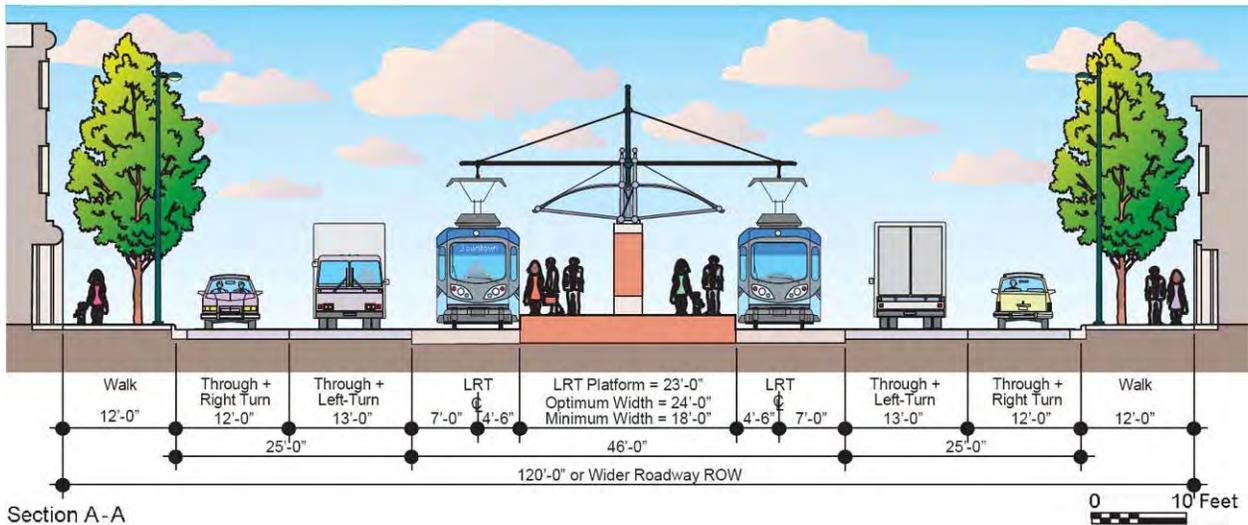
mounted square billboard structure extending 10 feet above the canopy (Figure 2-8). Canopy design guidelines would be developed during the proposed project’s design phase. Remaining sidewalk widths behind curb-running/mixed-traffic stations would be no less than eight feet. Stations with Alternatives B2 and B3 would bump out about eight feet from the existing sidewalks and remove any current on-street parking.

Table 2-2. Station Locations

Station	Alternative A1	Alternative B2	Alternative B3
Cobo Center: Larned at Washington Boulevard & Congress at Washington	X	X	
Woodward: Larned at Woodward & Congress at Woodward		X	X
Randolph St.: Larned at Randolph & Congress at Randolph	X		
Randolph Street		X	
Rosa Parks Transit Center (Washington Boulevard)	X	X	
Michigan Avenue			X
State/Gratiot		X	
Adams/Grand Circus Park		X	X
Foxtown/Stadium	X	X	X
Temple Street		X	X
MLK Blvd./Mack Avenue	X	X	X
Canfield Street		X	X
Warren Avenue	X	X	X
Ferry Street		X	X
Piquette Street/Amtrak Station	X	X	X
Grand Boulevard	X	X	X
Hazelwood Street/Holbrook Street	X	X	X
Calvert Street	X	X	X
Glendale Street	X	X	X
Manchester Street	X	X	X
McNichols Road	X	X	X
7 Mile Road	X	X	X
State Fair	X	X	X
Total Stations	15	21	18

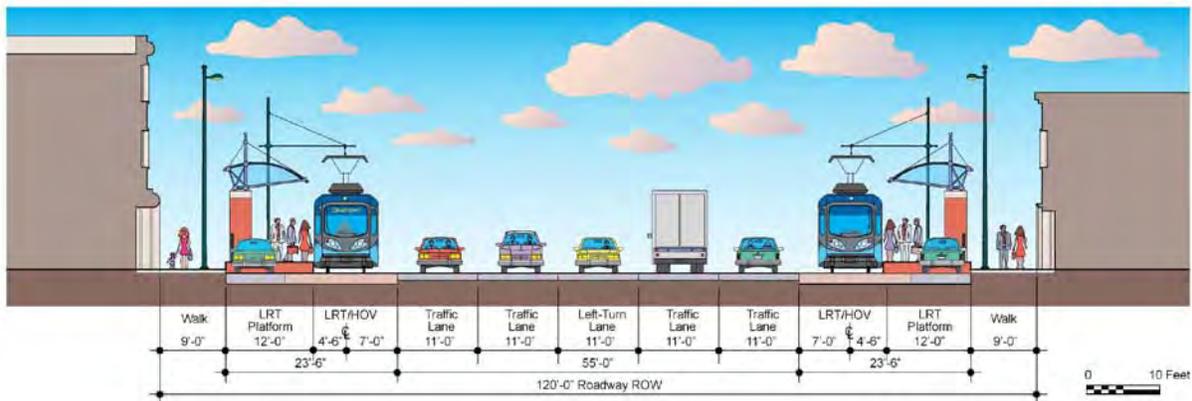
Source: Parsons Brinckerhoff, 2010

Figure 2-7. Operating Option A Cross Section at Station



Source: URS, 2010

Figure 2-8. Operating Option B Cross Section at Station



Source: URS, 2010

2.3.4 Facilities

Vehicle Storage and Maintenance Facility

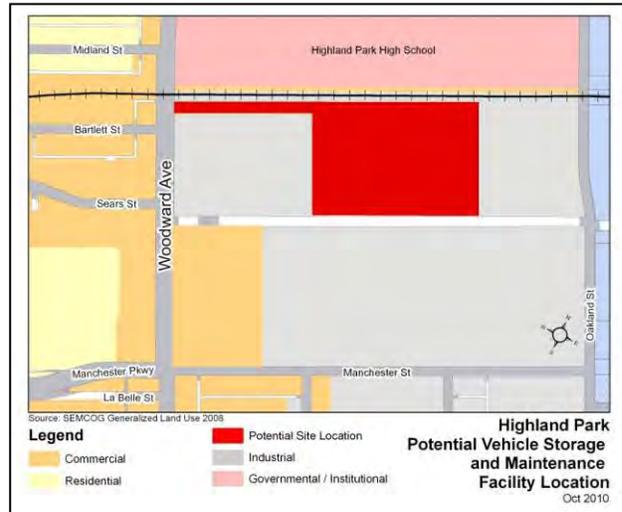
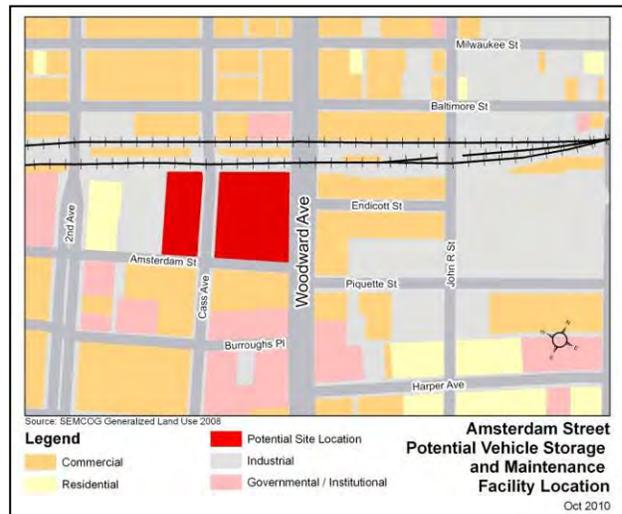
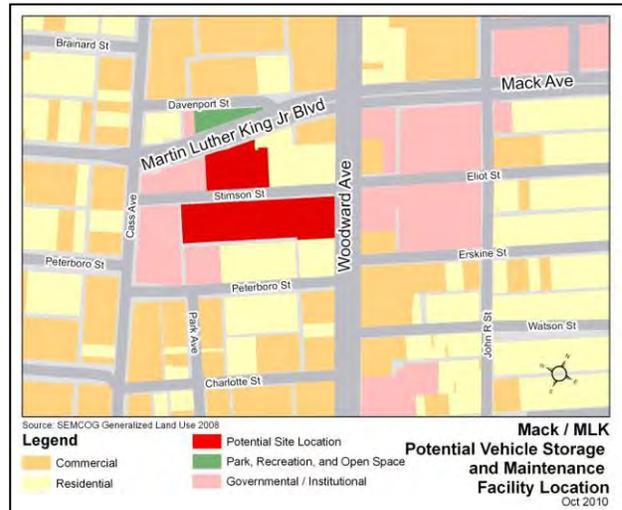
The proposed vehicle storage and maintenance facility would provide for indoor storage, inspection, repair and light maintenance of LRT equipment, and administrative offices. It would have its own storm water management system. The square footage of the facility is anticipated to be between 75,000 and 110,000 square feet, depending on site size, configuration and facility design. The three sites under consideration (Figure 2-9) were identified on the basis of proximity to Woodward Avenue, size and configuration, zoning, land use, site ownership, potential utilities and traffic impacts. The three potential sites are as follows:

Figure 2-9. Vehicle Storage and Maintenance Facility Site Options

- MLK Boulevard Site (4.2 acres) – would occupy two lots north and south of West Stimson Street, just west of Woodward Avenue and south of MLK/Mack Avenue. This site would have frontage on Woodward Avenue.
- Amsterdam Street Site (4.6 acres) – would occupy two lots east and west of Cass Avenue between Amsterdam Street and the two grade-separated tracks owned by Consolidated Rail Corporation (CR) and Canadian National Railway (CN), respectively, just south of Baltimore Avenue. This site would have frontage on Woodward Avenue and is adjacent to the Amtrak Station.
- Highland Park Ford Plant Site (19.0 acres) – would occupy one large lot east of Woodward Avenue north of Manchester Street and the former Highland Park Ford Plant. As this site is about 900 feet east of Woodward Avenue, direct access would be via the right-of-way for CR’s currently abandoned rail line.

Park and Ride Lot

A park and ride lot, which would be provided with all LPA variations, would be located near the proposed Shoppes at Detroit’s Gateway at the southeast corner of 8 Mile Road and Woodward Avenue. The location for the lot has been revised from the location originally identified at the State Fairgrounds, based on recent information confirming that up to six Land and Water Conservation Fund (LWCF) grants totaling over \$5 million dollars were used for the property. Therefore, the State Fairgrounds are protected under Section 6(f) of the LWCF Act of 1965 (16 USC 4601-4 et seq.), which prohibits conversion of property acquired or developed with assistance under this act to non-recreational purposes without the approval of the Department of Interior’s National Park Service. For this reason, an alternate site immediately north of the State Fairgrounds has been identified for the park and ride lot. The lot is accessible from northbound



Source: Parsons Brinckerhoff, 2010

and southbound Woodward Avenue. A pedestrian overpass would provide access from the parking lot to the median-located rail station. An existing bus stop and transfer station at the State Fairgrounds would be maintained.

Traction Power Substations

LRT's electric traction power system requires traction power substations (TPSS) approximately every mile, depending on the frequency and size of the vehicles. These substations, which are approximately 25 by 60 feet in dimension, require vehicular access and a relatively small site (35 by 70 feet). These facilities do not need to be immediately adjacent to the tracks. Because of this flexibility, substations can be located to minimize visual intrusions and can be visually shielded by fencing, landscaping, or walls, or can be incorporated into existing buildings. [Figure 2-10](#) shows an example of a typical substation, for illustrative purposes only. Nine TPSS sites have been preliminarily identified; eight TPSS for Alternatives A1 and B2 and seven for Alternative B3 ([Figure 2-3](#) and [Figure 2-6](#)). The locations will be refined during the preliminary engineering phase of project development.

Figure 2-10. Traction Power Substation Example

The overhead electrical system would include overhead wires used to power the LRT vehicles, poles to support the wires and the traction power substations ([Figure 2-7](#) and [Figure 2-8](#)). The overhead wire is typically suspended 17 to 22 feet above the street over each track. The poles would be located either between the two tracks, or on either side of the roadway, depending on the configuration of the alternative at the given location. The poles are typically located every 100 to 120 feet. Where curves are sharp, the poles and support wires would need to be more closely spaced.



Source: Parsons Brinckerhoff, 2010

Construction Staging Areas

During construction of the LRT, several small sites will be required for the temporary storage of materials and equipment and will be located in the general vicinity of the LPA. Following construction of the LPA, the construction staging areas would be made available for other, more permanent development. Four construction staging areas have been initially identified ([Figure 2-3](#)). Two sites, located north of I-75 and west of Woodward Avenue, are approximately 0.9 and 1.6 acres in size, respectively. A third site, 1.6 acres in size, is proposed for the northeast corner of East Bethune Street and Woodward Avenue. A fourth site, 0.9 acre in size, is proposed in Highland Park at the southwest corner of Sears Street and Woodward Avenue. Each of these four parcels is presently undeveloped and vacant.

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3.0 Transportation

3.1 Introduction

This chapter summarizes the existing transit and non-motorized transportation system in the study area and the potential impacts of the No Build alternative and Locally Preferred Alternative (LPA). Safety and security of the existing system and the LPA are also discussed. Details are provided in the *Transportation Technical Report* (Parsons Brinckerhoff, 2010).

The information and analysis presented within this chapter is based on the best available information assembled to date by the project team. The Final Environmental Impact Statement (FEIS) will contain a more detailed analysis and discussion of potential operational and safety impacts and mitigation associated with the Preferred Alternative. This analysis and discussion will be based on the public comments received on the Draft Environmental Impact Statement (DEIS) and further refinement of the alternatives. Operational and safety elements include such items as: travel lane configurations along Woodward Avenue, proposed passenger and commercial vehicle travel restrictions, non-motorized travel modifications, and emergency response access.

3.2 Public Transportation

3.2.1 Existing Transit Service

Four major transit service providers, three shuttle services and two transit centers provide service in the study area, as summarized below. Along Woodward Avenue, Detroit Department of Transportation (DDOT) and Suburban Mobility Authority for Regional Transportation (SMART) buses operate at or over capacity during the peak commuting hours. On an average weekday, the Detroit People Mover has available capacity all day, but operates over capacity during large events in Downtown Detroit. During the peak commuting hours, the Transit Windsor route between Detroit and Windsor, Ontario, operates at capacity.

Detroit Department of Transportation

DDOT, the largest transit provider in Michigan, carries 38.6 million annual passengers (2009) on 42 routes in Detroit and 22 neighboring communities in Southeastern Michigan. DDOT also provides paratransit service (Detroit MetroLift), with about 271,000 annual passenger trips (2009). Ten Downtown-oriented routes run at least partially along Woodward Avenue, including Route 53 with an annual ridership of 3.8 million (2009).

Suburban Mobility Authority for Regional Transportation

SMART serves Detroit, including Downtown, and more than 70 suburban communities in the counties of Macomb, Oakland, and Wayne. SMART is the second largest transit provider in Michigan with 12.4 million passengers annually (2009), including service with flexible pick-up and drop-off according to passenger needs for approximately 412,000 passengers annually. SMART service within Detroit consists of express commuter routes traveling between the suburbs and Downtown, while local service is more typical in suburban areas. Six SMART routes provide service along Woodward Avenue, with a combined annual ridership of 2.5 million (2009).

Detroit Transportation Corporation

The Detroit Transportation Corporation (DTC) operates the Detroit People Mover (DPM), connecting major activity centers in Downtown via a fully automated, elevated rail system and 13 stations. Twelve computer-controlled driverless vehicles travel along a 2.9-mile single-track,

one-way 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 per event.

Transit Windsor

Transit Windsor provides one bus route that shuttles passengers between Downtown 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.

Other Transit Providers

Three shuttle services are operated within the study area by Wayne State University and the Detroit Medical Center. Service is free for faculty and students, and patients, visitors and employees, respectively. Both services travel in a loop around their respective campuses and serve both buildings and parking lots. The University shuttle's northernmost stop is on Woodward Avenue at Burroughs Street; the southernmost is on Mack Avenue at John R Street. The Medical Center shuttle's stop closest to Woodward Avenue is on John R Street north of Mack Avenue. Finally, the College for Creative Studies offers shuttle service between its main campus at 201 East Kirby Street and a satellite campus in the Argonaut Building in the New Center area.

Transit Centers

Rosa Parks Transit Center

Located at 360 Michigan Avenue, the Rosa Parks Transit Center is a 25,000-square-foot facility with over two acres of exterior transit access. It serves as a single transfer point for 21 DDOT bus routes, the SMART suburban bus system, Transit Windsor, and the DPM. The center also has a Megabus stop, taxi access, a café, retail space, and ticket information and vending machines.

State Fair Transit Center

Located on the Michigan State Fairgrounds at 8 Mile Road and Woodward Avenue, the State Fair Transit Center is served by up to six DDOT bus routes seven days a week. The SMART suburban bus system serves a stop on Woodward Avenue, just outside the transit center.

Other Transportation Systems

Intercity passenger rail service is provided by Amtrak's Wolverine line, with a station at 11 Baltimore Street, west of Woodward Avenue. In 2009, 58,169 passengers arrived at and departed from the station, an increase of four percent since 2006. Three round trips are provided daily between the cities of Pontiac and Chicago via Detroit. The proposed Detroit-Ann Arbor Commuter Rail would also use this Amtrak Station. SMART and DDOT bus routes have stops near the Amtrak station, providing connectivity between the transit systems.

A Greyhound Bus Terminal at 1001 Howard Street in downtown Detroit offers intercity bus service.

3.2.2 Long-Term Effects

No Build

The No Build Alternative comprises existing transit services plus modification of DDOT's Route 53 service along Woodward Avenue. Route 53 buses would generally run less frequently (six buses per hour), with headways of ten minutes throughout the day. During peak commuting periods, an Express Route 53 with limited stops and 30-minute headways would be added to

Woodward Avenue (DDOT *5-Year Service Plan, Years 2008-2013*, August 2008), which would increase overall service during peak commuting periods. This increase would result in an average seven and one-half-minute headway during the weekday AM and PM peak periods (compared to a current eight-minute headway all day), and a ten-minute headway on weekends (compared to current ten- to 15-minute headways). Due to increased vehicle traffic on Woodward Avenue, bus travel times between State Fair Avenue and downtown Detroit would increase slightly, by one minute in the AM peak period and 30 seconds in the PM peak period (Table 3-1). No specific changes to future SMART or DTC services were identified for the No Build Alternative.

Table 3-1. Transit Travel Times on Project Alignment

Alternative	Transit Mode	Transit Travel Time	
		AM Southbound	PM Northbound
Existing	DDOT Route 53	47 min	50 min
No Build	DDOT Route 53	48 min	50 min
A1	LRT	41 min	37 min
B2	LRT	41 min	40 min
B3	LRT	35 min	33 min

Source: DDOT and Parsons Brinckerhoff, 2010.

Alternative A1

Alternative A1 would replace some DDOT bus service with light rail transit (LRT) facilities and service and 15 station stops along its median-running alignment. Service would be as follows:

- The schedule for Route 53 (Woodward Avenue) bus service would be revised to 15-minute service all day; alternating Route 53 service would be extended northward to central Oakland County.
- Off-peak service and bi-directional service would be provided for all bus routes along Woodward Avenue, and hours of operation would be expanded.
- Service mileage extensions would be added on Routes 17, 41, and 43.
- Schedules of Routes 14, 17, 32, and 43, which would feed LRT stops, would be adjusted to coordinate bus and LRT services.
- A park-and-ride facility, with 400 parking spaces, would be provided at the proposed Shoppes at Gateway development on the southeast corner of 8 Mile Road and Woodward Avenue.

The proposed LRT services, combined with bus services along Woodward Avenue, would result in transit service with six-minute headways in the AM and PM peak periods, and seven and one-half-minute headways in the off-peak period, including weekends. Compared to the No Build Alternative, this would result in increases of 25 percent in peak inbound, 67 percent in peak outbound, and 33 percent in off-peak weekday transit trips and would be monitored and adjusted based on demand. LRT travel times on Woodward Avenue between State Fair Avenue and Adams Street would be 13 to 17 minutes faster than by bus under No Build conditions (Table 3-1). SMART service along Woodward Avenue may see an increase in travel time due to

the reduced number of travel lanes. DTC may see an increase in ridership with LRT passengers transferring to the DPM once they reach Downtown. The Rosa Parks Transit Center may experience an increase in transfers due to improved access to the transfer center for LRT passengers, compared to Route 53. There would likely be no change in activity at the State Fair Transit Center since access to it would not change compared to Route 53.

Alternatives B2 and B3

Alternatives B2 and B3 would provide the same level of transit service as described above for Alternative A1, but Alternatives B2 and B3 would be in a curb-running alignment and would have 21 and 18 station stops, respectively. The combined bus and LRT services would again lead to increases of 25 percent in peak inbound, 67 percent in peak outbound, and 33 percent in off-peak transit trips compared to the No Build Alternative.

The addition of the LPA and the reduced number of travel lanes for general traffic would increase bus travel times by nine to 11 minutes. LRT travel times between State Fair Avenue and Adams Street would be 12 to 18 minutes faster than by bus (Table 3-1). Impacts to SMART and DTC services, and at the two transit centers, would be the same as with Alternative A1.

3.2.3 Short-Term Construction Effects

LPA construction would take about 36 to 42 months and is anticipated to be built in phases.

Alternative A1

Construction of a median-running system would be least disruptive to the existing bus service since it would occur away from curb-side bus stops, except where intersections and crosswalks are rebuilt at station locations. Existing traffic patterns would be affected during construction, which would result in longer travel times and may result in temporary detours for some routes.

Alternatives B2 and B3

The majority of construction activity for the curb-running alternatives would occur in the outside traffic lane and the existing parking lane. This may interfere with the ability of buses to pull into existing stops during construction. In addition, existing traffic patterns would be affected during construction, which may result in longer travel times and may result in temporary detours for some routes. Construction of LRT platforms adjacent to existing sidewalks may also result in relocations of selected bus stops.

3.2.4 Mitigation

In areas where construction would prevent buses from pulling into existing stops and make it difficult for passengers to reach the buses, bus stops would need to be relocated outside the immediate construction zone and a clear accessible path from the sidewalk through the construction zone would be maintained. Where temporary detours or stop relocations are necessary, DDOT would issue a Rider Alert, which would be posted at the affected stops, on buses, at schedule distribution outlets, and on the DDOT website. Traffic detours for motor vehicles and bicycles would also be posted, as needed.

3.3 Safety and Security (Motorized and Non-Motorized)

3.3.1 Existing Conditions

Existing bus transit in the study area currently travels in mixed traffic with autos and trucks. As there are no designated bicycle lanes, some bicyclists travel in the rightmost travel lane, in conformance with the Michigan Vehicle Code (2010), or on adjacent sidewalks. Based on SEMCOG crash data for 2005 through 2008, the study area intersections at Woodward

Avenue/MLK Jr. Boulevard/Mack Avenue and Woodward Avenue/Warren Avenue are considered critical crash intersections because their crash rates are higher than regional rates for similar types of intersections. These two intersections have a high percentage of head-on left-turn crashes. There were 203 crashes involving DDOT buses on Woodward Avenue during the three-year period. Along the corridor, about half of the crashes involving a single auto were between an auto and a pedestrian or bicyclist. Between 2005 and 2008, there were 172 crashes (eight fatal) along Woodward Avenue between vehicles and pedestrians (145 crashes) or between vehicles and bicyclists (27 crashes). Thirty-eight crashes (five fatal) occurred between vehicles and pedestrians outside the 250-foot radius of a signalized intersection, indicating that jaywalking pedestrians are at risk. Transit passengers in the study area currently use curbside bus stops but often jaywalk across Woodward Avenue at unsignalized midblock locations to reach bus stops rather than crossing at signalized crosswalks.

All roadways along the LPA alignments have sidewalks on both sides of the street. All traffic signals have phases for pedestrian crossings, with crossing times updated to 2005 Michigan Department of Transportation (MDOT) guidelines. Within Downtown, the City of Detroit has installed pedestrian countdown signals, which allow a minimum of seven seconds crossing time; a walking speed of four feet per second was assumed for the “do not walk” phase of the signals.

In case of a specific emergency on board a bus, the bus operator notifies a dispatcher who, in turn, requests the Detroit Police Department to respond to the situation. Incident data are compiled on a bi-weekly basis and forwarded to the Detroit Police Department; these data are used to assign patrol units to address specific concerns throughout the bus system.

In June 2006, the Detroit City Council adopted the City of Detroit Non-Motorized Urban Transportation Master Plan. However, while Woodward Avenue is listed as a regional connector, there is currently no funding to construct bicycle lanes on Woodward Avenue or in Downtown. In August 2010, the State of Michigan passed a Complete Streets law, which states that future transportation improvements identified in a plan must be appropriate to the context of the community and consider all legal users of the public right-of-way. Complete Streets will be taken into consideration during LPA design as rules and guidance are promulgated by the State. For this reason, the extent and scope of the final LPA design with respect to Complete Streets will be determined at that time.

3.3.2 Long-Term Effects

No Build Alternative

Safety and security conditions with the No Build Alternative are expected to be largely similar to existing conditions, as no roadway safety, pedestrian facility improvements, or bicycle facilities or accommodations are proposed in the study area. However, with projected traffic growth, crash frequencies may be expected to increase proportionally.

Alternative A1

Vehicular Safety Impacts and Mitigation

There were 64 sideswipe, head-on, and left-turn crashes between signalized intersections from 2005 to 2008. Alternative A1 would reduce these types of crashes as the LRT would separate the northbound and southbound lanes for auto travel. Also, all intersections that have a left-turn-only lane would have protected left-turn phases, including the high-crash intersection of Woodward Avenue and MLK Jr. Boulevard/Mack Avenue. This would help protect against angle and head-on left-turn crashes.

With a semi-exclusive right-of-way, the only interaction between the LRT vehicle and automobiles or buses would be at signalized intersections. Left turns would not be permitted at unsignalized intersections along the LRT alignment to avoid conflict with LRT vehicles in the median. At signalized intersections where left turns would be allowed, there is potential for conflict between the LRT vehicle and a left-turning automobile.

Mitigation may include several changes in traffic operations. For example, direct left-turns from Woodward Avenue onto Warren Avenue may be prohibited; vehicles wanting to turn left would need to first turn right onto Warren Avenue and then use a turnaround that would need to be constructed on either side of Woodward Avenue for vehicles to complete the left turn. Removing the left-turns from Woodward Avenue onto Warren Avenue would reduce the number of head-on left-turn crashes at this intersection. Vehicles would still be allowed to turn left from Warren Avenue onto Woodward Avenue.

Pedestrian/Bicycle Safety Impacts and Mitigation

It is not expected that pedestrian safety would be affected, although it has not yet been determined whether there would be a barrier separating LRT from vehicular traffic (and discouraging pedestrian mid-block crossings). To improve LRT travel time, traffic signals are proposed to be removed at seven intersections in the study area due to low traffic volumes. Therefore, in some instances, the time it would take a pedestrian to safely cross Woodward Avenue at a signalized intersection would increase. This increased walk-time may motivate pedestrians to jaywalk at the newly unsignalized intersections, which may increase pedestrian/vehicle or pedestrian/LRT conflicts. There would be sufficient space on LRT station platforms to safely accommodate passengers waiting to board or those getting off LRT vehicles.

As Alternative A1 does not include provision for bicycle lanes, cyclists would be expected to continue to ride in the rightmost travel lane, as per the Michigan Vehicle Code (2010). However, the average vehicle speed on Woodward Avenue is expected to decrease with the LPA due to the reduced number of travel lanes, allowing cyclists to mix with the slower-moving vehicular traffic more safely.

Transit Safety and Security Impacts and Mitigation

All crosswalks accessing LRT station platforms would be at signalized intersections. However, signalized mid-block pedestrian crosswalks may be necessary at some locations to prevent jaywalking and would be added if warranted by demand. Station design features would include lighting and security systems to enhance passenger safety and security. In case of emergency, the operator of the LRT would notify a dispatcher, who would then notify the Detroit Police Department, similar to the existing emergency procedures followed by bus operators. Local police would also patrol the LRT stations and vehicles. Informational and educational safety campaigns for drivers, students, pedestrians, cyclists, and transit users would begin prior to construction of the LRT.

Alternatives B2 and B3

Vehicular Safety Impacts and Mitigation

North of Grand Boulevard, the alignments of Alternatives A1, B2, and B3 are identical. South of Grand Boulevard, Alternatives B2 and B3 would travel in the outermost lane of traffic. Transit signal priority would be given to LRT vehicles, and transit-only phases would be implemented where the LRT alignment shifts from median-running to curb-running. There would be no other changes to traffic operations at intersections. As there would be no changes to vehicle turning movements along roadways or at signalized intersections, no reduction in vehicle/vehicle crashes or vehicle/pedestrian crashes would be expected along the LRT alignments.

With LRT vehicles traveling in the curb-side lane with autos, potential conflict between LRT vehicles and autos would be greater with Alternatives B2 and B3 than with Alternative A1. Motorists in the lane adjacent to the mixed-use LRT/auto lane may seek to quickly merge into the adjoining lane when a LRT vehicle approaches from behind, increasing the potential for side-swipe and rear-end crashes. Motorists traveling in the lane next to the curb-side lane may instinctively swerve away from a passing LRT vehicle and into the adjoining lane, also increasing the potential for side-swipe crashes. Finally, the potential for increased crashes would be even greater for trucks and buses traveling in or next to the curb-side lane with LRT vehicles. An informational campaign may be needed to inform drivers of the potential interaction between LRT and other vehicles.

Pedestrian/Bicycle Impacts and Mitigation

The curb-running LPA would have no impact on pedestrian safety at unsignalized intersections and would not provide any refuge to pedestrians jaywalking across Woodward Avenue at midblock locations. All LRT stations would be located in the outside parking lane along existing sidewalks, with sufficient space to accommodate passengers waiting to board or those getting off LRT vehicles.

The number of signalized intersections between Downtown and Grand Boulevard would not change with these alternatives. Therefore, the maximum time for pedestrians to cross Woodward Avenue at a signalized intersection would remain the same.

Alternatives B2 and B3 do not include provision for bicycle lanes. Bicycles on Woodward Avenue would continue to ride in the rightmost lane either in the LRT lane or the unoccupied parking lane when available. In the LRT lane, a groove in the pavement would accommodate the flanges on LRT vehicles on each track, which may affect bicyclists; the rest of the lane would be a smooth paved surface.

Transit Safety and Security Impacts and Mitigation

Safety and security measures at transit platforms and on LRT vehicles, as well as educational campaigns, would be the same as with Alternative A1.

3.3.3 Short-Term Construction Effects

With Alternative A1, crosswalks across Woodward Avenue may need to be closed at signalized intersections while center stations and LRT tracks are under construction. Construction would be staged so that at least one crosswalk would be maintained and signage would be placed to guide pedestrians to available crossing locations. With Alternatives B2 and B3, construction fencing would be placed between the construction zone and the adjoining sidewalk. At curbside LRT stops under construction, a through path would be maintained along the sidewalk behind the construction zone. During the construction of all three alternatives, cyclists would continue to ride in the rightmost traffic lane. Construction would likely result in reduced vehicle travel speeds, allowing cyclists to mix with vehicle traffic more safely.

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4.0 Affected Environment and Environmental Consequences

4.1 Introduction

This chapter describes the environmental resources present in the Woodward Avenue Light Rail Transit (LRT) study area and the potential environmental impacts, both positive and negative, that would occur with the No Build Alternative and with construction and operation of Locally Preferred Alternatives (LPA) A1, B2 and B3 ([Appendix D](#)). Detailed data and information are provided in technical reports, as referenced in this chapter.

The study area comprises the Woodward Avenue corridor extending 9.3 miles from Downtown Detroit, near the Detroit River, north to the State Fairgrounds near 8 Mile Road. The majority of the study area lies within the City of Detroit, while approximately two miles (from Webb Street to McNichols Road) are within the City of Highland Park. The study area boundary extends approximately one-half mile to the east and west of Woodward Avenue, the area within which project impacts may occur.

Environmental resources and analyses presented in this chapter are as follows:

- Air Quality
- Historic Resources
- Archaeological Resources
- Environmental Justice
- Noise and Vibration
- Land Use and Public Policy
- Neighborhoods
- Community Facilities and Services
- Parklands
- Visual and Aesthetic Quality
- Utilities
- Energy
- Parking, Roadways and Level of Service
- Storm water Management
- Hazardous Materials
- Natural Resources
- Indirect and Cumulative Effects

Existing conditions are described for 2009 or 2010, when data were collected for each of the environmental resource categories. Analysis years for potential construction- and operations-related impacts are 2012 and 2030, respectively.

The discussion of each environmental resource is organized, as appropriate, by legal and regulatory context, methodology, existing conditions, long-term (operations-phase) effects, short-term (construction-phase) effects, and mitigation.

4.2 Air Quality

4.2.1 Legal and Regulatory Context

Air quality is a term used to describe the amount of air pollution to which the public is exposed. Air quality is governed by the federal Clean Air Act (CAA), administered by the United States Environmental Protection Agency (USEPA). As required by the CAA, National Ambient Air Quality Standards (NAAQS) have been established for certain transportation-related air pollutants: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), and particulate matter (PM₁₀ and PM_{2.5}). USEPA also regulates mobile source air toxics (MSAT). The CAA states that transportation projects are subject to transportation conformity analysis, that is, a proposed transportation project must conform to the state air quality implementation plan (SIP).

Transportation conformity has two parts, regional (mesoscale) conformity and local (microscale or hotspot) conformity. Regional conformity is demonstrated by the project being included in the area's Regional Transportation Plan (RTP) and Transportation Improvement Plan (TIP). The project being included in these plans reflects conformity with the SIP. Local conformity, if required, demonstrates through hotspot analysis that the project would not result in localized concentrations of air pollutants that would cause or contribute to a violation of one of the NAAQS.

4.2.2 Methodology

The Southeast Michigan Council of Government's (SEMCOG), the Federal Highway Administration (FHWA), and FTA have found that the current RTP and TIP, which include the proposed project, conform to the SIP, in accordance with the USEPA's regulation on transportation conformity (40 CFR part 93). The project-level conformity analysis performed in conjunction with this NEPA review must also demonstrate that the project will not cause or contribute to a violation of the NAAQS for any transportation-related air pollutant for which the Detroit metropolitan area is a nonattainment or maintenance area. The Detroit region was once a nonattainment area for carbon monoxide (CO), but the USEPA has now designated it as a maintenance area.

Local (microscale) air quality modeling was performed using the USEPA mobile source emission factor model (MOBILE6.2) and the CAL3QHC version 2.0 air quality dispersion model to estimate future CO levels at selected locations in the study area. EPA's and FHWA's *Interim Guidance Update on Air Toxic Analysis in NEPA Documents* (September 2009) and USEPA's *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in PM_{2.5} and PM₁₀ Nonattainment and Maintenance Areas* (March 2006) were used to assess MSAT, PM_{2.5} and PM₁₀ impacts, respectively.

Details of the air quality analysis and results are provided in the *Air Quality Technical Report* (Parsons Brinckerhoff, 2011).

4.2.3 Existing Conditions

The proposed project is included in the Southeast Michigan Council of Government's (SEMCOG) RTP, *Direction2035*, as project I.D. #4430 and in the 2011-2014 TIP as project I.D. #2010353. (SEMCOG, the Federal Highway Administration (FHWA), and FTA have found that the current RTP and TIP, which include the proposed project, conform to the SIP, in accordance with the USEPA's regulation on transportation conformity (40 CFR part 93). The project-level conformity analysis performed in conjunction with this NEPA review must also demonstrate that the project will not cause or contribute to a violation of the NAAQS for any transportation-related air pollutant for which the Detroit metropolitan area is a nonattainment or maintenance area.

USEPA publishes a list of geographic areas that have always been in compliance ("attainment areas") and not in compliance ("nonattainment areas") with the NAAQS. The project area is in Wayne County, Michigan, which is classified as a nonattainment area for PM_{2.5}. The area is also classified as a maintenance area for O₃, CO and PM₁₀. The monitored information from three monitoring stations nearest the project area (at 11600 East 7 Mile Road, 6050 Linwood, and 6921 West Fort) reported violations of the federal eight-hour standard for O₃ in the latest three years of data. No other violations of the NAAQS were reported.

4.2.4 Long-Term Effects

The LPA is included in SEMCOG's RTP and in the 2011-2014 TIP. SEMCOG, FHWA, and FTA have found that the RTP and TIP, which include the proposed project, conform. The analysis of the RTP indicated that, although the project would reduce the number of though highway lanes on Woodward Avenue, the highway has excess capacity for much of the day, so the project would not seriously affect highway congestion and emissions. Furthermore, the project will attract some people out of their automobiles and thereby offset any tiny increase in emissions associated with the small change in the highway's capacity for automobiles.

A CO hotspot analysis of CO presented in the Air Quality Technical Report was conducted; no violations of the CO NAAQS are predicted to occur at any intersection. An interagency consultation must occur to establish if the project is classified as one of air quality concern for PM₁₀ and PM_{2.5}. As far as PM is concerned, the project is not proposing to expand or create new diesel bus or diesel rail terminals. The project is not expected to increase diesel traffic and associated PM emissions at any location within the project area. Therefore, it does not appear likely that the project will be classified as one of air quality concern, though the final determination will be made through interagency consultation. MSAT levels are not predicted to be adversely affected by the project. The LPA conforms to the air quality goals presented in the Michigan SIP for the Detroit area.

No Build Alternative

No new violations of the NAAQS and no adverse regional or local air quality impacts are expected.

Locally Preferred Alternative

No new violations of the NAAQS and no adverse regional or local air quality impacts are expected with Alternatives A1, B2 or B3. As such it conforms to the CAA, Section 176 (c)(1).

4.2.5 Short-Term Construction Effects

The project would result in limited to short-term increases in fugitive dust and mobile-source emissions during construction. State and local regulations, regarding dust control and other air quality emission reduction controls would be adhered to during construction. These include measures that reduce engine activity and/or reduce emissions per unit of operating time. FTA may require, where practicable, the use diesel engine retrofit technology in diesel construction vehicles and equipment to further reduce emissions. Such technology may include diesel oxidation catalysts, diesel particulate filters, engine upgrades, engine replacements, or combinations of these strategies. MDOT's Standard Construction Specification Sections 107.15(A) and 107.19 would apply to control fugitive dust during construction and cleaning of haul roads. All MDOT vehicles and equipment must follow MDOT Guidance #10179 (2/15/2009) *Vehicle and Equipment Engine Idling*. Also, construction equipment would be kept clean, tuned-up, and in good operating condition.

4.2.6 Mitigation

Long-term mitigation is not required as the operation of the LPA would not result in any adverse air quality impact. To alleviate PM emissions caused by construction, FTA may require the retrofit of all diesel construction vehicles and equipment.

4.3 Hazardous Materials

This section analyzes potential contaminant sources that may be present within the study area. It assesses the potential of encountering hazardous waste and impacted soil and/or groundwater

during project construction activities, as well as the project's potential use of hazardous materials and its potential impact to the environment.

To evaluate potential contaminant sources, Phase I Environmental Site Assessment (ESA) activities were conducted. The objective of a Phase I ESA is to identify, to the extent feasible, Recognized Environmental Conditions (RECs). Full Phase I ESAs were conducted for areas where properties are planned for acquisition; modified Phase I ESAs were conducted for areas where no property acquisition is planned. A modified Phase I ESA is one that includes some, but not all, elements of a comprehensive Phase I ESA, as described in [Section 4.3.2](#). In contrast, full Phase I ESAs include all of the elements outlined in American Society for Testing and Materials (ASTM) Method E 1527-05 Standard Practice for Environmental Site Assessments.

The evaluation included conducting the following:

- A modified Phase I ESA of the LPA Alternatives' alignments and LRT stations; this level of assessment was adequate to identify RECs where no property acquisition is planned;
- Phase I ESAs of the Highland Park Ford Plant, Amsterdam Street (in progress), and MLK Boulevard VSMF sites (in progress). More comprehensive Phase I ESAs were/are being conducted for the VSMF sites where property acquisition is planned; and
- Phase I ESAs are planned for the TPSS sites prior to property acquisition.

The above reports are included in the *Hazardous Materials Technical Report* (Parsons Brinckerhoff, 2011).

4.3.1 Legal and Regulatory Context

The primary federal laws regulating hazardous waste and materials are the Resource Conservation and Recovery Act of 1976 (RCRA) (USC 1976) and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) (USC 1980). The National Priority List (NPL) is a listing of the most polluted sites in the nation that are eligible for cleanup funding (Superfund) under CERCLA. The United States Environmental Protection Agency (USEPA) is the primary agency responsible for administering RCRA and CERCLA.

The Michigan Department of Natural Resources and Environment (MDNRE) regulates contaminated sites through a variety of programs primarily under the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), with additional guidance from various promulgated Administrative Rules and Operational Memoranda. Most of the identified contaminated sites near the project alignment are generally regulated under Part 213 Leaking Underground Storage Tank Regulations or Part 201 Environmental Remediation within NREPA; Part 115 of NREPA regulates Solid Waste. The MDNRE's Remediation Division (RD) administers the Part 201 and Part 213 programs, while the Environmental Resource Management Division (ERMD) oversees the Solid Waste Management program under Part 115 of NREPA.

4.3.2 Methodology

A modified Phase I ESA was conducted for the LPA in general accordance with ASTM Method E 1527-05 to identify RECs near (within 100 feet) of the LPA Alternatives' alignments and LRT stations. The following activities were conducted: environmental records search; review of standard historical sources, including Sanborn fire insurance maps, historic topographic maps and aerial photographs and city directories; and site reconnaissance of the LPA Alternatives' alignments and LRT stations to observe evidence of potential environmental concerns and/or

RECs, such as stained surface soil, material storage practices, and general land use. Photographs were taken to document existing conditions.

A Phase I ESA was also conducted for the Highland Park Ford Plant VSMF site; however, the ESA was limited, because the site owner(s) had not yet been contacted for site access so site access was not available. Site observations were limited to obstructed views from the property boundary, which was fenced and locked. Phase I ESAs are in progress for the MLK Boulevard and Amsterdam Street VSMF sites. To date, preliminary assessment information has been obtained through environmental database search reports of federal and state environmental records. Details of the investigation are provided in the *Hazardous Materials Technical Report* (Parsons Brinckerhoff, 2011).

4.3.3 Existing Conditions

The modified Phase I ESA identified about 300 contaminated or potentially contaminated properties of concern (RECs) along the length of the LPA; no superfund sites were identified. The RECs and their approximate locations are identified in the *Hazardous Materials Technical Report*. RECs most commonly include former and current gasoline stations (known or suspected), dry cleaners, auto repair shops, industrial buildings, and other commercial properties.

Subsurface impacts to soils and groundwater may have resulted from current and historical usage, material storage practices, spills, fill material, or leakage from storage tanks. Current and/or former gasoline stations and automotive repair facilities are examples of facilities that have subsurface contamination as a result of Leaking Underground Storage Tanks (LUSTs) or general petroleum substance use. Current and/or former dry cleaning operations represent a risk of subsurface contamination as the result of the use of chemicals in the dry cleaning process (chlorinated solvents, particularly tetrachloroethylene). Many vacant or abandoned properties with unknown use also pose a risk since several of these properties contained small one-story buildings with open areas fronting a road, giving the appearance that they might have once been gasoline service stations. The vacant or abandoned properties have been identified as potential RECs in the Phase I. Identification of the historical uses of these vacant or abandoned properties would require a site-specific Phase I ESA for each of these sites. Residential properties, churches, and office buildings pose the least risk; typically, hazardous substances in storage or use at these types of properties are kept in relatively small quantities and any spills or releases are normally minor. The primary concerns with residential properties, churches, or office buildings are former heating oil tanks.

While the extent of potential subsurface contamination from individual properties may not result in widespread contamination, there may be localized areas with significant levels of contamination.

All three potential VSMF sites contain RECs ([Table 4-1](#)), based on the completed ESA for the Highland Park Ford Plant site and preliminary investigations of the Amsterdam Street and MLK Boulevard sites.

Table 4-1. Summary of Potential Environmental Concerns at VSMF Sites

VSMF Site	Potential Environmental Concerns
MLK Boulevard	Five historical cleaners on site or immediately adjacent; a historical auto station, RCRA-NonGen and FINDS
Amsterdam Street	Two historical auto stations and one historical cleaner
Highland Park Ford Plant Site	Historic industrial use: presence of buried solvent and fuel oil tanks, a paint manufacturing plant, a varnish plant, a “color” building, freight sidings, and surrounding factories and warehouses. Large piles of coal were also historically situated on site.

4.3.4 Long-Term Effects

No Build Alternative

With no LPA-related construction or VSMF-related property acquisition, there would be no anticipated hazardous materials impact.

Locally Preferred Alternative

The LPA would have no long-term effect on localized areas that may contain significant levels of contamination since it would not make the existing contamination worse. Contamination found during construction activities would be properly removed and disposed of, improving the environmental condition.

The VSMF would be a full-service facility with indoor or outdoor storage, administrative offices, and on-site light maintenance repairs. The facility is expected to include a vehicle wash, paint booth, body shop, and other general repair, including maintenance pits and work areas that would store and use several types of hazardous and petroleum chemicals. Depending on the housekeeping and pollution prevention techniques at the VSMF, a low risk exists that a future impact to the environment would occur.

Preliminary Phase I activities show that RECs are associated with each of the three potential VSMF sites. These RECs could have adverse long-term effects if adequate due diligence is not performed. Adverse long-term effects include purchasing contaminated property and having potential environmental cleanup liability and associated due-care consequences. Due diligence includes updating the Phase I ESA to include site reconnaissance and interviews, and performing Phase II testing, to help establish whether contamination is present and, if present, to determine its nature and extent. Even if cleanup liability is not applicable, due care must still be exercised to minimize potential exposure to the contamination. Proper due-care activities are determined by the type, location, and concentrations of contaminants and the future property use and exposures, all of which are yet to be determined. Typical due-care activities include removal of highly contaminated soils, installation of vapor mitigation systems, and installation of a barrier to eliminate direct contact with contaminated soil.

No hazardous materials are used within the TPSS; Phase I ESAs would also be completed for the TPSS sites prior to property acquisition.

4.3.5 Short-Term Construction Effects

LPA construction would be limited to near-surface, at-grade work and is not expected to significantly disturb the subsurface; therefore, it would require minimal management, including proper handling and disposal of contaminated materials. The exceptions are at the LRT station

locations and two railroad underpasses. Excavation depths typically three to four feet below ground surface are expected at the station locations. For the railroad underpasses, between Endicott and Baltimore streets and Bartlett and Midland streets, excavation depths could reach 10 to 12 feet below ground surface.

Based on the modified Phase I ESA findings, LRT station locations -- with the exception of the Alternative A1 Randolph Station: eastbound (Larned at Randolph) and westbound (Congress at Randolph); Alternatives B2 and B3 Randolph Street, Manchester Street, and the State Fairground -- and both railroad underpasses have at least one or more known or suspected contaminated sites nearby.

4.3.6 Mitigation

Mitigation measures would be needed only in areas where construction activities encounter known or suspected contaminated soil or groundwater. Even where the LPA is located near or over part of a known contaminated site, the construction may not involve excavation to a depth that exposes contaminated soil.

If contaminated soil is suspected, due to visual and/or olfactory evidence of contamination, during subsurface construction activities and needs to be removed from the premises, the soil will be tested to evaluate whether it is contaminated and requires proper disposal. If it is found to be contaminated, that soil would be properly classified and disposed of as non-hazardous or hazardous waste (i.e., Type II landfill or hazardous waste treatment/landfill).

Environmental due-diligence activities would be performed prior to VSMF and TPSS property acquisition. According to ASTM 1527-05, “due diligence is the process of inquiring into the environmental characteristics of a parcel of commercial real estate or other conditions, usually in connection with a commercial real estate transaction. The degree and kind of due diligence vary for different properties and differing purposes.” A compliant Phase I ESA would be conducted; if the Phase I ESA concludes that one or more RECs exist, Phase II testing would be performed to help establish whether contamination is present and, if present, its nature and extent. If contamination is present above cleanup criteria, a Baseline Environmental Site Assessment (BEA) and Due Care Plan, as outlined in Part 201 of NREPA, would be completed and filed with the MDNRE to obtain liability protection. Depending on the nature and extent of contamination that may be present, due-care activities would be completed to satisfy ongoing due-care obligations. Part 201 of NREPA specifically requires that owners and operators take due-care measures to ensure that existing contamination on a property does not cause unacceptable risks and is not worsened. Such measures include evaluating the contamination and taking necessary response actions. Due-care requirements are not related to the owner or operator’s liability for the contaminants; they apply to non-liaible parties and liaible parties alike.

4.4 Historic and Archaeological Resources

4.4.1 Historic Resources

Legal and Regulatory Context

The LPA is subject to compliance with the National Historic Preservation Act (NHPA) of 1966, as amended (16 USC 470 et seq.) and its implementing regulations (36 CFR 800). Specifically, Section 106 of the NHPA requires that the responsible Federal agency consider the effects of its actions on historic properties, which are properties listed in or determined eligible for listing in the National Register of Historic Places (NRHP), and provide the Federal Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the undertaking.

The cities of Detroit and Highland Park have local ordinances (Detroit Ordinance 161-H and Highland Park Ordinance 1128, respectively) that require design review and regulation of project activity in locally designated historic resources. As the LPA would extend through such districts within Detroit, coordination with local officials regarding compliance with local ordinances is being undertaken as project design information is being developed.

Methodology

Per Section 106 requirements, the lead Federal agency, in consultation with the State Historic Preservation Officer (SHPO), develops the area of potential effects (APE), identifies historic properties (i.e., NRHP-listed and NRHP-eligible) in the APE, and makes determinations of the proposed project's effect on historic properties in the APE. Section 106 regulations require that the lead Federal agency consult with the SHPO and identified parties with an interest in historic resources during planning and development of the proposed project. The ACHP may participate in the consultation or may leave such involvement to the SHPO and other consulting parties. ACHP, if participating, and SHPO are provided an opportunity to comment on the proposed project and its effects on historic properties. They participate in development of a Memorandum of Agreement (MOA) or Programmatic Agreement (PA) to avoid, minimize, or mitigate adverse effects, as applicable. Stipulations in a MOA or a PA must be implemented. If a National Historic Landmark (NHL) is located within the APE and would be adversely affected by the project, the Federal agency must also comply with Section 110(f) of the NHPA. Section 110(f) requires that the agency undertake, to the maximum extent possible, planning and actions to minimize harm to any adversely affected NHL and afford the ACHP an opportunity to comment. The ACHP regulations require that the National Park Service (NPS), an agency of the U.S. Department of the Interior, be notified and be invited to participate in the consultation involving NHLs.

Area of Potential Effects

FTA, in consultation with the SHPO, determined the APE for identification of built resources. The SHPO concurred with the APE in January 2010. Due to new project information, including potential sites for the vehicle storage and maintenance facility (VSMF), the APE was revised; the SHPO concurred with the revised APE in October 2010 (SHPO correspondence is included in the *Historic Resources Technical Report*). The APE includes roadways on which the LRT would be located, properties adjacent to those roadways, and select areas of expansion, including properties surrounding the potential VSMF sites. Select properties near but not adjacent to a LRT alignment for which proposed LRT facilities were determined to be a significant visual element were also included in the APE; these properties were typically within 250 feet of the LRT alignment, station, and/or VSMF site.

Identification of Historic Properties

Architectural historians who meet the Secretary of the Interior's Professional Qualifications Standards conducted research at the Michigan SHPO office to obtain copies of previously identified and evaluated historic properties, most notably those listed in the NRHP. Using geographic information systems (GIS) mapping of tax parcel boundaries, field views of all built resources in the APE were conducted, with follow-up field views, as needed. Using Detroit tax parcel data, supplemental research, and visual assessments, all properties approaching 50 years old or older were surveyed, photographed and evaluated. Historic properties previously listed in the NRHP were also surveyed and photographed, at the SHPO's request, to document any property changes, verify validity of prior assessments, and determine if any properties have changed to the extent that they are no longer eligible for the NRHP or that NRHP boundaries

should be altered. Based on that review, no eligibility or boundary changes to NRHP-listed properties in the APE were needed. All NRHP-listed properties were documented in a survey data form modeled on the Michigan SHPO's form; current photographs and NRHP boundary maps were appended to each form.

Determinations of Eligibility

Following identification of built resources approaching 50 years of age or older, the history of each building, structure, site, object, and district was researched to develop historic contexts. Sources included public records, and primary secondary published sources. Detailed architectural descriptions and historic context statements were written; NRHP Criteria for Evaluation were applied; and determination of NRHP eligibility was made for each property. For properties determined eligible, architectural historians completed integrity assessments; determined periods of significance; and created historic boundaries. For each property, a survey data form, modeled on the Michigan SHPO's form, was completed. Current photographs and individual locator maps for each surveyed resource, regardless of eligibility determination, were appended to each form.

Historic properties are listed in or determined eligible for listing in the NRHP by applying the NRHP Criteria for Evaluation to evaluate a property's historic significance. The Criteria state that the quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that:

- A. are associated with events that have made a significant contribution to the broad patterns of our history; or
- B. are associated with the lives of persons significant in our past; or
- C. embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. have yielded, or may be likely to yield, information important in prehistory or history.

Built resources are typically evaluated under Criteria A, B, and C, and Criterion D applies primarily to archaeological resources.

If a property is determined to possess historic significance, its integrity is evaluated using the following seven Aspects of Integrity to determine if it conveys historic significance: location; design; setting; materials; workmanship; feeling; and association. If a property is determined to possess historic significance under one or more Criteria and retains integrity to convey its significance, the property was deemed eligible for the NRHP during the Section 106 review of this project.

Assessment of Effects to Historic Properties

Effects assessments are based on Criteria of Adverse Effect (36 CFR 800.5). An adverse effect is found when an undertaking may directly or indirectly alter a historic property's characteristics that qualify it for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

Examples of adverse effects include, but are not limited to, physical destruction of or damage to all or part of a historic property; property alteration that is inconsistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR 68); removal of a property from its historic location; change of the character of a property's use or physical features in a property's

setting that contribute to its historic significance; and/or introduction of visual, atmospheric, or audible elements that diminish the integrity of a property's significant historic features.

During the assessment of effects, information for each historic property was reviewed to determine which aspects of integrity are most critical to NRHP eligibility. In some cases, historic properties did not retain aspects of integrity; for example, many historic properties did not retain integrity of setting as their historic urban surroundings have been altered over time. Due to the scope and nature of the LPA, impacts are generally limited to changes to historic properties' visual settings that, in some cases, would diminish integrity of setting, feeling, and association.

Architectural historians conducted site visits to each historic property and reviewed project plans, conceptual station designs, and additional project documentation, including results of noise and vibration impact analyses. Following guidelines (36 CFR 800 and *National Register Bulletin: How to Apply the National Register Criteria for Evaluation*, National Park Service, 1997), the following categories of findings were used to assess effects to historic properties:

No Effect: An undertaking may be determined to have no effect to a historic property present in the APE if it would not alter any aspects of integrity for that historic property.

No Adverse Effect: An undertaking may be determined to have no adverse effect to a historic property if the undertaking would alter a specific aspect of integrity for that historic property but the effect would not alter a characteristic that qualifies that resource for inclusion in the NRHP in a manner that diminishes the significant aspect of integrity.

Adverse Effect: An undertaking may be determined to have an adverse effect to a historic property if the undertaking would alter a characteristic that qualifies that historic property for inclusion in the NRHP in a manner that diminishes the significant aspect(s) of integrity. Adverse effects can vary from demolition of the historic property to a visual effect that alters its setting but does not physically impact it. The historic property is lost forever if the project requires its demolition, whereas a change in setting, though adverse, does not remove the historic property.

Section 106 regulations (36 CFR 800.10) require that the NPS be invited to participate in consultation where there may be an adverse effect to an NHL.

Section 106 Consultation and Public Involvement

Section 106 regulations require that the lead Federal agency consult with the SHPO and interested and consulting parties during project planning and development. The City of Detroit initially met with the Michigan SHPO in September 2008 to discuss the proposed project and consult on general project documentation approaches. Since then, the FTA identified and invited certain parties to participate in the Section 106 consultation process. The consulting parties include representatives of municipal and county governments, cultural resource organizations, Native American tribes, and the National Park Service. Determination of Eligibility and Assessment of Effects reports were provided to the SHPO for concurrence and to consulting parties for comment.

In addition, FTA invited the SHPO and consulting parties to participate in Section 106 consultation meetings held to discuss the process and its findings. To date, three meetings have been held (September 8, October 3, and December 2, 2010).

Public involvement in the Section 106 process is achieved through the distribution of this DEIS, the posting of the related Section 106 reports on the project website, and the formal public hearing for the DEIS required under NEPA. Comments received on historic preservation issues will be addressed during preparation of the FEIS and Section 106 Agreement. Future LPA

refinements or changes that would affect evaluations and determinations presented in the Section 106 reports, including efforts to avoid or minimize identified adverse effects, will be coordinated with the SHPO through appropriate documentation and will also be provided to consulting parties for comment.

Existing Conditions

Historic Resources in the APE

Field surveys and background research identified 63 NRHP-listed historic properties in the APE, including three National Historic Landmarks (Guardian Building, Fox Theatre, and Highland Park Ford Plant) and two historic properties that the Michigan SHPO has nominated for the NRHP and are awaiting a decision by the Keeper of the NRHP, who is within the NPS. Evaluation to determine NRHP eligibility was completed for an additional 220 properties approaching 50 years of age or older. The NRHP Criteria were applied to the 220 properties and 28 properties were deemed eligible for the NRHP. Therefore, a total of 91 NRHP-listed properties and properties considered eligible by FTA were identified within the APE. These eligibility determinations were submitted to the SHPO for review and concurrence.

Detailed documentation and evaluation of historic properties for NRHP eligibility are provided in the *Historic Resources Technical Report* comprising a series of geographically based reports, as follows: *Phased Section 106 Submittal, Downtown Detroit to Interstate 75/Fisher Freeway* (September 2010); *Phased Section 106 Submittal, Interstate 75/Fisher Freeway to Grand Boulevard* (September 2010); *Phased Section 106 Submittal, Grand Boulevard to M-8/Davison Freeway* (November 2010); and *Phased Section 106 Submittal, M-8/Davison Freeway to M-102/8 Mile Road* (November 2010). These eligibility determination documents were submitted to the SHPO for review and concurrence.

Long-Term Effects

No Build Alternative

No effects to historic properties are anticipated with the No Build Alternative, as this alternative would include only increased bus frequencies on DDOT Route 53 on Woodward Avenue and reorganization of some feeder bus routes and would not involve construction activity.

Locally Preferred Alternative

Adverse effects to aboveground historic properties have been identified with Alternatives A1, B2 and B3. Therefore, an overall finding of Adverse Effect has been determined for the LPA.

Of the 91 NRHP-listed and eligible properties in the APE, the number of properties and the specific properties that would be adversely affected by the LPA differs by Alternative ([Table 4-1](#)). No adverse effects to the three NHLs were identified; no direct physical impacts would occur to these properties, and no indirect adverse effects, such as visual, auditory, or vibratory impacts, were found. In all, 20 historic properties would be adversely affected by at least one of the alternatives ([Figure 4-1](#), [Table 4-2](#)). Generally, the adverse effects consist of visual impacts to historic properties' setting, feeling, or association, although direct and adverse physical impacts would occur to some properties.

Table 4-2. Summary of Effect Findings

LPA Alternative	Number of Historic Properties with:		
	Adverse Effect (demolition, physical alteration, impact to visual setting)	No Adverse Effect	No Effect
Alternative A1	0, 0, 13	33	45
Alternative B2	0, 2, 18	29	44
Alternative B3	0, 1, 15	26	50

The project would not result in demolition of or alteration to any historic building. However, the Macomb Monument, a contributing element of the Washington Boulevard Historic District, would require relocation with Alternative B2, resulting in an adverse effect to the historic district. The presence of an LRT station within the Grand Circus Park Historic District would directly adversely affect the design and setting of the historic district with Alternatives B2 and B3. The LPA may require that the LRT's overhead catenary system be connected to historic railway bridges, but historic materials would not be removed to achieve this.

In some cases, LPA elements would be introduced into the historic boundaries of NRHP-listed or eligible districts, but, other than the aforementioned Macomb Monument with Alternative B2, no contributing resources would be physically altered and all work would occur within existing transportation rights-of-way. Based on the noise and vibration analyses, no auditory, vibratory, or atmospheric impacts were identified for any historic properties within the APE. NPS has expressed concerns that vibration impacts during construction may negatively affect the NHLs in the project area, especially the Fox Theatre. FTA is committed to ensuring that methods used to construct the stations and trackwork do not impact historically significant features of the NHLs. The presence of the LRT guideway and catenary system within the transportation right-of-way would not constitute adverse effects to historic properties. Adverse effects would primarily consist of impacts to setting, feeling, and association from the presence of an LRT station or the VSMF very near a historic property or a contributing property within a historic district.

Woodward Avenue, determined NRHP-eligible, has historically included mass transit vehicles, most notably a horse-drawn rail car system from 1863-1892, an electric streetcar system from 1892-1956, and exclusively bus service from 1956 to the present. The existing bus service includes bus shelters along Woodward Avenue within the transportation right-of-way. For historic districts that encompass the roadway and historic properties that flank the roadway, whose period of historic significance includes the era of mass transit use on Woodward Avenue, introduction of LRT in that roadway was not generally determined to be an adverse effect because these historic properties would retain integrity of setting, feeling, and association.

Figure 4-1. Adversely Affected Historic Properties

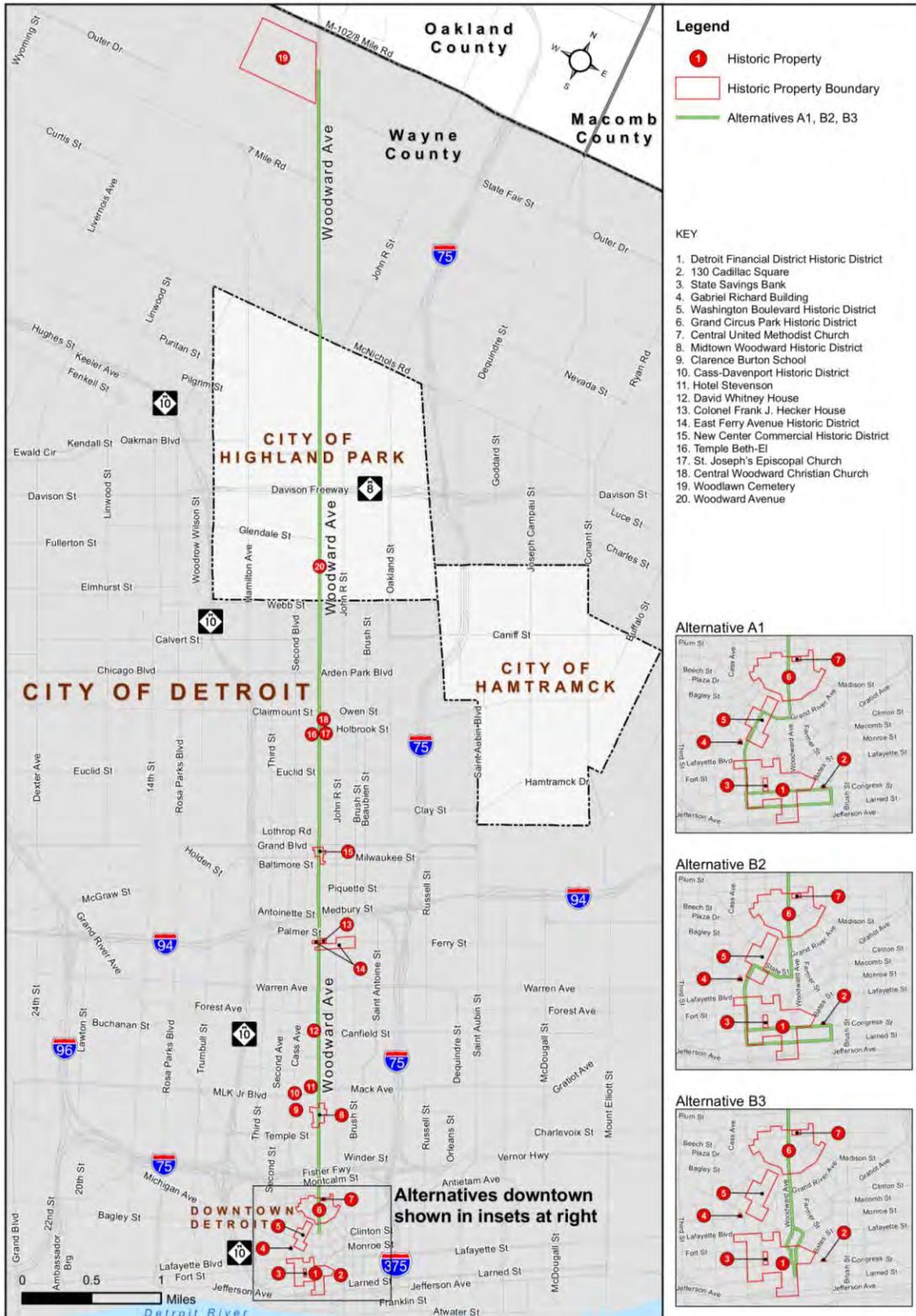


Table 4-3. Summary of Adverse Effect Determinations

AE = Adverse Effect; NA = No Adverse Effect; NE = No Effect

Map ID	Name and NRHP Status	Location or Address	Year Built	Effect			Photograph
				Alternative A1	Alternative B2	Alternative B3	
1	Detroit Financial District Historic District <i>Listed 2009</i>	Eight blocks in Downtown Detroit roughly bounded on the south by West Jefferson Avenue, east by Woodward Avenue, north by Lafayette Avenue, and west by Washington Boulevard	1900-1965	AE: Visual adverse effect to setting by LRT station within historic district boundary	AE: Visual adverse effect to setting by LRT station within historic district boundary	NA	
2	130 Cadillac Square <i>Deemed eligible 2010</i>	130 Cadillac Square	1895	AE: Visual adverse effect to setting and feeling by LRT station proximate to historic boundary	NA	NE	
3	State Savings Bank <i>Listed 1982</i>	151 West Fort Street	1900, 1915	AE: Visual adverse effect to setting, feeling, and association by LRT station proximate to historic district boundary	NA	NE	
4	Gabriel Richard Building <i>Deemed eligible 2010</i>	305 Michigan Avenue	1915	NA	AE: Visual adverse effect to setting by LRT station proximate to historic boundary	NE	
5	Washington Boulevard Historic District <i>Listed 1982</i>	Washington Boulevard between Michigan and Clifford streets on the east and between State and Grand River streets on the west	1901-1930	AE: Visual adverse effect to setting and feeling by LRT station within historic district boundary	AE: Removal of Macomb Monument to build LRT station within historic district boundary would result in adverse effect to location, design, materials, workmanship, setting, and feeling by LRT station within historic district boundary	NE	

Table 4-3. Summary of Adverse Effect Determinations

AE = Adverse Effect; NA = No Adverse Effect; NE = No Effect

Map ID	Name and NRHP Status	Location or Address	Year Built	Effect			Photograph
				Alternative A1	Alternative B2	Alternative B3	
6	Grand Circus Park Historic District <i>Listed 1982</i>	Roughly bounded by Clifford Street on the south and west, John R. Street on the south and east, and the north side of Adams Street on the north	1915-1928	NA	AE: Adverse effect to setting and design by LRT station within historic district boundary	AE: Adverse effect to setting and design by LRT station within historic district boundary	
7	Central United Methodist Church <i>Listed 1983</i>	23 East Adams Avenue	1867	NA	AE: Visual adverse effect to setting by LRT station proximate to historic boundary	AE: Visual adverse effect to setting by LRT station proximate to historic boundary	
8	Midtown Woodward Historic District <i>Listed 2008</i>	Approximately two blocks of Woodward Avenue between Charlotte and Stimson streets, including two buildings at 14 Charlotte Street and 25 Peterboro Street	1900-1920	AE: Visual adverse effect to setting and feeling from VSMF proximate to historic district boundary	AE: Visual adverse effect to setting and feeling from VSMF proximate to historic district boundary	AE: Visual adverse effect to setting and feeling from VSMF proximate to historic district boundary	
9	Clarence Burton School <i>Nominated 2010†</i>	3420 Cass Avenue	1912	AE: Visual adverse effect to setting and feeling from VSMF proximate to historic boundary	AE: Visual adverse effect to setting and feeling from VSMF proximate to historic boundary	AE: Visual adverse effect to setting and feeling from VSMF adjacent to historic boundary else NA	
10	Cass-Davenport Historic District <i>Listed 1997</i>	3527, 3550, and 3566 Cass Avenue, and 149 Davenport Street	1905-1947	AE: Visual adverse effect to setting, feeling, and association from VSMF proximate to historic district boundary	AE: Visual adverse effect to setting, feeling, and association from VSMF proximate to historic district boundary	AE: Visual adverse effect to setting, feeling, and association from VSMF proximate to historic district boundary	

Table 4-3. Summary of Adverse Effect Determinations

AE = Adverse Effect; NA = No Adverse Effect; NE = No Effect

Map ID	Name and NRHP Status	Location or Address	Year Built	Effect			Photograph
				Alternative A1	Alternative B2	Alternative B3	
11	Hotel Stevenson <i>Listed 1997</i>	40 Davenport Street	1913	AE: Visual adverse effect to setting and association from VSMF proximate to historic boundary	AE: Visual adverse effect to setting and association from VSMF proximate to historic boundary	AE: Visual adverse effect to setting and association from VSMF proximate to historic boundary	
12	David Whitney House <i>Listed 1999</i>	4421 Woodward Avenue	1890-1903	NE	AE: Visual adverse effect to setting, feeling, and association from LRT station proximate to historic boundary	AE: Visual adverse effect to setting, feeling, and association from LRT station proximate to historic boundary	
13	Colonel Frank J. Hecker House <i>Listed 1973</i>	5510 Woodward Avenue	1888	NE	AE: Visual adverse effect to setting, feeling, and association from LRT station proximate to historic boundary	AE: Visual adverse effect to setting, feeling, and association from LRT station proximate to historic boundary	
14	East Ferry Avenue Historic District <i>Listed 1980</i>	Approximately three blocks of East Ferry Avenue between Woodward Avenue and Beaubien Street	1885-1920	NA	AE: Visual adverse effect to setting and feeling from LRT station within historic district boundary	AE: Visual adverse effect to setting and feeling from LRT station within historic district boundary	
15	New Center Commercial Historic District <i>Deemed eligible 2010*</i>	Properties along Woodward Avenue from Baltimore Avenue to Grand Boulevard	1920-1942	AE: Visual adverse effect to setting, feeling, and association from LRT station within historic district boundary	AE: Visual adverse effect to setting, feeling, and association from LRT station within historic district boundary	AE: Visual adverse effect to setting, feeling, and association from LRT station within historic district boundary	

Table 4-3. Summary of Adverse Effect Determinations

AE = Adverse Effect; NA = No Adverse Effect; NE = No Effect

Map ID	Name and NRHP Status	Location or Address	Year Built	Effect			Photograph
				Alternative A1	Alternative B2	Alternative B3	
16	Temple Beth-El <i>Listed 1982</i>	8801 Woodward Avenue	1921	AE: Visual adverse effect to setting from LRT station proximate to historic boundary	AE: Visual adverse effect to setting from LRT station proximate to historic boundary	AE: Visual adverse effect to setting from LRT station proximate to historic boundary	
17	St. Joseph's Episcopal Church <i>Listed 1982</i>	8850 Woodward Avenue	1927	AE: Visual adverse effect to setting from LRT station proximate to historic boundary	AE: Visual adverse effect to setting from LRT station proximate to historic boundary	AE: Visual adverse effect to setting from LRT station proximate to historic boundary	
18	Central Woodward Christian Church <i>Listed 1982</i>	9000 Woodward Avenue	1928	AE: Visual adverse effect to setting from LRT station proximate to historic boundary	AE: Visual adverse effect to setting from LRT station proximate to historic boundary	AE: Visual adverse effect to setting from LRT station proximate to historic boundary	
19	Woodlawn Cemetery <i>Deemed eligible 2010*</i>	19975 Woodward Avenue	1895	AE: Visual adverse effect to setting, feeling, and association from LRT station proximate to historic boundary	AE: Visual adverse effect to setting, feeling, and association from LRT station proximate to historic boundary	AE: Visual adverse effect to setting, feeling, and association from LRT station proximate to historic boundary	
20	Woodward Avenue <i>Deemed eligible 2010†</i>	The entire length of Woodward Avenue between its intersections with Jefferson Avenue and M-102/Eight Mile Road, spanning the existing right-of-way and including the median where applicable	1805-1960	NA	AE: Visual adverse effect to feeling from LRT stations within proposed historic boundary	AE: Visual adverse effect to feeling from LRT stations within proposed historic boundary	

* Determination of eligibility pending the SHPO's concurrence.

† Pending NRHP listing.

‡ Determination of eligibility pending the SHPO's concurrence. A portion of Woodward Avenue, as part of the Historic Woodward Avenue Plan of 1805, was previously determined eligible in 1979.

However, specific LRT components, including stations and VSMF sites, were determined to adversely affect significant visual features of the setting of certain properties. . Furthermore, one of the station design concepts for Alternatives B2 and B3 (i.e., the inclusion of advertisement structures over the station) would adversely affect Woodward Avenue’s integrity of feeling. Alternative design concepts are under consideration.

Details of the effects determinations for historic structures are provided in the *Historic Resources Technical Report* comprising the following: *Phased Section 106 Submittal, Assessment of Effects, Downtown Detroit to Interstate 75/Fisher Freeway* (October 2010); *Phased Section 106 Submittal, Assessment of Effects, Interstate 75/Fisher Freeway to Grand Boulevard* (October 2010); *Phased Section 106 Submittal, Assessment of Effects, Grand Boulevard to M-8/Davison Freeway* (November 2010); and *Phased Section 106 Submittal, Assessment of Effects, M-8/Davison Freeway to M-102/8 Mile Road* (November 2010). These documents were submitted to the SHPO for review.

Following completion of the above-referenced analysis and documentation, preliminary sites for traction power substations (TPSS) were identified ([Chapter 2, Section 2.3.4](#)). TPSS sites will be subject to additional analysis and evaluation for Section 106 purposes because TPSS structures have the potential to adversely affect historic properties located proximate to them. This analysis will be conducted as part of the ongoing Section 106 consultation with the SHPO and other consulting parties.

Short-Term Construction Effects

No potential short-term construction effects to historic properties, including impacts related to construction staging and equipment storage, are anticipated. No preliminary sites for staging areas have been located within the boundaries of historic properties or districts, or would affect access to any historic properties; however, these sites will be subject to additional analysis during the ongoing Section 106 consultation with the SHPO and other consulting parties. No potential vibratory impacts related to construction activity have been identified.

Mitigation

Findings of adverse effect to historic properties require efforts to resolve these effects by developing and evaluating alternatives or modifications to the undertaking that could avoid, minimize, or mitigate adverse effects. Efforts have been made to avoid physical impacts to historic properties, and efforts will be made to avoid impacts during construction of the project as well. Any historic property that is adversely affected will be fully documented in accordance with the standards of the Historic American Building Survey or the Historic American Engineering Record (HABS/HAER) before construction begins. Contracts for final design of the stations will require that, for any station adversely affecting, or potentially adversely affecting a historic resource, the design be sensitive to its historic context and, that the SHPO be given several opportunities to comment on the design as it is being developed. The Macomb Monument would be relocated to a location within the same historic district, chosen by the City in consultation with the SHPO. All alternatives will be located entirely within existing transportation rights-of-way with the exception of the VSMF and the TPSSs. FTA will consult with the SHPO and other consulting parties to develop further measures and responsibilities to minimize or mitigate adverse effects, which will be documented in the Section 106 Agreement. The ACHP has been notified of the adverse effects findings.

4.4.2 Archaeological Resources

Legal and Regulatory Context

The archaeological investigation complies with Section 106 of the NHPA, as amended, and the guidelines for such surveys established by the Michigan Department of Transportation (MDOT) and the Michigan Office of the State Archaeologist (OSA). As part of this investigation, FTA has invited Native American comment and input on the proposed project and its potential to impact Traditional Cultural Properties. This has included communications with 12 federally-recognized tribes and two state-recognized tribes that might have an interest in the project. While Section 106 consultation is ongoing, there has been minimal response to date by the tribes, as documented in the *Public Participation Technical Report* (Parsons Brinckerhoff, 2011).

Methodology

Phase I archaeological literature review and land use history and archaeological disturbance assessments were completed to determine the LPA's potential to impact significant archaeological sites that may be eligible for the NRHP.

Through consultation with MDOT and OSA, the archaeological study area (ASA) was determined to include all areas within one-quarter mile of the LPA. Literature review and data collection were conducted at OSA, the Library of Michigan, and Michigan State Archives in Lansing. In Detroit, research was conducted at the Detroit Public Library and the Detroit Historical Museum. Relevant online inventories were examined. Field inspection consisted of visual inspection and photo documentation of the Woodward Avenue corridor and the potential VSMF sites. Details of the archaeological investigation are provided in the *Archaeological Resources Technical Report's Phase I Archaeological Literature Review, Land-Use History, and Disturbance Assessment, Woodward Avenue Light Rail Transit Project, City of Detroit, Wayne County, Michigan*.

Existing Conditions

The literature review revealed that 55 previously documented archaeological sites exist within the ASA as documented in the *Archaeological Resources Technical Report*. Many were identified in 27 archaeological survey reports on file at OSA. The documented archaeological sites are concentrated in downtown along the waterfront and south of Grand Circus Park. The density of reported sites decreases northward along Woodward Avenue due, in large part, to survey bias; a number of large archaeological investigations explored the archaeological potential of downtown, whereas fewer projects have been initiated along the more northerly sections of the Avenue. Two documented sites are solely prehistoric resources; three have both prehistoric and historic components. Thirteen sites have not been field verified; they are documented through historic cartography, deed records, unconfirmed field inspection, and historic documentation.

Five previously documented sites have been determined eligible for inclusion in the NRHP. All are located in downtown, four south of Fort Street. All of the eligible sites date to the late 18th and early to mid-19th centuries. Three of these sites have already been subjected to archaeological data-recovery excavations not associated with this project. Only one of the eligible sites, Capitol Park, falls within the LPA alignment or at LRT station locations. This site reportedly contains the remnants of the first territorial capitol building and at least one historic burial. Of the remaining sites, 14 were determined not eligible for inclusion in the NRHP; 36 require additional information before a final determination can be made.

At least six archaeological sites occur in or adjacent to the LPA alignment in downtown. These include Capitol Park and Fort Lernout including the 18th century palisaded city covering an area roughly from the intersection of Fort and Shelby streets to the intersection of Jefferson and Cass avenues, and the intersection of Jefferson Avenue and Griswold Street. In the 18th century, this area was highly developed and contained densely packed military, domestic, and commercial structures on streets that do not correspond to the modern, post-1805 street grid. Another potentially significant site of note is the Original Protestant Cemetery. Intact burials from this late 18th and early 19th century resource were discovered beneath the northern sidewalk of Larned Street at the northeast corner of Larned Street and Woodward Avenue.

Long-Term Effects

No Build Alternative

As the No Build Alternative does not involve construction at the sites of identified archaeological sensitivity; it would have no impact on extant archaeological resources.

Locally Preferred Alternative

Implementation of the LPA within the rights-of-way established in the 1805 plan of the city (the modern street grid) would have no impact on significant archaeological resources. That street grid has changed little since it was established, and in-street utility installation and infrastructure improvements have compromised any archaeological resource that may have been present. The only element of the post-1805 city that may be impacted by the project is Capitol Park, adjacent to State Street, which may be affected by curbside construction in that area. The archaeological reports reviewed at OSA reveal that circa 1830 to 1860 sites may occur in the potential MLK Boulevard VSMF site at Stimson Street; circa 1880 to 1920 residential and industrial sites may occur in the Amsterdam Street VSMF site; and 20th century industrial deposits may exist at the Highland Park Ford Plant VSMF site. However, the reports are clear that 20th century redevelopment and urban renewal projects have destroyed or compromised archaeological remains in many areas. Unassociated privy vaults, drains, and building foundations lacking solid interpretive contexts are not likely to be considered NRHP-eligible.

Review of historic cartographic resources reveals that the MLK Boulevard VSMF site was occupied by large, single-family residences by 1889. By 1921, about one-half of those buildings had been replaced with large industrial buildings, apartment blocks, and at least one hotel. None of the 19th century housing stock survives, but at least three lots have potential to contain intact archaeological evidence. The Amsterdam Street VSMF site was entirely undeveloped until the end of the 19th century, when a small portion was occupied by sheds and lumber piles for a nearby lumberyard. By 1910, almost the entire site was occupied by the Cadillac Car Company. By 1949, all structures in the VSMF site's limits had been razed and converted to automobile parking, a function that continues today. The Highland Park Ford Plant VSMF site has never been intensely developed, despite its proximity to the Highland Park Ford Plant National Historic Landmark. The property was entirely undeveloped until circa 1915 when it held athletic fields, three small paint sheds, three small underground storage tanks, and a series of railroad sidings for the Ford Plant. In the mid-20th century, the entire area was converted to materials storage; the standing structures were razed by the end of the century. (See the *Archaeological Resources Technical Report* for site mapping.)

Short Term Construction Effects

In the event of the unanticipated discovery of human remains or potentially significant archaeological sites during LPA construction, all work in the vicinity would stop. Work would not proceed until an appropriate treatment plan for the resource is developed through

coordination with the SHPO, and OSA cultural resources staff. If the discovery involves human remains, local law enforcement officials would be notified immediately of the discovery, prior to consultation with the above agencies.

Mitigation

Once a location for the VSMF site is chosen, and site layout and facility design plans, including specific information on the horizontal and vertical extent of excavation, have advanced, Phase I archaeological field investigations would be completed. Such investigations would be guided by the recommendations discussed below.

With two exceptions, there is no potential for the LPA in the proposed street rights-of-way to impact intact archaeological sites; no further work is necessary for the majority of the area. As there is likely historic and cultural significance attached to any sites associated with the pre-1805 city, particularly those of Fort Lernoult, the 18th century palisaded city, and the Old Protestant Cemetery, construction-phase monitoring is recommended for all excavations extending more than 24 inches below current ground surface above or adjacent to those potential resources for any of the LPA Alternatives. Excavation along the north side of State Street adjacent to Capitol Park would also be monitored for evidence of the Capitol Park archaeological site.

No additional archaeological investigation is warranted for either the Amsterdam Street or Highland Park Ford Plant VSMF sites. Additional archaeological investigation is warranted for the MLK Boulevard VSMF site if it is selected. It is possible that intact archaeological remains from three mid- to late-19th century residences exist in the central portion of this site. Phase I subsurface investigations targeting these potential resources would be undertaken if this site is selected for the VSMF facility.

4.5 Environmental Justice

4.5.1 Legal and Regulatory Context

Issued on February 11, 1994, Executive Order 12898 – Federal Actions to Address Environmental Justice in Minority and Low-Income Populations (EO 12898) directs federal agencies to identify and address disproportionately high and adverse human health or environmental effects that their programs, policies, and activities may have on minority and low-income populations. The roots of environmental justice (EJ) are in Title VI of the Civil Rights Act of 1964, which prohibits discrimination on the basis of race, color, and national origin in programs and activities receiving federal financial assistance. Following the direction of EO 12898, federal agencies developed their own guidelines to implement EJ. This analysis was developed under the U.S. Department of Transportation’s (USDOT) *Order to Address Environmental Justice in Minority Populations and Low-Income Populations* (USDOT Order 5610.2), the Federal Highway Administration/Federal Transit Administration’s (FHWA/FTA) *Actions to Address Environmental Justice in Minority Populations and Low-income Populations* (FHWA 6640.23) and the Council on Environmental Quality’s (CEQ) *Environmental Justice – Guidance Under the National Environmental Policy Act*.

USDOT Order 5610.2, an internal directive, is based on the framework of the National Environmental Policy Act (NEPA), Title VI of the 1964 Civil Rights Act, the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, and the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). USDOT Order 5610.2, as well as FHWA/FTA Order 6640.23, defines the fundamental principles of EJ as follows:

- Avoiding, minimizing, or mitigating disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations;
- Ensuring full and fair participation by all potentially affected communities in the transportation decision-making process; and
- Preventing the denial of, reduction in or significant delay in the receipt of benefits by minority and low-income populations (USDOT, 1997).

USDOT Order 5610.2 requires the following:

- Consideration of mitigation and enhancement measures to benefit the affected minority and/or low-income population and all off-setting benefits to the affected populations, as well as the design, comparative impacts, and the relevant number of similar existing system elements in non-minority and non-low-income areas;
- Evaluation of whether all alternatives or mitigation measures are practical; and
- Documentation of the findings, determinations, and/or demonstration made in accordance to the Order in the environmental document prepared for the program, policy, or activity.

FHWA/FTA Order 6640.23 guidelines emphasize that each project should be analyzed in the context of its surroundings.

Definitions of terms used in this analysis include the following:

- Low-Income – a person whose household income is at or below the Department of Health and Human Services poverty guidelines;
- Minority – a person who is Black, Hispanic, Asian American, American Indian, Native Hawaiian and other Pacific Islander, or Alaskan Native;
- Low-Income Population – any readily identifiable group of low-income persons who live in geographic proximity; and
- Minority Population – any readily identifiable group of minority persons who live in geographic proximity.

CEQ guidance defines the threshold for determining a minority population of the affected area as either (a) exceeding 50 percent of the affected area’s population or (b) being meaningfully greater than the minority percentage in the general population or other appropriate unit of geographic analysis (“meaningfully greater” is not specifically defined in CEQ guidance). These same threshold criteria were applied to low-income populations.

Limited English Proficiency (LEP) populations, defined as readily identifiable groups of persons who do not speak English well or at all, were also identified in the study area, as they may require language-specific outreach to be able to participate in the DEIS process (FTA Circular 4702.1A, May 2007; *Policy Guidance Concerning Recipients Responsibilities to Limited English Proficient (LEP) Persons*, [70 FR 74087]).

4.5.2 Methodology

The study area for this analysis is as defined in [Chapter 1](#) and illustrated in [Figure 1-1](#). The methodology for meeting EJ requirements consists of the following steps:

- Define the project area boundary and identify census block groups in the study area;
- Determine thresholds for minority and low-income populations to identify potential locations of EJ populations based on data from the 2000 Census;
- Identify the location of EJ populations based on thresholds and additional information;
- Analyze the location and severity of impacts associated with the alternatives; and
- Determine disproportionately high and adverse impacts (if any), full and fair access, and denial of benefits to EJ populations (if any).

Using Census 2000 Summary File 3 (SF) information, the minority percentage for each block group either fully or partially within the study area was calculated. A block group with either greater than 50 percent minority population or a minority population larger than the average of Wayne County was considered a minority population area for this EJ assessment. Using Census 2000 SF3 information indicating poverty-status population (as defined by Department of Health and Human Services poverty guidelines), the low-income percentage for each block group either fully or partially in the study area was calculated. Block groups with a low-income population percentage greater than 50 percent, or greater than the Wayne County low-income population percentage (50.1 percent) were considered a low-income population area for this EJ assessment. Census 2000 SF3 data were also used to identify LEP populations in the study area.

Public participation by EJ populations during preparation of the DEIS process was solicited via various customized outreach methods. Flyers were issued on DDOT's Woodward Avenue Route 53 buses to communicate project information, including the times, dates, and locations of scoping meetings; project history; the environmental review process; and project milestones. Project presentations were made to the Local Advisory Council. Project materials were made available through limited door-to-door distribution to study area residents, at the neighborhood Citizens District Council, laundromats in the study area, and meetings of various community associations, including the Arab American Chaldean Community Association and the local chapter of the National Association for the Advancement of Colored People (NAACP).

Details of the environmental justice evaluation are provided in the *Environmental Justice Technical Report* (Parsons Brinckerhoff, 2011). Public participation during preparation of the DEIS, including with EJ populations, is summarized in [Chapter 7](#); details are provided in the *Public Participation Technical Report*.

4.5.3 Existing Conditions

There are 87 US Census block groups in the study area, with a total population of 74,922. Three block groups have no population and, therefore, were not considered for this analysis, leaving 84 block groups. Based on US Census 2000 SF3 data, 61,514 persons identified themselves as a minority, as defined by EO 12898, and 24,626 met the definition of low-income. These numbers, as a percent of the total population, are higher than both the State of Michigan and Metro Detroit ([Table 4-4](#)).

Table 4-4. Population Statistics

	Study Area	Metro Detroit	Wayne County	Michigan
Total Population	74,922	4,043,467	2,061,162	9,938,444
Minority Population ¹	61,514 (82.1%)	1,322,778 (32.7%)	1,032,998 (50.1%)	2,133,119 (21.5%)
Low-Income Population ²	24,262 (34.0%)	442,086 (11.1%)	332,598 (16.4%)	1,021,605 (10.5%)

Source: US Census 2000 SF3; ¹Minority persons include Hispanic individuals who can be of any race;

²Poverty status is determined for all people except institutionalized people, people in military and group quarters, people in college dormitories, and unrelated individuals under 15 years old.

As the study area lies in the cities of Detroit and Highland Park, Wayne County, which encompasses both cities, was identified as the reference area, per CEQ guidance. As Wayne County’s minority percentage (50.1%) is already above the 50 percent level set forth in condition 1 in CEQ guidance (i.e., it exceeds 50 percent of the affected area’s population), 50 percent was used as the threshold for identifying a minority population. On that basis, 78 of the 84 block groups contain minority populations and, therefore, were determined to be EJ populations (Figure 4-2).

Thresholds for low-income populations were also set using CEQ guidance, which states that the US Census Bureau’s annual statistical poverty threshold (annual household income, in dollars, linked to household size) should be used to define “low-income.” As the guidance does not prescribe the population threshold for identifying the presence of such low-income populations, the same method was applied as was used for minority populations, above, but using the US Census Bureau poverty threshold. On that basis, 16 of the 84 block groups have 50 percent or more low-income populations. As Wayne County (16.4 percent) has a higher proportion of low-income populations than do Metro Detroit (11.1 percent) or the State of Michigan (10.5 percent), Wayne County was selected as the reference area. On that basis, an additional 54 block groups were determined to be low-income EJ populations and a total of 70 block groups were determined to contain low-income populations (Figure 4-3).

In all, 81 out of the 84 block groups under consideration meet the threshold for a minority population, a low-income population, or both and are considered EJ populations (Table 4-5, Figure 4-3).

Based on Census 2000 SF3 information, 1,397 persons in the study area identified themselves as LEP, representing two percent of the total study area population. Block groups with the highest LEP populations are Downtown, bounded by NI-75, Woodward and Gratiot avenues, and near the proposed 7 Mile Road LRT Station.

4.5.4 Long-Term Effects

No Build Alternative

The No Build Alternative includes no major transportation investments in the study area other than those required to maintain the existing transportation system. No long-term impacts to EJ populations are anticipated with the No Build Alternative. However, as the No Build Alternative does not include transit improvements such as those that would be introduced with the LPA, EJ populations would not benefit from enhanced economic development opportunities and activity that may result from the LPA (see Chapter 4.10).

Locally Preferred Alternative

Analyses have been conducted for this DEIS to identify the LPA's potential impact on air quality, noise and vibration, land use, hazardous materials and other resource categories. There are no substantial adverse impacts that would pose disproportionately high and adverse human health or environmental impacts to EJ populations.

No division of neighborhoods or adverse impacts to minority and/or low-income populations living in the study area are expected as a consequence of the LPA, as it would be constructed and operated in an existing transportation corridor, requiring limited property acquisition (at seven or eight sites, equally distributed at approximately one mile intervals along the corridor, each with a typical lot size less than 2,500 square feet). The presence of the in-street LRT alignment is not expected to have the effect or perception of a barrier to community cohesion. Rather, the LPA may unify the existing neighborhoods that were previously delineated and separated by the freeways, if supported by appropriate feeder services on the intersecting corridors, as the potential exists for neighborhood centers to develop around LRT stations.

The majority of LRT stations along each of the LPA alignments with Alternatives A1, B2 and B3 are within walking distance of minority and/or low-income areas, which would benefit these EJ populations. Minority and low-income residents would enjoy improved mobility and access to community facilities, housing and services near the LPA alignments. Transit stations may improve overall neighborhood safety due to police patrolling at and near the stations. These neighborhoods would gain access to an enhanced transit service that connects them to Downtown and other parts of the LPA study area.

The location of the vehicle storage and maintenance facility (VSMF) may result in impacts to EJ populations, particularly if the VSMF is located at the MLK Boulevard site, given nearby low income, senior, multi-family residences. The VSMF would introduce a new 24-hour light and noise source to the immediately surrounding properties.

4.5.5 Short-Term Construction Effects

No Build Alternative

The No Build Alternative includes no project construction. Therefore, there would be no project-related adverse impacts to EJ populations.

Locally Preferred Alternative

During construction, EJ communities would experience temporary disruption impacts to access and circulation, for both residences and businesses. Increased noise and vibration would also be experienced during construction hours. However, these impacts are not exclusive to EJ communities as construction would occur along the entire length of the LPA alignment, and measures would be implemented to mitigate such impacts.

Figure 4-2. Locations of Minority EJ Populations

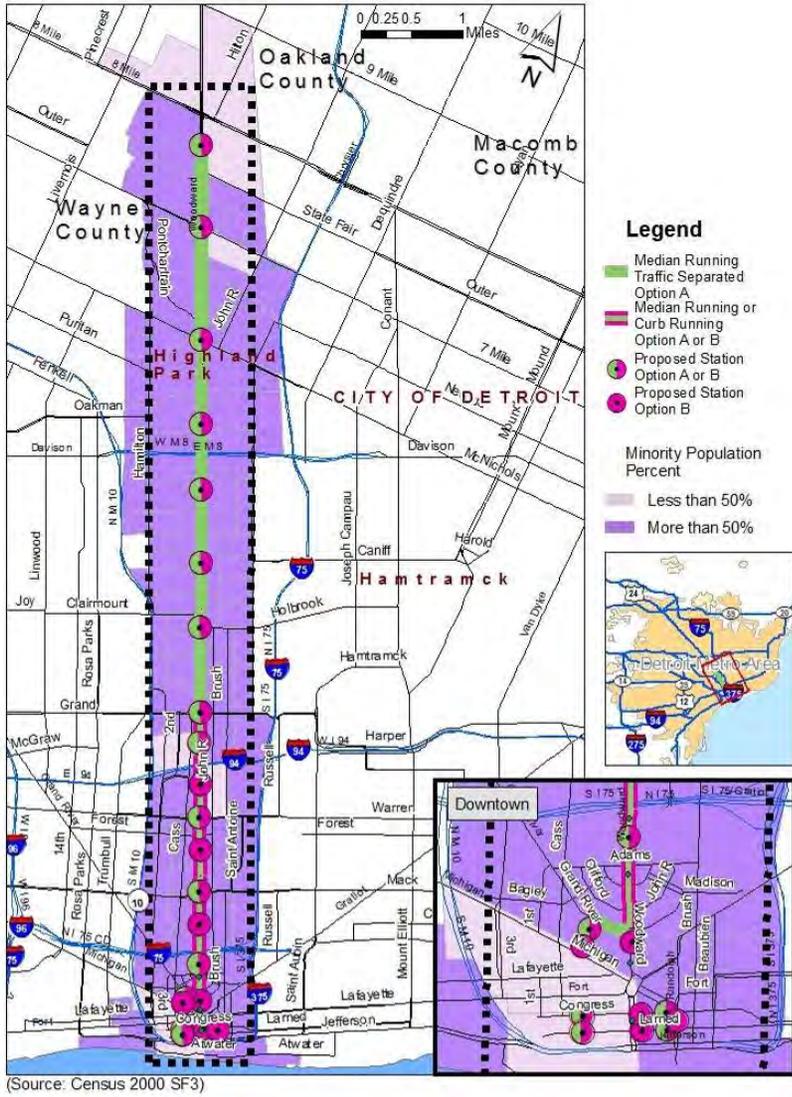


Figure 4-3. Locations of Low-Income EJ Populations

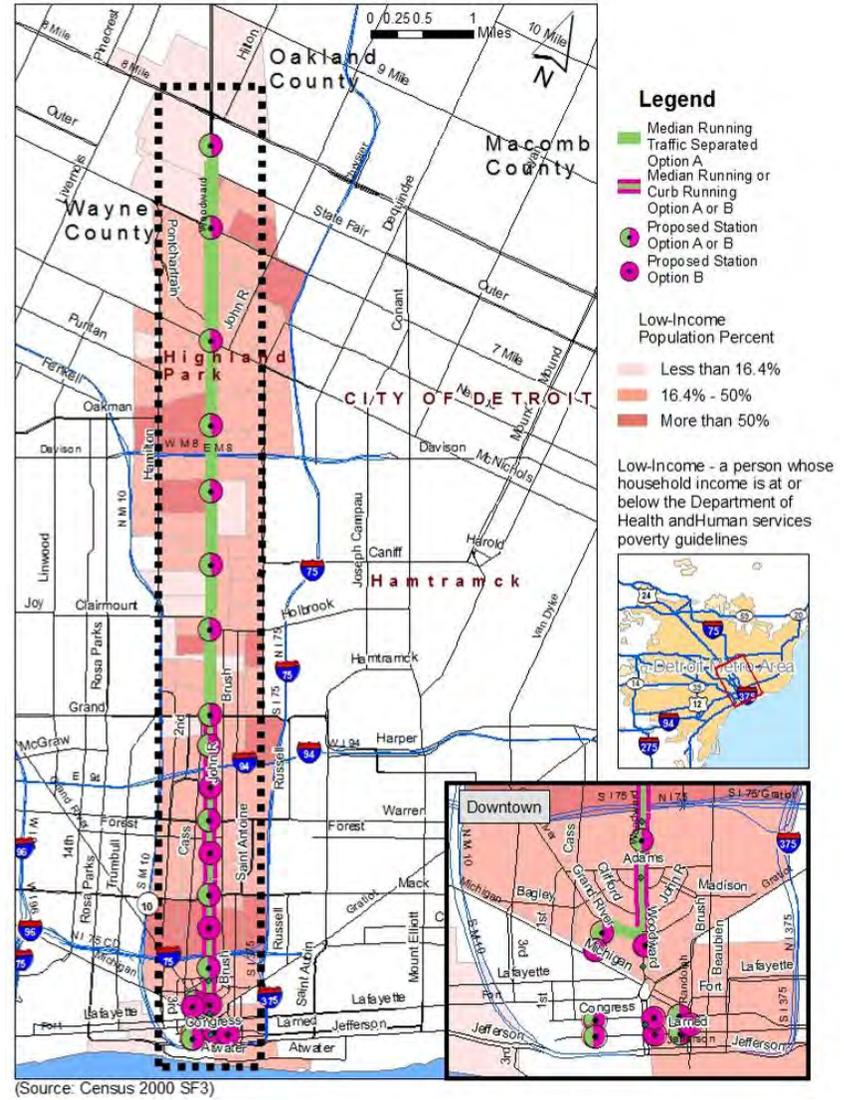


Table 4-5. Study Area Block Group Populations

Name	Total Pop	White	African-American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Persons Reporting Other Race	Persons Reporting Two or More Races	Hispanic or Latino Origin (Any Race)	Minority	Median Income	Percent Below Poverty	EJ Minority	EJ Low Income
Census Tract 1734, Block Group 5	2,124	90.3%	5.0%	0.0%	1.8%	0.0%	0.4%	2.4%	1.9%	11.2%	\$40,871	9.4%	No	No
Census Tract 1735, Block Group 1	1,027	79.2%	10.0%	1.9%	0.8%	0.0%	2.8%	5.4%	4.3%	23.2%	\$47,171	9.4%	No	No
Census Tract 1735, Block Group 2	2,357	93.9%	2.9%	0.0%	1.2%	0.2%	0.4%	1.4%	1.1%	6.7%	\$41,715	11.6%	No	No
Census Tract 5078, Block Group 1	542	13.3%	75.5%	0.0%	0.0%	0.0%	0.0%	11.3%	0.0%	86.7%	\$10,119	61.6%	Yes	Yes
Census Tract 5078, Block Group 2	586	13.8%	85.2%	0.0%	0.0%	0.0%	0.0%	1.0%	0.0%	86.2%	\$26,875	34.3%	Yes	Yes
Census Tract 5078, Block Group 3	437	3.4%	96.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	96.6%	\$16,250	47.1%	Yes	Yes
Census Tract 5079, Block Group 1	1,696	58.7%	26.4%	0.0%	0.6%	0.0%	0.4%	13.9%	0.9%	41.5%	\$18,358	42.8%	No	Yes
Census Tract 5079, Block Group 2	1,017	11.3%	86.9%	0.0%	0.0%	0.0%	0.0%	1.8%	0.0%	88.7%	\$28,438	18.3%	Yes	Yes
Census Tract 5079, Block Group 3	682	20.4%	66.0%	0.0%	2.5%	0.0%	0.0%	11.1%	0.0%	79.6%	\$48,750	21.7%	Yes	Yes
Census Tract 5079, Block Group 4	1,508	12.4%	76.9%	0.0%	0.0%	0.3%	0.0%	10.4%	0.5%	87.6%	\$16,700	42.8%	Yes	Yes
Census Tract 5080, Block Group 1	652	16.4%	58.6%	0.0%	0.0%	0.0%	5.5%	19.5%	0.0%	83.6%	\$25,703	38.3%	Yes	Yes
Census Tract 5080, Block Group 2	316	11.1%	82.6%	0.0%	2.8%	0.0%	0.0%	3.5%	0.0%	88.9%	\$25,250	38.9%	Yes	Yes
Census Tract 5080, Block Group 3	651	36.6%	41.5%	2.6%	0.0%	0.0%	0.0%	19.4%	0.0%	63.4%	\$11,838	58.2%	Yes	Yes
Census Tract 5080, Block Group 4	637	43.0%	42.5%	0.0%	0.0%	0.0%	0.0%	14.4%	0.0%	57.0%	\$15,893	52.4%	Yes	Yes
Census Tract 5080, Block Group 5	301	0.0%	93.7%	0.0%	6.3%	0.0%	0.0%	0.0%	0.0%	100.0%	\$8,586	50.8%	Yes	Yes
Census Tract 5080, Block Group 6	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Census Tract 5112, Block Group 2	605	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	\$11,471	61.3%	Yes	Yes
Census Tract 5112, Block Group 3	662	3.0%	97.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	97.0%	\$16,570	24.2%	Yes	Yes
Census Tract 5115, Block Group 1	544	1.8%	94.7%	2.4%	0.0%	0.0%	0.0%	1.1%	0.0%	98.2%	\$38,750	17.5%	Yes	Yes
Census Tract 5115, Block Group 2	569	1.1%	94.0%	0.0%	0.0%	0.0%	2.8%	2.1%	1.4%	98.9%	\$22,083	16.2%	Yes	No
Census Tract 5115, Block Group 3	927	0.0%	98.2%	0.0%	0.0%	0.0%	0.0%	1.8%	0.0%	100.0%	\$17,300	35.0%	Yes	Yes
Census Tract 5116, Block Group 1	546	0.4%	94.5%	0.0%	0.0%	4.0%	0.0%	1.1%	0.0%	99.6%	\$13,958	43.2%	Yes	Yes
Census Tract 5116, Block Group 2	609	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	\$21,595	30.9%	Yes	Yes
Census Tract 5116, Block Group 3	498	0.0%	99.8%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	100.0%	\$32,875	24.8%	Yes	Yes

Table 4-5. Study Area Block Group Populations

Name	Total Pop	White	African-American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Persons Reporting Other Race	Persons Reporting Two or More Races	Hispanic or Latino Origin (Any Race)	Minority	Median Income	Percent Below Poverty	EJ Minority	EJ Low Income
Census Tract 5116, Block Group 4	645	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.7%	100.0%	\$21,800	39.1%	Yes	Yes
Census Tract 5116, Block Group 5	878	2.4%	94.6%	0.0%	0.0%	0.0%	0.0%	3.0%	0.3%	97.6%	\$19,798	29.1%	Yes	Yes
Census Tract 5172, Block Group 1	44	40.9%	59.1%	0.0%	0.0%	0.0%	0.0%	0.0%	59.1%	59.1%	\$65,385	40.9%	Yes	Yes
Census Tract 5172, Block Group 2	1,889	19.7%	80.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	80.3%	N/A	N/A	Yes	N/A
Census Tract 5172, Block Group 3	982	17.4%	71.5%	0.4%	1.4%	0.0%	1.8%	7.4%	2.5%	82.6%	\$28,750	18.7%	Yes	Yes
Census Tract 5174, Block Group 1	251	21.9%	70.5%	0.0%	0.0%	0.0%	0.0%	7.6%	8.8%	86.9%	\$79,250	23.1%	Yes	Yes
Census Tract 5174, Block Group 2	253	20.9%	74.7%	0.0%	0.0%	0.0%	4.3%	0.0%	0.0%	79.1%	\$10,598	56.5%	Yes	Yes
Census Tract 5175, Block Group 1	802	2.0%	96.9%	0.0%	0.0%	0.0%	0.0%	1.1%	0.0%	98.0%	\$7,152	48.5%	Yes	Yes
Census Tract 5175, Block Group 2	1,121	11.3%	74.0%	0.0%	5.5%	0.0%	5.2%	4.0%	1.7%	88.7%	\$16,127	29.2%	Yes	Yes
Census Tract 5175, Block Group 3	681	4.8%	86.5%	1.2%	7.5%	0.0%	0.0%	0.0%	0.0%	95.2%	\$21,667	42.6%	Yes	Yes
Census Tract 5176, Block Group 1	1,727	0.3%	97.2%	0.0%	1.7%	0.0%	0.0%	0.8%	3.9%	99.7%	\$8,895	55.6%	Yes	Yes
Census Tract 5180, Block Group 1	877	59.1%	33.4%	0.0%	1.4%	0.0%	0.0%	6.2%	0.8%	41.7%	\$20,962	32.5%	No	Yes
Census Tract 5180, Block Group 2	1,013	4.1%	93.5%	0.0%	0.0%	0.0%	0.0%	2.4%	0.0%	95.9%	\$20,652	18.0%	Yes	Yes
Census Tract 5181, Block Group 1	213	4.7%	95.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	95.3%	\$37,344	21.6%	Yes	Yes
Census Tract 5181, Block Group 2	52	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	\$10,208	76.9%	Yes	Yes
Census Tract 5201, Block Group 1	141	72.3%	27.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	27.7%	\$17,250	32.6%	No	Yes
Census Tract 5201, Block Group 2	32	34.4%	65.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	65.6%	\$38,333	0.0%	Yes	No
Census Tract 5202, Block Group 1	1,247	33.0%	29.5%	0.0%	32.6%	0.0%	0.0%	4.9%	1.3%	67.8%	\$23,211	32.2%	Yes	Yes
Census Tract 5202, Block Group 2	1,201	38.1%	32.1%	0.0%	27.7%	0.0%	0.7%	1.4%	2.6%	63.9%	\$21,875	35.0%	Yes	Yes
Census Tract 5203, Block Group 1	1,524	27.6%	53.1%	0.0%	17.1%	0.0%	0.6%	1.6%	1.8%	73.3%	\$15,056	41.3%	Yes	Yes
Census Tract 5203, Block Group 2	664	23.9%	76.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	76.1%	\$13,203	49.8%	Yes	Yes
Census Tract 5204, Block Group 1	1,771	25.6%	58.9%	0.0%	9.5%	0.0%	0.7%	5.1%	3.6%	75.9%	\$18,750	33.3%	Yes	Yes
Census Tract 5205, Block Group 1	1,791	3.2%	95.1%	0.0%	0.0%	0.0%	0.0%	1.7%	1.7%	96.8%	\$12,697	62.0%	Yes	Yes
Census Tract 5206, Block Group 2	1,169	15.8%	76.4%	1.2%	0.0%	0.0%	0.0%	6.6%	0.7%	84.2%	\$8,025	61.2%	Yes	Yes

Table 4-5. Study Area Block Group Populations

Name	Total Pop	White	African-American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Persons Reporting Other Race	Persons Reporting Two or More Races	Hispanic or Latino Origin (Any Race)	Minority	Median Income	Percent Below Poverty	EJ Minority	EJ Low Income
Census Tract 5206, Block Group 3	1,162	27.6%	69.4%	1.7%	0.0%	0.0%	0.0%	1.3%	1.8%	73.2%	\$8,646	58.1%	Yes	Yes
Census Tract 5207, Block Group 1	664	35.7%	59.8%	1.2%	3.3%	0.0%	0.0%	0.0%	11.9%	74.8%	\$21,401	28.8%	Yes	Yes
Census Tract 5207, Block Group 2	1,083	11.6%	85.5%	0.0%	0.0%	0.0%	0.0%	2.9%	1.8%	89.0%	\$10,816	40.9%	Yes	Yes
Census Tract 5208, Block Group 3	1,104	28.8%	61.6%	0.0%	3.8%	0.0%	0.9%	4.9%	0.6%	71.8%	\$50,388	11.4%	Yes	No
Census Tract 5322, Block Group 2	934	1.1%	95.7%	0.0%	0.0%	0.0%	0.0%	3.2%	0.0%	98.9%	\$30,568	29.1%	Yes	Yes
Census Tract 5322, Block Group 3	631	0.0%	98.6%	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	100.0%	\$32,083	24.2%	Yes	Yes
Census Tract 5323, Block Group 2	618	22.2%	76.5%	0.0%	1.3%	0.0%	0.0%	0.0%	0.0%	77.8%	\$36,750	9.1%	Yes	No
Census Tract 5323, Block Group 3	841	9.3%	84.2%	0.0%	2.1%	0.0%	0.0%	4.4%	0.0%	90.7%	\$41,818	12.9%	Yes	No
Census Tract 5324, Block Group 1	795	7.0%	93.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	93.0%	\$20,526	29.8%	Yes	Yes
Census Tract 5324, Block Group 2	778	3.5%	88.9%	0.0%	5.8%	0.0%	0.0%	1.8%	0.0%	96.5%	\$11,012	69.0%	Yes	Yes
Census Tract 5324, Block Group 3	941	6.3%	93.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	93.7%	\$26,250	15.2%	Yes	No
Census Tract 5325, Block Group 1	1,601	6.7%	88.9%	0.5%	0.0%	0.0%	0.0%	3.9%	0.0%	93.3%	\$21,306	33.1%	Yes	Yes
Census Tract 5325, Block Group 2	574	1.4%	97.2%	0.0%	0.0%	0.0%	1.4%	0.0%	1.4%	98.6%	\$10,850	43.5%	Yes	Yes
Census Tract 5325, Block Group 3	714	1.0%	96.2%	0.0%	0.0%	0.0%	0.0%	2.8%	1.1%	99.0%	\$12,168	48.0%	Yes	Yes
Census Tract 5381, Block Group 1	1,239	12.5%	83.8%	0.0%	0.0%	0.0%	0.0%	3.7%	1.6%	87.5%	\$67,964	4.6%	Yes	No
Census Tract 5382, Block Group 1	952	22.6%	73.7%	0.0%	0.0%	0.0%	0.0%	3.7%	1.2%	78.6%	\$130,989	1.3%	Yes	No
Census Tract 5383, Block Group 1	3,084	5.8%	90.9%	0.6%	0.0%	0.0%	0.0%	2.8%	1.2%	94.2%	\$24,328	23.8%	Yes	Yes
Census Tract 5530, Block Group 1	858	18.3%	79.4%	0.0%	0.0%	0.0%	0.0%	2.3%	0.0%	81.7%	\$16,964	37.6%	Yes	Yes
Census Tract 5530, Block Group 2	532	2.1%	97.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	97.9%	\$18,036	25.2%	Yes	Yes
Census Tract 5530, Block Group 3	307	0.0%	97.1%	0.0%	0.0%	2.9%	0.0%	0.0%	0.0%	100.0%	\$16,442	29.6%	Yes	Yes
Census Tract 5531, Block Group 1	759	7.0%	91.2%	0.0%	0.7%	0.0%	0.0%	1.2%	0.0%	93.0%	\$26,071	24.4%	Yes	Yes
Census Tract 5531, Block Group 4	1,222	3.8%	94.1%	0.0%	0.0%	0.0%	0.0%	2.1%	0.0%	96.2%	\$34,453	34.3%	Yes	Yes
Census Tract 5531, Block Group 5	727	3.3%	92.4%	0.0%	1.0%	0.0%	0.0%	3.3%	0.0%	96.7%	\$22,647	38.0%	Yes	Yes
Census Tract 5532, Block Group 1	778	1.3%	98.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	98.7%	\$14,732	47.5%	Yes	Yes

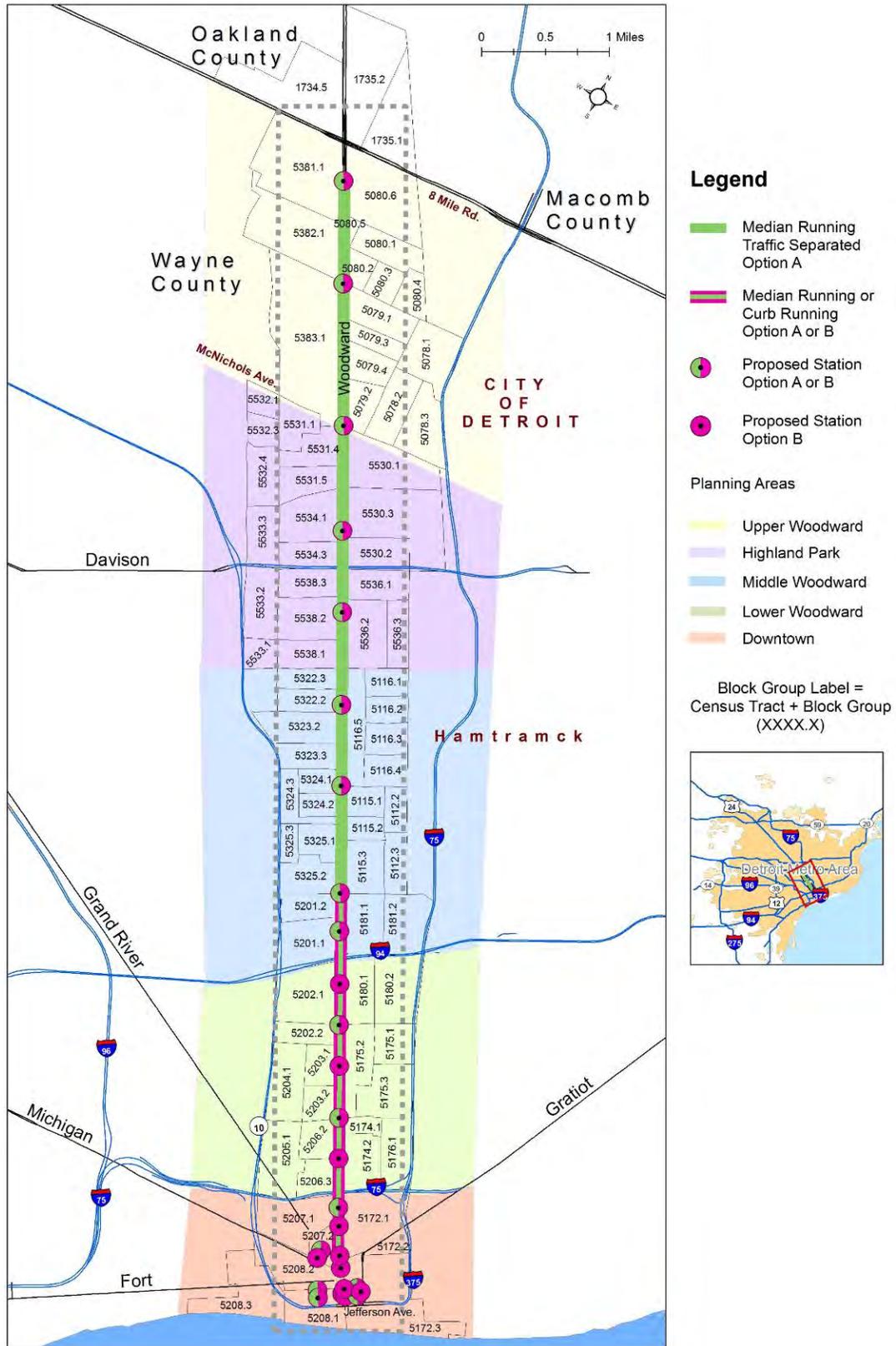
Table 4-5. Study Area Block Group Populations

Name	Total Pop	White	African-American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Persons Reporting Other Race	Persons Reporting Two or More Races	Hispanic or Latino Origin (Any Race)	Minority	Median Income	Percent Below Poverty	EJ Minority	EJ Low Income
Census Tract 5532, Block Group 3	428	2.1%	97.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	97.9%	\$20,238	10.7%	Yes	No
Census Tract 5532, Block Group 4	543	1.3%	90.8%	0.0%	6.1%	0.0%	0.7%	1.1%	0.7%	98.7%	\$17,208	41.3%	Yes	Yes
Census Tract 5533, Block Group 1	651	0.0%	97.8%	0.8%	0.0%	0.0%	0.0%	1.4%	0.0%	100.0%	\$25,192	16.7%	Yes	Yes
Census Tract 5533, Block Group 2	822	0.6%	97.9%	0.0%	0.7%	0.0%	0.0%	0.7%	1.2%	99.4%	\$10,458	41.6%	Yes	Yes
Census Tract 5533, Block Group 3	549	2.6%	94.7%	2.7%	0.0%	0.0%	0.0%	0.0%	0.0%	97.4%	\$7,043	64.7%	Yes	Yes
Census Tract 5534, Block Group 1	1,146	2.1%	97.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	97.9%	\$13,047	53.4%	Yes	Yes
Census Tract 5534, Block Group 3	786	3.4%	93.8%	0.8%	0.0%	0.0%	0.0%	2.0%	0.9%	96.6%	\$8,672	79.3%	Yes	Yes
Census Tract 5536, Block Group 1	1,123	6.5%	92.0%	0.0%	1.5%	0.0%	0.0%	0.0%	0.0%	93.5%	\$12,241	48.1%	Yes	Yes
Census Tract 5536, Block Group 2	1,501	3.6%	91.5%	0.0%	0.0%	0.0%	2.3%	2.6%	4.3%	98.2%	\$42,981	14.8%	Yes	No
Census Tract 5536, Block Group 3	822	7.1%	92.9%	0.0%	0.0%	0.0%	0.0%	0.0%	1.8%	92.9%	\$27,222	29.4%	Yes	Yes
Census Tract 5538, Block Group 1	1,051	5.6%	92.7%	0.0%	0.0%	0.0%	0.0%	1.7%	1.4%	94.4%	\$25,862	35.9%	Yes	Yes
Census Tract 5538, Block Group 2	1,086	7.5%	92.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.6%	92.5%	\$11,282	53.9%	Yes	Yes
Census Tract 5538, Block Group 3	1,055	2.2%	97.4%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	97.8%	\$27,083	39.4%	Yes	Yes

Source: US Census 2000 SF3

The physical location of census tracts and block groups is shown in [Figure 4-4](#).

Figure 4-4. Locations of Block Groups in Study Area



Source: Census 2000 SF3

4.5.6 Mitigation

No Build Alternative

As no construction or impacts would occur, no mitigation is required.

Locally Preferred Alternative

Design of the VSMF would be context-sensitive to minimize visual impacts, including sound and visual screening with walls and/or fences to mitigate the facility's potential disruption and intrusion into surrounding land uses. Additionally, final design and placement of the Traction Power Substations would be selected to minimize impacts to potential redevelopment sites.

As no substantial adverse impacts are anticipated with the LPA and, therefore, no disproportionately high and adverse human health or environmental impacts would affect EJ populations, additional mitigation measures would not be required.

4.6 Noise

4.6.1 Legal and Regulatory Context

FTA noise criteria are used to assess potential noise impacts of transit projects (74 *Federal Register* 12518, March 2009). FTA guidelines categorize noise impacts based on three primary land use categories (Table 4-6).

Table 4-6. FTA Guidelines on Land Use Categories and Metrics for Transit Noise

Land Use Category	Noise Metric (dBA)	Description of Land Use Category
1	Outdoor L_{eq} (h)	Tracts of land where quiet is an essential element of the land's intended purpose. This category includes lands set aside for serenity and quiet, and used as outdoor amphitheaters and concert pavilions, and National Historic Landmarks with significant outdoor use.
2	Outdoor L_{dn}	Residences and buildings where people normally sleep. This category includes homes, hospitals and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.
3	Outdoor L_{eq} (h)	Institutional land uses with primarily daytime and evening uses. This category includes schools, libraries, and churches where it is important to avoid interference with activities such as speech, meditation and concentration on reading material.

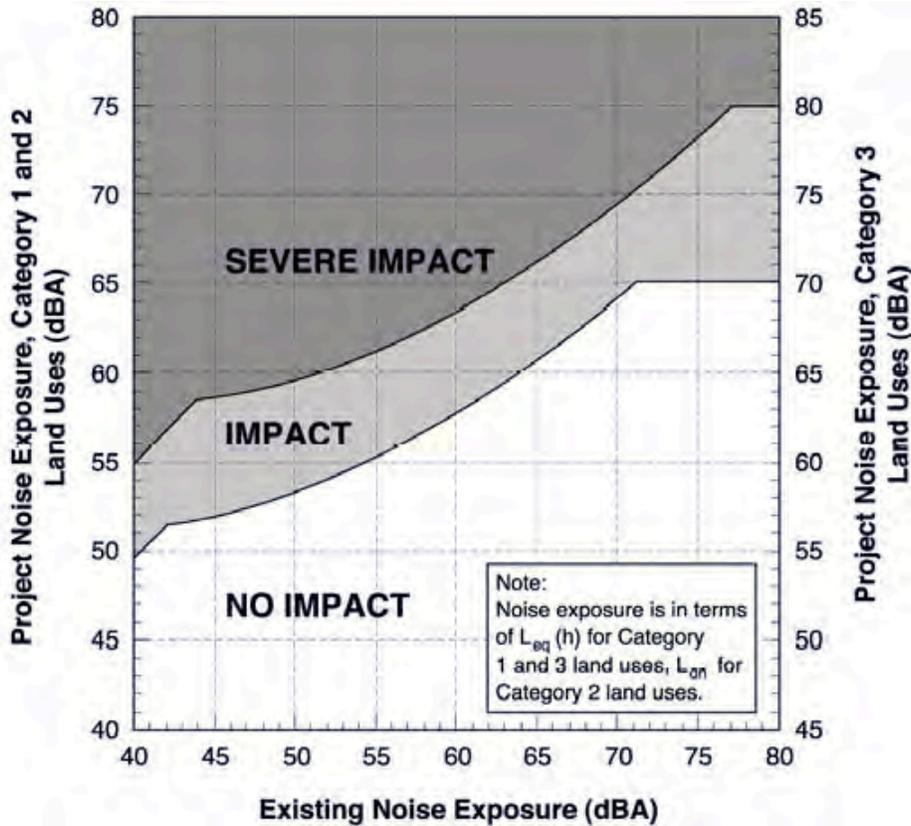
Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006

In Table 4-6, the unit used, A-weighted decibels or dBA, is a measure of sound loudness adjusted for the hearing range of the human ear. L_{eq} is measure of sound energy that is used to assess the impact for institutional and other land uses that do not have nighttime noise sensitivity. L_{eq} (h) is a measure of sound energy over a one-hour period that is referred to as the equivalent noise level and is used here to designate the noise during the noisiest hour of project-related activity. L_{dn} is a 24-hour noise descriptor referred to as the day-night noise level and is used to assess noise impacts for land uses where people sleep and, as a result, there is heightened sensitivity to nighttime noise.

The land use categories in Table 4-6 are needed because the noise sensitivities of land uses with primarily daytime activity vary from those where nighttime quiet is of paramount importance, such as where people normally sleep. For each of the land use categories, FTA defines the noise impact by comparing the noise level generated by the proposed project with the existing noise

level today. Figure 4-5 shows, for various levels of existing noise on the x-axis, what level of project noise (y-axis) would result in no impact at all, a moderate impact, and a severe impact. For example, at a given residential property (Category 2 land use) with an existing day-night noise level (Ldn) of 60 dBA, the predicted day-night noise level generated by the rail vehicles moving along the tracks over a 24-hour period would be a moderate impact if it is predicted to be in the range of 58 to 63 dBA, a severe impact if it is predicted to be 64 dBA or greater, and no impact at all if it is predicted to be under 58 dBA.

Figure 4-5. FTA Noise Impact Criteria



Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006

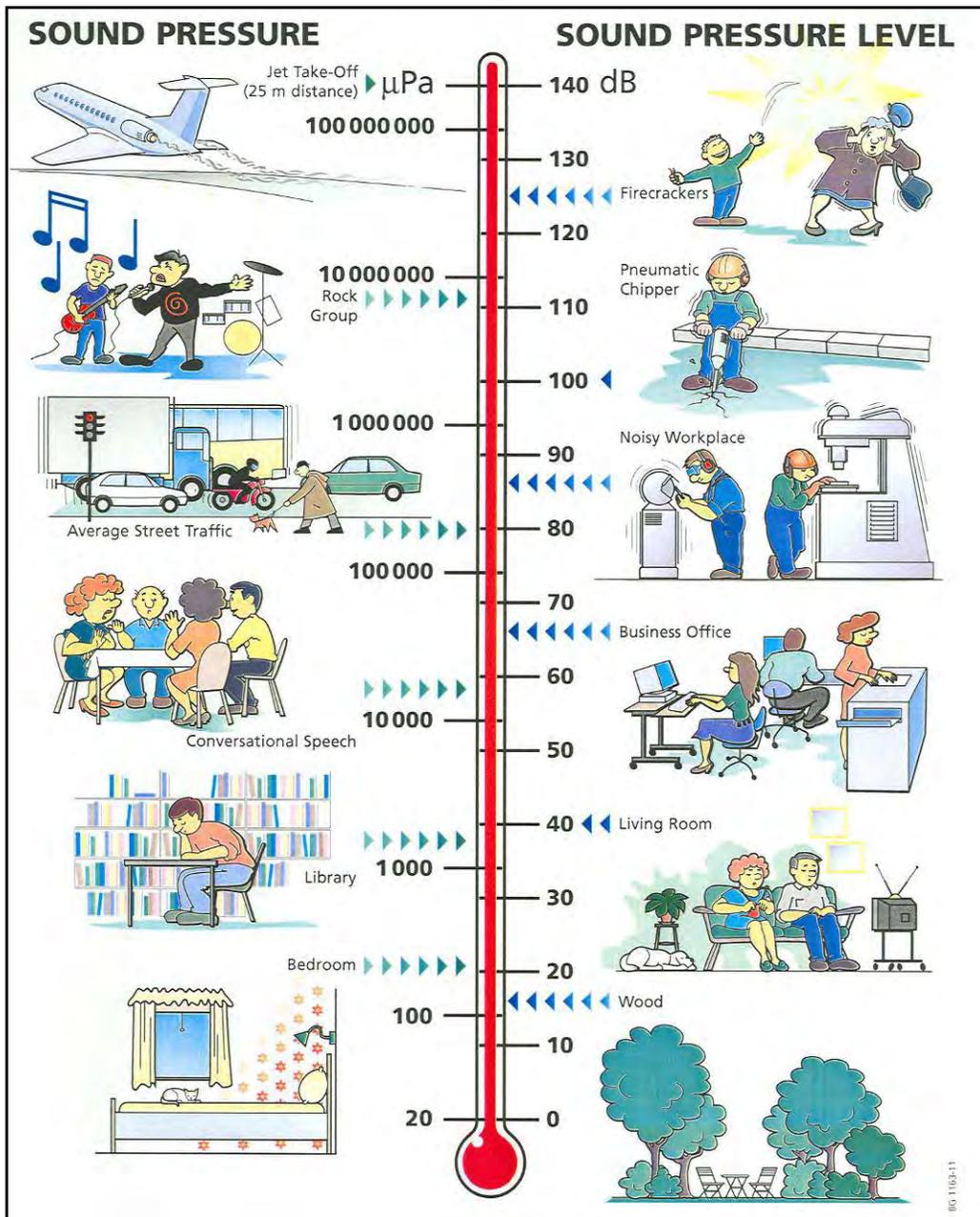
4.6.2 Methodology

Future noise exposure in the study area from the Locally Preferred Alternative (LPA) were determined in accordance with analysis procedures defined in Chapter 6 of the *Transit Noise and Vibration Impact Assessment* (FTA, May 2006). The LPA-generated noise level at each noise-sensitive property or “receptor” is calculated by determining four principal components: the noise level generated by the light rail transit (LRT), the hour-by-hour number of LRT operations over a 24-hour time period, the hour-by-hour speed at which the LRT travels between train stations and the distance between the LRT and a given receptor. The final calculated noise level is determined after applying adjustments for shielding provided by intervening buildings, special trackwork adjustments where track switches are planned, and adjustments for wheel squeal where there are curves in the tracks. For land uses where people normally sleep, a 24-hour noise descriptor referred to as the day-night noise level (Ldn) is used to assess potential noise impact. For land uses involving daytime activities, noise impact is assessed using the peak hour

equivalent noise level (Leq). All measured and calculated noise levels are adjusted to the “A” weighted hearing scale, which best accounts for varying perceptions of loudness by the human ear. Representative common noise sources and their associated decibel levels are shown in Figure 4-6.

The application of this methodology for analysis of the LPA is detailed in the *Noise and Vibration Technical Report* (Parsons Brinckerhoff, 2011). Traffic data used in the noise and vibration analyses are detailed in the *Transportation Technical Report* (Parsons Brinckerhoff, 2010).

Figure 4-6. Sound Pressure and Sound Pressure Levels of Common Noise-Generating Activities

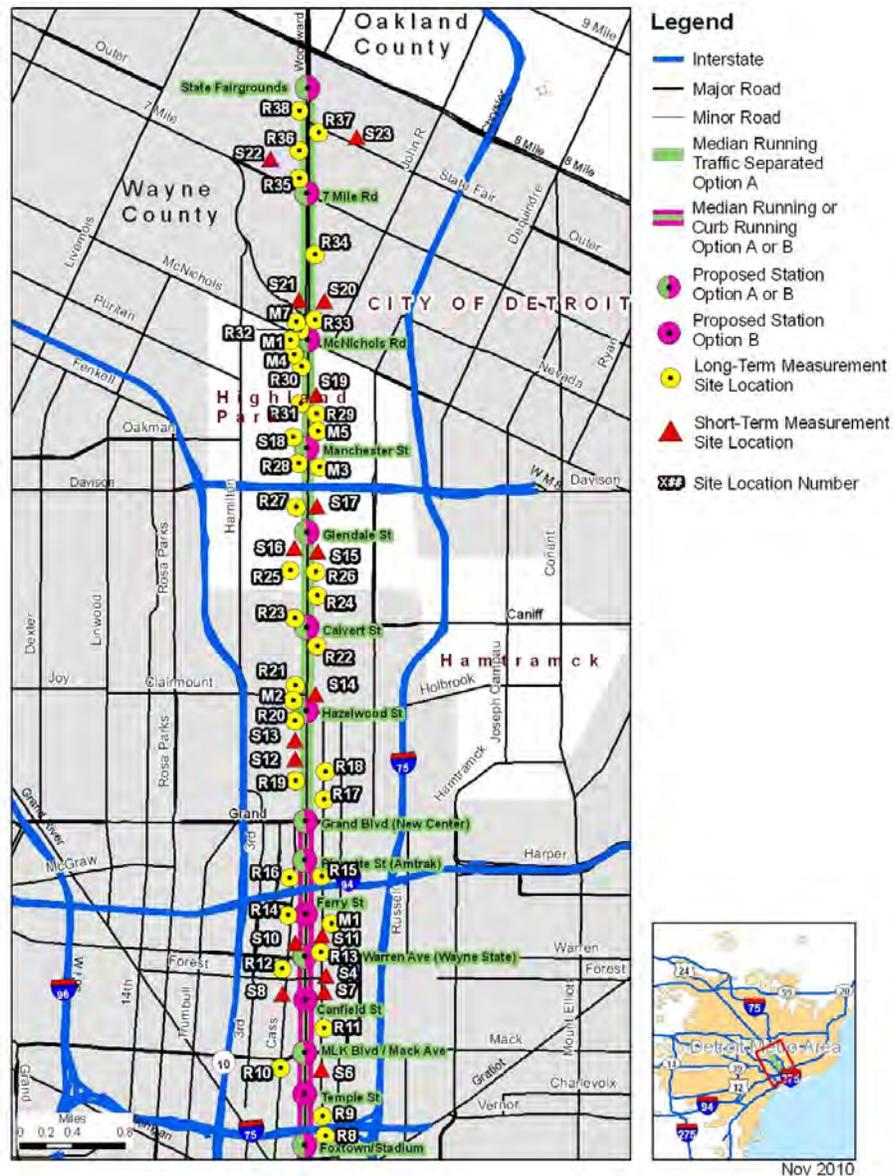


Source: Brüel and Kjær. *Environmental Noise, Sound and Vibration Measurements*, 2000

4.6.3 Existing Conditions

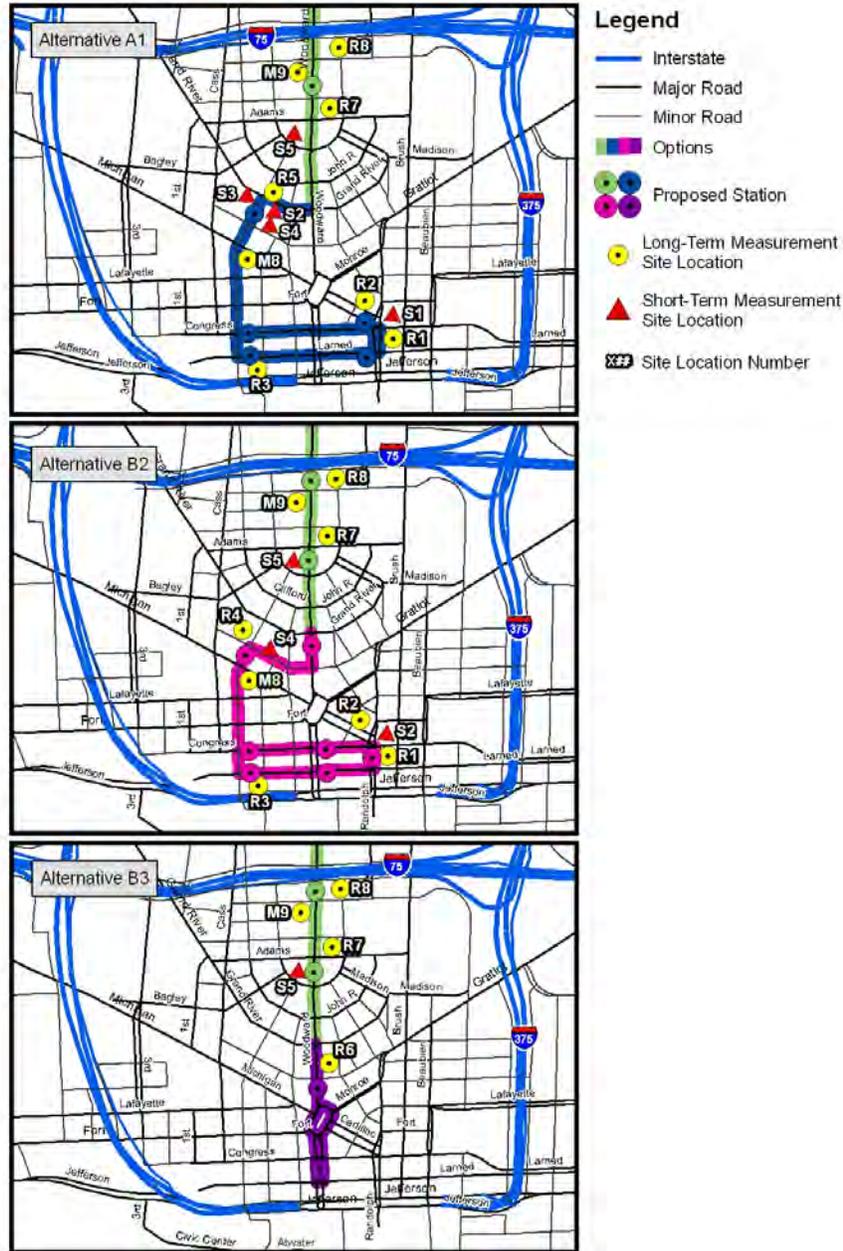
Seventy sites were selected for measurement of existing noise levels along the LPA alternatives' mainline alignments (Figure 4-7) and the alignments of the LPA's Downtown Design Options (Figure 4-8). These specific sites were selected in order to consider both stationary and mobile sound sources, represent different types of land uses along the alignments, and provide adequate geographic coverage for the different LPA Design Options. At 38 sites, 24-hour noise measurements were taken (Table 4-7) where people sleep and have sensitivity to nighttime noise. Noise measurements during the 7:00-8:00 a.m. and 5:00-6:00 p.m. peak periods were taken at 23 sites (Table 4-8) where sensitivity to noise is limited to the daytime. At nine additional sites (Table 4-9), existing noise levels were derived from noise readings collected at 24-hour and peak-hour measurement sites that were close enough to the nine sites to represent noise levels at those sites. All noise measurements were taken at exterior areas of each of the properties.

Figure 4-7. Mainline Noise and Vibration Measurement Site Locations



Source: Parsons Brinckerhoff, 2010

Figure 4-8. Downtown Noise and Vibration Measurement Site Locations



Source: Parsons Brinckerhoff, 2010

Existing noise levels throughout the study area are typical of noise levels found in urban communities. Motor vehicles are the principal source of noise within the study area. As the LPA alignment alternatives would follow existing travel routes, most communities adjacent to the LPA alignments are currently exposed to moderate to high ambient noise levels. Measured peak-hour noise levels in the study area range from a maximum of 80 dBA at Our Lady of the Rosary Parish (Site R15) to 58 dBA at a residence at 324 West Montana Street (Site 33) and at the entrance to the State Fairgrounds at 1120 West State Fair Avenue (Site S23). Twenty-four hour day-night noise levels (Ldn) range from a maximum of 82 dBA at Our Lady of the Rosary Parish (Site R15) to a low of 56 dBA at a residence at 600 West Grixdale Avenue (Site R34).

Table 4-7. Existing 24-hour Noise Measurements

Site Number	Site Description	FTA Land Use Category	Measured Maximum-Hour L _{eq} (dBA)	Measured L _{dn} (dBA)
R1	Tennis Court of Millender Center Apartments – 548 Brush Street – 5 th Floor	2	69	71
R2	Cadillac Square Apartments - 111 Cadillac Square – 29 th Floor	2	71	69
R3	Hotel at 2 Washington Boulevard – 4 th Floor	2	67	70
R4	The Westin Book Cadillac Detroit – 1114 Washington Boulevard - 4 th Floor	2	70	70
R5	Industrial Building Apartments -232 Grand River – 4 th Floor	2	72	74
R6	1450 Woodward Avenue	2	74	73
R7	Central United Methodist Church – 23 E Adams Avenue	3	65	66
R8	Saint John’s Episcopal Church – 50 E. Fisher Freeway	3	67	68
R9	2440 Woodward Avenue	2	71	73
R10	3501 Stimson Street	2	70	70
R11	Bi-Centennial Tower – 4 Alexandrine Street	2	67	68
R12	4501 Woodward Avenue, Apartment 2	2	74	74
R13	Hannah House – 4750 Woodward Avenue	2	71	72
R14	5501 Woodward Avenue	2	67	68
R15	Our Lady of the Rosary Parish - 5930 Woodward Avenue	3	80	82
R16	5979 Woodward Avenue	2	69	71
R17	Metropolitan United Methodist Church - 7730 Woodward Avenue	3	70	71
R18	42 Chandler Street	2	60	63
R19	8285 Woodward Avenue	2	65	68
R20	The Family Place – 8726 Woodward Avenue	1	70	70
R21	53 Chicago Boulevard	2	60	60
R22	Blessed Sacrament Cathedral – 9844 Woodward Avenue	2	62	63
R23	11501 Woodward Avenue/10 Lawrence Street	2	63	62
R24	Normandie Hotel – 11626 Woodward Avenue	2	65	65
R25	10 Tuxedo Street	2	61	62
R26	Massachusetts Avenue Park	1	59	61
R27	2 Buena Vista Street	2	65	65
R28	Labelle Towers Apartments – 33 Labelle Street	2	66	67
R29	Charter Communications - 15120 Woodward	3	65	67
R30	16140 Woodward Avenue	2	63	66
R31	21 Moss Street	2	64	65
R32	303 Covington Drive	2	62	63
R33	324 West Montana Street	2	58	61
R34	600 West Grixdale Avenue	2	62	56
R35	19300 Afton Road	2	61	59
R36	19390 Woodward Avenue	2	63	61
R37	State Fair Apartments – 1231 West State Fair	2	60	60
R38	Evergreen Cemetery	1	61	62

Source: Parsons Brinckerhoff, 2010.

Table 4-8. Existing Peak-Hour Noise Measurements

Site Number	Site Description	FTA Land Use Category	Measured Maximum-Hour L_{eq} (dBA)	Estimated L_{dn} (dBA)
S1	Kids Space Montessori at Wayne County Building	3	65	NA
S2	Steven Building Apartments – 1260 Washington Boulevard	2	68	72
S3	Washington Square Apartments – 1431 Washington Boulevard	2	69	72
S4	Capitol Park	3	64	NA
S5	Maybury Park at Corner of Woodward and Adams	1	65	NA
S6	American Red Cross – 3510 Woodward Avenue	3	70	NA
S7	Woodward Avenue at Canfield Street	3	68	73
S8	Whitney House - 4421 Woodward Avenue	3	69	NA
S9	4420 Woodward Avenue	3	70	NA
S10	Wayne State University, Welcome Center	3	78	NA
S11	Detroit Institute of Arts	3	68	NA
S12	Detroit Academy - 8401 Woodward Avenue	3	78	NA
S13	People’s Community Church - 8601 Woodward Avenue	3	72	73
S14	Northern High School	3	74	NA
S15	Massachusetts Avenue Park	1	62	NA
S16	Park United Presbyterian Church – 14 Cortland Street	3	74	NA
S17	Highland Park - 2 East Buena Vista	1	65	NA
S18	Corner of Sears Street and Woodward Avenue	3	71	NA
S19	Highland Park Community High School – 15900 Woodward Avenue	3	61	NA
S20	319 West Montana Street	2	57	61
S21	Palmer Park – Tennis Courts	1	61	NA
S22	19320 Afton Road	2	61	61
S23	1120 West State Fair Avenue	3	58	60

Source: Parsons Brinckerhoff, 2010

Table 4-9. Existing Noise Levels Estimated from Nearby Peak-Hour and 24-Hour Monitoring Sites

Site Number	Site Description	FTA Land Use Category	Measured Maximum-Hour L_{eq} (dBA)	Measured L_{dn} (dBA)
M1	Park Shelton Apartments	2	65	66
M2	10 Edison Street	2	74	74
M3	Church - 13158 Woodward Avenue	3	65	NA
M4	Apartments – 15948 Woodward	2	64	65
M5	Soul Harvest Ministries -16281 Woodward	3	64	NA
M6	Apartments - 16360 Woodward Avenue	2	69	70
M7	Apartments - 211 Merton Road	2	68	69
M8	Holiday Inn Express -1020 Washington Blvd	2	74	75
M9	Fox Theater – 2211 Woodward Avenue	3	67	NA

Source: Parsons Brinckerhoff, 2010

4.6.4 Long-Term Effects

No Build Alternative

No Build noise levels in the study area would continue to be generated principally from motor vehicles traveling on the study area's roadways. In the absence of planned roadway improvements or other major developments that would alter traffic patterns to a great degree, future No Build noise levels can be expected to increase slightly due to projected traffic growth of one percent per year by 2030. However, the increase in noise would not be perceptibly different from existing noise levels.

Locally Preferred Alternative

Traffic Noise

The noise from automobile traffic is not expected to change measurably as a result of the LPA. If there were any change at all, it would be a very small reduction in noise from automobiles, because the LPA is expected to take some automobiles off the streets, and the speed of the remaining cars may be slightly reduced. The slightly reduced speeds and traffic noise would be the result of the former traffic lanes on Woodward Avenue being devoted primarily to light rail transit vehicles.

Transit Noise

Alternative A1. LPA noise levels would exceed FTA impact thresholds for moderate impacts at five receptor sites (Table 4-10). Moderate noise impacts are predicted at residences at the Stevens Building Apartments (Site S2) and at 600 Grixdale Avenue (Site R34), the Park Shelton Apartments (Site M1) and the Normandie Hotel (Site R24). Impacts predicted at the Stevens Building Apartments would occur from the building's ground floor to the seventh floor (of 22 floors), comprising two distinct receptor sites analyzed.

Alternative B2. LPA noise levels would exceed FTA impact thresholds for moderate impacts at six receptor sites (Table 4-10). Noise impacts in the FTA "moderate" range are predicted at the Holiday Inn Express, the Westin Book Cadillac Detroit, and the Normandie Hotel (Sites M8, R4, R24, respectively) and residences at the Park Shelton Apartments (Site M1) and 600 Grixdale Avenue (Site R34). A moderate impact is also predicted at the Central United Methodist Church (Site R7) where noise sensitivity is limited to daytime hours.

Alternative B3. LPA noise levels would exceed FTA impact thresholds for moderate impacts at five receptor sites (Table 4-10). Noise impacts in the FTA "moderate" range are predicted at the Normandie Hotel (Site R24) and residences at the Park Shelton Apartments (Site M1), 1450 Woodward Avenue (Site R6) and 600 Grixdale Avenue (Site R34). A moderate impact is also predicted at the Central United Methodist Church (Site R7) where noise sensitivity is limited to daytime hours.

Mitigation of Operational Noise

Mitigation of moderate noise impacts would depend on the number of residences affected at a particular location, the magnitude of the exceedance of the threshold for moderate noise impacts, the noise sensitivity of the receptor, the cost and effectiveness of feasible approaches to mitigation at that location, among other considerations. (*Transit Noise and Vibration Impact Assessment*, FTA, May 2006, pages 3-11 – 3-12)

Feasible approaches to noise mitigation in an urban setting include the relocation of special trackwork, the automatic lubrication of tracks on tight curves, wheel dampeners, vehicle skirts, undercar absorption, and building insulation.

Most of the moderate impacts of the project are at the low end of the moderate-impact range and affect few receptors. No mitigation is proposed in these cases. The one moderate impact at the high end of the moderate range is the moderate impact on the Westin Book Cadillac Detroit, a hotel. Although people sleep at hotels, they are not nearly as noise-sensitive as other sensitive receptors because there are rarely outdoor activities of a noise concern. Therefore, no mitigation is proposed at this location either.

4.6.5 Short-Term Construction Effects

Noise from construction activities would temporarily impact properties in the immediate vicinity of construction activities, resulting in elevated noise levels for people in adjacent properties. The level of impact would depend on the time of day during which the construction activity occurs, the noise characteristics of the equipment being used, the duration of each of the impact-causing construction activities, the construction staging schedule, and the distance between the noise-generating equipment and the noise-sensitive properties. Construction of an LRT line in an existing street usually does not require an extended construction period that would make construction noise a serious concern. The LPA will be required to comply with all State and local noise ordinances, which would apply to its construction.

4.6.6 Mitigation of Construction Noise

All construction activities would have to comply with the requirements of Chapter 10-5 of the City of Detroit Noise Ordinance. The noise control measures listed below are examples of actions that could be written into contractor specifications.

Table 4-10. Noise Impacts with the LPA

Site Number	FTA Land Use Category	Existing Noise Level	FTA Noise Impact Thresholds		Alternative Impact	
			Moderate	Severe	Noise Level	Noise Impact
Alternative A1						
S2	2	72	66-71	>71	69	Moderate
S2	2	63	60-65	>65	63	Moderate
M1	2	70	65-69	>69	65	Moderate
R24	2	65	61-66	>66	63	Moderate
R34	2	56	56-62	>62	59	Moderate
Alternative B2						
M1	2	70	65-69	>69	65	Moderate
M8	2	75	66-73	>73	67	Moderate
R4	2	70	65-69	>69	69	Moderate
R7	3	66	62-67	>67	64	Moderate
R24	2	65	61-66	>66	63	Moderate
R34	2	56	56-62	>63	59	Moderate
Alternative B3						
M1	2	70	65-69	>69	65	Moderate
R6	2	73	66-71	>71	67	Moderate
R7	3	66	62-68	>68	64	Moderate
R24	2	65	61-66	>66	63	Moderate
R34	2	56	56-62	>62	59	Moderate

Source: Parsons Brinckerhoff, 2010

These potential measures should be evaluated during Final Design because impacts to noise-sensitive properties cannot be accurately determined without detailed construction plans and schedules of construction activities. Typical construction-phase noise-control measures include the following:

- Informing the public when work is going to be performed;
- Limiting the number and duration of idling equipment on site;
- Installing mufflers on equipment;
- Maintaining all construction equipment in good repair;
- Reducing noise from all stationary equipment with suitable enclosures;
- Minimizing the use of back-up alarms;
- Scheduling and spacing truck loading and unloading operations;
- Limiting the noisiest activities, such as operation of heavy equipment, to daylight hours; and
- Locating equipment and vehicle staging areas as far from noise-sensitive areas as possible.

4.7 Vibration

4.7.1 Legal and Regulatory Context

FTA impact criteria for ground-borne vibration and ground-borne noise from LRT operations relate to maximum vibration and ground-borne noise levels associated with a single event (Table 4-11), such as the pass-by of a light rail vehicle or train. This approach is unlike the previously discussed criteria for air-borne noise levels (Section 4.5), which are associated with cumulative air-borne noise levels over a one-hour or 24-hour period. To address the cumulative effects of multiple vibration events (i.e., the number of times a train passes by the receptor in a 24-hour period), the criteria are divided into “frequent” and “infrequent” event categories, with more stringent criteria applying to frequent events. As the LPA would have more than 70 vibration events per day, potential impacts are evaluated using the “frequent events” criteria.

Table 4-11. FTA Ground-Borne Vibration and Noise Impact Criteria

Land Use Category	Ground-Borne Vibration Impact Levels		Ground-Borne Noise Impact Levels	
	Frequent Events	Infrequent Events	Frequent Events	Infrequent Events
Category 1: Buildings where low ambient vibration is essential for interior operations.	65 V dB	65 V dB	NA	NA
Category 2: Residences and buildings where people normally sleep.	72 V dB	80 V dB	35 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime uses.	75 V dB	83 V dB	40 dBA	48 dBA

Source: Transit Noise and Vibration Impact Assessment, FTA, May 2006

Notes: Vibration levels expressed in V dB are 1 micro inch/sec and ground-borne noise levels expressed in dBA.

“Frequent Events” are defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.

“Infrequent Events” are defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.

4.7.2 Methodology

Vibration levels were estimated in accordance with the General Vibration Assessment procedures defined in Chapter 10 of the *Transit Noise and Vibration Impact Assessment* (FTA, May 2006). The method uses a generalized curve of vibration as a function of distance from the track to the building, and then adjusts the result to take into account LRT vehicle speeds, vehicle specifications, track conditions, geological transmission conditions, and interior building transmission conditions.

4.7.3 Existing Conditions

The FTA impact assessment procedure does not require measurement of existing vibration levels as a baseline against which to compare vibration from LRT operations. In the study area, existing vibration levels are generated principally from medium- and heavy-duty truck movements. Typical vibration levels caused by such traffic are typically in the 50 to 60 VdB range and are below the threshold of perception of people inside adjacent buildings and below the FTA criteria for frequent events.

4.7.4 Long-Term Effects

The vibration analysis findings contained in this Draft EIS section are limited to those properties where the operation of the Woodward Avenue LRT system would result in impacts. The detailed analysis findings at all 70 sites evaluated are contained in the Noise and Vibration Technical Report (Parsons Brinckerhoff, 2011). Vibration levels above the vibration impact criteria would adversely impact the building's occupants. Vibration levels would have to be very significantly above the FTA vibration impact criteria to result in structural damage to the building, so structural damage is generally not an issue.

No Build Alternative

The FTA impact assessment process does not require estimation of what vibration levels will be under future No Build conditions. In the absence of any nearby railroad improvements, future No Build vibration levels can be expected to remain similar to existing levels, which are typically in the 50 to 60 V dB range and would remain below the threshold of perception.

Locally Preferred Alternative

Estimated vibration levels generated by LRT operations are expected to remain below FTA impact thresholds at most properties evaluated in the study area. A few properties are expected to experience vibration levels at or slightly above the minimum impact levels. However, these vibration levels represent a worst-case scenario because potential vibration-dampening effects of soil conditions are not accounted for in these vibration estimates. Soil borings will be taken during Final Design to determine soil conditions and any dampening effects more accurately, so actual vibration impacts may ultimately be less than predicted at this point. No property is expected to experience vibration levels in the range that would result in structural damage to buildings. Predicted ground-borne noise would likely be inaudible as both existing and predicted airborne noise levels would exceed the noise levels caused by ground-borne vibration of the affected structures at the receptor sites analyzed.

Alternative A1. Vibration levels at the FTA impact threshold are predicted at the Stevens Building Apartments (Site S2) on the ground floor. Ground-borne noise levels at or slightly above the FTA ground-borne noise impact threshold are predicted at four sites: the Fox Theater (Site M9) and at residences at the Park Shelton Apartments (Site M1), 4501 Woodward Avenue (Site R12) and the Stevens Building Apartments (Site S2) ([Table 4-12](#)).

Alternative B2. Vibration levels at the FTA impact threshold are predicted at the Fox Theater (Site M9) and the Westin Book Cadillac Detroit (Site R4). Ground-borne noise levels at or slightly above the FTA impact threshold are predicted at five sites: residences at the Park Shelton Apartments (Site M1) and 4501 Woodward Avenue Site R12), and at the Fox Theater (Site M9), the Holiday Inn Express (Site M8) and the Westin Book Cadillac Detroit (Site R4) (Table 4-12).

Alternative B3. Vibration levels at the FTA impact threshold are predicted at the Fox Theater (Site M9). Ground-borne noise levels at or slightly above the FTA impact threshold are predicted at four sites: residences at the Park Shelton Apartments (Site M1), 1450 Woodward Avenue (Site R6), and 4501 Woodward Avenue (Site R12) and at the Fox Theater (Site M9) (Table 4-12).

Mitigation of Vibration and Ground-borne Noise Impacts

During Final Design, the need for mitigation at all buildings where vibration impacts are predicted will be re-evaluated, and that re-evaluation will take into account the results of a detailed study of soil conditions and building foundations through which vibration impacts would be transmitted to upper, inhabited stories of the building. Wherever the FTA criteria for vibration or ground-borne noise for frequent events is exceeded, mitigation will be used to eliminate the impact. Typical mitigation methods for vibration and ground-borne noise impacts include moving special trackwork, using resilient wheels, track fasteners or track frogs, using resilient track support systems, and modifying the building itself.

Table 4-12. Vibration Impacts with the LPA

Site Number	FTA Land Use Category	Vibration Criteria (V dB)	Vibration Level (V dB)	Vibration Impact	Ground-borne Noise Criteria	Ground-borne Noise Level	Ground-borne Noise Impact
Alternative A1							
S2	2	72	72	Impact	35	37	Impact
M9	3	72	70	No Impact	35	36	Impact
M1	2	72	70	No Impact	35	35	Impact
R12	2	72	70	No Impact	35	35	Impact
Alternative B2							
M1	2	72	70	No Impact	35	35	Impact
M8	2	72	71	No Impact	35	36	Impact
M9	3	72	72	Impact	35	37	Impact
R4	2	72	72	Impact	35	37	Impact
R12	2	72	70	No Impact	35	35	Impact
Alternative B3							
M1	2	72	70	No Impact	35	35	Impact
M9	3	72	72	Impact	35	37	Impact
R6	2	72	71	No Impact	35	36	Impact
R12	2	72	70	No Impact	35	35	Impact

Source: Parsons Brinckerhoff, 2010.

4.7.5 Short-Term Construction Effects

Construction of the LPA could result in short-term increases in vibration levels at properties in the immediate vicinity of construction activities. Common vibration-producing equipment includes jackhammers, pavement breakers, hoe rams, augur drills, bulldozers, and backhoes.

Pavement breaking and soil compaction would probably produce the highest levels of construction-related vibration. Potential vibration-related impacts to nearby building occupants would include shaking inside lower floors of buildings within 200 feet of the construction activity. Actual distances at which effects would occur would depend on the type of construction equipment used and soil characteristics in the study area. Construction of an LRT line in an existing street usually does not require an extended construction period that would make construction vibration a serious concern. The LPA will be required to comply with all State and local ordinances, which would apply to its construction.

4.7.6 Construction Mitigation

Vibration-control measures that can be used to reduce vibration-related annoyance at properties affected by the construction include:

- Specifying vibration limits in contract documents;
- Monitoring vibration levels at nearest vibration-sensitive structures to ensure these levels do not exceed FTA limits throughout the construction period; and
- Communicating with residents and businesses near construction activities about the potential for possible elevated vibration levels; and
- Measuring how well vibration is transferred through the soil. Prior to construction of the LPA, transfer mobility tests would be completed to establish the vibration/soil characteristics of the area and confirm the need for mitigation as part of Final Design.

4.8 Resources with Limited or No Effect

Environmental resource categories on which the Locally Preferred Alternative (LPA) would have a limited or no effect are discussed briefly below. Limited effects are considered to be minor impacts that can be readily mitigated.

4.8.1 Limited Effects

This section describes resources on which the LPA would have only limited effect.

Land Use, Zoning, and Public Policy

Methodology

Land use, zoning and public policy information was obtained from field surveys and from agencies of the cities of Detroit and Highland Park, including the Detroit Economic Growth Corporation. Potential impacts were identified through review of the LPA alignment and construction staging areas, traction substation sites, and vehicle storage and maintenance facility (VSMF) sites relative to existing and future land use patterns in the study area.

Existing Conditions

Land Use. Land use in the study area comprises commercial, residential, institutional and entertainment and cultural uses, concentrations of industrial uses, and scattered vacant and underutilized sites (Figure 4-9). The southern end is characterized by high-density commercial uses, and a mix of government, residential, retail, entertainment and cultural land uses. Beginning north of Grand Boulevard, major institutional uses (e.g., Wayne State University, Detroit Medical Center) are interspersed among heavier residential concentrations. South of Highland Park, uses along Woodward Avenue transition from commercial to single-family residential districts, while lower density residential use lies north of Highland Park; the Michigan State Fairgrounds and the Woodland and Evergreen cemeteries lie at the north end of the study

area. The study area has experienced some economic redevelopment activity since 2000, most notably in Downtown and New Center.

Zoning. There are 16 zoning designations within the study area, comprising residential, business and special districts. There are a number of historic districts along Woodward Avenue, which are subject to regulations and development standards designed to preserve their historic character.

Plans and Policies. Plans and policy documents pertinent to the study area include the *City of Detroit Master Plan of Policies* (May 2008 draft adopted by City Council); *Highland Park Master Plan* (Draft 2010); *Detroit Zoning Ordinance*; *Highland Park Zoning Ordinance*; *2030 Regional Transportation Plan*; and *Wayne County Comprehensive Economic Development Strategy* (2006-1010).

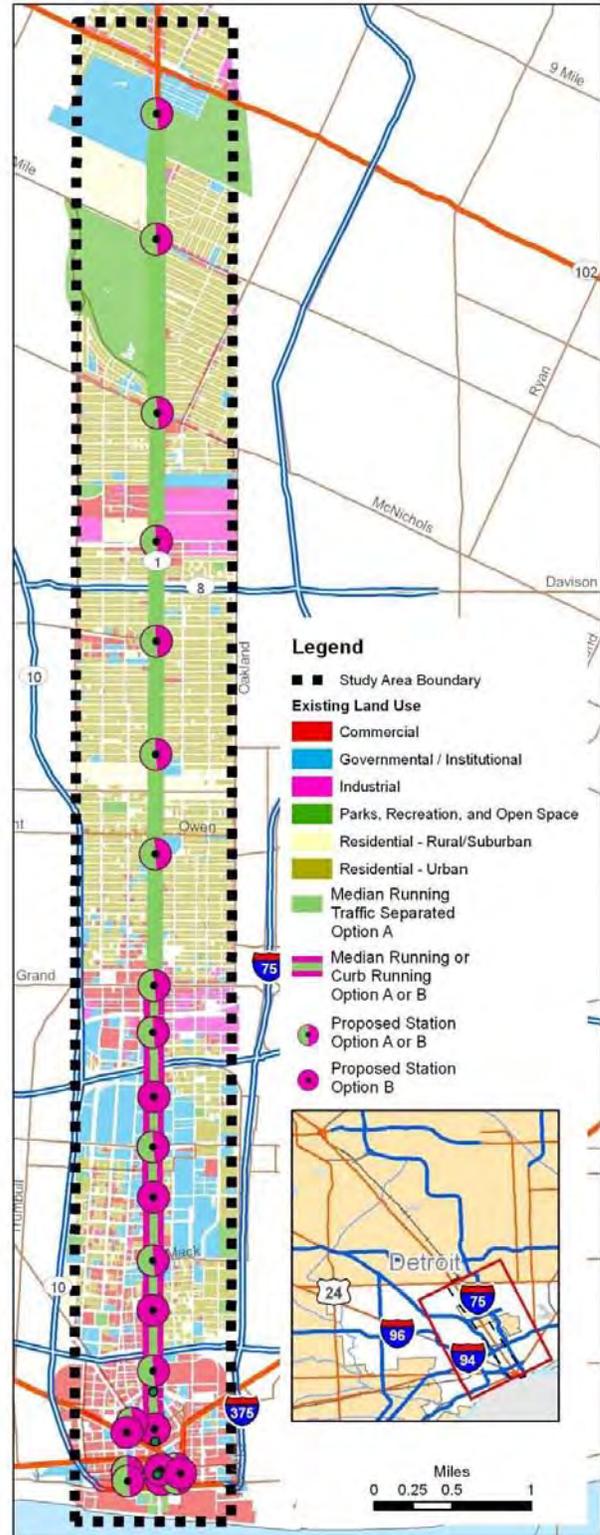
Long-Term Effects

No Build Alternative. Land use in the future without the LPA would be similar to existing land use; no substantial change is anticipated in the pattern of development in the study area.

Locally Preferred Alternative. The location and operation of LRT would not directly affect land use as it would be within existing roadway rights-of-way already traveled by autos, buses and trucks. In general, existing plans and policies are transit-supportive, and Woodward Avenue is designated as a mass transit route and a non-motorized route. The City of Detroit and M1 Rail have undertaken the Woodward Corridor Transit-Oriented Development (TOD) Strategy project, which is being conducted separate from this DEIS.

The LPA would have one VSMF. Such a facility would be compatible with existing land uses at the Amsterdam Street and Highland Park Ford Plant sites, which are situated near railroad and industrial uses, respectively. A VSMF at the MLK Boulevard site would be less compatible with surrounding land uses, given nearby multi-family residences including senior housing and cultural venues, resulting in some adverse land use impact at that location. Adverse impacts to

Figure 4-9. Existing Land Use



Source: Southeast Michigan Council of Governments, 2005 Adopted Forecast

parking are discussed in the [Parking section](#) on page 4-53.

A TPSS may have visual impacts on surrounding land uses. Therefore, the potential sensitivity of surrounding land uses to such impacts was considered in the identification of TPSS sites, requiring approximately 0.5 acre of properties along the corridor. Of the nine TPSS sites preliminarily identified, a TPSS on four sites along Woodward Avenue between Downtown and Middle Woodward would be compatible with on-site and surrounding land uses. A TPSS on the five remaining sites, also along Woodward Avenue, would be adjacent to residential uses.

Short-Term Construction Effects

Construction impacts may include temporary disturbance of residential, parkland, institutional and other noise-sensitive uses by noise-generating activities at construction staging yards and along the LPA's alignment as construction proceeds from segment to segment.

The four construction staging areas that have been preliminarily identified are located on vacant parcels fronting Woodward Avenue but near noise-sensitive residential uses. Noise generated during LPA construction would temporarily impact the nearby residential areas.

Mitigation

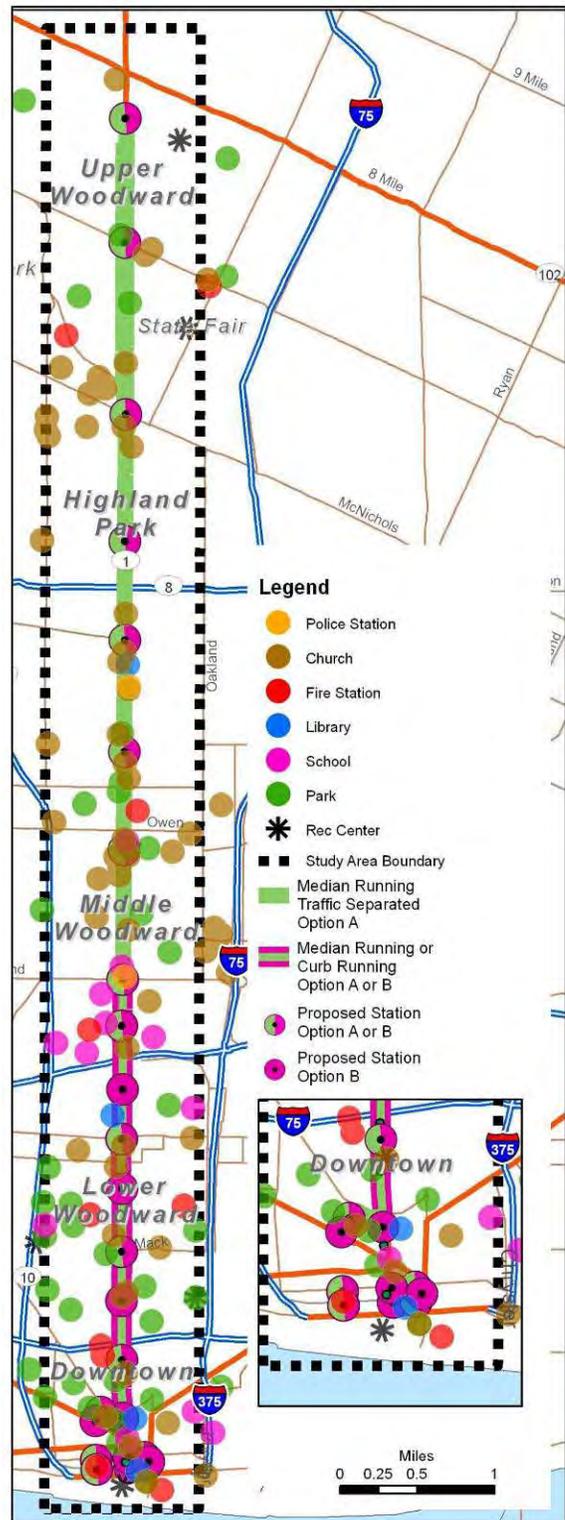
If a VSMF is located on the MLK Boulevard site, the facility's incompatibility with the nearby residential land use may be mitigated through context-sensitive design, which would better blend the VSMF into its surroundings. Similarly, context-sensitive design of the TPSS would mitigate the facilities' potential impacts on nearby residential uses. Mitigation of construction-related noise impacts is discussed in [Section 4.6](#).

Neighborhood Character

Methodology

Five areas have been defined for purposes of evaluating potential impacts on neighborhood character ([Figure 4-10](#)). While the City of Detroit has designated Planning Clusters used for grant applications and planning, they are too large for meaningful analysis of the Woodward Avenue LRT study area, and they exclude Highland Park.

Figure 4-10. Neighborhood Planning Areas and Community Facilities and Services



Source: Wayne County GIS, 2009

Existing Conditions

Existing neighborhood character is summarized in [Table 4-13](#).

Long-term Effects

No Build Alternative. Existing neighborhood character would not be expected to be noticeably impacted, based on adopted plans. The ongoing Detroit Works Project could have an effect, depending on its final recommendations.

Locally Preferred Alternative. LRT operation would not result in any displacements nor adversely affect community cohesion in the study area’s neighborhoods. It would improve mobility in the study area and thereby enhance economic development opportunities, but without adverse impact on neighborhood character. The MLK Boulevard site for the VSMF would occupy a currently vacant parcel fronting Woodward Avenue. The VSMF and associated on-site activities are not entirely compatible with and would alter views from adjacent residential and cultural uses. The Amsterdam Street and Highland Park VSMF sites are within areas of principally industrial and government/institutional uses, though visible from some residential uses and Highland Park High School, respectively. Neighborhood character would not be altered by the TPSS proposed to be sited on nine parcels along the length of the LPA alignment.

Table 4-13. Neighborhood Planning Areas

Neighborhood Planning Area	Description
Downtown Detroit (between Detroit River and I-75)	High concentration of retail and commercial buildings; urban development density typical of a Central Business District
Lower Woodward (between I-75 and I-94)	Includes Lower Woodward Avenue Historic District; institutional and commercial buildings; active entertainment and theater district
Middle Woodward (between I-94 and City of Highland Park)	New Center redevelopment area and several Detroit institutions including Henry Ford Medical Center and Wayne State University; experiencing population increase; areas west of Woodward are more stable, east of Woodward has more blight
Upper Woodward (between City of Highland Park and 8 Mile Road)	Historic residential districts with single- and multi-family residences, numerous churches, schools, sports and recreational uses; Michigan State Fairgrounds located at north end
City of Highland Park	Surrounded by the cities of Detroit and Hamtramck; home to historic Ford Plant; declining population, some new retail and employment

Short-Term Construction Effects

While not adversely impacting the character of study area neighborhoods, construction activities and siting of the four proposed construction staging areas would temporarily disrupt traffic and pedestrian activity patterns throughout the study area.

Mitigation

Ongoing coordination with the public and the study area’s neighborhoods would be used to establish the LPA’s interface with surrounding uses and incorporation in the fabric of the neighborhoods. Project planning to minimize construction effects on neighborhood activity patterns in the study area, particularly near the four proposed construction staging areas, would include appropriate signage and notifications of roadway and sidewalk detours and closures.

Community Facilities and Services

Methodology

An inventory was compiled through review of aerial maps and available records, a field survey, and contact with City officials. Potential impacts were identified through review of the LPA alignment and VSMF sites relative to identified community facilities and services, including schools, places of worship, libraries, police and fire stations, parks and recreation centers.

Existing Conditions

Existing community resources are located throughout the study area with the heaviest concentration directly along Woodward Avenue (Figure 4-10).

Long-Term Effects

No Build Alternative. No significant change is anticipated to community facilities and services in the future without the LPA.

Locally Preferred Alternative Pedestrian and vehicular access to community facilities and services on Woodward Avenue, and along the alignments of Downtown Design Options A1 and B2, would be affected by LRT operations. However, traffic signal timing to accommodate LRT vehicles' passage on the alignments and through intersections and pedestrian crosswalks would maintain safe operations and access to community facilities and services. None of the VSMF sites would directly affect community facilities and services.

Short-Term Construction Effects

While construction would occur within roadway rights-of-way, it would result in temporary impacts due to interruptions to through traffic and direct access to community facilities and services.

Mitigation

The Detroit Department of Transportation (DDOT) would install required safety equipment and take necessary precautions to ensure a safe environment for operation of and access to community facilities and services. Measures could include enhanced traffic signals, crosswalks, and striping, and signage and notifications of road and sidewalk closures and detours during construction.

Parkland

Legal and Regulatory Context

Section 4(f) of the U.S. Department of Transportation Act of 1966 (49 U.S.C. 303) protects significant publicly owned public parks and recreation areas, as well as wildlife and waterfowl refuges and historic sites, and directs conditions under which such properties may be used. (Chapter 5 provides a draft Section 4(f) evaluation.) Section 6(f) of the Land and Water Conservation Fund (LWCF) Act of 1965, as amended, (16 U.S.C. 4601-4 et seq.) protects recreational lands purchased or improved with LWCF program funds.

Methodology

Public parklands in the study area were identified from parcel data obtained from the City of Detroit Planning and Development Department, tax assessment records, and via field survey. Potential impacts to parkland were determined through overlay of the LPA on mapping of identified parklands.

Existing Conditions

Thirty-six parks and open space areas owned by the Detroit Recreation Department and the City of Highland Park lie within the study area; nine have frontage on Woodward Avenue. Major

parks include Campus Martius Park, Grand Circus Park, and Palmer Park. (study area parks are listed in the Human Environment Technical Report).

Long-Term Effects

No Build Alternative. No parkland impacts would occur with the No Build Alternative.

Locally Preferred Alternative. No parklands would be impacted by Alternatives A1, B2, or B3, or by any of the VSMF or TPSS site options. However, some of the parklands are visually sensitive areas where park users would notice change in the parks' visual environment. The proposed LRT stations and required infrastructure (e.g., rails, catenary wires, traction power substations, VSMF) would be visible to users of some of the parklands but consistent with the otherwise urban visual environment.

Short-Term Construction Effects

Construction activities would temporarily disrupt vehicular and pedestrian access to public parklands in the study area.

Mitigation

Where parkland access is affected during construction of the LPA, alternative access points would be identified and marked, and publicly noticed. Coordination with the Detroit Recreation Department has been initiated to identify opportunities to minimize the LPA's effect on park users' during construction.

Visual and Aesthetic Conditions

Methodology

Guidelines established by the American Association of State Highway Officials (1991) and the Federal Highway Administration (FHWA) (1981) were followed to define the study area's visual setting, identify areas of differing visual character, and define landscape units and visual quality.

Existing Conditions

In 2002, Woodward Avenue from the Detroit River to Pontiac was designated by FHWA from the Detroit River to Pontiac as a one of America's Scenic Byways. It is managed by the Woodward Heritage Team, which comprises the Michigan Department of Transportation (MDOT), local municipalities, public transit providers (DDOT and SMART), Wayne and Oakland counties, and local businesses. Woodward Avenue's visual character, which varies as the LPA alignment traverses south to north, is described below.

Downtown (near Jefferson Avenue to I-75). Prominent land uses include the Financial District, business/office uses, and transportation uses (People Mover and Rosa Parks Transit Center). Typical of a CBD's urban character, large-scale buildings and structures, including prominent theater, entertainment and sports facilities, dominate views. Visual continuity follows directly from these features.

Midtown (Fisher Freeway [I-75] to the Ford Freeway [I-94]). Cultural and university districts and educational and health-care institutions, including Wayne State University and the Detroit Medical Center, dominate this area. Distinctive cultural centers include the Detroit Institute of Arts, the Public Library and the College for Creative Studies. New residential development is also present.

New Center (north from crossing of I-94 to Euclid Street). Prominent visual features include the historic headquarters of General Motors, new residential development, commercial buildings, and the railroad overpass south of Grand Boulevard. This section generally comprises mixed land uses and stages of development.

Middle Woodward (Euclid Street to southern Highland Park limit). This section transitions to the historic Boston Edison/Arden Park residential neighborhoods with some scattered commercial development. When combined with local businesses, worship centers and school complexes, this residential stretch is more typically suburban in its visual character.

Highland Park. One of the more visually diverse sections, Highland Park has several business and commercial shopping centers, industrial lands, a crossing of the Davison Freeway and scattered single- and multiple-family residential areas. The Woodward Avenue right-of-way narrows to four lanes from six lanes, creating a more intensively developed character.

Upper Woodward (McNichols Road to 8 Mile Road). This is the most visually open section with Palmer Park, a wooded area and golf course, Woodlawn and Evergreen cemeteries and the State Fairgrounds. Woodward Avenue transitions to a six-lane cross-section with median.

Long-Term Effects

No Build Alternative. No impacts would occur with the No Build Alternative, as development would continue consistent with land use plans and development initiatives.

Locally Preferred Alternative. As design elements of the LPA (e.g., structures, construction materials, brand of vehicles, colors, etc.) have not been determined, the following assessment of effects is based on typical LRT design features and locations of the LPA's design options.

Transitway. Tracks are typically embedded in existing pavement, and are about 12 feet wide in the direction of travel. Although embedded tracks have little to no visual impact, they are often delineated by using different paving materials or striping to keep motor vehicles and bicycles from mistakenly traveling on them. Physical barriers such as low, mountable curbs may be used.

Catenary. Visual impacts are not significant, given the catenary system's comparable size and appearance with existing electric distribution facilities.

Stations. Shelter designs for Alternatives A1 and B2/B3 would have conventional and elevated canopy designs with billboards, respectively, interspersed with other built structures along the alignment. Visual impacts would be generally limited, given the urban and developed setting of the study area. The larger canopy structures with Alternatives B2 and B3 would result in some visual discontinuity and moderate impact in the Midtown and New Center areas.

Vehicle Storage and Maintenance Facility. The visual presence of the VSMF would vary among the three potential sites. The VSMF's light industrial character would appear inconsistent with the nearby multiple-family land uses near the MLK Boulevard site. There is less visual contrast and more consistent appearance near the Amsterdam site. Siting of the VSMF at the Highland Park Ford Plant site would be least disruptive as it would be about 1,000 feet east of Woodward Avenue and generally removed from view due to the intervening industrial structures.

Traction Power Substations. These relatively small facilities (typically 25 feet by 60 feet) would not create substantial impacts to visual resources, given their size and the architectural treatment or visual screening that would enclose the substation facilities. The design and character of the facility would be defined during future design studies. Several of the candidate locations are situated in proximity to commercial or transportation land uses which would also help to minimize the visual contrast of these facilities.

In summary, the LRT would be generally compatible with the character of roadways and neighborhoods in the study area. The LPA's infrastructure would have some visual effect, but would still be suitable to the corridor. The greatest visual effect of the Downtown Design

alternatives would be along Washington Boulevard where much of the existing landscaped median would be displaced with Alternative B2 which, along with one of a proposed TPSS sites, would potentially alter the boulevard's scenic qualities.

Short-Term Construction Effects

Construction activities would temporarily impact the visual environment, varying by construction type. Typically, impacts result from movement of equipment, placement of construction fences and screens, and material storage. During final design, construction measures would be developed to mitigate potential impacts in a more site-specific manner.

Mitigation

Design and construction of the LPA would result in some visual impact with introduction of new visual elements where no similar facilities exist. Coordination with local neighborhoods and pertinent agencies would help establish visual design guidelines, potentially including context-sensitive station facility design for each station's visual setting; vegetation, street trees and landscaping appropriate to sites of LPA structures; station and maintenance facility design that reduce lighting impacts from glare; and minimization of structural bulk, where appropriate.

Utilities

Methodology and Existing Conditions

The study area has a network of utilities (water mains, steam mains, sanitary and storm sewers, gas mains, telephone and electrical conduits, fiber optic communications system) below and above the roadbeds where the LPA would be constructed and operated. Known utilities in the study area include DTE Energy, AT&T, Michigan Intelligent Transportation System, Detroit Water and Sewage Department, Detroit Public Lighting Department and MISS Dig Systems, Inc. Utility details have not been determined; the assessment of potential impacts is qualitative.

Long-Term Effects

Implementation of the LPA would likely require replacement or reconstruction of some existing utilities and the introduction of some new infrastructure to support the LRT system, but it is not expected that there would be any long-term project-related utility effects.

Short-Term Construction Effects

Manhole entrances, overhead utilities and other above-ground utility elements may require relocation or restoration, on a case-by-case basis. Some older utilities may need to be replaced, adjusted or reinforced within or beyond the area of impact. Temporary service disruptions would be expected during any required utility relocations, and such relocations would affect traffic flows, likely requiring imposition of temporary detours. Plans to safeguard construction workers' safety would be developed and implemented.

Mitigation

A thorough utility search to identify size, age, and location of underground utilities and to develop strategies for maintaining, protecting, or relocating them would be developed during later project development phases. Construction activities would be planned and scheduled to minimize utility service outages to the greatest extent possible. All work involving utility relocation and protection would be coordinated with the City and the respective utility owner. Any planned outages would require notification of affected utility users.

Energy

Methodology

Transportation energy comprises direct and indirect energy. Direct energy includes all energy for vehicle propulsion; is a function of traffic characteristics (e.g., volume, speed, distance traveled,

vehicle mix, thermal value of fuel); and includes LRT electrical requirements. Indirect energy consumption includes non-recoverable, one-time energy expenditures associated with construction of the transportation infrastructure. A qualitative assessment was performed.

Existing Conditions

Specific figures on energy consumption are not available for the study area.

Long-Term Effects

No Build Alternative. With the No Build Alternative, direct energy use would likely increase in the study area due to increased auto travel, vehicle miles of travel (VMT), and associated fuel consumption.

Locally Preferred Alternative. The LPA is expected to cause a decrease in VMT and increased travel speeds, thereby reducing fuel need and direct energy use. The additional electricity to power the LPA is expected to be less than the energy saved through VMT reduction in the study area, resulting in an overall decrease in direct energy use.

Short-Term Construction Effects

Detailed VMT and construction data are not yet available for the LPA. However, it can be assumed that construction of the LPA would increase indirect energy consumption.

Mitigation

Planned energy conservation with the LPA would focus on facility design, construction, operation and maintenance, and may entail materials recycling, indigenous plants for landscaping, and applying Best Management Practices for maintenance and energy efficiency, among other measures.

Parking

Methodology

A 2009 parking survey in the study area was used to identify existing metered and non-metered spaces and parking utilization. Potential parking impacts were determined based on loss of parking spaces, availability of other parking nearby and the potential for replacement parking.

Existing Conditions

There are 296-metered parking spaces and 804 non-metered on-street parking spaces in the study area. Based on the 2009 parking study, the highest utilization was near Wayne State University and between McLean and Sears streets (58 percent utilization during the noon hour). Details of the analyses are documented in the Traffic and Parking Technical Report (Parsons Brinckerhoff, 2010).

Long-Term Effects

No Build Alternative. Parking availability and utilization is not expected to be impacted with the No Build Alternative, given the findings on utilization in the April 2009 parking study.

Locally Preferred Alternative. Parking effects with the LPA options are as follows.

Alternative A1. Alternative A1 would result in a net loss of approximately 28 parking spaces along Woodward Avenue and in Downtown, and 511 spaces between Alexandrine Street and McNichols Road. There would be limited parking from Grand Boulevard to McNichols Road, as 413 parking spaces would be removed. Within Downtown, there is adequate parking to offset the negative impact, including parking garages and on-street parking within a block of where spaces would be removed. Along Woodward Avenue north of Adams Street, there is available off-street and side-street parking to avoid negative impact. However, there are two locations along Woodward Avenue where there would be a negative impact to parking for businesses: the west

side of Woodward Avenue between Highland Street and Cortland Street, and in the northeast quadrant of the Woodward Avenue/Melbourne Street intersection. There are also historic properties or properties that are eligible for designation near both of these locations.

Alternative B2. Alternative B2 would result in a loss of 39 metered parking spaces in Downtown (south of Adams Street). There is currently adequate parking along other roadways in Downtown and in parking garages adjacent to metered locations. Overall, parking spaces from Adams Avenue to Grand Boulevard would increase. Because LRT would operate in mixed traffic next to the parking lane, there is greater potential for interaction between LRT vehicles and drivers performing parking maneuvers with Alternative B2.

Alternative B3. Alternative B3 would have no net change in metered parking spaces in Downtown. Six parking meters on Woodward Avenue between State Street and Campus Martius would be removed, but would be replaced with meters south of Campus Martius.

Short-Term Construction Effects

Parking along Woodward Avenue and in Downtown would be prohibited during construction. However, side-street and off-street parking would continue to be available and there would be available parking within two blocks of construction in Downtown.

Mitigation

In areas where on-street parking on Woodward Avenue would be removed, side-street or off-street parking is generally available, and new parking spaces may be added in such locations. The Transportation Technical Report details locations where additional off-street parking could be added to offset the negative impact of Alternative A1.

Roadways and Level of Service

Methodology

FHWA guidelines were used to develop VISSIM models, using VISSIM 5.10 software. VISSIM determines seconds of delay at signalized intersections, which is then equated to a level-of-service (LOS) ranging from A (least delay) to F (highest delay). The City of Detroit and MDOT have determined LOS A through D to be acceptable.

Existing Conditions

Based on results from VISSIM modeling, all major signalized intersections currently operate at acceptable LOS (D or better). The only signalized intersection in the study area where the side street operates at LOS E is at Woodward Avenue and Charlotte Street. Details of the analyses are documented in the Traffic and Parking Technical Report (Parsons Brinckerhoff, 2010).

Long-Term Effects

No Build Alternative. SEMCOG's travel demand forecasting model predicts minimal differences in a.m. and p.m. peak-period traffic volumes between 2005 and 2030. Through consultation with the City of Detroit and MDOT, a one-percent growth rate per year was used to increase traffic volumes from 2009 to 2030. At several intersections, either the overall intersection or an individual approach would operate at LOS E or F. With signal-timing adjustments, LOS could be improved to LOS D or better.

Locally Preferred Alternative. All major signalized intersections would operate at LOS D or better for all approaches.

Short-Term Construction Effects

While traffic re-routings and detours would be required along discrete alignment segments during LPA construction, one lane of traffic would be maintained in each direction, with reasonable access provided to all businesses and residences.

Mitigation

Mitigation would include traffic signal retiming at intersections to allow for additional time for vehicle travel on Woodward Avenue and in portions of Downtown. A comprehensive Maintenance and Protection of Traffic Plan would be developed and implemented in conjunction with MDOT and DDOT.

Storm Water Management

Existing Conditions

Located in the urbanized areas of the Lake St. Clair and Clinton River watersheds, the study area has no surface water features. The urban nature of these watersheds has affected peak flood flows and hydrologic characteristics of storm water management.

Long-Term Effects

No Build Alternative. The No Build Alternative would result in no direct impacts to water resources.

Locally Preferred Alternative. The LPA may slightly increase the study area's impervious surface, and may require new storm water management structures. New station sites are in areas of existing impervious surfaces; VSMF sites are vacant or undeveloped. Non-point source pollutants currently entering the storm water management system would continue to do so, with no substantial increase because of the limited increase of storm water entering the storm sewer system. Storm water runoff at the station sites would be directed toward existing urban storm water conveyance systems. However, the VSMF sites would likely require a separate storm water management system, separating and treating vehicle cleaning discharges containing oil and grease, before discharging to the existing storm water management system. The post-construction storm water discharge rate would not increase as appropriate detention methods would be implemented.

Short-Term Construction Effects

Potential water quality impacts would be minimized via adherence to approved sediment- and erosion-control plans, including best management practices. Storm water management plans would be designed to conform to requirements for construction site storm water runoff control.

Mitigation

Temporary soil disturbance during construction would be addressed through project compliance with the soil erosion and sedimentation control law. Permanent mitigation measures for storm water runoff would be determined during final project design and site plan approval.

4.9 Resource Categories of No Concern

Several resource categories are of no concern for impact analysis as the resources are absent from the urbanized study area: wetlands, natural habitats, threatened and endangered species, floodplains, prime and unique farmlands, and surface water features. The US Fish and Wildlife Service (letter dated August 19, 2010) has stated that a review of information did not suggest the presence of wetlands or floodplains within the project area. Also, records do not indicate the presence of any species that are federally listed as endangered or threatened, species proposed

for listing, candidate species, designated critical habitat, or areas proposed as critical habitat in the immediate project area.

Correspondence received from the Michigan Department of Natural Resources and Environment (letter dated August 23, 2010) indicated that the project should have no impact on rare species or unique natural features within the project vicinity.

4.10 Indirect and Cumulative Impacts

4.10.1 Legal and Regulatory Context

The Council on Environmental Quality (CEQ) regulations at 40 CFR 1500-1508 require an assessment of indirect and cumulative impacts for federally assisted projects.

Indirect impacts are ~~effects~~ which are caused by the [proposed] action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on air and water and other natural systems, including ecosystems” (40 CFR § 1508.8).

Cumulative impacts are ~~the~~ impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time” (40 CFR § 1508.7). Cumulative impacts include the direct and indirect impacts of a proposed project together with impacts of other reasonably foreseeable future actions.

4.10.2 Methodology

Indirect impacts were assessed using information from the land use and socio-economic analyses² of the LPA and policy/plan information obtained through interviews with the Detroit Planning and Development Department (PDD) and the Detroit Economic Growth Corporation (DEGC). Cumulative impacts were assessed based on consideration of the LPA’s potential direct impacts on resources as well as past, current and future planned development in the study area. This analysis was conducted pursuant to the following guidance: ~~Considering Cumulative Effects under the National Environmental Policy Act (CEQ 1997)” and “Questions and Answers Regarding the Consideration of Indirect and Cumulative Impacts in the NEPA Process”~~ (<http://www.environment.fhwa.dot.gov/projdev/qaimpact.asp>).

The timeframe for considering cumulative impacts extends from past known effects to future predicted effects. While Detroit grew rapidly from 1900 to 1930 and somewhat more slowly between 1930 and 1950, its population has declined substantially since 1950. Because of the substantial population change since 1950, the period from 1950-2010 was selected as the period for consideration of past actions. The time for consideration of future actions is between 2010 and 2030, the long range planning horizon as defined by the 2030 Regional Transportation Plan.

The study area for assessment of indirect and cumulative impacts includes the following geographic areas:

- Project region - Wayne County, MI (includes Detroit and Highland Park) (Figure 4-11);

² *Human Environment Technical Report*, Parsons Brinckerhoff, 2011.

- Study area - one-half mile on either side of Woodward Avenue between the Detroit River and 8 Mile Road, in both Detroit and the City of Highland Park (Figure 4-11); and
- Light rail transit (LRT) station areas - areas within one-half mile radius of each proposed LRT station (see Figure 2-2 and Figure 2-6 for proposed LRT station locations).

Details of the analyses are provided in the Human Environment Technical Report.

4.10.3 Indirect Effects

No Build Alternative

The anticipated indirect effect of the No Build Alternative is a continuation of present development activity and land use patterns. These development decisions would assume continuation of existing bus service in the study area and implementation of existing land use controls and development policies.

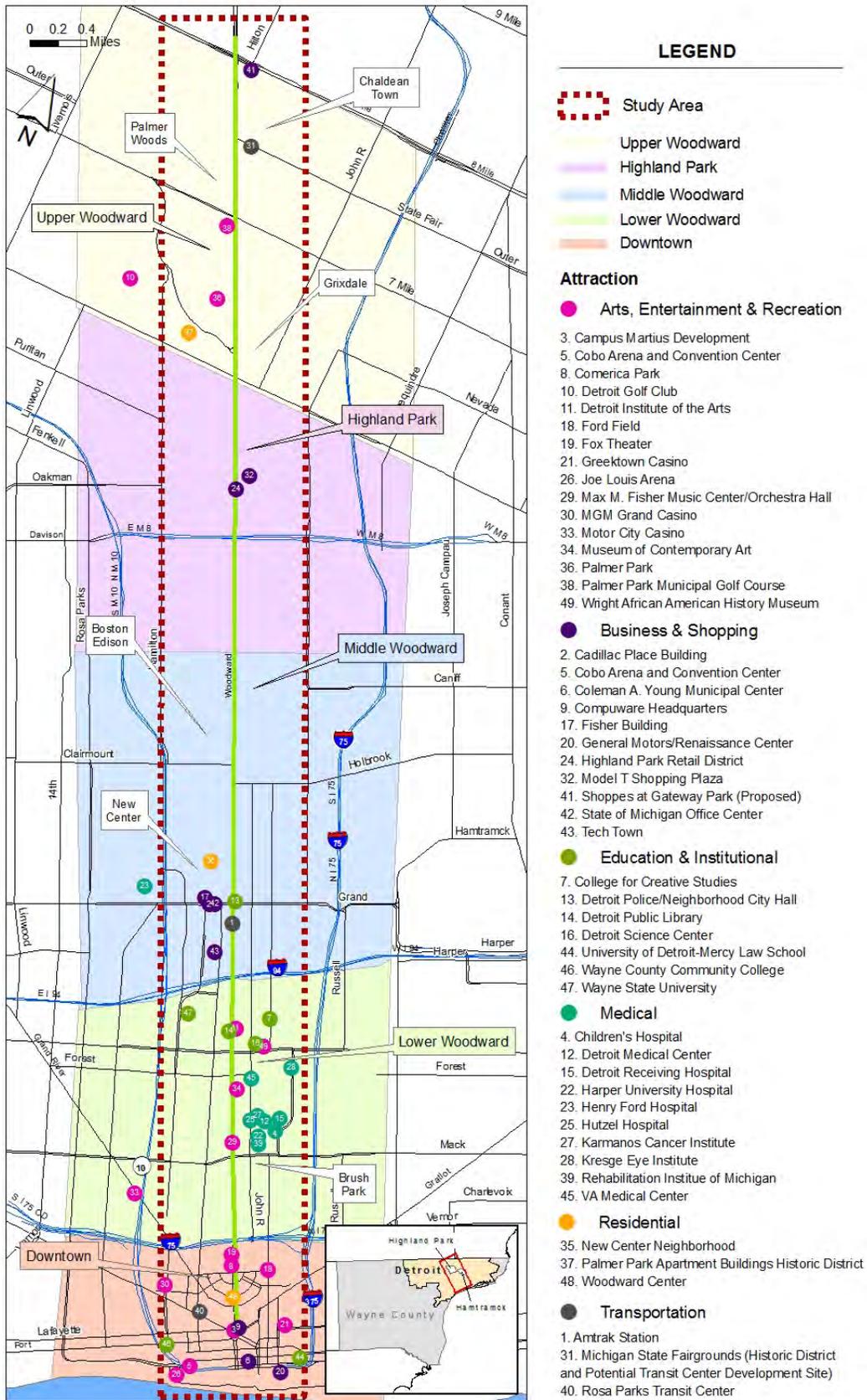
The cities of Detroit and Highland Park and private entities have plans for development in the study area. These plans, among others, include continued expansion of the Detroit Medical Center and Wayne State University in Lower and Middle Woodward, respectively, and the Shoppes at Gateway Park near 8 Mile Road in Upper Woodward. Employment densities in the study area resulting from such development would follow a pattern similar to existing development, with the highest densities in Downtown Detroit, New Center, and in the vicinities of Wayne State University and the Detroit Medical Center. This development pattern is expected to remain constant between 2010 and 2030.

There were approximately 85,000 people and 115,000 jobs in the study area in 2005. These numbers are not expected to increase substantially, based on the Southeast Michigan Council of Government's (SEMCOG) forecasts to 2030. Future private development would be driven by market conditions in the study area and by regional and national economic trends. Future institutional development, such as expansion at Wayne State University and the Detroit Medical Center, would continue based on the development plans of each institution in the study area. The City-initiated Detroit Works Project, to be concluded in late 2011, will target selected underdeveloped and vacant parcels for development. Based on the existing pattern of development, growth, in Upper Woodward area, would likely be automobile-oriented. Degradation of the walking/transit environment in the study area may continue over time as automobile-oriented land uses grow and the number of automobile trips increases relative to transit trips.

Locally Preferred Alternative

The LPA will result in a temporary increase in construction jobs and a long-term increase in administrative, maintenance and operations jobs.

Figure 4-11. Existing and Planned Developments in the Study Area



However, the study area would become more attractive for development with the LPA. The LPA's primary indirect effect would be to alter development near LRT stations, bringing higher densities than presently planned or could otherwise be developed in these areas. New development would be concentrated near key LRT stations in areas that are already well developed, namely in Downtown Detroit and in the Lower and southern Middle Woodward segments of the study area. These land use effects may take the form of transit-oriented development (TOD), generally defined as more concentrated development patterns in transit station areas. TOD features a mix of uses, moderate- to higher-density development, convenient pedestrian access to transit and managed parking. Such an indirect project-related impact is supported by current public planning and development policies.

The cities of Detroit and Highland Park have transit-supportive policies. The Detroit Master Plan of Policies (2008) stresses development in concert with a transit system, including higher densities, mixed uses and reduced parking. Although the addition of transit does not directly cause development to occur, transit-supportive plans and policies would encourage new development to be located near transit stations. The LPA, supported by such policies, would have an indirect effect on property values in the vicinity of LRT stations.

The City of Highland Park's 2010 Draft Comprehensive Master Plan includes recommendations for a mix of land uses, economic development sites, open space and infrastructure improvements that are generally consistent with development of an expanded transit system with LRT service. Woodward Avenue bisects Highland Park and is identified in the City's Master Plan as the City Center—the hub for economic redevelopment.

Each of the Downtown Design Options for the LPA would have the same indirect effects since the Downtown area is already highly developed. The LPA has the potential to encourage infill redevelopment of the underutilized or vacant parcels within the area.

Land use and development patterns within segments of the study area and the potential for TOD in those study area segments are briefly described below. Based on the number of venues for sports, entertainment and conventions in and near the study area (Figure 4-11), it is expected that the LPA would be used by patrons traveling to these destinations from origins throughout the region.

Downtown Detroit (Between the Detroit River and I-75)

Downtown is a dense concentration of retail, office and institutional uses. General Motors and Compuware Corporation have relocated their headquarters there. Three large casinos and three professional sports venues generate a high number of visitor trips. There is a concentration of other entertainment venues, such as restaurants, bars and music clubs. Major transportation uses (People Mover and Rosa Parks Transit Center) are located in Downtown.

Existing and planned future high-density, mixed-use development in the area is transit-oriented. Strong TOD-supportive public policies favor this area, especially nearest Woodward Avenue. Also, Detroit's Master Plan of Policies promotes efforts to reestablish Woodward Avenue as a major shopping destination.

Lower Woodward (Between I-75 and I-94)

Major institutions, including Wayne State University, the Detroit Medical Center, the Detroit Institute of Art, the Detroit Public Library and the College of Creative Studies are located here. Wayne State University has nearly 33,000 students, more than 1,800 faculty and 2,300 staff (<http://wayne.edu/keyfacts.php>, 2010). The Detroit Medical Center is the largest health care

provider in southeast Michigan with more than 2,000 beds, 3,000 affiliated physicians and 10,000 staff (<http://www.dmc.org>, 2010).

Development near Wayne State University, cultural attractions and the Detroit Medical Center is already transit-oriented. Therefore, proposed LRT station areas with vacant and underutilized parcels in Lower Woodward are prime candidates for development. This development potential is recognized in Detroit's Master Plan of Policies, which encourages high density and mixed uses. The proposed MLK VSMF site would be less conducive to future TOD in this segment of the study area.

Middle Woodward (Between 1-94 and City of Highland Park)

The New Center area is considered the northern anchor of Downtown Detroit with 400,000 square feet of retail space, 2,400 housing units, and 6.9 million square feet of office space. The area includes National Historic Landmark office buildings and the architecturally significant Fisher and Cadillac Place buildings. Tech Town, a research and technology park, has been developed and is undergoing expansion in conjunction with Wayne State University.

The LRT stations in the southern portion of this segment of the study area have the most TOD potential, particularly at New Center and Piquette Street because of the existing Amtrak station and planned Ann Arbor commuter rail station. The Michigan Department of Transportation has indicated that a new intermodal center is planned here, which could increase TOD potential. The northern stations have low TOD potential, despite ample vacant land, largely because of the low-density character of the existing development. Stabilization and priority infill development is supported by Detroit's Master Plan of Policies.

The proposed Amsterdam Street VSMF site is consistent with current land use and, due to its proximity to the Amtrak station, certain types of future TOD in this segment.

City of Highland Park

Highland Park is surrounded by the City of Detroit. Its population was less than 17,000 in 2000 and it continues to decrease. SEMCOG projects the downward trend will continue through 2030, but at a slower rate. With progressive planning policies, the city is continuing its efforts to attract new housing and retail development including the Woodward Center, Model T Plaza, and new residential housing near Woodward Avenue. While there is much vacant and underutilized land in the Highland Park segment of the study area, past development plans have yet to be realized. Development potential will increase gradually with the LPA and as public planning policy supporting TOD is activated and implemented. The possible location of the LPA's VSMF here may reduce TOD potential, depending on VSMF siting and design.

Upper Woodward (Between Highland Park and 8-Mile Road)

The predominant land uses in Upper Woodward are historic residential districts with single- and multi-family housing, commercial areas, numerous churches, schools, sports and recreational uses, including a golf course and tennis courts. The Palmer Park Apartment Buildings Historic District is architecturally significant. The former Michigan State Fairgrounds, at the northern end of this segment of the study area, represents a very large land parcel that could be redeveloped but within constraints of its historic designation.

The LPA's proposed park-and-ride lot at the Shoppes at Gateway Park, while not designed as TOD, could be transit-friendly and encourage development in this segment of the study area. The proposed design of the planned Shoppes at Gateway Park, which would be a suburban-style shopping center, is auto-oriented, but there is a large transit-dependent population nearby.

The area is surrounded by low-density, stable, automobile-oriented, suburban-type residential neighborhoods. In the Palmer Park area, Detroit's Master Plan of Policies recognizes that there is little opportunity for increased density or redevelopment, although the City of Detroit Planning and Development Department has identified areas with opportunity for limited and priority infill development.

Property Values

Changes in property values resulting from construction and operation of a new transit system are considered an indirect impact. Prior research has shown that residential property values near a transit station may increase as a result of improved accessibility and reduced travel time. In several US cities with new or existing rail systems, increases in home prices for every 100 feet that a residence is closer to a transit station have ranged from \$0.23 in Washington, D.C., with the Washington Metropolitan Area Transit Authority Metro system, to \$2,300 in New York City, with the Metropolitan Transportation Authority-New York City Transit system (Parsons Brinckerhoff, 2001). (See the Human Environment Technical Report for the data). Research indicates that increases in residential land values with LRT are typically less than with rapid rail and commuter rail because of the reduced travel time with these two latter modes.

For residential properties, property value increases reflect better access to transit service and reductions in household vehicle costs. For commercial properties, transit proximity potentially broadens the customer base, increases foot traffic near the business, and contributes to employee accessibility to the place of employment.

Transit may also have a negative impact on real estate values due to “nuisance” effects—noise, unsightly infrastructure, transit parking lots and increased bus traffic. These factors may reduce the desirability of properties near a transit station or fixed guideway. However, since the LPA would result in travel-time savings and its alignment would be within an existing roadway right-of-way, the likelihood of negative impacts on real estate values in the study area is expected to be minimal.

4.10.4 Cumulative Effects

Past Actions

The most notable past action affecting the study area was the urban and suburban development of Detroit beginning in the 1940s and continuing in the post-World War II years. By 1950, the study area was virtually built out between Downtown and 8 Mile Road. Since then, the suburban areas north of 8 Mile Road have been developing at a faster pace than in the study area.

Construction of the I-75 and M-10 freeways redefined the boundaries of existing neighborhoods in Lower Woodward and supported this outward push into the northwestern suburbs. The construction of other highways, such as I-94 and I-96, while helping to improve accessibility between Downtown Detroit and its western suburbs, altered neighborhood character by segmenting Downtown, and promoted suburbanization and dispersion of employment centers by encouraging development farther outside the city.

Present and Reasonably Foreseeable Actions

Planned and reasonably foreseeable development within the study area would contribute to cumulative impacts. Within Downtown Detroit, many upper floors of previously used office buildings have been reprogrammed and continue to be converted to residential uses for sale and rent. The new enclosed Rosa Parks Transit Center in Downtown, opened in 2009, has increased bus ridership by 11 percent because of its quality and comfort for patrons, compared to previous

outdoor locations in Cadillac Square and Capitol Park. The LPA would attract some ridership from Woodward Avenue bus routes, but possible new feeder bus routes to the LPA would be expected to increase bus ridership.

Other completed projects in Downtown Detroit include the following:

- The Detroit Regional Convention Facility Authority's \$200 million redesign and facility upgrades to the Cobo Center convention facility;
- The Campus Martius development, including the \$300 million Compuware headquarters and \$15 million Campus Martius Park;
- Construction of two casino and hotel facilities with estimated total investments of approximately \$1 billion; and
- More than \$45 million in roads, streetscape and facade improvements.

Lower Woodward is experiencing major development by Wayne State University, including more than 160,000 square feet of new medical, engineering and retail space, 128 residential units and a parking garage. Middle Woodward is the site of the terminus of the proposed commuter rail line from Ann Arbor at the Amtrak station. Also in Middle Woodward, the first phase of Tech Town (research start-ups) is TechOne, a 100,000-square-foot rehabilitated structure. The New Center Council is sponsoring more than \$257 million in office, residential and retail development.

Portions of the areas to be redeveloped are designated Renaissance Zones and Neighborhood Enterprise Zones. Mixed-use and redevelopment opportunities are abundant and are encouraged by the City of Detroit along Woodward Avenue according to the City's Master Plan of Policies. The former General Motors Headquarters has undergone major renovation and will house offices of the State of Michigan. This renovation retained 4,000 State employees at New Center. The continuing increase in activity in Downtown Detroit, Lower Woodward and Middle Woodward would likely generate additional transit ridership and pedestrian activity in this part of the study area.

In the City of Highland Park, no major developments have been announced. However, the City's policies encourage development of this section of Woodward Avenue as the City's "Main Street," which, if implemented, would also support transit ridership. The design of the planned shopping center in Upper Woodward (Shoppes at Gateway Park) is automobile-oriented. Increased automobile traffic would be expected in Upper Woodward because it is the northern terminus of the LPA and would attract riders from the suburbs with parking provided at the proposed park-and-ride lot.

The LPA is included in the SEMCOG 2035 Regional Transportation Plan. At the study area level, the LPA would be consistent with the development policies of the Detroit Master Plan of Policies and the Highland Park Comprehensive Plan.

Cumulative Effects

No Build Alternative

The No Build Alternative would not add to or alter past or future impacts due to displacements, noise, vibration, or changes to the visual environment. Current development patterns and increased traffic congestion along Woodward Avenue and in the study area would continue. Future private-market demand for new development may be limited despite progressive public planning policy since there would be no improvement in study area accessibility.

Locally Preferred Alternative

Over time, the potential increase in study area development densities and land values, particularly in key LRT station areas, may adversely affect low- and moderate-income households near these stations, although housing prices and rents in the study area are relatively low compared with the suburbs. This potential impact would likely be slow and would be mitigated through adherence to policies at the City and State level that encourage a wide variety of housing types, including affordable and low-income housing.

Potential cumulative impacts anticipated with the LPA are summarized below.

Transportation

Although regional traffic congestion is forecast to increase in the future, the degree would be moderated with the LPA compared with the No Build Alternative. The LPA is projected to reduce travel time using transit by 10 minutes in the study area, compared to bus service in the future without the LPA. In conjunction with the planned Ann Arbor-Detroit Commuter Rail Project (scheduled to open in 2011, according to PDD), the LPA may reduce traffic volumes, particularly in the Lower Woodward area near the commuter rail station.

The LRT in station areas would affect transportation and traffic by shifting a portion of the overall trips associated with increased land-use densities from automobiles to transit. While there would still be an increase in vehicle miles of travel in the study area, a larger portion of trips would be captured by non-motorized and transit modes.

Neighborhoods

The LPA would not result in any displacements nor adversely affect community cohesion in the study area's neighborhoods. The LPA may have a cumulative impact on neighborhood character depending on density, design, and location of future new development near a LRT station in an existing neighborhood. The redevelopment of vacant lots and abandoned buildings over time could result in a positive cumulative impact, depending on the rate and intensity of growth. TOD may contribute to the cumulative impact by helping to revive neighborhoods and make them more vibrant.

Economic

The LPA, in combination with other economic development initiatives, particularly in the southern end of the study area, would improve mobility in the study area. This, in turn, would enhance economic development opportunities farther north in the study area, which would be a positive effect.

Environmental Justice

Environmental justice populations, which are more transit-dependent than the general population, would benefit from the addition of an improved transit travel option in the study area. However, potential changes in land values near new LRT stations, particularly in Downtown, Lower Woodward and New Center, combined with other planned developments in these areas, may impact small businesses and limit affordable housing opportunities.

Visual

As discussed with PDD, TOD and future zoning rules may modify the height limit and/or setback distances near LRT stations. TOD and redevelopment, in general, may result in a change in visual character and design in station areas and, to a somewhat lesser degree, elsewhere in the study area. This would likely be a positive impact.

Historic and Cultural

The LPA, in combination with current and other planned developments, may stimulate redevelopment of historic or cultural resources at a greater rate than would the No Build Alternative. Redevelopment may alter the surroundings of historic resources and thereby detract from their setting. Conversely, redevelopment pressures could stimulate efforts to preserve and rehabilitate historic resources.

Natural Resources

As there are no natural resources of concern (e.g., wetlands, waterways, habitat) in the study area, there would be no cumulative effects to natural resources with the LPA.

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5.0 Draft Section 4(f) Evaluation

5.1 Legal and Regulatory Context

As the LPA is subject to federal approval and the project sponsor will seek federal funding, it must comply with the provisions of 49 U.S.C. § 303 (hereinafter referred to as “Section 4(f)”) and its implementing regulation. This regulation (codified jointly by FHWA and FTA in 23 CFR Part 774) provides certain protections for public parklands and recreational lands, wildlife and waterfowl refuges, and historic sites. These resources are referred to as Section 4(f) properties.

In compliance with Section 4(f), FTA may not approve the use of a Section 4(f) property unless it determines that:

- there is no prudent and feasible alternative to the use of land from the property;
- the action includes all possible planning to minimize harm resulting from such use; and
- except when the use results in impacts to the Section 4(f) property that are *de minimis*, as defined below.

Avoidance of the use of Section 4(f) property and agency coordination is at the heart of the Section 4(f) regulation. It requires that FTA provide an opportunity for comment by the State Historic Preservation Office (SHPO) for historic properties; by the agency having jurisdiction over any parkland used by the project; and by the U.S. Department of the Interior.

5.1.1 Section 4(f) “Use” Definitions

“Use” of a protected Section 4(f) property occurs (23 CFR Part 774.17) when any of the following conditions is met.

Direct Use

A direct use of a Section 4(f) property occurs when property is permanently incorporated into a proposed transportation project. This may occur as a result of partial or full acquisition of a fee simple interest, permanent easements, or temporary easements that exceed regulatory limits.

Constructive Use

Constructive use of a Section 4(f) property occurs when a transportation project does not permanently incorporate land from the property, but the proximity of the project results in impacts so severe that the protected activities, features, or attributes that qualify the property for protection under Section 4(f) are substantially impaired. Substantial impairment occurs only if the protected activities, features, or attributes of the property are substantially diminished (23 CFR Part 774.15).

Temporary Occupancy, Which May or May Not Be a Use

Temporary use of a Section 4(f) property occurs when there is temporary occupancy of property that is considered adverse in terms of the preservation purpose of the Section 4(f) statute. Under FHWA/FTA regulations (23 CFR Part 774.13), temporary occupancy of property does not constitute a use of a Section 4(f) property when all the following conditions are satisfied:

- Duration is temporary (i.e., less than the time needed for construction of the project), and there is no change in ownership of the land;
- Scope of work is minor (i.e., both the nature and magnitude of the changes to the Section 4(f) property are minimal);

- There are no anticipated permanent adverse physical impacts, nor is there interference with the protected activities, features, or attributes of the property, on either a temporary or permanent basis;
- The land being used will be fully restored (i.e., the property must be returned to a condition that is at least as good as that which existed prior to the project); and
- There is a documented agreement of the official(s) having jurisdiction over the Section 4(f) property regarding the above conditions.

A Use with *De minimis* Impacts

Section 4(f) requirements are satisfied if it is determined that the use of a Section 4(f) property by the transportation project would have “*de minimis* impact” on the Section 4(f) property. The provision allows avoidance, minimization, mitigation, and enhancement measures to be considered in making the *de minimis* impact determination. The agencies with jurisdiction must concur in writing that the project, including any committed mitigation or enhancement measures, will not adversely affect the Section 4(f) resource. *De minimis* impact is defined as follows (23 CFR Part 774.17):

- For parks, recreational areas, and wildlife and waterfowl refuges, the use has *de minimis* impact if FTA finds that it would not adversely affect the features, attributes, or activities qualifying the property for protection under Section 4(f), and the official with jurisdiction over the park or refuge concurs in writing; and
- For historic sites, *de minimis* impact means that the FTA has determined, in accordance with Section 106 (36 CFR Part 800), that the project would have “no adverse effect” on the property in question. The SHPO and Advisory Council on Historic Preservation (ACHP), if involved, must concur in writing with the FTA finding of “no adverse effect.”

The National Park Service (NPS) should be notified regarding determinations of *de minimis* impacts for National Historic Landmarks (per Section 110) of the National Historic Preservation Act.

5.2 Alternatives Evaluation and Description of the Project

During the previous DTOGS Alternatives Analysis, a range of modal options, transit technologies, and alternative alignments were considered to identify transportation solutions to meet the purpose and need for the proposed project (Chapter 2, Section 2.2). The Alternatives Analysis concluded with selection of a Locally Preferred Alternative consisting of light rail transit on Woodward Avenue from Downtown to 8 Mile Road. Subsequent to the Alternatives Analysis, mainline and Downtown design options were identified, consistent with the project’s purpose and need and, therefore, are evaluated in this DEIS.

Three LPA Alternatives (Chapter 2, Section 2.3) are considered in this Section 4(f) evaluation. All three include LRT stations (between 15 to 21 depending on the alternative) and supporting facilities, including trackwork, overhead catenary system, two vehicle storage and maintenance facilities, and seven traction power substations. Since these facilities have not yet been designed, reasonable conservative assumptions have been made regarding their location and appearance for purposes of this Section 4(f) evaluation. Of particular note is the design option for curbside LRT stations (with LPA Alternatives B2 and B3) between Downtown and Grand Boulevard that would contain billboards atop station canopies. The billboards would measure approximately 10 feet-tall by 10 feet-wide, with a total height for these stations of about 20 feet.

5.3 Description of Section 4(f) Properties

5.3.1 Parks and Recreational Areas

Nine public parks ([Chapter 4, Section 4.8](#)) are located adjacent to all three LPA Alternatives' alignments ([Table 5-1](#)). No public school playgrounds, ball fields, or recreational areas would be used by the LPA Alternatives.

5.3.2 Historic Sites

FTA, in consultation with SHPO, has determined the historic properties listed on or eligible for listing on the National Register of Historic Places (NRHP) ([Chapter 4, Section 4.4](#)) within the agreed-upon Area of Potential Effects, for purposes of Section 106 of the National Historic Preservation Act of 1966.

The historic properties included in this Section 4(f) evaluation include only those where there would be a use of the historic property as previously defined. Each NRHP-eligible property that was evaluated for potential Section 4(f) use is listed in [Table 5-1](#) with its proposed Section 4(f) use determination.

A literature review was conducted, which revealed that 55 previously documented archaeological sites exist within the Archaeological Study Area (ASA). With two exceptions, there is no potential for any of the LPA Alternatives to impact intact archaeological sites; no further work is recommended for the majority of the study area. As there is likely historic and cultural significance attached to sites associated with the pre-1805 City of Detroit, particularly those of Fort Lernoult and the Old Protestant Cemetery, construction-phase monitoring will be required for all excavations that would extend more than 24 inches below current ground surface on or immediately adjacent to those sites. Excavation along the north side of State Street adjacent to Capitol Park would also be monitored for evidence of the Capitol Park archaeological site.

No additional archaeological investigation is warranted for either the Amsterdam Street or Highland Park Ford Plant site for the vehicle storage and maintenance facility (VSMF). Additional archaeological investigation is warranted for the MLK VSMF site if it is selected. It is possible that intact archaeological remains from three mid- to late-19th century residences exist in the central portion of this site. Additional archaeological investigation, including Phase I subsurface investigations, targeting these potential properties should be undertaken if this site is selected for the vehicle storage and maintenance facility. If archaeological properties are encountered during the archaeological inventory survey or during construction, and are determined to be eligible for the NRHP, a separate Section 4(f) evaluation will be prepared.

5.3.3 Wildlife or Waterfowl Refuges

There are no wildlife or waterfowl refuges in the study area.

5.4 Use of Section 4(f) Properties

An assessment has been made as to whether any permanent or temporary occupancy of a property is likely to occur, and whether the proximity of the LPA is likely to substantially impair the features or attributes that qualify a given property for protection under Section 4(f) which is defined as a constructive use. In the evaluation of potential constructive use, only major LRT elements were considered to have potentially substantial aesthetic impacts on Section 4(f) properties. These elements include: stations, clusters of catenary poles (more than 1 every 50 feet), VMSFs, and substations where they are proximate--within 50 feet of the Section 4(f) property and within primary view of historic resources. System trackwork and individual

catenary poles are considered minor elements that would not result in substantial aesthetic impacts to such an extent as to result in a constructive use of the Section 4(f) property and were, therefore, not included in the evaluation. Draft Section 4(f) findings are summarized in [Table 5-1](#).

Table 5-1. Properties Evaluated for Potential Section 4(f) Use

Name/ NRHP Status for Historic Properties	Location or Address	Description of Property	Potential Use of Section 4(f) Property
Park Properties			
Grand Circus Park	1600 Woodward Avenue	4.6 acres. City of Detroit Recreation Department. Plazas, fountains, planting beds, planter seat walls, trash receptacles, paved walks, civic monuments and sculptures, parking garage ramps, lighting.	Alternative A1: Alignment LRT on Woodward Avenue ROW through the park, no stations in or near the park: No Use. Alternative B2 & B3: Two (2) LRT station platforms located entirely on transportation right-of-way through the park. No Use.
Campus Martius Park	800 Woodward Avenue, between Fort Street and Michigan Avenue	2.5 acres. Public/private ownership between City of Detroit Recreation Department and Detroit 300 Conservancy. Plaza, extensive landscaping, fountains, moveable seating, performance stages, seasonal ice rink, one-story restaurant building, NRHP-listed, Michigan Soldier's & Sailors Monument.	Alternatives A1, B2: No LRT elements in or near the park. No Use. Alternative B3: Guideway alignment and overhead catenary system (OCS) on sidewalk around the park plaza, not on park property. Station platform located proximate to the park. No Use.
Capitol Square Park	150 State Street	0.44 acres. City of Detroit Recreation Department. Raised planters, trees, bus shelters, benches, trash receptacles, historic markers, paved urban plaza and walks, lighting, ticket booth, civic statue, sculpture.	Alternatives A1, B3: No LRT elements in or near the park. No Use. Alternative B2: No proximate major LRT elements ¹ ; alignment and widely-spaced catenary poles along State Street, not on park property. No Use.
Maiullo Park	1 Chicago Boulevard	0.84 acres. City of Detroit Recreation Department. Undeveloped open space planned as future park.	Alternatives A1, B2, B3: Not on park property; no proximate major LRT elements ¹ . No Use.
Lawrence Parklot	11491 Woodward Avenue	0.11 acres. City of Detroit Recreation Department. Undeveloped open space planned as future park.	Alternatives A1, B2, B3: Not on park property; no proximate major LRT elements ¹ . No Use.
Future Park	Northeast corner of Woodward Avenue and California Street	3.26 acres. City of Highland Park. Undeveloped open space planned as future park, with parking area.	Alternatives A1, B2, B3: Not on park property; no proximate major LRT elements ¹ . No Use.

Table 5-1. Properties Evaluated for Potential Section 4(f) Use

Name/ NRHP Status for Historic Properties	Location or Address	Description of Property	Potential Use of Section 4(f) Property
Massachusetts Block Club Park	Southeast corner of Woodward Avenue and Massachusetts Street	0.3 acres. City of Highland Park. Undeveloped open space planned as future park.	Alternatives A1, B2, B3: Not on park property; no proximate major LRT elements ¹ . No Use.
Hildale-Grixdale Parklot	18428 Woodward Avenue	1 acre. City of Detroit Recreation Department. Largely undeveloped open space, three separate parcels at end of two residential blocks, neighborhood sign, trees, small planting bed.	Alternatives A1, B2, B3: Not on park property; no proximate major LRT elements ¹ . No Use.
Palmer Park	19021 Woodward Avenue	281.29 acres. City of Detroit Recreation Department. Regional Park with full complement of active and recreational amenities, including ball fields, courts, swimming pool, golf course, historic features, etc.	Alternatives A1, B2, B3: Not on park property; no proximate major LRT elements ¹ . No Use.
Historic Properties			
Detroit Financial District Historic District <i>Listed 2009</i>	Eight blocks in Downtown Detroit roughly bounded on the south by West Jefferson Avenue, east by Woodward Avenue, north by Lafayette Avenue, and west by Washington Boulevard	Historic office buildings and financial core contains 36 buildings, all but one constructed between 1900 and 1964. Most buildings are in the Neoclassical style; Renaissance, Romanesque, Commercial, Art Deco, and International styles are also represented. The district was listed in the NRHP under Criteria A, B, C.	Alternative A1: Alignment within district; Two (2) curbside LRT station platforms located within district boundary. Use - <i>De minimis</i> Impact². Alternative B2: Alignment within district; One (1) curbside LRT station platform located within district boundary. Use - <i>De minimis</i> Impact². Alternative B3: Alignment within district; One (1) LRT station located in the median of Woodward Ave. within district boundary. Use - <i>De minimis</i> Impact.
130 Cadillac Square <i>Determined eligible 2010</i>	130 Cadillac Square	Early twentieth-century, four-story commercial building with a distinctive triangular footprint and features suggestive of the Renaissance Revival style. The property was determined eligible for the NRHP under Criterion C.	Alternative A1: One (1) LRT station located approximately 10 feet from building's rear, south elevation and immediately south of property's NRHP boundary. No Use. Alternative B2, B3: No proximate major LRT elements. ¹ No Use.

Table 5-1. Properties Evaluated for Potential Section 4(f) Use

Name/ NRHP Status for Historic Properties	Location or Address	Description of Property	Potential Use of Section 4(f) Property
<p>State Savings Bank <i>Listed 1982</i></p> <p>Within the Detroit Financial District Historic District.</p>	<p>151 West Fort Street</p>	<p>Late 19th, two-story, Beaux Arts-style commercial building designed by architectural firm McKim, Mead & White.</p> <p>The property was listed in the NRHP under Criteria A and C.</p>	<p>Alternative A1, B2, B3: No proximate major LRT elements.¹ No Use.</p>
<p>Gabriel Richard Building <i>Determined eligible 2010</i></p>	<p>305 Michigan Avenue</p>	<p>Early 20th-century, 10-story, steel-frame office building in the Commercial Style by architectural firm Marshall & Fox.</p> <p>The property was determined eligible for the NRHP under Criterion C.</p>	<p>Alternative A1, B2, B3: No proximate major LRT elements.¹ No Use.</p>
<p>Washington Boulevard Historic District <i>Listed 1982</i></p>	<p>Washington Boulevard between Michigan and Clifford streets on the east and between State and Grand River streets on the west</p>	<p>Three blocks along Washington Boulevard composed of twelve contributing buildings, from 2 to 36 stories in height. Contributing buildings represent Art Deco, Beaux Arts, Chicago, Romanesque, and Tudor Gothic styles.</p> <p>The district was listed in the NRHP under Criteria A and C.</p>	<p>Alternative A1: Alignment within district; one (1) LRT station in median of Washington Blvd within district. Use - <i>De minimis Impact</i>².</p> <p>Alternative B2: Alignment within district; one (1) LRT median station located within district boundary will require removal of existing Macomb Monument (contributing element) at Michigan Ave. Direct Use.</p> <p>Alternative B3: Alignment outside district; no proximate major LRT elements¹. No Use.</p>
<p>Grand Circus Park Historic District <i>Listed 1982</i></p>	<p>Roughly bounded by Clifford Street on the south and west, John R. Street on the south and east, and the north side of Adams Street on the north</p>	<p>Collection of late 19th- and early 20th-century high-rise commercial buildings surrounding a semi-circular public park.</p> <p>The district was listed in the NRHP under Criteria A and C.</p>	<p>Alternative A1: Alignment within district; no proximate major LRT elements¹. Use - <i>De minimis Impact</i>.</p> <p>Alternative B2 and B3: Alignment within district; two (2) LRT curbside station platforms located within district boundary. Use - <i>De minimis Impact</i>².</p>

Table 5-1. Properties Evaluated for Potential Section 4(f) Use

Name/ NRHP Status for Historic Properties	Location or Address	Description of Property	Potential Use of Section 4(f) Property
<p>Central United Methodist Church <i>Listed 1983</i></p> <p>Within Grand Circus Park Historic District.</p>	<p>23 East Adams Avenue</p>	<p>Late 19th-century, Gothic Revival-style church designed by architect Gordon W. Lloyd.</p> <p>The property was listed in the NRHP under Criterion C and Criteria Consideration A.</p>	<p>Alternative A1, B2, B3: No proximate major LRT elements.¹ No Use.</p>
<p>Midtown Woodward Historic District <i>Listed 2008</i></p>	<p>Approximately two blocks of Woodward Avenue between Charlotte and Stimson Streets, including two buildings at 14 Charlotte Street and 25 Peterboro Street</p>	<p>Thirteen commercial and residential buildings constructed in early 20th century representing Renaissance Revival, Neoclassical, Chicago Style, and Art Deco architectural styles.</p> <p>The district was listed in the NRHP under Criteria A and C.</p>	<p>Alternatives A1, B2, B3: Alignment within district; no proximate LRT stations.</p> <p>MLK Blvd. vehicle storage and maintenance facility (VSMF) site located proximate to district. Use- De minimis Impact ².</p>
<p>Clarence Burton School <i>Nominated 2010†</i></p>	<p>3420 Cass Avenue</p>	<p>School building of red brick and embellished by limestone trim, decorative brick and terracotta panels, and large window bays; it is indicative of the Collegiate Gothic-style and Arts and Crafts aesthetic. Constructed in 1912 by local Detroit firm Malcomson & Higginbotham. The building was nominated to the NRHP in 2010 under Criteria A and C.</p>	<p>Alternatives A1, B2, B3: No proximate LRT stations.</p> <p>MLK Blvd. VSMF site located proximate to rear of NRHP boundary, distant to building. No Use.</p>
<p>Cass-Davenport Historic District <i>Listed 1997</i></p>	<p>3527, 3550, and 3566 Cass Avenue, and 149 Davenport Street</p>	<p>Four, early twentieth-century apartment buildings representing the Beaux Arts, Neoclassical Renaissance Revival, Italian Renaissance, and Tudor Revival styles. The district was listed in the NRHP under Criteria A and C.</p>	<p>Alternatives A1, B2, B3: No proximate major LRT elements.¹ No Use.</p>
<p>Hotel Stevenson <i>Listed 1997</i></p>	<p>40 Davenport Street</p>	<p>Eight-story, brown brick-clad, Georgian Revival-style apartment hotel building. Constructed in 1913 by an unknown architect and owned by prominent local leader and businessman Charles Hugh Stevenson. It was primarily occupied by automotive workers for much of its early twentieth-century history.</p> <p>The building was listed in the NRHP under Criteria A, B, and C.</p>	<p>Alternative A1, B2, B3: No proximate major LRT elements.¹ No Use.</p>
<p>David Whitney House³ <i>Listed 1972</i></p>	<p>4421 Woodward Avenue</p>	<p>An irregularly massed, three-story, Romanesque Revival-style mansion constructed from 1890 to 1894. The property was listed in the NRHP under Criteria B and C.</p>	<p>Alternative A1: No proximate major LRT elements¹. No Use.</p> <p>Alternatives B2, B3: No Use.</p>

Table 5-1. Properties Evaluated for Potential Section 4(f) Use

Name/ NRHP Status for Historic Properties	Location or Address	Description of Property	Potential Use of Section 4(f) Property
Colonel Frank J. Hecker House³ <i>Listed 1973</i>	5510 Woodward Avenue	Imposing three-story mansion in a Chateausque style distinguished by three corner towers; a similarly styled carriage house is located at the property's southeast corner. Constructed in 1888. The property was listed in the NRHP under Criteria B and C.	Alternative A1: No proximate major LRT elements ¹ . No Use. Alternatives B2, B3: No Use.
East Ferry Avenue Historic District³ <i>Listed 1980</i>	Approximately three blocks of East Ferry Avenue between Woodward Avenue and Beaubien Street	Twenty-four large, single-family houses constructed between 1885 and 1920 representing the progression of residential architecture in Detroit; including Queen Anne, Romanesque Revival, Colonial Revival, Mediterranean Revival, and Arts and Crafts styles. The district was listed in the NRHP under Criteria A and C.	Alternative A1: Alignment within district; no proximate major LRT elements. ¹ Use- De minimis Impact. Alternatives B2, B3: Alignment within district; two (2) curbside station platforms, outside district, proximate to contributing buildings. Use- De minimis Impact².
New Center Commercial Historic District <i>Determined eligible 2010*</i>	Properties along Woodward Avenue from Baltimore Avenue to Grand Boulevard	Fifteen late 19th- and early-20-century commercial buildings located along Woodward Avenue; eleven buildings are contributing resources. The district includes two architecturally notable buildings: an Art Deco-style commercial building and Neoclassical bank branch building. The district was determined eligible for the NRHP under Criterion A.	Alternative A1: Alignment within proposed district; one (1) LRT station in Woodward Ave., median within district boundary. Use- De Minimis Impact². Alternatives B2, B3: Alignment within proposed district; one (1) LRT curbside station platform within proposed district boundary, proximate to two contributing buildings. Use- De Minimis Impact².
Temple Beth-El <i>Listed 1982</i>	8801 Woodward Avenue	Three-story, Neoclassical former synagogue with massive, full-height Ionic portico on facade. Constructed in 1921 and designed by Detroit architect Albert Kahn. The property was listed in the NRHP under Criterion C and Criteria Consideration A.	Alternatives A1, B2, B3: No proximate major LRT elements to historic building. ¹ No Use.
St. Joseph's Episcopal Church <i>Listed 1982</i>	8850 Woodward Avenue	English Gothic Revival-style, church building defined by a prominent gabled facade with a large, Gothic-arched central entrance. An L-shaped parish house wing is connected to the church by a buttressed tower. The property was listed in the NRHP under Criterion C and Criteria Consideration A.	Alternatives A1, B2, B3: No proximate major LRT elements to historic building. ¹ No Use.

Table 5-1. Properties Evaluated for Potential Section 4(f) Use

Name/ NRHP Status for Historic Properties	Location or Address	Description of Property	Potential Use of Section 4(f) Property
Central Woodward Christian Church <i>Listed 1982</i>	9000 Woodward Avenue	Late Gothic Revival-style, L-shaped church building distinguished by a prominent facade entrance oriented to Woodward Avenue; a two-and-a-half story parish house wing is located at the east (rear) elevation. Constructed in 1928 and designed by local architect George D. Mason. The property was listed in the NRHP under Criterion C and Criteria Consideration A.	Alternatives A1, B2, B3: No proximate major LRT elements to historic building ¹ . No Use.
Woodlawn Cemetery <i>Determined eligible 2010*</i>	19975 Woodward Avenue	A sprawling, turn-of-the-century, landscape lawn cemetery containing an abundance of high-style monuments, mausoleums, chapels, and accessory structures. The site is distinguished by winding paths, large plots, extensive vegetation, and various other park-like amenities. The property was determined eligible for listing in the NRHP under Criteria A and C and Criterion Consideration D.	Alternatives A 1, B 2, B 3: No proximate major LRT elements. ¹ No Use.
Woodward Avenue <i>Determined eligible 2010‡</i>	Woodward Avenue between its intersections with Jefferson Avenue (downtown) and M-102/Eight Mile Road, spanning the existing right- of-way and including the median where applicable	A northwest-southeast running road that originates in Downtown Detroit and passes through 11 municipalities before its termination 27 miles northwest in the City of Pontiac. The 8-mile portion of Woodward Avenue between Jefferson Avenue and Eight Mile Road was determined eligible for listing in the NRHP under Criteria A and B.	Alternative A1: Alignment within proposed district; LRT elements in the median of Woodward Avenue. Use - De Minimis Impact. Alternatives B2, B3: Alignment within proposed district; LRT curbside stations within proposed district boundary. Use- De Minimis Impact².

¹ Major LRT element signifies: station, cluster of catenary poles (more than 1 every 50 feet), vehicle storage and maintenance facility, or substation. LRT element proximity is defined as being within 50 feet of the Section 4(f) property.

² The Section 106 adverse effect of the project on this property would preclude the possibility of a Section 4(f) *de minimis* impact determination (and avoidance alternatives would have to be considered.) However, with historic context-sensitive design and siting of the proposed facility (station or VSMF) in relation to its surroundings, the project may have no adverse effect on the historic district and the resulting *de minimis* impact determination would make this alternative viable

* Determination of eligibility pending SHPO concurrence.

† Pending NRHP listing.

‡ Determination of eligibility pending SHPO concurrence. A portion of Woodward Avenue, as part of the Historic Woodward Avenue Plan of 1805, was previously determined eligible, in 1979.

The findings presented in this DEIS are based on conceptual engineering of the LPA Alternatives' alignments and their associated physical features³ (stations, substations, vehicle storage and maintenance facility, park and ride lot, catenary poles).

5.4.1 Park and Recreational Resources

Nine public park and recreational resources adjacent to the three LPA Alternatives' alignments were considered in the Section 4(f) evaluation (Table 5-1). None of the LPA Alternatives would result in use of any Section 4(f) park resource. In each case, the alignments would run within existing transportation rights-of-way and would not substantially impair or diminish the activities, features, or attributes that qualify properties in these areas for protection under Section 4(f). Where parkland access would be affected during construction of the LPA, alternative access points would be identified and marked, and publicly noticed. Coordination with the Detroit Recreation Department has been initiated to identify opportunities to minimize the LPA's effect on park users. No temporary occupancy of parkland is anticipated.

5.4.2 Historic Resources

Of 91 historic sites identified in the APE, 20 were determined to have Section 106 adverse effects with the LPA (Chapter 4, Section 4.4); these were considered in the Section 4(f) evaluation (Table 5-1). Except for LPA Alternative B2 which would result in a direct use at one Section 4(f) historic property, no other use of historic property would occur with any of the alternatives.

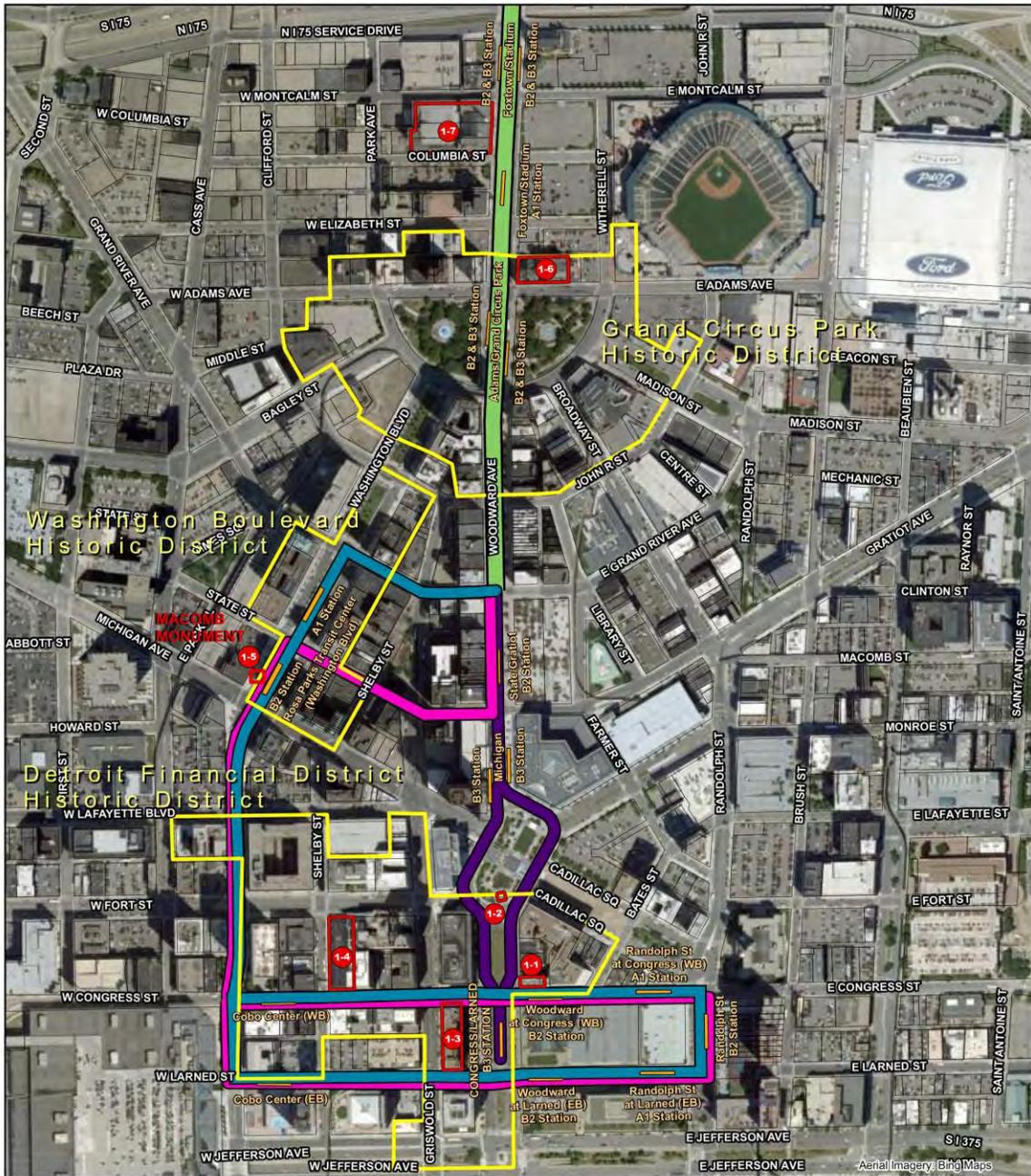
Detroit Financial District Historic District

Description and Significance of Property

The district covers eight blocks in Downtown Detroit, roughly bound by West Jefferson Avenue on the south, Woodward Avenue on the east, Lafayette Avenue on the north, and Washington Boulevard on the west (Figure 5-1). It features 36 office buildings, all but one of which was constructed between 1900 and 1964, which have historically served as the city's financial core. While most of the buildings are in the Neoclassical style, Renaissance, Romanesque, Commercial, Art Deco, and International styles are also represented. The district is listed in the NRHP under Criteria A, B, and C. The district's features and attributes that qualify it for protection under Section 4(f) are related to its historic association as Detroit's financial and commercial center (many of the buildings built between 1900 and 1930 are related to Detroit's automotive industry) and for its significant examples of high-style architecture, some of which are works of master architects. All three LPA Alternatives would locate at least one LRT station within the district.

³ Major LRT elements are listed here. Tracks in the street and overhead catenary wires are not considered significant features that could potentially result in a Section 4(f) use.

Figure 5-1. Section 4(f) Properties – Downtown Detroit



LEGEND

- █ Locally Preferred Alternative (LPA)
- █ Alternative A1
- █ Alternative B2
- █ Alternative B3
- █ Proposed Station

NRHP-Listed Property

0 700 Feet

KEY

- 1-1 VINTON BUILDING
- 1-2 MICHIGAN SOLDIERS' AND SAILORS' MONUMENT
- 1-3 GUARDIAN BUILDING
- 1-4 STATE SAVINGS BANK
- 1-5 MACOMB MONUMENT
- 1-6 CENTRAL UNITED METHODIST CHURCH
- 1-7 FOX THEATRE BUILDING NATIONAL HISTORIC LANDMARK

Section 4(f) Evaluation

The use of the district by Alternative B3 would result in a *de minimis* impact on the historic district. Alternative A1 and B2 would have an adverse effect on the historic district under Section 106 and a *de minimis* impact determination is not possible. FTA cannot approve these Alternatives unless Alternative B3 (which has a *de minimis* impact) proves to be not feasible or not prudent. However, with historic context-sensitive design, the station may have no adverse effect on the historic district and the resulting *de minimis* impact determination would make Alternatives A1 and B2 viable. FTA is proposing such design so that the use of this historic district by Alternative A1 and B2 would have *de minimis* impact on the historic district.

LPA Alternative A1

Two LRT stations (Cobo Center: Larned at Washington Boulevard and Cobo Center: Congress at Washington) would be located within the district boundary at its southwestern edge (Figure 5-1). The westbound side-platform station along the south edge of Congress Street, east of Washington Boulevard, would be about 10 feet north of two contributing buildings; the eastbound side-platform station along the north edge of Larned Street, east of Washington Boulevard, would be about 10 feet south of portions of two contributing buildings. The westbound Randolph Street LRT station would be about 105 feet east of district boundary.

The curbside stations would be approximately 10 to 14 feet in height and would not substantially block street-level views of buildings contributing to the historic district. With historic context-sensitive design, these stations would have no adverse effect on this large, architecturally historic district, and the use of the district would be considered to have *de minimis* impact.

LPA Alternative B2

One LRT station (Cobo Center: Larned at Washington Boulevard) would be located within the district boundary, at its southwestern edge. The westbound side-platform station along the south edge of Congress Street, east of Washington Boulevard, would be 15 feet north of two contributing buildings.

One proposed design of the curbside station would make it about 20 feet in height and would partially block street-level views of the historic district. However, with historic context-sensitive design, the station would have no adverse effect on this large, architecturally historic district and the use of the district would be considered to have *de minimis* impact.

LPA Alternative B3

One LRT station (Congress/Larned: on Woodward Avenue between Congress and Larned) would be located in the median of Woodward Avenue, on the eastern edge of the district boundary. The station would be on the eastern side of Woodward Avenue, approximately 170 feet from the nearest contributing building (Guardian Building National Historic landmark which is also individually listed). Therefore, FTA is proposing that the use of this historic district by Alternative B3 would have *de minimis* impact on the historic district.

Washington Boulevard Historic District

Description and Significance of Property

This three-block-long historic district contains 12 contributing buildings that represent a wide range of styles popular in the late 19th to early 20th century (from Beaux Arts to Art Deco). While the district centers on Washington Boulevard, the 78-foot-wide street itself was completely rebuilt in 2003. The district's features and attributes that qualify it for protection under Section

4(f) are its diverse architectural design elements and historic associations. LPA Alternatives A1 and B2 go through the historic district, constituting a use (Figure 5-1).

Section 4(f) Evaluation

Alternatives A1 and B2 traverse the Washington Boulevard Historic District in the median of Washington Boulevard and Alternative B3 avoids the district entirely. Alternative B2 would incorporate property from the Washington Boulevard Historic District and displace the Macomb Monument (a contributing element to the district). Alternative A1 is expected to have de minimis impact on the Washington Boulevard Historic District with the same understanding regarding historic context-sensitive design as described previously under the Detroit Financial District Historic District.

LPA Alternative A1

The LPA would be located in the median of Washington Boulevard south of Michigan Avenue, and adjacent to the planted median in Washington Boulevard north of Michigan Avenue. Some views across the street toward the buildings may be partially obstructed by the proposed Rosa Parks Transit Center LRT Station and overhead catenary poles at the corner of Grand River Avenue and Washington Boulevard. The LRT station and catenary poles would be about 70 feet from the nearest contributing buildings. Primary views of the historic district's contributing buildings from the Washington Boulevard median and sidewalks would remain and the LRT station would be designed in a style compatible with the historic district. Additionally, the median would be restored with new landscaping where trees in conflict with the overhead catenary would be removed.

This alternative would introduce new physical elements within the historic district along Washington Boulevard including the proposed trackway, catenary poles and wire, and LRT station. This Alternative would have an adverse effect on the historic district under Section 106 and a *de minimis* impact determination is not possible. FTA cannot approve this Alternative unless the other Alternatives that result in no use of the district or a use with *de minimis* impacts prove to be not feasible or not prudent. However, with historic context-sensitive design, the station may have no adverse effect on the historic district and the resulting *de minimis* impact determination would make this alternative viable.

LPA Alternative B2

Within the historic district, Alternative B2 would be located within the median of State Street and then turn into the median of Washington Boulevard where the Rosa Parks Transit Center Station would be located, displacing the existing planted median north of Michigan Avenue. The Macomb Monument, a contributing element of the historic district, has stood in the median of Washington Boulevard north of Michigan Avenue since 1906. It would be removed from its present location to accommodate the LRT station, and the area covered by the monument (approximately 1,200 square feet) would be incorporated into Alternative B2. Even if the Macomb Monument is relocated elsewhere within the historic district, this Alternative would have an adverse effect on the historic district under Section 106 and a *de minimis* impact determination is not possible. FTA cannot approve this Alternative unless the other Alternatives that result in no use of the district or a use with *de minimis* impacts prove to be not feasible or not prudent.

LPA Alternative B3

LPA Alternative B3 would avoid any use of this historic district, as it would remain on Woodward Avenue outside of the district.

Grand Circus Park Historic District

Description and Significance of Property

The district comprises 40 commercial buildings dating from 1866 to 1900, which surround and radiate from the heavily landscaped Grand Circus Park (Figure 5-1). The district is roughly bounded by Clifford Street on the south and west, John R Street on the south and east, and the north side of Adams Street on the north. The district is listed in the NRHP under Criteria A and C for its significance in the social history of Detroit (A) and for its significant examples of high-style architecture, some of which are works of master architects. The elevated People Mover traverses the district, following the south side of Witherell Street between Bagley and Broadway Streets. Currently there are two DDOT bus shelters situated on sidewalks along Woodward Avenue where it passes through the park, and these shelters serve several bus routes that travel north and south along Woodward Avenue.

Section 4(f) Evaluation

All three alternative alignments pass through the historic district on Woodward Avenue and constitute a use of the property; however Alternative A1 would have a *de minimis* impact and Alternatives B2 and B3 may be considered to have a *de minimis* impact assuming historic context-sensitive design of curbside stations.

LPA Alternative A1

LPA Alternative A1 would have a *de minimis* impact on the district as only trackwork and OCS would be located within it.

LPA Alternatives B2 and B3

One LRT station with two platforms (Adams/Grand Circus Park) would be located within the historic district boundary, on both sides of the 109-foot-wide Woodward Avenue, which bisects the park.

One proposed design of the curbside station with billboards over the canopies would make it about 20 feet in height and would partially block street-level views of the historic district. The Section 106 adverse effect of this design would preclude the possibility of a Section 4(f) *de minimis* impact determination and the avoidance alternative (Alternative A1) would have to be selected. However, with historic context-sensitive design, the station may have no adverse effect on the historic district and the resulting *de minimis* impact determination would make this alternative viable.

Midtown Woodward Historic District

Description and Significance of Property

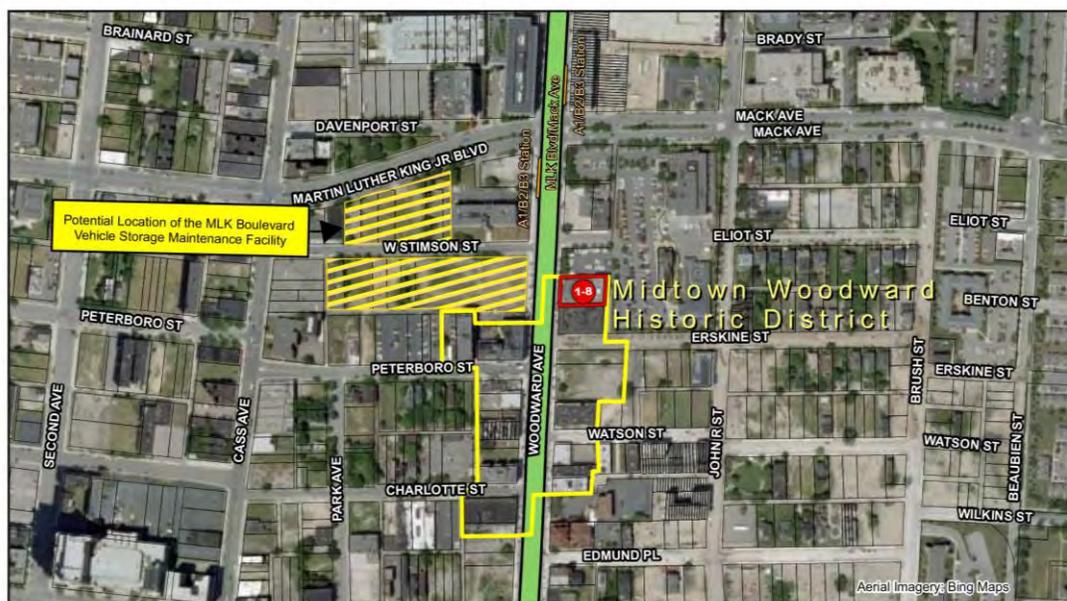
The district covers about two blocks of Woodward Avenue between Charlotte and Stimson streets, including two buildings at 14 Charlotte Street and 25 Peterboro Street (Figure 5-2). It consists of 13 commercial and residential buildings, which were constructed in the early 20th century, representing Renaissance Revival, Neoclassical, Chicago Style, and Art Deco architectural styles. The district was listed in the NRHP under Criteria A and C for its significance in the commercial development of Detroit and for its significant examples of high-style architecture, some of which are works of master architects.

Section 4(f) Evaluation

LPA Alternatives A1, B2 and B3

All three of the alternatives penetrate the historic district on Woodward Avenue, though there is no station located within the district. The MLK Boulevard site for the vehicle storage and

Figure 5-2. Section 4(f) Properties – Midtown Woodward Historic District



LEGEND

- Locally Preferred Alternative (LPA)
- Proposed Station
- NRHP-Listed Property

0 700 Feet



KEY

1-8 Temple Beth-El

maintenance facility (VSMF), located west of Woodward Avenue, south of MLK Jr. Boulevard, and along Stimson Street, would be near the historic district. This VSMF site abuts portions of the historic district’s northwestern boundary, but it would not be located within the district at all. This VSMF site would be about 130 feet west of the easternmost contributing building and about 20 feet north of the rear side of the westernmost contributing building.

The Section 106 adverse effect from the proposed VSMF would preclude the possibility of a Section 4(f) *de minimis* impact determination. However, with historic context-sensitive design, the facility may have no adverse effect on the historic district and the resulting *de minimis* impact determination would make this a viable site alternative.

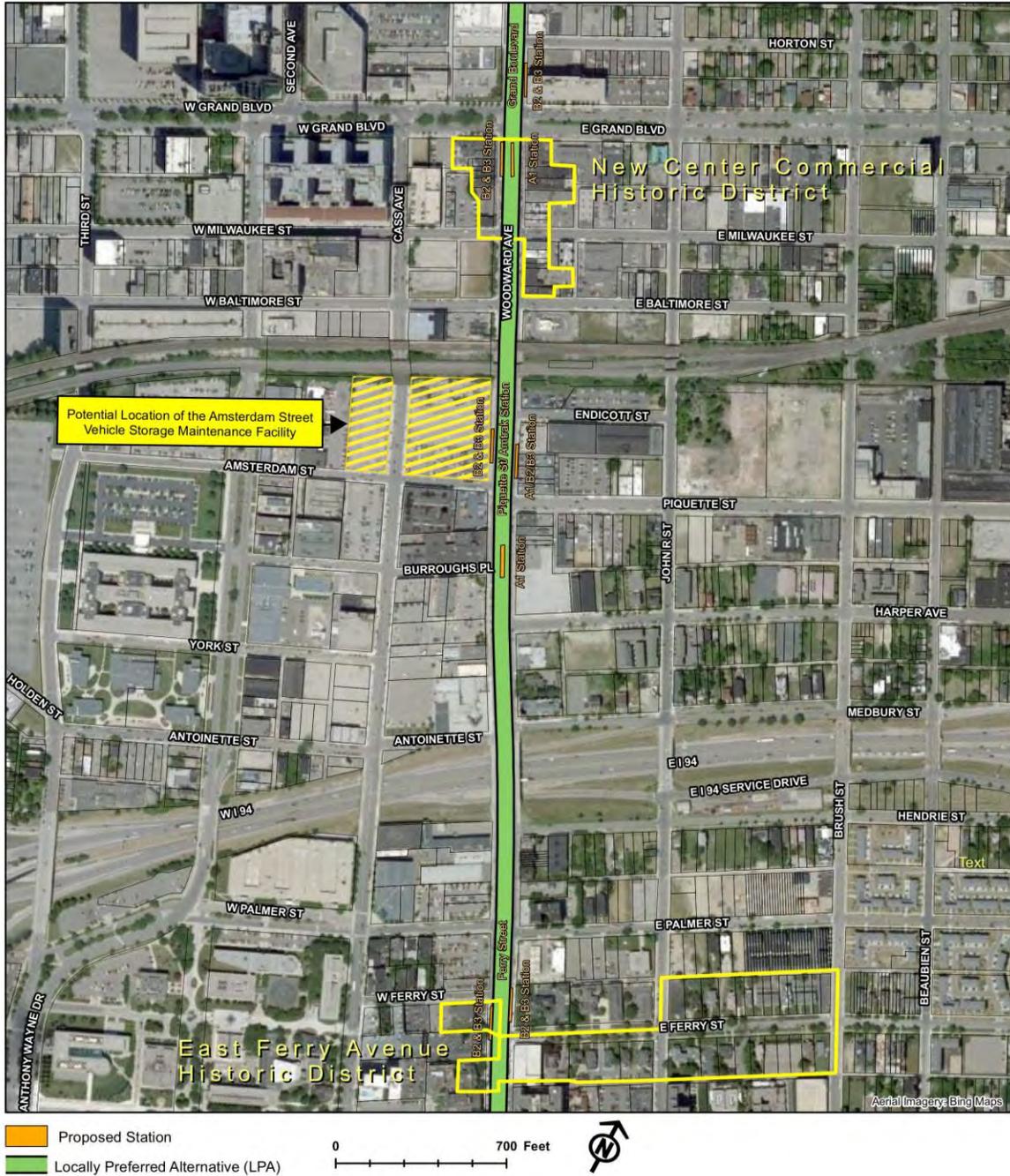
Should another VSMF site be selected then the Section 106 adverse effect determination for this historic district would likely change to No Effect or No Adverse Effect and the three alternatives would be found to have a *de minimis* impact.

East Ferry Avenue Historic District

Description and Significance of Property

The district covers approximately three blocks of East Ferry Avenue between Woodward Avenue and Beaubien Street and contains 24 single-family houses constructed between 1885 and 1920 (Figure 5-3). The buildings represent the progression of residential architecture in Detroit, including Queen Anne, Romanesque Revival, Colonial Revival, Mediterranean Revival, and Arts and Crafts styles. The district was listed in the NRHP under Criteria A and C for its significance in the social history of Detroit and for its significant examples of high-style architecture.

Figure 5-3. Section 4(f) Properties – East Ferry Avenue Historic District and New Center Commercial Historic District



Section 4(f) Evaluation

LPA Alternative A1

LPA Alternative A1 would have a *de minimis* impact on the district as only trackwork and OCS would be located within it.

LPA Alternatives B2 and B3

One curbside LRT station platform (Ferry Street SB) would be located adjacent to, but outside the district boundary, on the west side of Woodward Avenue. It would be approximately 20 feet east of two of the district's contributing buildings.

One proposed design of the curbside station with billboards over the canopies would make it about 20 feet in height and would partially block street-level views of the historic district. The Section 106 adverse effect of this design would preclude the possibility of a Section 4(f) *de minimis* impact determination and the avoidance alternative (Alternative A1) would have to be selected. However, with historic context-sensitive design, the station may have no adverse effect on the historic district and the resulting *de minimis* impact determination would make this alternative viable.

New Center Commercial Historic District

Description and Significance of Property

The district contains 15 late 19th- and early 20th-century commercial buildings located along Woodward Avenue from Baltimore Avenue to Grand Boulevard; 11 are contributing resources (Figure 5-3). Most of the buildings, constructed between 1920 and 1942, are one and two stories tall. The district includes two architecturally notable buildings: an Art Deco-style commercial building and a Neoclassical bank branch building. The district was listed in the NRHP under Criteria A for its significance as an early edge city, as a result of increasing availability and reliance on the automobile. Many of the buildings have lost their original integrity, and original storefronts have been significantly modified.

Section 4(f) Evaluation

All three alternative alignments run on Woodward Avenue through the historic district and they each have a station located within the district.

LPA Alternative A1

One LRT station platform would be located within the district boundary, in the median of Woodward Avenue between Milwaukee Street and Grand Boulevard. It would be approximately 50 feet from the district's contributing buildings on either side of the avenue.

One proposed design of the curbside station with billboards over the canopies would make it about 20 feet in height and would partially block street-level views of the historic district. The Section 106 adverse effect of this design would preclude the possibility of a Section 4(f) *de minimis* impact determination. However, with historic context-sensitive design, the station may have no adverse effect on the historic district and the resulting *de minimis* impact determination would make this alternative viable.

LPA Alternatives B2 and B3

One curbside LRT station platform (Grand Boulevard SB) would be located within the district boundary, on the west side of Woodward Avenue between Milwaukee Street and Grand Boulevard. It would be approximately 20 feet east of two of the district's contributing buildings.

One proposed design of the curbside station with billboards over the canopies would make it about 20 feet in height and would partially block street-level views of the historic district. The Section 106 adverse effect of this design would preclude the possibility of a Section 4(f) *de minimis* impact. However, with context-sensitive design, the station may have no adverse effect on the historic district and the resulting *de minimis* impact determination would make these alternatives viable.

Woodward Avenue

Description and Significance of Property

Woodward Avenue extends 27 miles and runs northwest-southeast between downtown Detroit and the City of Pontiac, passing through 11 municipalities. An eight-mile portion of Woodward Avenue between its intersections with Jefferson Avenue (Downtown) and M-102/8 Mile Road (including the existing right-of-way and portions of the median) was determined eligible for the NRHP as part of the Section 106 review of this project. It was determined eligible under Criteria A and B as a historically significant major transportation corridor that has contributed to Detroit's history and development, and for its association with Judge Augustus B. Woodward who created the plan for the City of Detroit in 1805. This downtown plan centered on Woodward Avenue as the main arterial.

Section 4(f) Evaluation

All three alternatives would follow Woodward Avenue for most of their length and include LRT stations (both median- and curb-running) within the proposed Woodward Avenue historic district. All three of the alternatives under consideration result in the use of land within the Woodward Avenue historic district.

LPA Alternative A1

The median-running Alternative A1 would have a *de minimis* impact on the historic district as it was found to no adverse effect per Section 106.

LPA Alternatives B2 and B3

The Section 106 adverse effect of these two alternatives would preclude the possibility of a Section 4(f) *de minimis* impact determination. However, with context-sensitive design of the associated curbside stations, the alternatives may have no adverse effect on the proposed historic district and the resulting *de minimis* impact determination would make these alternatives viable.

Preliminary Section 4(f) use findings are summarized in [Table 5-2](#).

Table 5-2. Summary of Potential Section 4(f) Use

	No Build	Alternative A1	Alternative B2	Alternative B3
Detroit Financial District Historic District		Use - <i>De minimis</i> Impact*	Use - <i>De minimis</i> Impact*	Use - <i>De minimis</i> Impact
Washington Boulevard Historic District		Use - <i>De minimis</i> Impact*	Direct Use	No Use
Grand Circus Park Historic District		Use - <i>De minimis</i> Impact	Use - <i>De minimis</i> Impact*	Use - <i>De minimis</i> Impact*
Midtown Woodward Historic District		Use - <i>De minimis</i> Impact*	Use - <i>De minimis</i> Impact*	Use - <i>De minimis</i> Impact*
E. Ferry Avenue Historic District		Use - <i>De minimis</i> Impact	Use - <i>De minimis</i> Impact*	Use - <i>De minimis</i> Impact*
New Center Commercial Historic District		Use - <i>De minimis</i> Impact*	Use - <i>De minimis</i> Impact*	Use - <i>De minimis</i> Impact*
Woodward Avenue Historic District		Use - <i>De minimis</i> Impact	Use - <i>De minimis</i> Impact*	Use - <i>De minimis</i> Impact*
Summary by Alternative		7 <i>De minimis</i> impacts (including 4 provisional findings described below).	1 Direct Use and 6 <i>De minimis</i> impacts (all of which are provisional findings, described below).	6 <i>De minimis</i> impacts (including 5 provisional findings, described below) and 1 No Use.

Notes: * Use - *De minimis* Impact. The Section 106 adverse effect of the project on this property would preclude the possibility of a Section 4(f) *de minimis* impact determination (and a prudent and feasible avoidance alternative would have to be considered.) However, with context-sensitive design and siting of the proposed facility (station or VSMF) in relation to its historic surroundings, the project may have no adverse effect on the historic district and the resulting *de minimis* impact determination would make this alternative viable.

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6.0 Evaluation of Alternatives

This chapter provides a summary comparison of the No Build and LPA Alternatives, using information and analyses presented in the previous chapters. Following a summary of the evaluation methodology, the key differences among the alternatives' environmental impacts and transportation benefits and other considerations in selecting a preferred alternative are presented. Permits and approvals required for implementation of the LPA are also identified.

6.1 Evaluation Methodology

The evaluation of alternatives considers the extent to which each alternative would satisfy the purpose and need for the proposed transportation improvement ([Chapter 1, Section 1.2](#)). The No Build Alternative and LPA Alternatives A1, B2 and B3 ([Chapter 2, Section 2.3](#)) are evaluated in this DEIS.

The evaluation criteria used to compare the alternatives reflect the project purpose and need, and include selected criteria from the previously completed DTOGS Alternatives Analysis and from local jurisdictions and agencies; the criteria are identified in [Table 6-1](#). Quantitative and qualitative results of the technical analyses, which are presented in this DEIS and detailed in supporting Technical Reports, are presented in [Table 6-1](#) to enable comparison of the No Build and LPA Alternatives' potential impacts and benefits.

This evaluation framework supports decision-making for the City of Detroit and the FTA, as it is expected that federal funding would be sought when the final LPA design option ([Chapter 2, Section 2.3.2](#)) is selected for implementation.

6.2 Environmental Consequences

6.2.1 Environmental Consequences of No Build and LPA Alternatives

Potential environmental impacts of the No Build and LPA Alternatives are summarized below. Unless otherwise stated for a given environmental category, the No Build Alternative would have no impact. As the LPA Alternatives' alignments would follow existing roadway rights-of-way, their potential environmental impacts would be relatively minor in type and degree for a project of this size. The impacts summarized for the LPA Alternatives include those that would result with construction and operation of the LPA Alternatives' proposed alignments, light rail transit (LRT) stations, and ancillary facilities (traction power substations along the LRT alignment, a vehicle storage and maintenance facility [VSMF], a park and ride lot [[Chapter 2, Sections 2.3.4](#)]), as well as from temporary construction staging areas.

Environmental categories for which impacts are not anticipated or would be limited with any of the LPA Alternatives include air quality, neighborhood character, community facilities and services, parkland, visual and aesthetic conditions, utilities, energy, roadways and levels of service, storm water management, and indirect and cumulative impacts.

Hazardous Materials - Preliminary Phase I activities show that Recognized Environmental Conditions (REC) are associated with each of the three potential vehicle storage and maintenance facility (VSMF) sites. These RECs could have adverse long-term effects if adequate due diligence is not performed. Adverse long-term effects include purchasing contaminated property and having potential environmental cleanup liability and associated due care consequences.

Table 6-1. Summary of Evaluation of Alternatives

Evaluation Measures		No Build Alt.	Locally Preferred Alternative		
			A1	B2	B3
ENVIRONMENTAL CONSEQUENCES					
Air Quality impact		No impact	No impact		
Hazardous Materials impact		No impact	Potential hazardous materials present on each of the three potential VSMF sites; One or more known or suspected contaminated sites near almost all LRT stations and at two railroad underpasses		
Historic Resources impact	<i>Adverse Effect</i>	0	13 resources	18 resources	15 resources
	<i>No Adverse Effect</i>	0	33 resources	29 resources	26 resources
	<i>No Effect</i>	0	45 resources	44 resources	50 resources
Archaeological Resources impact		No impact	Potential impact to archaeological sites associated with 18 th -century Detroit south of Lafayette Boulevard and west of Randolph Street.	Potential impact to archaeological sites associated with 18 th -century Detroit south of Lafayette Boulevard and west of Randolph Street, and with Capitol Park north of State Street.	Potential impact to archaeological sites associated with 18 th -century Detroit south of Lafayette Boulevard and west of Randolph Street.
Environmental Justice impact		No impact	Impact from VSMF at MLK Boulevard site (24-hour light and noise source) to nearby residences		
Noise impact		No change	5 sites	6 sites	5 sites
Vibration impact		No impact	1 site	2 sites (including Fox Theater)	1 site (Fox Theater)
Ground-borne vibration-related noise impact		No impact	4 sites	5 sites	4 sites
Land Use, Zoning, Public Policy impact		No impact	VSMF at MLK Boulevard site incompatible with nearby multi-family and senior-housing; Temporary construction-phase noise impact to residential and other noise-sensitive land uses		
Neighborhood Character impact		No impact	Temporary construction-phase disruption of traffic and pedestrian travel patterns		
Community Facilities and Services impact		No impact	Temporary construction-phase disruption of direct access to community facilities		
Parkland impact		No impact	Temporary construction-phase disruption of vehicular and pedestrian access to parklands		
Visual and Aesthetic Conditions impact		No impact	Minor impact	Impact to visual continuity in some neighborhoods from curb-side LRT stations' vertical elements	
Utilities impact		No impact	Temporary service disruptions and traffic detours during required utility relocations		

Table 6-1. Summary of Evaluation of Alternatives

Evaluation Measures	No Build Alt.	Locally Preferred Alternative		
		A1	B2	B3
Energy impact	Likely increase in energy use	Likely decrease in overall energy use with LRT operation; Temporary increase in energy use for LPA construction		
Parking impact	No impact	Impact to business parking in two locations along Woodward Avenue	Overall increase in number of parking spaces	No net change in number of parking spaces
Roadways and Levels of Service (LOS) impact	LOS D or better	All major signalized intersections would operate at LOS D or better. Traffic re-routings and detours would be required along discrete alignment segments during construction.		
Storm Water Management impact	No impact	No impact		
Indirect impact	No impact	Would encourage new development near LRT stations. May encourage infill redevelopment of underutilized or vacant parcels.		
Cumulative impact	No impact	Would enhance economic development opportunities in northern part of study area.		
Section 4(f) Use	No impact	7 <i>de minimis</i> impacts ¹	1 direct use 6 <i>de minimis</i> impacts ¹	6 <i>de minimis</i> impacts ¹
TRANSPORTATION BENEFITS AND IMPACTS				
Encourages transit ridership by providing linkages to existing transit.	No impact	Moderate positive impact		Minor positive impact
Provides transportation options (modal choices).	No impact	Would provide LRT as an additional transit option.		
Provides transit access to schools, shopping, events, healthcare and other services and cultural attractions in the corridor. ²	No impact	48 attractions		43 attractions
Transit travel time: range during peak hours for the given Alternative's entire route	46 – 51 minutes	37 - 41 minutes	40 – 43 minutes	33 – 36 minutes
Transit travel time reliability	Depends on traffic volume/ conditions	Travel time would be predictable	South of Grand Boulevard, travel time would be dependent on traffic volume and conditions.	
Vehicular travel time: range during peak hours between State Fair Avenue and Adams Street	15-17 minutes	24 - 26 minutes	24 - 25 minutes	
Corridor capacity and traffic operations ³	LOS D or better	LOS D or better	LOS D or better	LOS D or better
Motor vehicle safety ³	No impact	Minor positive impact	Minor negative impact	Minor negative impact

Table 6-1. Summary of Evaluation of Alternatives

Evaluation Measures	No Build Alt.	Locally Preferred Alternative		
		A1	B2	B3
Pedestrian safety	No impact	Minor negative impact	No impact	No impact
Bicycle safety	No impact	Minor positive impact	Negative impact	Negative impact
TRANSPORTATION EQUITY AND ENVIRONMENTAL JUSTICE				
Improves public transit service and provides greater mobility options along Woodward Avenue	No impact	Yes		
Transit-dependent households served ⁴ (% of total households served)	No change	5,500 (83%)	7,100 (85%)	6,900 (85%)
Minority population served ⁴ (% of total population served)	No impact	11,500 (83%)	14,200 (83%)	14,200 (83%)
Low-Income population served ⁴ (% of total population served)	No impact	5,000 (36%)	6,300 (37%)	6,300 (37%)
SUPPORT ECONOMIC AND COMMUNITY DEVELOPMENT GOALS				
Consistent with City of Detroit Master Plan	No	Yes		
Provides transit connections to existing and planned economic development areas	No impact	Yes		
Potential for future transit-supportive and new economic development	Minor positive impact	Moderate positive impact		Minor positive impact

Source: Parsons Brinckerhoff, 2010

¹ The Section 106 adverse effect of the LPA Alternative on the historic properties would preclude the possibility of a Section 4(f) *de minimis* impact determination (and a prudent and feasible avoidance alternative would have to be selected). However, with context-sensitive design and siting of the proposed facility (LRT station, VSMF) in relation to its surroundings, the LPA Alternative may have no adverse effect on the historic district and the resulting *de minimis* impact determination would make this LPA Alternative viable.

² Attractions directly served by alternative calculated within 1/4 mile of LRT stations.

³ Information on potential traffic operations and safety impacts is preliminary, based on the best available information assembled to date by the project team. The FEIS will contain a more detailed analysis and discussion of potential operational and safety impacts and mitigation associated with the LPA Alternatives.

⁴ US Census 2000 SF3, population and households within 1/4 mile of LRT stations

Due diligence includes updating the Phase I Environmental Site Assessment (ESA) to include site reconnaissance and interviews, and performing Phase II testing to help establish whether contamination is present and, if present, to determine its nature and extent. Mitigation measures would be needed only in areas where construction activities encounter known or suspected contaminated soil or groundwater.

Historic Resources - There are numerous historic properties that are listed in or determined eligible for the National Register of Historic Places in the study area, including three National Historic Landmarks. Alternative A1 would result in an adverse effect to slightly fewer historic properties (13) than would Alternatives B2 (18) and B3 (15). The magnitude of each of the adverse effects varies by resource and the nature of each adverse effect ([Chapter 4, Section 4.4.4](#)). Continued consideration of historic resources through the ongoing Section 106 consultation process, and potential modifications to LRT station locations and other LPA details, may result in refinement of the effects conclusions. Therefore, differences among the LPA Alternatives' relative impacts to historic resources may also change as discussions continue with the Consulting Parties prior to selection of a preferred alternative. Any resulting changes in the extent of impacts to historic properties, as described in this DEIS, will be taken into account during selection of a preferred alternative, and will be reported in the FEIS. The FTA will consult with the Michigan State Historic Preservation Office (SHPO) and the Consulting Parties to develop measures and responsibilities to minimize or mitigate adverse effects, which will be documented in a Memorandum of Agreement or a Programmatic Agreement.

Archaeological Resources – All three LPA Alternatives may impact archaeological sites associated with 18th-century Detroit south of Lafayette Boulevard and west of Randolph Street. Alternative B2 may additionally impact Capital Park north of State Street. Once a location for the VSMF site is chosen, and site layout and facility design plans, including specific information on the horizontal and vertical extent of excavation, have advanced, Phase I archaeological field investigations would be completed. Also, construction-phase monitoring would be conducted for all excavations extending more than 24 inches below current ground surface above or adjacent to the potential archaeological resources.

Environmental Justice - The location of the VSMFs, which will be selected as part of the preferred alternative, may result in disproportionate impacts to environmental justice populations if a VSMF is located at the MLK Boulevard site, given nearby low-income, senior, multi-family residences. Potential impacts of the VSMF, which would introduce a new 24-hour light and noise source to the immediately surrounding properties, would be the same with all of the LPA Alternatives, should the MLK Boulevard site be selected. Design of the VSMF at that site would be context-sensitive to minimize impacts, including use of sound and visual screening.

Noise - While noise conditions with the No Build Alternative would remain largely unchanged, LPA Alternatives A1, B2, and B3 would each result in a noise impact on five, six, and five noise-sensitive properties, respectively. Such noise impacts would be mitigated with the use of custom-designed LRT vehicle wheel skirts.

Vibration - Alternatives A1, B2 and B3 would each result in a vibration impact at one, two, and one properties, respectively. The curb-running Alternatives B2 and B3 would impact the Fox Theater in Downtown Detroit. All three LPA Alternatives would result in ground-borne noise impacts at the Fox Theater and several other properties. Ground-borne noise is a rumbling sound caused by vibration of the LRT system that is carried through the ground to the foundations of nearby buildings. Such noise would be inaudible as predicted airborne-noise levels associated with the LPA would exceed noise caused by ground-borne vibration of the affected structures.

Land Use - There are no envisioned residential or business displacements for any of the LPA Alternatives' mainline and downtown alignments. With all three LPA Alternatives, the VSMF at the potential MLK Boulevard site would be incompatible with nearby multi-family and senior housing; however, context-sensitive design of the VSMF would mitigate its impact.

Section 4 (f) - The most important differentiator among the LPA Alternatives relates to the protection of historic resources, per Section 4(f) of the U.S. Department of Transportation Act of 1966. The study area's historic resources that would be adversely affected by the LPA, as determined through the Section 106 consultation process ([Chapter 4, Section 4.4](#)), were evaluated to determine whether the LPA Alternatives would result in a Section 4(f) impact ([Chapter 5](#)). A Section 106 adverse effect of the LPA on historic properties would preclude the possibility of a Section 4(f) *de minimis* impact determination (and a prudent and feasible avoidance alternative would have to be selected). For several historic properties, a provisional *de minimis* impact determination has been made. This assumes that further consultation with the SHPO regarding context-sensitive design and siting of the LPA facilities (LRT stations or VSMFs) may result in a Section 106 no adverse effect finding and Section 4(f) *de minimis* impact determination.

All three LPA Alternatives would have a *de minimis* impact on the following six historic districts (HD): Detroit Financial District HD, Grand Circus Park HD, Midtown Woodward HD, East Ferry Avenue HD, New Center Commercial HD, and Woodward Avenue HD. Alternative A1 would additionally have a *de minimis* impact on the Washington Boulevard HD, while Alternative B2 would result in a direct use, as it would require relocation of the Macomb Monument. Alternatives A1 and B3, which would not result in a direct use, present feasible and prudent alternatives to Alternative B2.

Any changes to the Section 106 determinations of effect through the ongoing Section 106 consultation process, and potential modifications to LRT station locations and other LPA details, will be taken into account to refine the Section 4(f) evaluation and select the preferred alternative, and will be documented in the FEIS.

6.3 Transportation Benefits and Impacts

6.3.1 Transportation Benefits

Transportation benefits that would result with the LPA Alternatives are summarized below in terms of mobility, accessibility, travel time and reliability.

Mobility and Accessibility - Each of the LPA Alternatives would have a positive impact on transit ridership by improving access to existing and planned attractions and development in the study area. Alternatives A1 and B2 further encourage ridership by providing more direct connections than would Alternative B3 to the Rosa Parks Transit Center and two People Mover stations at Michigan Avenue and Times Square in Downtown Detroit. The No Build Alternative would not provide a comparable future transit benefit.

The LPA Alternatives would provide an additional transportation option. Since the Alternatives have similar alignments, service plans and many of the same LRT station locations, their relative attractiveness to transit markets and resulting transit-user benefits would primarily be a function of differences in transit travel time improvement compared to the No Build Alternative. However, in terms of reliability, transit travel time with the median-running Alternative A1 would be predictable; travel time with Alternatives B2 and B3 would be subject to general traffic conditions as the LRT vehicles would operate in mixed traffic.

As the study area is comprised largely of environmental justice populations, increased mobility and improved accessibility resulting with the LPA Alternatives in study area neighborhoods would principally benefit these populations, as well as those that are transit-dependent.

Travel Time and Reliability - Vehicular travel times in the study area would increase slightly with the No Build alternative compared to existing conditions. With the LPA Alternatives, travel times would increase by about nine minutes due mainly to the reduction in travel lanes north of Grand Boulevard. Congestion levels at study area intersections would be in the acceptable range (LOS D or better) with all No-Build and LPA Alternatives.

Transit travel time with the No Build Alternative (i.e., Route 53 bus service) would be between 46 to 51 minutes. The LPA Alternatives would each decrease transit travel time. Alternative A1 would reliably have an average travel time of 39 minutes as it would not be dependent on vehicular traffic volumes or congestion. Alternative B2 would have an average travel time of 41 minutes, with somewhat less reliability as the LRT vehicles would travel in a mixed-use lane with vehicular traffic south of Grand Boulevard. Alternative B3 would have an average travel time of 34 minutes, due to its shorter route along Woodward Avenue and fewer stations; however, travel time would also be less reliable, as with Alternative B2. The reduced travel time associated with Alternative B3, compared to the other LPA Alternatives, is due to a shorter alignment Downtown.

6.3.2 Transportation Impacts

The transportation impact information and analysis presented in [Table 6-1](#) and [Chapter 3](#) of this DEIS are preliminary, based on the best available information assembled to date by the project team. The FEIS will contain a more detailed analysis and discussion of potential operational and safety impacts and mitigation associated with the LPA Alternatives. The analysis and discussion will be based on the public comments received on this DEIS and further refinement of the alternatives. Operational and safety elements include such items as: travel lane configurations along Woodward Avenue, proposed passenger and commercial vehicle travel restrictions, non-motorized travel modifications, and emergency response access.

6.4 Transportation Equity and Environmental Justice

Transportation equity and environmental justice considerations used to evaluate the alternatives are two-fold: 1) the extent to which an alternative would improve transit service to various population segments, particularly those that are transit-dependent; and 2) the incidence of any substantial environmental impacts and their distribution among various population segments in the study area, particularly in terms of whether an alternative would have disproportionately high and adverse impacts on EJ populations. Federal EJ regulation requires that federal agencies identify and address disproportionately high and adverse human health or environmental effects that their programs, policies, and activities may have on minority and low-income populations.

Socioeconomic indicators for the study area indicate the presence of a high number of transit-dependent persons living and/or working in and visiting the study area on a daily basis ([Table 1-2](#)). The study area's residential neighborhoods comprise principally minority and low-income populations ([Chapter 4, Section 4.5.3](#)).

The LPA Alternatives would improve transit service within the study area for persons residing and/or working there, and for visitors traveling to its many and varied attractions. Benefits of access to an additional travel mode, reduced transit travel times and improved connectivity with the existing transit system would accrue to all population segments, though transit-dependents

would likely take greatest advantage of the transit improvements. While the LPA Alternatives' transportation benefits vary somewhat for the various evaluation measures (Table 6-1), each would provide transit improvements for travelers to, from and within the study area that would not occur with the No Build Alternative.

Each of the LPA Alternatives would result in some adverse environmental impacts; however, none would pose disproportionately high and adverse human health or environmental impacts to EJ populations. Conversely, EJ populations would benefit from the transit service improvements and the indirect benefit of enhanced economic development potential, particularly near LRT stations, that would result with the LPA Alternatives, but not with the No Build Alternative.

6.5 Support Economic and Community Development Goals

The cities of Detroit and Highland Park and private entities have plans for development in the study area (Chapter 4, Section 4.10.3). With the No Build Alternative, employment densities resulting from such development would follow a pattern similar to existing development, and is expected to remain constant between 2010 and 2030. Two key ongoing economic redevelopment initiatives focused on the Woodward Avenue corridor seek to align transit investments to support the corridor's growth and sustainability (Chapter 1, Section 1.5). The No Build Alternative, providing no transit improvement, would provide no support for these initiatives. The LPA Alternatives would each be consistent with and support the cities' development plans and the Woodward Avenue-focused redevelopment initiatives. Alternatives A1 and B2 would both have moderate positive impact due to their alignments through Downtown providing improved access to more attractions than would Alternative B3. Alternative B2 may offer the greatest potential for station-area development as it proposes 21 LRT stations compared to 15 and 18, respectively, with Alternatives A1 and B3.

6.6 Permits and Approvals

Several permits and approvals are required for the LPA (Table 6-2), including some related to Woodward Avenue's inclusion in the National Highway System or as the M-1 state trunk line.

Table 6-2. Permits and Approvals

Permit/Approval	Responsible Agency	Comments
Obtain Section 402/Part 31 – National Pollutant Discharge Elimination System (NPDES) Permit	Michigan Department of Natural Resources and Environment	Regulates storm water runoff.
Negotiate Lease Agreement	FHWA/MDOT/City of Detroit	Allows project facilities (rails, stations, catenary) to be constructed, operated and maintained within MDOT right-of-way (on Woodward Avenue north of Adams Street). As Woodward Avenue is also a part of the National Highway System, FHWA concurrence is necessary.
Obtain Permit to Construct	MDOT/City of Detroit	MDOT Transportation Service Center (Traffic and Construction) approves plans for maintenance of traffic during construction.
Secure Utility/Drainage Permits	Utility Owners/Operators (various)	Addresses prior rights or authority of existing utilities to require permit. Typically, sanitary and water facilities have "permits," which specify minimum cover and clearance requirements.

7.0 Public Participation and Agency Consultation and Coordination

7.1 Introduction

This chapter summarizes public participation and agency consultation and coordination during development of the environmental studies and documentation of this DEIS. Details are provided in the Public Participation and Agency Consultation and Coordination Technical Report.

7.1.1 Public Participation

Public participation strategies and activities have been used to disseminate project information and solicit and receive public input and comment on project-related issues, concerns and potential environmental impacts of the LPA. Activities and results, to date, are summarized below.

7.1.2 Public Scoping Meetings

Notice of Intent

The Notice of Intent (NOI) to prepare an environmental impact statement for the proposed Woodward Avenue LRT Project was issued in the *Federal Register* by the Federal Transit Administration (FTA) on July 30, 2010. It provided information on the scoping process purpose and meeting logistics, the project's proposed purpose and need, location and environmental setting, possible alternatives, possible effects, FTA procedures, and other pertinent project information.

Community/Stakeholder Outreach

Two public scoping meetings were held on August 14, 2010, at 11:00 a.m. and 5:00 p.m. at the Considine Little Rock Family Life Center (Auditorium) in Detroit, located at 8904 Woodward Avenue in a central part of the project corridor. A number of outreach strategies were employed to advertise the scoping meeting and encourage public attendance and participation. Print advertisements were placed in key newspapers accessible to constituents within and beyond the study area. Ads were placed in the Detroit News and Detroit Free Press on July 30, 2010. Spanish- and Arabic-language ads were placed, respectively, in the El Central Hispanic News on August 7, 2010, and the Arab American News on August 5, 2010, to accommodate the diversity of the communities in the vicinity of the project.

In addition to print advertising, 1,400 invitation postcards were printed and distributed. Of these, 350 were sent via first-class mail ten days before the scoping meetings to study area community groups; key transit, planning and other agencies; churches and block clubs; members of DDOT's Local Advisory Counsel; a list of invitees who had attended previous DDOT events; and, Woodward Corridor Transit-Oriented Development (TOD) workshop attendees. Remaining postcards were hand-distributed five days before the scoping meetings on board DDOT's 53 Woodward bus route and at heavily patronized locations in the North Woodward section of the study area. These locations included businesses in New Center One and the Fisher Building; two CVS locations; the Michigan Secretary of State's Office; the NAACP Detroit office; the main branch of the Detroit Public Library; the Rosa Parks Transit Center; and business and civic locations in Highland Park.

Approximately 75 electronic invitations were sent eight days before the scoping meetings to those who had provided e-mail addresses from previous meeting opportunities and occasions.

Scoping Meetings

More than 120 individuals attended the Public Scoping meetings. At the meetings participants were provided an overview of the project and afforded an opportunity to provide verbal and written comments. The formal 30-day scoping comment period began on August 14, 2010, and closed on September 13, 2010.

A total of 260 comments were received. One hundred and eight-one (181) comments were submitted by e-mail to the project website (<http://woodwardlightrail.com/>) and 34 were sent via the US Postal Service (USPS). Eleven written and 34 verbal comments were submitted at the meetings.

Scoping Comments

The comments were generally categorized as related to either environmental impacts or non-environmental impacts, and were further categorized by content area. The total number of comments tabulated exceeds the number of scoping commentators, as many commentators addressed multiple content areas.

For the Environmental Impact category a total of 86 comments were received (Table 7-1). The most frequently mentioned environmental comment was safety (system and pedestrian), which constituted nearly 73 percent of the comments in this category. The next mentioned concerns were environmental justice and neighborhood integrity, which were 9 percent and 6 percent, respectively. These comments reflect the substantial and adverse impacts to the human and natural environment, which are discussed in this DEIS.

Table 7-1. Number and Percentage of Environmental Impacts Comments

Total Number and Percentage	Number of Comments	Percentage
Safety	63	73%
Environmental Justice	8	9%
Neighborhood Integrity	5	6%
Noise /Vibration	3	4%
Historical	3	4%
Parks	2	2%
Air Quality	2	2%

In the non-environmental impact category 292 comments were received (Table 7-2). These comments were more widely dispersed, and as shown below, included a broader range of categories such as economic development, non-motorized transportation, parking, regional impacts, design, implementation, and costs. Comments reflecting issues such as the ones listed below will not be examined in great detail, if at all, in this DEIS, because these issues do not present substantial and adverse impacts to the human and natural environment.

Website

A public website was established for the project (<http://woodwardlightrail.com/>). Persons visiting the website can obtain information on the status of the project, reference material regarding studies completed to date, and news articles. The website is a comprehensive source of project information. The website also provides a means for the public to provide comments. Since July 2010, the site has registered 30,841 page hits.

Table 7-2. Number and Percentage of Other Impacts Comments

Total Number and Percentage	Number of Comments	Percentage
Economic Development	73	25%
Non-Motorized Transportation	55	19%
Parking	55	19%
Regional Impact	40	14%
Design	34	12%
Implementation	22	7%
Costs	10	3%
Maintenance/Vehicle Storage	3	1%

In addition to providing general project information, the project website includes a news and events archive; copies of material provide at the Public Scoping meeting; technical studies which preceded the preparation of this DEIS; Frequently Asked Questions; and, background information on the National Environmental Policy Act.

Future Outreach Activities

Public participation for the Woodward LRT project is ongoing. Upcoming activities include publication of a project newsletter; periodic updates to the project website; and a formal public hearing and comment period to receive public comment on this DEIS.

7.2 Agency Coordination and Consultation

7.2.1 Technical Committee

A Technical Committee was established during an early scoping process for the Woodward LRT Project in 2007 to provide technical input and guidance during preparation of preliminary studies and technical reports that support the DEIS. The Technical Committee was comprised of resource agencies, stakeholders and applicable City departments, and meetings were held regularly to present and discuss technical assumptions and findings of the environmental studies. It concluded meeting in 2009.

7.2.2 Interagency Coordination

Cooperating agencies are those with jurisdiction by law or special expertise regarding a proposed action. The Federal Highway Administration, Michigan Department of Transportation and the National Park Service are cooperating agencies for this EIS, the latter joining in September 2010. Participating agencies are those that may have an interest in the project. The following agencies were represented at an Interagency Scoping meeting on August 17, 2010, in addition to the FTA and the City of Detroit, which was represented by several departments.

- Michigan Department of Transportation (MDOT)
- Federal Highway Administration (FHWA)
- City of Detroit, Planning Commission, Detroit Historic Commission, Municipal Parking Department
- Southeast Michigan Council of Governments (SEMCOG)
- Detroit Economic Growth Corporation (DEGC)
- Suburban Mobility Authority for Regional Transportation (SMART)

- M-1 Rail
- Wayne County
- Detroit Transportation Commission (DTC)

Cooperating agencies' comments addressed many issues, including concept-level design details of the Downtown Design Options, traffic operations, parking impacts, pedestrian and non-motorized safety, business access during construction, and potential Section 4(f) and 6(f) issues. Participating agencies' comments addressed a similar range of issues, along with the following: regional transit needs; parking impacts; non-motorized travel; access to businesses; methodologies for assessing historic resources; and, station siting considerations. These cooperating agencies also offered assistance in collecting data for the impact analyses and commented on findings, as presented in the technical studies that were completed during the *Detroit Transit Options for Growth Study*.

Agency coordination meetings were held on October 13 and December 2, 2010 for discussion of scoping comments received, the DEIS annotated outline, a phased DEIS submission schedule, and other matters related to preparation of the DEIS.

7.2.3 Other Coordination

Coordination with the Michigan State Historic Preservation Office (SHPO) began with a June 24, 2010, tour of the project area. Subsequently, coordination efforts were formally initiated for consideration of historic resources pursuant to requirements of the Section 106 consultation process (36 CFR Part 800). While this process is separate from the National Environmental Policy Act (NEPA) environmental review process, Section 106 consultation has been done concurrently with NEPA for the Woodward Avenue LRT Project, given the federal action and funds involved in constructing the proposed project. Following issuance of the NOI, three Section 106 Consulting Parties meetings were held on September 8, October 13, and December 2, 2010. Discussion focused on a phased schedule for submission of Eligibility Determination and Effects Assessment reports; methodologies used in preparing the Eligibility Determinations and Effects Assessments; progress on these deliverables; and issues regarding the findings. For more information on the Section 106 process, please see [Chapter 4, Section 4.4](#) Historic and Archaeological Resources.