MICHIGAN OHIO UNIVERSITY TRANSPORTATION CENTER

Alternate energy and system mobility to stimulate economic development.

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TRANSIT-ORIENTED DEVELOPMENT ON DETROIT RAIL TRANSIT SYSTEM

FINAL REPORT

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16. Abstract

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This study, conducted jointly at Wayne State University (WSU) and the University of Detroit Mercy (UDM), develops transit-oriented development (TOD) programs around two selected stations along the planned light-rail transit (LRT) route in Metropolitan Detroit. This study identifies two transit stations along the Woodward Avenue corridor, proposes TOD packages for these sites, and identifies planning, economic, and institutional mechanisms for their effective implementation. The study integrates TOD with the planning and design of selected stations in the Detroit area, with the intent to maximize economic growth potential and to improve the quality of life of the citizens of the local communities and the users of the LRT facility.

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Abstract

The term transit-oriented development (TOD) is being used increasingly in transit literature, particularly in studies related to planning and design of urban rail-transit. TOD relates to the integration of diverse (but desirable) land uses with transit, both temporally and spatially, and is designed to increase transit ridership and to promote desirable land uses surrounding the station areas. Light-rail transit (LRT) stations appear to be ideal sites for TOD programs, primarily because of compatibility in their scale of operation. Currently, there are a number of transit initiatives in the Detroit metropolitan region that, if implemented, may significantly change the transportation characteristics in the southeast Michigan area.

The purpose of this study, conducted jointly at Wayne State University (WSU) and the University of Detroit Mercy (UDM), is to develop TOD programs on two selected stations along the planned LRT route in Metropolitan Detroit (Chapter 1). This study identifies two transit stations along the Woodward Avenue corridor, proposes TOD packages for these sites, and identifies planning, economic, and institutional mechanisms for their effective implementation. The study integrates TOD with the planning and design of selected stations in the Detroit area, with the intent to maximize economic growth potential and to improve the quality of life of the citizens of the local communities and the users of the LRT facility.

After network-level analysis, the project team selected, within the City of Detroit, the Masonic Temple site based primarily upon the availability of a large amount of vacant land adjacent to Woodward Avenue presumed to be at reasonable prices. For the suburban station, the Troy-Birmingham site was selected because of the steady growth in the area, the excellent level of intergovernmental cooperation by the two cities in promoting new development, and the proposed development of the Multi-modal Transit Center (MTC) and much-needed private developer support. The project team felt the site lends itself to pedestrian friendliness, considered vital for TOD.

The project level analysis, demonstrating the development of TOD packages at the two selected stations are presented in the full report along with a discussion of a set of mechanisms that can be used to implement/expedite the respective TOD packages at the two sites. In developing the TOD packages, the project team reviewed the zoning and associated regulations, and the current land uses, along with the site characteristics, both from their land use and transportation point of view, and proposed land uses that would "blend" with the current fabric.

A set of mechanisms (both general and station-specific) is also presented in recognition of the probability that the implementation of any new program, encompassing transportation-land use interface such as TOD, is likely to be hindered by different institutional barriers. A "mechanism" in this case can be looked upon as a strategy or a group of strategies (planning, economic, financial, etc.) that can be deployed through proper intergovernmental cooperation to implement the proposed development. Finally, a set of conclusions are presented at the end of the report.

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EXECUTIVE SUMMARY

The term transit-oriented development (TOD) is being used increasingly in the literature, particularly in studies related to planning and design of urban rail-transit. TOD relates to the integration of diverse (but desirable) land uses with transit, both temporally and spatially, and is designed to increase transit ridership and to promote desirable land uses surrounding the station areas. Over the last decade, there has been increased interest in North American cities, to construct light-rail transit (LRT) systems to improve mobility. LRT stations appear to be ideal sites for TOD programs, primarily because of compatibility in their scale of operation. Currently, there are a number of transit initiatives in the Detroit metropolitan region that, if implemented, may significantly change the transportation characteristics in the southeast Michigan area. A number of studies are currently underway with the intent of exploring the feasibility of constructing an LRT system along Woodward Avenue, one of the most dominant travel corridors in Metropolitan Detroit.

The purpose of this study, conducted jointly at Wayne State University (WSU) and the University of Detroit Mercy (UDM), is to develop TOD programs on two selected stations along the planned LRT route in Metropolitan Detroit (Chapter 1). Reducing the cost of transportation and congestion on our highways, and creating opportunities for economic development, are major challenges in metro Detroit at this time. TOD programs can contribute to these goals by reducing the public's dependence on automobile travel and revitalizing the local economy. An LRT system would present great opportunities to the community to address these critical needs. This study identifies two transit stations along the Woodward Avenue corridor, proposes TOD packages for these sites, and identifies planning, economic, and institutional mechanisms for their effective implementation. The focus of this study is to integrate TOD with the planning and design of selected stations in the Detroit area, with the intent to maximize economic growth potential and to improve the quality of life of the citizens of the local communities and the users of the LRT facility.

Following a comprehensive review of the current literature on TOD and recent planning efforts on LRT in the Detroit metropolitan area, the project team adopted a two-stage procedure (Network Level and Project Level) to select two stations for TOD along the proposed and current rail corridors in the region. The purpose of the network level analysis is to develop measures for identifying a set of candidate stations where TOD may be feasible based upon factors such as:

- Availability of land
- Proximity to a transit mode/station
- Proximity of adjacent land use conducive to TOD
- Pedestrian "friendliness"

The purpose of the project level analysis, on the other hand, is to develop specific TOD projects at the two selected sites within the area of influence.

The network-level analysis resulted in the initial identification of the following for sites for preliminary consideration:

1. New Center Area, city of Detroit
2. Masonic Temple Theater District, city of Detroit
3. Dearborn Amtrak station, city of Dearborn
4. Troy-Birmingham Amtrak station, cities of Troy & Birmingham

While each of the four sites were found to be appropriate for TOD, project requirement called for the selection of one site in the city of Detroit, and the other in the suburbs for the consideration of TOD. Among the two Detroit stations identified above, the project team selected the Masonic Temple site, based primarily upon the availability of a large amount of vacant land adjacent to Woodward Avenue presumed to be at reasonable prices. The New Center site, while considered more walkable and more vibrant than the Masonic Temple site, was omitted from consideration based primarily upon the nature of local real estate characterized by smalls plots of land that are spatially discontinuous, that may not lend themselves to creative and new development. The project team fully recognizes that the New Center area remains a viable candidate for TOD, based upon the current land uses and their vibrancy. The team, however, felt that the cost of assembling large tracts of land for TOD might be prohibitive.

For the suburban station, the Troy-Birmingham site was selected because of the steady growth in the area, the excellent level of intergovernmental cooperation by the two cities in promoting new development, and the proposed development of the Multi-modal Transit Center (MTC) and much-needed private developer support. The project team felt the site lends itself to pedestrian friendliness considered vital for TOD. While the exact location of the nearest LRT station on Woodward is not known at this time, the project team felt that with proper planning, the station can be integrated with the Amtrak station-site through appropriate pedestrian interfaces, thereby increasing the overall vibrancy of the general area. In the long-run, the site could have a significant and positive impact on the local economy. The Dearborn Amtrak station, even though it met all the fundamental criteria (Table 4), was considered somewhat deficient in pedestrian access.

The project-level analysis, demonstrating the development of TOD packages at the two selected stations are presented in this report along with a discussion of a set of mechanisms that can be used to implement/expedite the respective TOD packages at the two sites. The analysis presented considers the inherent similarities and differences between the two sites within the analytic framework that calls for the same intent, i.e., to propose development packages that would be pedestrian friendly; that could promote land use resulting in economic benefits, increased vibrancy, and higher quality of life; which in turn, would contribute to higher transit ridership. In developing the TOD packages, the project team reviewed the zoning and associated regulations, and the current land uses, along with the site characteristics, both from their land use and transportation point of view, and proposed land uses that would “blend” with the current fabric.

The developments proposed at the two sites encompass a variety of land uses including multi-family residential, retail, service-oriented, and other uses within the area of influence of the proposed station. Pedestrian friendliness serves as a common thread in designing the future development. The availability of large amounts of vacant land is considered a key factor at the Masonic Temple site. Much of the activity proposed at the Troy-Birmingham Amtrak site will be enhanced by the proposed MTC that would serve as the much-needed access point for SMART buses, automotive traffic, and pedestrians.

A set of mechanisms (both general and station-specific) is also presented in Chapter in recognition to the probability that the implementation of any new program, encompassing transportation-land use interface such as TOD, is likely to be hindered by different institutional barriers. A "mechanism" in this case can be looked upon as a strategy or a group of strategies (planning, economic, financial, etc.) that can be deployed through proper intergovernmental cooperation to implement the proposed development. First, a set of general mechanisms is presented that may be applied to transportation projects in general, and that may require interface with land use planning and economic development. This discussion is followed with station-specific mechanisms that attempt to relate the proposed development with strategies that may be deployed to expedite their effective implementation. Finally, a set of conclusions are presented at the end of the report.

1. INTRODUCTION

1.1. What is Transit-Oriented Development?

The term transit-oriented development (TOD) is being used increasingly in the transit literature, particularly in studies related to planning and design of urban rail transit. TOD relates to the integration of diverse (but desirable) land uses with transit, both temporally and spatially, designed to increase transit ridership and to promote desirable land uses surrounding the station areas. A desirable feature of TOD is pedestrian orientation, as demonstrated in number of recent studies. A TOD complex is typically centered on a transit station with gradually decreasing density contour lines, characterized by high density development in the center with "progressively lower density development spreading outward from the center". A formal definition available in literature is as follows [*1*]:

> "*A transit-oriented-development (TOD) is a mixed-use residential and commercial area designed to maximize access to public transport and often incorporates features to encourage transit ridership...TOD's generally are located within a radius of one quarter to one-half mile from a transit stop, as this is considered appropriate for pedestrians*."

Although the above definition of TOD does not mention any specific transit mode, current development patterns in North America suggest that urban rail transit, particularly light-rail transit (LRT) is most conducive to TOD. The focus of this study is on the integration of TOD with the planning and design of selected stations in the Detroit area, along Woodward Avenue. For the remaining sections of this report, the term "pedestrian" has been used to describe all forms of non-motorized travel (e.g., rollerblading, bicycling, skateboarding, and walking).

1.2. The Relationship Between TOD and LRT

Over the last decade, there has been an increased interest in North American cities (i.e., the United States and Canada) in constructing LRT systems in metropolitan areas with the intent of improving mobility. Other factors that have driven this trend include, but are not limited to, the following:

- Reduced negative environmental impact, compared to standard buses (powered by fossil fuels).
- Ability to carry larger passenger volumes efficiently.
- Better service reliability than standard buses.
- Reduced dependence on foreign-sourced fossil fuels (i.e., crude oil).
- Ability to generate significant economic development.
- Less capitally-intensive than rapid-rail transit (RRT) systems.
- Better societal image than standard buses.

A preliminary search conducted by the project team indicated that there are [*2*]:

- 27 cities in North America that have LRT systems in operation.
- 13 cities under extension or under construction for LRT
- Another 40 cities where LRT systems have been approved or proposed (including the Detroit metropolitan area).
- At least 20 of the 27 cities that have constructed LRT have implemented some type of TOD program surrounding transit station locations.

The current literature indicates that many of the TOD programs are on their way to achieving their desired goals of generating higher passenger ridership than (standard) buses, creating significant economic development, and reducing travel congestion. One recent study found that a major economic advantage of TOD is a significant reduction in transportation costs for households located in or around TOD areas [*3*]. The study shows that households with sufficient access to transit stations (i.e., considered to be within a five-minute walk of the transit station), spend about nine percent of their household income on transportation, while the corresponding figures of the average household and households in the suburbs in the United States are 19 percent and 25 percent, respectively. The recent increases in crude oil prices are likely to cause this gap to increase even further.

Another study found that TOD-type housing options in four metropolitan areas produced significantly less traffic than what is generated by a comparable conventional development [*4*]. At the national level, these savings are likely to result in less dependence on foreign oil. Lastly, recent experience with LRT in different cities show that for every dollar of investment in LRT, there is an additional five to six dollars worth of economic development generated by TOD programs [*5*].

Thus, the major benefits of TOD can be summarized as follows:

- Reduced traffic congestion, traffic hazards, and environmental pollution.
- Increased transit ridership resulting from denser development near the station areas.
- Potential for significant economic development in proximity to TOD.
- Reduced household spending on transportation, with a focus on lower-income households.
- Reduced dependence on non-renewable energy.
- Promoting walkable communities and desirable land uses.
- Potential to reduce urban sprawl.
- Vibrant station centers, conducive to pedestrian travel.

The rendering in Figure 1 depicts an ideal configuration for a TOD, a mixed-use redevelopment proposed in the city of Beaverton, OR (a suburb of Portland) [*6*]. In the foreground, passenger boarding platforms and shelters for an LRT system can be observed, while in the background a number of high-density buildings (presumably mixed-use, where both retail and residential land uses are represented) have been sited within a pedestrian plaza. The TOD site has been complemented by street lighting, landscaping, and wide walking paths, all at pedestrian scale.

Figure 1. Ideal TOD Site Configuration
(Source: The Urban Renaissance Group and Group Mackenzie)

1.3. Transit in Metropolitan Detroit, Michigan

1.3.1. Overview:

The Southeast Michigan Council of Governments (SEMCOG) is the metropolitan planning organization (MPO) designated for the southeast Michigan region encompassing seven counties: St. Clair, Macomb, Wayne, Oakland, Livingston, Washtenaw, and Monroe (Figure 2) [*7*]. The current population of the southeast Michigan area of four million places it among the top five regions in the country. Long-term predictions conducted in the early 2000s indicate significant growth in population, households, and employment during the upcoming two decades.

Figure 2. SEMCOG Area Map
(Source: SEMCOG Website)

Approximately 192,000 households in the SEMCOG region have been identified as households without access to a private automobile. Despite this figure, the modal split for transit in the region is very low: only 2.5 percent of people commuting to their place of employment do so using public transit (mostly captive riders). In contrast, 94 percent of commuters travel to work by car, van, or light truck. Thus, the Detroit metropolitan area cannot be designated as a transit-oriented community.

Regions with similar population bases in North America (e.g., Washington, D.C., San Francisco, CA; Boston, MA; and Toronto, Canada) have successfully created and maintained a transit base by attracting choice riders, thereby significantly reducing congestion levels, environmental pollution, and dependence on fossil fuels. The common ingredient among these cities is some type of rail-based travel mode, either LRT or RRT. Choice riders are those commuters who choose to travel by way of public transit, despite the fact that they own at least one private automobile. Very little emphasis, if any, has been placed by policy makers in this region to attract these riders. This is evident from the fact that, while the region ranks fifth in population in the country, it ranks 23rd both in the number of miles and hours of transit services provided [*8*]. Furthermore, the region ranks 21st in the amount of local dollars spent on transit.

1.3.2. Historical Perspective:

As stated in the SEMCOG report, many regions in the United States spend more than three times as much, per capita, for transit services than in the Detroit metropolitan area (Detroit: $59.00, Cleveland: $124.00, San Francisco: $255.00) [8]. Other factors that have limited the availability of transit activities in the region include: the lack of consensus among the city of Detroit and adjoining counties/townships about the structure, governance and funding of a regional transit system, and lack of support among the public at large for a viable transit base.

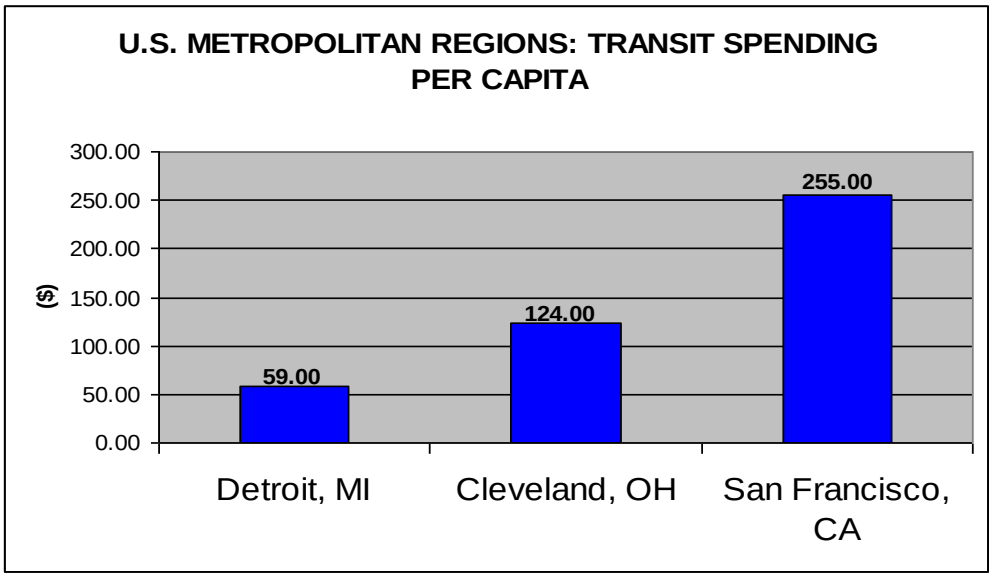

Figure 3. United States Metropolitan Regions: Transit Spending Per Capita

This phenomenon is exemplified by a number of missed opportunities experienced in obtaining transit resources. For instance, the bulk of a $600 million commitment made by the Federal government in 1974 was "lost" because of a general lack of consensus on the programming and planning aspects for a transit system. Similarly, the first regional transit agency in the Detroit metropolitan area, Southeast Michigan Transportation Authority (SEMTA), was created in the early 1970s without a dedicated local transit support base (unlike other metropolitan regions in the country), thereby limiting the region's ability to compete for federal grants. Lastly, no transit allocations were made out of increased gasoline tax revenues in the state, resulting from 1997 legislation, despite the fact that up to ten percent of these funds could be dedicated for transit. Transit services are currently provided by three major agencies in the Detroit metropolitan area:

1. Detroit Department of Transportation (DDOT): service within the city limits of Detroit, Hamtramck, and Highland Park.
2. Suburban Mobility Authority for Regional Transportation (SMART): service for the Detroit metropolitan area, with limited service within the Detroit city limits (including the cities Hamtramck and Highland Park).
3. Detroit Transportation Corporation (DTC): Service for the people mover system.

DDOT and SMART provide bus route service for over 100,000 transit miles per operating day, generating a daily ridership of over 170,000. A number of other transit services are available in the SEMCOG area for their respective local communities:

4. Ann Arbor Transportation Authority (AATA): service for the city of Ann Arbor.
5. Blue Water Area Transportation Commission (BWATC): service for the city of Port Huron.
6. Lake Erie Transit (LET): service for the city of Monroe and Monroe County

1.3.3. Current Developments:

Lately, there has been some renewed interest in rail transit investments within the SEMCOG region. This interest has resulted in a number of studies conducted by both public and private sector stakeholders [*8,9,10,11,12,13,14*]:

- SEMCOG has identified three major travel corridors: Woodward Avenue (connecting the cities of Detroit and Pontiac), Interstate 94/Michigan Avenue (connecting the cities of Detroit and Ann Arbor), and Gratiot Avenue (connecting the cities of Detroit and Mt. Clemens) [*8*].
- A 2001 SEMCOG study recommended rapid transit on 12 regional corridors in the region covering approximately 259 miles. Speed-link services, which would consist of rubber-tired systems on dedicated lanes (i.e., BRT) were recommended along Woodward Avenue, of the 12 corridors identified [*8*].
- A later study, conducted by the Michigan Department of Transportation (MDOT) investigated the potential for deploying traffic signal pre-emption along the Woodward Avenue corridor. This study indicates that signal pre-emption can be an effective tool for improving the flow for BRT through signalized intersections along Woodward Avenue.
- The Metropolitan Affairs Coalition and the Detroit Regional Chamber (DRC) developed a three-tiered rapid transit system, comprising of both fixed and flexible-route local services [*9*].
- Past transit studies have identified the three travel corridors for viable rapid-transit systems, with the first two having the highest potential for success. Transportation experts have expressed that a transit corridor developed along Woodward Avenue could attract riders from corridors parallel to it (e.g., Interstate 75, Michigan Highway 10/John C. Lodge Freeway), over and above Woodward Avenue. Similarly, any transit system developed along I-94/Michigan Avenue could also draw riders from its parallel east-west travel routes (e.g., Interstate 96, Ford Road/Michigan Highway 153). The potential for transit development along the Gratiot Avenue corridor has never been fully investigated.
- The "Woodward Corridor Transit Alternative Study", conducted in 2000 by the Detroit Transportation Corporation, recommended that both bus-rapid transit (BRT) and LRT be further investigated [*10*].
- A recent SEMCOG study explored the possibility of commuter rail transit (CRT) development between the cities of Detroit and Ann Arbor, with a connection to the Detroit Metropolitan Wayne County Airport (DTW), located in the city of Romulus. A myriad of alternatives, ranging from BRT, LRT, and CRT, (following several of alignments) were examined.[1]
- A recent study conducted by a consultant for both SEMCOG and the city of Detroit, explored the feasibility of constructing an LRT system in the city of Detroit from the central business district (CBD) to the northern city limits at Eight Mile Road The proposed system would follow the alignment of Woodward Avenue with an approximate track length of nine miles [*11*]. The capital cost for the system (including rail track, train vehicles, and station structures) was estimated at $373 million.

[1] "Ann Arbor-Downtown Detroit-Metro Airport Transit Study," prepared for SEMCOG, Parsons Corporation, August 2006.

- The M1-RAIL organization is a non-profit, public/private partnership of Detroit-area business and civic leaders that intends to plan and construct an LRT system within the city of Detroit to stimulate economic development. The proposed system will operate along a 3.4-mile route on Woodward Avenue from the Detroit riverfront (W. Jefferson Avenue), northward to the New Center district (W. Grand Boulevard). The proposed LRT system differs from that of the previous studies, in that the planned stations are to be located less than 1/2-mile from one another. Given the shorter distances planned for spacing, the M1-RAIL partnership envisions the proposed system as an urban connector rather than a commuter facility. The organization has so far raised $125 million for the preliminary planning and pre-construction studies of the system [*12*].
- The cities of Troy and Birmingham (located in Oakland County), along with their respective chambers of commerce, have collaborated with one another to acquire funding for the construction of a multi-modal transit center: the Troy-Birmingham Multi-modal Transit Center (MTC). The proposed MTC is located along a railroad route shared by Canadian National Railway (CN) and Amtrak that borders the two cities. The cities have successfully combined their efforts to gain political support at the local, state, and Federal government levels. Such efforts have resulted in the allocation of approximately $8.5 million in Federal funding from the American Recovery and Reinvestment Act of 2009 (ARRA), dedicated to the MTC. The MTC will provide access to SMART, Amtrak, private sedan services, and the Oakland/Troy airport [*13*,*14*].

1.4. Objectives

The objectives of this study are as follows:

1. Identify factors that contribute to the realization of TOD benefits at LRT transit stations.
2. Identify two stations in proximity to the proposed Woodward Avenue LRT corridor, with one located in the city of Detroit and another in the suburban Detroit area that could serve as candidates of TOD, based upon factors identified.
3. For each station identified, develop separate TOD packages (i.e., a combination of mixed uses) in a functional form with due consideration given to the zoning and land use plans of the respective city which will improve quality of life for the surrounding residents.
4. Quantify the packages into appropriate units of development for sketch planning purposes and conduct economic analysis for testing viability of these TOD projects.
5. Develop a set of strategies for implementing TOD packages around LRT station areas (e.g., tax increment financing (TIF), land banking, density booms).

Reducing the cost of transportation, minimizing congestion of our highways, reducing dependency on foreign fossil fuel, and reducing adverse environmental impact are the primary national priorities of today. By exploring the feasibility of implementing TOD programs around proposed LRT stations along the Woodward corridor, this study contributes to the attainment of objectives and priorities of the U.S. Department of Transportation (USDOT) and other federal agencies: Federal Highway Administration (FHWA), Environmental Protection Agency (EPA), Department of Energy (DOE), and Department of Housing and Urban Development (HUD).

2. STATE OF THE PRACTICE

In order to propose techniques, mechanisms, tools, and configurations for transit station locations in Metropolitan Detroit, the project team endeavored to review the current state of the practice for TOD planning. Significant effort has been exerted to seek out information for TOD's that have been planned in metropolitan areas with new LRT systems, particularly in areas where transit service (prior to the construction of LRT) was limited. Lastly, this section focuses on ideal, rather than developments that are simply adjacent to transit facilities. The latter of the two types of developments are typical of land uses in proximity to newly constructed transit facilities.

2.1. Center for Transit-Oriented Development

Funded by Congress in 2005, the Center for Transit-Oriented Development (CTOD) serves as a national clearinghouse on best practices for TOD. It is a national nonprofit effort that works with the Federal Transit Administration (FTA) and the U.S. Department of Housing and Urban Development in matters related to transit and land use policy and funding.
Along with best practices, CTOD also provides research and tools to support market-based TOD and also provides communities with technical assistance regarding TOD [*15*]. The project team received valuable information from CTOD concerning development around transit stations.

CTOD studied neighborhoods located near transit and notes that they were more racially and socio-economically diverse than other neighborhoods.

Through research, CTOD has found that the demand for housing in areas that are near public transportation and that feature walkable neighborhoods with mixed-uses is on the rise due to changes in demographics and increasing traffic problems. Table 1 is a modified table taken from the CTOD brochure *5 Years of Progress* that shows the expected increase of system size of each region from the year 2005 to the projected sizes in the year 2030. Whether a system is small, medium, large, or extensive depends on the number of stations in the system. The designations are as follows: small (24 or few stations), medium (25-69 stations), large (70-200 stations), extensive (201 or more stations). The transit zone households from the year 2000 to the projected totals in the year 2030 are also shown in the table. It is observed that growth in household near transit zone will vary from as low as 56.39 percent (Galveston) to as high as 3969.44 percent (Sacramento) during next 30 years (base line year 2000). This trend will create a tremendous potential for TOD around transit stations [*16*].

Table 1. National Demand for TOD Housing

NATIONAL DEMAND FOR TOD HOUSING						
TRANSIT REGION	TRANSIT ZONES 2005	SYSTEM SIZE 2005	SYSTEM SIZE 2030	TRANSIT ZONE HOUSEHOLDS 2000	2030 PROJECTED TRANSIT ZONE HOUSEHOLDS	PERCENT INCREASE IN TRANSIT ZONE HOUSEHOLDS
New York	955	Ext.	Ext.+	2,876,160	5,371,866	86.77
Los Angeles	113	Large	Ext.	261,316	1,708,447	553.79
Chicago	401	Ext.	Ext.+	787,204	1,503,638	91.01
San Francisco Bay	286	Ext.	Ext.+	409,497	832,418	103.28
Philadelphia	370	Ext.	Ext.+	506,058	809,058	59.87
Boston	288	Ext.	Ext.+	396,261	750,726	89.45
Washington	127	Large	Ext.	234,202	688,582	194.01
Portland	108	Large	Ext.	72,410	279,891	286.54
Miami	60	Med.	Large	62,595	271,326	333.46
Dallas	48	Med.	Large	46,429	270,676	482.99
Atlanta	38	Med.	Large	44,542	228,430	412.84
Baltimore	61	Med.	Large	70,303	198,594	182.48
San Diego	56	Med.	Large	65,743	187,300	184.90
Houston	18	Small	Med.	12,259	181,331	1379.17
Seattle	29	Med.	Large	29,492	159,781	441.78
Denver	24	Small	Large	17,881	138,207	672.93
Minneapolis-St. Paul	17	Small	Med.	18,703	123,776	561.80
Tampa Bay Area	10	Small	Med.	3,024	117,012	3769.44
Sacramento	55	Med.	Large	51,179	107,441	109.93
Pittsburgh	68	Med.	Large	42,792	98,349	129.83
St. Louis	28	Med.	Med.	21,438	94,475	340.69
Cleveland	49	Med.	Large	53,649	86,733	61.67
Las Vegas	9	Small	Med.	8,257	79,448	862.19
Charlotte	10	Small	Large	3,752	76,931	1950.40
New Orleans	18	Small	Med.	31,685	64,160	102.49
Salt Lake City	22	Small	Med.	20,023	63,328	216.28
Memphis	23	Small	Med.	7,269	56,303	674.56
Buffalo	16	Small	Small	19,183	32,616	70.03
Little Rock	11	Small	Med.	1,100	26,434	2303.09
Galveston	15	Small	Med.	5,821	12,029	106.65
Syracuse	8	Small	Small	6,489	10,147	56.37
Total	3349	-	-	6,189,147	15,209,786	145.75*

** Note: Percent increase of transit households from 2000 to 2030. This is not the total percentage of the column.*

(Source: http://www.reconnectingamerica.org/public/display_asset/ctod5yearbrochure)

2.2. Successful Implementation of TOD

In the planning literature, there is no universally-accepted premise about what a TOD should accomplish. Therefore, past projects that have been completed, but labeled as failures, may only have been recognized as such since there is no benchmark for success [*17*]. For the purpose of this study, the project team has considered successful TODs to be characterized by meeting the following benefits:

1. A strong relationship between the land use surrounding a transit station, and the transit facility itself (e.g., more dense development close to the facility, less dense away from it).
2. Developments where facilities have been planned with pedestrians and transit riders in mind.
3. Developments that have had a positive impact on the areas adjacent to transit stations, following their completion (e.g., increased property values, new development, increased pedestrian activity).

2.2.1. Ohlone/Chynoweth TOD - San Jose, CA:

The Ohlone/Chynoweth TOD is located along the Ohlone/Chynoweth-Almaden LRT route, operated by the Santa Clara Valley Transportation Authority (VTA) in San Jose, CA. The route is just over one mile in length, serving three stations, where the Ohlone/Chynoweth station serves as transfer point to the Alum Rock/Santa Teresa line. The Ohlone/Chynoweth-Almaden route was opened for service in 1991 [*18,19*].

Historically, most of the San Jose area has experienced land development that has been largely driven by developers. Thus, the area surrounding the Ohlone/Chynoweth TOD reflects a suburban pattern around a single-family residential neighborhood. However, the city government began to implement more transit-friendly policies after the development of the VTA LRT system: transportation demand management, zoning regulations, master plans, etc.. Those political and institutional mechanisms, along with a $250,000 grant obtained (by VTA) from the Federal Transit Administration, facilitated the planning for this particular station TOD [*20*]. The Ohlone/Chynoweth TOD once existed as a park-and-ride facility, where the bulk of the land was utilized as surface parking with more than 1,000 spaces. The station area was reconfigured with the intent to better utilize the available land for transit-based mobility, to reduce auto-orientation, and to incorporate a mix of land uses:

- Reduction of park-and-ride spaces from 1,100 to 240.
- Medium-density affordable housing development made up of 330 units.
- Addition of 4,400 square feet of retail space.
- Child daycare facility.
- Transit-friendly amenities, such as indoor bicycle parking (with lockers), HVAC, low-floor boarding platforms, and payphones.

In a study conducted by the Mineta Transportation Institute (MTI), the Ohlone/Chynoweth TOD was determined to have had a positive impact on the single-family residences. Using a distance-based empirical relationship, the study found that for every 100 ft decrease in the distance between a home and the TOD, the average sale price for the home increased by $10,500. Additionally, the number of automotive trips generated by the TOD is expected to be somewhat lower than those generated by the original park-and-ride facility [*21*]. Because each of the three conditions listed above have been realized, the Ohlone/Chynoweth TOD has been considered a success.

2.2.2. Center Commons TOD - Portland, OR:

The Center Commons TOD is located along the Red, Blue, and Green lines of Portland's Metropolitan Area Express (MAX) LRT system operated by the Tri-County Metropolitan Transportation District of Oregon (TriMet) [*22*]. The MAX Blue line, connecting suburban Gresham with the Portland CBD was constructed in 1986 as the first LRT system in the area. Today, Portland's regional governing body, Metro, is renowned for having the most aggressive smart-growth, sustainable development and TOD policies in the United States and has been used as a benchmark for other planning agencies for implementing similar policies [*23*].

Prior to the implementation of Metro's TOD policies, most development that took place near transit stops was merely transit-adjacent, where densities were often lower than those typical of single use, saturated with surface parking facilities. Metro's current policies encourage developers to construct multi-story structures with retail space on the lower floors and significantly reduced surface parking facilities.

The Metro planning process has also been successful in creating financing options to facilitate land-use planning. Center Commons, for instance, was one of nine LRT stations that utilized a $3.5 million FTA grant for TOD implementation. This TOD has also successfully integrated a mix of mixed-income rental and for-sale residential units in the same 4.9 acre parcel of land. Additionally, 75 percent of the units constructed were marketed toward residents earning less than the area's median income. The Center Commons TOD boasts the following amenities:

- 314 residential units (combination of affordable rentals and for-sale units, as well as market-rate units).
- Improved pedestrian paths between the TOD site and the adjacent transit station.
- Conservation of a number of large, mature oak trees that remained from the previously abandoned site.
- Located five miles outside of Portland CBD (strategic location for city workers), with an estimated 19 minute travel time.
- Proximity to both MAX and bus services (located approximately 1/4-mile and 1/3 miles away, respectively).
- Infill location in an area where mature flora (trees), a large grocer, a stable single-family residential neighborhood, and a hospital had already existed.

Based on the results of a survey conducted within the TOD, it has been determined that transit mode share for work trips increased from 31 to 46 percent after residents moved into the units, while that for non-work trips increased from 20 to 31 percent [*24*]. Because Center Commons has targeted and attracted occupants that were interested in having better access to transit, and because amenities have been developed to suit transit riders, the TOD program has been considered to be very successful.

2.3. Additional General TOD Information

Upon review of TOD experience of other cities, the project team concluded the following:

- Neighborhoods near transit are more racially and socio-economically diverse than other neighborhoods.
- The growth of households within transit zone will be significant in next 20 years.
- For every 100-foot-decrease in distance between a home and the TOD, the average sale price of the home increased by $10,500.
- After implementation of TOD, the transit mode share of work trips increase from 31 to 46 percent, while non-work trip increase from 20 to 31 percent.

3. METHODOLOGY

The TOD project team initiated the study by seeking objective metrics regarding the possible implementation of TOD in the Detroit metropolitan area. The most critical of such metrics was the location of the area of interest relative to a transit line, proposed or existing. Methods used for this analysis in this effort were conducted on two separate levels: network and project. The network level approach was used to select two station sites for TOD. The project-level approach was used to prescribe probable TOD packages for each station.

3.1. Network-Level Analysis

The purpose of the Network-Level analysis is to develop a measure for identifying a set of candidate stations where TOD programs may be feasible. Potential stations were judged against a set of criteria in order to determine possible TOD eligibility.

3.1.1. Overview:

A set of candidate TOD sites in the Detroit metropolitan area were identified based on the following criteria:

1. Availability of blighted parcels of vacant land.
2. Proximity to a transit mode or facility that is along, or in proximity to, a well-defined travel corridor.
3. Proximity to land uses that may be improved by TOD, through increased foot traffic from growth in transit ridership (e.g., major centers of employment, tourist attractions, and entertainment facilities).
4. Availability of facilities that are conducive to pedestrian mobility: sidewalks, pedestrian-scale land development, street lighting, pedestrian crosswalks.

Criterion number one relates to the assumption that a new development would be less capital intensive if it were to be constructed from the "ground up", as opposed to seeking the redevelopment of an existing structure through demolition. For instance, the J.L Hudson department store, formerly located on Woodward Avenue in the Detroit CBD, was at one time the tallest store in the United States and the second largest by total square footage (second only to the Macy's flagship store located in New York City). In October of 1998, the 33-level (23 of which were above street-level) 2.2 million square foot building was imploded at an upfront cost of $15 million.

Additional societal costs were incurred upon the completion of the implosion, primarily the cleanup of demolition debris, as well as, structural and utility damage incurred by the Detroit People Mover system located nearby [*25*,*26*]. Using the J.L. Hudson department store as (an upper boundary example), the cost of imploding the building (in 1998 dollars) was approximately $6.82 per square foot of space.

$$UnitCost_{IMPLOSION} = \left(\frac{TotalCost}{TotalArea}\right) = \left(\frac{\$15{,}000{,}000}{2.2E6\,ft^2}\right) = \frac{\$6.82}{ft^2} \qquad (1)$$

This estimation, while an extreme case, was considered relevant to the areas in and around the Detroit CBD, where a number of vacant high-density, high square footage buildings remain. The purpose of this example is to illustrate the prohibitive cost associated with the demolition of old structures, thereby increasing the capital cost of the project.

The second criterion reflects one of the most critical intended effects of TOD: accessibility. Most riders access transit modes using park and ride facilities, which require connectivity via an automotive travel corridor (e.g., major freeways, arterials) or by walking (or bicycling). In each of the two methods of access, the TOD serves as a portal to the transit mode in question (e.g., CRT, LRT, RRT, BRT). The third criterion places greater value on potential sites where the use of existing transit services has been observed (e.g., SMART, DDOT, Amtrak). The use of this criterion would imply that the addition of TOD would have a positive effect on transit ridership and the quality of life for those communities served. It has been assumed that the addition of facilities and land uses conducive to non-vehicular travelers in an area around transit activity centers would improve the walkability and increase mobility for all demographics of the affected population (e.g., captive and choice riders, disabled, elderly).

The final criterion relates to the physical layout of the potential TOD site. From a pedestrian standpoint, the walkability of an area is derived from the facilities in place there. For instance, a typical "big-box" retailer located on a high-speed divided arterial highway (e.g., a posted speed limit of 45 MPH along Eight Mile Road) is unlikely to be welcoming to pedestrians in the area. Such developments are often surrounded by large surface parking facilities, without paths or clearance for pedestrians to travel from the side of the road to the structure. Thus, sites with poor access for pedestrians are not suited for TOD.

In order to quantify the walkability of a candidate site for TOD, Walk Score (a tool developed with the intent of scoring geographic locations on their pedestrian-friendly attributes) was utilized. The algorithm used by its developers ranks addresses on an additive scale ranging from 0 to 100 (representing descriptions of "Car-Dependent" to "Walker's Paradise," respectively; Table 2) [*27*]. Using this approach, points are awarded to the address in question according to the number of destinations in its proximity, and their relative distance to them as well. Points of pedestrian attraction beyond one mile from the entity in are not counted in the "Walk Score."

Table 2. Walk Score Thresholds

WALK SCORE	DESCRIPTION	
90 - 100	"Walker's Paradise"	Daily errands do not require a car.
70 - 89	"Very Walkable"	Most errands can be accomplished on foot.
50 - 69	"Somewhat Walkable"	Some amenities within walking distance.
25 - 49	"Car-Dependent"	A few amenities within walking distance.
0 - 24	"Car-Dependent"	Almost all errands require a car.

(Source: Walk Score, "How it Works")

The types of destinations considered in calculating the walk score include, but are not limited to, the following [*28*]:

1. **Transit Modes**
2. **Retail Land Uses**
    a. Grocery
    b. Restaurants
    c. Coffee Shops
    d. Bars
    e. Movie Theaters
    f. Bookstores
    g. Drug Stores
    h. Hardware Stores
    i. Clothing & Music
3. **Municipal Land Uses**
    a. Libraries
    b. Parks
    c. Schools

3.1.2. Additional Criteria for TOD Site Selection:

The following criteria, in addition to proximity to transit (as mentioned in section: *Methodology*), were considered for the selection of candidate TOD sites in the Detroit area. These criteria are intended to capture characteristics of a site that may be most critical to transit riders. Additionally, Walk Score developers have identified many of these criteria as weaknesses in the algorithm used to calculate scores [*28*]:

- **Aesthetics**: refers to street landscaping, outdoor artwork/sculptures, and architectural quality and design of structures in proximity to areas where pedestrians may travel. Neighborhoods that are aesthetically pleasing are expected to have a positive effect on the pedestrian experience.
- **Sidewalk quality and condition:** refers to the actual width of the walking path as well as the condition of the pavement (i.e., cracks, surface friction). Walking areas that are in poor condition, or without pavement at all, are expected to inhibit pedestrian mobility.
- **Topography:** refers to the change in elevation between any two points. Drastic changes in elevation or steep inclines/declines are expected to inhibit pedestrian mobility.
- **Climate:** areas having climates with extreme weather conditions are not likely to be conducive to pedestrian mobility (e.g., high heat and dry winds typical of the climate in Yuma, AZ).
- **Land development configuration:** streetscape and curb designs may potentially influence the travel behavior for pedestrians. For instance, sidewalks that are farther from developments may not generate the same amount of foot traffic as those in a typical urban environment where sidewalks and structures are immediately adjacent to one another.

- **Safety/Crime:** the frequency and severity of crimes committed in a neighborhood are expected to have a significant effect on the amount of pedestrian travel generated by the land uses there. Choice transit riders and consumers may be particularly sensitive to this attribute.
- **Roadway geometry and classification:** the types of roadways in the areas where pedestrians may travel may adversely affect their travel behavior (choosing one walking route in favor of another). For instance, a sidewalk near an intersection of two arterial roads with high posted speed limits and poor-maintained crosswalks may not be attractive. The elderly and young children are particularly sensitive to such areas.

3.2. Project Level Analysis

The purpose of the Project Level analysis is to develop a TOD package for each selected site (an outcome of Network level analysis). The process of identifying TOD packages at each selected site would require detailed analyses of the existing conditions (e.g., population, land ownership) and the possible barriers that may inhibit TOD implementation (e.g., zoning definitions and classifications).

3.2.1. Development Inventory:

In order to develop a TOD package at any site, it is first necessary to assess the type of existing development within some pre-defined influence boundary. For TOD projects, that pre-defined boundary should be established as no greater than a 1/2-mile walking distance (to capture the upper boundary of comfortable walking distance for transit riders and TOD inhabitants), and the types of development that may be of interest include, but are not limited to, the following:

- Residential (e.g., for-sale, rental, senior, low-income)
- Retail/Service/Commercial (e.g., eateries, apparel, drugstore)
- Public/Civic/Institutional (e.g., parks, pedestrian plazas/common areas, schools, churches, hospitals)

This data will enable developers to determine what type of new businesses to include among the existing development to allow for growth and expansion.

Table 3. Sample TOD Site Ranking Matrix

#	LOCATION NAME	CITY	MAJOR THOROUGHFARES	TRANSIT SERVICE?		TRANSIT MODES (AGENCY)	MAJOR ATTRACTIONS / EMPLOYMENT CENTERS / LANDMARKS?	VACANT / BLIGHTED LAND?		# ACRES	SIDEWALKS?		WALKSCORE (out of 100)
				YES	NO			YES	NO		YES	NO	

3.2.2. Population Characteristics:

Along with noting the existing developments in a TOD area, the characteristics of the surrounding area's population must be analyzed when considering development/redevelopment. Developments that cater to the needs of this population, while attracting new population would be considered highly desirable. For example, if part of the population in a TOD area consists of people of a certain demographic (elderly, low-income, etc.), one may consider including businesses that not only accommodate their interests, but also those that are likely to attract new people.

3.2.3. Land Ownership:

Available land may have to be transferred from an existing owner to a developer in order for development to occur. Rather than owning several parcels of land scattered throughout an area, a developer may wish to assemble parcels of land in close proximity into larger blocks to facilitate desirable development patterns.

3.2.4 Zoning:

Zoning is a primary determinant of the types of land uses permissible under the current law, and may be a major issue when dealing with any type of development/redevelopment project. With the TOD goal in mind, zoning definitions/classifications may have to be adjusted to allow for a specific type of building/project. The feasibility of such zoning changes under the current city ordinances must be carefully assessed.

3.2.5. Funding:

A key factor to the successful implementation of any TOD program is the availability of funding. Funding can come in various forms, such as: grants, special tax provisions, incentives, private donations, etc. Amidst all the planning barriers, funding may be the last hurdle to be cleared before project ground-breaking takes place.

3.2.6. Barriers to Implementation:

Although there are many factors in each of the TOD sites that are believed to ease the implementation process (e.g., high transit ridership, existing vibrant community, proximity to frequently-traveled travel corridors), there may also be underlying factors that could inhibit TOD implementation as well. Examples of those factors include:

1. Assembly of disaggregate and scattered land parcels (properties may be difficult to purchase or obtain)
2. Costs of infrastructure improvements (e.g., sidewalk/curb construction, storm water drainage, pedestrian and vehicular traffic signals, street lighting)
3. Vehicular and pedestrian traffic issues (e.g., capacity, safety, operations).
4. Financing challenges (e.g., sources of funding, tax revenue)
5. Lack of coordination between TOD stakeholders (e.g., public versus private organizations; local/state/federal governments, private property owners).
6. Market conditions (lack of demand for new developments)

With regard to real estate, the acquisition of land for development projects may be delayed, and in some cases blocked altogether, by land owners who are unwilling to negotiate. On the other end of the spectrum, the topic of eminent domain often invokes considerable opposition from the public. For instance, the Poletown industrial development located in the city of Detroit displaced a community of more than 4,000 residents for the construction of a new General Motors plant in the 1970's. A small group of those displaced challenged the city of Detroit and General Motors, and would eventually take their argument to the Michigan Supreme Court, only to be defeated in a 1981 ruling: Poletown Neighborhood Council v. City of Detroit. The power of eminent domain has been a sensitive and controversial topic, and has been challenged in many cities in the U.S. [*29*].

The use of eminent domain for the sake of economic development remains blocked by the state of Michigan constitution, as the result of the 2004 Michigan Supreme Court ruling in the case of County of Wayne v. Edward Hathcock. In that case, the court justices expressed that the state law allowing eminent domain for public use was interpreted, at the time, to favor those leading the movement for the Poletown development. The law generally allows land to be taken if it is to be used for purposes benefiting the public [*30*].

Although the ruling was considered a victory for those supporting the rights of private property owners, it simultaneously became a barrier to the planning and implementation of development projects, particularly, TOD projects that often require significant amounts of (often disaggregate) land parcels. In the following sections, factors that may inhibit efforts to implement TOD at each of the locations selected for this study will be discussed.

Another potential mechanism is use of tax abatement, zoning modification, etc. through the concept of consent judgment. This can be applied in a legal sense, and an example of use is the land designation for the Troy-Birmingham Multimodal Transit Center. In this case, Grand Sakwa (the land owner) agreed to give a piece of land to the cities of Troy and Birmingham, with a major stipulation; they had to start development on the site within a specified time frame or else the land would revert back to Grand Sakwa ownership. The cities of Troy and Birmingham were able to secure sufficient funding to allow for development on the land within the specified time frame, thus fulfilling the agreement set forth by Grand Sakwa.

4. NETWORK LEVEL ANALYSIS / SITE SELECTION[2]

Based on a set of factors (as presented in *Network Level Analysis*) such as availability of vacant land, proximity of transit corridor, pedestrian friendly environment and others, the following four sites were selected for the preliminary consideration of this study:

1. New Center - New Center District, city of Detroit
2. Masonic Temple Theater District - Midtown/Downtown District, city of Detroit
3. Dearborn Amtrak station - Fairlane Town Center District, city of Dearborn
4. Troy-Birmingham Amtrak station - Rail District, cities of Troy and Birmingham

The site locations, relative to the Detroit metropolitan area, are depicted as black stars in Figure 4. All but one of the sites considered are located within Wayne County, the exception, site 4, is located in Oakland County. Eight Mile Road, depicted as a grey line in the east-west direction, serves as a physical boundary that mirrors the county line. Site numbers 1, 2, and 4 are located along the proposed Woodward LRT alignment, where Woodward Avenue has been highlighted by the red line in Figure 4. Site number three, the Dearborn Amtrak station, is located along the proposed Interstate 94/Michigan Avenue CRT alignment. Each of the four candidate locations are shown below:

Figure 4. Location of Candidate TOD Sites

[2] Data collected for this chapter were obtained in the period between August 2009 and March 2010.

4.1. New Center

Detroit's New Center district is home to a number of centers of employment and entertainment. The area was first developed in the early 1920's by a group of automotive pioneers wishing to construct their offices within the city of Detroit. At that time, the City was experiencing an economic boom fueled by the private automobile industry and it was difficult to acquire large tracts of land in the central business district. Hence, the New Center area is regarded by many as one of the first major suburban centers in the United States.

The New Center is located near the intersection of Woodward Avenue and W. Grand Blvd., approximately 3.4 miles north of the Detroit River. The most prominent buildings/attractions are described as follows. Their locations, as well as the location of the Amtrak CRT route (depicted as a purple line) are shown in Figure 5. Images of the three buildings considered major landmarks within the city are listed below, and shown in Figure 6 [*31*,*32*,*33*]:

- **Cadillac Place**: this building is located at the southeast quadrant of the intersection of M-10 and W. Grand Boulevard, and served as the world headquarters for the General Motors Company (GM) from 1923, when the building was constructed, until 1996 when the company relocated into the Renaissance Center along the Detroit River in the Detroit CBD. The building is currently occupied by the State of Michigan.
- **Fisher Building:** this building, as well as Cadillac Place, has been listed on both the National Historical Landmarks (NHL) and National Register of Historic Places (NRHP) and in 1978 and 1989, respectively. The Fisher Building houses the headquarters for the Detroit Public School district, as well as 30 floors of office space and the historic Fisher Theater.
- **Henry Ford Hospital:** located at the northwest quadrant of the same intersection, the Henry Ford Hospital is a part of the Henry Ford Health System, a regional center for medical care based in Metropolitan Detroit. The hospital houses more than 900 beds, and typically responds to nearly 20 percent of ambulatory care in southeast Michigan.

Figure 5. New Center District Location

Figure 6. New Center District: Cadillac Place (upper-left), Fisher Building (upper-right), and Henry Ford Hospital (bottom)
(Sources: Skyscrapercity.com; Flickr.com, Henry Ford Hospital Photostream; UrbanToronto.ca)

4.2. Masonic Temple Theater

The Masonic Temple, the largest theater of its kind in the world, is located at the intersection of 2nd Avenue and Temple Street, less than one-half mile west of Woodward Avenue and less than one-half mile north of the Detroit CBD (Figure 7). The Temple was constructed in 1922 and encompasses a number of connected structures: Ritualistic Building, Moslem Temple Tower, Scottish-Rite Cathedral, two ballrooms, and a large drill-hall space. In 1980, the Masonic Temple was added to the NRHP [*34,35,36,37*].

The Temple has historically hosted a number of theatrical and musical performances held by globally-renowned acts throughout the year. Additionally, the property is strategically located along the Woodward Avenue corridor where a number of entertainment centers have been completed within the past decade. Some of the most prominent developments are described below and illustrated in Figure 8:

- **Woodward Place Townhouses at Brush Park:** this development is located at the corner of Woodward Avenue and Adelaide Street, less than one-half of a mile west of the Masonic Temple property. The Woodward Place Townhouses were constructed by the Crosswinds Communities, a major homebuilder in the Detroit area, in a strategic location between the Detroit Medical Center (to the north) and the Detroit CBD (to the south). The development was constructed at a minimal setback from Woodward Avenue, providing good access to the adjacent sidewalks.

- **Ford Field:** home to the Detroit Lions of the National Football League (NFL), construction was completed in 2002 after the franchise relocated from its previous home, the Pontiac Silverdome in Pontiac, MI. The stadium is located in Detroit's CBD, at the intersection of Brush and E. Montcalm streets, which is just east of the Comerica Park complex, located near Woodward Avenue and I-75. Ford Field was constructed for a cost of approximately $500 million, with a seating capacity of 65,000. In addition to the NFL season, many concerts and events are held throughout the year in the stadium space. In recent years, Ford Field has hosted a few special events, most notably the NFL Super Bowl XL, 2009 NCAA Men's Final Four, etc.
- **Comerica Park:** home to the Detroit Tigers of Major League Baseball (MLB), construction on the Comerica Park complex was completed in 2000, after the team moved from their previous home, Tiger Stadium, on Michigan Avenue in the outskirts of the Detroit CBD. The ballpark is located at the intersection of Woodward Avenue and Montcalm Street, just south of I-75. In addition to the MLB regular season, Comerica Park hosts a number of entertainment events throughout the calendar year.

Figure 7. Midtown/Downtown District Location

The areas in the city of Detroit north of I-75, near the Masonic Temple have undergone some redevelopment in the past decade, particularly along the Woodward Avenue corridor. Those developments have included residential, mixed-use, and retail buildings, and have added significantly to the economic vibrancy of the area.

Figure 8. Midtown/Downtown District: Masonic Temple (upper-left), Woodward Place Townhouses (upper-right), Ford Field (lower-left), Comerica Park (lower-right)
(Sources: Wikipedia.com, Wikipedia Commons; Crosswinds Communities; Metro-Melt.com; ExperienceDetroit.com)

4.3. Dearborn Amtrak Station

The Fairlane Town Center district, located in the city Dearborn is home to a number of economic and cultural places of interest, most notably the world headquarters for the Ford Motor Company, located across from the Dearborn Amtrak station near the interchange of Southfield Fwy. (M-39) and Michigan Avenue (Figure 9). The Ford Motor Company is ranked as the sixth largest company in the nation, based on the Fortune 500 listings for the year 2009 [*38*]. Many of Ford assembly plants and research and development facilities are located in the vicinity of the area depicted in Figure 10.

The city of Dearborn has two business districts: West Dearborn and East Dearborn. The Fairlane district is nearly central to both locations, however unlike those downtowns, pedestrian mobility within the Fairlane district is constrained by limited sidewalk connections. Other major attractions in the district include the following [*39,40,41,42,43*] in Figure 10:

- **The Henry Ford Museum and Greenfield Village:** located approximately 2 miles southwest of the Amtrak station, the complex houses a vast collection of memorabilia, structures, and machinery from America's Industrial Revolution period. The museum and village (outdoor portion) were listed as a NRHP and NHL district in 1981. Prominent pieces of the collection include the limousine of Former President John F. Kennedy and Thomas Edison's laboratory.
- **Fairlane Town Center Mall:** located in the area bounded by M-39, Evergreen Road, Michigan Avenue, and Hubbard Drive, the mall is within a 15-minute drive from the major population centers in the region. Constructed in 1976, Fairlane Town Center consists of three floors of retail space, totaling approximately 1.5 million square feet, more than 8,000 surface parking spaces, and 150 tenants.
- **Hyatt Regency Hotel:** located adjacent to the Fairlane Town Center complex, the AAA four-diamond-rated hotel offers 772 guest rooms, 62,000 feet^2 of event facilities. The Hyatt Regency is strategically located between the city of Detroit and the Detroit Metropolitan airport.
- **UM-Dearborn:** located just west of the Fairlane Town Center complex, this branch of the University of Michigan educational system was founded in 1959. It has an enrollment of approximately 8,600 students, offering undergraduate and master's degrees in arts and sciences, education, engineering and computer science, and management.
- **Henry Ford Community College:** located just north of the UM-Dearborn campus, this college was founded in 1938 and has been fully accredited since 1949. Approximately 13,000-14,000 students are enrolled in various disciplines, which include liberal arts, science, fine arts, culinary arts and health science disciplines.

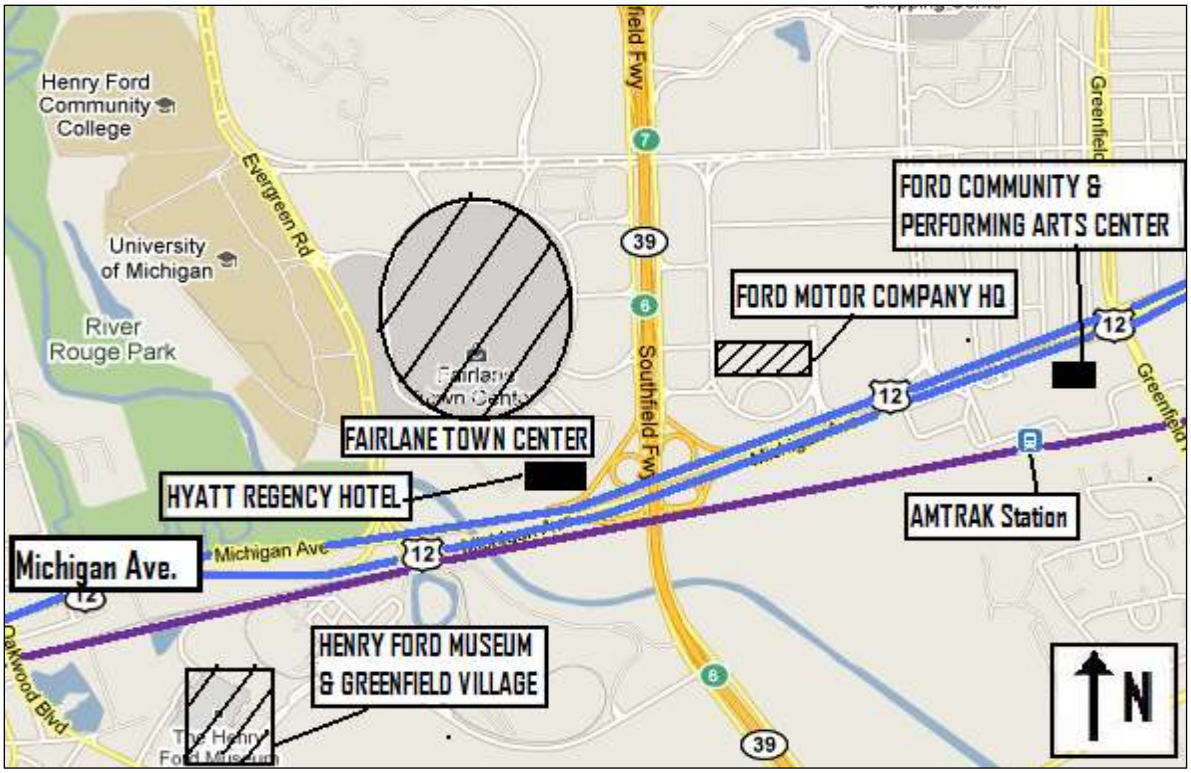

Figure 9. Fairlane Town Center District Location

Figure 10. Fairlane Town Center District: Greenfield Village (upper-left), Fairlane Town Center Mall (upper-right), Ford Motor Company Headquarters (lower-left), Hyatt Regency Hotel (lower-right)
(Sources: City-Data.com, Dearborn; Detroit Travel Guide; Flickr.com; Wikipedia.com, Wikipedia Commons)

4.4. Troy-Birmingham Amtrak Station

The Rail District is an emerging development market that is located in the cities of Troy and Birmingham in Oakland County. The district area has been created through the redevelopment of land parcels once occupied by heavy industrial land uses. Major travel corridors such as I-75 (to the east), Woodward Avenue (to the west), and the lines shared by CN and Amtrak (immediately adjacent) are easily accessible (Figure 11). Overall the area surrounding the Rail District offers a mix of land uses, with varying levels of density.

The Rail District is expected to be further improved by the construction of the Multi-modal Transit Center (MTC). Access to this area from the city of Troy is currently inhibited by the physical barrier caused by the double set of railroad tracks that are located between the Troy-Birmingham boundary. This barrier requires Troy residents to access the site by vehicles through the easement located on S. Eton Street. A preliminary site plan for the new MTC, obtained from the city of Troy is shown in Figure B1 of the Appendix B. Plans for the MTC and the adjoining areas include the following (Figure 11) [*44,45*]:

1. Relocation of the existing Amtrak station south, along the eastern set of tracks on which Amtrak operates.
2. The proposed MTC includes a staging area for storage of four SMART buses, a small pedestrian plaza, passenger parking facilities, bicycle storage, and a hybrid vehicle charging station.
3. Construction of an ADA-compliant pedestrian tunnel under the railroad ROW, that connects the relocated Amtrak station (along eastern tracks) and the MTC (along the western tracks).

Figure 11. Troy-Birmingham Rail District, Birmingham CBD Location

A stable residential community that largely consists of single-family homes with a small cluster of rental units, is located immediately south of the Rail District. Within the past two years, the city of Birmingham has improved pedestrian mobility along S. Eton Street and Maple Road. Some of the attractions near this area have been located in Figure 11, described in the list below, and depicted in Figure 12 [*46*]:

- **Birmingham Theater:** also known as the "Birmingham 8" which reflects the number of movie screen available, has been a part of the city of Birmingham since 1927. The building housing the theater experienced a complete reconstruction and renovation in the mid-1990's and has improved to compete with newer theaters with updated sound and seating systems. First run movies can also be viewed at the theater.
- **Rail District Lofts:** this high-density, four-story residential development has been constructed near the heart of the Rail District, at the intersection of S. Eton and Villa Streets in the city of Birmingham. The development has been designed in contemporary architecture and is made up of larger rental apartments within walking distance to the Amtrak station.

- **Midtown Square Shopping Center:** this shopping center is typical of the North American "big-box" development with a cluster of retail outlets surrounded by a significant amount of surface parking. Midtown Square, located in the Troy portion of the rail district, offers a diverse group of shopping options such as The Home Depot (hardware), Kroger (grocery), and Old Navy (apparel).

- **The Village at Midtown Square:** this multi-family residential development is located in the city of Troy, adjacent to the Midtown Square Shopping Center. The units here have been styled more traditionally than those on the Birmingham side of the Rail District, utilizing a brownstone town home façade. Although the Troy side of this area is less pedestrian-oriented than its Birmingham counterpart, this development offers abundant sidewalks and the units are within (short) walking distance to the shopping center.
- **Oakland-Troy Airport:** the Oakland-Troy Airport allows for private, corporate, and charter flights. Business travelers and tourists can benefit from the airport's proximity to business, recreation, and entertainment venues.

Figure 12. Troy-Birmingham Rail District, Birmingham CBD: Birmingham Theater (upper-left), Birmingham Rail District (upper-right), Midtown Square Shopping Center (lower-left), The Village at Midtown Square (lower-right)
(Sources: Water Winter Wonderland; Masonry Institute of Michigan; Berridge Manufacturing Company; MichiganHomes.net)

4.5. Candidate TOD Site Ranking

The information compiled for the four sites has been used to complete the ranking matrix composed in *Network Level Analysis* (Table 3). The matrix serves as an objective documentation from which the final two TOD sites were selected (Table 4). The data collected in Table 4 can be summarized, as follows:

- All of the sites were serviced by at least one bus transit authority (SMART or DDOT).
- Only one of the sites was not within one-half mile of the proposed Woodward LRT route: the Dearborn Amtrak station.
- Only one of the sites was not in proximity to vacant or undeveloped land (at least one acre): the Birmingham Amtrak station.
- Sidewalks were abundant in all but one of the sites: the Dearborn Amtrak station.

4.6. Selection of the two TOD Sites

Based on the data presented in Table 4 and the requirements set forth in the proposal (one of the two stations selected for TOD to be located in the city of Detroit, the other being in the suburbs) the following two sites were selected:

2. Masonic Temple Theater District - Midtown/Downtown District, city of Detroit
4. Troy-Birmingham Amtrak station - Rail District, cities of Troy and Birmingham

Site numbers 2 and 4 best satisfied the conditions described in *Network Level Analysis: Overview*; availability of vacant or blighted parcels of land, proximity to a transit facility along, or in proximity to, a well-defined travel corridor, proximity to land uses that may be improved by TOD, and the availability of facilities that are conducive to pedestrian mobility.

Site number 2 (Masonic Temple) is a strong candidate for TOD implementation because of its location with respect to the proposed Woodward LRT route, as well existing transit services provided by SMART and DDOT. Furthermore, a sizeable amount of vacant land was identified and located adjacent to Woodward Avenue. This location is expected to be a critical factor in any TOD implementation because it would be a suitable place for a transit station in the least ambitious scenario (e.g., a minimal amount of development). The strategies used to catalyze development near this area are discussed later in this report.

Site number 4, the Troy-Birmingham Amtrak station located in the Rail District, was selected for consideration because of the steady growth that has taken place as of late. The early commitment made by both cities to plan and develop medium-density residential and mixed land uses has resulted in a revitalization of the area. The completion of the MTC is expected to further facilitate the revitalization process, where both cities will be connected along the Troy-Birmingham border, resulting in improved accessibility for the local residents. Considering these factors, site number 4 was identified as a suitable location for TOD implementation.

Table 4. TOD Site Ranking Matrix

#	LOCATION NAME	CITY	MAJOR THOROUGHFARES	TRANSIT		TRANSIT MODES (AGENCY)	MAJOR ATTRACTIONS / EMPLOYMENT CENTERS / LANDMARKS?	VACANT /		# ACRES	SIDEWALKS?		WALKSCORE (out of 100)
				YES	NO			YES	NO		YES	NO	
1	New Center	Detroit	Woodward Ave. I-75, M-10, I-94	X		BUS (DDOT, SMART) LRT (Proposed)*	Henry Ford Health Systems Detroit Public Schools Detroit Police Dept. Fisher Theater	X		4.1	X		77
2	Masonic Temple Theater	Detroit	Woodward Ave. I-75, M-10	X		BUS (DDOT, SMART) LRT (Proposed)*	Masonic Temple Theater Ford Field (NFL - Lions) Comerica Park (MLB - Lions)	X		5.5	X		75
3	Dearborn AMTRAK Station	Dearborn	Michigan Ave. Southfield Fwy./M-39	X		BUS (SMART, DDOT) CRT (AMTRAK)	Ford Motor Company World HQ Hyatt Regency Hotel Fairlane Town Center Ford Community & Performing Arts Center Henry Ford Museum & Greenfield Village	X		5.2		X	57
4	Birmingham AMTRAK Station	Birmingham	Woodward. Ave.	X		BUS (SMART) CRT (AMTRAK) LRT (Proposed)*	Birmingham CBD Troy Shopping Center		X	< 1.0	X		80

The project team realizes that site number 1, the New Center district, is the most walkable and vibrant of the four sites considered. They also felt that while vibrancy has been observed within the New Center district, that the existing development may be prohibitive to new TOD projects. This sentiment was based on the nature of the local real estate characterized by small plots of land that are spatially discontinuous, and that do not lend themselves to creative new development. Thus, the New Center was omitted from consideration of this study. However, if an LRT system were constructed along Woodward, the New Center area is expected to retain the vibrancy, utilizing the current land use patterns.

The Dearborn Amtrak area, on the other hand, was difficult to consider for this study since there were no concrete plans to begin CRT service along the Amtrak route. At the time of this writing, local governments along the route (i.e., the city of Detroit, city of Dearborn, city of Ann Arbor), county governments (i.e., Wayne and Washtenaw counties), and regional governments (e.g., SEMCOG) have been unable to secure adequate funding to begin CRT services. Furthermore, the area surrounding the station is solidly automotive-oriented in design, where the sidewalks along Michigan Avenue are adequate but somewhat disconnected with the land uses there. Thus, the "sidewalks" entry in Table 4 reflected the connectivity of said sidewalks in addition to their existence. Any funds that have been granted for Amtrak or commuter rail in the state of Michigan do not have any application for a CRT service between Detroit and Ann Arbor. That proposed service would NOT be operated by Amtrak, but along Amtrak tracking. Considering these factors, the Dearborn Amtrak station was omitted from consideration of this study.

5. PROJECT LEVEL ANALYSIS / TOD PACKAGES

In the previous chapter, the network level analysis that resulted in the selection of two stations in the Detroit metropolitan area for implementing TOD was presented. The objective of this section is to propose a set of TOD packages for each station, along with a set of institutional, planning, and economic mechanisms to aid the implementation of the respective TOD packages. As a part of this effort, first TOD packages are developed for each station and then a general discussion of various sets of mechanisms relevant to both sites is presented, followed by station-specific discussion.

5.1. Masonic Temple Theater

This is one of the two stations selected based primarily on the availability of vacant land, proximity to a transit line, and the location of major activity/employment centers within a short distance. Detailed information about the location of the center, site characteristics, and the proposed TOD packages/mechanisms are presented below.

5.1.1. General Overview:

Figures 13 and 14 are modified revisions of maps obtained from the records maintained by the City of Detroit Geographic Information Systems (GIS) and Planning and Development Departments. These maps depict the current zoning patterns of the area surrounding the Masonic Temple site which is bisected by Woodward Avenue [47]. Each of the maps has been overlaid with descriptions of the current land uses.

Referring to Figures 13 and 14, the city of Detroit has made provisions for denser, infill-type development to occur in proximity of the Masonic Temple Theater area, particularly along the east side of Woodward Avenue (as reflected in R5 and R6 zoning classifications). Many of these parcels of land directly east of the Woodward Place Townhomes have been zoned as “Planned Development” and may be best described as medium-density residential development (Figure 13).

The land use definition “Planned Development District” (PD) refers to a zone established under Article XI, Division 2 of the Detroit Zoning Ordinance: Specialty Purpose Zoning Districts and Overlay Areas. The description for the PD zoning definition generally states that those plots of land classified as such may be useful when urban renewal and infill development projects are being considered. Furthermore, the PD zoning may be applied to allow a variety of land uses: residential, public/civic/institutional, retail/service/commercial, etc. [*48*].

The Masonic Temple Theater area located west of Woodward Avenue and south of Temple Street, on the other hand, is entirely zoned as "General Business." Additionally, nearly half of those parcels of land have been observed to be vacant properties. The project team felt that this section of the Temple area would have the most opportunity for TOD implementation because of the availability of vacant land directly along Woodward Avenue. Furthermore, the parcels are physically contiguous and are likely to be owned by the same entity, whether public (e.g., Wayne County, city of Detroit) or private (e.g., real estate holding company, business owner). Single-ownership of contiguous parcels of land (as opposed to multiple-ownership of scattered parcels) are better suited for planned development projects.

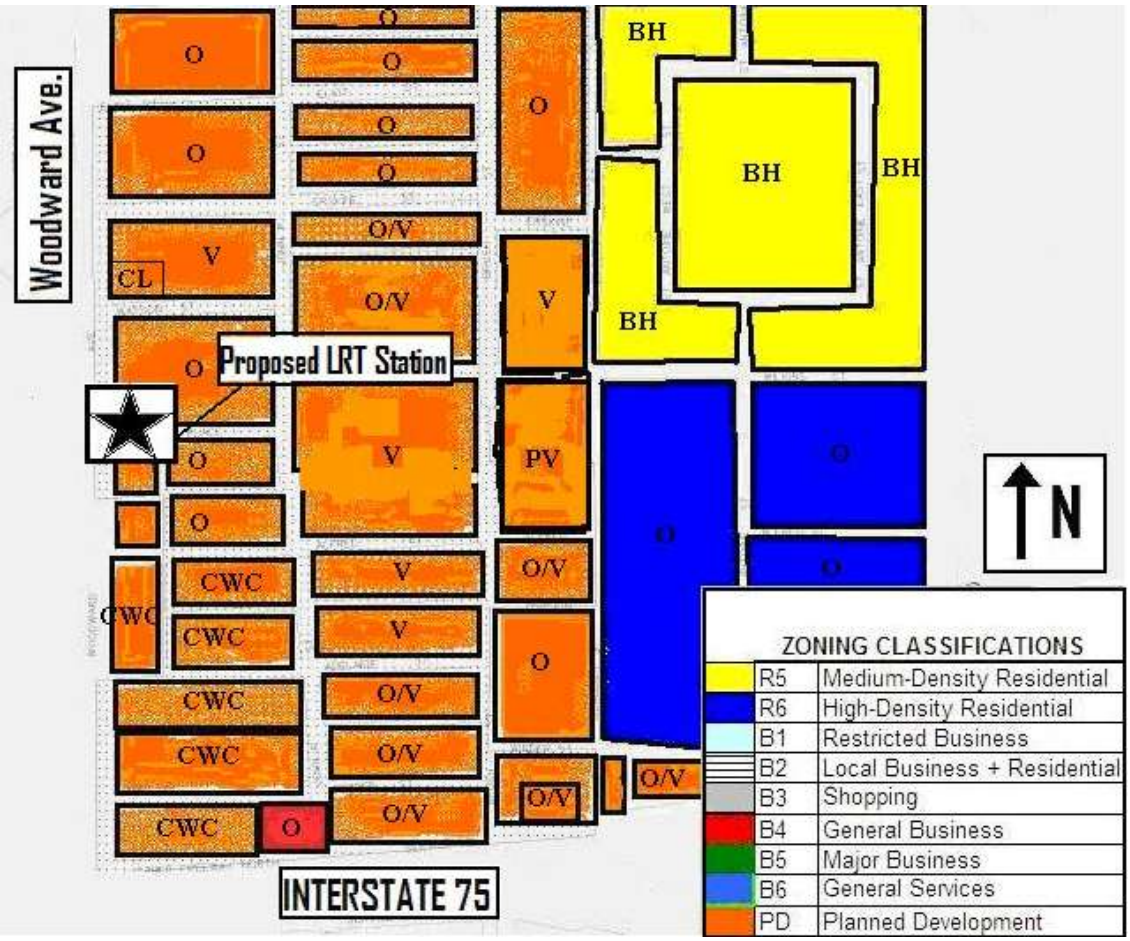

Figure 13. Masonic Temple Theater, East of Woodward Avenue

- O: occupied land, building(s) on-site
- V: mostly vacant land, building may be on-site
- O/V: building(s) on-site, mixed with vacant land
- CL: Crystal Lofts
- PV: Village-Brush Park Manor: Paradise Valley (Senior-Living Community)
- CWC: Crosswinds Communities, Woodward Place Townhomes at Brush Park
- BH: Brewster Homes

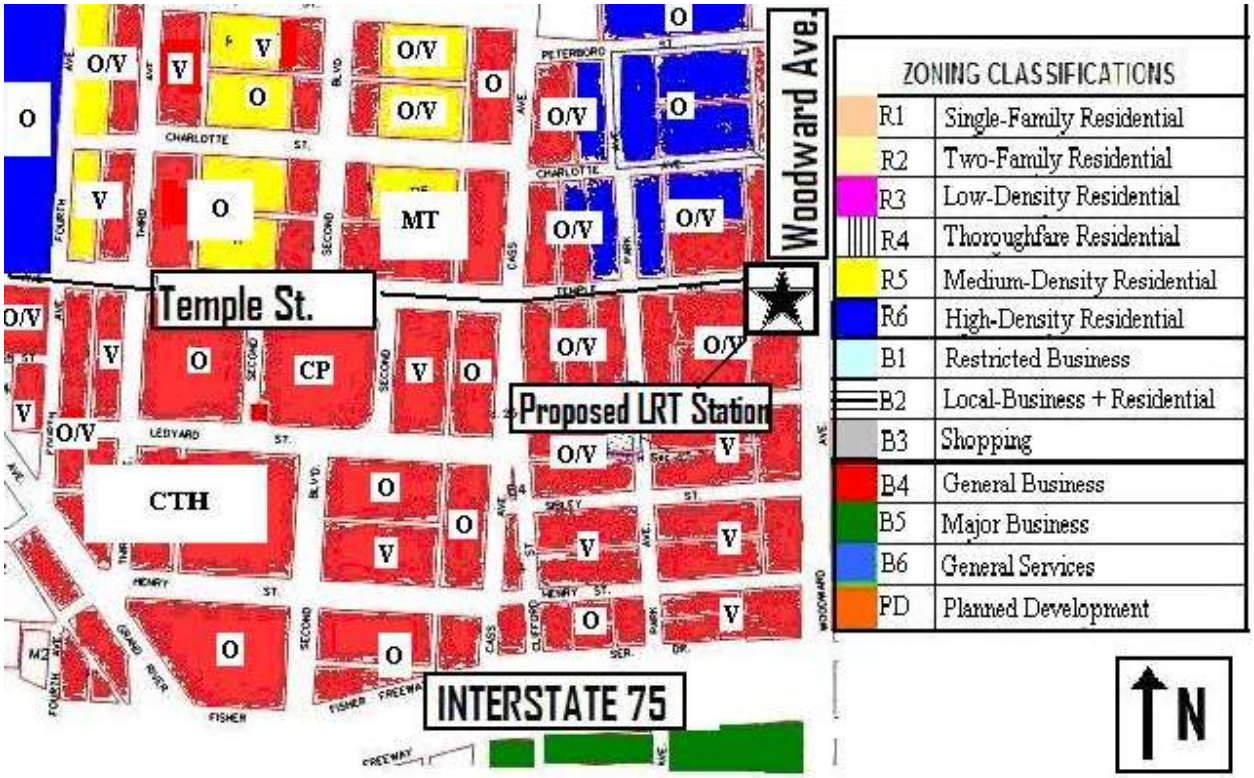

Figure 14. Masonic Temple Theater, West of Woodward Avenue

- O: occupied land, building(s) on-site
- V: mostly vacant land, building may be on-site
- O/V: building(s) on-site, mixed with vacant land
- MT: Masonic Temple Theater property
- CP: Cass Park
- CTH: Cass Technical High School

Aerial images of the vacant properties and occupied parcels of land with respect to Woodward Avenue and Temple Street are shown in Figures 15 and 16. The total land area of the vacant land depicted is estimated at 5.5 acres (Table 4).

Figure 15. Masonic Temple Theater, West of Woodward Avenue and North of Temple Street: Aerial View

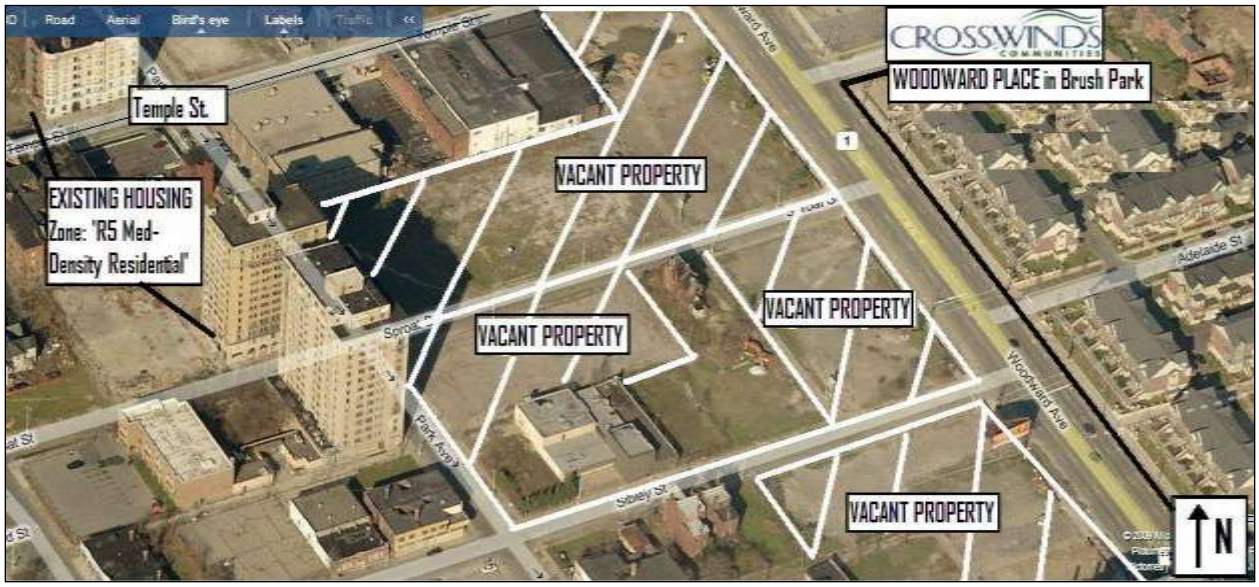

Figure 16. Masonic Temple Theater, West of Woodward Avenue and South of Temple Street: Aerial View

5.1.2. Site Characteristics and Land use activities Inventory:

In the Masonic Temple Theater area, the influence area is centered around the intersection of Woodward Avenue and Temple Street. The residential development in the Masonic Temple area has experienced significant growth in supply during the past decade, particularly along the Woodward Avenue corridor. Those new developments have largely been marketed toward individuals wishing to live closer to Detroit's Cultural Center (to the north) and Detroit CBD (to the south), consisting of a mix of contemporary loft-styled condominiums (i.e., The Ellington, Crystal Lofts) and more traditional-styled townhomes (i.e., Woodward Place at Brush Park). A summary of the residential market development inventory, within the influence area, is shown in Table 5 [*49,50,51,52*].

Table 5. Residential Market

NAME	WALK DISTANCE TO STATION [mi]	TYPE	MARKET	TOTAL # FLOORS	TOTAL # UNITS	ADDITIONAL INFO
Woodward Place at Brush Park	< 0.1	Condo, Townhome	For-Sale	NA	180	2,3-bedroom units (1,300 - 2,002 ft^2)
Village-Brush Park: Manor Paradise Valley	0.3	Senior	Rent	3	113	1-bedroom apts.
Heritage Senior Living	0.5	Senior	Rent	4	50	
Carlton Lofts	< 0.2	Condo	For Sale	7	51	Studio (1 or 2-level), 1-2 bedroom units (700-1,800 ft^2)
Crystal Lofts	0.1	Condo	For Sale	4	17	Studio, 1,2-bedroom units (1,137-1,885 ft^2)
Ellington Lofts	0.4	Condo	For Sale	4	55	1,2-bedroom units (860-1500 ft^2)
Peterboro Place Apartments	0.2	Rent	Rent	6	?	

Commercial development in the Masonic Temple, by contrast, has not experienced much growth during the past. Most of the new commercial developments constructed have been focused along the Woodward corridor, and are attached to the aforementioned residential developments as mixed-use facilities: first-floor commercial, second-floors and higher residential. The real estate market for residential and commercial spaces remains weak, as the hardships faced by the American automotive manufacturers (historically, the backbone of the Detroit-area economy) have had a ripple effect on the metro area and the state of Michigan as a whole. Furthermore, the world economic crisis of 2008-2009 has severely deepened those effects. As a result, many of the newer residential developments (especially along the Woodward corridor) are sparsely occupied.

A summary of the commercial market development inventory, within the influence area, is shown in Table 6.

Table 6. Retail/Service/Commercial Market

NAME	WALK DISTANCE TO STATION (mi)	TYPE	MARKET	ADDITIONAL INFO
Park Sibley Market	0.2	Retail	Convenience	
Big Eagle Market	0.4	Retail	Convenience	
Source Apparel	< 0.1	Retail	Apparel	Woodward Ave. corridor
Detroit 1 Coney Island	0.2	Service	Restaurant (Casual)	
People's Records & Collectibles	0.2	Retail	General	
FedEx Kinko's	0.4	Service	General	Mixed Use Development (Ellington Lofts Structure)
Starbucks Coffee	0.4	Service	Restaurant	
T-Mobile	0.4	Retail	General	
Temple Bar	0.2	Service	Pub, Lounge	
Atlas Global Bistro	< 0.1	Service	Restaurant	

Public/civic/institutional land uses near a TOD are expected to improve the quality of life of the local residents. Many of these land uses, such as hospitals, schools, and libraries may present employment opportunities within the community as well. Considering these factors, the Masonic Temple area is strategically located near the Detroit Medical Center (DMC) (approximately one mile north), a campus of medical research institutions that have strong relationships with many institutions of higher learning within the state of Michigan: University of Michigan, Michigan State University, and Wayne State University (located approximately one mile north of the proposed Temple transit stop). A summary of the public/civic/institutional land uses in the influence area (within one-half mile) surrounding the Masonic Temple is shown in Table 7.

Table 7. Public/Civic/Institutional Market: Masonic Temple Area

NAME	WALK DISTANCE TO STATION (mi)	TYPE	ADDITIONAL INFO
Cass Park	0.3	Public Park	
University of Michigan - Detroit Center	0.4	Higher Learning	Satellite campus
Ecumenical Theological Seminary	< 0.1	Place of Worship	Training center
Cass Park Baptist Church / Hope Baptist Center	0.4	Place of Worship	
St. Patrick's Parrish Catholic Church	0.5	Place of Worship	
Jehovah's Witnesses Woodward	0.4	Place of Worship, hall	
St. John's Episcopal Church	0.4	Place of Worship	NRHP, 1982

One of the most prominent places listed is the St. John's Episcopal Church, located at the intersection of Woodward Avenue and the I-75 service drive (Figure 17). St. John's is the oldest functioning church located along Woodward Avenue in the Detroit metropolitan area and in 1982 it was added to the NRHP [*53*]. Currently, the church remains as a local landmark of the Detroit lower Woodward Avenue/CBD area.

Figure 17. St. John's Episcopal Church

In summary, the data presented in Tables 5-7 has indicated the following, with regard to the Masonic Temple influence area:

- The residential housing stock is diverse, but the newer developments are sparsely occupied (particularly the Ellington Lofts and Crystal Lofts).
- The commercial development market is largely open. The city of Detroit lacks a major chain-based grocery chain (e.g., Meijer, Kroger). Within the influence area, there are no developments consisting of: chain-based hardware retailer (e.g., Home Depot, Lowe's, Menards, ACO Hardware), drugstore (e.g., CVS, Walgreen's, Rite-Aid), casual dining restaurant (e.g., Applebee's, TGI Friday's, Chili's, Red Lobster), or general apparel (e.g., Old Navy, H & M, Marshall's, Kohl's, Target).
- There is a wealth of institutional land uses nearby (WSU, DMC, places of worship), but there is a lack of pedestrian facilities in the area, particularly along the Woodward Avenue corridor. The sidewalks located are in good condition but are relatively narrow, considering the urban location. Aside from the Cass Park property, located across from the Masonic Temple, there are no common areas or pedestrian plazas within the influence area.
- There are more than six churches within half-a-mile radius of the temple that attract in excess of 1000 worshipers during Sundays. However, there is no nearby quality eating establishment for those patrons.

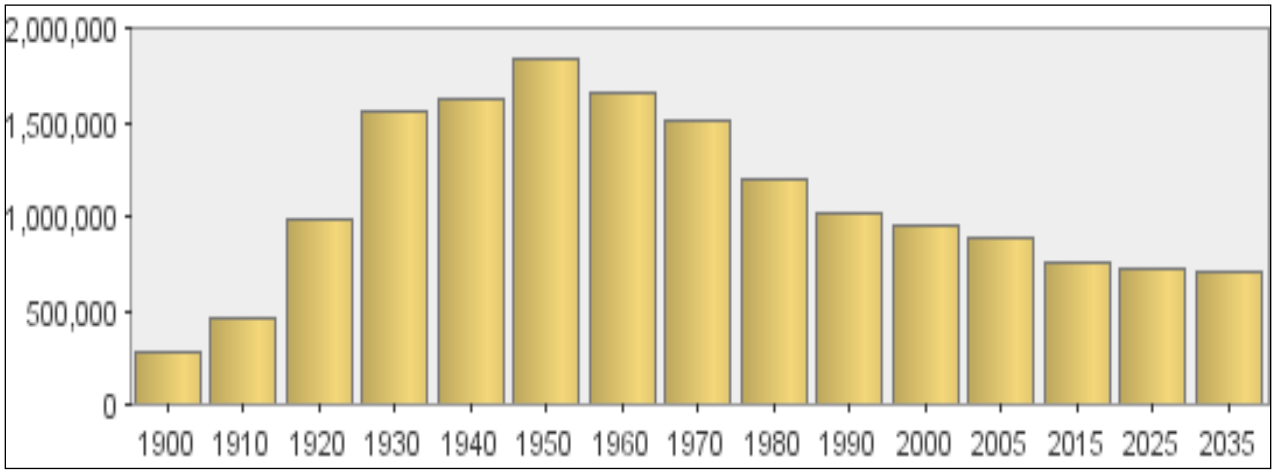

Figure 18. Population Forecast: City of Detroit
(Source: U.S. Census Bureau, SEMCOG 2035 Forecast)

5.1.3. Pedestrian Access:

From an engineering standpoint, the configuration of the Woodward Avenue corridor and its adjacent streets in the Masonic Temple area are not conducive to pedestrian mobility or TOD. The most challenging issue in this regard is that the total width of the Woodward Avenue. The right-of-way consists of nine lanes:

- Through movements (six lanes): three lanes in each direction of travel (northbound and southbound)
- Left-turn movements (LT): one center lane
- Curbside parking (two lanes): one lane in each direction of travel

According to aerial imagery obtained for the area, the crossing width for the Woodward Avenue. ROW is approximately 10 feet per lane, or a total of 90 feet [*54*]. Although traffic along this corridor is not particularly heavy along this highway segment (ADT: 10,168 vehicles per day (vpd), PHV: 971 vehicles per hour (vph)), pedestrian safety would be questionable even under non-peak traffic conditions due to the large crossing width that pedestrians must overcome when traveling from one side of Woodward Avenue to another [*55*] (Figures 19-21). Further analysis of geometric highway and traffic signal design in this area revealed the lack of the following pedestrian-friendly features:

1. Properly delineated crosswalks
2. Pedestrian relief center island
3. Pedestrian crossing signals

The T-shaped intersection configuration for cross-streets in the area (moving from north to south: Charlotte Street, Edmund Place, Temple Street, Alfred Street, and Sproat Street; represented

by locations 1-5 in Figure 19), make it difficult to implement pedestrian crossing signals, while simultaneously maintaining vehicular traffic along Woodward Avenue. The cross-streets at locations 1-5 are controlled by 'STOP' signs only. Past efforts to improve pedestrian safety at un-signalized intersections have included the installation of pavement markings/delineation and warning signs. Such improvements, however, have had limited success in achieving goals to increase pedestrian safety. One of the most challenging problems in solely relying on signage and markings is that they may be ignored by drivers and pedestrians [*56*].

Although the technology used in traffic and pedestrian signals has increased dramatically in the past 20 years (i.e., video detection), and methods to stop vehicular flow along Woodward Avenue in order to allow safer pedestrian crossing movements are achievable, the main function of Woodward is that of a primary arterial roadway. Thus, the addition of five traffic signals within a distance less than one-quarter mile (the exact distance between Charlotte and Sproat Streets is one-sixth of a mile) is likely to have adverse effects on throughput capacity.

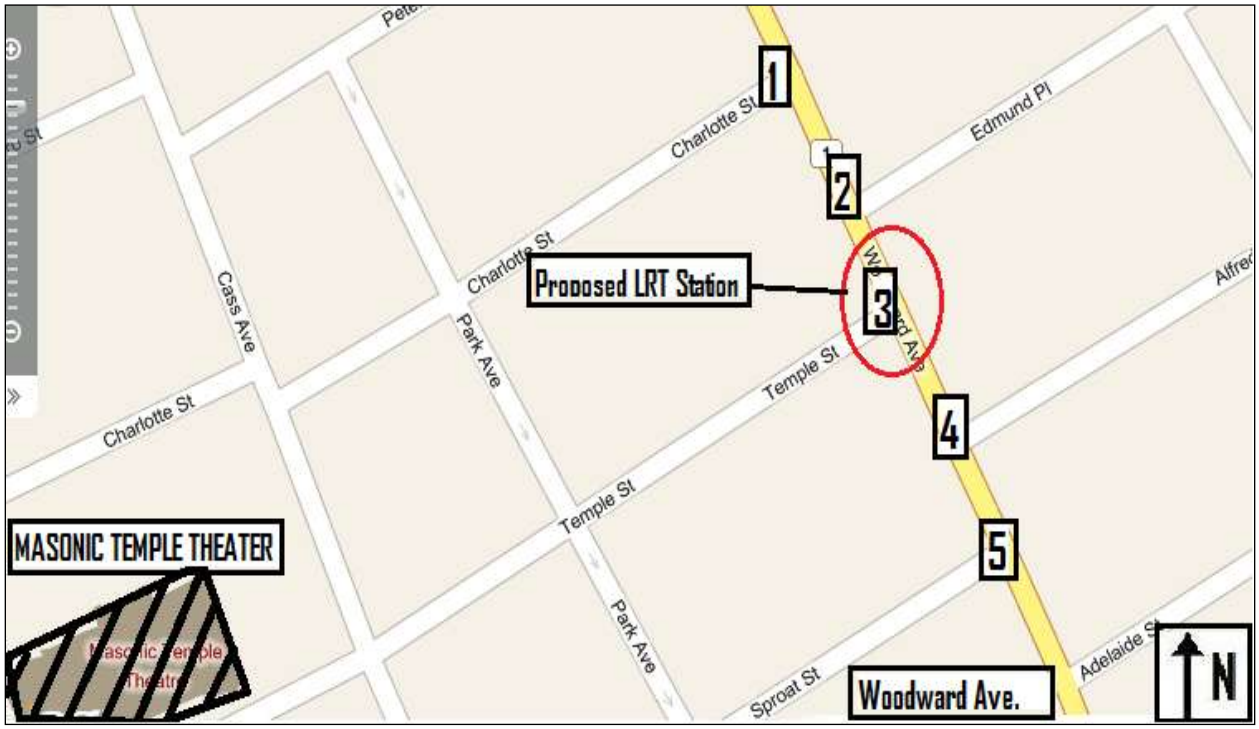

Figure 19. Proposed LRT Station Locations

Preliminary plans for the M-1 Rail LRT system, call for the LRT vehicles (LRTV) to travel along Woodward Avenue by utilizing the second travel lane from the curbside. Using this convention, northbound LRT passengers would need to access the east side curb of Woodward Avenue, so that they may board the system, and vice versa. Based upon the existing conditions of the site, it would appear that successful implementation of LRT would require significant improvement in pedestrian safety.

In order for the area near the Masonic Temple LRT station to function as a true TOD, the east and west sides of the Woodward Avenue must be better connected for pedestrian movement.

Figure 20. Aerial View of Woodward Avenue ROW

Figure 21. Street View of Woodward Avenue, Looking South (Figure 19, Location 3)

5.1.4. TOD's Proposed:

The records maintained by the city of Detroit related to the real property surrounding the proposed LRT station at Woodward Avenue and Temple Street (referred to as location 3 in Figures 19 and 22), indicate that a total eight parcels are currently city-owned. The total area of those parcels, located adjacent to Woodward Avenue and north of Sproat Street, is approximately 2.63 acres (Figure 22). Those parcels are conducive to any efforts taken by the city to construct passenger boarding/alighting facilities for the proposed LRT system, and are strategically located to support a system that operates LRTVs through the median (where two sets of track are laid side-by-side), or along travel lanes (where one track is laid in a traveled lane, for each direction of travel). In regard to future development in the Masonic Temple area, this scenario would largely represent the most conservative scenario.

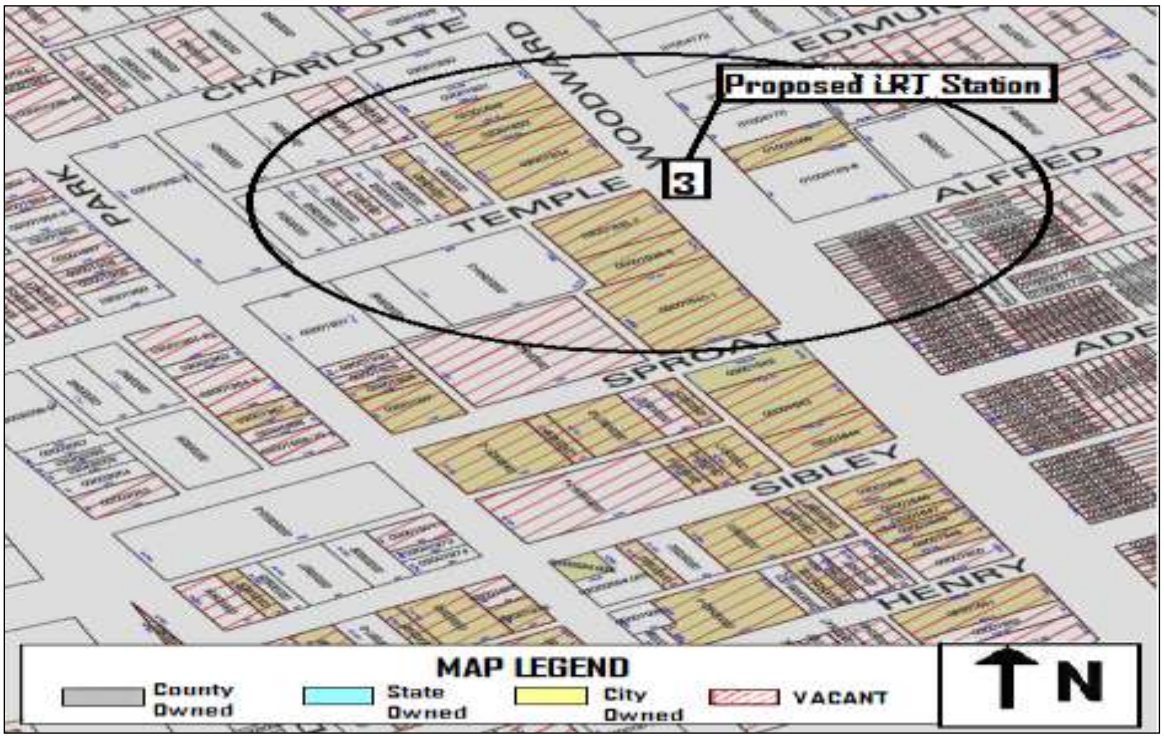

Figure 22. Land Use and Property Ownership

The Temple area was selected for consideration in this study for its potential for future growth. The area currently lacks many features that are typical of an ideal TOD. Of particular importance is the lack of connectivity across Woodward Avenue, as well as, the land uses within walking distance of the proposed LRT station. Table 8 lists land uses that may be added to the area with the intent to improve the quality of life and livability for the local residents. A discussion of possible mechanisms to complement proposed land uses is provided in the next section.

Lastly, a spatial reference with respect to the area near the proposed Masonic Temple LRT station is provided for each proposed land use. It should be noted that the proposed changes for the area are subject to change and other alternatives may be implemented for TOD.

Table 8. Proposed Land Uses

	LAND USE TYPE	DESCRIPTION	ADDITIONAL INFO
1	Retail/Service/Commercial	Child Care Center	
2		Bookstore	e.g., Borders Books & Music, Schuler's Books & Music
3		Casual Dining Restaurant	e.g., Chili's, Applebee's, TGI Friday's, Denny's
4		Grocery or General	e.g., Meijer, Kroger, Target, Wal-Mart
5	Public/Civic/Institutional	Transit Station w/ Shelter	May be integrated into mixed-use structure, located on street-level
6	Residential	Apartment Complex	For Rent, Marketed toward students (WSU, UM, MSU)
7	Public/Civic/Institutional	Traffic calming/Pedestrian facilities	e.g., pedestrian relief island (Woodward Ave.), HAWK pedestrian signals, capacity reduction (Woodward Ave.), "zebra" crosswalk markings

The land uses and improvements listed in Table 8 are all proposed for the area encircled in Figure 22. Items 1-6 could be sited in the circled area, on the west side of Woodward Avenue, if they were incorporated into a large, mixed-use structure. Using this convention, land uses that generally generate pedestrian traffic (such as the non-residential types of development listed), could be located at street-level of such mixed-use structures. Residential units (preferably rentals) or additional retail (such as a large grocery chain) could then be planned for the higher floors of the proposed structure. The amount of first-floor space available for tenants, such as a large grocery chain or general retailer, may be a limiting factor when implemented in the area encircled in Figure 22. To mitigate this, additional parcels of land (located south of Sproat Street and west of Woodward Avenue) could be released from city ownership. Examples of mixed-use structures are depicted in Figures 23 and 24. The density of such a development and its precise location would largely depend on the willingness of the administration/policy makers of the city of Detroit to release the city-owned land parcels and the willingness of developers to pursue such projects.

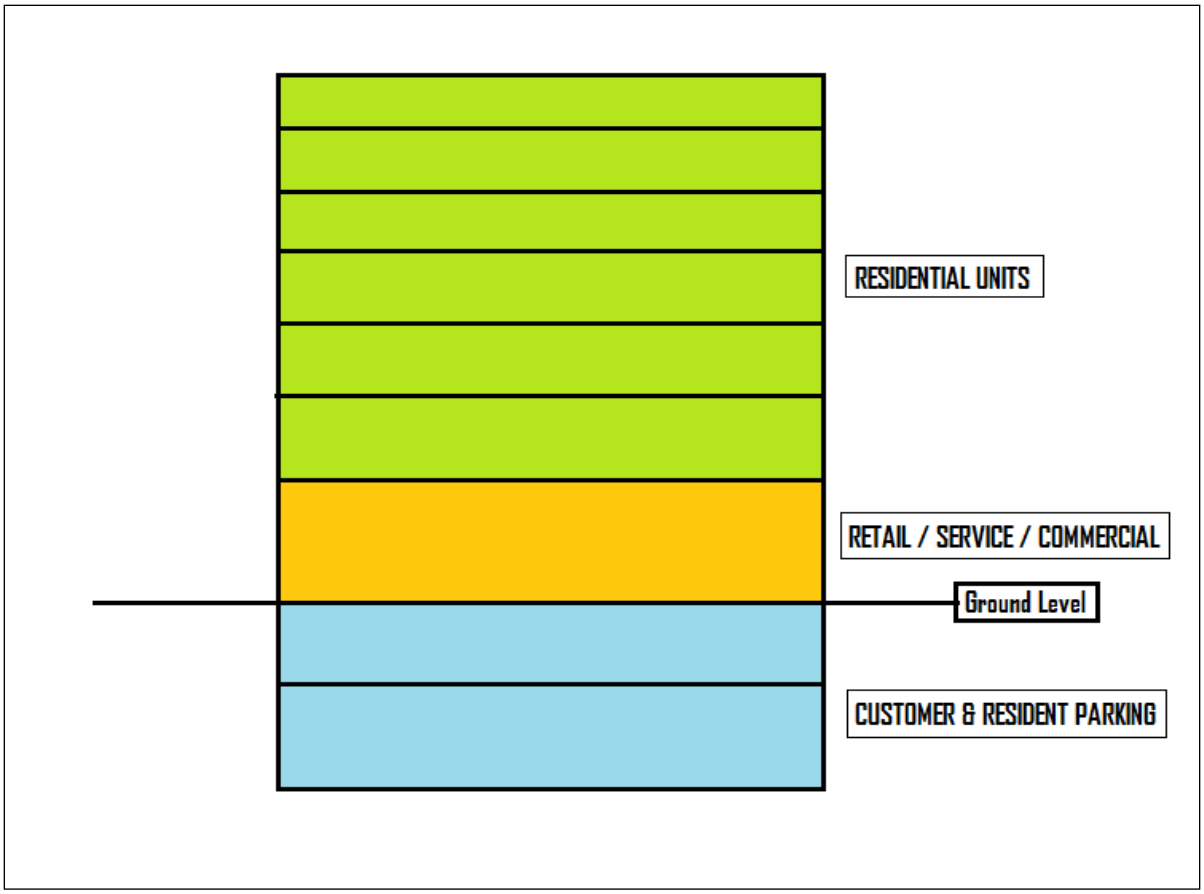

Figure 23. Diagram of Typical Mixed-Use Structure

In the spirit of TOD, it is also suggested that plans for additional parking facilities are significantly reduced or omitted if possible. This suggestion parallels research conducted for Transit Cooperative Research Program (TCRP) Report 128: Effects of TOD on Housing, Parking, and Travel. In the study, trip generation and parking data were collected from 17 completed TOD projects located in four metropolitan areas in the United States: Philadelphia/NE New Jersey, Portland, San Francisco Bay, and Washington, D.C. It was determined that residential TOD's generate approximately 50 percent less vehicle trips, during the peak periods (i.e., A.M. and P.M. peaks), than the most current rate estimates established by the Institute of Transportation Engineers (ITE) [*57*]. Furthermore, it is suggested that if additional parking is considered absolutely necessary for the development, that such parking be located as an underground facility (blue portion of Figure 23), to maintain the pedestrian friendliness of the general area at the street level.

Each of the land uses proposed in Table 8 are intended to complement, and in many cases to provide for the needs of the community living in proximity to the Masonic Temple area (community areas listed in Table 5). For instance, there is a lack of a major bookstore chain in the area. With the added advantage of the proximity of the MSU and UM-based facilities, and those currently maintained by WSU, UDM, and the DMC, additional book sellers could be valuable to metro Detroit residents affiliated by those institutions.

Another example would be the lack of a major grocer or general retail chain within the city limits. The lack of such a facility requires the residents of the city, including the temporary student populations and existing Temple-area residents, generally must travel outside of the city of Detroit (e.g., Dearborn, Warren, Redford Township) for such retailers or settle for limited options available at local convenience stores.

Figure 24. Completed Mixed-Use Structure
(Source: http://yochicago.com/mixed-use-shops-and-lofts-in-grand-boulevard-to-feature-140-new-apartments/13924/)

5.2. Troy-Birmingham Amtrak Station

The second site selected for possible implementation of TOD, was based primarily upon the proximity to a rail station, potential interface with the proposed LRT station on Woodward, strong pedestrian friendliness in the design of the streetscape of the partner city of Birmingham, potential to incorporate a pedestrian orientation with the retail development in Troy, and the availability of a relatively large high-density residential development around the station area. Detailed discussion of these features and proposed TOD and associated institutional mechanisms are presented below.

5.2.1.General Overview:

Figure 25 is an aerial photograph obtained from the city of Troy Planning Department that displays what the area looked like in 1990, when a Ford plant occupied the land and before major development occurred. Zoning maps for the cities of Troy and Birmingham were also obtained from records maintained by their respective city planning departments. Figures 26 and 27 have been modified from those records, and depict the current zoning definitions and their distribution for the cities of Troy and Birmingham, respectively [*58,59*]. Each of the zoning maps has been overlaid with descriptions of the current land uses that have been observed in the area.

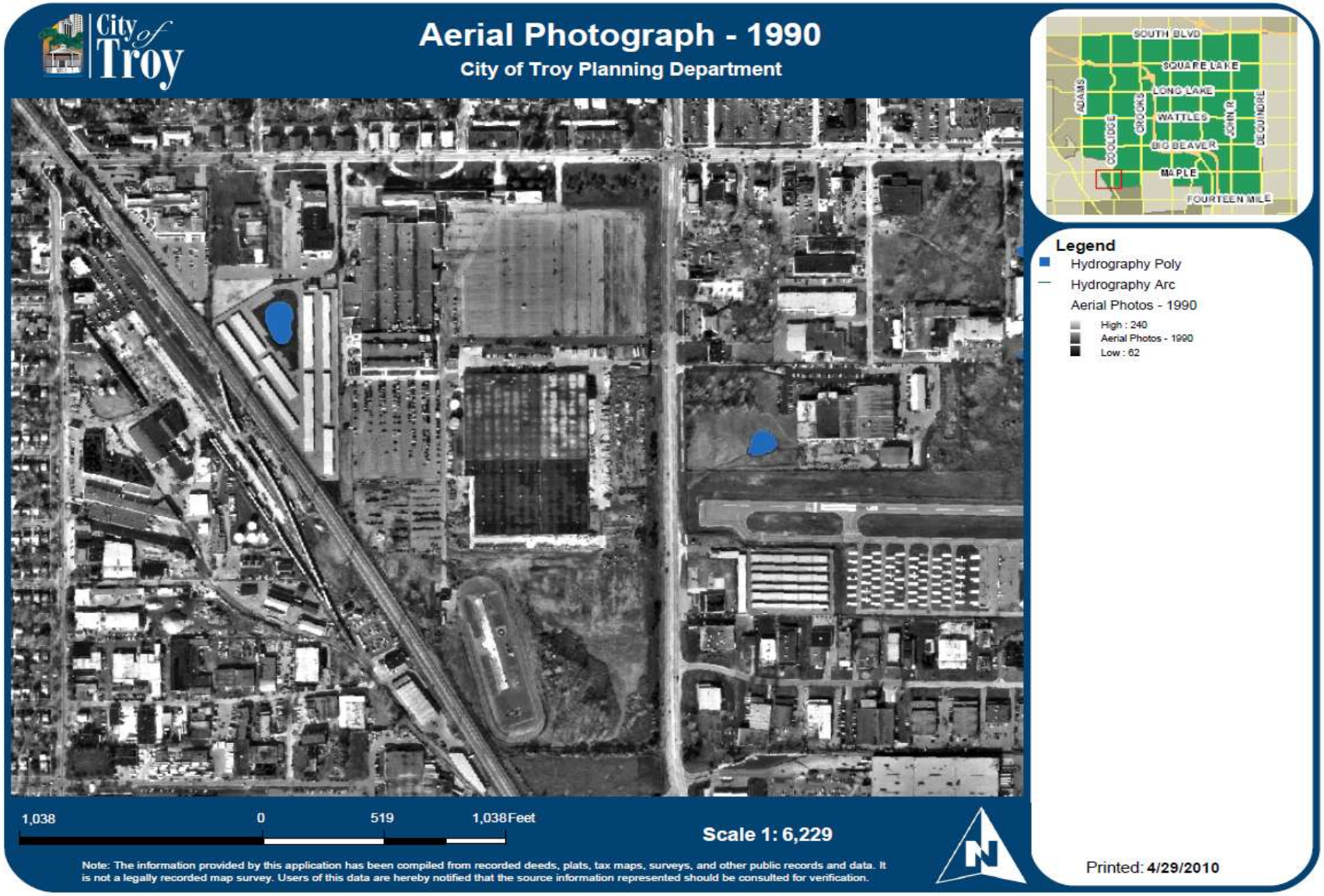

Figure 25. Ford Tractor Plant – Circa 1990

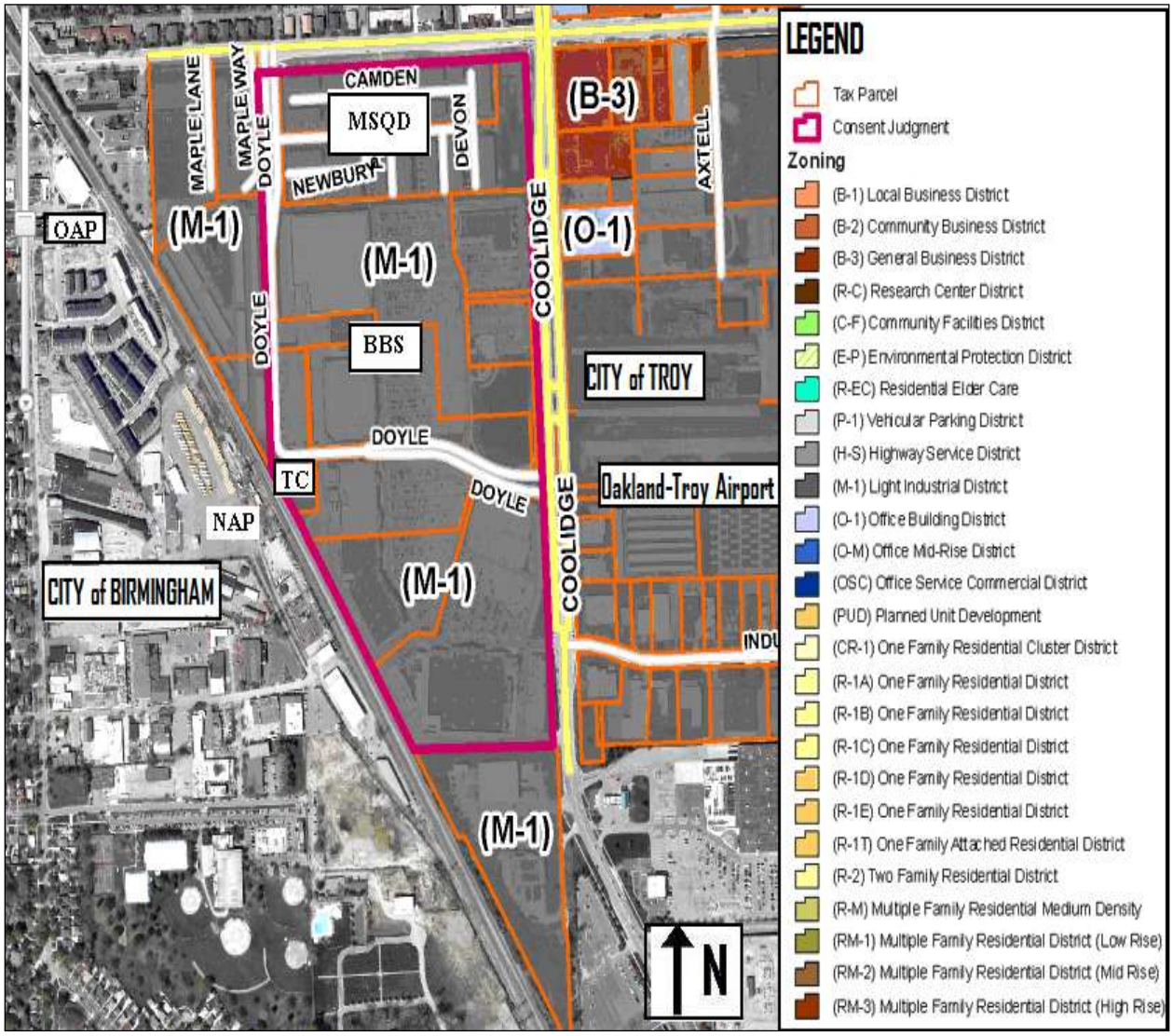

Figure 26. Troy-Birmingham Amtrak Station: City of Troy (North of Railroad Tracks)

- TC: proposed Troy-Birmingham Multi-modal Transit Center (MTC)
- OAP: existing Amtrak station
- NAP: proposed Amtrak platform
- BBS: Midtown Square Shopping Center (big-box retailers)
- MSQD: The Village at Midtown Square

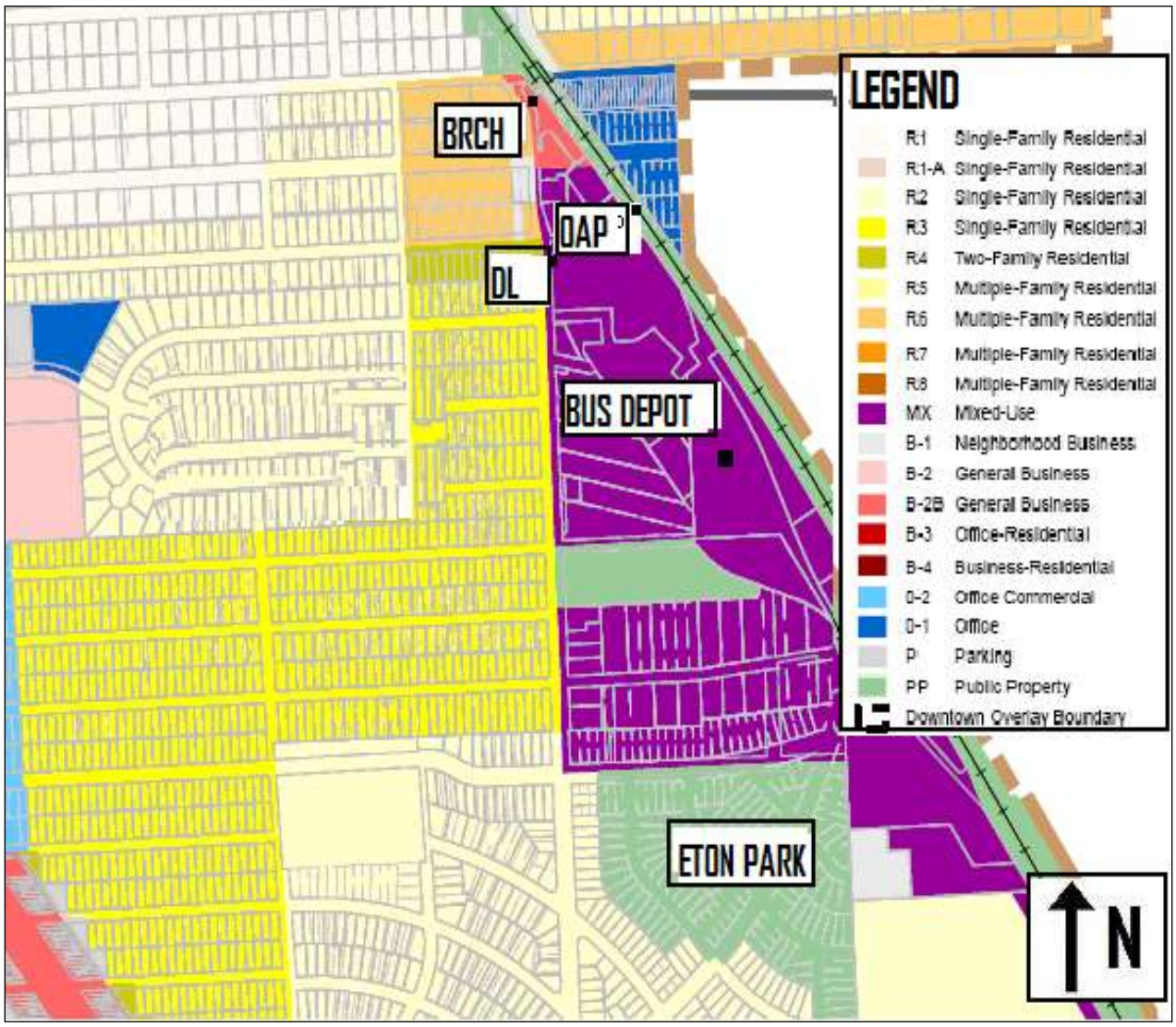

Figure 27. Troy-Birmingham Amtrak Station: City of Birmingham (South of Railroad Tracks)

- BRCH: Big Rock Chop House
- OAP: existing Amtrak platform
- DL: The District Lofts
- BUS DEPOT: surface school bus parking and maintenance facility for the City of Birmingham School District.

An aerial image of the Rail District, near the proposed Multi-modal Transit Center (MTC) is shown in Figure 28. The boundary of the MTC site is depicted as the white triangular area north of the railroad tracks, which are depicted by purple lines. The location of the Birmingham School District bus depot and Midtown Square Shopping Center can also be identified to the west and east of the railroad tracks, respectively. The records maintained by the cities of Troy and Birmingham appear to indicate that the bulk storage area (located just south of the bus depot in Figure 28) will remain as such.

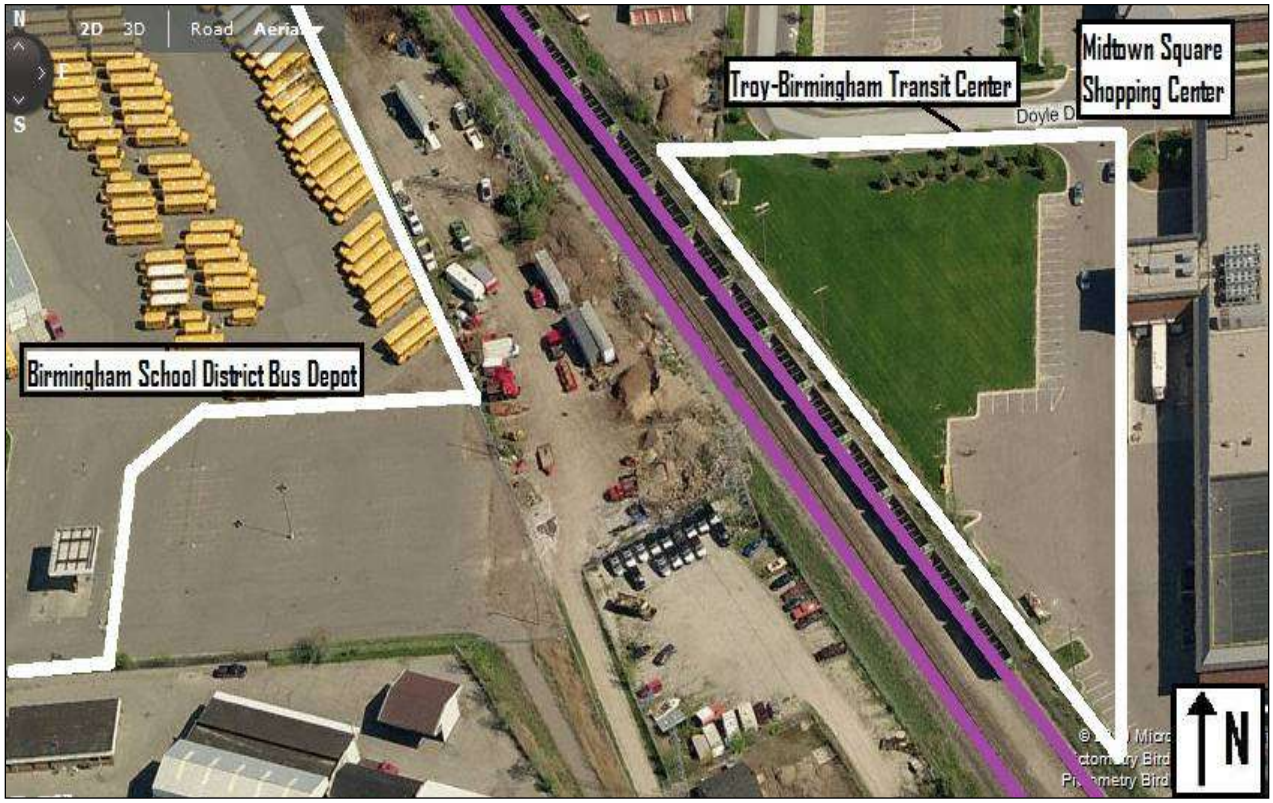

Figure 28. Proposed Troy-Birmingham Multi-modal Transit Center (MTC) Site

The lack of vacant property within the Rail District has been validated and was based on field observations made by the project team and aerial imagery. Although the amount of vacant land in the Rail District has diminished as the result of the completion of development projects (e.g., The District Lofts, Lofts at Eton Street Station), the addition of pedestrian-friendly features is expected to further improve the quality of life for those who frequent the area. In particular, pedestrian activities will be greatly facilitated on the Troy portion of the district, along the Midtown Square Shopping Center that border the proposed MTC site. For the Troy-Birmingham Amtrak station, the influence area is centered around the proposed MTC site, along the railroad tracks located there (Figures 11, 26, and 28).

Two local organizations have a key role in the development programs currently underway at this site. The descriptions of those organizations have been listed below [*60,61*]:

- **Birmingham-Bloomfield Chamber of Commerce (BBCC):** The BBCC is an organization that intends to build strong relationships with the government, education, and communities to create and maintain a prosperous business climate for its members: cities of Beverly Hills, Bingham Farms, Birmingham, Bloomfield Hills, Bloomfield Township, and Franklin. Among those cities, the city of Birmingham is of particular interest because of the speculation of rail transit in the Detroit metropolitan area.
- **Troy Chamber of Commerce (TCOC):** An organization formed with the intent to promote an environment that builds successful businesses and a thriving community, through service and regional collaboration.

In the midst of the proposals for rail transit investments in the Detroit metropolitan area, the BBCC, TCOC, and the cities that they represent, have collaborated to ensure that their member cities are able to capitalize on new mobility improvements. One of such collaborations was the planning and execution of a transit design charrette, intended to bring groups of professionals (e.g., designers, architects, engineers, and planners) together to share ideas and thoughts about the (then) proposed Troy-Birmingham Multi-modal Transit Center (MTC). Although the participants of the charrette were rather diverse (with respect to their fields of interest and profession), it was generally understood that the implementation of TOD was critical in meeting the mobility needs in the Detroit metropolitan region.

5.2.2. Site Characterization and Planning Perspectives:

The residential market in the area surrounding the rail district is very diverse in nature. The relative proximity to the city of Troy, which is generally known to be more affordable and less walkable than the city of Birmingham, creates additional diversity in housing type (rentals versus for-sale), price ranges (senior, low-cost, moderate, or upscale), and development configuration (apartment, townhome, loft, or single-family).

A telephone survey of the residential developers (leasing management companies, and sales offices for for-sale units) appears to indicate that vacancy rates in the influence area surrounding the proposed MTC are relatively low. A partial list of multi-family residential developments within the influence area for the MTC has been presented in Table 9 [*62,63,64*].

TABLE 9 Residential Market

NAME	WALK DISTANCE TO STATION (mi)	TYPE	MARKET	TOTAL # FLOORS	TOTAL # UNITS	ADDITIONAL INFO
The District Lofts	< 0.1	For Sale, Rent	Upscale condo	4	24	all units are 2 bedoom, 2 bath (1,500 - 1,950ft^2)
Eton Street Station	0.1 - 0.2	For Sale	Townhomes (40), Live/Work Studio (60)		110	Studio units are live/work artisan units, offering commercial retail space on first floor.
Eton Square Apartments & Townhomes	0.3	Rent	Apartments, townhomes		158	Troy side; Apartments (1,2 bedrooms), Townhomes (3 bedrooms)
Maplecrest Apartments	0.3	Rent	Apartments		68	Troy side; 1 bedroom (64 units), 2 bedroom (4 units)
2755 E. Maple Rd.	0.5	Rent	Apartments		6	Troy side; 1 bedroom
The Village at Midtown Square	0.3	For Sale	Townhomes		285	Troy side; 2 bedroom (1,480 - 2,321 ft^2)

The commercial markets in the cities of Troy and Birmingham are one of the most coveted areas in the Detroit metropolitan region, and arguably in the entire state of Michigan. In the city of Troy, the Somerset Collection is located approximately two miles north of the proposed MTC. This retail development is renowned as the most upscale commercial center in the state of Michigan. For the city, the mall serves as a local landmark, where a number of office buildings, hotels, and restaurants have been constructed in the last decade as the result of its success. In Birmingham on the other hand, the most attractive shopping destination is located in the CBD, located approximately one mile west of the Rail District. Like the Somerset Collection, the Birmingham CBD is considered a desired destination for shoppers in the Detroit metropolitan area, and a local center of lifestyle for the residents of both Troy and Birmingham.

Table 10. Commercial Market

NAME	WALK DISTANCE TO STATION (mi)	TYPE	MARKET	ADDITIONAL INFO
Whistle Stop	0.3	Service	Restaurant (Casual)	Birmingham side
Big Rock Chophouse / The Reserve	0.4	Service	Restaurant (Upscale)	Built on the site of the former Birmingham rail depot
Baja Fresh	0.4	Service	Restaurant (Casual)	Troy side
Target	> 0.4	Retail	General, Apparel	Troy side; Midtown Square Shopping Center
Dunham's		Retail	Apparel, Sports	
Kohl's		Retail	Apparel	
Old Navy		Retail	Apparel	
Petco		Retail, Service	Pets	
Famous Footwear		Retail	Apparel	
The Home Depot		Retail	Hardware, Tools, Materials	
Cole St. Salon & Spa	0.5	Service	Beauty parlor	Birmingham side (Cole St.)
Moran's Flora		Retail	Florist	

The Rail District has been marketed toward a younger and affluent demographic, a stark comparison to the demographics of Troy and Birmingham: older, conservative, affluent residents often living with at least one child in a single-family home. Much of the land uses located on Cole Street (Birmingham side), have been renovated and redeveloped from what were once industrial-related structures: warehouses, factories, etc. Table 10 summarizes the commercial developments located in the influence area for the Rail District.

Public/civic/institutional land uses in the Troy-Birmingham MTC influence area include the Goldfish Swimming School, located on Cole Street. Although there are a number of parks in both cities, there is a general lack of pedestrian facilities around the proposed MTC area.

In summary, collection of the data obtained for this section has indicated the following:

- Residential housing market is robust, despite the economic downturn, where newer developments (for-sale) have been successful and older ones (rental) have largely remained occupied. Additionally, the newer developments in the Rail District have successfully attracted a younger, more urban-influenced (e.g., a desire to reside in walkable communities, reduced dependence on private automobiles for travel) demographic sector.
- Commercial developments have been successful. The group of offerings within the Rail District is diverse, but will remain separated from one another until completion of the MTC.

5.2.3. Population Characteristics:

The populations of the cities of Troy and Birmingham are characterized by the relatively high median household incomes that they earn (according to the 2000 Census). The incomes are well above the averages for both Oakland County and the seven-county SEMCOG region [*65*].

Table 11. Comparison of Median Incomes in Oakland County, SEMCOG Region

COMMUNITY	POPULATION	MEDIAN HH INCOME ($ in 1999)
Birmingham	20,570	80,861
Troy	80,084	77,538
Oakland County	1,204,053	61,907
SEMCOG Region	4,782,407	49,979

Considering these data, it is expected that the development market in these cities would be stronger than the market in other parts of the Detroit area. The strength of that market may be a sign of hope for Metropolitan Detroit land developers; however, it may also be the biggest barrier to the success of new developments. The challenge for these two affluent cities to implement TOD will be to attract and retain a demographic that is naturally attracted to transit service and TODs.

Although, there are rental options available for those demographic groups that typically earn less than their wealthy counterparts (i.e., senior citizens, young professionals), there does not seem be many that cater to those that typically inhabit TOD's. Since the housing market in the area has fared better than most communities in the SEMCOG region, it could be argued that additional housing developments would have success here.

The Troy portion of the Rail District generally lacks features expected to promote pedestrian-oriented development. One exception is the Village at Midtown Square Development. This high-density community has been constructed with sidewalks adjacent to every unit of the development, but those facilities do not sufficiently connect pedestrians and shopping center. The sheer size of the parking capacity at Midtown Square may be prohibitive to those travelers. To mitigate this, an additional set of walkways could be constructed that "criss-cross" the large parking area, so that pedestrian travel time is shortened.

While the exact measures that may be used to mitigate these issues have not been determined, the project team has expressed that improvements in pedestrian safety and walkability and can be realized. Examples of those improvements and the mechanisms that may ease their implementation will be discussed later in this report.

The proposed MTC, as planned, would expose Amtrak passengers that enter or exit trains in the area to the (rear) service-entry elevations of the retail outlets located in the Midtown Square Shopping Center: Target, Kroger, Dunham's, etc. These areas are often used for the storage of waste dumpsters, recycling containers, loading docks and platforms, and building utilities (e.g., HVAC, water control). Additionally, the shopping center has been constructed using a layout that is typical of "big-box" retail outlets: large expanses of surface parking facilities, limited pedestrian facilities, limited common/green spaces, and significant separation between the development and the roadways adjacent to it.

The existing layout of the Midtown Square Shopping Center is shown below in Figure 29, in which the lack of pedestrian-friendly facilities can be observed. The posted speed limits in the parking area have not been determined, but it is expected that overall pedestrian safety could be improved upon. .

Figure 29. Midtown Square Shopping Center: Street-Level View

5.2.4. TOD's Proposed:

The Rail District has undergone significant changes in the last 20 years, but more may be needed so that it may approach an idyllic TOD. As mentioned in the previous sections, the amount of undeveloped land here is limited. Projects such as The District Lofts, Eton Street Station, and Midtown Square have consumed the vacant land in the area. However, additional growth may be realized along Cole Street, located at the southern end of the Rail District in the city of Birmingham. The city planning department has rezoned most of the Cole Street corridor as "Mixed Use," according to records maintained by the city government (shown as the purple-shaded area, located south of the proposed MTC, in Figure 27). Cole Street has lately undergone significant development and property reinvestment. The Rail District is now considered an affordable alternative to the Birmingham CBD for entrepreneurs wishing to relocate their operations to the city.

New businesses that have relocated to this growing community are diverse and include architects, engineers, florists, swim instructors, interior designers, and beauty salons. Considering this trend, the area may be the most viable option for redevelopment projects in the Rail District because most of the remaining sections in Birmingham and Troy have been occupied.

Suitable areas for new development and reconstruction may be the low-density developments that are adjacent to Cole Street, shown in Figure 30. The area shown in the image has historically been utilized for light-to-medium industrial land uses (e.g., warehousing, auto repair), but is now well-equipped to accommodate TOD, as a result of zoning modifications by the city of Birmingham (institutional mechanism). It should also be noted, that much of the Cole Street corridor is strategically located within half a-mile walking distance from the proposed MTC across the CN ROW.

The addition of affordable, medium to high-density residential land uses along the corridor may be a boon to the MTC investment, and the quality of life for those living there.

Figure 30. Rail District: Cole St. Corridor

It has been observed that there is a lack of a major bookstore or bookseller within an approximate one-mile radius surrounding the Rail District. While such retail outlets can be found near the Somerset collection in Troy and the Birmingham CBD, it would be expected that demand for an additional bookstore would be generated by growth in the area. Oakland County boasts a demographic of highly-educated residents, more than 23 percent hold a bachelor's degree and an additional 15 percent hold graduate or professional degrees (relatively high values compared to Wayne County: corresponding values of 10.9 and 6.4 percent respectively) [*65*].

Again, the most critical limiting factor for redevelopment in the Birmingham section of the Rail District is the availability of vacant land. Although additional development is possible, its magnitude and pattern (in terms of acres redevelopment) would ultimately be subject to the willingness of the entities that own the properties discussed to participate in the project.

In order to create a more people-friendly environment, existing stores such as Target, Kohl's, Kroger, Old Navy, and others should consider adding another exit/entry point at the other side of the store, so that transit patrons may get in/out from both side.

Pedestrian improvements, on the other hand, may be the missing link in connecting both communities in the Rail District. Some of these improvements could include but are not limited to the following: speed bumps, improved pedestrian crossing markings, widened walkways dedicated to pedestrians, ADA-compliant curb cuts, and traffic calming measures (e.g., narrowed lanes, warning signal/signs). Those facilities, in addition to the CN right of way (ROW) pedestrian tunnel planned for the MTC project, would truly connect the two cities of Birmingham and Troy, and would have the potential to stimulate additional economic investment. A complete list of the proposed land uses suggested for the area is shown in Table 12.

Table 12. Proposed Land Uses

	LAND USE TYPE	DESCRIPTION	ADDITIONAL INFO
1	Retail/Service/Commercial	Bookstore	e.g., Borders Books & Music, Schuler's Books & Music
2		Child Care Center	
3	Public/Civic/Institutional	Common spaces (Troy)	e.g., pedestrian plaza, small park, landscaping, sidewalks/pathways
4		Traffic Calming/Pedestrian Facilities (Both cities)	e.g., pedestrian crossing signals & crosswalks, curb cuts, pedestrian lighting, wayfinding facilities
5	Residential	Apartment complex (Birmingham)	e.g., Affordable senior living community, affordable rental units

5.3. Mechanisms Deployed to Implement TOD

5.3.1. General Mechanisms:

The implementation of any new programs (e.g., TOD, joint development, etc.) is often hindered by different barriers. In order to overcome these barriers, it may be necessary to deploy a different set of mechanism or techniques. The mechanisms described below may be executed by TOD stakeholders, a broad range of groups and organizations that may include but are not limited to: local governments (e.g., planners, city council, public works), federal/state/regional governments (e.g., FHWA, HUD, MDOT, SEMCOG), private developers, transit providers/agencies, and financial institutions. The deployment of these mechanisms requires significant intergovernmental cooperation at different levels. Mechanisms have been classified into three categories:

1. **Planning:** relates to strategies that may be used to change zoning definitions or master plans for communities to facilitate the implementation of TOD programs. Examples include creating overlay zoning districts, benefit assessment districts, empowerment zones, and re-zoning properties.
2. **Institutional:** relates to strategies involving a planned arrangement for the coordination of efforts and/or resources exerted between different TOD stakeholders. Examples of this mechanism include the creation of project-specific planning commissions (i.e., TOD), joint-development programs, municipal powers, development rights, and court rulings.
3. **Economic:** relates to strategies that may be used by TOD stakeholders to overcome economic barriers through a commitment of public monetary resources. Examples include property leasing, public private partnerships (PPP), TIF, land banking, alternative sources of funding, land acquisition, and grants (local, state, or federal).

There have been numerous examples, in the Detroit metropolitan area, where such mechanisms have been utilized for the execution of development projects. Mechanisms that may be used for the implementation of TOD projects in the state of Michigan, the SEMCOG region, or counties and local governments are listed in Table 13 [*66*].

The state of Michigan, the SEMCOG region, and the city governments represented by each of the two station areas selected, all are eligible for varying degrees of development incentives. For instance, although the city of Detroit has experienced a decrease in population over the past three decades, the city government and the Detroit Economic Growth Corporation (DEGC) have established well-defined mechanisms to promote developments expected to improve the quality of life for the remaining population. Programs intended to attract nationally-recognized casual dining restaurants and grocery stores are likely to be of particular interest in this context. Such programs are examples of local support for new development.

On the other side of the scale, the current federal administration has expressed a strong desire to incorporate smart growth, sustainability, and livability into new developments in the nation's communities. Federal monies are largely available though a competitive process, rewarding the most suitable projects with grants. The marriage of local incentives, on the lower scale, federal incentives, on the upper scale, and state and regional programs, in between, may be highly attractive to stakeholders wishing to pursue development projects.

The project team has assembled packages for mixed-use TOD implementation at each of the two sites that have been selected. Each package addresses the following items, with regard to the site location:

- Changes in zoning definitions
- New land uses
- Geometric constraints and safety issues (i.e., traffic control, pedestrian facilities)
- Mechanisms for effective implementation (i.e., planning, institutional, economic)
- Real property available for new construction

Table 13. Mechanisms: General

	JURISDICTION	AGENCY	PROGRAM	APPLICATIONS	FINANCING (TYPE)
1	Federal	FHWA / FTA	Metroplotan & Statewide Planning Formula Grant	Regional planning, decision-making	Grants (Formula)
2			Transportation Planning Capacity Building Program	Land use and scenario planning, TOD, non-motorized transportation, safety	
3		FTA	Urbanized Areas Formula Grant Program (Transit agencies in urbanized areas population of 200,000+)	Planning, engineering design, and evaluation of transit projects; 1%+ of funds used for historic preservation, landscaping, public art, pedestrian access, disabilities access	
4			Bus & Bus Facilities Discretionary Grant Program (Transit agencies in urbanized areas population of 200,000+)	New and replacement buses, equipment, facilities, intermodal transit centers	Grants (Competitive)
5		FHWA	Transportation Enhancement (TE) Program	Expand transportation mode choices, safety programs, historic preservation, environmental mitigation, scenic beautification	Grants (Formula)
6			Congestion Mitigation and Air Quality (CMAQ) Program	Reduce pollution, transportation system efficiency, non-motorized transportation facilities, travel demand management	General fund
7		EPA	Smart Growth Implementation Assistance (SGIA) Program	Technical assistance for resolving transportation and parking issues, affordable housing, storm water management, infill and redevelopment.	Competitive
8		EDA	Economic Development Program	Aid in financing economic development.	Grants, loans
9			Economic Development Planning	Provides assistance to public agencies for economic development planning	Grants
10	State of Michigan	MSHDA	Housing Development Authority (PA 346 of 1966)	Study housing issues, acquire and release real property	Grants, bonds, appropriation, operation revenues

Table 13. Mechanisms: General (cont.)

	JURISDICTION	AGENCY	PROGRAM	APPLICATIONS	FINANCING (TYPE)
11	State of Michigan	MEDC	Economic Development Corporations (PA 338 of 1974)	Plan/acquire/prepare sites, loan guarantees, equip facilities for private enterprise	Grants, bonds, operation revenues
12		DDA	Downtown Development Authorities (PA 197 of 1975)	Devise and maintain plans, acquire/hold/develop property, enter PPP, operation of projects	Grants, bonds, operation revenues, TIF, tax proceeds
13		MTA	Metropolitan Transit Authorties (PA 204 of 1967)	Plan/acquire/operate transit and related facilities, utilize eminent domain for land needs	

The city of Detroit utilizes a number of organizations and authorities in planning for development limits intended to improve economic growth and quality of life for its citizens. The Detroit Economic Growth Corporation (DEGC) is a private, non-profit organization that provides the city with the following services with the intent of creating new investments and employment: project management, financial assistance, planning, and development assistance.

The DEGC was founded in 1978 to circumvent many of the bureaucratic obstacles that may slow the progress of a planned project by combining the resources of both the private and public sector. The 35 members of the DEGC collectively serve as the authority governing other organizations, all of which are intended to boost economic activity within the city of Detroit. An organization chart depicting the structure of the DEGC is shown in Figure 31.

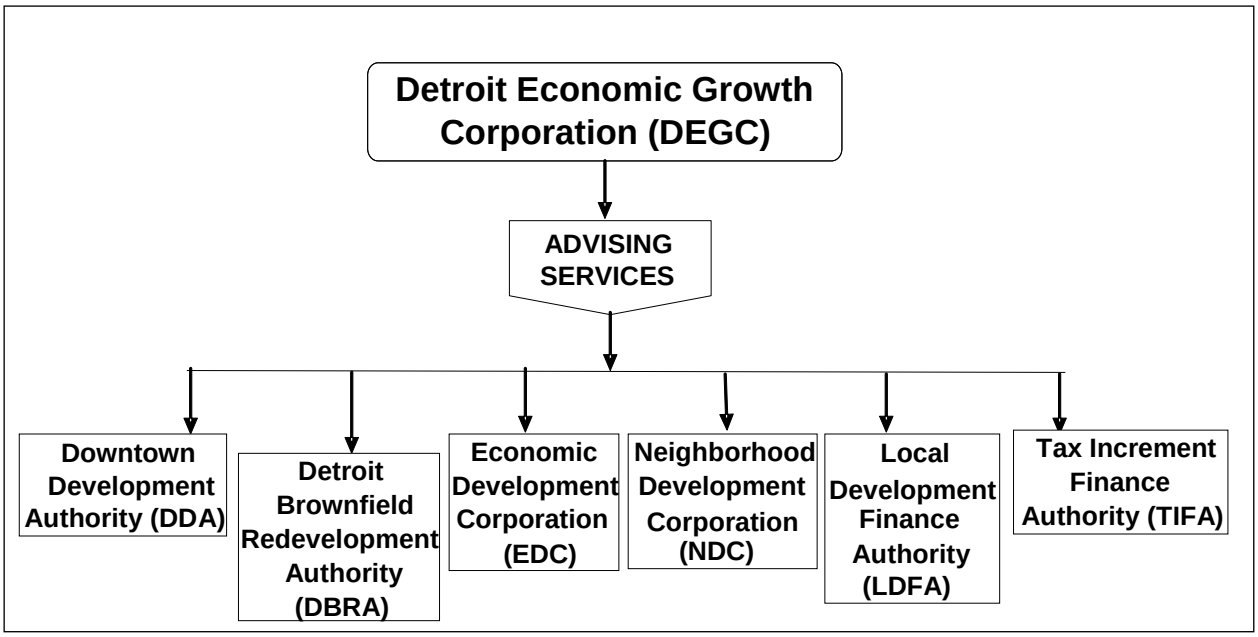

Figure 31. Detroit Economic Growth Corporation (DEGC) Organization Chart

The affiliated organizations have been listed below [*67,68,69,70,71,72*]:

- **Downtown Development Authority (DDA):** The DDA was created in 1976 with the intent on promoting economic growth, focused in the downtown district of the city of Detroit. This area contains approximately two square-miles of land area, and is bounded by: John C. Lodge Freeway (M-10) to the west, Fisher Freeway (I-75) to the north, Chrysler Freeway (I-375) to the east, and the Detroit River to the south.
- **Detroit Brownfield Redevelopment Authority (DBRA):** Provides incentives for the city of Detroit to pursue redevelopment and revitalization efforts in areas in need (e.g., environmentally contaminated, blighted, abandoned, under-utilized). The authority is governed by a nine-member-board of directors.

- **Economic Development Corporation (EDC):** A component unit of both the city of Detroit and the DEGC. Some of the long-term activities involving the EDC include making loans payable to the city of Detroit utilizing U.S. Housing and Urban Development grants (HUD), and designating land parcels for tax benefits and incentives.
- **Neighborhood Development Corporation (NDC):** Established as a subsidiary corporation by the EDC, housing and neighborhood programs within qualified blighted or redevelopment areas can be implemented by the NDC. The NDC can implement a program to acquire property, construct improvements, and rehabilitate or construct houses for immediate sale as long as it is in accordance to a City Council approved project plan.
- **Local Development Finance Authority (LDFA):** A component unit of both the city of Detroit and the DEGC, the LDFA was created in October 1988. The objectives of the authority are as follows: collection of taxes from within tax increment districts to pay debt service used to complete development projects, establishing additional tax increment districts within the city limits (e.g., East Riverfront Conservancy, Jefferson Avenue Chrysler Corporation assembly plant).
- **Tax Incentive Finance Authority (TIFA):** This branch was established in 1982 under PA 450 of 1980. Funding for TIFA comes from tax increments captured as a result of new growth. Spending of funds must be in accordance with a City Council-approved plan.

The city of Detroit has the benefit of a well-defined hierarchy of planning organizations and departments. Throughout the city, there are a number of completed developments that exhibit the full potential of public-private partnerships. For instance, Joe Louis Arena (home of the Detroit Red Wings of the National Hockey League (NHL)) and Cobo Hall were constructed through the use of well-executed PPPs.

Perhaps the most challenging of the barrier to TOD, for the Masonic Temple area, is the lack of demand for development. The world economic crisis has had a devastating effect on the Detroit metropolitan region which is primarily a manufacturing-based economy. Although the total employment for the region is expected to increase by four percent through the year 2020, employment figures in Wayne County and the city of Detroit have been projected to change by 0.4 and -2 percent respectively, for the same duration (based on the 10-year duration from the year 2010 to 2020) [*65*]. These data are listed in Table 14.

Table 14. Projected Employment (2010-2020)

AREA	EMPLOYMENT (x 1,000)			% CHANGE
	2010	2015	2020	
SEMCOG Region	2,586.662	2,638.848	2,690.492	4.0
Wayne County	909.527	908.457	913.495	0.4
City of Detroit	326.620	322.879	320.536	-1.9

(Source: SEMCOG)

As expected, employment figures for the city have a strong correlation with city population. The city of Detroit has been losing significant population for the past six decades. The result of this staggering decline is a city of approximately 800,000 residents distributed across an area of 140 square-miles. Of those 140 square-miles, roughly one-third of the land area is vacant and more than 30,000 structures are empty [*73*]. Factors that further complicate new development, and attracting developers to the city, are related to the affluence level of the potential patrons.

5.3.2. Mechanisms for Effective Implementation at the Masonic Temple Site

There are various mechanisms available to stakeholders pursuing development within the Detroit city limits. As mentioned earlier, there are a number of organizations that operate within the city who are empowered to execute these mechanisms in cooperation with the city.

Institutional mechanisms, such as joint development (JD), have been used for the planning and construction of Cobo Hall, a 700,000 square feet convention center, located in Detroit's CBD. The structure is most notable as the historical home of the North American International Auto Show, held every January. Cobo Hall was opened to the public in 1960, and was constructed in the airspace directly above a portion of the John C. Lodge Freeway (M-10). This project and others that have been supported by the city of Detroit (expansion of Cobo Hall exhibition spaces) suggest that there are no legal objections to development in the airspace over or below public facilities. If this assumption holds true, spaces above or below public facilities may be utilized for more productive uses: commercial, residential, institutional, etc [*74*,*75*].

Mechanisms involving local, state, and Federal organizations and agencies that may be used for the implementation of TOD projects in the city Detroit have been listed in Table 15 and 16 [*76*].

Table 15. Mechanisms: City of Detroit

	JURISDICTION	AGENCY	PROGRAM	APPLICATIONS	FINANCING (TYPE)
1	Federal	FHWA	Pedestrian & Bicycle Safety Program	Research, developing guidelines, tools, safety countermeasures, identifying 'hot' spots	
2		HUD	Sustainable Communities	Regional planning, land use planning, affordable housing, multi-family housing, linking land uses, zoning reform, energy-efficient housing	General fund
3			HOPE VI	Elimination/reclamation of distressed public housing, demolition, rehab, new construction, supportive services for the relocated, green building	Grants (Competitive)
4			Public Housing Program	Operating expenses, repairs, incorporating environmental sustainability, energy & water conservation	Grants (Formula)
5			Housing Choice and Project-Based Vouchers	Provide funding to local public housing agencies for rental subsidies. Allow tenants to relocate closer to work, family, or places of worship	
6			Community Development Block Grants (CDBG)	May be used for low-to-moderate income persons, prevention of slums/blighted area, meets community development needs having urgency.	Grants (Formula)
7			Supportive Housing for the Elderly (Section 202) & Supportive Housing for Persons with Disabilities (Section 811)	Support operating and maintenance costs so that rent prices remain affordable for those with very low incomes	Grants (Competitive)

Table 15. Mechanisms: City of Detroit (cont.)

	JURISDICTION	AGENCY	PROGRAM	APPLICATIONS	FINANCING (TYPE)
8	City of Detroit CBD	DDA	Housing/Office/Retail Development Program	Assistance for the construction, redevelopment, or improvement of real property.	Loans
9			Small Business Loan Transactions Program	Assistance for building owners, tenants, and business owners, with the intent to halt decay of property values and create new employment.	
10		DEGC	Business Development Loan Fund	Foster investment in national or regional recognized chain retail/restaurant ventures.	
11			Real Property Gap Fund	Encourage investment in the rehabilitation of real property by Detroit residents.	
12	City of Detroit		Neighborhood Enterprize Zones (NEZ)	Provides tax incentives for housing developments and improvements.	Tax relief
13			Commercial Rehabilitation Act (PA 210 of 2005)	Encourage the rehabilitation of commercial properties no less than 15 years old by abating taxes on new investments. Particular effort exerted in seeking grocery or produce markets.	
14			Personal Property Tax Abatement Program	Encourage development of the following projects: mining, manufacturing, R&D, wholesale trade, office operations.	
15			Obsolete Property Rehabilitation Program	Encourages rehabilitation and reconstruction in districts that may contain properties that are blighted or functionally obsolete.	
16			Renaissance Zone: Woodward Ave.	Approximately 2 acres of land is eligible for a number of tax incentives: business, income, state education, personal property, real property, utility use.	
17			Creative Corridor Incentive Fund	Intended to develop 125,000 ft^2 of real estate, 400 jobs, new centers of dense commercial activity that may attract creative talent and companies. Project management assistance.	Grants

Table 16. Proposed Land Uses with Available Mechanisms

	LAND USE TYPE	DESCRIPTION	ADDITIONAL INFO	MECHANISMS AVAILABLE
1	Retail/Service/Commercial	Child Care Center		G11, D8, D11, D15
2		Bookstore	e.g., Borders Books & Music, Schuler's Books & Music	G11, D8, D11, D15, D16
3		Casual Dining Restaurant	e.g., Chili's, Applebee's, TGI Friday's, Denny's	G11, D8, D10, D11, D15, D16
4		Grocery or General	e.g., Meijer, Kroger, Target, Wal-Mart	G11, D8, D11, D13, D15, D16
5	Public/Civic/Institutional	Transit Station w/ Shelter	May be integrated into mixed-use structure, located on street-level	G3-G5, G13
6	Residential	Apartment Complex	For Rent, Marketed toward students (WSU, UM, MSU)	G7, G10, G11, D8, D11, D12, D15, D16
7	Public/Civic/Institutional	Traffic calming/Pedestrian facilities	e.g., pedestrian relief island (Woodward Ave.), HAWK pedestrian signals, capacity reduction (Woodward Ave.), "zebra" crosswalk markings	G2, G5, G6, D1

Note: Under the "MECHANISMS AVAILABLE" column, the notations refer to the General Mechanisms table and the Detroit- specific mechanisms table (G: General, D: Detroit). The numbers refer to the row in each table, which point to a specific mechanism.

5.3.3. Mechanisms for Effective Implementation at the Troy-Birmingham Site

The cities of Troy and Birmingham enjoy the state and regional-wide distinction of having robust commercial districts and economies. Such distinction may serve as a proxy for a complex economic growth or planning organization, such as the Detroit DDA and DEGC.

An institutional mechanism was the driving force in the planning and development of the Troy-Birmingham MTC. A consent judgment (mutual agreement between the plaintiff and defendant) combined with intergovernmental collaboration enabled the city of Troy to take ownership and control over a 77-acre parcel of land, located near in the intersection of E. Maple Road and Coolidge Highway. The plaintiff in this case was Grand/Sakwa Properties, Inc., a privately-held land development corporation and the defendant was the city of Troy. The ruling is the result of a dispute between the two parties over zoning regulations for the parcel of land that at one time was zoned as "M-1: Light Industrial by the city of Troy Zoning Ordinance. That definition reflects an earlier period in Troy history when the area was largely undeveloped and the site was utilized as a tractor assembly plant by the Ford Motor Company. Today, much of the 77-acre parcel has undergone complete demolition of the Ford tractor plant, environmental remediation of the land, the eventual construction of the Midtown Square Shopping Center and the Village at Midtown Square residential development. Additionally, the parcel is planned to be re-zoned from "M-1: Light Industrial" to "Mixed-Use" [*77*].

The conditions of the consent judgment, however, required that the remaining portion of the site, (approximately 3.5-acres located the Midtown Square Shopping Center) to be utilized as a transportation center, so that the entire parcel may reflect its new zoning definition [*78*]. At the time of this writing, the cities are anticipating to break ground at the time before the end of this calendar year.

Other mechanisms involving local, state, and federal organizations/agencies that may be used for the implementation of TOD-related projects in the cities of Troy and Birmingham have been listed in Table 17 and 18 [*79,80,81*].

Table 17. Mechanisms: Cities of Troy and Birmingham

JURISDICTION	AGENCY	PROGRAM	APPLICATIONS	FINANCING (TYPE)
Oakland County	Economic Development	Planning & Economic Development Services (PEDS)	Offers community assistance, planning, market research data, aerial imagery, and financial assistance for businesses.	Various
City of Birmingham	Planning Division	Special Land Use Permits (SLUP)	Required for the following: schools, community buildings, churches, publicly-owned buildings, gasoline stations, drive-in facilities, child care centers, beer/wine sales, automatic laundries, trailer camps, bus stations, funeral homes, outdoor storage and parking facilities.	
City of Troy	City Council	Real Estate & Economic Development Department	Assistance in obtaining Federal/State/Local funding, site location, tax incentives, and relocation for businesses.	Various
		Local Development Financing Authority (LDFA)	Offers assistance to local developments so that unemployment is prevented, and additional growth is promoted.	Bonds, permits, tax relief, operations revenue

Table 18. Proposed Land Uses with Available Mechanisms

	LAND USE TYPE	DESCRIPTION	ADDITIONAL INFO	MECHANISMS AVAILABLE
1	Retail/Service/Commercial	Bookstore	e.g., Borders Books & Music, Schuler's Books & Music	G11, T1, T3, T4
2		Child Care Center		G11, T1-T4
3	Public/Civic/Institutional	Common spaces (Troy)	e.g., pedestrian plaza, small park, landscaping, sidewalks/pathways	G2, G5, G6
4		Traffic Calming/Pedestrian Facilities (Both cities)	e.g., pedestrian crossing signals & crosswalks, curb cuts, pedestrian lighting, wayfinding facilities	G2, G5, G6, T2
5	Residential	Apartment complex (Birmingham)	e.g., Affordable senior living community, affordable rental units	G7-G11, T1

Note: Under the "MECHANISMS AVAILABLE" column, the notations refer to the General Mechanisms table and the Troy/Birmingham-specific mechanisms table (G: General, T: Troy/Birmingham). The numbers refer to the row in each table, which point to a specific mechanism.

6. CONCLUSIONS

The term transit-oriented development (TOD) is being used increasingly in transit literature, particularly in studies related to planning and design of urban rail-transit. TOD relates to the integration of diverse (but desirable) land uses with transit, both temporally and spatially, and is designed to increase transit ridership and to promote desirable land uses surrounding the station areas. Over the last decade, there has been increased interest in North American cities, to construct light-rail transit (LRT) systems to improve mobility. LRT stations appear to be ideal sites for TOD programs, primarily because of compatibility in their scale of operation. Currently, there are a number of transit initiatives in the Detroit metropolitan region that, if implemented, may significantly change the transportation characteristics in the southeast Michigan area. A number of studies are currently underway with the intent of exploring the feasibility of constructing an LRT system along Woodward Avenue, one of the most dominant travel corridors in Metropolitan Detroit.

The purpose of this study, conducted jointly at Wayne State University (WSU) and the University of Detroit Mercy (UDM), is to develop TOD programs on two selected stations along the planned LRT route in Metropolitan Detroit (Chapter 1). Reducing the cost of transportation and congestion on our highways, and creating opportunities for economic development, are major challenges in metro Detroit at this time. TOD programs can contribute to these goals by reducing the public's dependence on automobile travel and revitalizing the local economy. A LRT system would present great opportunities to the community to address these critical needs. This study identifies two transit stations along the Woodward Avenue corridor, proposes TOD packages for these sites, and identifies planning, economic, and institutional mechanisms for their effective implementation. The focus of this study is to integrate TOD with the planning and design of selected stations in the Detroit area, with the intent to maximize economic growth potential and to improve the quality of life of the citizens of the local communities and the users of the LRT facility.

The specific conclusions of this study are as follows:

- Four rail stations in the Detroit metropolitan area were initially selected following a preliminary network-level analysis that included two stations in the city of Detroit and two in two different suburban communities based upon land use, transportations, and other factors.
- The network-level analysis culminated in the selection of two stations for further TOD analysis. The two stations selected for TOD analysis are the Masonic Temple site along Woodward Avenue in the city of Detroit, and the Amtrak rail station in the cities of Troy and Birmingham. Pedestrian friendliness (either current or potential) was one of the major factors considered, along with the availability of vacant land, and the proximity to major transportation corridor(s) in selecting the station site.

- Detailed project-level analyses were conducted on the two selected transit stations that are marked by both significant similarities and contrasts. The developments proposed at the two stations encompass a variety of land use including multi-family residential, retail, service-oriented, and other use within the area of influence of the station.
- A set of mechanisms (both general and station-specific) also is presented in recognition of the probability that the implementation of any new program, encompassing transportation-land use interface such as TOD, is likely to be hindered by different institutional barriers. A "mechanism" in this case can be looked upon as a strategy or a group of strategies (planning, economic, financial, etc.) that can be deployed through proper intergovernmental cooperation to implement the proposed development. First, a set of general mechanisms is presented that may be applied to transportation projects in general and that may require interface with land use planning and economic development. This discussion is followed with station-specific mechanisms that attempt to relate the proposed development with strategies that may be deployed to expedite their effective implementation.

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9. LIST OF ACRONYMS

AATA	Ann Arbor Transportation Authority
ADA	Americans with Disabilities Act
ADT	Average daily traffic
ARRA	American Recovery and Reinvestment Act of 2009
BBCC	Birmingham-Bloomfield Chamber of Commerce
BRT	Bus rapid transit
BWATC	Blue Water Area Transportation Commission
CBD	Central business district
CN	Canadian National Railway
CRT	Commuter rail transit
CTOD	Center for Transit-Oriented Development
DDA	Downtown Development Authority
DDOT	Detroit Department of Transportation
DEGC	Detroit Economic Growth Corporation
DMC	Detroit Medical Center
DOE	Department of Energy
DRC	Detroit Regional Chamber
DTC	Detroit Transportation Corporation
DTW	Detroit Metropolitan Wayne County Airport
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
HUD	Department of Housing and Urban Development
ITE	Institute of Transportation Engineers
JD	Joint development
LET	Lake Erie Transit
LRT	Light rail transit
LRTV	LRT vehicles
MAX	Portland's Metropolitan Area Express
MDOT	Michigan Department of Transportation

MLB	Major League Baseball
MSU	Michigan State University
MTC	Multi-modal transit center
MTI	Mineta Transportation Institute
NFL	National Football League
NHL	National Historical Landmarks
NRHP	National Register of Historic Places
PD	Planned Development District
PHV	Peak-hour volume
PPP	Public private partnership
ROW	Right of way
RRT	Rapid rail transit
SEMCOG	Southeast Michigan Council of Governments
SEMTA	Southeast Michigan Transportation Authority
SMART	Suburban Mobility Authority for Regional Transportation
TCOC	Troy Chamber of Commerce
TCRP	Transit Cooperative Research Program
TIF	Tax increment financing
TOD	Transit oriented development
TriMet	Tri-County Metropolitan Transportation District of Oregon
UDM	University of Detroit Mercy
UM	University of Michigan
VPD	Vehicles per day
VPH	Vehicles per hour
VTA	Santa Clara Valley Transportation Authority
WSU	Wayne State University