



# Saint Paul Ford Site: Multimodal Transportation Study and Report Executive Summary

Prepared for the City of St. Paul



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# Executive Summary

The Ford site is a once in a lifetime opportunity to benefit the City of St. Paul and the Twin Cities region. This significant endeavor carries many hopes and challenges, and managing transportation in balance with other site objectives is chief among them. The Transportation Study was undertaken to understand how transportation related to redevelopment can and will function, and how infrastructure and public amenity design can affect it. The critical part of this effort is to develop a transportation system that accurately captures the aspirations and challenges of this once in a generation opportunity and reconnects the Ford site to the neighborhood and the region.

The Ford site is at the forefront of the region's multimodal future and assists St. Paul's transition to the economy of the next century. For it to be successful, the Site must employ national best practices for transportation, sustainability and livability, while incorporating leading design and operation.

Today, the Ford site acts as a barrier within the Highland neighborhood, elongating trips and contributing to congestion at its periphery. As proposed by the City of Saint Paul, the Ford site will become a 21<sup>st</sup> century community that ensures access for all people using all modes of transportation. The site will provide multiple connections to the surrounding Highland neighborhood and to the Mississippi River, enabling live, work, and play opportunities in a compact, mixed-use neighborhood.

These connections will build on the robust options already available in the Highland neighborhood. The A Line provides high quality Bus Rapid Transit service on Ford Parkway, with ridership well exceeding expectations. Growing pedestrian and bicycle amenities in the region are serving the already walkable, diverse neighborhood. Meanwhile, there are openings for transformative

changes, such as making direct connections to Mississippi River Boulevard and the regional trail system along it, and the city's aspiration to convert the Canadian Pacific Railway spur into a regional facility for bicyclists and pedestrians, possibly co-located with transit.

After full redevelopment and with the recommended improvements, conditions for pedestrians and cyclists in and around the Ford site improve dramatically, with manageable vehicle travel.

## Transportation Analysis

Saint Paul recognizes that traditional national standards for trip generation and local procedures for development review are not sophisticated enough to effectively evaluate a multi-modal transportation system for the Ford site. Traditional transportation analysis and modeling focuses only on cars and does not adequately capture the other ways people travel. Traditional vehicle trip modeling has been found to greatly inflate the actual numbers of cars experienced from development, particularly in mixed-use, urban settings.<sup>1</sup> Recent trends in transportation thinking and analysis take a more holistic approach to gauging the real impacts and transportation patterns of mixed-use environments. The analysis completed for the Ford site factors these based on the most current trends and available data to reflect the emerging truisms such as:

- A complementary mix of uses produces shorter, more efficient trips.
- People—especially young people—are driving less.
- Connected street networks distribute vehicular trips.
- Shared parking facilities minimize overall parking need.
- Multiple transportation options decrease car use and ownership.

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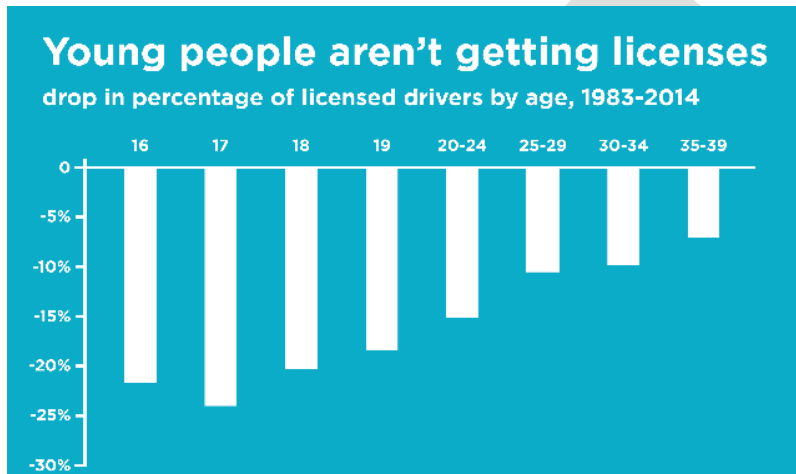
<sup>1</sup> Walters, Jerry et al. "Getting Trip Generation Right – Eliminating the Bias Against Mixed Use Development". American Planning Association. May 2013.



Source: Federal Highway Administration, 2009 National Household Travel Survey

**A complementary mix of uses produces shorter, more efficient trips.**

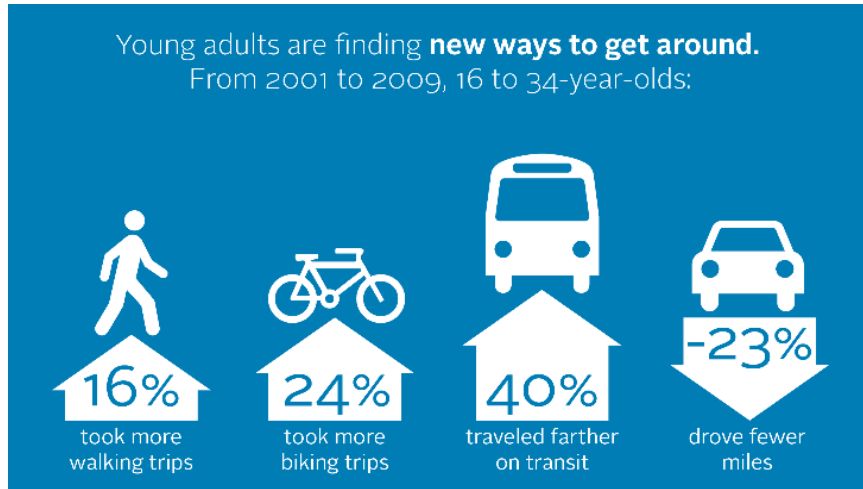
Simply, when you live close to your destination, you are more likely to walk. Trips less than a mile are ideal candidates, and adding a range of uses to the Ford Site will allow neighborhood residents to walk to the proposed shops and offices, while the residents at Ford enjoy the benefits of the Highland Park neighborhood.



Source: University of Michigan Transportation Research Institute, 2016

**People—especially young people—are driving less.**

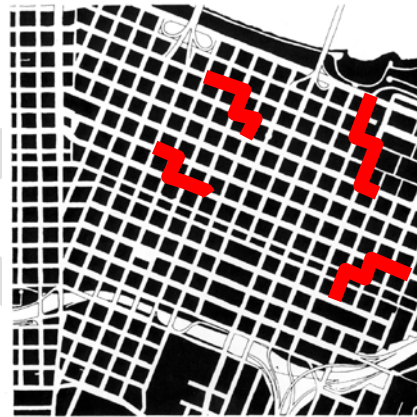
National trends show a steady and significant drop in the percentage of young people obtaining drivers licenses. While most pronounced among teenagers, even 20 and 30-year olds are less likely to even get drivers licenses than 30 years ago.



Source: Federal Highway Administration "National Household Driving Trends" 2001-2009

### Young adults are finding new ways to get around

Young people, even into their thirties, are leading the charge on finding alternative (non-driving) modes of travel. They are increasingly walking, bicycling and taking transit at higher rates, and driving less. The average number of miles driven by people aged 16 to 34 fell by 23 percent from as recently as 2001, leading to a more sustainable transportation system.



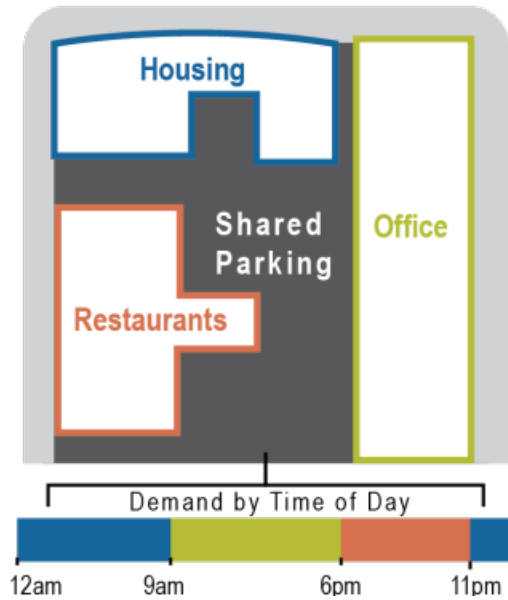
### Connected street networks better distribute vehicular trips.

Grid systems distribute vehicular traffic over multiple corridors, minimizing the impacts in any one location or roadway. Today, the Highland Park neighborhood funnels traffic around the Ford Site onto Cleveland Avenue and Ford Parkway, creating the most congested intersection in our focus area. Building out the grid system will help alleviate this bottleneck.



# Saint Paul Minnesota

The most livable city in America



Source: Transportation Research Board, using estimates from the Institute of Transportation Engineers, 2007

## Shared parking facilities efficiently meet demand.

Residences and businesses often need parking at different times of the day. Sharing parking between uses allows for fewer overall parking spaces to be built. Intentionally planning for shared parking allows more room for housing, shops and offices and to create additional open space. This maximizes community benefits, sustainability and tax revenue.

## TOD means less traffic

Households near transit take **46%** fewer car trips than other households



## Multiple transportation options decrease car use and ownership.

People that live in or near transit oriented development (TOD) environments take fewer car trips. TOD means less traffic on neighborhood streets and more walking, bicycling, transit and alternative transportation use for all types of daily trips.

Source: Transportation Research Board, using estimates from the Institute of Transportation Engineers, 2007

## Goals, Targets, and Metrics

The Ford site will develop over twelve to twenty years and an analysis that respects the neighborhood and City must look forward. Operationalizing the transportation plan at the Ford site to measure and track tangible outcomes, was critical to this effort. Working with the study's Technical Steering Committee, a process to establish goals, targets and performance measures (PMs) was completed. These are the means to measure success.



- **Goals** are the high level aims of the Ford site, and broadly speaking, what the Site is intending to achieve.
- **Targets** are how the goals are assessed and are designed to show potential tradeoffs.
- **Performance Measures** are specific data points or metrics used to evaluate the transportation system relative to the targets and goals.

Each of these is meant to be long-term and fluid. Goals should not change, but stand as the long term aims of the Ford site and surrounding neighborhood. As the Site builds out, the metrics and targets may fluctuate, but are designed to show progress towards the goals. Where results are falling short of expectations, additional investments in design solutions, transportation management, and/or policy shifts may be necessary to more closely align resulting transportation patterns with the original intended goals. The final report shows the full complement of goals, targets, and performance measures.

### Goals

The Ford site project team collaboratively developed key goals to guide the transportation analysis and to move the project forward on a defined path. These transportation goals incorporated the

community values laid out for the Ford site during the eight years of planning and public input prior to the study. The goals reflect the evolving global, regional, and community desires to create a more sustainable Ford development that effectively supports a balanced system of transportation options for all people.

#### Goals Used for the Ford Site Analysis

1. The Ford site should provide multimodal access with an express goal of minimizing vehicular impacts.
2. The Ford site and streets within a 1/2-mile of the Ford site should be designed and operated to provide equitable and safe access by all means of transportation for users of all ages and abilities.
3. The Site should provide safe and pleasurable access for people walking.
4. The Site should provide safe and pleasurable access for people bicycling.
5. Frequent, convenient, quality transit or carshare is available for Site residents, employees, and visitors within 1/4 mile.
6. Vehicular level of service at the Ford site and intersections within a 1/2 mile of the Ford site should continue to function within acceptable levels.
7. Parking should be shared and minimized as part of the overall site plan. The Site should accommodate cars, but not encourage them.
8. The Site should reduce greenhouse gases related to vehicle miles driven.



## Targets

The goals are assessed using targets, which are designed to show potential tradeoffs. Targets provide each of the goals with meaning and measurability and have been separated into three major rating categories:

- Desired targets represent optimal achievement of goals, but may not always be fully reachable due to tradeoffs, cost, or physical restrictions.
- Acceptable targets are the minimum at which a goal should be achieved, and should primarily occur when it is necessary to compromise between multiple desired results.
- Unacceptable targets represent substandard levels of operation or layout and require further intervention.

## Performance Measures

Performance Measures (PMs) are the indicators of the Ford site targets and can be grouped into four types. These are quantifiable metrics and can take multiple forms:

**Figure 1-1: Examples of Performance Measures Used for the Ford Site Analysis**

<u>Physical</u>	<u>Policy-Oriented</u>	<u>Use-Based</u>
<ul style="list-style-type: none"> <li>• Street Design Elements</li> <li>• Spatial Measurement</li> <li>• Parking Spaces per 1,000 SQFT</li> <li>• Transit Stop Accessibility</li> <li>• Roadways with Sidewalks</li> <li>• Sidewalk Width</li> <li>• Bicycle Parking Distance</li> <li>• Pedestrian Crossing Distance</li> </ul>	<ul style="list-style-type: none"> <li>• Transit Stop Amenities</li> <li>• Internal Street Speeds</li> <li>• Shared Parking Percentage</li> <li>• EV Ownership</li> <li>• Parking Price</li> <li>• Bicycle Lockers</li> <li>• Bicycle Showers</li> </ul>	<ul style="list-style-type: none"> <li>• Surveys</li> <li>• Peak Hour Multimodal Traffic</li> <li>• Mode Share</li> <li>• Peak Hour Vehicular Traffic</li> <li>• Trip Lengths</li> </ul> <p><u>Operational</u></p> <ul style="list-style-type: none"> <li>• Bus Frequency</li> </ul>

## The Ford Approach

The most important part of this effort is to develop a transportation model that accurately captures the aspirations and challenges of this once in a generation opportunity. Saint Paul recognizes that traditional standards for trip generation and local procedures for development review are not sophisticated enough to effectively evaluate and guide the desired program for multi-modal transportation at the Ford site. Therefore, this effort uses guidelines that more accurately capture all the ways in which development at the Ford site will function within the site, with the surrounding neighborhood, and with the whole Twin Cities region.

For the Ford site, this effort has established a ***detailed, traceable, localized, and comprehensive multi-modal trip generation and mode choice model*** to measure and demonstrate the impacts of Ford site development. The team considered and referenced the latest research on proven trip-reduction factors and incorporated them. This approach allows for the City to align its goals, targets, and metrics with factors proven to reduce vehicle trips and achieve larger goals, with progress measured and improved over time.

The transportation analysis proceeded in two major parts. The first focused on external trips - that is trips from the neighborhood, the surrounding area, and the Twin Cities region - to or from the Ford site. The analysis developed here shows how the study arrived at aggregate numbers of external trips by mode.

The second part measured how those additional trips influence or affect the existing or proposed transportation network. Multiple route options will help to disperse travel to the surrounding roadway network. Then, transportation impacts were measured and compared to existing conditions.



## External Trips

External trips (from the surrounding network, to or from the Ford site) use surrounding streets, bike paths, neighborhood sidewalks, or public transit facilities. A significant number of the Ford trips generated will be internal -- people who live, work and/or shop on the Ford site, constituting local trips that do not reach the surrounding transportation system.

## Trip Generation

Trip generation refers to the activity generated by a building or development. The Ford site Trip Generation process starts with the breakout of the land use types and quantities, and the associated trips. The development estimated in Table 1-1 was generated based on a maximum build-out of the site using draft zoning proposed by the City of Saint Paul.

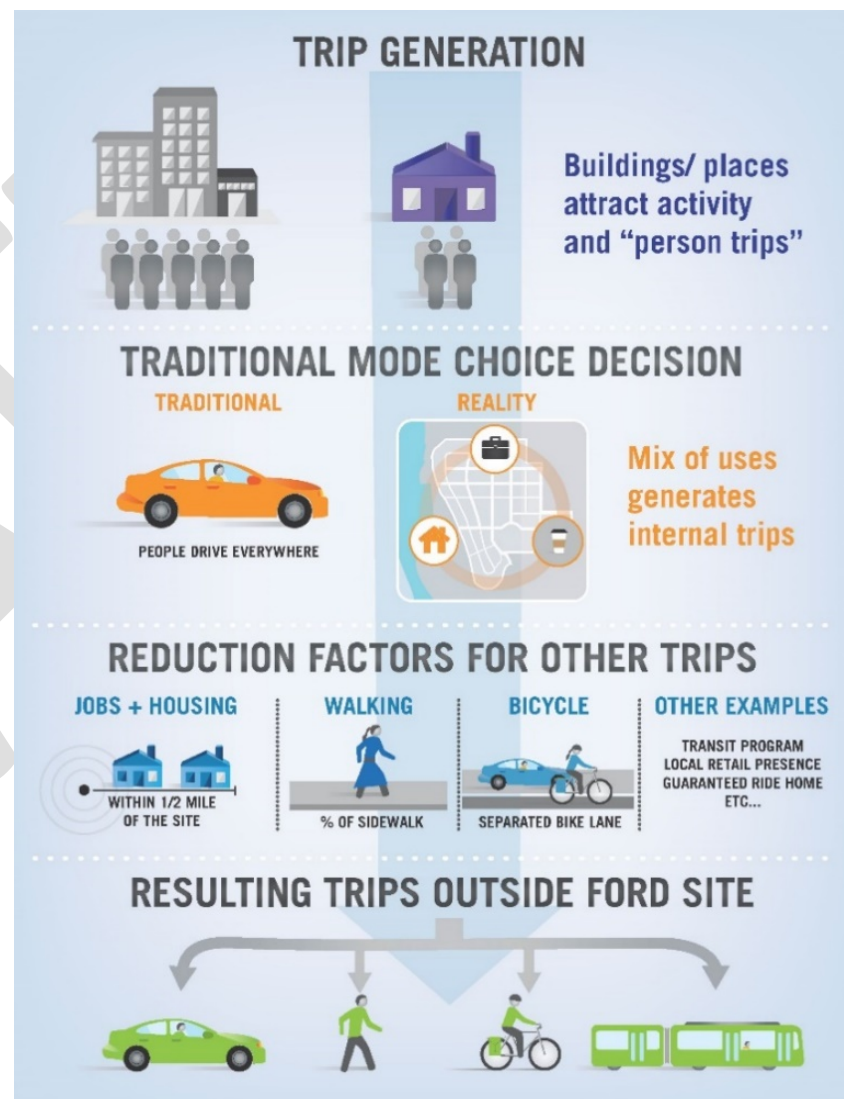
**Table 1-1 General Land Use Program at the Ford Site**

Land Use	Quantity
Civic	150,000 GFA*
Employment (Office, etc.)	450,000 GFA
Retail	300,000 GFA
Residential	4,000 Units

Total Vehicle Daily Trips (Per ITE)	38,648 Vehicles Trips
Vehicle Trips X Average Vehicle Occupancy	$38,648 \times 1.08 = 41,740$ Person Trips
* Gross Floor Area, in square feet	

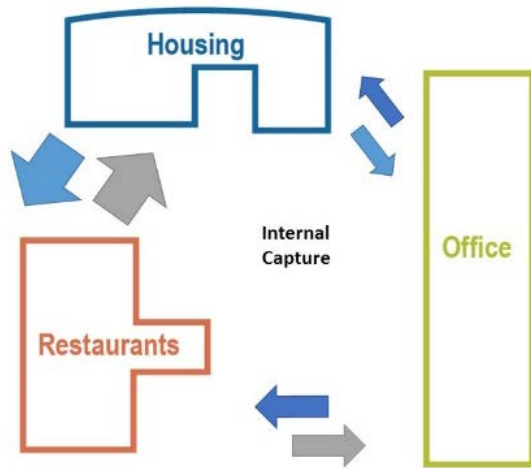
ITE - Institute of Transportation Engineers.

**Figure 1-2 Process to develop the Ford Site Trip Generation Numbers**



## Internal Capture

The 135-acre Ford site will include a complementary mix of buildings. Many Ford site “trips” will be people travelling between uses within the site itself. Residents may work at the offices. Workers will shop at the stores. An internal site capture factor, based on leading national research, coordinated with the Technical Committee, and benchmarked with observed behavior and trip making in the Twin Cities region, was used to account for this behavior.



Source: PM Peak Unconstrained Trip Capture Rates, NCHRP Report 684

## External Trip Reduction Factors




Standard trip generation analysis assumes all travelers drive. In reality, vibrant, integrated places like the Highland Park neighborhood see people using multiple ways to travel. The Ford site is poised to build on neighborhood strengths to deliver greater connectivity and attract different types of users. A series of factors, tied back to goals, targets, and metrics, were developed and used to

show trip reduction at the Ford site. Low and high levels of multi-modal design impact were tested, but only the more conservative numbers showing the high end of vehicle use were used in travel impact analysis.

## External Person Trips by Mode

The resulting external trips were then further divided by likely travel mode. The resulting external trips are shown for low and high scenarios, for daily (24 hour) trips and for AM and PM peak hour trips.

**Table 1-2 Total External Trip Generation for the Ford Site**

Mode	Total External Trips	Low Multi-Modal	High Multi-Modal
Vehicular Trips 	Daily	24,463	17,539
	AM Peak Hour	2,540	1,802
	PM Peak Hour	2,489	1,792
Transit Trips 	Daily	6,167	10,675
	AM Peak Hour	640	1,121
	PM Peak Hour	627	1,081
Non-Motorized Trips 	Daily	4,063	7,033
	AM Peak Hour	422	738
	PM Peak Hour	413	712

# Transportation Impact Analysis

The second major part of the analysis involved measuring the impacts of the external trips on the surrounding street network. Neighbors, area businesses, and the City itself all want to understand how the “traffic” from the Ford site will impact their street and the Highland Park area.

The proposed Ford site is laid out with a network of streets that will extend neighborhood connectivity into the site. This eliminates existing barriers and provides new pathways into the area. Extending multiple roadways directly into the Ford site, and especially Montreal and Cretin, disperses trips and minimizes impacts on any particular roadway or area. Figure 1-3 shows the network of streets proposed for the Ford site.

**Figure 1-3 Ford Site Functional Classification (as proposed Fall 2016)**



Having multiple direct entry points is beneficial for the Ford site because trips are projected to come from all directions and many destinations around the Twin Cities region. Figure 1-4 shows the likely origin of all trips destined for the Ford site, based on current trip patterns to and from the Highland area. Two items in particular stand out. First, thirty-five (35%) percent of all trips are likely to be from within only 2.5 miles of the Ford site. Second, there is no other significant concentrated destination. Downtown Saint Paul is only a destination for 3% of trips, while the combined University District/Downtown Minneapolis area represents only 5% of all trips.

In order to conduct analysis, trips were assigned to specific roadways, using the distribution shown in Figure 1-5. Streets like Ford Parkway carry all Westerly trips (20-25% of total trips), while trips to the North are dispersed on multiple streets. While the study recognizes that vehicular capacity on existing streets varies, the proportion of additional trips added to the street network are small as compared to the overall traffic volumes already traveling through those corridors.

**Figure 1-4 Trip Distribution to-from the Ford Site**

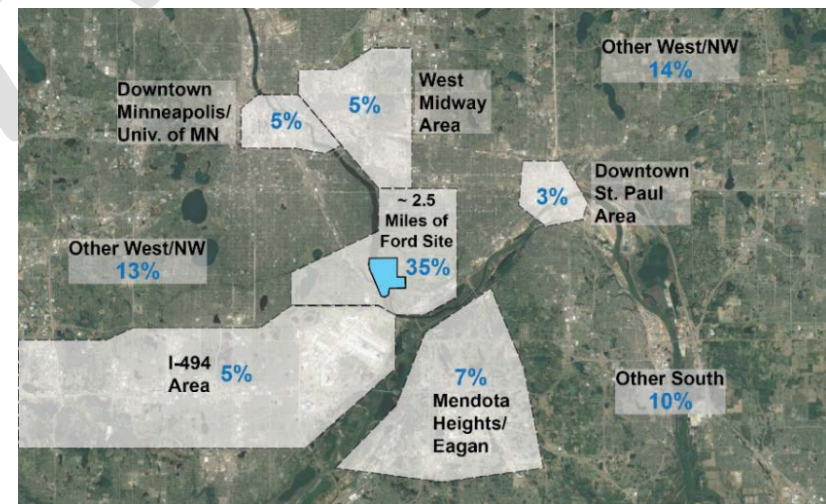


Figure 1-5 Trip Distribution to/from the Ford Site (Fall 2016 Draft)



## Vehicular Traffic Analysis

For vehicular intersection analysis, the study analyzed existing conditions and compared them to the conditions with the full Ford site buildout (Build). The Build analysis included assumptions for a number of needed intersection improvements to accommodate the proposed changes. These will also benefit the Highland neighborhood. They will augment traffic flow and enhance the pedestrian/bicycle environment. A summary of these is included in Table 1-3.

With the proposed improvements, all intersections are shown to operate within acceptable levels of service as described in the Ford site goals and targets. The levels of service (LOS), which measures average vehicle delay, are at LOS D<sup>2</sup> or better, which is acceptable in an urban environment. We note further that many intersections and approaches will show only minimal change from current operations. This is due to the realigned traffic and roadway network, and the suggested improvements.

**Table 1-3 Potential Intersection Improvements**

Intersection	Improvements
<b>Ford Parkway/ Mount Curve Boulevard</b>	Signalize intersection Provide NB/SB left-turn lanes Extend WB left-turn lane
<b>Ford Parkway/ Cretin Avenue</b>	Add NB left- and right-turn lanes Extend WB left-turn lane Remove part of the median EB right-turn lane
<b>Cleveland Avenue/ Montreal Avenue</b>	Signalize intersection Add west leg
<b>Montreal Avenue/ St. Paul Avenue</b>	Signalize intersection Requires removal of part of the median EB/WB left-turn lanes
<b>Cleveland Avenue/ St. Paul Avenue</b>	Optimize signal timing

<sup>2</sup> A LOS D intersection has the majority of vehicles stopping at the traffic signal and vehicles occasionally must wait through more than one green light before proceeding. A full discussion and presentation of this analysis is included in Chapter 4.

**Figure 1-6 Proposed Build Conditions AM Peak Hour LOS (as proposed Fall 2016)**



**Figure 1-7 Proposed Build Conditions PM Peak Hour LOS (as proposed Fall 2016)**



Intersections	LOS Score
Ford Parkway/Mississippi River Boulevard Access Ramps (North and South Ramps at Ford Pkwy)	A
Ford Parkway/Woodlawn Avenue	A
Ford Parkway/Mount Curve Blvd	B
Ford Parkway/Cretin Avenue	A
Ford Parkway/Finn Avenue	C
Ford Parkway/Cleveland Avenue	A
Cleveland Avenue/Saint Paul Avenue	A
Cleveland Avenue/Montreal Avenue	B
Saint Paul Avenue/Montreal Avenue	B

Intersections	LOS Score
Ford Parkway/Mississippi River Boulevard Access Ramps (North and South Ramps at Ford Pkwy)	A
Ford Parkway/Woodlawn Avenue	A
Ford Parkway/Mount Curve Blvd	B
Ford Parkway/Cretin Avenue	C
Ford Parkway/Finn Avenue	B
Ford Parkway/Cleveland Avenue	D
Cleveland Avenue/Saint Paul Avenue	A
Cleveland Avenue/Montreal Avenue	B
Saint Paul Avenue/Montreal Avenue	B



## Non-Auto Analysis

Many of the goals for the Ford site demand improved pedestrian, bicycle and transit infrastructure and use in order to be achieved. Vehicle Level of Service (LOS) is limited and captures only a driver's experience in the transportation system. For a multimodal perspective, a different level of service methodology was applied for non-vehicular modes.

### Transit Service Quality

Factors such as transit availability, frequency of service, access, and even roadway LOS were used to measure the quality of proposed service for non-drivers at the Ford site and in the Highland neighborhood.

### Pedestrian and Bicycle LOS via the Charlotte Methodology

The Charlotte Department of Transportation developed a methodology to analyze pedestrian and bicycle LOS<sup>3</sup>, which was chosen to quantify anticipated non-motorized conditions for the Ford site. Where vehicle LOS is based on delay, pedestrian/bicycle geometric features are the main inputs for Pedestrian and Bicycle LOS. The analysis incorporates features such as:

- Traffic lanes pedestrians must cross
- Bicycle facilities – lanes, paths
- Crosswalk design
- Sidewalk design

- Pedestrian “walk” time at traffic signals

Current bicycle and pedestrian LOS scores are substantially worse than vehicle LOS scores. When the improvements are included, in all cases, these physical interventions result in improved levels of service for pedestrian and bicyclists. We note that the improvements proposed represent a minimum acceptable level and should be expanded as the Ford site builds out, with a goal of achieving pedestrian and bicycle LOS 'A' or 'B' at each location.

### Summary

After full redevelopment and with the recommended improvements, conditions for pedestrians and cyclists in and around the Ford site improve dramatically, without adversely affecting vehicle travel.

Tables 1-4 and 1-5 show the proposed vehicle, pedestrian and bicycle LOS after the Ford buildout and associated improvements. If built according to the goals and adjusted per the targets described herein,

- All intersections will operate at acceptable LOS for vehicular traffic and delay.
- Pedestrian and bicycle conditions will measurably improve at all locations.
- New roadways and paths on the Ford site will provide improved travel within the Site, while directly connecting these to the surrounding neighborhood will provide greater integration and use for all.

<sup>3</sup>

<https://www.smartgrowthamerica.org/app/legacy/documents/cs/impl/nc-charlotte-pedbikelos.pdf>

**Table 1-4 Existing Vehicle, Pedestrian, and Bicycle Level of Service Performance**

Intersection	Vehicle Level of Service	Bicycle Level of Service	Pedestrian Level of Service
Ford Parkway/Mississippi River Boulevard Access Ramps (North and South Ramps at Ford Pkwy)	A	C	B
Ford Parkway/Woodlawn Avenue	A	D	C
Ford Parkway/Mount Curve Blvd	A	D	C
Ford Parkway/Cretin Avenue	B	D	C
Ford Parkway/Finn Avenue	B	E	C
Ford Parkway/Cleveland Avenue	D	D	C
Cleveland Avenue/Saint Paul Avenue	A	D	C
Cleveland Avenue/Montreal Avenue	A	C	B
Saint Paul Avenue/Montreal Avenue	B	D	C
E. 46th Street/46th Avenue S. (Minneapolis)	B	D	C
Davern Street/Montreal Avenue	A	D	B

**Table 1-5 Proposed Build Vehicle, Pedestrian, and Bicycle Level of Service Performance (as proposed Fall 2016)**

Intersection	Vehicle Level of Service	Bicycle Level of Service	Pedestrian Level of Service
Ford Parkway/Mississippi River Boulevard Access Ramps (North and South Ramps at Ford Pkwy)	A	C	A
Ford Parkway/Woodlawn Avenue	A	C	B
Ford Parkway/Mount Curve Blvd	<b>B</b>	B	B
Ford Parkway/Cretin Avenue	B	B	B
Ford Parkway/Finn Avenue	A	C	B
Ford Parkway/Cleveland Avenue	C	C	B
Cleveland Avenue/Saint Paul Avenue	A	C	B
Cleveland Avenue/Montreal Avenue	B	B	A
Saint Paul Avenue/Montreal Avenue	B	B	B
E. 46th Street/46th Avenue S. (Minneapolis)	B	C	B
Davern Street/Montreal Avenue	A	B	B