6. SCREEN 2 – DETAILED EVALUATION

Screen 2 – Detailed Evaluation used refined criteria relative to those used in the fatal flaw analysis. The purpose of Screen 2 is to further refine the list of alternatives to identify specific alignments (e.g. roadway rights-of-way) and transit technologies (e.g. bus, light rail, heavy rail) for further analysis and that would eventually result in the selection of the LPA for the DTOGS project. The general categories of assessment were:

- Community Sentiment – What do the public and stakeholders say are the transit priorities in the DTOGS project area?
- Transportation – How does each alignment fit into the existing network of modes in the area?
- Development – What opportunities exist along each alignment to ensure that rapid transit improvements would be used and complement the economy of the area they serve?
- Environment – What are the potential environmental resources adjacent to each alignment that could be affected by rapid transit development?
- Conceptual Engineering – What are the potential physical requirements of rapid transit in each alignment, including cost?

Public and stakeholder input, together with technical analysis, formed the basis for the recommendations on which alignments were to be carried forward into the Evaluation of Alternatives.

6.1 Level 1: Identify and Evaluate Rapid Transit Alignments

As described in the previous section, each corridor was defined as a two-mile buffer centered on each of the fourteen main thoroughfares. For example, the Michigan Avenue corridor included the area one mile to the north and one mile to the south of Michigan Avenue. In identifying potential alignments within the each of the fourteen corridors, all roadways within this two-mile buffer that were at least classified as a collector route according to the SEMCOG functional classification plan were considered a potential alignment within a corridor.

Table 6-1 presents the criteria used to evaluate each of the potential rapid transit alignment in each corridor. Similar to the fatal flaw analysis, Screen 2 evaluation used a five-point scoring scheme to determine how well an alignment met a specific criterion. An alignment that received a rating of "Very Good" garnered five points, while another alignment that received a rating of "Very Poor" garnered only one point. In the end, the alignments that received the total highest points within the "Good" and "Very Good" categories were recommended for detailed development.

Appendix E presents details of Screen 2 evaluation, dated June 2007. **Table 6-2** presents the highest scoring alignments, in descending order of total score.

Table 6-1
Screen 2 Evaluation Criteria

Community Sentiment	Land Use and Development Opportunities
Resident/neighborhood sentiment Business community sentiment	Consistency with land use patterns Proximity to developed and redevelopable land
Transportation and Mobility	**Conceptual Engineering**
Multimodal connectivity Accessibility Ridership	Capital cost Operating cost per revenue hour Operating costs per passenger Right-of-way availability Ability to phase construction Traffic impacts Parking impacts
Communities and Environment	
Transit dependent population Water resources Parklands and open space Cultural and historic resources	

Table 6-2
Screen 2 Results: Recommended Alignments

Alignment	Score
Woodward Avenue	66 points
Michigan Avenue	59 points
Gratiot Avenue	58 points
MLK/Myrtle/Mack Avenues	58 points
Warren Avenue	58 points
Grand River Avenue	56 points
Eight Mile Road	55 points
Mound Avenue	52 points
Mack Avenue	50 points

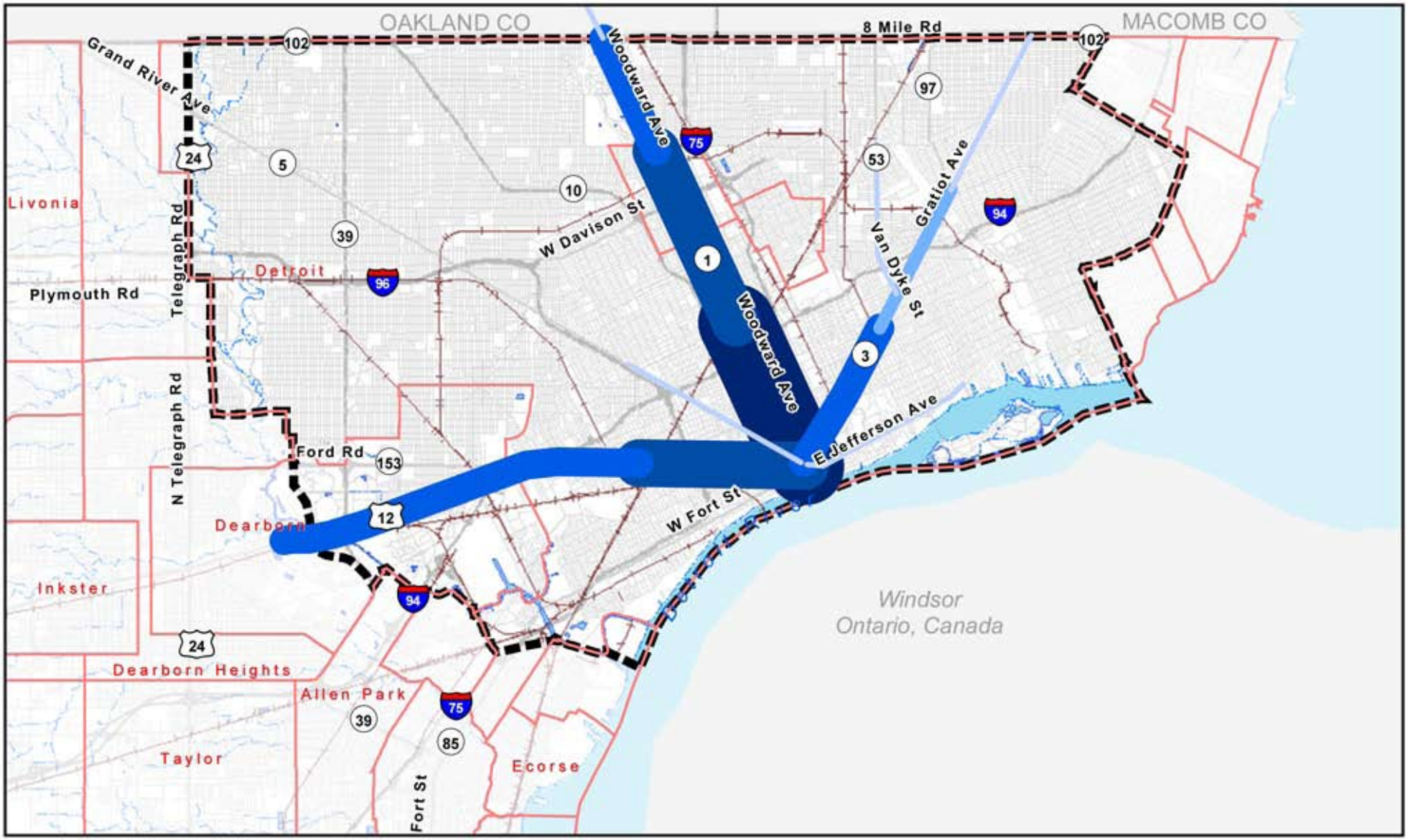
6.1.1 Community Sentiment

One of the criteria used in the detailed evaluation was community sentiment, encompassing feedback from residents, neighborhoods and the business community. Within the Screen 2 evaluation, this assessment was completed through the early scoping meetings conducted in July 2007. Similar to the public meetings conducted in March 2007, DDOT obtained public feedback on needed transit improvements, corridor preferences, and rapid transit technologies at these meetings.

A tool that was used at these meetings to facilitate public feedback was a mapping exercise that asked participants to indicate their preferred transit alignments using stickers, with two conditions. The first condition was that the alignment must serve downtown Detroit. The second condition that the alignment segments must be contiguous. A purpose of this exercise was to determine from the public what they thought a rapid transit starter line alignment in the Detroit area should look like.

This exercise indicated that the public considered the segment of Woodward Avenue between downtown Detroit and Grand Boulevard as an important alignment of any rapid transit starter line that could be implemented in the Detroit area (see **Figure 6-1** on the next page). This finding helped shape the alignment alternatives to be considered in the third and final level of evaluation in the DTOGS project, prior to identifying the locally preferred alternative. **Appendix D** presents the detailed findings from the July 2007 early scoping meetings.

Another exercise used to engage the public asked them their preference on the potential rapid transit alignments. For example, within the Woodward Corridor, which roadways seem suitable for rapid transit operation? This information was also used to prioritize the alignments identified for further study resulting from the first level of analysis under Screen 2.



DETROIT TRANSIT
Options for Growth Study

URS

DETROIT DEPARTMENT OF TRANSPORTATION

Votes

1 - 5
6 - 15
16 - 25
26 - 29
30 - 46

Data Source: City of Detroit, URS

January 28, 2008

Figure 6-1

Results of the Build Your Own Rapid Transit Alignment Exercise

6.2 Level 2 – Prioritize Rapid Transit Alignments

The alignments identified as suitable for rapid transit were than prioritized based on their ability to meet the needs of the DTOGS project. The alignments were then prioritized into three categories, as follows:

- First Priority: Woodward Avenue has an overall rating of 66 points.
- Second Priority: Gratiot and Michigan Avenues each has an overall rating of 58 points and 59 points, respectively.
- Third Priority: Grand River Avenue and Eight Mile Road have an overall rating 56 points and 55 points, respectively.

The remaining four alignments (Grand River, MLK/Myrtle/Mack, Mound and Warren) were excluded from further consideration because their travel markets overlapped with that of one or more of the higher scoring alignments.

6.3 Level 3 – Evaluate Transit Technologies

In addition to examining possible rapid transit alignments and consistent with the FTA's requirement that an AA examines a breadth of transit options, the DTOGS project assessed thirteen different transit technologies to determine their consistency with project goals. The evaluation of transit technologies (see **Appendix F** for details) also completed a general assessment of the applicability of each transit technology to the five corridors recommended for Screen 2 evaluation by the DTOGS project Technical Committee on January 25, 2007. The transit technologies were grouped into the following categories:

- Bus – Conventional and electric trolley bus
- BRT – Conventional and guided bus
- LRT
- Modern Streetcar – Currently operating in Portland, OR
- Magnetic Levitation
- Heavy Rail

- Commuter Rail
- Automated Guideway Transit (AGT) – People mover, monorail, and personal rapid transit (PRT).

Criteria used in determining the suitability of each of these modes included capital cost, operating and maintenance cost, right-of-way requirements, passenger-carrying capacity, and trip length. The results of this technology assessment recommended carrying forward the following transit modes for further analysis:

- Conventional Bus – The FTA requires analysis of conventional buses as part of the No-Build and TSM Alternatives.
- Conventional BRT – The FTA requires analysis of BRT in the AA process.
- LRT –This recommendation is consistent with public opinion garnered from open houses conducted in March 2007.

The FTA New Starts process requires analysis of both conventional bus and BRT in addition to transit modes as part of the Build Alternatives. **Table 6-3** presents a summary of the characteristics of the three recommended transit technologies. Section 6.3.1 summarizes the rationale for the transit technologies excluded from further consideration in the DTOGS project.

Table 6-3
Summary Characteristics of Recommended Transit Technologies[1]

Transit Technology	Description	Capital Cost per Mile ($ millions)	Operating Speed[2] (Max/ Average)	Stop/Station Spacing	Characteristic Advantages
 Conventional Bus	Most common form of transit Self-propelled, rubber tired vehicles Flexible routes and spacing of stops On-board fare collection Typically runs in mixed traffic on ordinary roadways Currently in operation throughout the U.S., including the Detroit metropolitan area	Related to vehicles in operation	65 mph/ 12 mph	Close (<.5 mi.)	Lowest capital cost Routing flexibility Can meet wide range of demand by varying vehicle size and locations served
 Conventional Bus Rapid Transit (BRT)	Combines the speed of rail with the flexibility of buses Has upgraded station amenities Employs automated fare collection system Includes real-time passenger information system Exclusive guideway BRT Operating in Pittsburgh	$10 to $40	50 mph/ 25 mph	One-half to 1 mile	Improved reliability and travel time over conventional buses as a result of exclusive travel lane Use of buses allow route variations or extensions that are not available to LRT
 Light Rail Transit (LRT)	Powered by electricity through an overhead wire Can operate in exclusive rights-of-way or adjacent to traffic Vehicles can operate singly or joined as trains up to four cars long Operating in Minneapolis, Portland, Denver, Dallas, Pittsburgh and St. Louis	$20 to $40	55 mph/ 22 mph	One-quarter to 1 mile	Clean, quiet propulsion High passenger-carrying capacity and lower operating costs that result from coupling LRT vehicles to create a train

[1] Sources and references: URS Corporation, American Public Transportation Association, New Flyer and Siemens.
[2] Average operating speed associated with urban routes such as downtowns.

6.3.1 Transit Technologies Not Recommended

A number of technologies were considered, but ultimately not recommended. These technologies did not sufficiently address the goals of the study, were not well suited to the corridors being studied, and/or were cost prohibitive. They include electric trolley bus, guided BRT, magnetic levitation, heavy rail, conventional commuter rail, diesel multiple unit (DMU), automated guideway transit (e.g. People Mover, Monorail, Personal Rapid Transit), and modern streetcar. Further information about these technologies and their application is available in the *Evaluation of Transit Technologies* report, June 2007.

Electric Trolley Bus

Guided BRT

Conventional Commuter Rail

In general, these technologies are not suitable for the DTOGS project area for one or more of the following reasons:

- Does not sufficiently address key transportation and mobility goals of the Study (electric trolley bus, modern streetcar, Maglev, commuter rail, people mover, monorail, PRT)
- Cost prohibitive (electric trolley bus, guided BRT, Maglev, heavy rail, monorail, people mover, monorail, PRT)
- Technology better serves longer or shorter trips than what is envisioned in the DTOGS project (electric trolley bus, modern streetcar, Maglev, commuter rail, people mover, monorail, PRT)
- Regional system cannot be built based on selected technology (electric trolley bus, guided BRT, modern streetcar, Maglev, monorail, people mover, monorail, PRT)
- Limited passenger-carrying capacity (electric trolley bus,

Diesel Multiple Unit (DMU)

Automated Guideway Transit

Modern Streetcar

modern streetcar, people mover, PRT)

- Technology cannot utilize shared right-of-way corridors identified in DTOGS project (Maglev, commuter rail, commuter rail)
- Available right-of-way for technology would not directly serve DTOGS project area neighborhoods and activity centers (Maglev, commuter rail, PRT).

6.3.2 Public Survey of Transit Technology Preferences

At the four open houses held in March 2007, a number of techniques were used to obtain public input, including comment forms available at public open houses, surveys and polls at both the public open houses and online, and individual interviews by project staff. One question on the public survey asked, "How much do you favor each mode of rapid transit?" The survey question addressed five transit technologies with which participants would most likely be familiar. Participants were presented with a five-point scale. Combined favorable and unfavorable responses are indicated in **Table 6-4**. Based on these responses, participants appear to favor rail and rail-type transit technologies more strongly than other technologies.

Table 6-4
Public Preferences – Transit Technologies

Transit Technology	Strongly Favor/ Somewhat Favor	Strongly Disfavor/ Somewhat Disfavor
Commuter train (Amtrak)	280 responses	39 responses
Subway/Elevated Rail	280 responses	42 responses
Light Rail/Streetcars	275 responses	51 responses
Automated Guideway	216 responses	91 responses
Bus Rapid Transit/Express Bus	215 responses	103 responses

Generally, survey respondents had favorable impressions of all forms of transit listed. The recommended technologies in the DTOGS project considered this type of public input along with FTA requirements: technical feasibility, ability to meet study goals and objectives (as shaped by public agencies), and right-of-way opportunities and constraints. The recommended technologies for further consideration included LRT, which received a large number of favorable responses and a limited number of unfavorable responses. Survey respondents indicated that BRT and express bus service were their least favorite.

6.4 Recommended Alignments and Next Steps

The first priority alignment, Woodward Avenue, was advanced for further evaluation. Technical analysis also indicated that the segment of Woodward Avenue between downtown Detroit and Grand Boulevard was a critical portion of the alignment because of high population and employment densities. This segment of Woodward Avenue is home to almost 200,000 employees. Further, large institutions and activity centers are located here, including Wayne State University, Detroit Medical Center, Henry Ford Hospital, Detroit Public Library, Detroit Institute of Arts, Detroit Science Center, Museum of African American History, Max M Fisher Music Center, Fox Theatre, Detroit Opera House, Comerica Park, and Ford Field. Also, the proposed Detroit-Ann Arbor Commuter Rail line would terminate at the Amtrak Station at Woodward Avenue and Endicott Street, just south of Grand Boulevard. Creating an easy transfer between the future Detroit-Ann Arbor commuter rail service and existing Amtrak service would allow riders to easily reach their destinations, potentially increasing ridership on each of these systems.

Public feedback also indicated that the segment of Woodward Avenue between downtown Detroit and Grand Boulevard as the most commonly preferred segment, based on the early scoping meetings held in July 2007. Forty-six of the fifty-four participants identified this segment of Woodward Avenue as part of their preferred rapid transit starter line alignment.

Thus, this segment of Woodward Avenue was added to the two other high-priority alignments – Gratiot and Michigan Avenues. The recommend alignments are:

- Gratiot/Woodward Avenue – Between Eight Mile Road and downtown Detroit along Gratiot Avenue, and between downtown Detroit and Grand Boulevard along Woodward Avenue. This alignment is approximately 13.5 miles long.

- Michigan/Woodward Avenue – Along Michigan Avenue between Greenfield Village in Dearborn and downtown Detroit, and along Woodward Avenue between downtown Detroit and Grand Boulevard. This alignment is approximately 15 miles long.

- Woodward Avenue – Along Woodward Avenue between downtown Detroit and Eight Mile Road. This alignment is approximately 10.5 miles long.