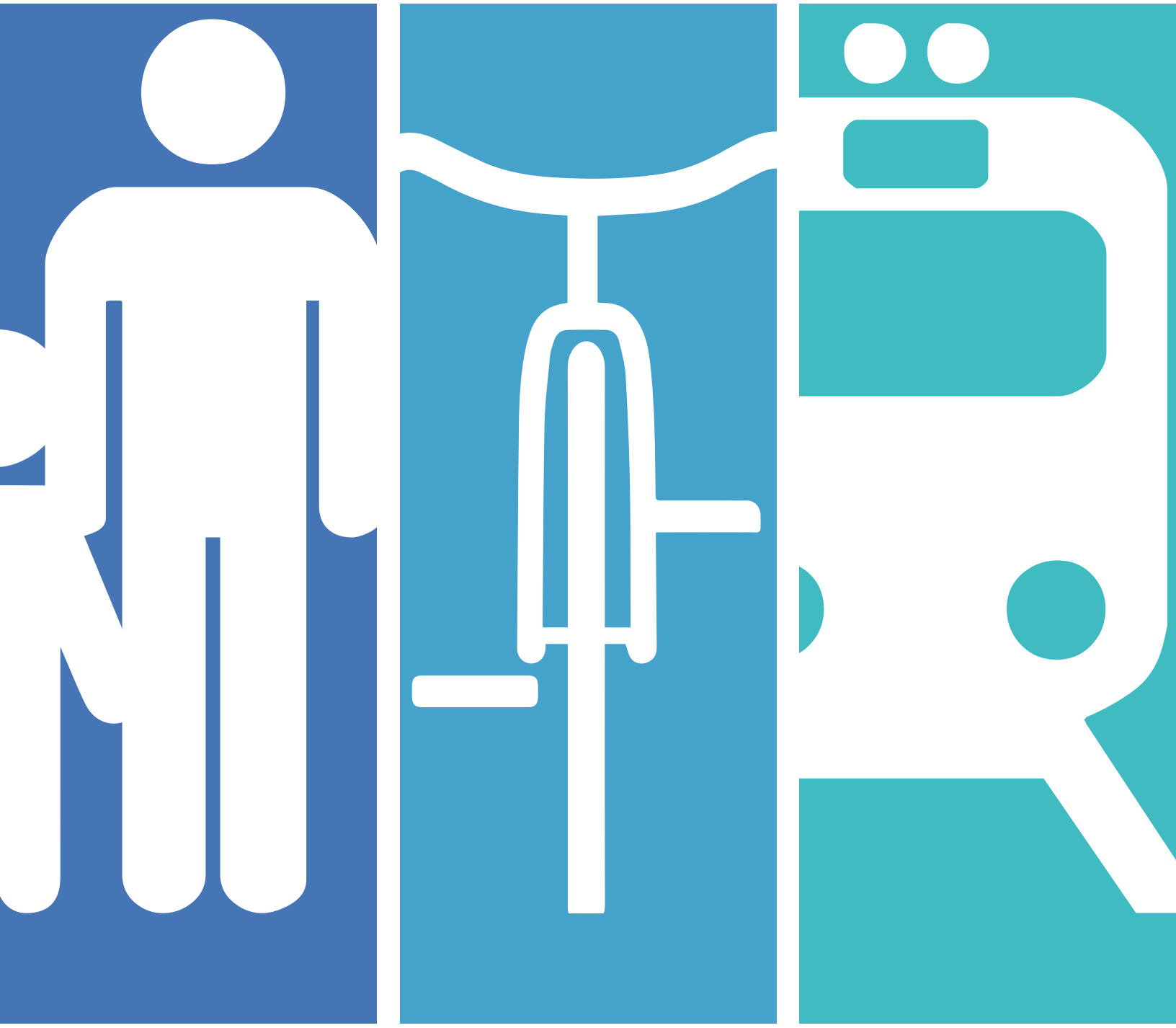
# WEST LAKE MULTIMODAL TRANSPORTATION STUDY

## Inventory and Analysis Report



February 2016

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## Project Partners

**City of Minneapolis**

**Metropolitan Council**

**Hennepin County**

**Minneapolis Parks and Recreation Board**

## Technical Advisory Committee

**City of Minneapolis**
- Nathan Koster, Project Manager
- Allan Klugman
- Paul Miller
- Brian Schaffer

**Metropolitan Council**
- Mark Bishop
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- John Doan
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- Jack Sullivan

**SEH**
- Heather Kienitz, Project Manager
- Kristin Petersen
- Nikki Farrington

**Toole Design Group**
- Hannah Pritchard

## Community Collaborators

Cedar Isles Dean Neighborhood Association

West Calhoun Neighborhood Council

Midtown Greenway Coalition

Hennepin County Bicycle Advisory Committee

Minneapolis Bicycle Advisory Committee

Minneapolis Pedestrian Advisory Committee

Councilmember Lisa Goodman, Ward 7

Councilmember Linea Palmisano, Ward 13

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# WEST LAKE MULTIMODAL TRANSPORTATION STUDY

Inventory and Analysis Report

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# 1. INTRODUCTION

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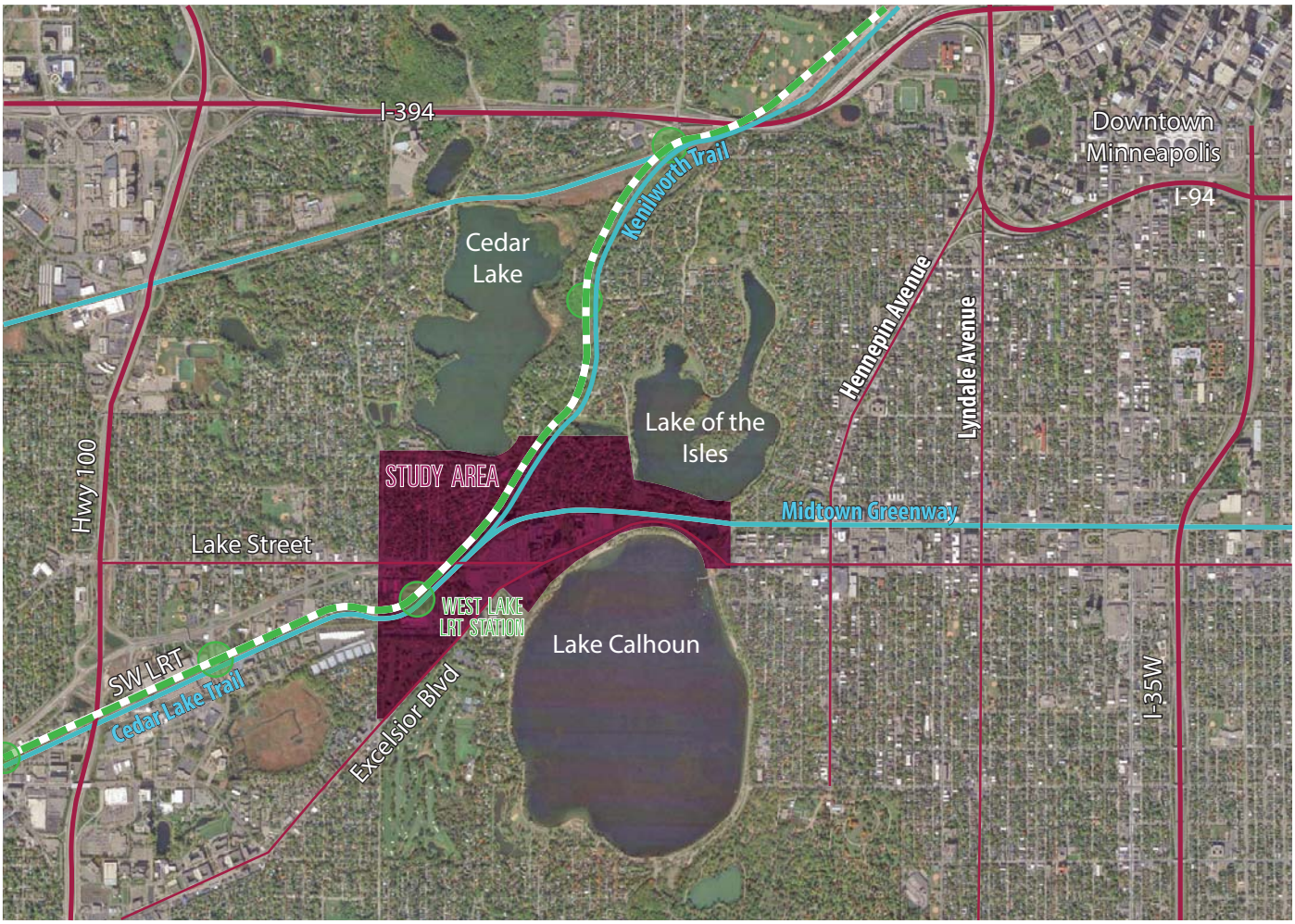
## STUDY BACKGROUND

The West Lake Multimodal Transportation Study was initiated to identify opportunities to improve safety, access, connectivity, and mobility for all modes of travel in the area surrounding the proposed West Lake Station for the Southwest Light Rail Transit line. This study was included in the Memorandum of Understanding between the Metropolitan Council and the City of Minneapolis as a requirement to the City granting municipal consent for the Southwest Light Rail Transit project (SWLRT).

The study emphasizes bicycle and pedestrian modes with the purpose of identifying non-motorized needs, challenges, and opportunities in the vicinity of the West Lake Station. Motorized travel was also analyzed to guide intersection and roadway modifications that were identified as part of the preliminary designs for the West Lake Station area. The goal of the study is to identify opportunities to address non-motorized and motorized travel within the West Lake Station area with projects that can be implemented as a part of the construction of the SWLRT or as part of other capital initiatives. Potential longer-term improvements that would not occur before the SWLRT opening were also identified. Study efforts were coordinated with partner agencies including the City of Minneapolis, Minneapolis Park and Recreation Board, Hennepin County and Metropolitan Council.

The study area comprises an area north of Lake Calhoun and south of Cedar Lake and Lake of the Isles in southwest Minneapolis. The borders of the study area are France Avenue on the west, Cedar Lake Parkway on the north, East Calhoun Parkway on the east, and West Calhoun Parkway/Excelsior Boulevard on the south.

### FIGURE 1-1
### STUDY AREA LOCATION



## STUDY AREA CONTEXT

The area north of Lake Calhoun is a popular, vibrant and oftentimes congested part of Minneapolis. It is anchored by Lake Calhoun and the adjacent recreational area and characterized by large multi-story apartment and condo complexes; single family detached homes and estates; businesses and services; and unique dining, retail, and commercial destinations. In addition to being densely populated with residents, many visitors come to the area for recreation on and around the Minneapolis Chain of Lakes. The primary thoroughfare in the study area is Lake Street, which is also the only east-west connection located between Lake of the Isles and Lake Calhoun and an important gateway to the area. Lake Street is also a heavily used connection between the downtown core and areas to the west.

### FIGURE 1-2
### STUDY AREA


In other parts of the city, a typical street grid pattern with sidewalks and bicycle facilities provides opportunities for alternative routes and choices for navigation. In the West Lake Multimodal Transportation study area, the lakes (primarily Lake Calhoun) act as obstacles that one must go around. The circuitous route around the lake typically trends to the north side, generally from France Avenue to East Calhoun Parkway. This, combined with the existing freight rail and Midtown Greenway corridors that bisect the study area, creates a pinch point in the travel grid where Lake Street and Excelsior Boulevard converge into the only east-west thoroughfare. All modes of travel must navigate through the same constricted space. The City of Minneapolis is currently planning and preparing for the construction and introduction of the Southwest Light Rail Transit line (SWLRT), which is an extension of the Metro Green Line, and expected to bring additional travelers to the study area as well as encourage some shift in mode choice.

## INVENTORY & ANALYSIS PROCESS

The Inventory and Analysis Report is one element of the West Lake Multimodal Transportation Study and provides a comprehensive inventory and analysis of existing conditions and known issues throughout the study area. The process included the following efforts:

- Monthly meetings and frequent communication and coordination with the Technical Advisory Committee (TAC) comprised of the City of Minneapolis, Metropolitan Council, Hennepin County, Minneapolis Park & Recreation Board, the City of St. Louis Park, Toole Design Group, and SEH
- Review and summary of all previous planning studies relating to the project area
- Hosting community workshops for the greater public
- Individual meetings with the Cedar-Isles Dean Neighborhood Association (CIDNA), the West Calhoun Neighborhood Council (WCNC), and the Midtown Greenway Coalition
- Individual meetings with the Hennepin County Bicycle Advisory Committee, the Minneapolis Bicycle Advisory Committee, and the Minneapolis Pedestrian Advisory Committee
- Study area walking tour with the project team and community members
- Individual meetings with property and business owners
- On-site observations
- Technical data collection

## INVENTORY & ANALYSIS OUTCOME: ISSUE IDENTIFICATION & RECOMMENDATIONS

The base data, community feedback, and technical analysis of the existing conditions were assembled into this Inventory & Analysis Report. The primary outcome of the analysis and outreach undertaken for this study phase is a series of ***identified issues*** from which the team will develop ***recommendations*** that can be implemented over time. The number of issues identified during the Inventory & Analysis Phase exceeded 60, and the project team will categorize the related recommendations for each issue identified based upon when they might be implemented:

**Green Line Design Recommendations:** Refinements to the SWLRT design, expected to be implemented by SPO during construction.

**Near-Term Recommendations:** Implemented near opening day of SWLRT service, but do not have funding sources identified at this time.

**Long-Term Recommendations:** Potential to be planned and implemented after SWLRT is constructed.

**Planning Horizon Recommendations**: Larger concepts with the potential to be considered in the long-term.

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# 2. PREVIOUS PLANNING STUDIES SUMMARY

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# SUMMARY OF PREVIOUS PLANNING STUDIES

Government agencies, neighborhood groups, and developers in Minneapolis have adopted many different plans, conducted many studies and have pending projects which affect the safety, convenience, and desirability of the environment in the West Lake Study Area. The plans and studies relate to multi-modal transportation, neighborhoods, design and parks. This document includes the key multimodal transportation aspects of existing plans, studies and projects and what they mean for the West Lake Station area.

## REPORTS SUMMARIZED

# METROPOLITAN COUNCIL PLANS AND STUDIES

## SOUTHWEST LRT 30% DESIGN PLAN

The Southwest LRT (SWLRT) 30% Design Plan includes conceptual designs and key features that impact multimodal transportation in the West Lake area. The station platform will have additional sidewalk access connecting to 31st Street, which will be realigned. There will also be passenger drop-off location on West 31st Street as well as a bus stop layover.

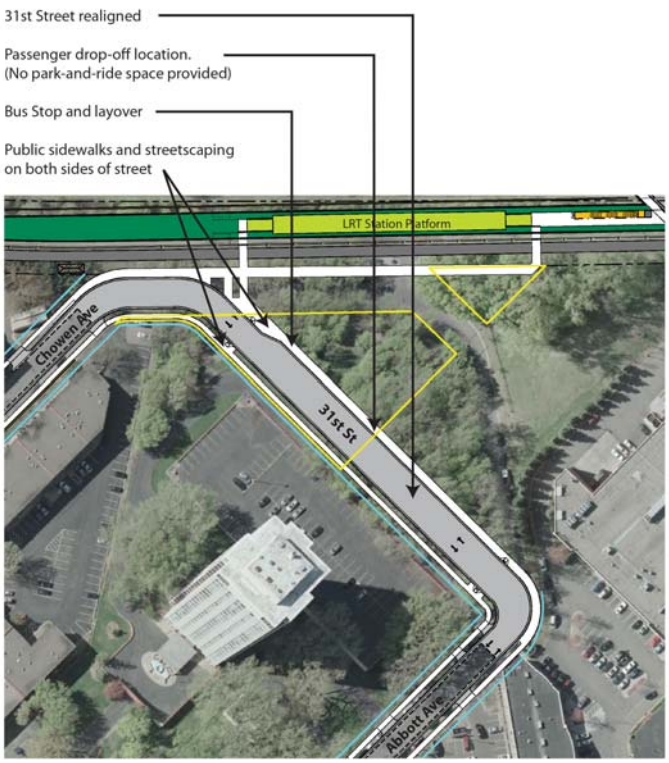
Vertical circulation is incorporated between the station and the Lake Street Bridge via an elevator and staircase, which includes a bicycle wheeling ramp.

Consistent with the Memorandum of Understanding between the Southwest LRT Project Office and the City of Minneapolis, the West Lake Station's design includes:

Enhanced pedestrian connections along West Lake Street between Drew Avenue South and Market Plaza and along Excelsior Boulevard between Market Plaza and West 32nd Street

Realignment of Abbott Avenue and Chowen Avenue to accommodate development on the HCRRA property

Enhanced pedestrian connections along Chowen Avenue and Abbott Avenue and along the newly realigned street segment




## 2040 TRANSPORTATION POLICY PLAN (2015)

The Metropolitan Council adopted the 2040 Transportation Policy Plan (TPP) in January 2015. Based on the region's development guide, Thrive MSP 2040, the TPP sets policies for the transportation system in the region. It also addresses federal planning guidance. The TPP was developed through technical analysis, policy discussion, and public input. Of note for this project are land use and local planning influence on transportation investments, regional transportation investments, and policies related to pedestrians, bicycles, and transit.

The Council's role in regional bicycle and pedestrian infrastructure is to find solutions to regional barriers to biking and walking trips and to improve access to jobs and opportunities. The regional bicycle system includes more than 2,650 miles of bike ways, and since the previous TPP, bicycling activity has increased 78%. However, there are still gaps in the system that need to be filled. The TPP refers to the Twin Cities Regional Bicycle System Study (see next section).

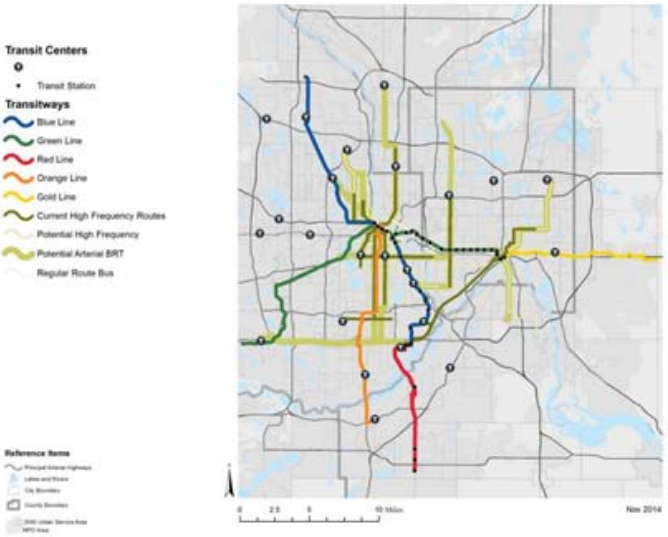
The TPP indicates that pedestrian infrastructure including sidewalks, trails, trees, lighting, and benches is key to making places feel accessible, inviting, and safe. Opportunities for walking such as going to the store or to a transit station are prevented by physical barriers such as busy intersections or lack of sidewalks. Coordinating projects with input from businesses, residents, and adjacent communities and implementing accessible design standards are recommended. A better pedestrian, bicycle and transit system benefits all travelers.

The TPP provides investment prioritization factors for pedestrian and bicycle projects including opportunities for pedestrian improvements, safety, cost effectiveness, multimodal projects and bicycle connections to transit, and reconstruction of existing facilities.

The Transit Investment Direction and Plan identifies the Study Area as part of the existing and potential high-frequency transit route network (Green Line, see below).

All of the TPP's investment prioritization factors for pedestrian and bicycle projects apply to this study area (opportunities for pedestrian improvements, safety, cost effectiveness, multimodal projects and bicycle connections to transit, and reconstruction of existing facilities). This indicates that pedestrian, bicycle and transit improvements are critical not just to this project, but should be considered some of the most important in the region.

### EXISTING AND POTENTIAL HIGH FREQUENCY TRANSIT ROUTES



## HOW THIS APPLIES TO THE STUDY AREA

The TPP recommends the following to local governments who influence the design of transit services and have control over land use, planning, and infrastructure design:

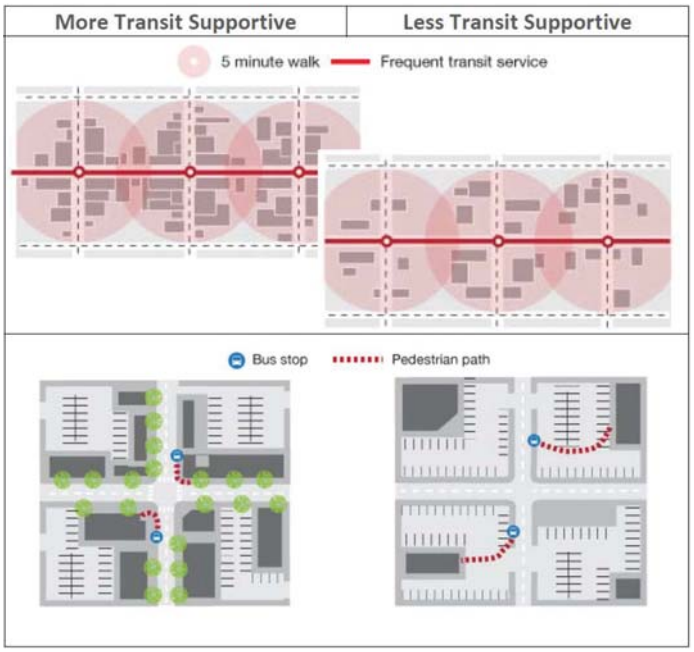
Design for a pedestrian-friendly environment: provide a comfortable walking environment and minimize walking distance from transit stop to front doors.

Develop an interconnected street network that maximizes pedestrian and bicycle access and allows for simple route design

In addition, passenger amenities such as comfortable waiting areas are particularly important at West Lake Station because it is a transit station. Other amenities such as public art, custom shelters, and landscaping are encouraged.

The regional bike ways data and maps are intended to provide planning guidance to build a bicycle transportation network for the Twin Cities metro area.

### TRANSIT SUPPORT




### PASSENGER AMENITIES

| Facility Type | Shelter | Light | Heater | Trash Receptacle | Stand Alone Bench | Security Cameras | Pedestrian access | Bike parking | Secure bike storage | Customer information | Real-time Customer Information |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Transit Centers | ● | ● | ● | ● | ● | ◑ | ● | ◑ | ◑ | ● | ◑ |
| Park-and-rides | ● | ● | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ◑ | ● | ◑ |
| Rail Stations | ● | ● | ● | ● | ● | ● | ● | ● | ◑ | ● | ● |
| Bus Stop | ◑ | ◑ | ◑ | ○ | ○ | ○ | ● | ◑ | ◑ | ◑ | ◑ |

Always Provided ●; Occasionally Provided ◑; Not Provided ○

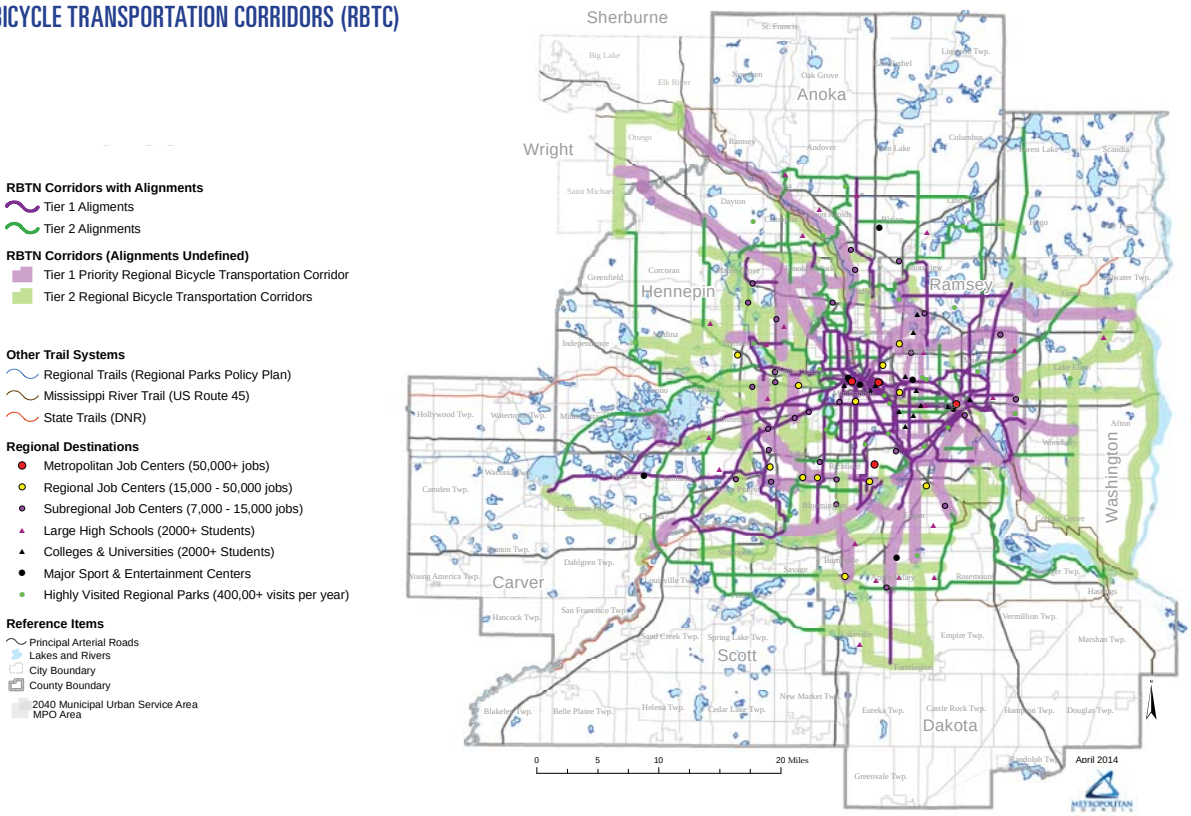
In some cases transit providers lease park and-rides and some shelters are owned and maintained by other entities. In such cases, providers may not offer all the customer amenities identified above.

## TWIN CITIES REGIONAL BICYCLE SYSTEM STUDY (2014)

The Regional Bicycle Transportation Network is the set of proposed corridors that serve as the "backbone" arterial system, connecting the county and local system with regional destinations.

Priority Regional Bicycle Transportation Corridors are a subset of the Regional Bicycle Transportation Network that have been identified as high priority. The "priority" corridors represent the highest potential bicycle demand corridors based on urban/suburban development context, existing and planned population, and employment densities in the region.

## REGIONAL BICYCLE TRANSPORTATION CORRIDORS (RBTC)

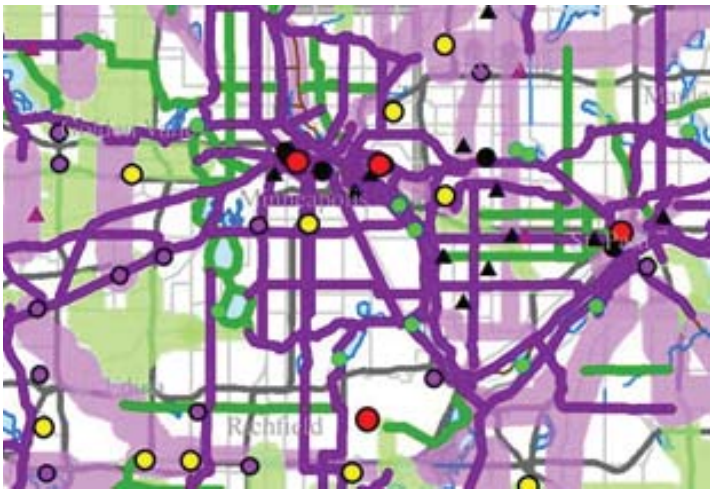



## HOW THIS APPLIES TO THE STUDY AREA

The study area includes Priority Regional Bicycle Transportation Corridors which are high priority based on network scoring and the degree to which the corridors connect population centers with key regional destinations and the regional transit system. They are intended to serve the highest potential bicycle demand based on Met Council's development context reflecting the existing and planned population and employment densities in the region.

Specifically, the Midtown Greenway, the Cedar Lake Trail, and the Kenilworth Trail are priority corridors; therefore, bicycle connections to, within, and through the study area are critical to the Regional Bicycle Transportation Network.

Projects aligning with the Metropolitan Council's Transportation Policy Plan tend to score higher in the Regional Solicitation for the allocation of federal transportation funds to locally-initiated projects to meet regional transportation needs.



## 2040 REGIONAL PARKS POLICY PLAN (2015)

The 2040 Regional Parks Policy Plan indicates a need for coordinated multimodal planning within the Twin Cities to support consistency and livability goals for the Metropolitan Council.

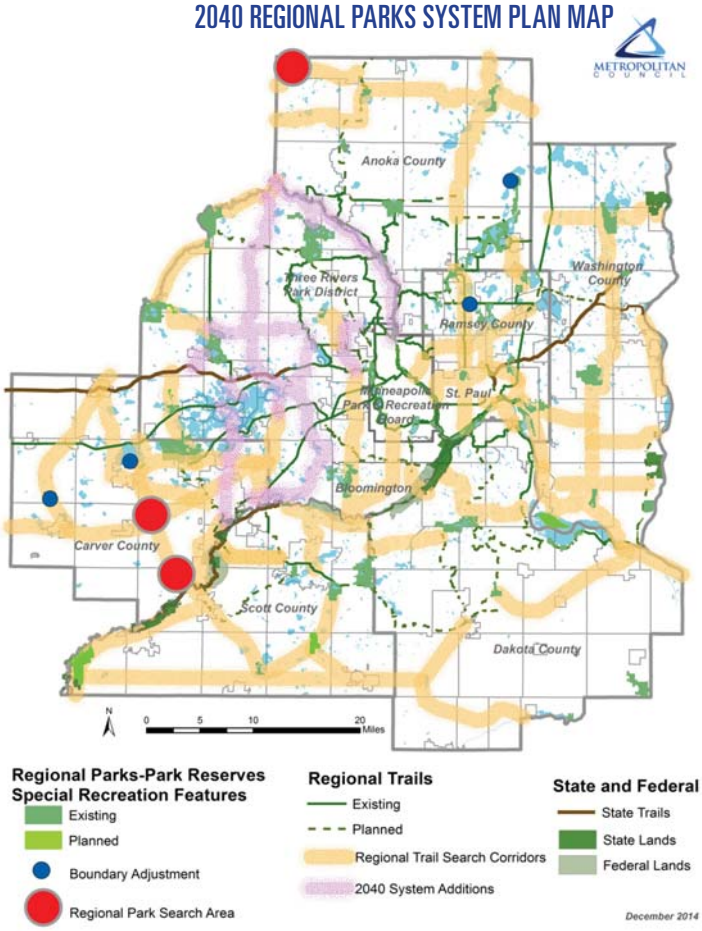
### HOW THIS APPLIES TO THE STUDY AREA

The 2040 Regional Parks Policy Plan recommends following the guidance from the Twin Cities Regional Bicycle System Study.

In the Study Area, this plan include the Midtown Greenway, Cedar Lake Trail, Kenilworth Trail and Dean Parkway.

The Plan also emphasizes equitable usage of the park system noting the implementation by agencies of various programs and practices to help reach and serve their diverse base of users. The 2040 Regional Parks Policy Plan strives to build upon that work of the regional park implementing agencies to advance equity.

#### 2040 REGIONAL PARKS SYSTEM PLAN MAP

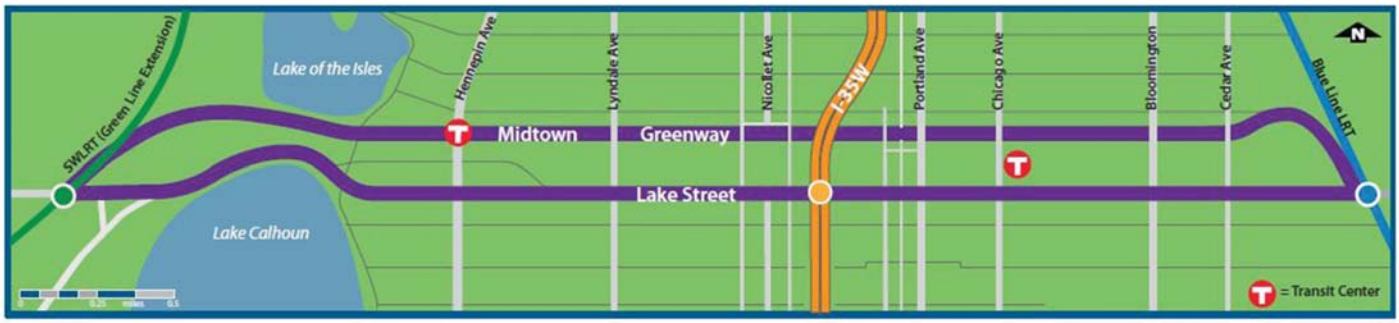



## MIDTOWN CORRIDOR ALTERNATIVES ANALYSIS (2014)

The Midtown Corridor Alternatives Analysis examines the benefits, costs and impacts of implementing a transitway along Midtown Greenway or Lake Street. The desired outcomes are to increase transit use among corridor residents and visitors, improve regional mobility, improve local access to jobs and activities, catalyze and support economic development along the corridor, support a healthier community, and improve the overall environment.

The Midtown Corridor would connect to the planned West Lake Station on the west end of the streetcar line.

#### MIDTOWN CORRIDOR STUDY AREA



The project initially considered ten transitway alternatives, but narrowed them down to three: enhanced bus on Lake Street, double/single-track rail in the Greenway, and dual alternative (combination of enhanced bus on Lake Street and rail in the Greenway). The locally preferred alternative (LPA) was the dual alternative, with enhanced bus extending into Saint Paul.


## HOW THIS APPLIES TO THE STUDY AREA

Projections from Midtown Corridor Study indicate that the selected alignment will increase ridership at the West Lake Station to a high level (more than 2,000 boardings and alightings per day) compared to the Lake Street alternative (1,000-2,000 boardings and alightings per day). In addition, the constrained right-of-way within the station will require thoughtful multimodal design to provide a smooth transition from the Midtown Corridor to the station. The Memorandum of Understanding includes the following language regarding the Midtown Corridor: Realign Abbott Ave and Chowen Ave to accommodate development on the HCRRA property as shown in the Transitional Station Area Action Plan (TSAAP) and build "Mid-Town Station" ready.

# HENNEPIN COUNTY PLANS AND STUDIES

## HENNEPIN COUNTY PEDESTRIAN PLAN (2013)

The Hennepin County Pedestrian Plan recommends strategies for improving the safety of walking, increasing walking for transportation, and improving the health of county residents through walking. The plan identifies priority locations where the enhancement of pedestrian infrastructure has the greatest potential impact on pedestrian safety and rates of walking: Minneapolis and its inner ring suburbs.

The County Road Safety Plan is also referred to in this plan and identified corridors with a history of at least one severe pedestrian-vehicle crash between 2005 and 2009 including CSAH 3/Lake Street between Excelsior Blvd and Chicago Ave S. Because installation of curb extensions and pedestrian refuge medians is a proven safety strategy, those treatments were recommended.

High priority is given to walksheds around transit stops and along routes to LRT and BRT stations. Pedestrian improvements should include filling sidewalk and trail gaps, upgrading signals (if necessary), installing curb extensions, pedestrian refuge medians, wayfinding, benches, bus shelters, and pedestrian-level lighting. The County will evaluate ways to better partner with transit agencies to install and maintain transit-supportive infrastructure such as benches and bus shelters along county roads.

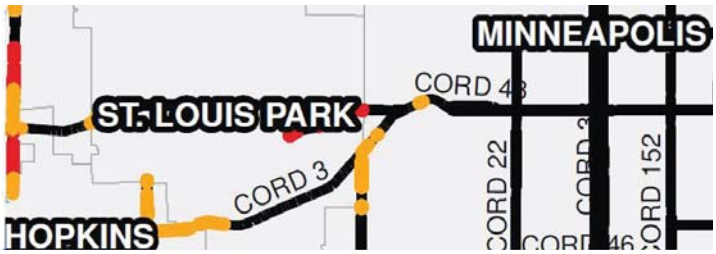
## HOW THIS APPLIES TO THE STUDY AREA

According to the Hennepin County Road Safety Plan, the study area is classified as a high priority because it has at least one severe pedestrian-vehicle crash on CSAH 3/Lake Street between Excelsior Blvd and Chicago Ave S. Installation of curb extensions and pedestrian refuge medians is a recommended proven safety strategy.

The study area is a high priority location for the Hennepin County Pedestrian Plan because the enhancement of pedestrian infrastructure has the greatest potential impact on pedestrian safety and rates of walking.

It is also a high priority for implementation since this study is related to West Lake Station improvements and includes bus stops along existing transit routes.

The Study Area is also a medium priority for filling Pedestrian Gaps on CSAH 3/Lake Street.




LEGEND

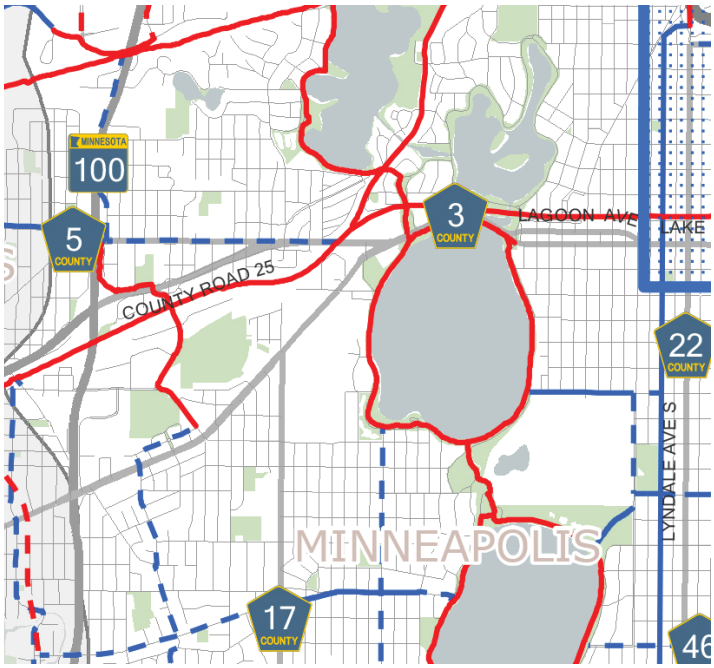
- Hennepin county roads
- Medium priority segments with existing pedestrian facilities, 1 side
- Medium priority segments w/o pedestrian facilities

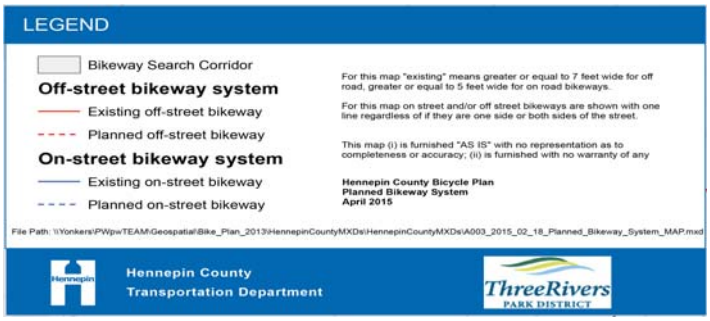
## 2040 HENNEPIN COUNTY BICYCLE TRANSPORTATION PLAN (2014)

The 2040 bicycle transportation plan lays out a vision that emphasizes ways to make bicycling safe and comfortable for people of all ages and abilities. The plan guides how, where, and when Hennepin County and Three Rivers Park District will build bike ways and outlines an integrated system that will be developed through 2040.

As part of the plan, Three Rivers Park District completed a comprehensive assessment of all locations where trails cross public roads or internal park roads. During that process, over 400 trail crossings were evaluated for safety, consistency, and maintenance. This evaluation was based on the "Guidance for Three River Park District Trail Crossings" document and identified areas recommended for engineering study.

Six crossings will be impacted by the SWLRT project between Eden Prairie and Minneapolis. The engineering study, design, and construction of each crossing will be included in the SWLRT project.



## HOW THIS APPLIES TO THE STUDY AREA

The vast majority of the bikeway system in the study area relies on the trail network. On-street bike ways are not planned on Excelsior Boulevard.

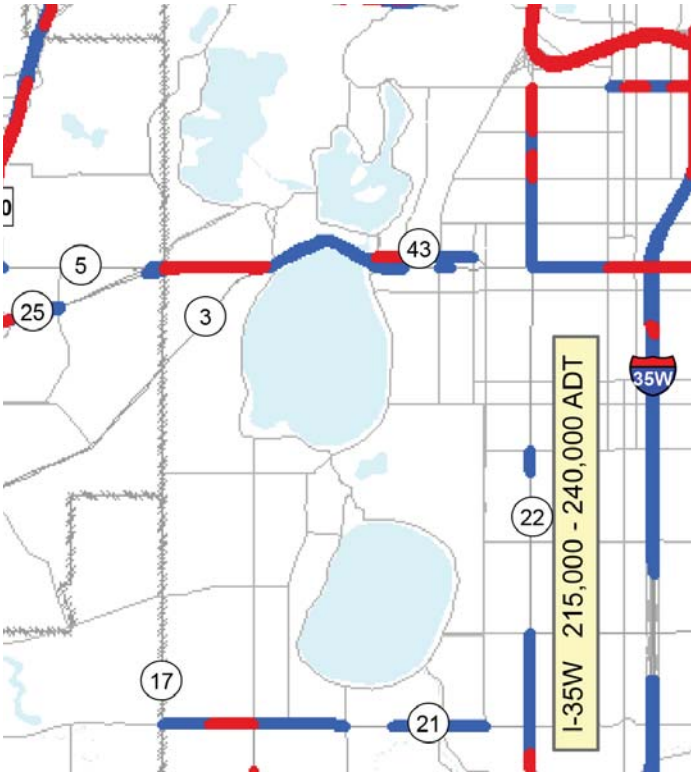
The study area appears in the Three Rivers Parks District Regional Trail Crossings Recommended for Engineering Study Map; however, it is not identified as a priority area.

## HENNEPIN COUNTY TRANSPORTATION SYSTEMS PLAN (2011)

The Hennepin County Transportation Systems Plan (HC-TSP) was adopted in 2011 and includes a transportation vision, updates previous planning work, and provides guidance for future transportation decisions. It addresses many transportation systems and in this iteration, expanded previous efforts in the realm of pedestrian, bicycle, and transit planning.

The plan addresses the SWLRT Corridor that will connect two of the region's largest job centers: downtown Minneapolis and the Opus/Golden Triangle area in Minnetonka and Eden Prairie, including a stop in the study area.

The plan references a City of Minneapolis Streetcar Feasibility Study (2007) which identified seven corridors as potential streetcar routes and Midtown Corridor (SW LRT to Hiawatha LRT) was selected for future implementation. The east-west corridor is about 5.5 miles long and extends from the Mississippi River to somewhere near the junction of the Kenilworth/Cedar Lake Corridor within the Study Area. It is worth noting that there was another study completed in 2014, the Midtown Corridor Alternatives Analysis, and is referenced above. The HC-TSP also includes analysis of roadway adequacy (congestion potential) and spot safety and corridor issue areas.




ROADWAY SYSTEM ADEQUACY: 2030 OPERATIONS

Based On Volume/Capacity Ratio

- Roadway Network
- Possible Congestion (1-1.20)
- Probable Congestion (>1.20)
- **2030 Forecasted ADT Range**

SPOT SAFETY & CORRIDOR ISSUE AREAS

INTERSECTION CANDIDATES

- Funded - 13 Int.
- Unfunded - 58 Int.
- Spot safety issue areas

## HOW THIS APPLIES TO THE STUDY AREA

Forecasts for 2030 ADT indicate probable congestion on CSAH 5 (Minnetonka Boulevard) and CSAH 43 (Excelsior Boulevard and Lake Street). Short and long-term solutions should be considered if reducing congestion is a goal for the project.

The intersection of Dean Parkway and West Calhoun Parkway was identified as a spot safety intersection. "Spot Safety Issue Areas" are intersections that have been shown to exceed the critical crash rate and have a severity cost of greater than $200,000. They are identified based on 2004-2006 crash data, as well as input from internal discussions with other agencies and comments from citizens.

## TRANSITIONAL STATION AREA ACTION PLAN: WEST LAKE STATION CHAPTER

The station area action plan suggests ways to build on local assets, enhance mobility, identify infrastructure needs, and capitalize on promising opportunities for development and redevelopment near each station. This includes access and circulation issues for pedestrians, bicycles, and motor vehicles. Non-motorized connectivity to the West Lake Station is lacking. There are no sidewalks on Abbott Ave and Chowen Ave, the existing streets closest to the station platform. Current land uses and large block sizes emphasize automobile use and make walking and biking challenging. Existing pedestrian and bike connections from the station to Lake Calhoun are unclear and the potential connector streets lack sidewalk and/or bikeway facilities. Other challenges for bikes and pedestrians include the grade separation between the station platform and West Lake Street. Vertical circulation strategies will need to be well-thought out.

**Recommendations for Pedestrians**

IMMEDIATE TERM

- Focus sidewalk and streetscape enhancements along Lake Street, Excelsior Boulevard, Abbott Avenue, Chowen Avenue, and 32nd Street near the station platform.
- Improve pedestrian facilities along Lake Street and provide vertical access (elevator and wheeling ramps) from the Lake Street Bridge down to the LRT station platform area.
- Improve pedestrian crossings of Lake Street and Excelsior Boulevard to enhance connections to the station.
- Improve pedestrian connections to the Cedar Lake LRT Regional Trail near the station area.

LONG TERM

- Improve connections to Lake Calhoun through integration with the Minneapolis Park and Recreation Board plans.

**Recommendations for Bikeways**

IMMEDIATE TERM

- Provide bike parking, lockers, bike sharing, and pump stations in a highly visible area near the station platform.
- Provide bike connections to the Cedar Lake LRT Regional Trail and Midtown Greenway.
- Provide vertical circulation for bikes and pedestrians at the Lake Street Bridge.

LONG TERM

- Improve bike connections to Lake Calhoun.
- Provide on-street bike facilities (lanes, routes, signage, etc.) on local streets to better connect the LRT station to nearby neighborhoods, businesses, amenities, and destinations.
- Promote bike sales/service/rental businesses near the station platform.

# CITY OF MINNEAPOLIS: PLANS, STUDIES, AND PROJECTS

## CITYWIDE TRANSPORTATION ACTION PLAN (2009)

There are six components of Access Minneapolis: Downtown Action Plan, Citywide Action Plan, Design Guidelines for Streets and Sidewalks, Streetcar Planning (see Midtown Corridor Alternatives Analysis), Pedestrian Master Plan (following section), and Bicycle Master Plan (following section).

The Citywide Action Plan defines land use features that influence the street design type characteristics. In the study area, Major Retail Centers, Commercial Corridors, and Activity Centers are all identified. Major Retail Centers should include easy access to regional road networks and need to be designed to accommodate pedestrians to retain compatibility with the city. Commercial Corridors serve as a focal point for activity and can accommodate intensive commercial uses and high levels of traffic but this must be balanced with pedestrian access to commercial property. New medium- to high-density residential development – particularly mixed use - is encouraged by the city. Activity Centers support a wide range of commercial, office, and residential uses. Busy with street life and activity throughout the day and into the evening, Activity Centers are heavily oriented toward pedestrians and maintain traditional urban form and scale. They are also well served by transit and must mitigate undesirable impacts like overflow parking and traffic impacts on neighborhood streets.

The Citywide Action Plan defines street design type characteristics that include functional class, traffic lanes, target operating speed, whether or not pedestrian and bicycle facilities should be included, and other features. The study area includes streets with the following street type classifications:

- Activity Area Street: Activity Area Streets support retail, service commercial and higher intensity residential land uses in a large node of several blocks. The streets may be under the jurisdiction of Hennepin County or the city. Often, connections and transition needs between adjacent neighborhoods and higher intensity land use areas are more important than the linear needs of the street. They typically need significant pedestrian capacity, need to accommodate high transit boarding/alighting, often serve high bicycle volumes and have significant parking demand. Higher traffic volumes are common and are mostly associated with accessing parking and properties within or near the activity center.
- Community Connector Street: Community Connector Streets are high capacity roadways that carry primarily through traffic and serve longer trips. They provide limited access to land uses. They are usually Principal Arterials.
- Commerce Street: Commerce Streets are medium capacity streets that support retail, service commercial and higher intensity residential land uses.

- Parkway Street: Parkway Streets are low-capacity streets designed to provide circulation through parkland. They can be under the jurisdiction of the Park Board or the city. They serve many different types of trips. While they often carry higher traffic volumes, they will still be designed as parkway streets.
- Neighborhood Connector: Neighborhood Connectors are low capacity streets that connect neighborhoods with each other.

## STREET DESIGN TYPE CHARACTER

| Proposed Street Types | Description | Equivalent Functional Class | Through Traffic Lanes | Target Operating Speed | Transit | Pedestrian Facilities | Bicycle Facilities[5] | Freight | Connection to Freeway System | Median | Turn Lanes | Curb Parking[6] | Curb Extensions | Driveway Access | Trees and landscaping |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Commuter Street** | High capacity; carries through traffic, serves longer trips and provides limited access to land uses | Principal or A Minor Arterial | 4-6[1] | 40 mph | PTN | Yes | Yes (on Parallel paths)[4] | Regional truck routes | Yes | Yes | Yes | No | No | Limited; access from alleys or access lanes | Yes |
| **Commerce Street** | Medium capacity; supports retail, service commercial and higher intensity residential land uses on a corridor basis | A and B Minor Arterials | 2-4 | 30 mph | PTN and Local routes | Yes | Yes if in Master Plan | Local truck routes | Yes | Optional | Optional | Yes | Yes | Limited; access from alleys | Yes |
| **Activity Area Street[7]** | Medium capacity; provides access to abutting properties in activity centers, growth centers, transit station areas, and neighborhood commercial nodes | A and B Minor Arterials, Collectors, and Locals | 2-4 | 30 mph | PTN and Local routes | Yes | Yes if in Master Plan | Local delivery | Provisional | Optional | Optional | Yes | Yes | Allowable where side or rear not feasible | Yes |
| **Community Connector** | Medium capacity; connects neighborhoods together and with commercial corridors and other districts, districts with each other; serves as the main street of a neighborhood commercial node. Some streets have a commuter function that require special frontage design | B Minor Arterials and Collectors | 2-3[2] | 30 mph | PTN and Local routes | Yes | Yes if in Master Plan | Local truck routes | Provisional | Optional | Optional | Yes | Yes | Allowable where side or rear not feasible | Yes |
| **Neighborhood Connector** | Low capacity; connects neighborhoods with each other. Some streets have a commuter function that require special frontage design | Collectors | 2 | 30 mph | PTN and Local routes | Yes | Yes if in Master Plan | Local deliveries | Provisional | Optional | Optional | Yes | Yes | Yes | |
| **Industrial Connector** | Low capacity; connects districts with neighborhoods and serves abutting property in single use (industrial/ employment) districts | Collectors | 2-3[2] | 30 mph | PTN and Local routes | Yes | Yes if in Master Plan | Local truck routes | Provisional | Optional | Optional | Optional | Yes | Yes | Yes |
| **Parkway Street** | Low-capacity thoroughfare designed to provide circulation adjacent to and through parkland | Locals | 1-2 | 25 mph | Provisional | Yes | Yes (on Parallel paths) | No | No | Optional | Optional | Recessed in bays | Yes | Optional | Yes |
| **Local Street** | Low capacity; serves abutting property in residential neighborhoods or single use (industrial/employment) districts | Locals | 1-2[3] | 30 mph | Local Routes | Yes | Yes if in Master Plan | Local deliveries | No | No | Optional | Yes | Yes | Yes | Yes |
| **Alley** | Property and parking access | Locals | 1-2 | 5 mph | No | No | No | Local deliveries | No | No | No | No | No | Yes | No |

Notes
[1] Six lanes is an exception for surface streets in Minneapolis
[2] Three lane streets are two-way streets with one travel lane in each direction and left turn lane (not necessarily continuous)
[3] One lane streets are two-way yield streets with parking on one or both sides and one wide travel lane
[4]Parallel paths - shared bicycle/pedestrian facilities adjacent to streets, but separated by wide planting areas
[5]If in Bicycle Master Plan, bicycle facility should be provided on target street or on a parallel street serving the same travel shed.
[6]Curb extensions should be provided except in conditions where the parking lane is used as a traffic lane during peak periods or space is required at the intersection for a turn lane.
[7]There are many street types and land uses in Activity Areas – actual design characteristics and space allocation must be determined taking into account each street's contextual and modal requirements.

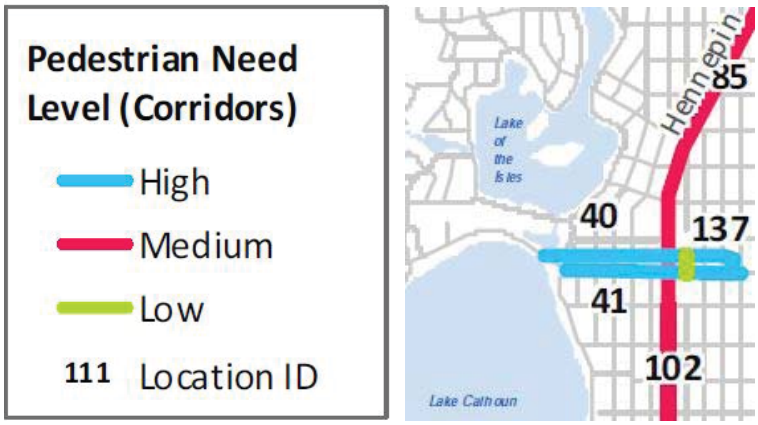
## HOW THIS APPLIES TO THE STUDY AREA

In the study area, portions of Lake Street are classified as a Commerce Street and an Activity Area Street. Dean Parkway is a Neighborhood Connector, Excelsior is a Community Connector, and Calhoun Parkway is a Parkway Street. These classifications have different design characteristics that should be considered in this project (see chart on 2-12).

## MINNEAPOLIS PEDESTRIAN PLAN (OCTOBER 2009)

The Minneapolis Pedestrian Master Plan is one of six components of Access Minneapolis, the City's 10-year transportation action plan to implement the transportation policies articulated in The Minneapolis Plan for Sustainable Growth.

The plan was developed under the guidance of the City's Pedestrian Advisory Committee and contains detailed implementation strategies focused upon seven goals for making Minneapolis a great walking city where people choose to walk for transportation, recreation, and health:




**Goal 1:** A Well-Connected Walkway System

**Goal 2:** Accessibility for All Pedestrians

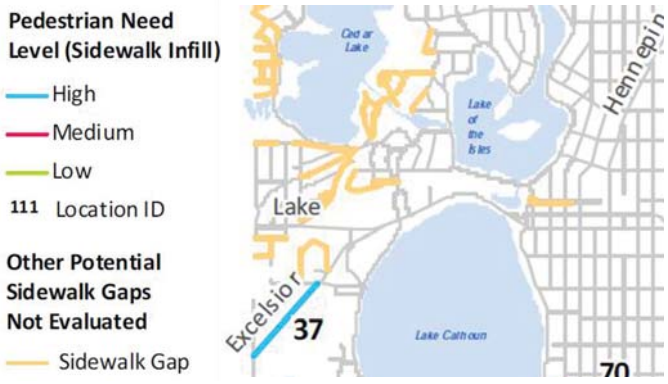
**Goal 3:** Safe Streets and Crossings

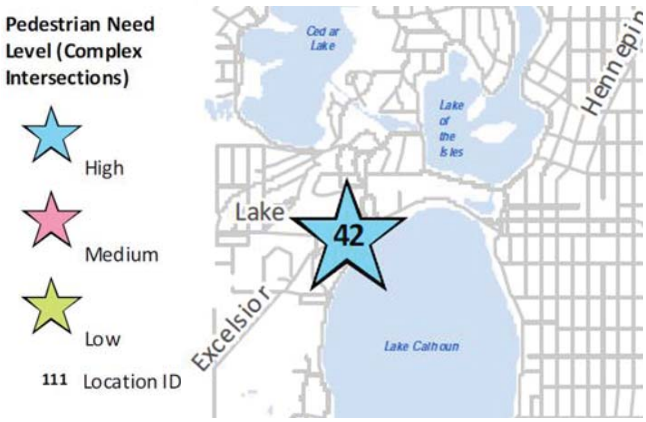
**Goal 4:** A Pedestrian Environment that Fosters Walking

**Goal 5:** A Well-Maintained Pedestrian System

**Goal 6:** A Culture of Walking

**Goal 7:** Funding, Tools and Leadership for implementing Pedestrian Improvements



## HOW THIS APPLIES TO THE STUDY AREA

**Specific information about the Study Area includes:**

- Excelsior Blvd/Lake Street/CSAH 25 intersection designated as a 'High' Pedestrian Need Level (complex intersection)
- Excelsior Blvd designated as a 'High' Pedestrian Need Level (Sidewalk infill)


**Implementation strategies related to the study area include:**

- Add new pedestrian connections where possible.
- Implement pedestrian wayfinding improvements where needed and where maintenance responsibilities are established.
- Evaluate signal timing for pedestrians in all signal retiming efforts.
- Improve the visibility of crosswalk pavement markings.
- Design streets with sufficient sidewalk and boulevard width for all required uses of the pedestrian zone.
- Provide appropriate street lighting for pedestrian needs.
- Implement a coordinated street furniture program.
- Continue to provide trash receptacles for pedestrian use.
- Continue to implement the Art in Public Places program and other arts partnerships that enhance the pedestrian environment.
- Investigate innovative and practical ways to create vibrant public spaces for pedestrians.
- Prioritize and implement improvements to sidewalks at railroad crossings.
- Maintain pedestrian safety and accessibility in construction zones.
- Utilize and improve the City's Design Guidelines for Streets and Sidewalks.
- Evaluate all infrastructure projects for potential pedestrian improvement opportunities.
- Coordinate the pedestrian improvement program with other improvement opportunities.
- Encourage public reporting of pedestrian issues to 311.
- Support neighborhood advocacy for pedestrian improvements.

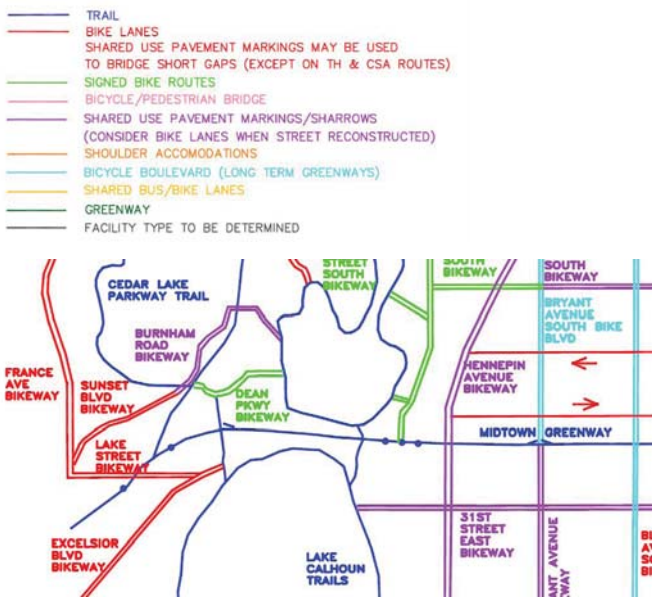
## MINNEAPOLIS BICYCLE MASTER PLAN (2011)

The Minneapolis Bicycle Master Plan is one of six components of Access Minneapolis, the City's 10-year transportation action plan to implement the transportation policies articulated in The Minneapolis Plan for Sustainable Growth.

The Plan was adopted in 2011 and identifies goals and strategies for equity, education, enforcement, encouragement, evaluation and engineering. Chapter 7 is about project identification and prioritization based on many other plans including, but not limited to, Access Minneapolis 10-year Transportation Action Plan and the 5-year Capital Improvement Program.

Infrastructure prioritization criteria were used to rank projects and advise the City for which projects to submit funding requests.

The City recently developed the Protected Bikeway Update, a draft addendum to the Minneapolis Bicycle Master Plan, which was approved on June 23rd 2015 by the Minneapolis Transportation and Public Works committee. The draft does not identify new protected bike ways in the study area.




### HOW THIS APPLIES TO THE STUDY AREA

Bike lanes and shared use pavement markings were identified along Excelsior Boulevard and Lake Street.

## MIDTOWN GREENWAY LAND USE DEVELOPMENT PLAN (2007)

The Midtown Greenway Land Use Development Plan was approved by the Minneapolis City Council in 2007 and sets policy direction for land use and development in the Midtown Greenway corridor and includes properties within one block of the greenway. Included in the plan are case studies of particular sites.

Case Study #1 is Lake Street and Calhoun. The area is zoned C3S (Community Shopping Center District) with commercial land use with a total property value of $12,400,000. It is the only case study site west of Hennepin Avenue and is unique in that it has commercial frontage on Lake Street as well as the Midtown Greenway. There is currently on-site surface parking oriented towards West Lake Street in addition to structured parking, but the planned redevelopment has less auto-oriented uses facing Lake Street and a more active street level. The case study suggests a more defined block and street pattern to connect with other proposed development in the area.

### HOW THIS APPLIES TO THE STUDY AREA

Pedestrian activity should be a priority and increased activity on Lake Street should be anticipated. The surface lot facing Lake Street may be redeveloped in the future based on this plan.


Case Study #1: Lake Street and Calhoun


Case Study #1: Redevelopment Concept Axon View

## MINNEAPOLIS COMPREHENSIVE PLAN TRANSPORTATION CHAPTER (2005)

The Minneapolis Comprehensive Plan's Transportation Chapter includes recommendations for all modes. Policies most relevant to the Study Area are:

- 2.2.6 Encourage reconnection of the traditional street grid where possible, to increase connectivity for all travel modes and strengthen neighborhood character.
- 2.3.1 Ensure that there are safe and accessible pedestrian routes to major destinations, including transit corridors, from nearby residential areas.
- 2.3.2 Identify and encourage the development of pedestrian routes within Activity Centers, Growth Centers, and other commercial areas that have superior pedestrian facilities.
- 2.3.4 Maintain the street grid, reconnecting it where possible, and discourage the creation of superblocks that isolate pedestrians and increase walking distances.
- 2.4.2 Concentrate transit resources in a manner that improves overall service and reliability, including service for seniors, people with disabilities, and disadvantaged populations.
- 2.5.3 Continue to integrate bicycle and transit facilities where needed, including racks on transit vehicles and bicycle parking near transit stops.
- 2.5.8 Incorporate bike parking into street furniture configurations.

### HOW THIS APPLIES TO THE STUDY AREA

Policies in the Transportation Chapter supports improvements in the study area that emphasize safe and accessible pedestrian routes because of the major destinations and transit corridors, reconnecting the street grid, and engaging people with disabilities, seniors, and disadvantaged populations. Often these disadvantaged populations are people who rely on walking for transportation.

## MINNEAPOLIS COMPREHENSIVE PLAN URBAN DESIGN CHAPTER (2005)

The Minneapolis Comprehensive Plan's Urban Form chapter envisions Minneapolis being an attractive and inviting city that promotes harmony between the natural and built environments, gives prominence to pedestrian facilities and amenities, and respects the city's traditional urban features while welcoming new construction and improvements. Policies most relevant to the study area are:

- 10.10.3 Enhance pedestrian and transit-oriented commercial districts with street furniture, street plantings, plazas, water features, public art and improved transit and pedestrian and bicycle amenities.
- 10.15.3 Reduce street widths for safe and convenient pedestrian crossing by adding medians, boulevards, or bump-outs.
- 10.16.2 Provide streetscape amenities, including street furniture, trees, and landscaping, that buffer pedestrians from auto traffic, parking areas, and winter elements.
- 10.16.4 Employ pedestrian-friendly features along streets, including street trees and landscaped boulevards that add interest and beauty while also managing storm water, appropriate lane widths, raised intersections, and high-visibility crosswalks.
- 10.17.1 Provide high-quality lighting fixture designs that are appropriate to street types and land use, and that provide pedestrian friendly illumination, but minimize glare and dark sky conditions, and other unnecessary light pollution.
- 10.17.3 Encourage pedestrian scale lighting throughout neighborhoods as well as in areas such as waterfronts, pathways, parks and plazas, and designated historic districts.
- 10.19.4 Landscaped areas should be maintained in accordance with Crime Prevention
- Through Environmental Design (CPTED) principles, to allow views into and out of the site, to preserve view corridors and to maintain sight lines at vehicular and pedestrian intersections.
- 10.23.2 Locate pedestrian places on the sunny sides of streets and buildings to provide shelter from the wind and utilize the sun's warmth.
- 10.23.4 Encourage snow removal and storage practices that promote pedestrian and bicycle activity and safety.
- 10.23.6 Encourage street tree plantings to reduce wind speed and provide separation between pedestrians and cars.

### HOW THIS APPLIES TO THE STUDY AREA

Creating an inviting, pedestrian-scale environment is one of the key themes in the Urban Design chapter. This project should consider sun direction having positive and negative effects on the pedestrian experience during different seasons (e.g. sunny transit shelters are more comfortable in winter), seasonality, lighting, scale of signing and lighting, vegetation as buffers for wind, and traffic.

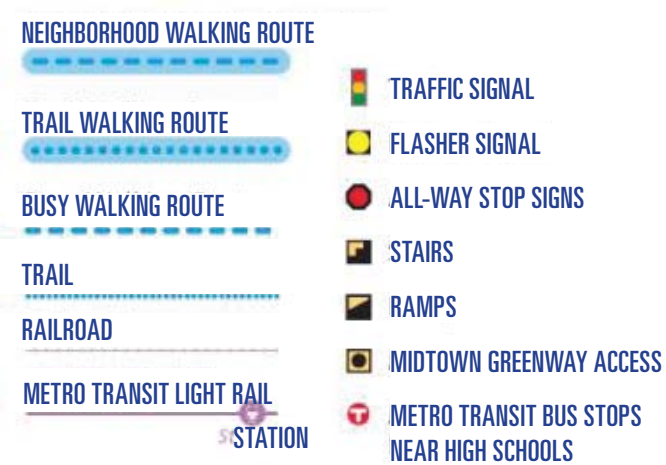
## MINNEAPOLIS WALKING ROUTES FOR YOUTH

The purpose of the City's Walking Routes for Youth Map is to help students and families navigate their neighborhoods in a new way. The paper maps can be found at schools, park recreation centers, and libraries within Minneapolis. The maps show the location of traffic signals, pedestrian short cuts, and other improvements that help users cross barriers and get to where they need to go. Minneapolis Walking Routes for Youth Map is a collaboration between Minneapolis Public Works and Minneapolis Public Schools.

### HOW THIS APPLIES TO THE STUDY AREA

Walking Routes for Youth Map identifies trail walking routes and neighborhood walking routes in the Study Area. When planning transportation infrastructure in this area, children must be expected users.

While trails are emphasized as important walking routes, many of them do not have direct connections to residences within the neighborhoods, so a complete sidewalk network within the neighborhoods will continue to need improvement.





## 3118 WEST LAKE STREET REDEVELOPMENT (2014)

The City Planning Commission approved the conditional use permit (CUP) application for construction of a six-story building with 157 dwelling units and 5,000 square foot commercial space. Approximately two-thirds of the property is in the SH Shoreland Overlay District which limits the height to 2 ½ stories, hence the CUP.

The CUP approval included a letter of support from the Midtown Greenway Coalition with an emphasis on the importance of the building set back from the Greenway to increase solar access to the corridor and park-like space for residents. Neighborhood groups and the MPRB had concerns about viewsheds and disregard for the Shoreland Overlay District.

## HOW THIS APPLIES TO THE STUDY AREA

The development is within walking distance of the West Lake Station and it is intended for the residents to utilize the Greenway, the LRT, and the streetcar. The trips due to the additional dwelling units will be considered in the traffic analysis work for the study area. Pedestrian pathways to access the Greenway and Lake Street will be included. Lake Street will get streetscape improvements with new pavement, landscaping, lighting and outdoor dining areas. There will also be a linear urban auto courtyard and feature green landscape elements, high quality pavement, and decorative street lighting. There will also be green landscaped exterior space between the north end of the building and the Midtown Greenway to provide solar access to the Greenway.

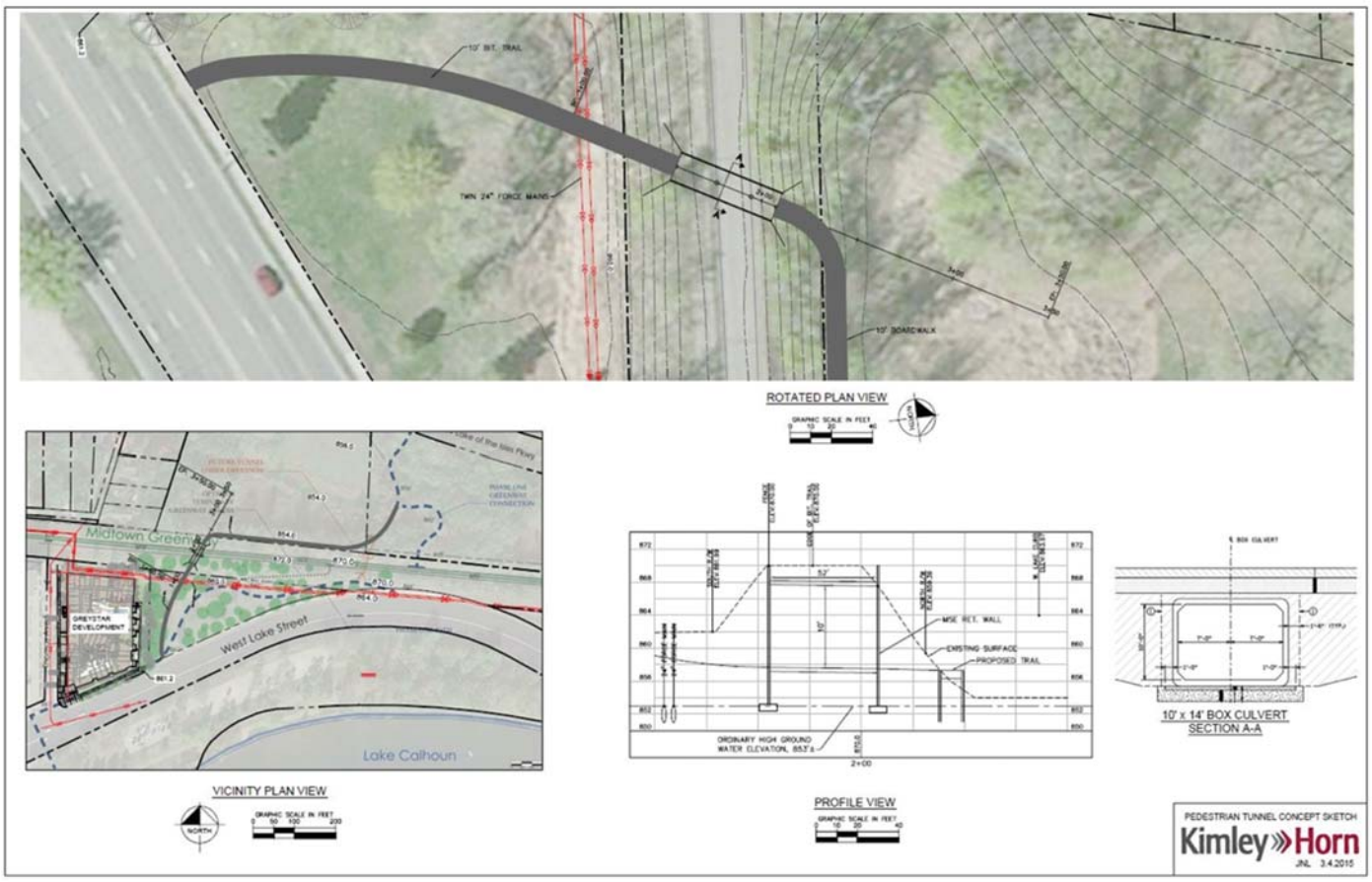

IMPROVED PEDESTRIAN EXPERIENCE - NEW BOULEVARD ALONG W LAKE STREET

## 2622 WEST LAKE STREET

The development is an 8-story, 90-unit multi-family residential building with 160 underground parking spaces. The building is designed to step down in height from eight stories at West Lake Street to three stories at the Midtown Greenway. Access to parking will be provided at Thomas Avenue South. The site currently has no direct access to the Midtown Greenway which is elevated as it passes the site. The development plan includes a future potential bike and pedestrian path to the Lake of the Isles. The plan does not explicitly describe a connection to the Greenway, though the plans include indoor parking for at least 90 bicycles "with easy access to the street and Greenway". The applicant is also committed to collaborating with CIDNA, the Park Board, The Midtown Greenway Coalition and the Hennepin County Regional Rail Authority to create new and safer pedestrian and bike pathways including a possible pedestrian and bicycle path between the building and the Greenway. This path would connect Thomas Avenue to the park land including grading improvements between the building façade and the Greenway. In addition, CIDNA has requested the design allow for the creation of a future bike and pedestrian path that would connect across the Midtown Greenway and allow for a connection to south of Lake of the Isles and the dog park.

BIRDSEYE AERIAL FROM SOUTH EAST

CIDNA worked with Kimley-Horn, ESG Architects and Greystar to develop an improved concept for a tunnel under the Midtown Greenway. This concept provides connectivity at a location to the west requiring minimum use of HCRRA property taking trail users along the north side of the Midtown Greenway berm farther away from Lake Street traffic where wetland nature could be observed.

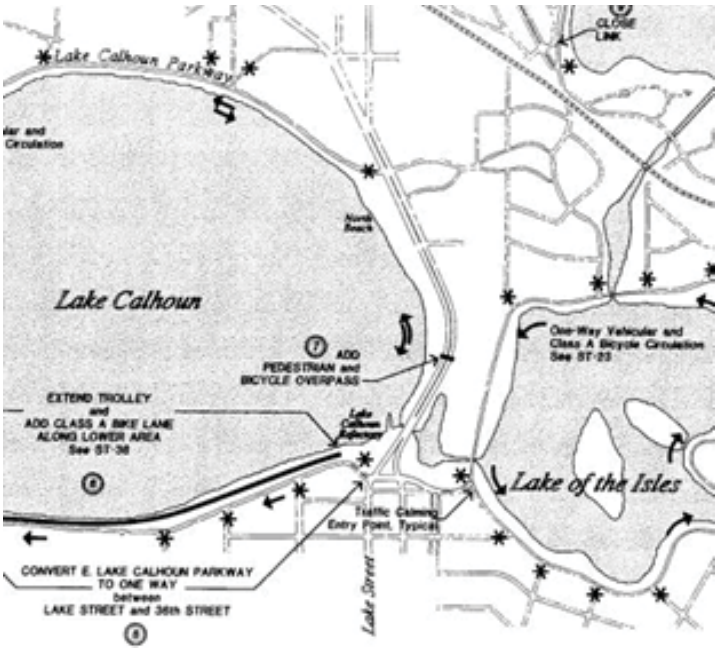



## HOW THIS APPLIES TO THE STUDY AREA

Increased pedestrian traffic should be anticipated. Parking access will be funneled to Thomas Avenue South. Pedestrian accommodations are along Thomas Avenue South and West Lake Street. The development also includes future potential bike and pedestrian path to the Lake of the Isles, and possible enhanced pedestrian and bike friendly streetscape along Thomas Avenue South. New trips related to the new development will be considered in the traffic analysis work for the study area.

## CHAIN OF LAKES REGIONAL PARK MASTER PLAN (1997)

The Chain of Lakes Regional Park Master Plan was adopted in 1997. It includes recommendations for motorized and non-motorized transportation, landscaping, water access, and other aspects. The Minneapolis Park and Recreation Board (MPRB) is in the process of updating the Chain of Lakes Regional Park Master Plan for Lake Calhoun and Lake Harriet with an emphasis on trail improvements.




### HOW THIS APPLIES TO THE STUDY AREA

The plan identifies traffic calming measures throughout the park area and identifies street crossings on Lake Street that need improvement. For example, a pedestrian and bicycle overpass is recommended. There is also a new planning effort in coordination with this study: the Lake Calhoun Lake Harriet Master Plan Update that began in Summer 2015.

## OPEN SPACES AND PARKS CHAPTER (2009)

The MPRB has a number of strategies for creating new parks. Most relevant to this project are:

- Ensuring easy park access for all residents by providing parks within an easy walk from their homes (no more than six blocks) and achieving a ratio of .01 acres of parkland per household.
- Working with the City of Minneapolis and other entities to identify and support multimodal transportation corridors between parks, with preference given to routes that encourage non-motorized linkages between parks.

**Relevant policies:**

- 7.1.3 Provide safe pedestrian and bike routes to open spaces and parks.
- 7.2.5 Evaluate the needs of users in order to provide effective signage, kiosks, and other way-finding tools to make people aware of open spaces.
- 7.3.1 Ensure that access to the city's lakes, streams and the Mississippi River continues to be maintained for the benefit of present and future citizens of Minneapolis.
- 7.3.6 Ensure that in all areas of the city people feel safe so that they are comfortable using parks and open spaces.

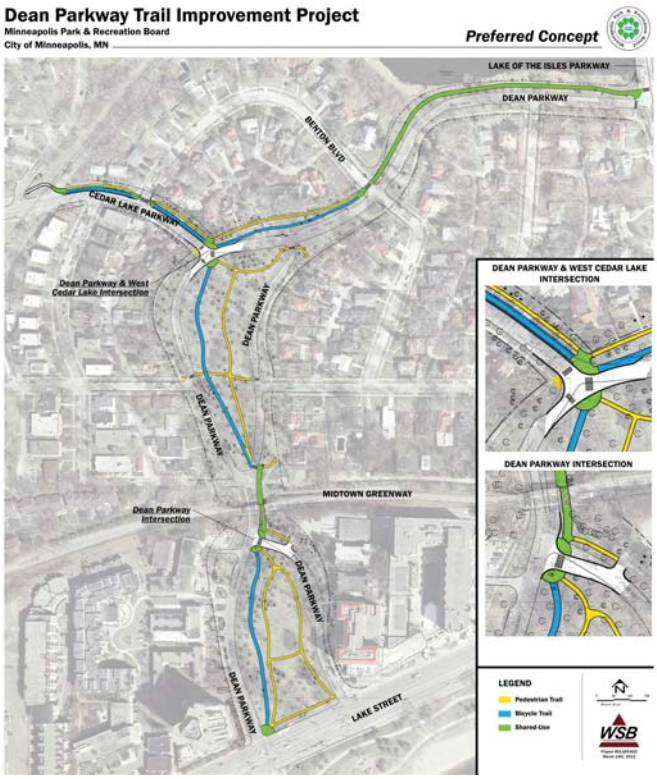
- 7.6.1 Where open spaces and the built environment interface, seek greater design integration between them to create interesting spaces for active and passive use.
- 7.6.2 Provide visual and physical connections between urban areas and open spaces including lakes and rivers.
- 7.6.3 Invest in the greening of streets, particularly those that connect into and supplement the parks and open spaces network.
- 7.6.7 Maintain multimodal transportation corridors to link open spaces and parks with surrounding neighborhoods.
- 7.8.1 Continue to collaborate and coordinate space sharing, maintenance agreements, and programming among public agencies.
- 7.8.2 Support the preservation of former transportation corridors that are intact or largely intact and use them to connect neighborhoods to each other and to major amenities.

### HOW THIS APPLIES TO THE STUDY AREA

The parks and trails in the study area are of regional significance. Per policy 7.6.7, maintaining multimodal transportation corridors need to be a priority. Throughout this project, Open Spaces and Parks policies should be considered with an emphasis on safe pedestrian and bicycle connections from the planned West Lake Station to regional trails, wayfinding and kiosks, greening the streets, and connecting the neighborhoods to parks.

## MINNEAPOLIS PARKS AND RECREATION BOARD COMPREHENSIVE PLAN (2007)

The Park Board's comprehensive plan provided the City of Minneapolis with information it needed to address Metropolitan Council requirements for parks in the Minneapolis Plan for Sustainable Growth.



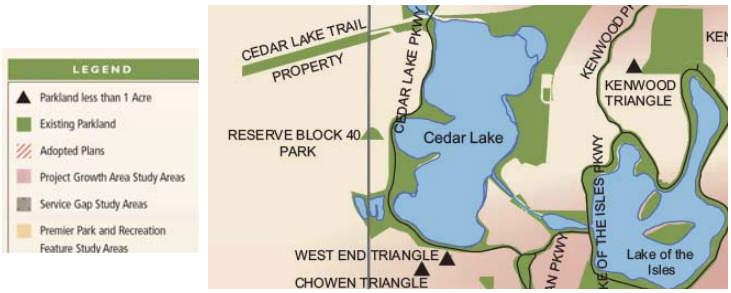
## HOW THIS APPLIES TO THE STUDY AREA

The Plan calls out a specific strategy to work toward the goal of "Parks shape an evolving city". The Plan strives to ensure park access for all residents by providing parks within an easy walk from their homes (no more than six blocks) and achieving a ratio of .01 acres of parkland per household.

The Minneapolis Chain of Lakes, including the portion of the city within the study area, was identified as one of Minneapolis' Project Growth Area Study Areas. The most recent adopted plan for that area was 1997 (right).

The Plan includes the preferred concept for Dean Parkway.

### FUTURE PARKLAND AND FACILITY STUDY AREAS & ADOPTED PLANS

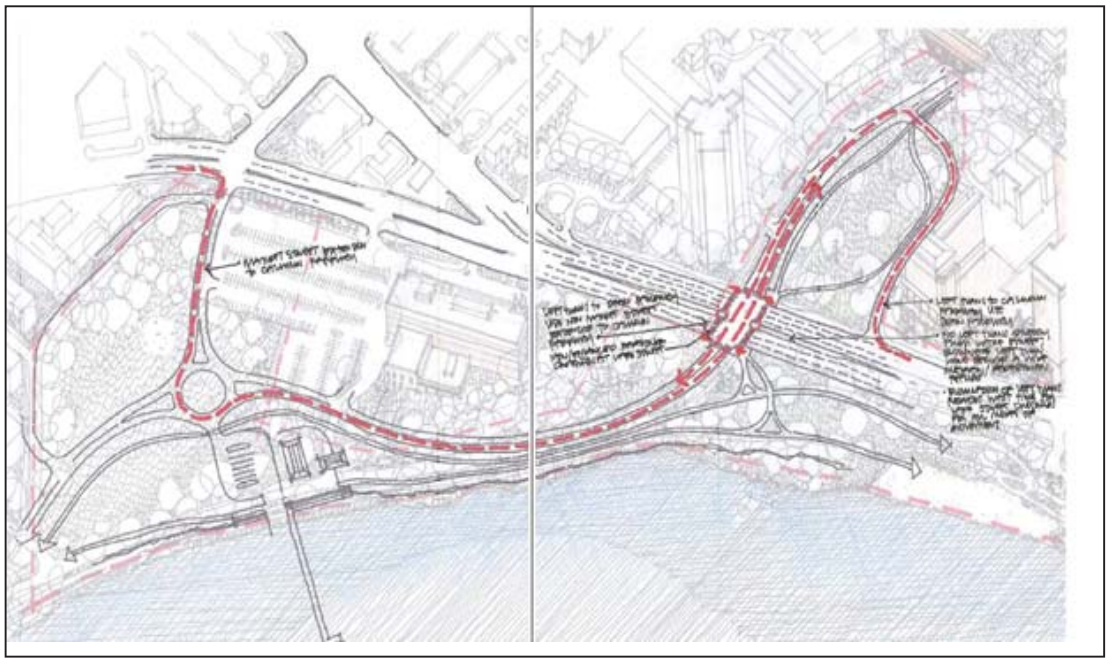



## NORTH LAKE CALHOUN-SOUTH ISLES CHARRETTE SUMMARY REPORT (2013)

The North Lake Calhoun-South Lake of the Isles Design Charrette Summary Report was developed for the MPRB and published in January 2013. Within the Chain of Lakes, the area between the north shore of Lake Calhoun and the south shore of Lake of the Isles experienced many changes since the previous master plan (1997). Changes include Tin Fish, the Midtown Greenway, and the Calhoun Sailing Club redevelopment. This study serves to supplement the Chain of Lakes Master Plan and revise the portion that addresses this area in particular.

Four primary principles were used: Respect current uses, solve identified problems, envision a positive inter-relationship between park and development, and reweave the landscape.

The study was conducted as a multi-day design charrette which aimed to gather input from stakeholders and the general public. As a result, thematic ideas emerged that resonated with the public and stakeholders.

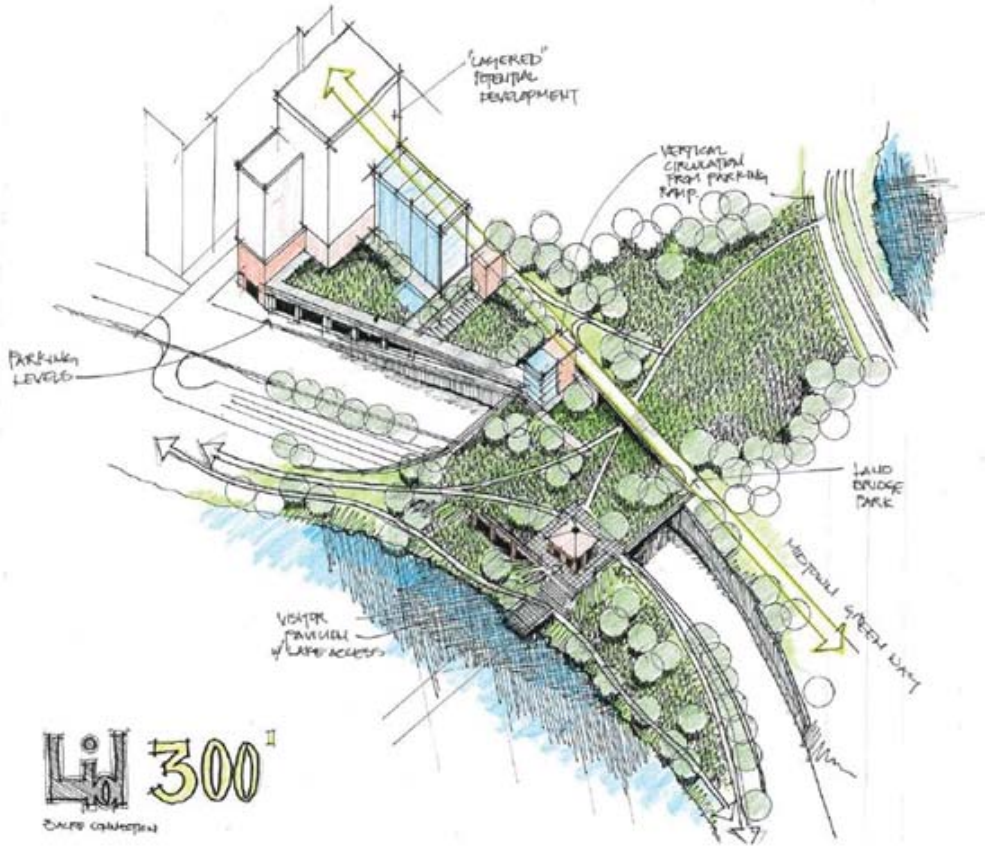


The first theme is the development of a lake-centered activity zone on the northwest corner of Lake Calhoun. The roadway and bicycle-pedestrian paths exist in a narrow corridor, so realignment to create more space for each mode was explored. Extending Market Plaza from Excelsior Boulevard to West Calhoun Parkway was explored to offer a link to the Grand Rounds that avoids a busy intersection.

The second theme was the enhancement of pedestrian and bicycle connections between West Calhoun Parkway and Dean Parkway. Charrette results suggested more definitive street crossings with pavement markings, more pedestrian-scaled features such as streetlights, and paths leading to the intersection. The third eastbound lane (the bus lane) could be eliminated in favor of a bus pull out and result in a boulevard space. Elimination of left turn bays along Lake Street was considered in favor of left turn movements using Dean Parkway and an extension of Market Street leading to West Calhoun Parkway.

The third theme was reorganization of activities at the northeast corner of Lake Calhoun. Public and stakeholders noted concerns about safety, conflicts in movements and use, and operations in a congested area. The greatest need is a clarification of movements: conflicts between pedestrian and bicycle path crossings, bicycle paths moving through other use zones, illogical geometries, and where vehicles cross other paths. Greater separation between pedestrian and bicycle paths east of the Lagoon Bridge and a clearer alignment of the bicycle path past the Tin Fish area were identified as solutions.

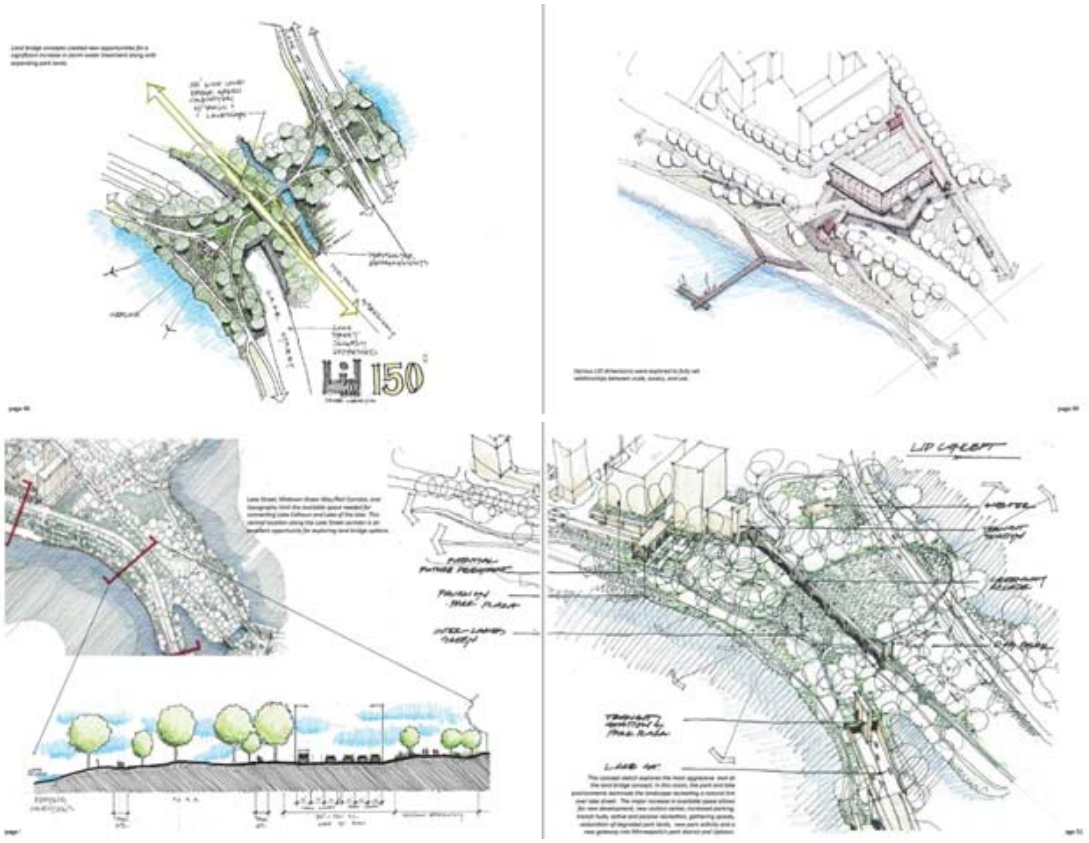
The fourth theme was the creation of a land bridge over Lake Street. Lake Street poses challenges to vehicular and pedestrian circulation. The current pedestrian crossing of Lake Street is limited to the west end intersection at Dean Parkway and east end intersection at East Lake Calhoun Parkway  both problematic due to poor connectivity to the park trails and activity centers. There is no direct pedestrian connection between Lake of the Isles and Lake Calhoun.




Three solutions were explored:

- Bridge crossing east of Thomas Avenue near Calhoun Beach Club Apartments.
- Underpass crossings at the Lagoon location.

The land bridge had the most support spanning Lake Street and connecting the landscape of Lake Calhoun to Lake of the Isles. The land bridge would also be enhanced by creating a direct connection with the Greenway and the Lake of the Isles.



## HOW THIS APPLIES TO THE STUDY AREA

In the study area, considerations must be given to improving Lake Street crossings, clarifying separate routes for each mode of travel, and lane reconfiguration(s) to improve conditions for all users and travelers with an emphasis on connecting Lake of the Isles to Lake Calhoun.

# NEIGHBORHOOD PLANS AND STUDIES

## PHASE II ACTION PLAN: CEDAR-ISLES-DEAN NEIGHBORHOOD (CIDNA) (2010)

The CIDNA Board approved the Phase II Action Plan in 2010. The plan includes recommendations for housing, community building, neighborhood safety, and the environment.

One goal identified is to: "Maintain and enhance a safe environment within the Cedar-Isles-Dean neighborhood." Strategies for that goal include: promote pedestrian safety and provide safer pedestrian access on Sunset Boulevard east of Chowen Ave to Cedar South Beach.

Strategy Description: Provide support for installation of sidewalks where they are needed as part of disruptions created by City street and sewer projects.

## HOW THIS APPLIES TO THE STUDY AREA

According to the goals and strategies of the CIDNA plan, pedestrians should be emphasized in the study area. Specifically, installing additional sidewalk and slowing motorized traffic to provide safer pedestrian crossings and provide safer pedestrian access on Sunset Boulevard east of Chowen Avenue to Cedar South Beach.

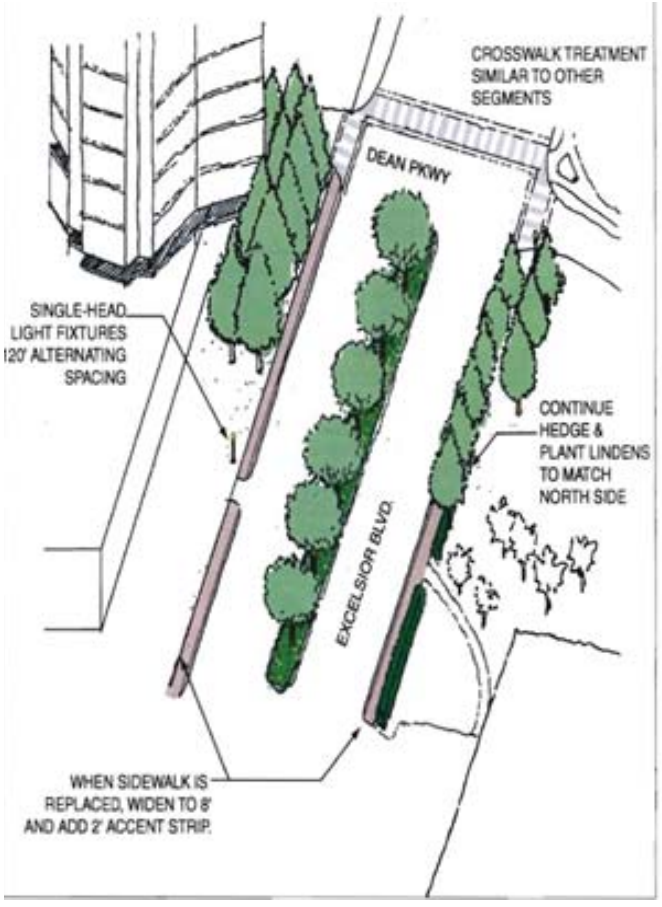
# WEST CALHOUN NEIGHBORHOOD COUNCIL: EXCELSIOR BOULEVARD (1999)

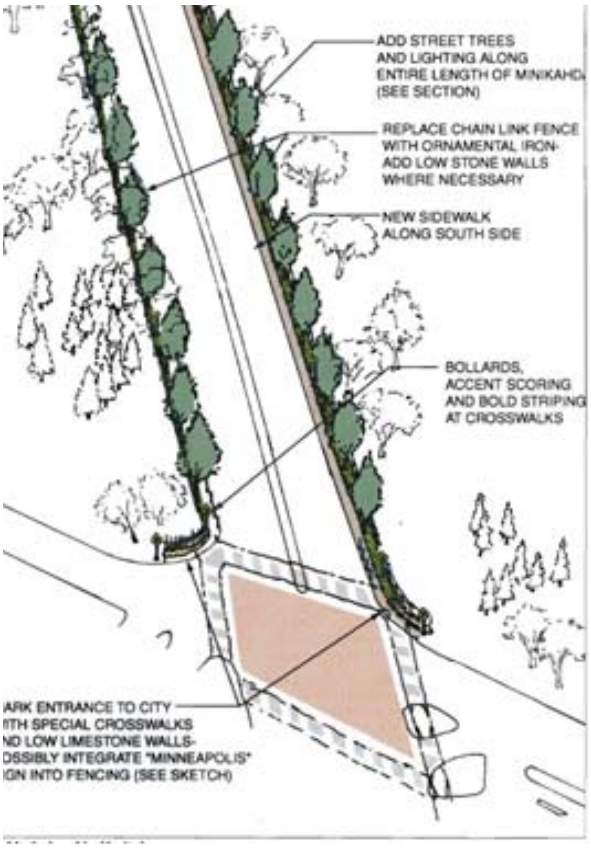
The Excelsior Boulevard Master Plan was adopted in 1999, so priorities may have changed since it was developed. The plan seeks solutions to calm traffic, improve the pedestrian character, and enhance the physical appearance of the street.

## HOW THIS APPLIES TO THE STUDY AREA

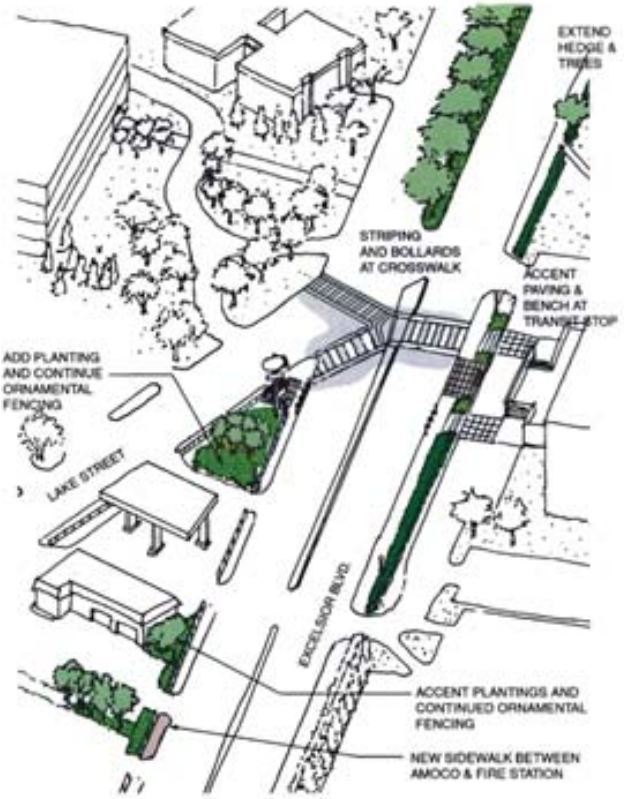
Traffic calming, landscaping, lighting, crossings, ornamental treatments, street furnishings, and other features related to a safe, inviting pedestrian environment are emphasized. Details of this plan should be consulted during the design and outreach phase of this study and include:

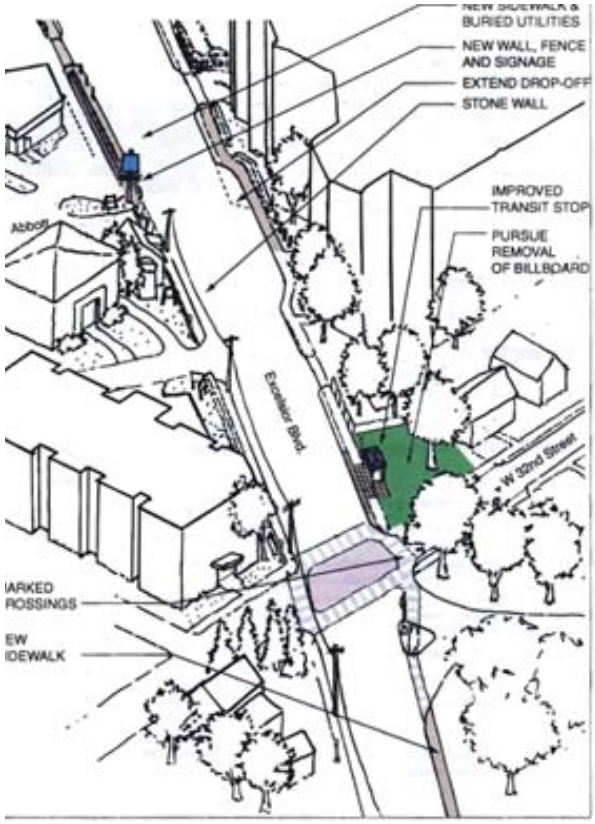
- West Gateway from France Avenue to the Minikahda Pedestrian Bridge should serve as a city entrance with sidewalks, walls and fencing. Traffic calming is also recommended for 30mph posted speeds.

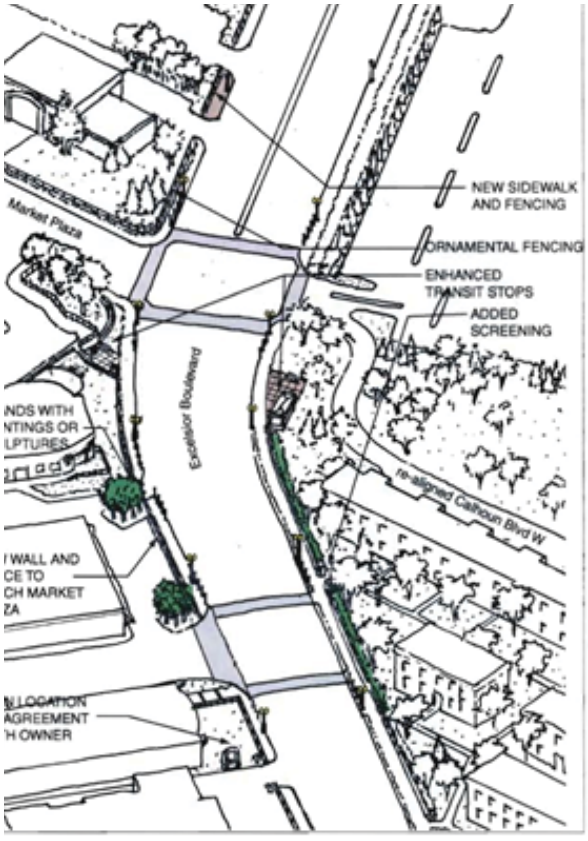


- Dean Parkway crossing should be improved.
- Transition from Minikahda Pedestrian Bridge to Abbott Avenue should be a transitional segment. Sidewalks should be a minimum of 6' wide and the intersection of Excelsior Boulevard and 32ndStreet should be landscaped. This intersection should also have improved crosswalks.
- Excelsior Boulevard and Lake Street intersection should have better crossings, paving, and street furniture for the transit stops.
- Excelsior Boulevard and 32nd Street should also have transit and crossing improvements.



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# 3. EXISTING MULTIMODAL TRAFFIC

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## AVERAGE ANNUAL DAILY TRAFFIC

Average Annual Daily Traffic (AADT) counts for the corridor were obtained from MnDOT. The AADTs for the major corridors in the study area are as follows:

- Lake Street, east of Excelsior Blvd **39,500**
- Lake Street, west of Excelsior Blvd **25,000**
- Excelsior Blvd **17,000**
- Market Plaza **1,850**
- Dean Parkway **8,000**

## TURNING MOVEMENT COUNTS

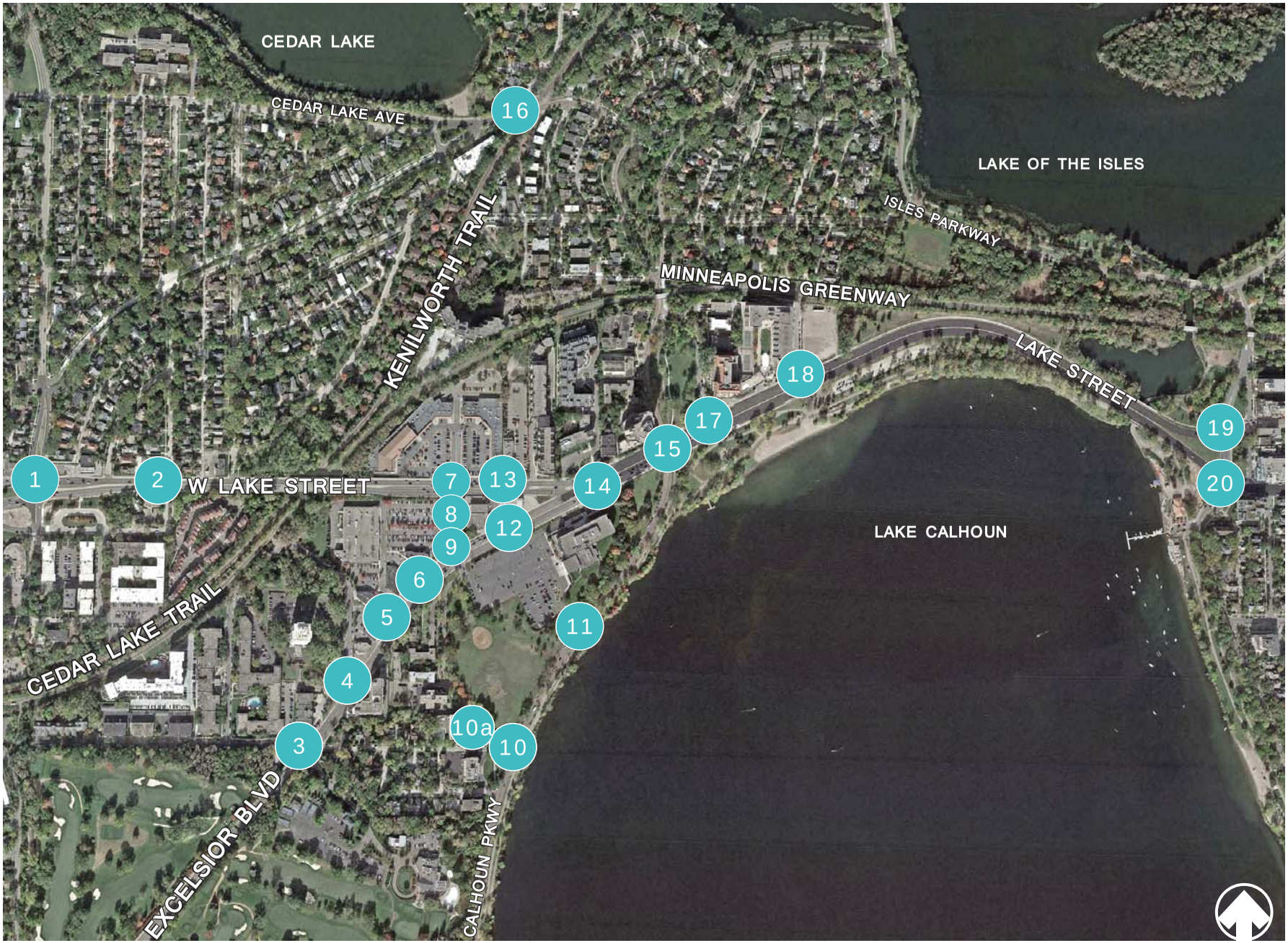
In order to assess the quantity of motor vehicles at 21 intersections within the corridor, turning movement counts were obtained. Data was collected for 13 hours on Tuesday, May 12, 2015 from 6 AM to 7 PM. The study team obtained the count data using video cameras for the following intersections:

1. Lake Street & France Avenue
2. Lake Street & Drew Avenue
3. Excelsior Boulevard & 32nd Street Minikahda
4. Excelsior Boulevard & Abbott Avenue
5. Excelsior Boulevard & Calhoun Commons Signal
6. Excelsior Boulevard & Calhoun Commons Stop
7. Lake Street & Market Plaza
8. Market Plaza & Calhoun Commons
9. Excelsior Boulevard & Market Plaza
10. West Calhoun Parkway & West 32nd Street

10a. West Calhoun Boulevard & West 32nd Street

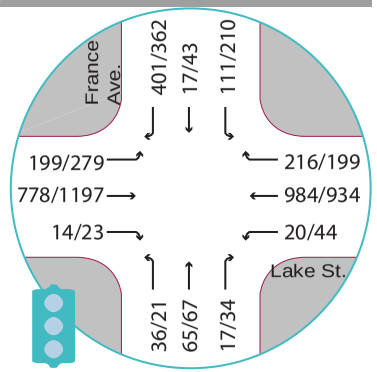
11. West Calhoun Parkway
12. Excelsior Boulevard & Executive Offices/BP Gas
13. Lake Street & BP Gas/Apartments
14. Lake Street & Excelsior Boulevard
15. Lake Street & West Dean Pkwy/West Calhoun
16. Cedar Lake Trail & Burnham Trail
17. Lake Street & East Dean Parkway
18. Lake Street & Thomas Avenue
19. Lagoon Avenue & East Calhoun Parkway
20. Lake Street and East Calhoun Parkway

# FIGURE 3-1
## 2015 INTERSECTION TURNING MOVEMENTS

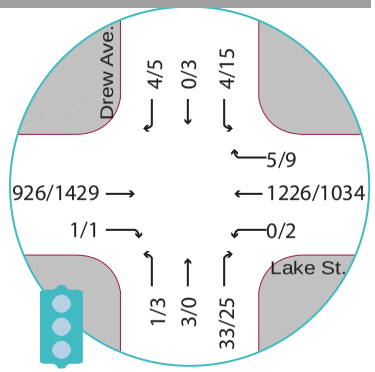


# FIGURE 3-2
## 2015 INTERSECTION TURNING MOVEMENTS

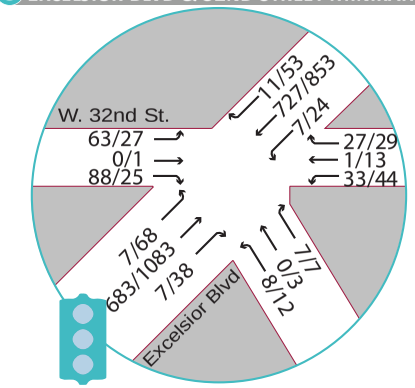
### 1 Lake Street & France Ave



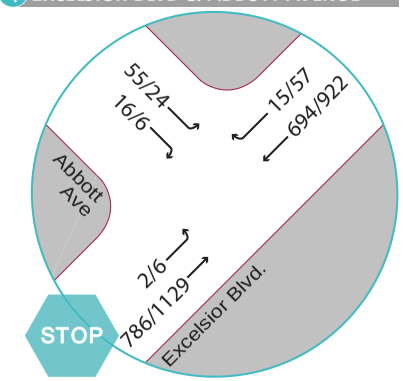

### 2 Lake Street & Drew Avenue



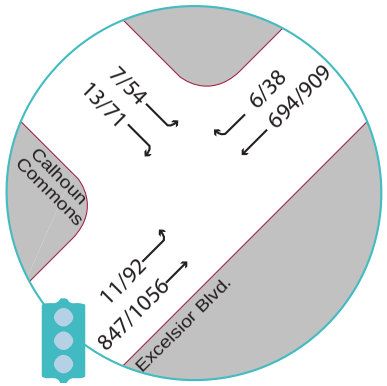

### 3 Excelsior Blvd & 32nd Street Minikahda



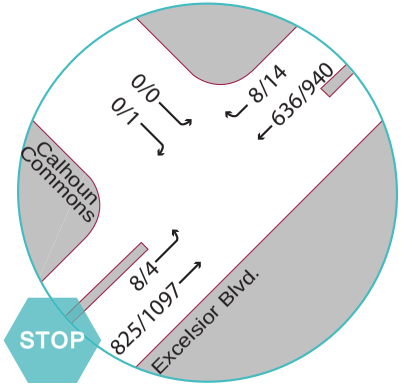

### 4 Excelsior Blvd & Abbott Avenue




### 5 Excelsior Blvd & Calhoun Commons Signal




### 6 Excelsior Blvd & Calhoun Commons Stop





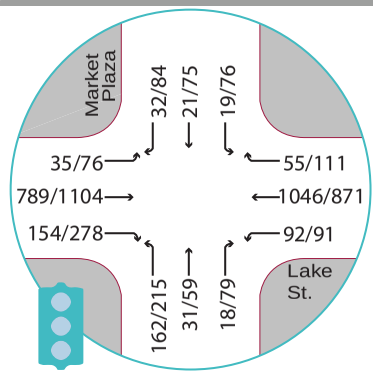
### Key

**Peak Traffic Volume: AM / PM**

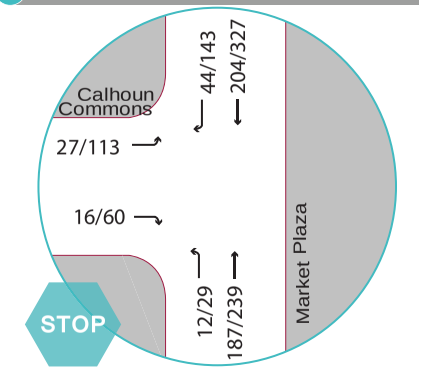
- Data point location
- Signalized intersection
- STOP — Unsignalized intersection
- Vehicle movement

# FIGURE 3-3
## 2015 INTERSECTION TURNING MOVEMENTS

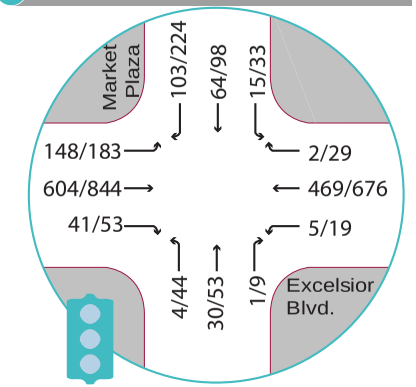
### 7 LAKE ST. & MARKET PLAZA



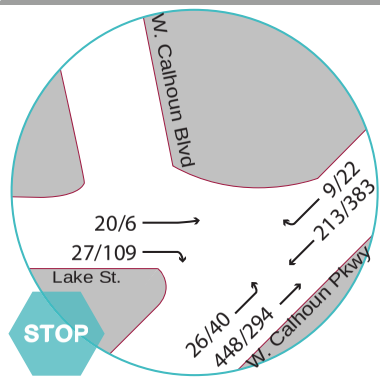

### 8 MARKET PLAZA & CALHOUN COMMONS



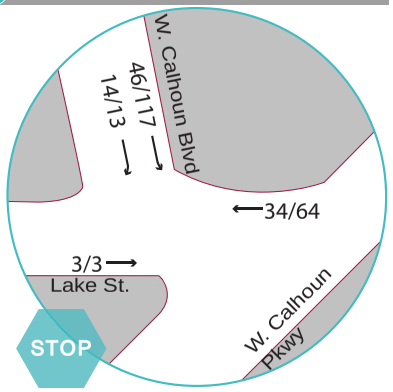

### 9 EXCELSIOR BLVD & MARKET PLAZA



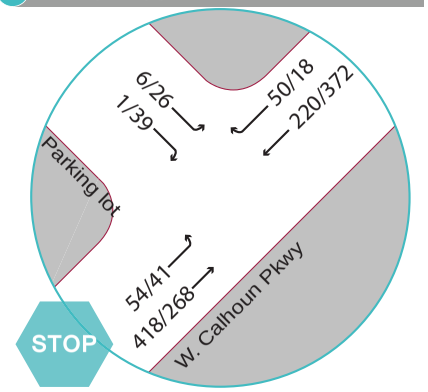

### 10 WEST CALHOUN PKWY & 32ND STREET




### 10a WEST CALHOUN BLVD & 32ND STREET




### 11 WEST CALHOUN PARKWAY





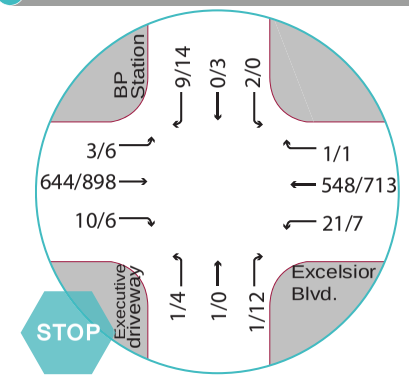
### KEY

PEAK TRAFFIC VOLUME: AM / PM

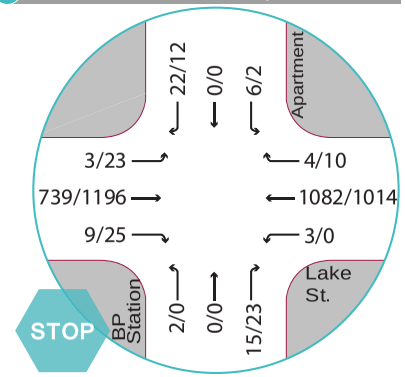
- DATA POINT LOCATION
- SIGNALIZED INTERSECTION
- STOP UNSIGNALIZED INTERSECTION
- VEHICLE MOVEMENT

# FIGURE 3-4
## 2015 INTERSECTION TURNING MOVEMENTS

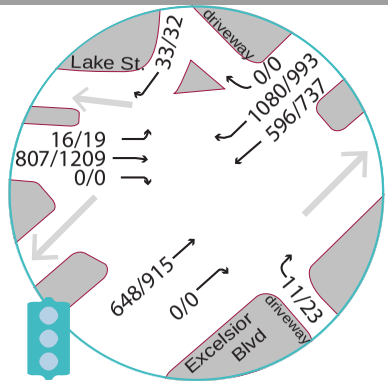
### 12 Excelsior Blvd & Executive Offices & BP Station



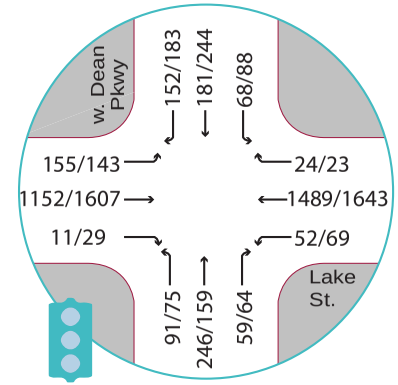

### 13 Lake Street & BP Station / Apt



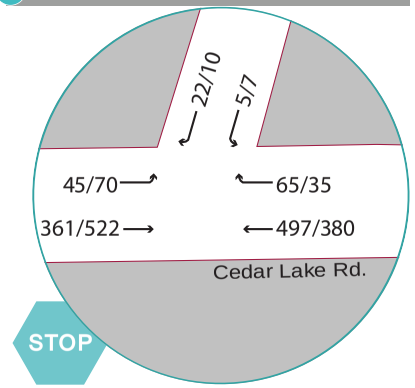

### 14 Lake St. & Excelsior Blvd




### 15 Lake Street & W Dean Parkway / Calhoun Pkwy




### 16 Cedar Lake Trail & Burnham Trail





### Key

Peak Traffic Volume: AM / PM

- Data point location
- Signalized intersection
- Unsignalized intersection
- Vehicle movement

# FIGURE 3-5
## 2015 INTERSECTION TURNING MOVEMENTS

## BICYCLE AND PEDESTRIAN VOLUME DATA

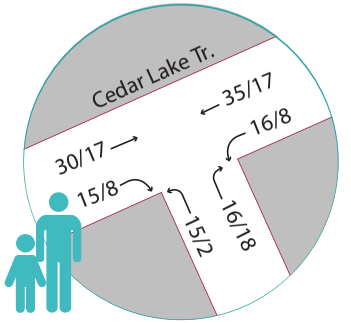
Non-motorized turning movements and intersection crossings were counted in order to assess the quantity of pedestrians and bicycles at 12 intersections along the corridor. Data was collected for 2 hours on both Wednesday, June 10, 2015 from 5-7 PM and Saturday, June 20, 2015 from 1-3 PM. Turning movement count data was collected using video cameras for the following intersections:

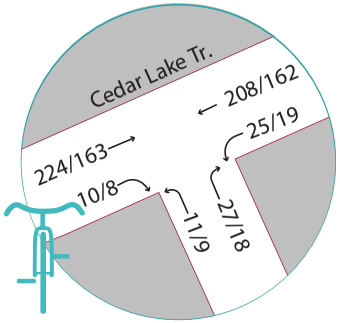
1. Trail Access at Cedar Lake Parkway near Burnham Road
2. Midtown Greenway & Calhoun Village Access
3. Cedar Lake Trail & Chowen Avenue Access
4. Lake Street and Market Plaza
5. Excelsior Boulevard & Market Plaza
6. Lake Street & Excelsior Boulevard
7. Lake Street & West Calhoun Parkway/Dean Parkway
8. Excelsior Boulevard & Abbott Avenue
9. Excelsior Boulevard & West 32nd Street
10. West 32nd Street & West Calhoun Parkway
11. Lagoon Avenue & East Calhoun Parkway
12. Lake Street & East Calhoun Parkway

# FIGURE 3-6
## BIKE & PEDESTRIAN VOLUMES

### 3 Cedar Lake Trail & Chowen Ave Access

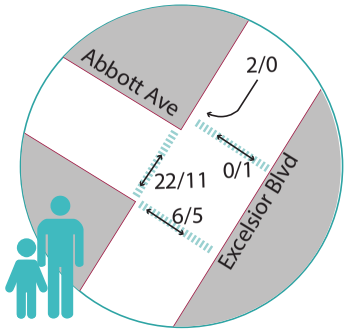
wed 650 1117 sat 181 1087

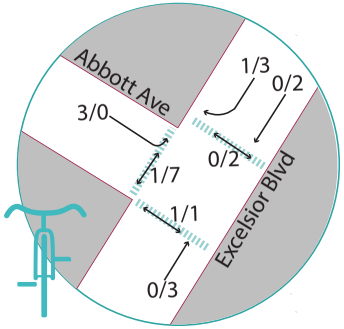



### 8 Excelsior Blvd & Abbott Ave S

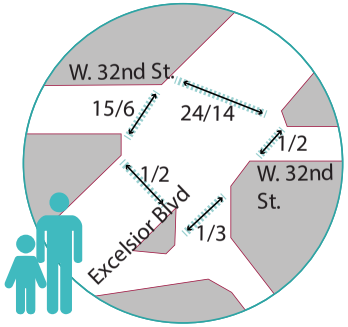
wed 65 15 sat 46 36

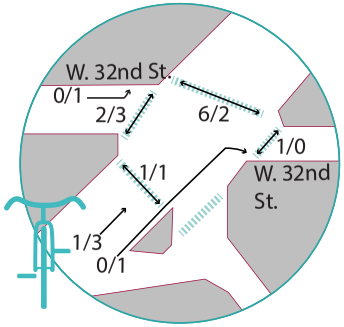



### 9 Excelsior Blvd & W 32nd St

wed 84 32 sat 64 35

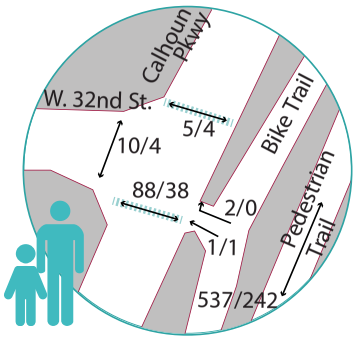


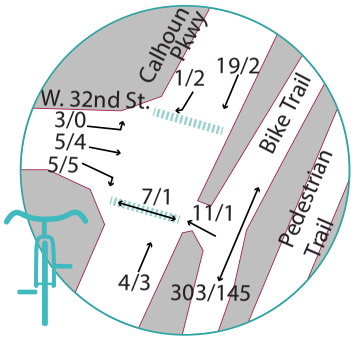





### 10 W Calhoun pkwy & W 32nd St.

wed 1710 1003 sat 829 597



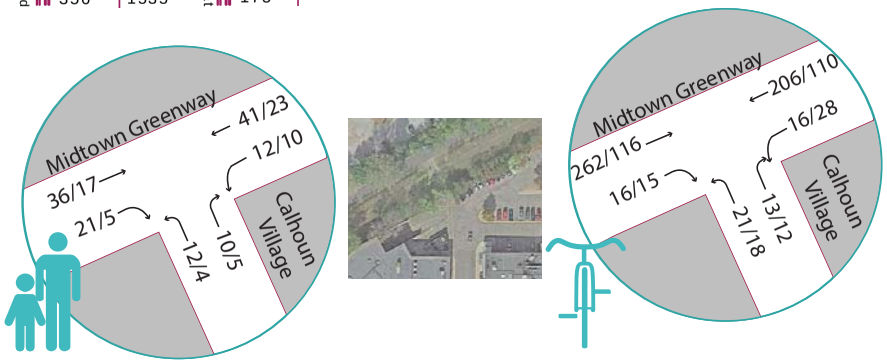

**KEY:**

xxx/xxx
**Wednesday evening / Saturday afternoon**
**data collected June 2015
**Two hour total**
wed xxx xxx sat xxx xxx

# FIGURE 3-7
# BIKE & PEDESTRIAN VOLUMES

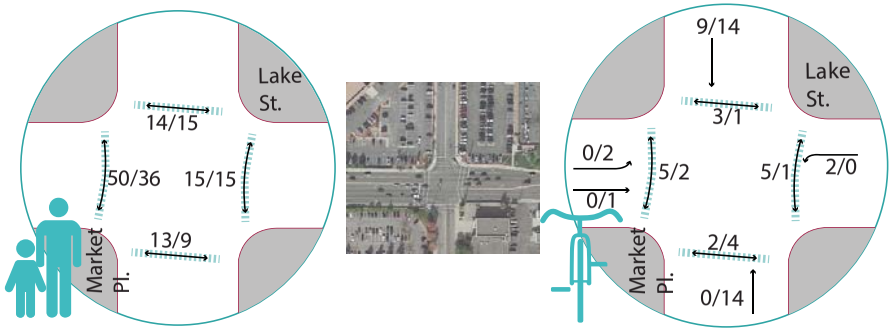

## 2 Midtown Greenway & Calhoun Village Access

wed 356 1535 sat 175 849



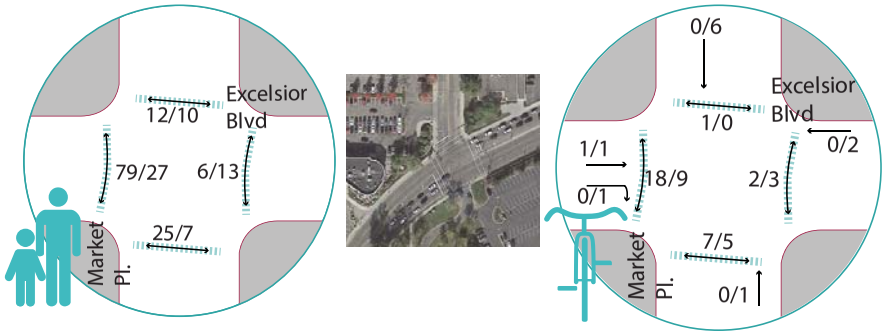

## 4 Lake St & Market Plaza

wed 262 69 sat 214 91



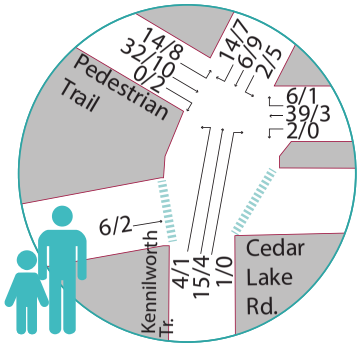

## 5 Excelsior Blvd & Market Plaza

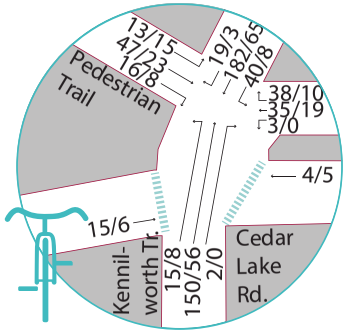
wed 325 83 sat 154 77




## 1 Cedar Lake Pkwy / Burnham Rd

wed 361 1731 sat 170 663



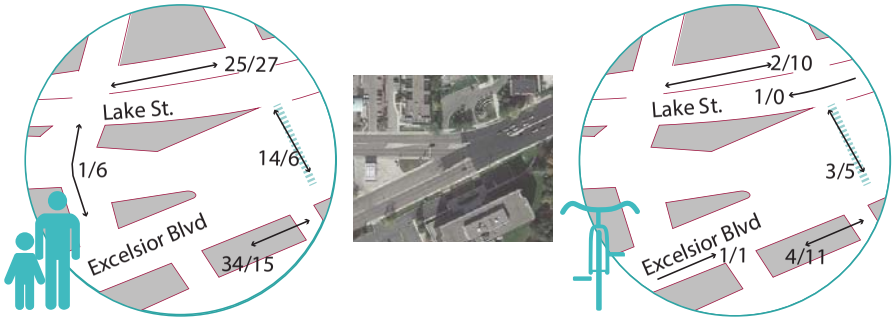

**KEY:**

xxx/xxx
**Wednesday evening / Saturday afternoon**
**data collected June 2015
**Two hour total**
wed xxx xxx sat xxx xxx

# FIGURE 3-8
## BIKE & PEDESTRIAN VOLUMES

### 6 Lake St & Excelsior Blvd

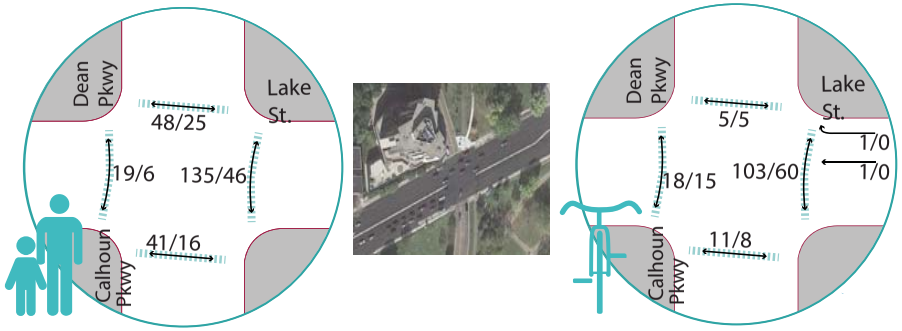
wed 195 32 sat 150 56






### 7 Lake St & W Calhoun Pkwy/Dean Pkwy

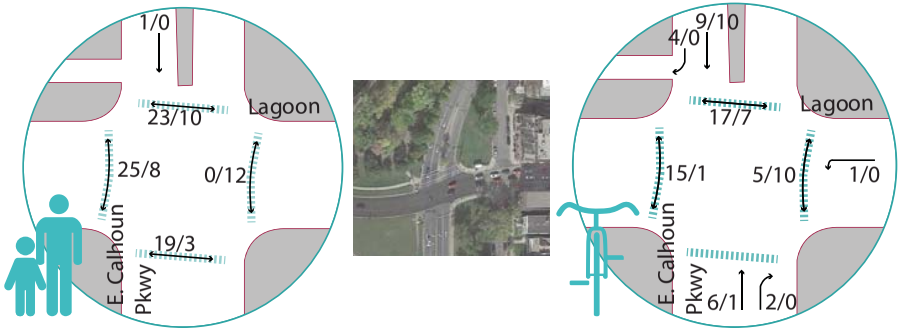
wed 634 232 sat 355 233






### 11 Lagoon Ave & E Calhoun Pkwy

wed 197 164 sat 80 78

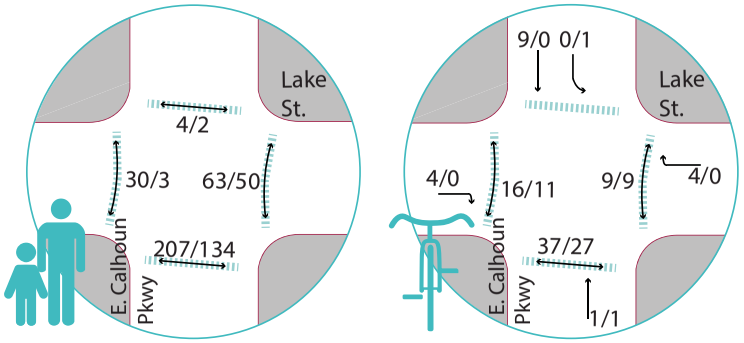






### 12 Lake St & E Calhoun Pkwy

wed 816 228 sat 519 139




**KEY:**

xxx/xxx
**Wednesday evening / Saturday afternoon**
**data collected June 2015
**Two hour total**
wed xxx xxx sat xxx xxx

# BUS TRANSIT

## EXISTING METRO TRANSIT BUS ROUTES - WEST LAKE STUDY AREA

Metro Transit buses that presently serve the West Lake Study area include routes 12, 17, 25, and 114. These routes travel along the Lake Street, Excelsior Boulevard, Cedar Lake Road and France Avenue. Table 3-1 below shows the existing frequency throughout the day for each route. Figure 3-9 illustrates the routes and existing stop locations.

### TABLE 3-1
### EXISTING BUS ROUTES

| Route | Frequency of Route (minutes) | | | Description of Route |
|---|---|---|---|---|
| | Peak | Midday | Night | |
| 12 | 15 | 30 | 30 | Lake Street and Excelsior Boulevard |
| 17 | 5 to 15 | 15 | 30 | Lake Street |
| 25 | 20 | 60 | N/A | France Avenue and Cedar Lake Boulevard |
| 114 | 10 to 15 | 15 to 60 | N/A | Lake Street and Excelsior Boulevard |

# FIGURE 3-9
## EXISTING METRO TRANSIT ROUTES AND STOPS


*SOURCES:*
*www.datafinder.org/metadata/TransitRoutes.html*
*www.metrotransit.org/imap*

## PLANNED METRO TRANSIT BUS ROUTES - WEST LAKE STATION

The Southwest LRT Project Office (SPO) provided a summary of the buses that will serve the West Lake Station. Buses 17 and 21 will stop on the Lake Street Bridge and buses 601, 602, and 612 will stop in the Abbott Avenue/ Chowen Avenue/32nd Street loop just south of the West Lake Station.

Descriptions of routes 17, 21, 601, 602, and 612 were summarized to describe where the bus travels within the study area as well as where the bus will stop within relation to the station. Planned bus frequencies were also provided by SPO as shown in the table below.

### TABLE 3-2
### PLANNED BUS ROUTES

| Route | Frequency of Route in Corridor (minutes) | | | Description of Stop | Description of Direction |
|---|---|---|---|---|---|
| | Peak | Midday | Night | | |
| 17 | 10 to 20 | 10 to 20 | 60 | Stops on Lake Street Bridge | Eastbound and Westbound over Lake Street Bridge |
| 21 | 12 | 20 | 30 | Stops on Lake Street Bridge | Eastbound and Westbound over Lake Street Bridge |
| 601 | 30 | 30 | 60 | Stops in the Abbott/31st/Chowen/32nd Loop | Eastbound on Lake Southbound on Excelsior, Right onto Abbott |
| 602 | 30 | 30 | 60 | Stops in the Abbott/31st/Chowen/32nd Loop | Northbound on Excelsior, Left onto Abbott |
| 612 | 15 | 10 to 20 | 60 | Stops in the Abbott/31st/Chowen/32nd Loop | Northbound on Excelsior, Left onto Abbott |

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# 3. EXISTING MULTIMODAL TRAFFIC

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## AVERAGE ANNUAL DAILY TRAFFIC

Average Annual Daily Traffic (AADT) counts for the corridor were obtained from MnDOT. The AADTs for the major corridors in the study area are as follows:

- Lake Street, east of Excelsior Blvd **39,500**
- Lake Street, west of Excelsior Blvd **25,000**
- Excelsior Blvd, east of Lake Street **17,000**
- Market Plaza **1,850**
- Dean Parkway, north of Lake Street **8,000**

## TURNING MOVEMENT COUNTS

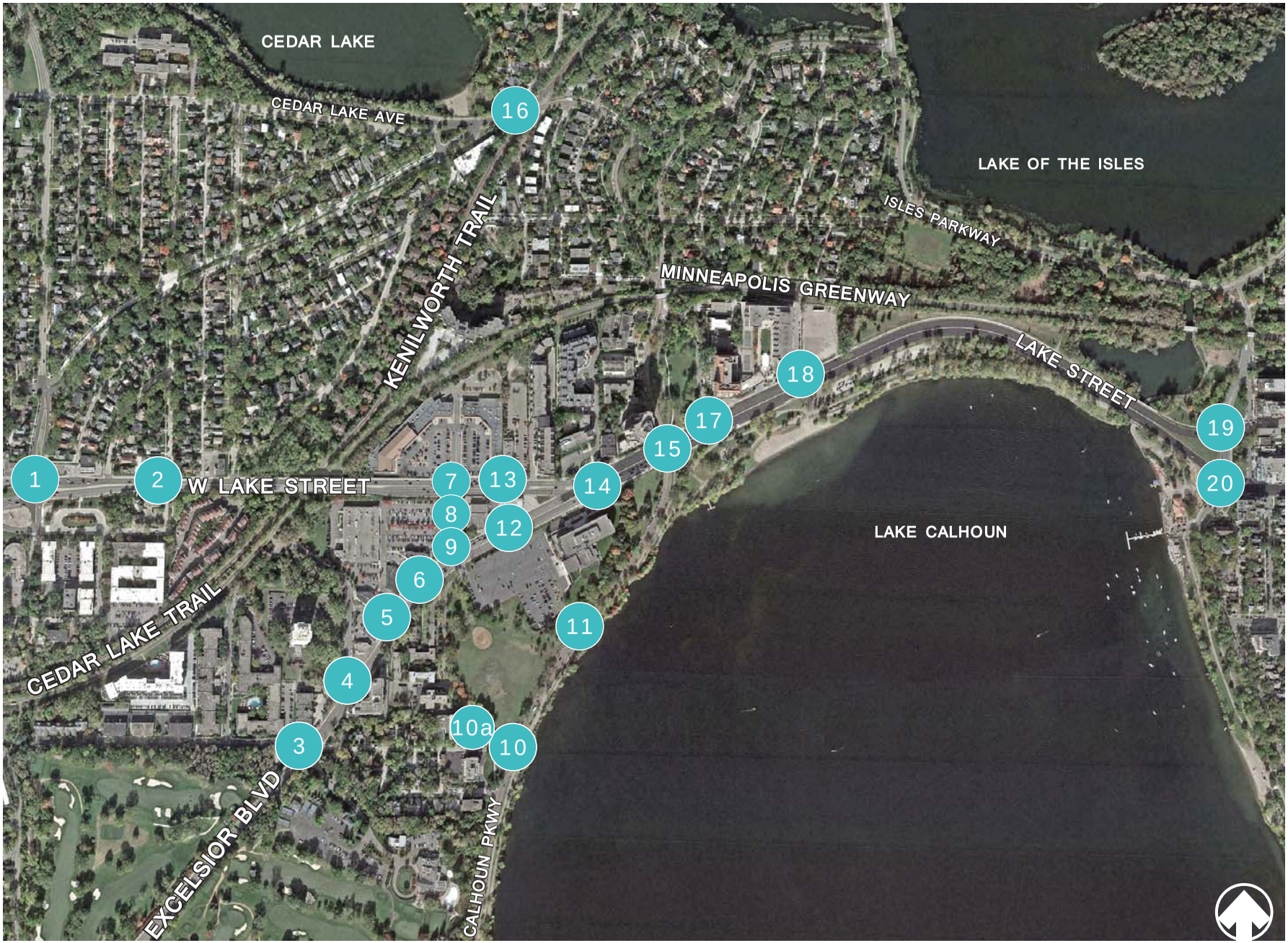
In order to assess the quantity of motor vehicles at 21 intersections within the corridor, turning movement counts were obtained. Data was collected for 13 hours on Tuesday, May 12, 2015 from 6 AM to 7 PM. The study team obtained the count data using video cameras for the following intersections:

1. Lake Street & France Avenue
2. Lake Street & Drew Avenue
3. Excelsior Boulevard & 32nd Street Minikahda
4. Excelsior Boulevard & Abbott Avenue
5. Excelsior Boulevard & Calhoun Commons Signal
6. Excelsior Boulevard & Calhoun Commons Stop
7. Lake Street & Market Plaza
8. Market Plaza & Calhoun Commons
9. Excelsior Boulevard & Market Plaza
10. West Calhoun Parkway & West 32nd Street

10a. West Calhoun Boulevard & West 32nd Street

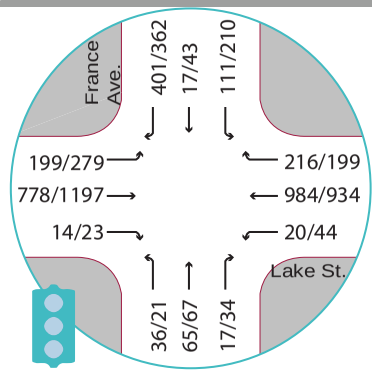
11. West Calhoun Parkway
12. Excelsior Boulevard & Executive Offices/BP Gas
13. Lake Street & BP Gas/Apartments
14. Lake Street & Excelsior Boulevard
15. Lake Street & West Dean Pkwy/West Calhoun
16. Cedar Lake Trail & Burnham Trail
17. Lake Street & East Dean Parkway
18. Lake Street & Thomas Avenue
19. Lagoon Avenue & East Calhoun Parkway
20. Lake Street and East Calhoun Parkway

# FIGURE 3-1
## 2015 INTERSECTION TURNING MOVEMENTS

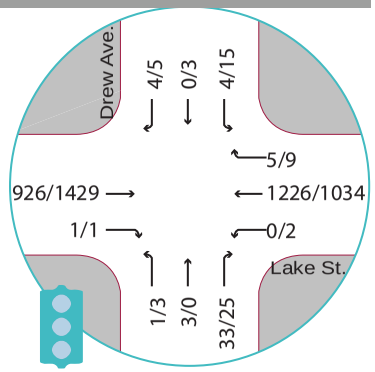


# FIGURE 3-2
## 2015 INTERSECTION TURNING MOVEMENTS

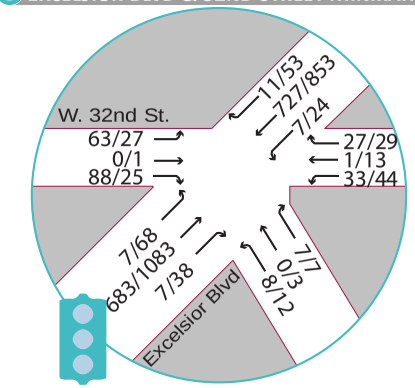
### 1 Lake Street & France Ave



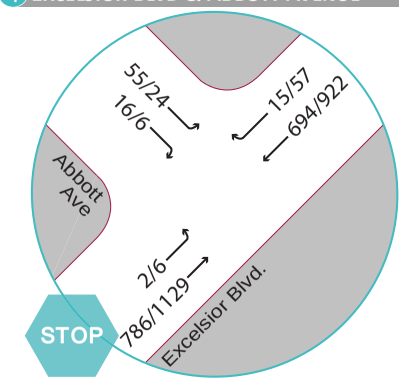

### 2 Lake Street & Drew Avenue



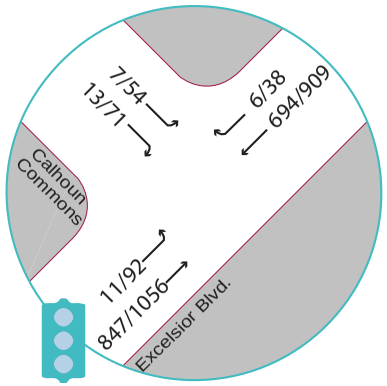

### 3 Excelsior Blvd & 32nd Street Minikahda



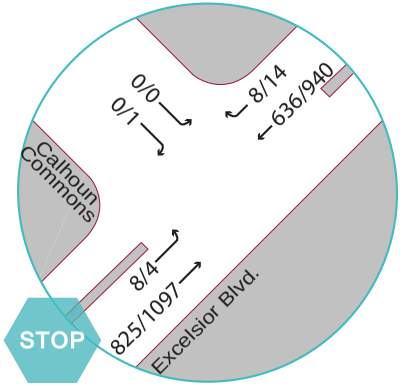

### 4 Excelsior Blvd & Abbott Avenue




### 5 Excelsior Blvd & Calhoun Commons Signal




### 6 Excelsior Blvd & Calhoun Commons Stop





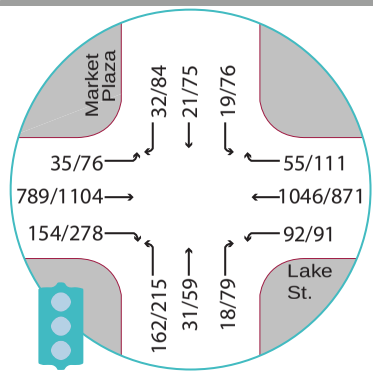
### Key

**Peak Traffic Volume: AM / PM**

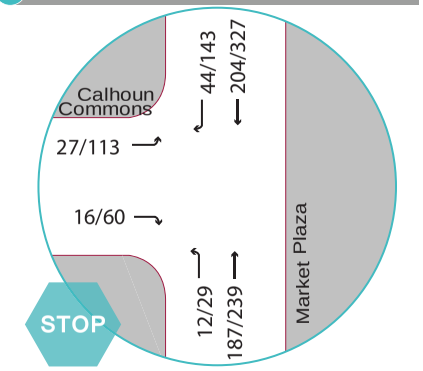
- Data point location
- Signalized intersection
- STOP — Unsignalized intersection
- Vehicle movement

# FIGURE 3-3
## 2015 INTERSECTION TURNING MOVEMENTS

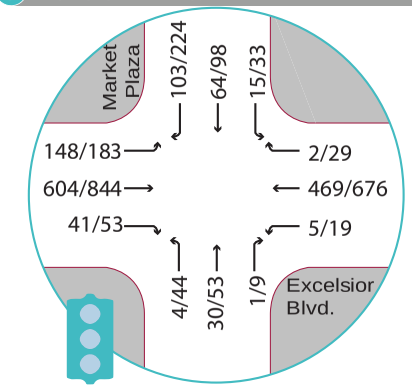
### 7 LAKE ST. & MARKET PLAZA



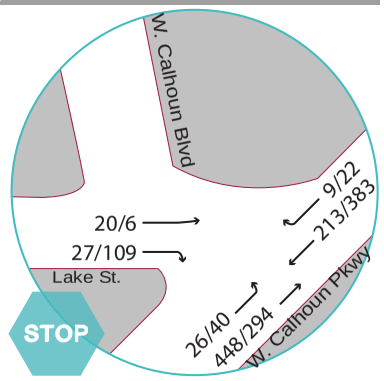

### 8 MARKET PLAZA & CALHOUN COMMONS



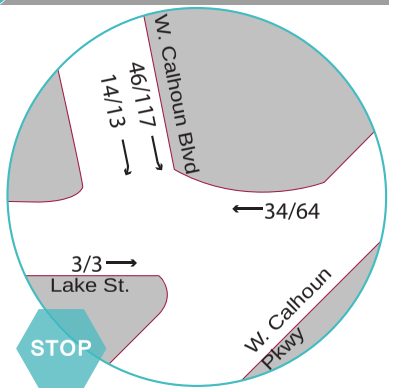

### 9 EXCELSIOR BLVD & MARKET PLAZA



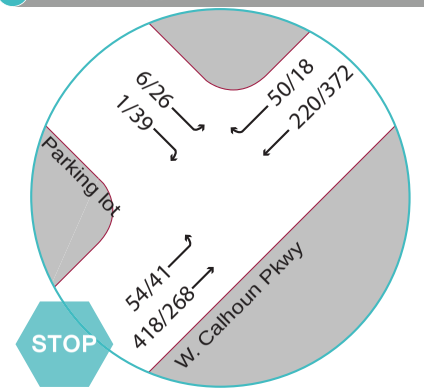

### 10 WEST CALHOUN PKWY & 32ND STREET




### 10a WEST CALHOUN BLVD & 32ND STREET




### 11 WEST CALHOUN PARKWAY





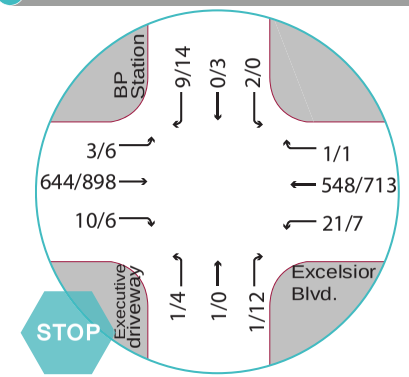
### KEY

PEAK TRAFFIC VOLUME: AM / PM

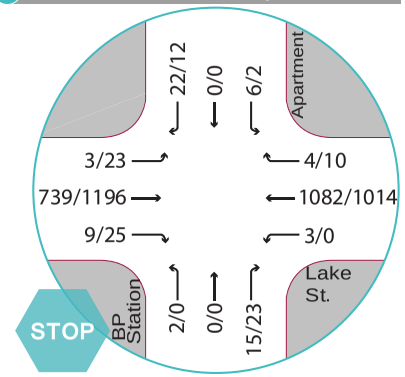
- DATA POINT LOCATION
- SIGNALIZED INTERSECTION
- STOP UNSIGNALIZED INTERSECTION
- VEHICLE MOVEMENT

# FIGURE 3-4
## 2015 INTERSECTION TURNING MOVEMENTS

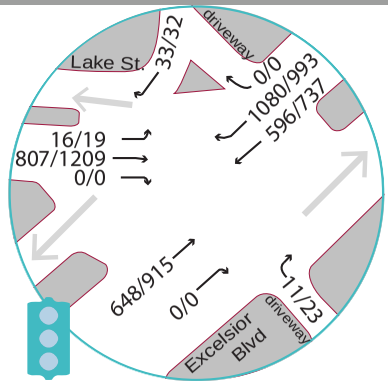
### 12 Excelsior Blvd & Executive Offices & BP Station



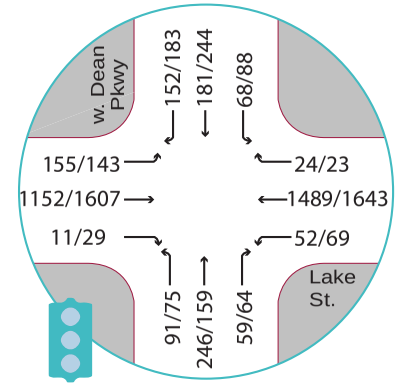

### 13 Lake Street & BP Station / Apt



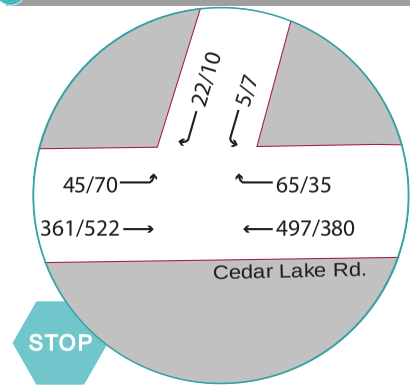

### 14 Lake St. & Excelsior Blvd




### 15 Lake Street & W Dean Parkway / Calhoun Pkwy




### 16 Cedar Lake Trail & Burnham Trail





### Key

Peak Traffic Volume: AM / PM

- Data point location
- Signalized intersection
- Unsignalized intersection
- Vehicle movement

# FIGURE 3-5
## 2015 INTERSECTION TURNING MOVEMENTS

## BICYCLE AND PEDESTRIAN VOLUME DATA

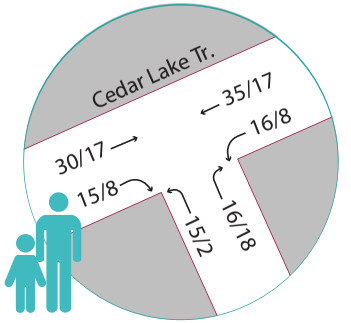
Non-motorized turning movements and intersection crossings were counted in order to assess the quantity of pedestrians and bicycles at 12 intersections along the corridor. Data was collected for 2 hours on both Wednesday, June 10, 2015 from 5-7 PM and Saturday, June 20, 2015 from 1-3 PM. Turning movement count data was collected using video cameras for the following intersections:

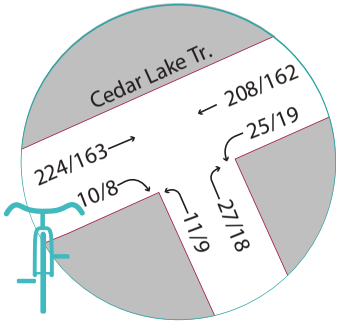
1. Trail Access at Cedar Lake Parkway near Burnham Road
2. Midtown Greenway & Calhoun Village Access
3. Cedar Lake Trail & Chowen Avenue Access
4. Lake Street and Market Plaza
5. Excelsior Boulevard & Market Plaza
6. Lake Street & Excelsior Boulevard
7. Lake Street & West Calhoun Parkway/Dean Parkway
8. Excelsior Boulevard & Abbott Avenue
9. Excelsior Boulevard & West 32nd Street
10. West 32nd Street & West Calhoun Parkway
11. Lagoon Avenue & East Calhoun Parkway
12. Lake Street & East Calhoun Parkway

# FIGURE 3-6
## BIKE & PEDESTRIAN VOLUMES

### 3 Cedar Lake Trail & Chowen Ave Access

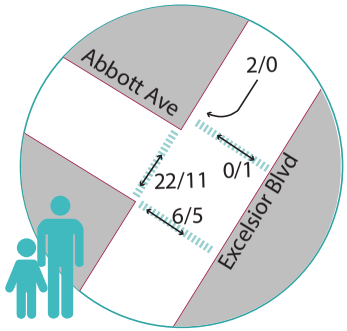
wed 650 1117 sat 181 1087

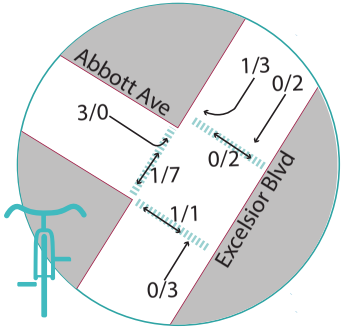



### 8 Excelsior Blvd & Abbott Ave S

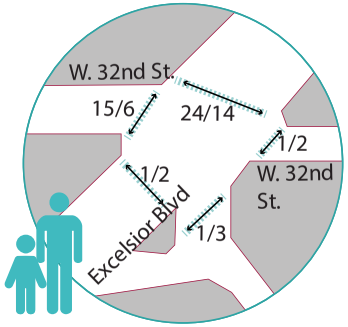
wed 65 15 sat 46 36

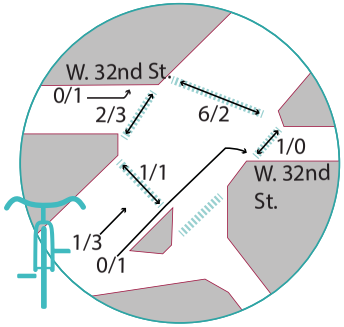



### 9 Excelsior Blvd & W 32nd St

wed 84 32 sat 64 35

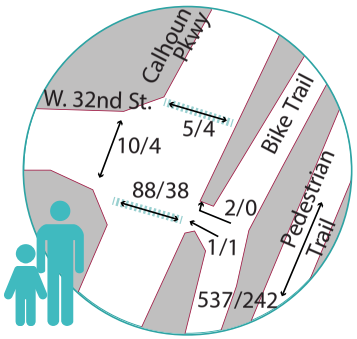


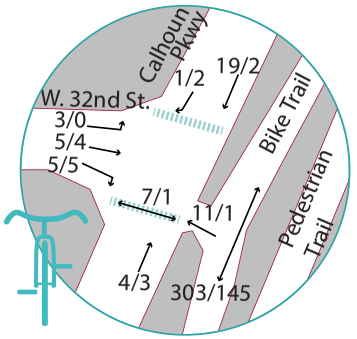





### 10 W Calhoun pkwy & W 32nd St.

wed 1710 1003 sat 829 597



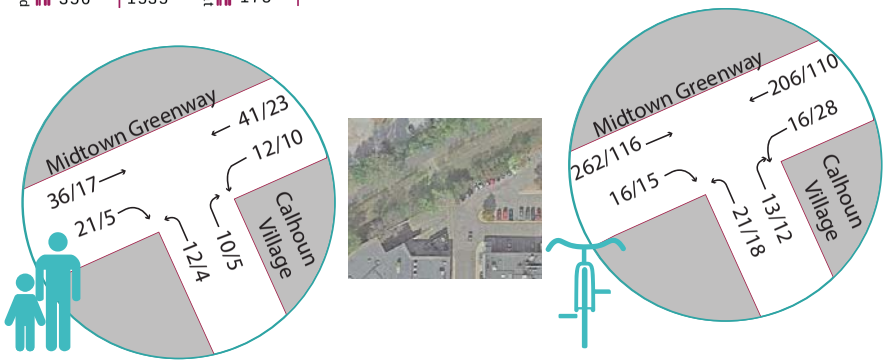

**KEY:**

xxx/xxx
**Wednesday evening / Saturday afternoon**
**data collected June 2015
**Two hour total**
wed xxx xxx sat xxx xxx

# FIGURE 3-7
# BIKE & PEDESTRIAN VOLUMES

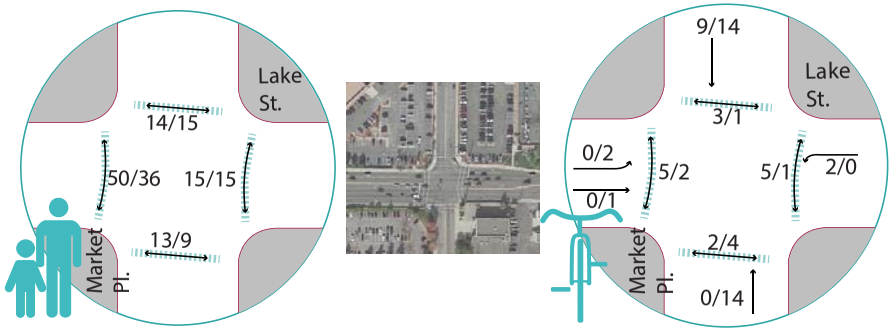

## 2 Midtown Greenway & Calhoun Village Access

wed 356 1535 sat 175 849



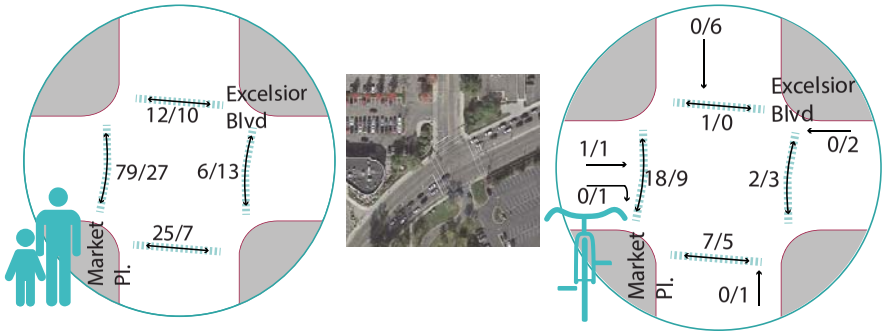

## 4 Lake St & Market Plaza

wed 262 69 sat 214 91



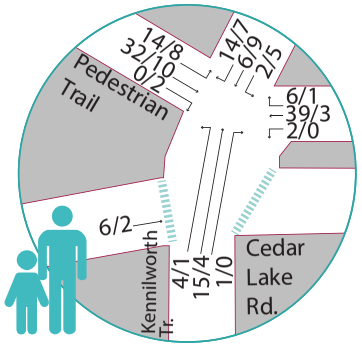

## 5 Excelsior Blvd & Market Plaza

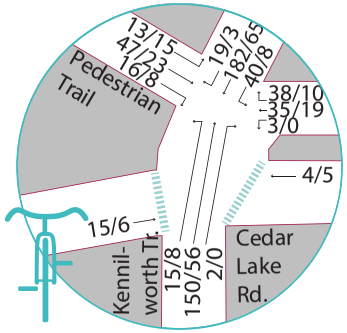
wed 325 83 sat 154 77




## 1 Cedar Lake Pkwy / Burnham Rd

wed 361 1731 sat 170 663



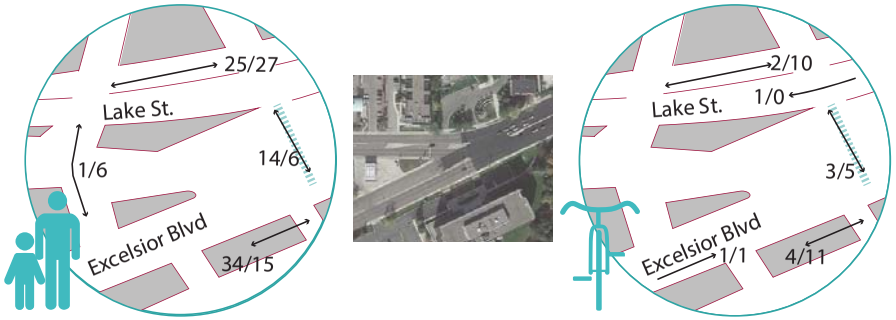

**KEY:**

xxx/xxx
**Wednesday evening / Saturday afternoon**
**data collected June 2015
**Two hour total**
wed xxx xxx sat xxx xxx

# FIGURE 3-8
## BIKE & PEDESTRIAN VOLUMES

### 6 Lake St & Excelsior Blvd

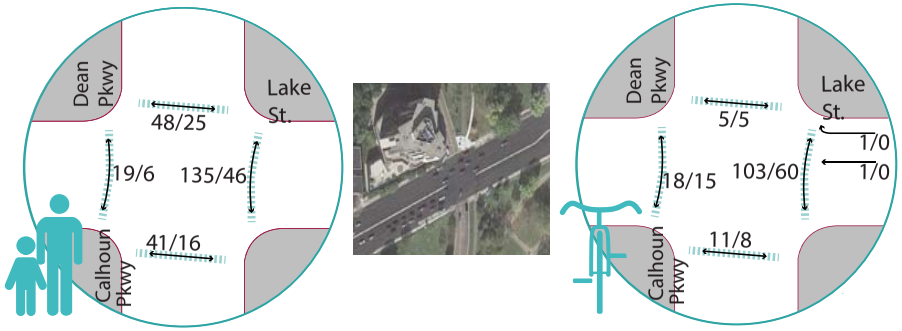
wed 195 32 sat 150 56






### 7 Lake St & W Calhoun Pkwy/Dean Pkwy

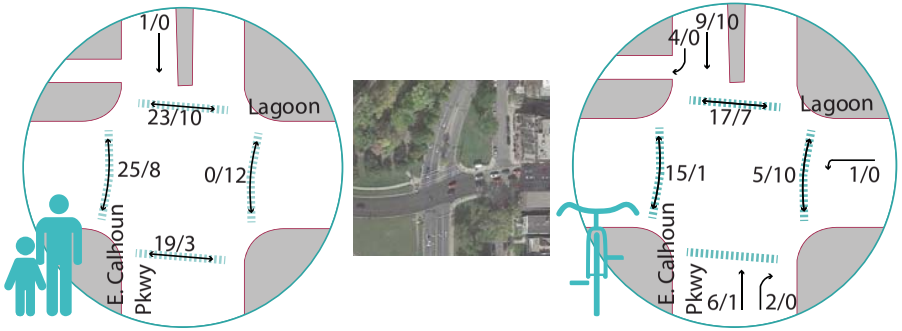
wed 634 232 sat 355 233






### 11 Lagoon Ave & E Calhoun Pkwy

wed 197 164 sat 80 78

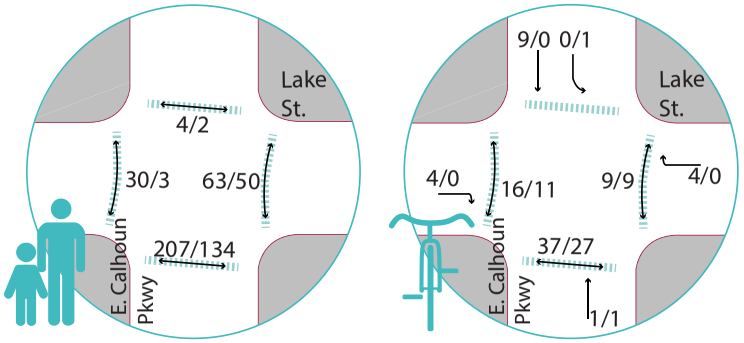






### 12 Lake St & E Calhoun Pkwy

wed 816 228 sat 519 139




**KEY:**

xxx/xxx
**Wednesday evening / Saturday afternoon**
**data collected June 2015
**Two hour total**
wed xxx xxx sat xxx xxx

# BUS TRANSIT

## EXISTING METRO TRANSIT BUS ROUTES - WEST LAKE STUDY AREA

Metro Transit buses that presently serve the West Lake Study area include routes 12, 17, 25, and 114. These routes travel along the Lake Street, Excelsior Boulevard, Cedar Lake Road and France Avenue. Table 3-1 below shows the existing frequency throughout the day for each route. Figure 3-9 illustrates the routes and existing stop locations.

### TABLE 3-1
### EXISTING BUS ROUTES

| Route | Frequency of Route (minutes) | | | Description of Route |
|---|---|---|---|---|
| | Peak | Midday | Night | |
| 12 | 15 | 30 | 30 | Lake Street and Excelsior Boulevard |
| 17 | 5 to 15 | 15 | 30 | Lake Street |
| 25 | 20 | 60 | N/A | France Avenue and Cedar Lake Boulevard |
| 114 | 10 to 15 | 15 to 60 | N/A | Lake Street and Excelsior Boulevard |

# FIGURE 3-9
## EXISTING METRO TRANSIT ROUTES AND STOPS


*SOURCES:*
*www.datafinder.org/metadata/TransitRoutes.html*
*www.metrotransit.org/imap*

## PLANNED METRO TRANSIT BUS ROUTES - WEST LAKE STATION

The Southwest LRT Project Office (SPO) provided a summary of the buses that will serve the West Lake Station. Buses 17 and 21 will stop on the Lake Street Bridge and buses 601, 602, and 612 will stop in the Abbott Avenue/ Chowen Avenue/32nd Street loop just south of the West Lake Station.

Descriptions of routes 17, 21, 601, 602, and 612 were summarized to describe where the bus travels within the study area as well as where the bus will stop within relation to the station. Planned bus frequencies were also provided by SPO as shown in the table below. Information subject to change.

### TABLE 3-2
### PLANNED BUS ROUTES

| Route | Frequency of Route in Corridor (minutes) | | | Description of Stop | Description of Direction |
|---|---|---|---|---|---|
| | Peak | Midday | Night | | |
| 17 | 10 to 20 | 10 to 20 | 60 | Stops on Lake Street Bridge | Eastbound and Westbound over Lake Street Bridge |
| 21 | 12 | 20 | 30 | Stops on Lake Street Bridge | Eastbound and Westbound over Lake Street Bridge |
| 601 | 30 | 30 | 60 | Stops in the Abbott/31st/Chowen/32nd Loop | Eastbound on Lake Southbound on Excelsior, Right onto Abbott |
| 602 | 30 | 30 | 60 | Stops in the Abbott/31st/Chowen/32nd Loop | Northbound on Excelsior, Left onto Abbott |
| 612 | 15 | 10 to 20 | 60 | Stops in the Abbott/31st/Chowen/32nd Loop | Northbound on Excelsior, Left onto Abbott |

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# 4. 2040 FORECAST TRAFFIC VOLUMES (AUTO)

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# 2040 FORECAST METHODOLOGY

To understand how motor vehicle traffic demand may increase over the next 25 years, a motorized travel demand forecast was completed for the study area. The study area includes major roadway segments and intersections bounded by Cedar Lake Parkway on the north, East Calhoun Parkway on the east, West 32nd Street on the south and France Avenue on the west.

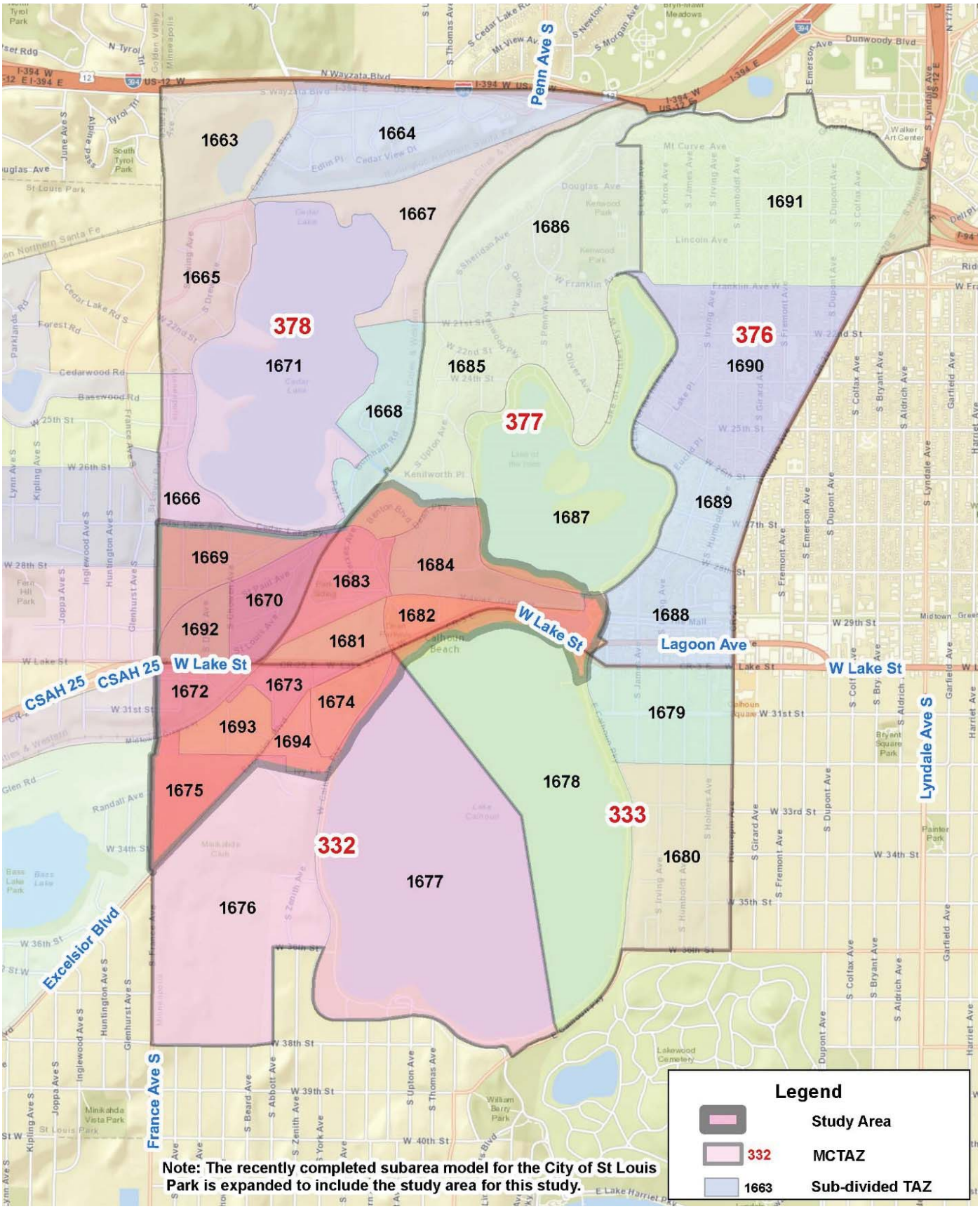
Traffic forecast models developed for this study were based largely on the 2040 SWLRT forecast model obtained from SPO, which was based on the most current Twin Cities Regional Travel Demand Model (TCRTD model). The forecast model also considered the Metropolitan Council Transportation Analysis Zones (TAZs) and refined the study area TAZs to better characterize trip patterns within and through the study area.

The traffic forecasts for major roadway segments and peak hour turning movements for the intersections in the study area were developed using the following steps:

1. Review the 2040 SWLRT forecast models along with 2040 socioeconomic data (SE data) and planned land use updates from the City of Minneapolis.
2. Re-run the 2040 SWLRT model with updated 2040 SE data and refined land use designations to produce vehicle Origin/Destination (OD) tables for all trip purposes.
3. Refine the TAZs and roadway networks in the subarea model for improved accuracy and detail.
4. Adjust the base existing model and 2040 subarea models such that daily outputs for major roadway segments match actual counts.
5. Develop peak hour turning movements for the study intersections based on the daily traffic growth, then adjust to account for peak hour spreading and balance different growth for different approaches.

Figure 4-1 on the following page shows the regional TAZs as well as the refined and subdivided TAZs that were developed for this study.

# FIGURE 4-1
## TWIN CITIES REGIONAL MODEL TAZS AND SUBDIVIDED TAZS IN THE STUDY AREA



## SUMMARY OF 2040 MODEL NETWORK AND SOCIOECONOMIC DATA

The following regional transit and freeway improvement projects were included in the assumptions for both the 2040 SWLRT models as well as the refined study forecast model:

- METRO Blue Line Extension (LRT)
- METRO Green Line Extension (LRT)
- METRO Gold Line (BRT)
- METRO Orange Line (BRT)
- A Line (Arterial BRT)
- Penn Avenue (Arterial BRT)
- Chicago Emerson/Fremont (Arterial BRT)
- I-35W/Lake Street Access project including:
    - New northbound I-35W exit ramp to 28th Street
    - New southbound I-35W exit ramp to Lake Street
    - New southbound I-35W MnPASS lanes from 26th Street to 46th Street

The TCRTD Model utilizes the traditional four-step modeling process which includes trip generation, trip distribution, mode choice, and trip assignment. The SE data, including population and employment, is one of the most important inputs for the travel demand model. The 2040 SE data from the SWLRT model was reviewed and the data in the study area were revised to reflect the City's latest land use plan. The table below summarizes the SE data for the study area, City of Minneapolis, and the Metropolitan Council metropolitan area.

### TABLE 4-1
### STUDY AREA, MINNEAPOLIS & METRO AREA SOCIO-ECONOMIC DATA SUMMARY

| Area | Year | Population | Households | Retail Employment | Non-Retail Employment | Total Employment |
|---|---|---|---|---|---|---|
| Subarea Model Study Area | 2010 | 16,070 | 8,836 | 2,406 | 3,618 | 6,024 |
| | 2040 | 23,312 | 12,008 | 2,696 | 5,186 | 7,882 |
| | Annual Growth(%) | 1.25% | 1.03% | 0.38% | 1.21% | 0.90% |
| City of Minneapolis | 2010 | 383,159 | 163,892 | 33,123 | 247,387 | 280,510 |
| | 2040 | 467,572 | 203,668 | 48,946 | 309,536 | 358,482 |
| | Annual Growth(%) | 0.67% | 0.73% | 1.31% | 0.75% | 0.82% |
| Metro Total | 2010 | 2,849,546 | 1,117,741 | 263,625 | 1,277,179 | 1,540,804 |
| | 2040 | 3,676,082 | 1,510,009 | 382,076 | 1,720,103 | 2,102,179 |
| | Annual Growth(%) | 0.85% | 1.01% | 1.24% | 1.00% | 1.04% |

*Base Development Scenario

The table below summarizes the socioeconomic data for subdivided TAZs in the study area.

## TABLE 4-2
## SUB-DIVIDED TAZ SOCIO-ECONOMIC DATA SUMMARY

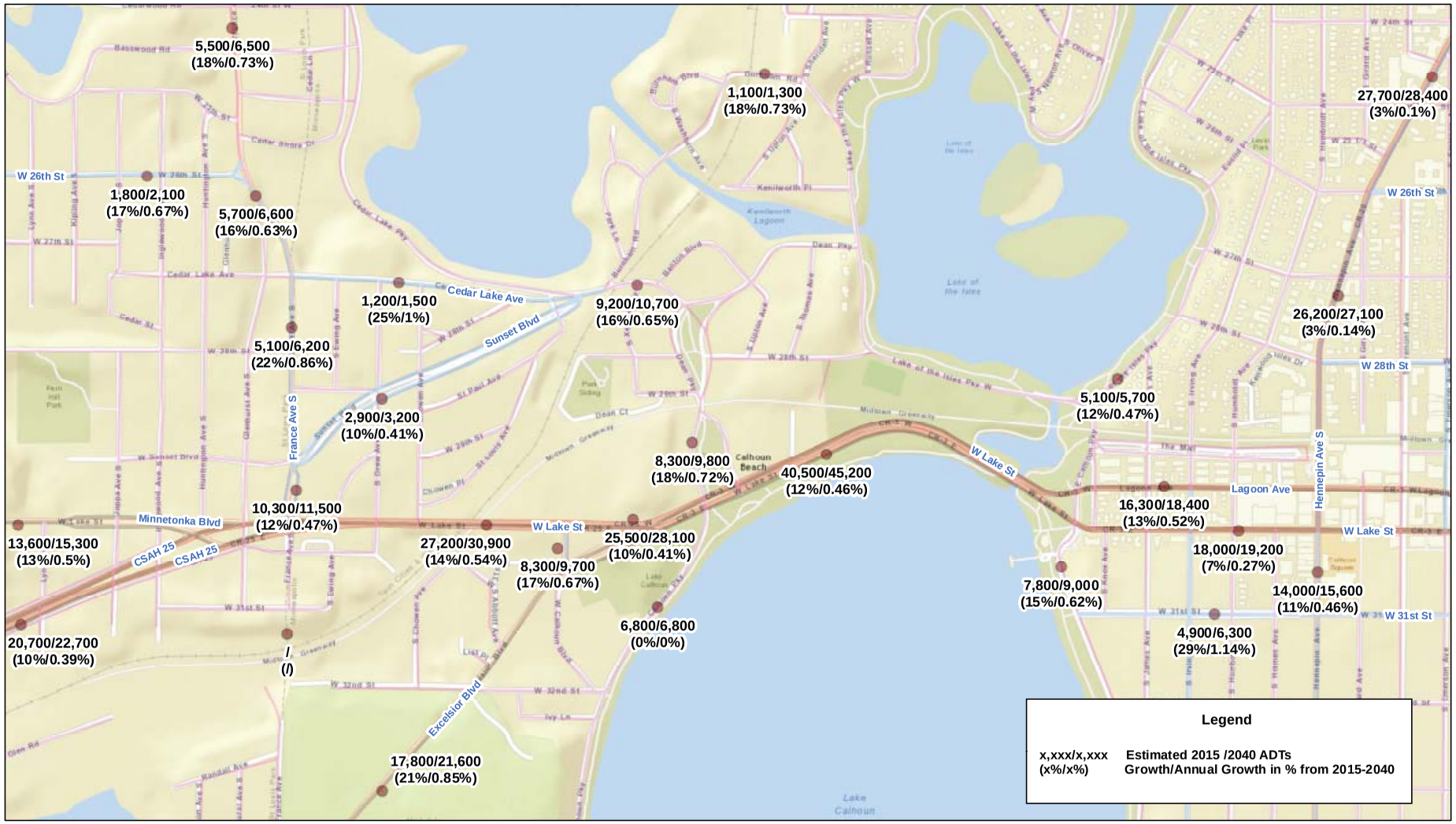
| MCTAZ | SubTAZ | 2010 | | | | 2040 | | | | Increase from existing | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Population | Household | Retail | Non-Retail | Population | Household | Retail | Non-Retail | Population | Household | Retail | Non-Retail |
| 332 | 1672 | 614 | 412 | 0 | 1 | 1,444 | 712 | 24 | 22 | 830 | 300 | 24 | 21 |
| | 1673 | 0 | 0 | 382 | 36 | 702 | 350 | 332 | 89 | 702 | 350 | -50 | 53 |
| | 1674 | 0 | 0 | 0 | 557 | 0 | 0 | 24 | 874 | 0 | 0 | 24 | 317 |
| | 1675 | 23 | 12 | 0 | 0 | 44 | 17 | 0 | 0 | 21 | 5 | 0 | 0 |
| | 1676 | 100 | 42 | 0 | 146 | 152 | 47 | 0 | 178 | 52 | 5 | 0 | 32 |
| | 1677 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1693 | 642 | 465 | 0 | 25 | 1,297 | 690 | 24 | 30 | 655 | 225 | 24 | 5 |
| | 1694 | 381 | 263 | 196 | 0 | 618 | 313 | 0 | 0 | 237 | 50 | -196 | 0 |
| | **subtotal** | **1,760** | **1,194** | **578** | **765** | **4,257** | **2,129** | **404** | **1,193** | **2,497** | **935** | **-174** | **428** |
| 333 | 1678 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1679 | 1,149 | 623 | 253 | 365 | 1,365 | 823 | 357 | 471 | 216 | 200 | 104 | 106 |
| | 1680 | 1,308 | 638 | 30 | 49 | 1,313 | 713 | 43 | 88 | 5 | 75 | 13 | 39 |
| | **subtotal** | **2,457** | **1,261** | **283** | **414** | **2,678** | **1,536** | **400** | **559** | **221** | **275** | **117** | **145** |
| 376 | 1688 | 1,318 | 884 | 517 | 230 | 1,967 | 1,234 | 630 | 256 | 649 | 350 | 113 | 26 |
| | 1689 | 648 | 349 | 268 | 135 | 1,189 | 599 | 325 | 143 | 541 | 250 | 57 | 8 |
| | 1690 | 1,713 | 842 | 315 | 231 | 2,484 | 1,142 | 384 | 247 | 771 | 300 | 69 | 16 |
| | 1691 | 2,985 | 1,752 | 20 | 401 | 3,280 | 1,802 | 50 | 480 | 295 | 50 | 30 | 79 |
| | **subtotal** | **6,664** | **3,827** | **1,120** | **997** | **8,920** | **4,777** | **1,389** | **1,126** | **2,256** | **950** | **269** | **129** |
| 377 | 1681 | 547 | 401 | 157 | 328 | 1,275 | 801 | 187 | 419 | 728 | 400 | 30 | 91 |
| | 1682 | 450 | 333 | 208 | 263 | 667 | 423 | 159 | 336 | 217 | 90 | -49 | 73 |
| | 1683 | 428 | 287 | 0 | 33 | 517 | 297 | 0 | 24 | 89 | 10 | 0 | -9 |
| | 1684 | 177 | 73 | 0 | 3 | 220 | 78 | 0 | 0 | 43 | 5 | 0 | -3 |
| | 1685 | 879 | 352 | 18 | 46 | 1,068 | 367 | 18 | 0 | 189 | 15 | 0 | -46 |
| | 1686 | 641 | 250 | 0 | 41 | 793 | 265 | 0 | 52 | 152 | 15 | 0 | 11 |
| | 1687 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **subtotal** | **3,122** | **1,696** | **383** | **714** | **4,540** | **2,231** | **364** | **831** | **1,418** | **535** | **-19** | **117** |
| 378 | 1663 | 0 | 0 | 0 | 28 | 0 | 0 | 0 | 1,081 | 0 | 0 | 0 | 1,053 |
| | 1664 | 513 | 219 | 0 | 307 | 1,247 | 594 | 61 | 157 | 734 | 375 | 61 | -150 |
| | 1665 | 276 | 131 | 0 | 18 | 280 | 133 | 0 | 0 | 4 | 2 | 0 | -18 |
| | 1666 | 254 | 69 | 0 | 309 | 261 | 71 | 0 | 234 | 7 | 2 | 0 | -75 |
| | 1667 | 13 | 6 | 0 | 0 | 13 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1668 | 113 | 46 | 0 | 0 | 120 | 49 | 0 | 0 | 7 | 3 | 0 | 0 |
| | 1669 | 333 | 129 | 42 | 17 | 310 | 134 | 42 | 0 | -23 | 5 | 0 | -17 |
| | 1670 | 290 | 144 | 0 | 25 | 332 | 184 | 0 | 0 | 42 | 40 | 0 | -25 |
| | 1671 | 78 | 26 | 0 | 2 | 78 | 26 | 0 | 0 | 0 | 0 | 0 | -2 |
| | 1692 | 197 | 88 | 0 | 22 | 276 | 138 | 36 | 5 | 79 | 50 | 36 | -17 |
| | **subtotal** | **2,067** | **858** | **42** | **728** | **2,917** | **1,335** | **139** | **1,477** | **850** | **477** | **97** | **749** |
| **Total** | | **16,070** | **8,836** | **2,406** | **3,618** | **23,312** | **12,008** | **2,696** | **5,186** | **7,242** | **3,172** | **290** | **1,568** |

## 2040 TRAFFIC FORECAST RESULTS

Based on the refined forecast model developed for the study area, the 2040 daily traffic forecasts show that:

1. Traffic volumes on Lake Street are expected to grow at an annual rate varying from 0.46% east of Thomas Avenue, 0.41% between Market Place and Dean Parkway, and 0.54% west of Market Place in the study area.
2. The traffic growth on Excelsior Boulevard south of West 32nd Street is expected to grow at a slightly higher annual rate at 0.85%.
3. The AM (and PM) peak hour annual growth rates are respectively 0.34% (0.22%), 0.32% (0.21%), 0.44% (0.3%) and 0.72% (0.58%) at the above four locations, slightly lower than the daily growth rates due to peak spreading.
4. All major roadway segments in the study area are expected to experience annual growth rates that are less than 1%.

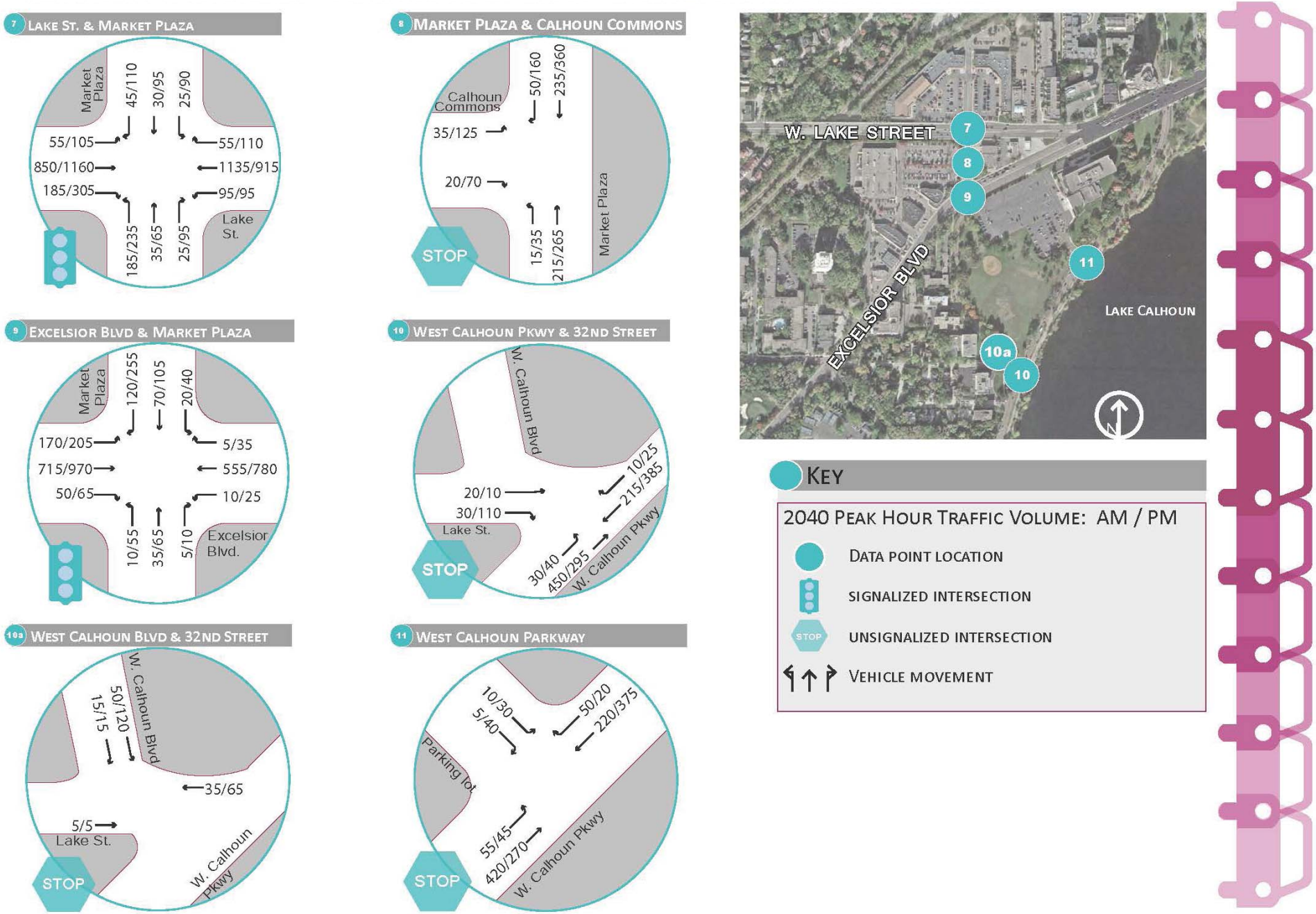
# FIGURE 4-2
## EXISTING AND 2040 FORECAST DAILY TRAFFIC VOLUMES



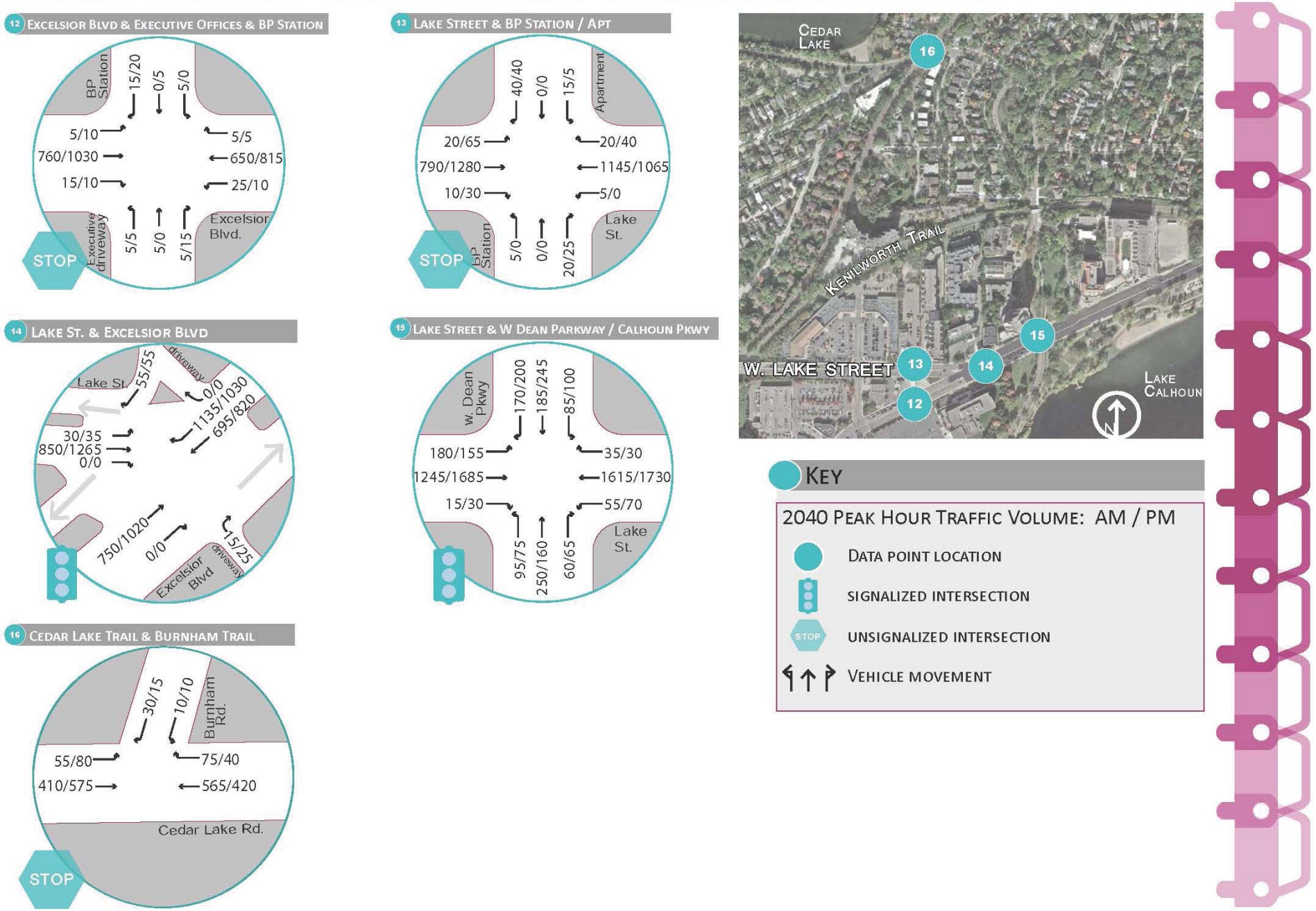
# FIGURE 4-3
## INTERSECTION NUMBERING KEY - TURNING MOVEMENT COUNTS 2040 FORECAST

# FIGURE 4-4
## INTERSECTION TURNING MOVEMENT COUNTS 2040 FORECAST

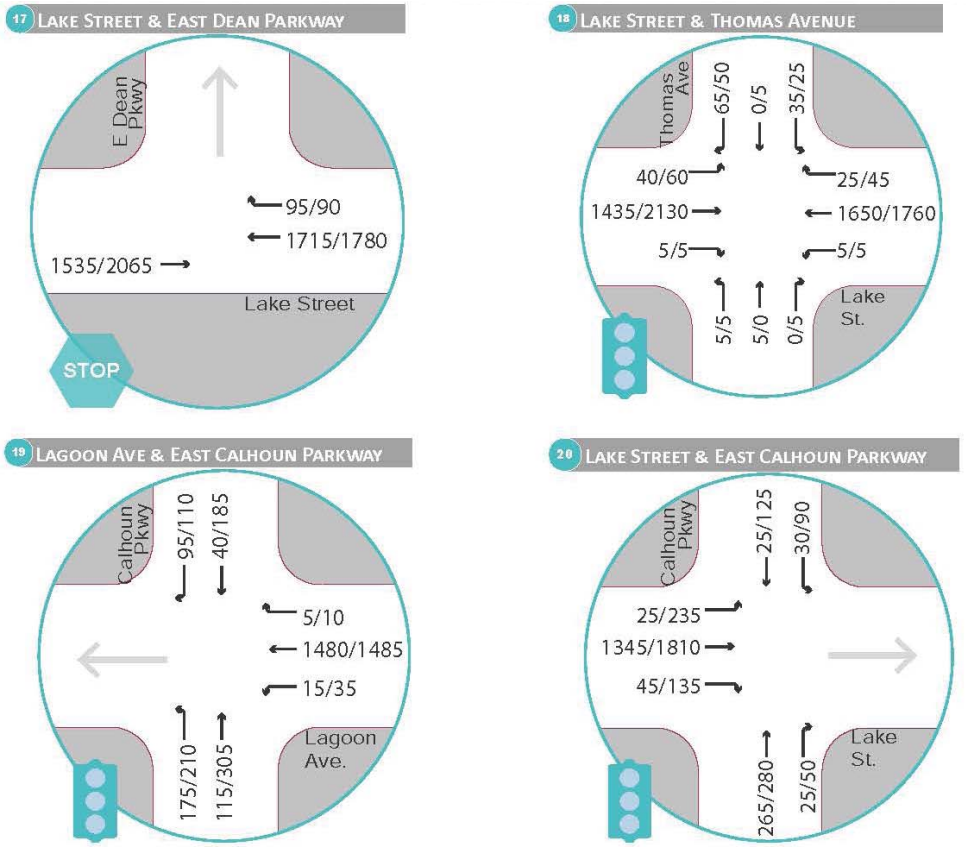
# FIGURE 4-5
## INTERSECTION TURNING MOVEMENT COUNTS 2040 FORECAST



# FIGURE 4-6
## INTERSECTION TURNING MOVEMENT COUNTS 2040 FORECAST



# FIGURE 4-7
## INTERSECTION TURNING MOVEMENT COUNTS 2040 FORECAST





**KEY**

2040 PEAK HOUR TRAFFIC VOLUME: AM / PM

- DATA POINT LOCATION
- SIGNALIZED INTERSECTION
- UNSIGNALIZED INTERSECTION
- VEHICLE MOVEMENT

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# 5. MULTIMODAL CRASH HISTORY

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# REPORTED CRASH DATA

A five-year crash history for all travel modes was obtained using MnDOT's Crash Mapping Analysis tool (MnCMAT). The data obtained from this database includes all reported crashes along Lake Street and Excelsior Boulevard within the study area between 2010 and 2014. It is important to recognize that some crashes do not get logged into the MnCMAT system or even reported at all. Pedestrian and bicycle crashes have a particularly high rate of being unreported and therefore not logged into the database. It is difficult to estimate the number of crashes that go unreported thus, the data that follows is referred to as reported crash data.

The MnCMAT crash data from 2010 through 2014 were summarized and compared to data for similar MnDOT and Hennepin County facilities. There were a total of 397 reported crashes in the study area. Of the reported crashes, 334 were intersection related crashes and the remaining 63 were segment crashes, meaning they occurred at least 200 feet away from an intersection.

The reported crashes along Lake Street and Excelsior Boulevard are summarized in this section as follows:

- Lake Street Intersections
- Lake Street Segments
- Excelsior Boulevard Intersections
- Excelsior Boulevard Segments
- Bicycle and Pedestrian Crashes

## Description of Rates

Crash and severity rates were calculated for all intersections and segment sections along Lake Street and Excelsior Boulevard in the study area. The rates were compared to Hennepin County and MnDOT Statewide average rates for similar intersections and street segments.

- **Crash Rate** – Crash rate analysis is a useful tool to determine how a specific intersection compares to the average intersection or segment on the street network. The calculation is based on the number of vehicles entering an intersection and the units are expressed as the number of crashes per million entering vehicles for intersections and per million vehicle miles traveled for segments.
- **Severity Rate** – Severity rates are unit-less and measure the reported severity of crashes at a location based on the entering vehicles or vehicle miles traveled, with crashes of greater severity weighted more heavily in the calculation.
- **Critical Crash Rate** – While the crash rate calculation allows for comparison of locations with similar designs but different volumes, the critical crash rate calculation adjusts the average rate based on exposure and is a statistically adjusted crash rate to account for the random nature of crashes. If an intersection or segment crash rate is at or above the critical rate, there is a sustained crash issue.

## LAKE STREET INTERSECTIONS

The calculated crash rates at the intersections along Lake Street do not exceed Hennepin County average crash rates for similar intersections with the exception of one location, Dean Parkway/West Calhoun Parkway. The calculated crash rate at the intersection is 0.98 while the Hennepin County average crash rate is 0.74 for similar intersections (Table 5-1). The crash and severity rates at the intersection of Lake Street and Dean Parkway/West Calhoun Parkway exceed the average MnDOT crash and severity rates as well as the MnDOT critical rates. This intersection also had the highest number of crashes (71) with the next highest number of crashes (37) occurring at two locations, Lake Street & Excelsior Boulevard and Lake Street & East Calhoun Parkway. Each of these intersections had crash and severity rates below average rates and critical rates. No Lake Street intersection crash rates exceeded the Hennepin County critical crash rate.

### Lake Street and Dean Parkway/West Calhoun Parkway

The Lake Street and Dean Parkway/West Calhoun Parkway intersection crashes were reviewed in greater detail to identify patterns. Twenty six of the crashes were rear ends (Table 5-2). Rear end crashes are common at traffic signals where congestion is experienced and field reviews as well as existing operations analysis show that this intersection experiences congestion during peak periods. Common factors noted in the data for these crashes were "following too closely" and "weather".

At the Lake Street and Dean Parkway/West Calhoun Parkway intersection there were also crashes related to turns and other maneuvers including 7 left-turn, 15 right-angle and 6 head-on crashes. The crash data show the following:

- **Right-angle Crashes** – three southbound right-turning motorists failed to yield and two westbound motorists disregarded the signal and speed limit.
- **Head-on Crashes** – these crashes occurred on Lake Street between westbound and eastbound motorists due to weather or the eastbound left-turning motorist failing to yield.
- **Left-turn Crashes** – three southbound left-turning motorists proceeded when they did not have the right-of-way, hitting eastbound motorists. Two northbound left-turning motorists proceeded when they did not have the right-of-way hitting westbound motorists.
- **Sideswipe Crashes** – six eastbound motorists sideswiped the vehicle in the adjacent lane. Three northbound motorists sideswiped the vehicle in the adjacent lane.
- **Pedestrian and Bicycle Crashes** – three crashes involved a pedestrian or bicycle, one of which included an incapacitating injury. These crashes are illustrated later in this section.

The study team will review opportunities to mitigate crashes at the Lake Street intersection with Dean Parkway/ West Calhoun Parkway through pavement marking, signing, traffic signal timing and geometric modifications.

# TABLE 5-1
# LAKE STREET INTERSECTION CRASH SUMMARY

**2010 to 2014 Crash Data**
**MnDOT Crash Mapping Software Information**

| Lake Street | Crash Severity | | | | | | Comparison to Hennepin County Crash Rates | | | Comparison to MnDOT Crash Rates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Lake Street Calculated Rates | | Hennepin County | Lake Street Calculated Rates | | MnDOT | |
| Intersection | Fatal | A | B | C | Property Damage | Total | Crash Rate | Severity Rate | Critical Crash Rate | Crash Rate | Severity Rate | Critical Crash Rate | Critical Severity Rate |
| France Avenue at Lake Street** | 0 | 0 | 1 | 2 | 12 | 15 | 0.31 | 0.40 | 1.07 | 0.31 | 0.40 | 1.01 | 1.26 |
| Lake Street at Drew Avenue** | 0 | 0 | 3 | 6 | 17 | 26 | 0.53 | 0.78 | 1.07 | 0.53 | 0.78 | 1.01 | 1.26 |
| Lake Street at Chowen Avenue | 0 | 0 | 0 | 3 | 2 | 5 | 0.10 | 0.16 | 1.07 | 0.10 | 0.16 | 0.35 | 0.42 |
| Lake Street at Market Plaza** | 1 | 0 | 2 | 1 | 15 | 19 | 0.38 | 0.56 | 1.06 | 0.38 | 0.56 | 1.00 | 1.26 |
| Lake Street at Excelsior Boulevard** | 0 | 0 | 1 | 7 | 29 | 37 | 0.60 | 0.74 | 1.03 | 0.60 | 0.74 | 0.97 | 1.26 |
| Lake Street at Dean Pkwy** | 0 | 1 | 1 | 19 | 50 | 71 | 0.98 | 1.31 | 1.01 | 0.98 | 1.31 | 0.95 | 1.26 |
| Lake Street at Thomas Avenue** | 0 | 0 | 0 | 4 | 25 | 29 | 0.40 | 0.45 | 1.01 | 0.40 | 0.45 | 0.95 | 1.26 |
| Lake Street at East Calhoun Parkway** | 0 | 0 | 2 | 6 | 29 | 37 | 0.57 | 0.73 | 1.02 | 0.57 | 0.73 | 0.96 | 1.26 |
| **TOTAL** | **1** | **1** | **10** | **48** | **179** | **239** | | | | | | | |
| | **0%** | **0%** | **4%** | **20%** | **75%** | | | | | | | | |

| | |
|---|---|
| | Rate is Higher than the Critical Rate |
| | Rate is Higher than the Average Crash/Severity Rate |

**Signalized Intersections

| Minneapolis, MN Average Rates | |
|---|---|
| Hennepin County Public Works 2008 - 2010 Data | |
| Intersection Type | Crash Rate |
| 1 SG-B One Road Channelized | 0.74 |

| MnDOT Statewide Average Rates | | |
|---|---|---|
| MnDOT 2013 Data | | |
| Intersection Type | Crash Rate | Sev. Rate |
| Signal-High Vol. & Low Speed | 0.69 | 0.96 |
| Urban Thru/Stop | 0.18 | 0.26 |

# TABLE 5-2
## LAKE STREET INTERSECTION CRASH TYPE SUMMARY

**2010 to 2014 Crash Data**
**MnDOT Crash Mapping Software Information**

| Lake Street | Diagram - Crash Type | | | | | | | | Rates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| From | Rear End | Left Turn | Right Angle | Side Swipe | Head On | Ran Off Road | Other | Total | Crash Rate | Severity Rate | Pedestrian Crashes | Bicycle Crashes |
| France Avenue at Lake Street** | 12 | 0 | 1 | 1 | 0 | 0 | 1 | 15 | 0.31 | 0.40 | 0 | 0 |
| Lake Street at Drew Avenue** | 13 | 1 | 7 | 2 | 0 | 1 | 2 | 26 | 0.53 | 0.78 | 1 | 0 |
| Lake Street at Chowen Avenue | 1 | 0 | 0 | 2 | 0 | 1 | 1 | 5 | 0.10 | 0.16 | 0 | 1 |
| Lake Street at Market Plaza** | 10 | 0 | 3 | 2 | 0 | 1 | 3 | 19 | 0.38 | 0.56 | 1 | 0 |
| Lake Street at Excelsior Boulevard** | 17 | 3 | 4 | 8 | 3 | 0 | 2 | 37 | 0.60 | 0.74 | 0 | 1 |
| Lake Street at Dean Pkwy** | 26 | 7 | 15 | 10 | 6 | 1 | 6 | 71 | 0.98 | 1.31 | 1 | 2 |
| Lake Street at Thomas Avenue** | 14 | 2 | 3 | 4 | 1 | 2 | 3 | 29 | 0.40 | 0.45 | 0 | 0 |
| Lake Street at East Calhoun Parkway** | 16 | 2 | 4 | 6 | 2 | 2 | 5 | 37 | 0.57 | 0.73 | 1 | 1 |
| **TOTAL** | **109** | **15** | **37** | **35** | **12** | **8** | **23** | **239** | | | **4** | **5** |
| | **46%** | **6%** | **15%** | **15%** | **5%** | **3%** | **10%** | | | | | |

**Signalized Intersections

## LAKE STREET SEGMENTS

Along the segments between the intersections on Lake Street, 95 crashes were reported. Table 5-3 shows that the crash and severity rates for three Lake Street segments are at or above the MnDOT average rates though none are above the average Hennepin County rates nor the critical rates. Due to the closely spaced intersections on the corridor, more crashes are attributed to intersections than segments. The segments with crash rates higher than the average rate had severities ranging from non-incapacitating injury to property damage (Table 5-3).

- The short segment between France Avenue and Drew Avenue experienced 2 crashes and has a crash rate of 0.62 crashes per million vehicle miles traveled and a severity rate of 1.24, while the MnDOT average crash and severity rates are 0.59 and 0.78, respectively.
- The segment between Market Plaza and Excelsior Boulevard experienced 4 crashes and has a crash rate of 0.67 crashes per million vehicle miles traveled and a severity rate of 1.01. The crashes included a rear end crash in each direction, a right turn crash and an undocumented crash type.
- The six lane segment between Thomas Avenue and East Calhoun Parkway experienced 20 crashes and has a crash rate of 0.83 crashes per million vehicle miles traveled and a severity rate of 1.24. The crashes included 6 rear end crashes and 4 sideswipe crashes.

# TABLE 5-3
# LAKE STREET SEGMENT CRASH SUMMARY

**2010 to 2014 Crash Data**
**MnDOT Crash Mapping Software Information**

| Lake Street | | | | Crash Severity | | | | | | | Comparison to Hennepin County Crash Rates | | | | Comparison to MnDOT Crash Rates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Lake Street Calculated Rates | | Hennepin County | | Lake Street Calculated Rates | | MnDOT | |
| Type CODE | From | To | Road Section Type | Length (Miles) | Segment ADT | Fatal | A | B | C | Property Damage | Total | Crash Rate | Severity Rate | Critical Crash Rate | Critical Severity Rate | Crash Rate | Severity Rate | Critical Crash Rate | Critical Severity Rate |
| 1 | France Avenue | Drew Avenue | U-4-DIVID Urban 4 lane Divided | 0.07 | 26,500 | 0 | 0 | 1 | 0 | 1 | 2 | 0.62 | 1.24 | 3.41 | 8.36 | 0.62 | 1.24 | 1.85 | 2.20 |
| 1 | Chowen Avenue | Market Plaza | U-4-DIVID Urban 4 lane Divided | 0.21 | 26,500 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 | 0.00 | 2.53 | 6.84 | 0.00 | 0.00 | 1.25 | 1.54 |
| 1 | Market Plaza | Excelsior Boulevard | U-4-DIVID Urban 4 lane Divided | 0.12 | 26,500 | 0 | 0 | 0 | 2 | 2 | 4 | 0.67 | 1.01 | 2.88 | 7.45 | 0.67 | 1.01 | 1.49 | 1.80 |
| 1 | Excelsior Boulevard | Dean Parkway | U-4-DIVID Urban 4 lane Divided | 0.14 | 39,500 | 0 | 0 | 0 | 0 | 1 | 1 | 0.10 | 0.10 | 2.54 | 6.86 | 0.10 | 0.10 | 1.26 | 1.55 |
| 2 | Dean Parkway | Thomas Avenue | U-6-DIVID Urban 6 Lane Divided | 0.45 | 39,500 | 0 | 0 | 0 | 4 | 9 | 13 | 0.40 | 0.52 | 2.03 | 6.03 | 0.40 | 0.52 | 0.95 | 1.19 |
| 2 | Thomas Avenue | East Calhoun | U-6-DIVID Urban 6 Lane Divided | 0.45 | 39,500 | 0 | 0 | 2 | 3 | 15 | 20 | 0.62 | 0.83 | 2.03 | 6.03 | 0.62 | 0.83 | 0.95 | 1.19 |
| | **TOTAL** | | | | | **0** | **0** | **3** | **9** | **28** | **40** | | | | | | | | |
| | *Does not include crashes at major intersections; see Intersection Crash Table. | | | | | **0%** | **0%** | **8%** | **23%** | **70%** | | | | | | | | | |

| |
|---|
| Rate is Higher than the Critical Rate |
| Rate is Higher than the Average Crash/Severity Rate |

| Lake Street | | | Diagram - Crash Type | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| From | Total | Road Section Type | Rear End | Left Turn | Right Angle | Side Swipe | Head On | Ran Off Road | Other | Total | Pedestrian Crashes | Bicycle Crashes |
| France Avenue | Drew Avenue | Urban 4-Lane Undivided | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 2 | 1 | 0 |
| Chowen Avenue | Market Plaza | Urban 4-Lane Barrier Divided | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Market Plaza | Excelsior Boulevard | Urban 4-Lane Barrier Divided | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 0 | 0 |
| Excelsior Boulevard | Dean Parkway | Urban 4-Lane Barrier Divided | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| Dean Parkway | Thomas Avenue | Urban 4-Lane Undivided | 7 | 0 | 0 | 4 | 0 | 0 | 2 | 13 | 0 | 0 |
| Thomas Avenue | East Calhoun | Urban 4-Lane Undivided | 6 | 0 | 0 | 4 | 0 | 2 | 8 | 20 | 0 | 0 |
| **TOTAL** | | | **15** | **0** | **1** | **9** | **1** | **2** | **12** | **40** | **1** | **0** |
| *Does not include crashes at major intersections; see Intersection Crash Table. | | | **38%** | **0%** | **3%** | **23%** | **3%** | **5%** | **30%** | | | |

| Minneapolis, MN Average Rates | | |
|---|---|---|
| Hennepin County Average Rates (2008-2010 Data) | | |
| Type CODE | Section Type | Crash Rate |
| 1 | U-4-DIVID Urban 4 lane Divided | 1.50 |
| 2 | U-6-DIVID Urban 6 Lane Divided | 1.47 |

| MnDOT Statewide Average Rates (2013 Data) | | |
|---|---|---|
| Section Type | Crash Rate | Severity Rate |
| 4-Lane Urban Divided | 0.59 | 0.78 |

## EXCELSIOR BOULEVARD INTERSECTIONS

The calculated crash rates at the intersections along Excelsior Boulevard exceed Hennepin County average crash rates for similar intersections at two locations, West 32nd Street and Market Plaza. These two intersections also exceed the MnDOT average crash and severity rates. At Market Plaza the calculated crash rate is 1.27 while the Hennepin County critical crash rate is 1.14 for similar intersections, and the MnDOT critical crash rate is 1.08 for similar intersections (Table 5-4). Thus the intersection of Market Plaza at Excelsior Boulevard shows a sustained crash issue with crash rates exceeding both Hennepin County and MnDOT critical crash rates.

This intersection also had the highest number of crashes along Excelsior Boulevard (42) with the next highest number of crashes (26) occurring at West 32nd Street and Excelsior Boulevard. Table 5-4 also shows that one of the intersection crashes resulted in a fatality on April 24th, 2012. The reported data indicate that a right-angle crash occurred when a westbound left-turning motorist had a collision with a southwest bound motorcycle traveling at an illegal/unsafe speed.

The 5-leg intersection of West 32nd & Excelsior Boulevard experienced three additional right-angle crashes and 12 rear end crashes (Table 5-5).

It should be noted that the Excelsior Boulevard intersection with Lake Street is included in the Lake Street summary tables 5-1 and 5-2.

### Excelsior Boulevard and Market Plaza

The intersection of Excelsior Boulevard and Market Plaza crashes were reviewed in greater detail to identify patterns. Twenty two of the crashes were rear ends with 9 each in the eastbound and westbound directions, two in the southbound direction and two others unidentified (Table 5-5). The majority of the crash data for the rear end crashes noted "no clear contributing factor" with the next most common factor noted as "driver distraction" (5 crashes).

At the Excelsior Boulevard and Market Plaza intersection there were also crashes related to turns and other maneuvers including 6 right angle and 6 sideswipe crashes. The crash data show the following:

- **Right-angle Crashes** – five of the six crashes occurred between left turning motorists and straight traveling motorists on the mainline and side street. The contributing factor documented for each was failure to yield the right of way.
- **Sideswipe Crashes** – five of the six crashes occurred between motorists traveling the same direction (two eastbound, two westbound and one undocumented). One eastbound motorist sideswiped a westbound motorist with no clear contributing factor listed.
- **Pedestrian and Bicycle Crashes** – one crash involved a pedestrian and another a bicycle. These crashes are illustrated later in this section.

The study team will review opportunities to mitigate crashes at the Excelsior Boulevard intersection with Market Plaza through pavement marking, signing, traffic signal timing and geometric modifications.

# TABLE 5-4
# EXCELSIOR BOULEVARD INTERSECTION CRASH SUMMARY

**2010 to 2014 Crash Data**
**MnDOT Crash Mapping Software Information**

| Excelsior Blvd | | Crash Severity | | | | | | Comparison to Hennepin County Crash Rates | | | Comparison to MnDOT Crash Rates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Excelsior Blvd Calculated Rates | | Hennepin County | Excelsior Blvd Calculated Rates | | MnDOT | |
| Type CODE | From | Fatal | A | B | C | Property Damage | Total | Crash Rate | Severity Rate | Critical Crash Rate | Crash Rate | Severity Rate | Critical Crash Rate | Critical Severity Rate |
| 1 | Excelsior Boulevard at France Avenue** | 0 | 0 | 1 | 2 | 17 | 20 | 0.47 | 0.56 | 1.09 | 0.47 | 0.56 | 1.03 | 1.36 |
| 2 | Excelsior Boulevard at 32nd Street** | 1 | 0 | 0 | 4 | 21 | 26 | 0.81 | 1.06 | 1.17 | 0.81 | 1.06 | 1.08 | 1.36 |
| 3 | Excelsior Boulevard at List Place | 0 | 0 | 0 | 2 | 1 | 3 | 0.10 | 0.16 | 0.52 | 0.10 | 0.16 | 0.40 | 0.47 |
| 3 | Excelsior Boulevard at Abbott Avenue | 0 | 0 | 0 | 1 | 3 | 4 | 0.13 | 0.16 | 0.52 | 0.13 | 0.16 | 0.40 | 0.47 |
| 1 | Excelsior Boulevard at Market Plaza** | 0 | 0 | 0 | 12 | 30 | 42 | 1.27 | 1.63 | 1.14 | 1.27 | 1.63 | 1.08 | 1.36 |
| | **TOTAL** | **1** | **0** | **1** | **21** | **72** | **95** | | | | | | | |
| | | **1%** | **0%** | **1%** | **22%** | **76%** | | | | | | | | |

| | |
|---|---|
| | Rate is Higher than the Critical Rate |
| | Rate is Higher than the Average Crash/Severity Rate |

**Signalized Intersections

| Minneapolis, MN Average Rates | | |
|---|---|---|
| Hennepin County Public Works 2008 - 2010 Data | | |
| Type CODE | Intersection Type | Crash Rate |
| 1 | SG-B One Road Channelized-With Continous Island | 0.74 |
| 2 | SG-MT 5 Way or More | 0.76 |
| 3 | T-INTERX Tee Intersection | 0.27 |

| MnDOT Statewide Average Rates | | |
|---|---|---|
| MnDOT 2013 Data | | |
| Intersection Type | Crash Rate | Sev. Rate |
| Signal-High Vol. & Low Speed | 0.69 | 0.96 |
| Urban Thru/Stop | 0.18 | 0.26 |

# TABLE 5-5
# EXCELSIOR BOULEVARD INTERSECTION CRASH TYPE SUMMARY

**2010 to 2014 Crash Data**
**MnDOT Crash Mapping Software Information**

| Excelsior Blvd | Diagram - Crash Type | | | | | | | | Rates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| From | Rear End | Left Turn | Right Angle | Side Swipe | Head On | Ran Off Road | Other | Total | Crash Rate | Severity Rate | Pedestrian Crashes | Bicycle Crashes |
| Excelsior Boulevard at France Avenue** | 7 | 1 | 2 | 5 | 0 | 1 | 4 | 20 | 0.47 | 0.56 | 1 | 0 |
| Excelsior Boulevard at 32nd Street** | 12 | 1 | 4 | 1 | 2 | 2 | 4 | 26 | 0.81 | 1.06 | 0 | 0 |
| Excelsior Boulevard at List Place | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0.10 | 0.16 | 0 | 0 |
| Excelsior Boulevard at Abbott Avenue | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 4 | 0.13 | 0.16 | 0 | 0 |
| Excelsior Boulevard at Market Plaza** | 22 | 2 | 6 | 6 | 1 | 1 | 4 | 42 | 1.27 | 1.63 | 1 | 1 |
| **TOTAL** | **45** | **6** | **12** | **12** | **3** | **4** | **13** | **95** | | | **2** | **1** |
| | **47%** | **6%** | **13%** | **13%** | **3%** | **4%** | **14%** | | | | | |

**Signalized Intersections

## EXCELSIOR BOULEVARD SEGMENTS

Along the segments between the intersections on Excelsior Boulevard, 23 crashes were reported. Table 5-6 shows that the crash and severity rates for three Excelsior Boulevard segments are at or above the MnDOT average rates, though none are above the average Hennepin County rates. Only the segment between the unsignalized intersection at Abbott Avenue and Market Plaza has a crash rate exceeding the MnDOT critical crash rate (none exceeded the Hennepin County critical crash rate).

The Excelsior Boulevard segments with crash rates higher than the average rates had severities ranging from possible injury to property damage (Table 5-6). The segment crash data include the following:

- An eastbound sideswipe of a parked vehicle occurred on the short segment between List Place and Abbott Avenue.
- The segment between Abbott Avenue and Market Plaza experienced 9 crashes and has a crash rate of 2.01 crashes per million vehicle miles traveled and a severity rate of 2.67. The crashes included two westbound sideswipes, one due to ice, and one rear end crash in the northbound direction and one in the southwest bound direction.
- The segment between Market Plaza and Lake Street experienced 9 crashes and has a crash rate of 2.16 crashes per million vehicle miles traveled and a severity rate of 2.40. The crashes included 5 westbound rear end crashes and 2 sideswipe crashes.

# TABLE 5-6
# EXCELSIOR BOULEVARD SEGMENT CRASH SUMMARY

**2010 to 2014 Crash Data**
**MnDOT Crash Mapping Software Information**

| Excelsior Blvd | | | | Crash Severity | | | | | | | Comparison to Hennepin County Crash Rates | | | Comparison to MnDOT Crash Rates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Lake Street Calculated Rates | | Hennepin County | Lake Street Calculated Rates | | MnDOT | |
| Type CODE | From | To | Road Section Type | Length (Miles) | Segment ADT | Fatal | A | B | C | Property Damage | Total | Crash Rate | Severity Rate | Critical Crash Rate | Crash Rate | Severity Rate | Critical Crash Rate | Critical Severity Rate |
| 1 | France Avenue | 32nd Street | 4-Lane Urban Undivided | 0.41 | 17,000 | 0 | 0 | 0 | 1 | 2 | 3 | 0.23 | 0.31 | 5.39 | 0.23 | 0.31 | 1.58 | 1.95 |
| 1 | 32nd Street | List Place | 4-Lane Urban Undivided | 0.05 | 17,000 | 0 | 0 | 0 | 0 | 1 | 1 | 0.68 | 0.68 | 8.48 | 0.68 | 0.68 | 3.19 | 3.75 |
| 1 | List Place | Abott Avenue | 4-Lane Urban Undivided | 0.03 | 17,000 | 0 | 0 | 0 | 1 | 0 | 1 | 1.13 | 2.27 | 9.94 | 1.13 | 2.27 | 4.00 | 4.64 |
| 1 | Abbott Avenue | Market Plaza | 4-Lane Urban Undivided | 0.14 | 17,000 | 0 | 0 | 0 | 3 | 6 | 9 | 2.01 | 2.67 | 6.45 | 2.01 | 2.67 | 2.12 | 2.55 |
| 1 | Market Place | Lake Street | 4-Lane Urban Undivided | 0.13 | 17,000 | 0 | 0 | 0 | 1 | 8 | 9 | 2.16 | 2.40 | 6.55 | 2.16 | 2.40 | 2.17 | 2.61 |
| | **TOTAL** | | | | | **0** | **0** | **0** | **6** | **17** | **23** | | | | | | | |
| | *Does not include crashes at major intersections; see Intersection Crash Table. | | | | | **0%** | **0%** | **0%** | **26%** | **74%** | | | | | | | | |

Rate is Higher than the Critical Rate
Rate is Higher than the Average Crash/Severity Rate

| Excelsior Blvd | | | Diagram - Crash Type | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| From | Total | Road Section Type | Rear End | Left Turn | Right Angle | Side Swipe | Head On | Ran Off Road | Other | Total | **Pedestrian Crashes** | **Bicycle Crashes** |
| France Avenue | 32nd Street | 4-Lane Urban Undivided | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 3 | 0 | 0 |
| 32nd Street | List Place | 4-Lane Urban Undivided | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| List Place | Abott Avenue | 4-Lane Urban Undivided | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| Abbott Avenue | Market Plaza | 4-Lane Urban Undivided | 2 | 0 | 1 | 4 | 1 | 0 | 1 | 9 | 0 | 1 |
| Market Place | Lake Street | 4-Lane Urban Undivided | 5 | 0 | 1 | 2 | 1 | 0 | 0 | 9 | 0 | 0 |
| **TOTAL** | | | **7** | **0** | **2** | **8** | **2** | **2** | **2** | **23** | **0** | **1** |
| *Does not include crashes at major intersections; see Intersection Crash Table. | | | **30%** | **0%** | **9%** | **35%** | **9%** | **9%** | **9%** | | | |

| Minneapolis, MN Average Rates | | |
|---|---|---|
| Hennepin County Public Works 2008 - 2010 Data | | |
| Type CODE | Segment Type | Crash Rate |
| 1 | 4-Lane Urban Undivided | 3.93 |

| MnDOT Statewide Average Rates (2013 Data) | | |
|---|---|---|
| Section Type | Crash Rate | Severity Rate |
| 4-Lane Urban Undivided | 0.87 | 1.14 |

## PEDESTRIAN & BICYCLE CRASHES

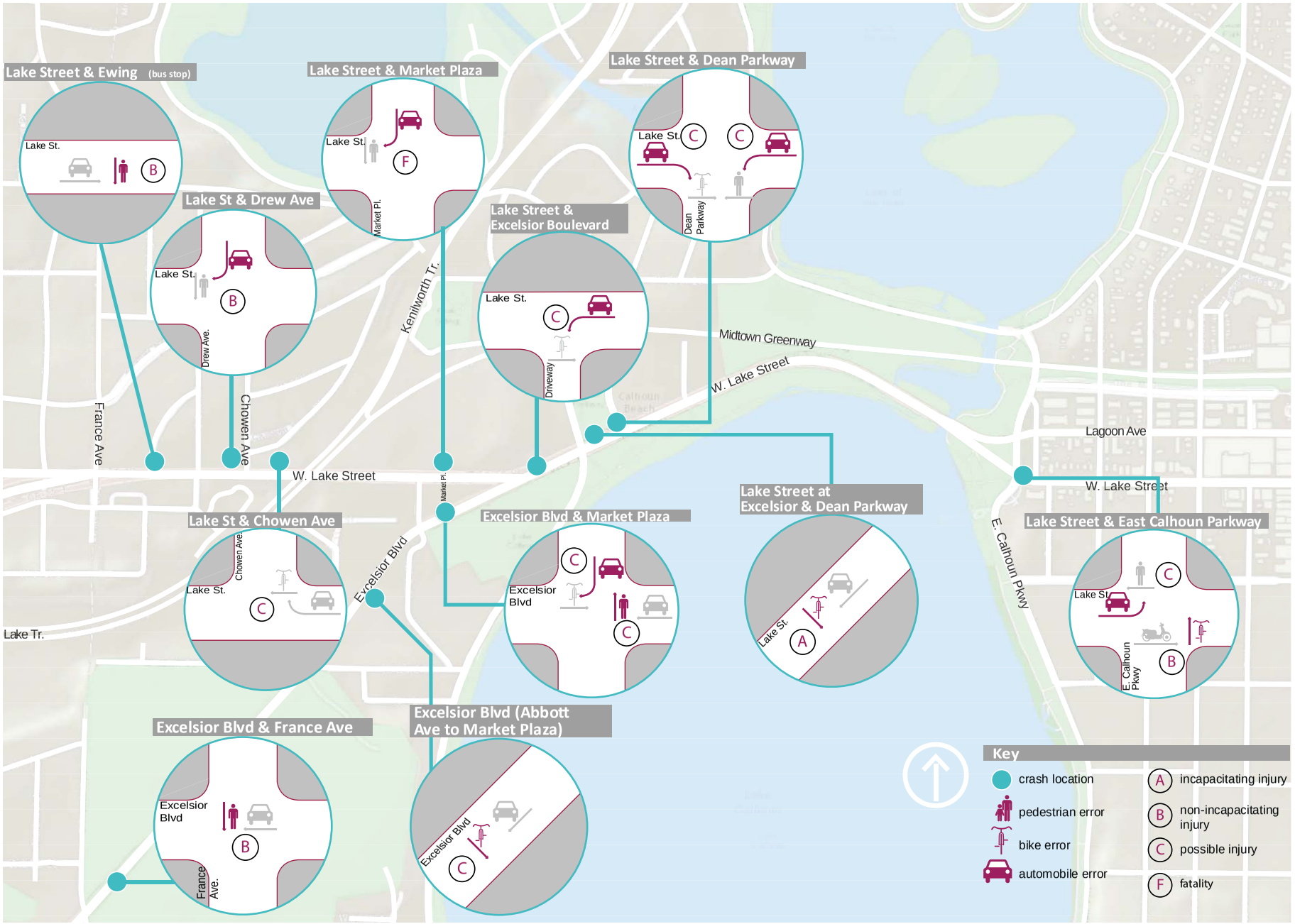
Field reviews, community feedback, and collected data indicate significant pedestrian and bicycle activity throughout the study area, as such a critical part of the analylis included review of each reported pedestrian and bicycle crash. There were 14 reported crashes involving bicyclists or pedestrians in the study area between 2010 and 2014. Seven of these occurred with a pedestrian and seven occurred with a bicyclist. These crashes were analyzed in greater detail to understand the potential causes and contributing factors and to assist in identifying potential improvements to pedestrian and bicyclist safety in the study area. Crashes involving pedestrians and bicyclists are summarized separately in Tables 5-1 through 5-6.

Figure 5-1 graphically summarizes the reported crashes between motorists and pedestrians or bicyclists along Lake Street and Excelsior Boulevard in the study area. The figure shows the direction of motorist travel, bicyclist or pedestrian action/direction and highlights in red, which of those involved made an error based on the crash data. The crash severity is also included in the illustrations.

The figure shows that right-turning (4) and left-turning (3) motorists were in error for not yielding to the pedestrian or bicyclist (7 of the 14 crashes with non-motorized users). In February of 2014, one of these crashes resulted in a pedestrian fatality at the intersection of Market Plaza and Lake Street. The crash occurred when a southbound motorist turned right across the west crosswalk in which a pedestrian was crossing with the "walk" indication. The crash data listed "driver inattention/distraction" as a contributing factor in this crash. The turn-related nature of this fatal crash and the majority of the reported bicycle and pedestrian crashes will guide the identification of potential improvements to emphasize the presence of bicycles and pedestrians.

The data also showed that three pedestrians and three bicyclists made errors. These errors included disregarding the traffic signal (1), failing to yield at signal or mid-block (4) and a pedestrian departing a bus stop mid-block and failing to yield.

# FIGURE 5-1
## BICYCLE & PEDESTRIAN CRASH DATA (2010-2014)



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# 6. PARKING INVENTORY

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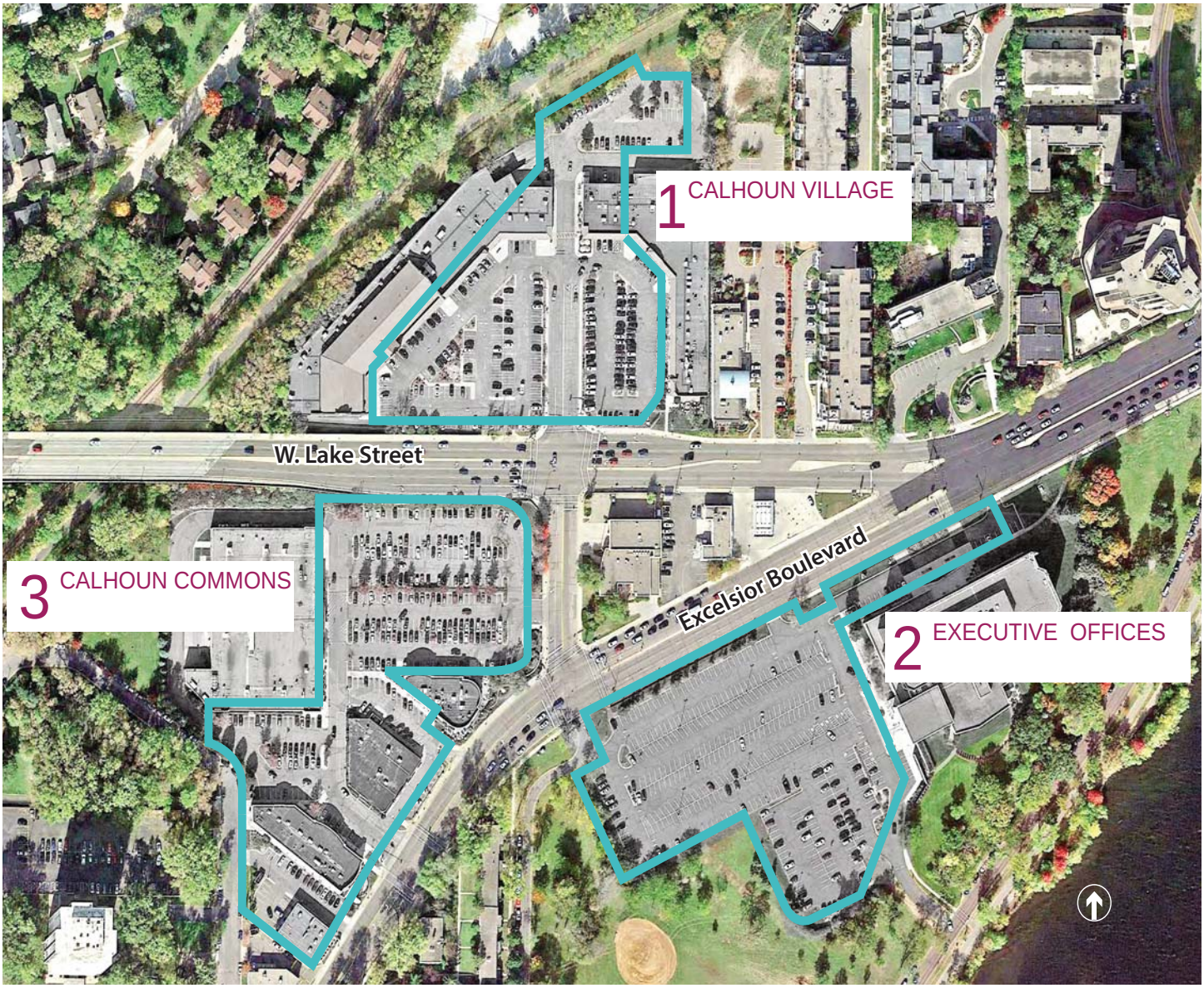
## DATA COLLECTION

A parking inventory was conducted as part of the existing conditions analysis for the West Lake Multimodal Study. The parking inventory documents the lowest, average, and peak occupancy of three parking lots that serve the popular commercial developments located near the future West Lake LRT station. The assessment includes three parking areas:

1. Calhoun Village (North of West Lake Street)
2. Lake Calhoun Executive Center (South of Excelsior Boulevard)
3. Calhoun Commons (South of West Lake Street)

The occupancy of each lot was observed and documented on a weekday evening (from 5-7 PM on 6-11-15) and a weekend day (from 1-3 PM on 6-13-15), which represent typical peak demand times for the overall area during the week.

## PARKING INVENTORY AREAS



## PARKING AREA 1: CALHOUN VILLAGE

The Calhoun Village parking lot serves multiple commercial retailers, restaurants, and service providers; including:

- Massage Envy Spa
- Moksha Yoga
- Orange Theory Fitness
- Homegevity
- Sprint Wireless
- Western Union
- Chuck and Don's Pet Food Supplies
- Falafel King
- Samuel A. Oduro Pharmacy
- The Locker Minneapolis, LLC
- 1st Wok
- European Wax Center
- Punch Pizza
- Rustica Bakery
- Pari & Nora, Women's Apparel
- H & R Block
- Bread Basket
- Goddess Nails
- Subway
- Calhoun Vision
- Dry Cleaners
- Burger Jones

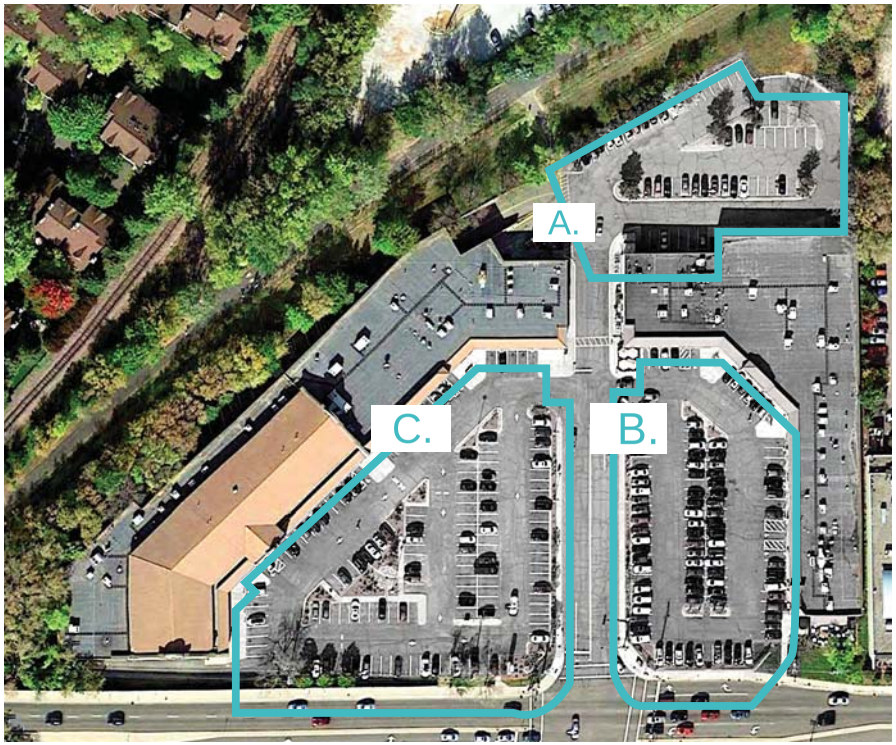
This lot experiences a steady stream of patrons throughout the day for the retail and service providers as well as peak restaurant traffic at breakfast, lunch, and dinner. The results of the observed parking lot occupancy are summarized below:

### TABLE 6-1
### OBSERVED PARKING LOT OCCUPANCY - AREA 1

| | |
|---|---|
| WEEKDAY (5-7 pm) **Lowest** Occupancy: **63%** | WEEKEND (1-3 pm) **Lowest** Occupancy: **77%** |
| WEEKDAY (5-7 pm) **Average** Occupancy: **66%** | WEEKEND (1-3 pm) **Average** Occupancy: **80%** |
| WEEKDAY (5-7 pm) **Peak** Occupancy: **68%** | WEEKEND (1-3 pm) **Peak** Occupancy: **83%** |

*% Occupancy out of 289 available parking spaces*


# FIGURE 6-1
## PARKING OCCUPANCY
### 1.0 CALHOUN VILLAGE
289 total parking spaces




**Area A.** — 54

SATURDAY
1pm: 49/54 91%
2pm: 43/54 80%

THURSDAY
5pm: 30/54 56%
6pm: 37/54 69%

**Area B.** — 98

SATURDAY
1pm: 86/98 77%
2pm: 84/98 69%

THURSDAY
5pm: 57/98 58%
6pm: 94/98 96%

**Area C.** — 137

SATURDAY
1pm: 106/137 88%
2pm: 95/137 86%

THURSDAY
5pm: 96/137 70%
6pm: 66/137 48%

## TOTAL OCCUPANCY

| Thursday | | Saturday | |
|---|---|---|---|
| 5pm | 6pm | 1pm | 2pm |
| 183 | 197 | 241 | 222 |
| 63% | 68% | 83% | 77% |

peak occupancy by parking lot

**data collected June 2015

## PARKING AREA 2: LAKE CALHOUN EXECUTIVE CENTER

The Lake Calhoun Executive Center parking lot serves several professional businesses, including:

- The Ackerberg Group, Property Management
- Coldwell Banker Burnet Realty
- Construction Service and Supply Headquarters
- Willow Midwives in Minnesota
- Private Office Suites
- Fitness Center
- On-Site Cafe

This lot serves professional businesses that generally operate between 8 am and 6 pm. The parking area includes a guest parking lot on the north side of the building, and public parking in the majority of the main lot. This lot also functions as a pedestrian route to private residences to the West, Calhoun Parkway, the beach, and trails to the south. The results of the observed parking lot occupancy are summarized below:

### TABLE 6-2
### OBSERVED PARKING LOT OCCUPANCY - AREA 2

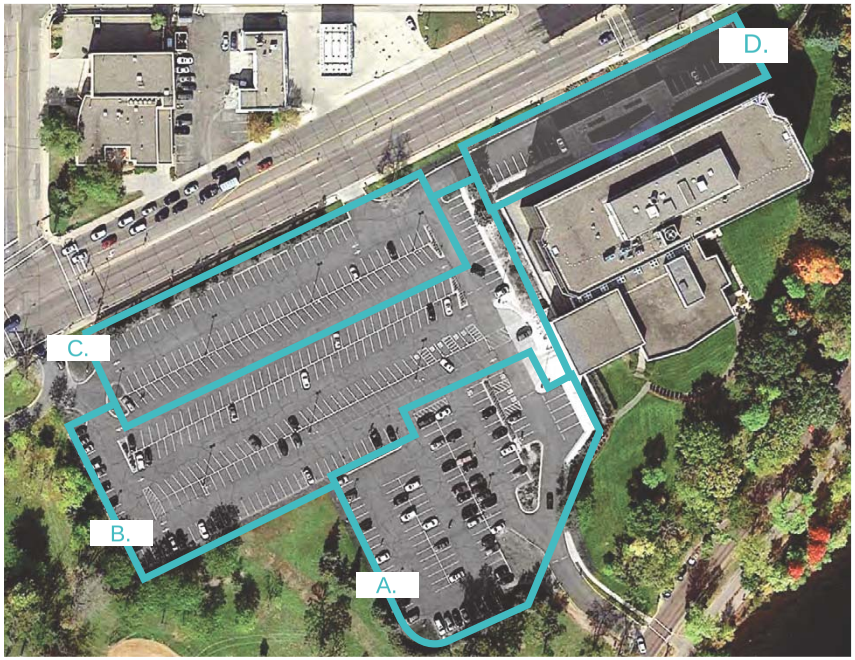
| | |
|---|---|
| WEEKDAY (5-7 pm) **Lowest** Occupancy: 21% | WEEKEND (1-3 pm) **Lowest** Occupancy: 44% |
| WEEKDAY (5-7 pm) **Average** Occupancy: 22% | WEEKEND (1-3 pm) **Average** Occupancy: 47% |
| WEEKDAY (5-7 pm) **Peak** Occupancy: 22% | WEEKEND (1-3 pm) **Peak** Occupancy: 49% |

*% Occupancy out of 468 available parking spaces*

# FIGURE 6-2
## PARKING OCCUPANCY

2.0 EXECUTIVE OFFICES

468 total parking spaces




SATURDAY 1pm: 50/117 42%
2pm: 51/117 43%

THURSDAY 5pm: 69/117 58%
6pm: 73/117 61%

A. 117

SATURDAY 1pm: 29/220 13%
2pm: 33/220 15%

THURSDAY 5pm: 91/220 41%
6pm: 129/220 58%

B. 220

SATURDAY 1pm: 15/111 14%
2pm: 12/111 11%

THURSDAY 5pm: 40/111 36%
6pm: 20/111 18%

C. 111

SATURDAY 1pm: 4/20 20%
2pm: 5/20 25%

THURSDAY 5pm: 8/20 40%
6pm: 5/20 25%

D. 20

## TOTAL OCCUPANCY

| Thursday | | Saturday | |
|---|---|---|---|
| 5pm | 6pm | 1pm | 2pm |
| 98 | 101 | 208 | 227 |
| 21% | 22% | 44% | 49% |

peak occupancy by parking lot

**data collected June 2015

## LOT AREA 3: CALHOUN COMMONS

The Calhoun Commons parking lot serves commercial retailers, restaurants, and service providers; including:

- Noodles & Company
- Caribou Coffee
- Chipotle Mexican Grill
- Sunwerks Tanning Spa
- Ben & Jerry's
- Salon Intrigue
- Wakame Sushi & Asian Bistro
- Whole Foods
- MGM Liquor
- Vitamin Shoppe
- Moss Envy
- Indulge & Bloom
- TC2 Salon

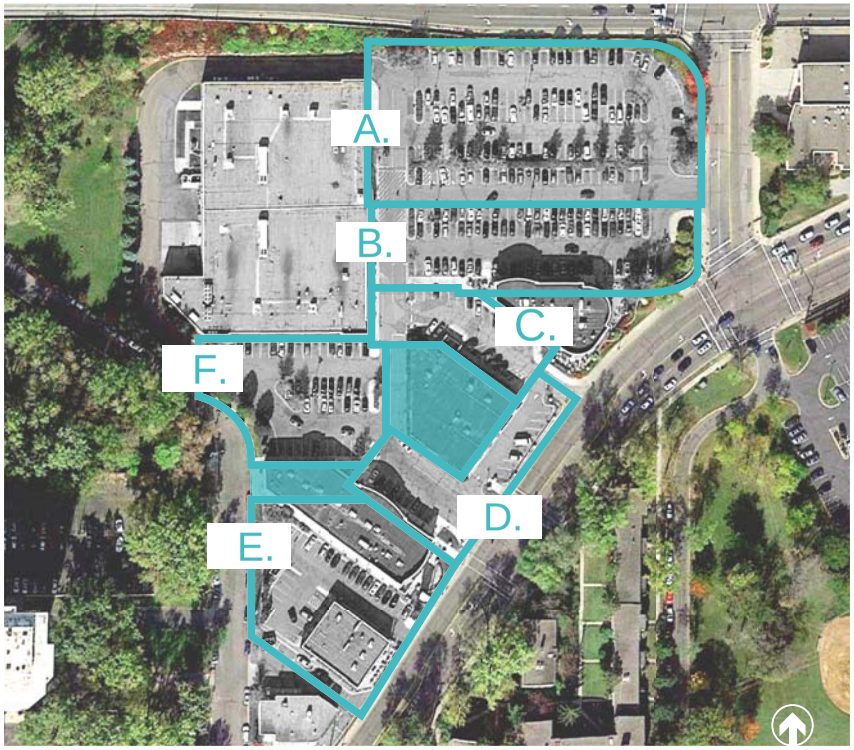
This lot experiences a steady stream of patrons throughout the day for the retail and service providers as well as peak restaurant traffic at breakfast, lunch, and dinner. The results of the observed parking lot occupancy are summarized below:

### TABLE 6-3
### OBSERVED PARKING LOT OCCUPANCY - AREA 3

| | |
|---|---|
| WEEKDAY (5-7 pm) **Lowest** Occupancy: **72%** | WEEKEND (1-3 pm) **Lowest** Occupancy: **80%** |
| WEEKDAY (5-7 pm) **Average** Occupancy: **76%** | WEEKEND (1-3 pm) **Average** Occupancy: **83%** |
| WEEKDAY (5-7 pm) **Peak** Occupancy: **79%** | WEEKEND (1-3 pm) **Peak** Occupancy: **86%** |

*% Occupancy out of 316 available parking spaces*

# FIGURE 6-3
## PARKING OCCUPANCY
### 3.0 CALHOUN COMMONS
316 total parking spaces




**A. 138**

| | | |
|---|---|---|
| SATURDAY | 1pm: 112/138 | 81% |
| | 2pm: 98/138 | 71% |
| THURSDAY | 5pm: 65/138 | 47% |
| | 6pm: 88/138 | 64% |

**B. 77**

| | | |
|---|---|---|
| SATURDAY | 1pm: 67/77 | 87% |
| | 2pm: 69/77 | 84% |
| THURSDAY | 5pm: 65/77 | 96% |
| | 6pm: 88/77 | 92% |

**C. 22**

| | | |
|---|---|---|
| SATURDAY | 1pm: 19/22 | 86% |
| | 2pm: 21/22 | 95% |
| THURSDAY | 5pm: 21/22 | 95% |
| | 6pm: 21/22 | 95% |

**D. 18**

| | | |
|---|---|---|
| SATURDAY | 1pm: 11/18 | 61% |
| | 2pm: 11/18 | 61% |
| THURSDAY | 5pm: 14/18 | 78% |
| | 6pm: 17/18 | 94% |

**E. 30**

| | | |
|---|---|---|
| SATURDAY | 1pm: 20/30 | 67% |
| | 2pm: 14/30 | 47% |
| THURSDAY | 5pm: 9/30 | 30% |
| | 6pm: 7/30 | 23% |

**F. 48**

| | | |
|---|---|---|
| SATURDAY | 1pm: 44/48 | 92% |
| | 2pm: 44/48 | 92% |
| THURSDAY | 5pm: 47/48 | 98% |
| | 6pm: 48/48 | 100% |

## TOTAL OCCUPANCY

| Thursday | | Saturday | |
|---|---|---|---|
| 5pm | 6pm | 1pm | 2pm |
| 230 | 252 | 273 | 253 |
| 72% | 79% | 86% | 80% |

peak occupancy by parking lot

**data collected June 2015

## SUMMARY OF PARKING INVENTORY FINDINGS

The parking data collected show that areas of the two commercial retail parking lots approached occupancy during the periods between 5 PM and 7 PM on the weeknight and 1 PM and 3 PM on the Saturday. As the occupancy of a parking lot approaches 85% the motorist's perception is that the lot is full resulting in longer search times and more circulation to locate a parking space.

The results of the survey show that the east areas of the Calhoun Village parking lot would be perceived to be full during the Saturday observation period with weekend average occupancies of 80% or higher and weekend peak occupancy of 88% or higher. This results in the entire lot having a peak Saturday occupancy of 83%.


The Calhoun Commons parking lot overall would be perceived to be full during the period between 1 PM and 3 PM on Saturday with occupancies of 86% and 80% during the two-hour collection period. Several areas of this lot showed high occupancy during the observation periods. Areas B, C, and F experienced occupancies ranging from 84% to 100%. This information can be useful to site managers in directing traffic through the site to disburse motorists to less congested access routes.

The Executive Center parking lot was counted during the same time periods as the commercial retail lots to understand how this lot is utilized during the "off-peak" period for the Executive Center which coincides with peaks for the commercial retail parking lots. During the weeknight evening the lot was only about 20% occupied while it was near half full during the Saturday count periods (44% and 49%). The low occupancies recorded in this lot while the other two nearby lots experience high occupancy provide an indication of an opportunity to better utilize the parking supply through enhanced connections (in particular pedestrian facilities) and shared parking practices.

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# 6. PARKING INVENTORY

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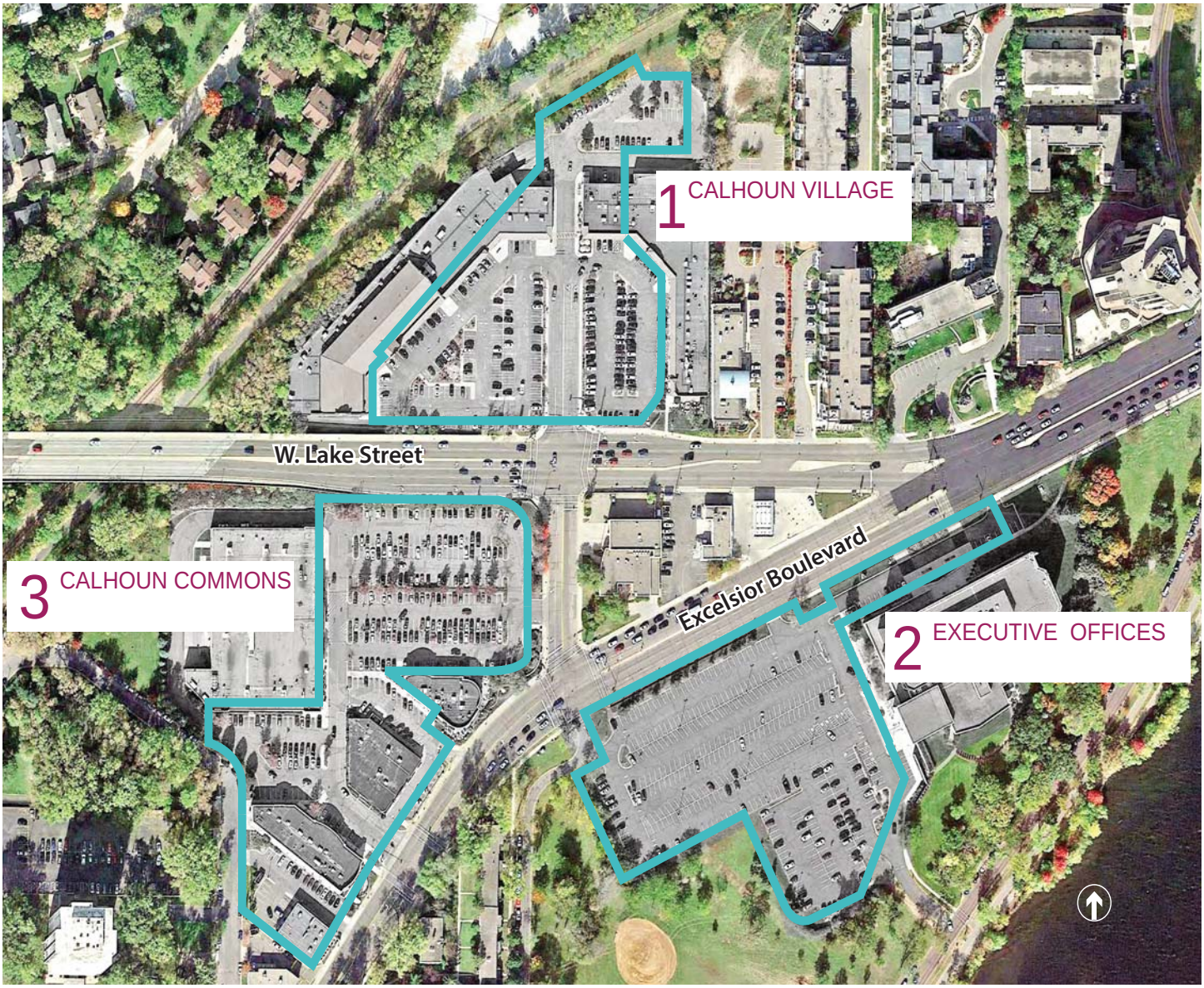
## DATA COLLECTION

A parking inventory was conducted as part of the existing conditions analysis for the West Lake Multimodal Study. The parking inventory documents the lowest, average, and peak occupancy of three parking lots that serve the popular commercial developments located near the future West Lake LRT station. The assessment includes three parking areas:

1. Calhoun Village (North of West Lake Street)
2. Lake Calhoun Executive Center (South of Excelsior Boulevard)
3. Calhoun Commons (South of West Lake Street)

The occupancy of each lot was observed and documented on a weekday evening (from 5-7 PM on 6-11-15) and a weekend day (from 1-3 PM on 6-13-15), which represent typical peak demand times for the overall area during the week.

## PARKING INVENTORY AREAS



## PARKING AREA 1: CALHOUN VILLAGE

The Calhoun Village parking lot serves multiple commercial retailers, restaurants, and service providers; including:

- Massage Envy Spa
- Moksha Yoga
- Orange Theory Fitness
- Homegevity
- Sprint Wireless
- Western Union
- Chuck and Don's Pet Food Supplies
- Falafel King
- Samuel A. Oduro Pharmacy
- The Locker Minneapolis, LLC
- 1st Wok
- European Wax Center
- Punch Pizza
- Rustica Bakery
- Pari & Nora, Women's Apparel
- H & R Block
- Bread Basket
- Goddess Nails
- Subway
- Calhoun Vision
- Dry Cleaners
- Burger Jones

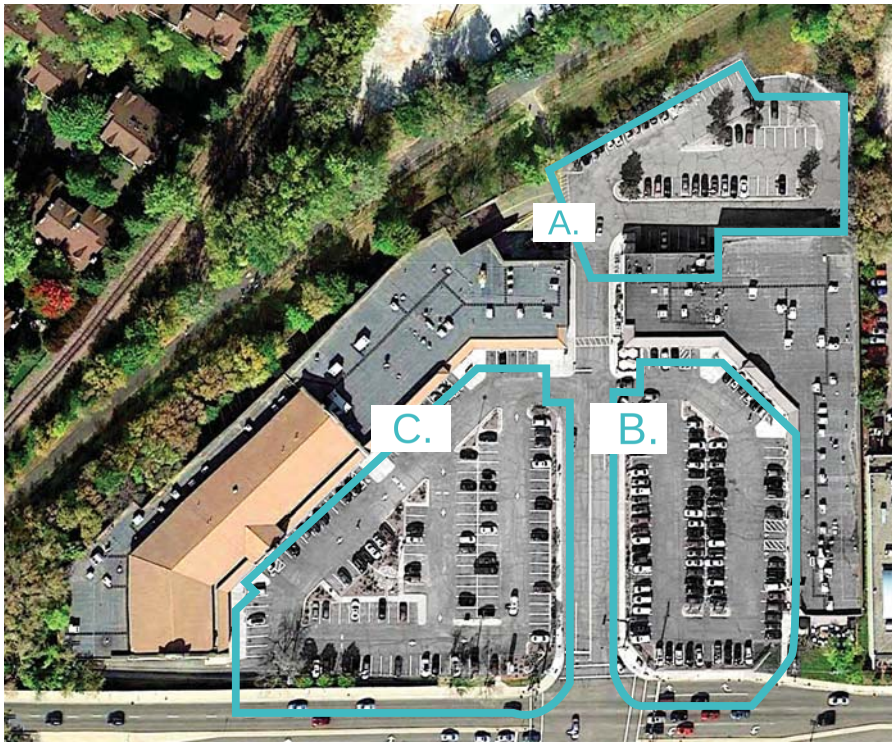
This lot experiences a steady stream of patrons throughout the day for the retail and service providers as well as peak restaurant traffic at breakfast, lunch, and dinner. The results of the observed parking lot occupancy are summarized below:

### TABLE 6-1
### OBSERVED PARKING LOT OCCUPANCY - AREA 1

| | |
|---|---|
| WEEKDAY (5-7 pm) **Lowest** Occupancy: **63%** | WEEKEND (1-3 pm) **Lowest** Occupancy: **77%** |
| WEEKDAY (5-7 pm) **Average** Occupancy: **66%** | WEEKEND (1-3 pm) **Average** Occupancy: **80%** |
| WEEKDAY (5-7 pm) **Peak** Occupancy: **68%** | WEEKEND (1-3 pm) **Peak** Occupancy: **83%** |

*% Occupancy out of 289 available parking spaces*


# FIGURE 6-1
## PARKING OCCUPANCY
### 1.0 CALHOUN VILLAGE
289 total parking spaces




**Area A.** — 54

SATURDAY
1pm: 49/54 91%
2pm: 43/54 80%

THURSDAY
5pm: 30/54 56%
6pm: 37/54 69%

**Area B.** — 98

SATURDAY
1pm: 86/98 77%
2pm: 84/98 69%

THURSDAY
5pm: 57/98 58%
6pm: 94/98 96%

**Area C.** — 137

SATURDAY
1pm: 106/137 88%
2pm: 95/137 86%

THURSDAY
5pm: 96/137 70%
6pm: 66/137 48%

## TOTAL OCCUPANCY

| Thursday | | Saturday | |
|---|---|---|---|
| 5pm | 6pm | 1pm | 2pm |
| 183 | 197 | 241 | 222 |
| 63% | 68 | 83% | 77% |

peak occupancy by parking lot

**data collected June 2015

## PARKING AREA 2: LAKE CALHOUN EXECUTIVE CENTER

The Lake Calhoun Executive Center parking lot serves several professional businesses, including:

- The Ackerberg Group, Property Management
- Coldwell Banker Burnet Realty
- Construction Service and Supply Headquarters
- Willow Midwives in Minnesota
- Private Office Suites
- Fitness Center
- On-Site Cafe

This lot serves professional businesses that generally operate between 8 am and 6 pm. The parking area includes a guest parking lot on the north side of the building, and public parking in the majority of the main lot. This lot also functions as a pedestrian route to private residences to the West, Calhoun Parkway, the beach, and trails to the south. The results of the observed parking lot occupancy are summarized below:

### TABLE 6-2
### OBSERVED PARKING LOT OCCUPANCY - AREA 2

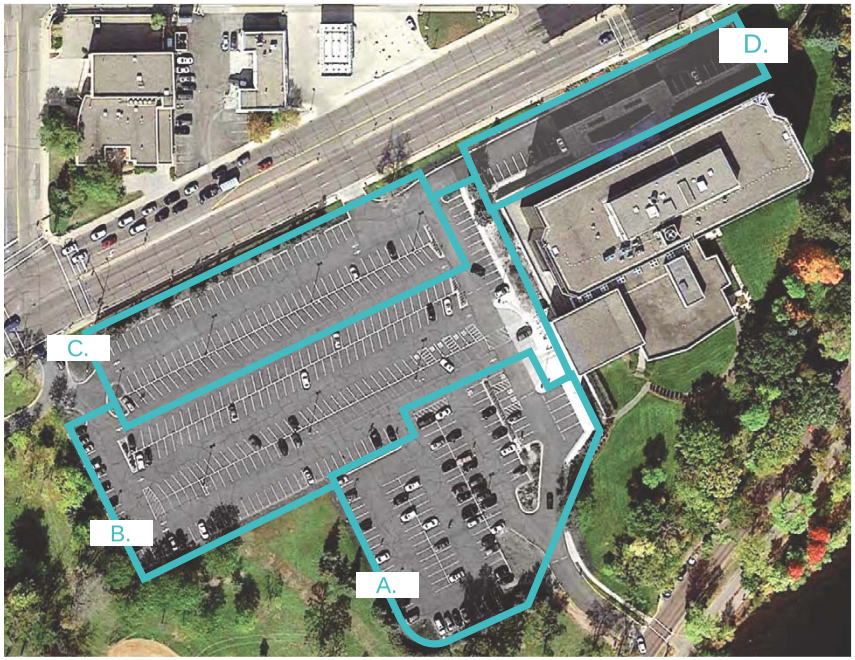
| | |
|---|---|
| WEEKDAY (5-7 pm) **Lowest** Occupancy: 21% | WEEKEND (1-3 pm) **Lowest** Occupancy: 44% |
| WEEKDAY (5-7 pm) **Average** Occupancy: 22% | WEEKEND (1-3 pm) **Average** Occupancy: 47% |
| WEEKDAY (5-7 pm) **Peak** Occupancy: 22% | WEEKEND (1-3 pm) **Peak** Occupancy: 49% |

*% Occupancy out of 468 available parking spaces*

# FIGURE 6-2
## PARKING OCCUPANCY

2.0 EXECUTIVE OFFICES

468 total parking spaces




SATURDAY 1pm: 50/117 42%
2pm: 51/117 43%

THURSDAY 5pm: 69/117 58%
6pm: 73/117 61%

A. 117

SATURDAY 1pm: 29/220 13%
2pm: 33/220 15%

THURSDAY 5pm: 91/220 41%
6pm: 129/220 58%

B. 220

SATURDAY 1pm: 15/111 14%
2pm: 12/111 11%

THURSDAY 5pm: 40/111 36%
6pm: 20/111 18%

C. 111

SATURDAY 1pm: 4/20 20%
2pm: 5/20 25%

THURSDAY 5pm: 8/20 40%
6pm: 5/20 25%

D. 20

## TOTAL OCCUPANCY

| Thursday | | Saturday | |
|---|---|---|---|
| 5pm | 6pm | 1pm | 2pm |
| 98 | 101 | 208 | 227 |
| 21% | 22% | 44% | 49% |

peak occupancy by parking lot

**data collected June 2015

## LOT AREA 3: CALHOUN COMMONS

The Calhoun Commons parking lot serves commercial retailers, restaurants, and service providers; including:

- Noodles & Company
- Caribou Coffee
- Chipotle Mexican Grill
- Sunwerks Tanning Spa
- Ben & Jerry's
- Salon Intrigue
- Wakame Sushi & Asian Bistro
- Whole Foods
- MGM Liquor
- Vitamin Shoppe
- Moss Envy
- Indulge & Bloom
- TC2 Salon

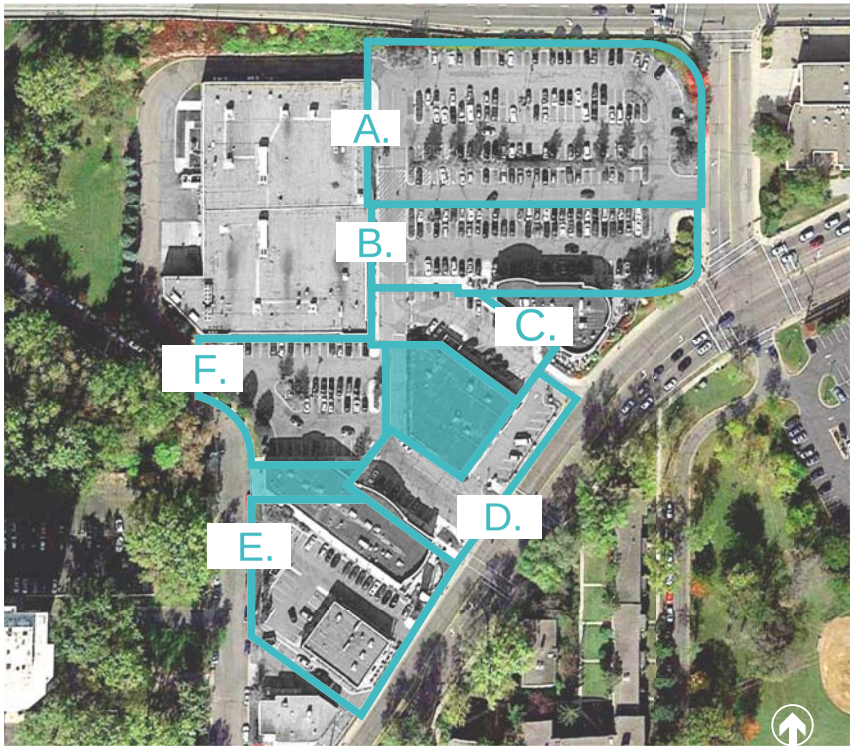
This lot experiences a steady stream of patrons throughout the day for the retail and service providers as well as peak restaurant traffic at breakfast, lunch, and dinner. The results of the observed parking lot occupancy are summarized below:

### TABLE 6-3
### OBSERVED PARKING LOT OCCUPANCY - AREA 3

| | |
|---|---|
| WEEKDAY (5-7 pm) **Lowest** Occupancy: **72%** | WEEKEND (1-3 pm) **Lowest** Occupancy: **80%** |
| WEEKDAY (5-7 pm) **Average** Occupancy: **76%** | WEEKEND (1-3 pm) **Average** Occupancy: **83%** |
| WEEKDAY (5-7 pm) **Peak** Occupancy: **79%** | WEEKEND (1-3 pm) **Peak** Occupancy: **86%** |

*% Occupancy out of 316 available parking spaces*

# FIGURE 6-3
## PARKING OCCUPANCY
### 3.0 CALHOUN COMMONS
316 total parking spaces




**A. 138**

| | | |
|---|---|---|
| SATURDAY | 1pm: 112/138 | 81% |
| | 2pm: 98/138 | 71% |
| THURSDAY | 5pm: 65/138 | 47% |
| | 6pm: 88/138 | 64% |

**B. 77**

| | | |
|---|---|---|
| SATURDAY | 1pm: 67/77 | 87% |
| | 2pm: 69/77 | 84% |
| THURSDAY | 5pm: 65/77 | 96% |
| | 6pm: 88/77 | 92% |

**C. 22**

| | | |
|---|---|---|
| SATURDAY | 1pm: 19/22 | 86% |
| | 2pm: 21/22 | 95% |
| THURSDAY | 5pm: 21/22 | 95% |
| | 6pm: 21/22 | 95% |

**D. 18**

| | | |
|---|---|---|
| SATURDAY | 1pm: 11/18 | 61% |
| | 2pm: 11/18 | 61% |
| THURSDAY | 5pm: 14/18 | 78% |
| | 6pm: 17/18 | 94% |

**E. 30**

| | | |
|---|---|---|
| SATURDAY | 1pm: 20/30 | 67% |
| | 2pm: 14/30 | 47% |
| THURSDAY | 5pm: 9/30 | 30% |
| | 6pm: 7/30 | 23% |

**F. 48**

| | | |
|---|---|---|
| SATURDAY | 1pm: 44/48 | 92% |
| | 2pm: 44/48 | 92% |
| THURSDAY | 5pm: 47/48 | 98% |
| | 6pm: 48/48 | 100% |

## TOTAL OCCUPANCY

| Thursday | | Saturday | |
|---|---|---|---|
| 5pm | 6pm | 1pm | 2pm |
| 230 | 252 | 273 | 253 |
| 72% | 79% | 86% | 80% |

peak occupancy by parking lot

**data collected June 2015

## SUMMARY OF PARKING INVENTORY FINDINGS

The parking data collected show that areas of the two commercial retail parking lots approached occupancy during the periods between 5 PM and 7 PM on the weeknight and 1 PM and 3 PM on the Saturday. As the occupancy of a parking lot approaches 85% the motorist's perception is that the lot is full resulting in longer search times and more circulation to locate a parking space.

The results of the survey show that the east areas of the Calhoun Village parking lot would be perceived to be full during the Saturday observation period with weekend average occupancies of 80% or higher and weekend peak occupancy of 88% or higher. This results in the entire lot having a peak Saturday occupancy of 83%.


The Calhoun Commons parking lot overall would be perceived to be full during the period between 1 PM and 3 PM on Saturday with occupancies of 86% and 80% during the two-hour collection period. Several areas of this lot showed high occupancy during the observation periods. Areas B, C, and F experienced occupancies ranging from 84% to 100%. This information can be useful to site managers in directing traffic through the site to disburse motorists to less congested access routes.

The Executive Center parking lot was counted during the same time periods as the commercial retail lots to understand how this lot is utilized during the "off-peak" period for the Executive Center which coincides with peaks for the commercial retail parking lots. During the weeknight evening the lot was only about 20% occupied while it was near half full during the Saturday count periods (44% and 49%). The low occupancies recorded in this lot while the other two nearby lots experience high occupancy provide an indication of an opportunity to better utilize the parking supply through enhanced connections (in particular pedestrian facilities) and shared parking practices.

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# 7. MULTIMODAL OPERATIONS ANALYSIS

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# MULTIMODAL OPERATIONS ANALYSIS

Analysis of the existing conditions for multimodal traffic was conducted at several locations within the West Lake Study Area. The approach incorporates tools to address auto, pedestrian and bicycle traffic considering the needs of all travelers. The following describes the approach, methodologies and results obtained from the multimodal analysis.

# AUTOMOBILE TRAFFIC OPERATIONS ANALYSIS

Traffic operations analysis was performed for 20 intersections in the study area, primarily along Lake Street and Excelsior Boulevard to understand and document how effectively automobiles are able to navigate through the study area today. The automobile traffic operations analysis includes several factors:

- The number of autos at each intersection (Traffic Volume)
- The geometry at each intersection (Number of Lanes)
- The length of the green, red and pedestrian intervals at a traffic signal (Traffic Signal Timing)
- The amount of time autos spend at each intersection (Delay)
- How much space waiting autos need (Queuing Distances)

## METHODOLOGY

The automobile intersection analysis uses the methodology for evaluating level of service (LOS) at signalized and unsignalized intersections established in the Highway Capacity Manual 2010. LOS is a qualitative rating system used to describe the efficiency of traffic operations at an intersection. The measure is based on the average amount of delay, in seconds, experienced by motorists at intersections during an hour – typically the peak hour of the day. Six LOS are defined based on the delay and they are designated by letters A through F. LOS A represents free flow conditions and LOS F represents congested conditions. LOS E is generally considered acceptable for future design conditions in the Metro area.

Traffic operations analysis of auto LOS was performed using the Synchro/SimTraffic (version 9) software package. Synchro/SimTraffic is a macro and micro simulation tool used to analyze operations along a corridor and at intersections. The software allows for traffic signal timing to be adjusted and optimized as well as the input and output measures of effectiveness to be easily transferred into spreadsheets for analysis purposes. The resulting measures of effectiveness represent an average of five model runs from the SimTraffic portion of the software.

Existing Synchro/SimTraffic models were obtained from the City of Minneapolis and provided the geometric and signal timing parameters for morning (AM) and evening (PM) peaks at each signalized intersection in the study area. The cycle lengths currently used during peak hours are:

- AM peak hour – 130 seconds
- PM peak hour – 140 seconds

The City of Minneapolis also provided traffic signal detector data for signals in the study area for two separate week-long periods as well as a recent traffic impact study for the study area (TDMP). The study team conducted a thorough review of this data, field conditions and model inputs resulting in several adjustments to the existing Synchro/SimTraffic model.

The AM and PM peak hours were determined from the existing motor vehicle volume data (described in Section 3.0 of the report). The AM peak occurs between 7:00AM and 8:00AM and the PM peak hour occurs between 4:45PM and 5:45PM. The Synchro/SimTraffic model was updated to include the AM and PM peak hour turning movements for both vehicles and trucks as well as pedestrian crossings at intersections.

## AUTOMOBILE LOS ANALYSIS CONTEXT

The significance of auto LOS in the West Lake Study Area is balanced with that of other modes and safety. The area is part of a network with popular destinations and several barriers lacking connectivity or alternative routes, motorists are channelized to a limited number of streets which must serve several modes of travel. As such, the intersections on these streets experience concentrated demand from autos, pedestrians, bicyclists and buses during peak periods. A goal of this planning study is to balance the needs of these modes and address safety issues that arise from congestion as well as other factors such as visibility, lane arrangement, gaps in connectivity, and motorist expectation.

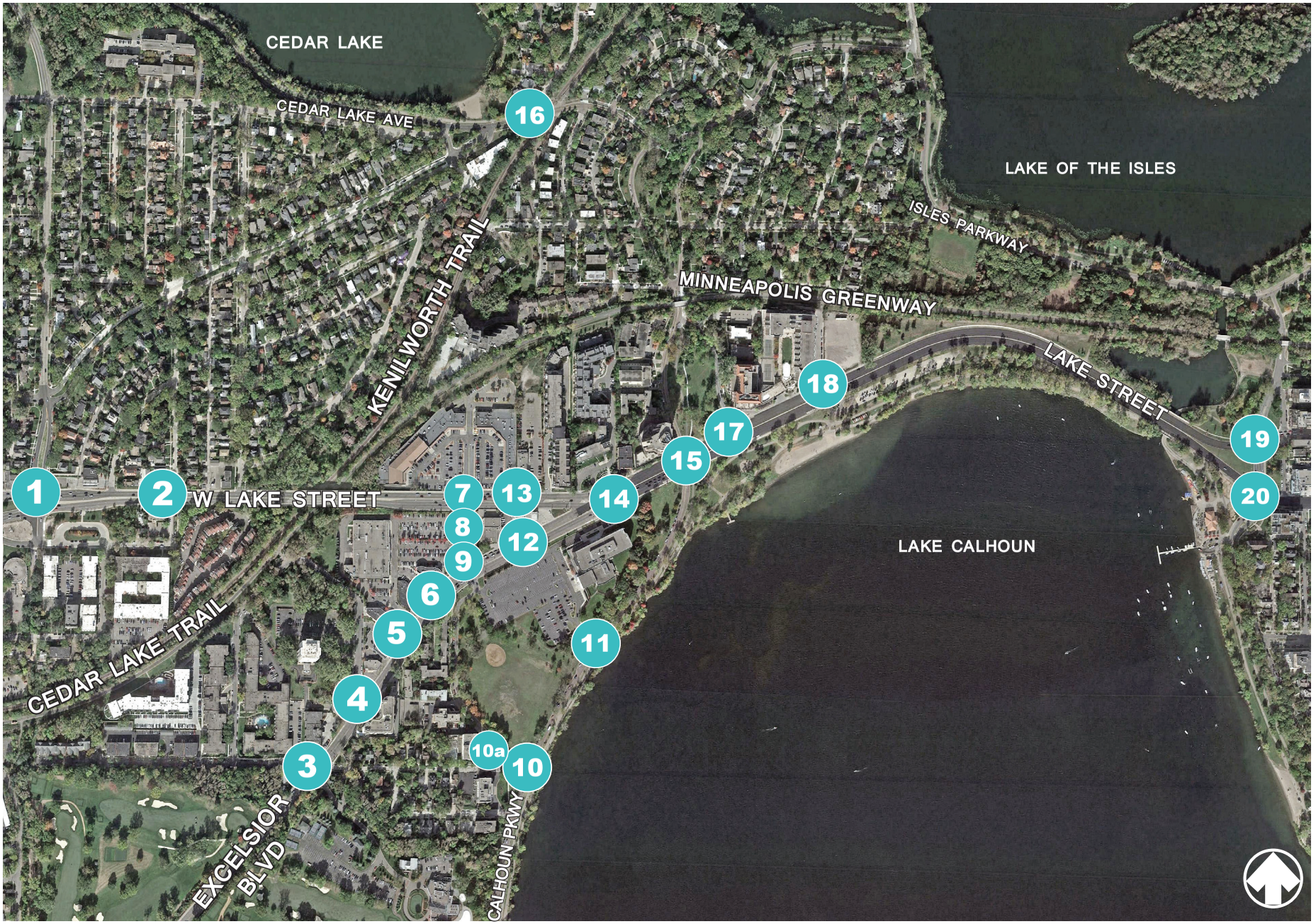
Since Lake Street and Excelsior Boulevard are mature corridors within an urban context, it is assumed that any future improvement alternatives will not seek to add capacity at the corridor level and improve the motor vehicle LOS, but rather the focus of improvements will be to make spot safety, operational, and non-motorized enhancements where possible without additional adverse impact to motor vehicle operations.

## SYNCHRO/SIMTRAFFIC ANALYSIS RESULTS – EXISTING

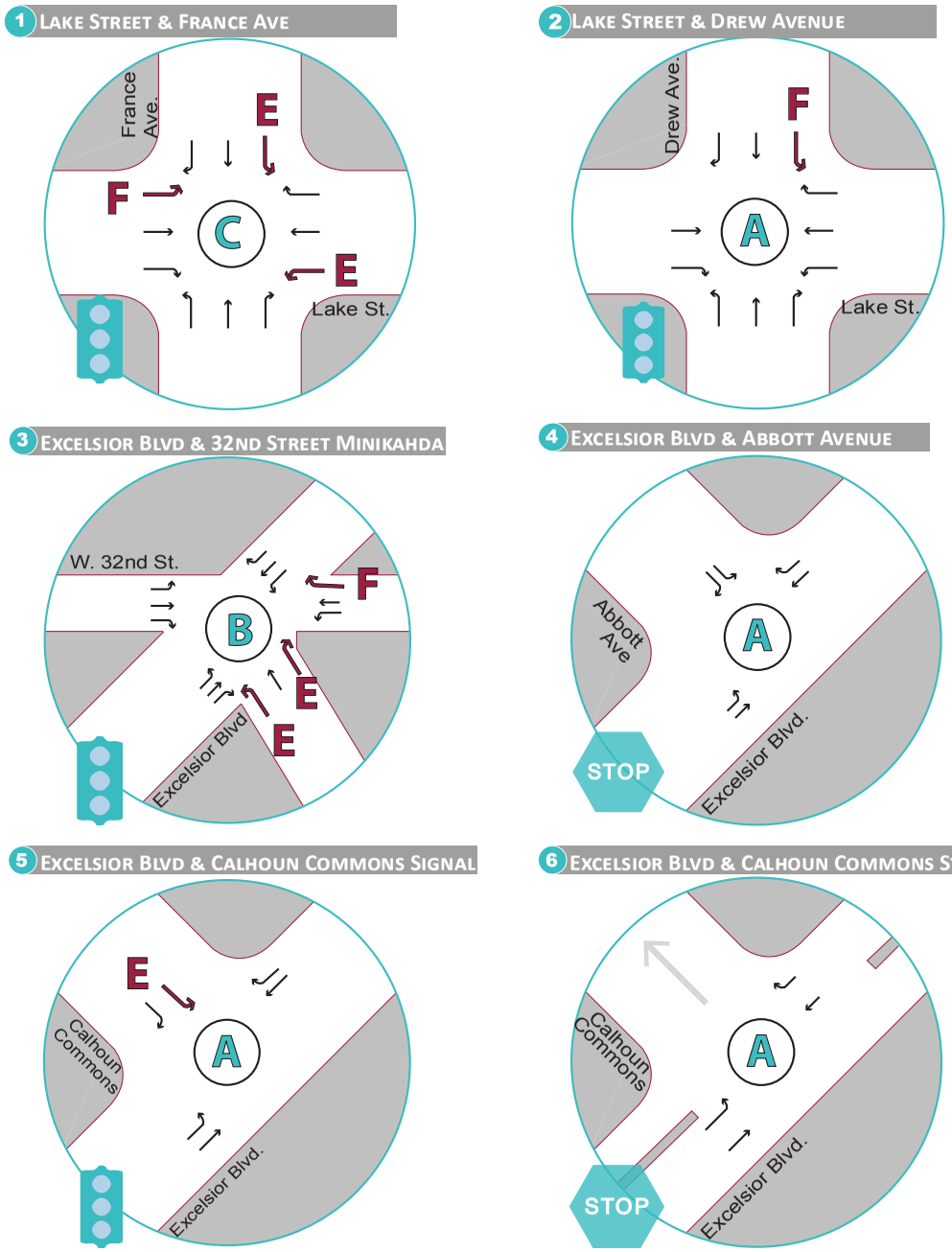
**AM Peak Hour**

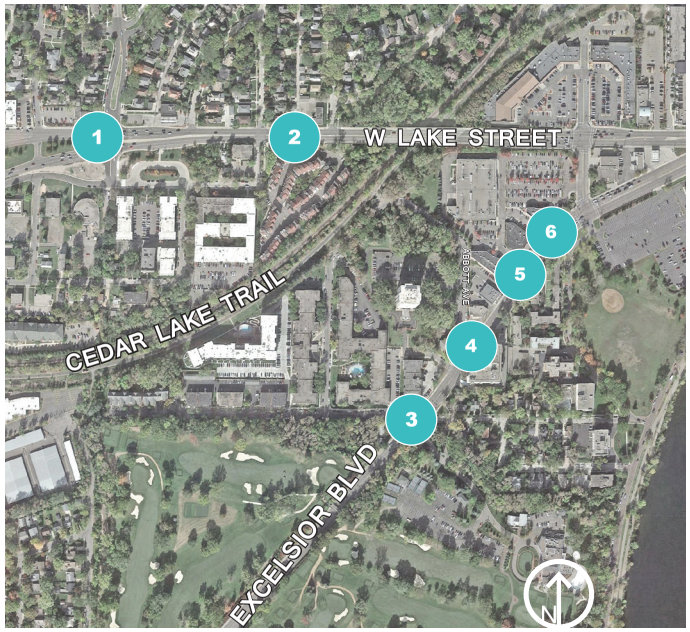
The operations analysis results during the AM peak hour are summarized in Figures 7-1 through 7-5 which display the overall intersection LOS and highlight the specific movements with LOS E or F. The detailed results of the analysis are also tabulated in Appendix B. This table includes the traffic volume and average delay per vehicle by each individual intersection movement as well as the associated LOS.

# FIGURE 7-1
## KEY MAP - EXISTING AM INTERSECTION OPERATIONS: AUTO LEVEL OF SERVICE (LOS)



# FIGURE 7-2
## EXISTING AM INTERSECTION OPERATIONS: AUTO LEVEL OF SERVICE (LOS)



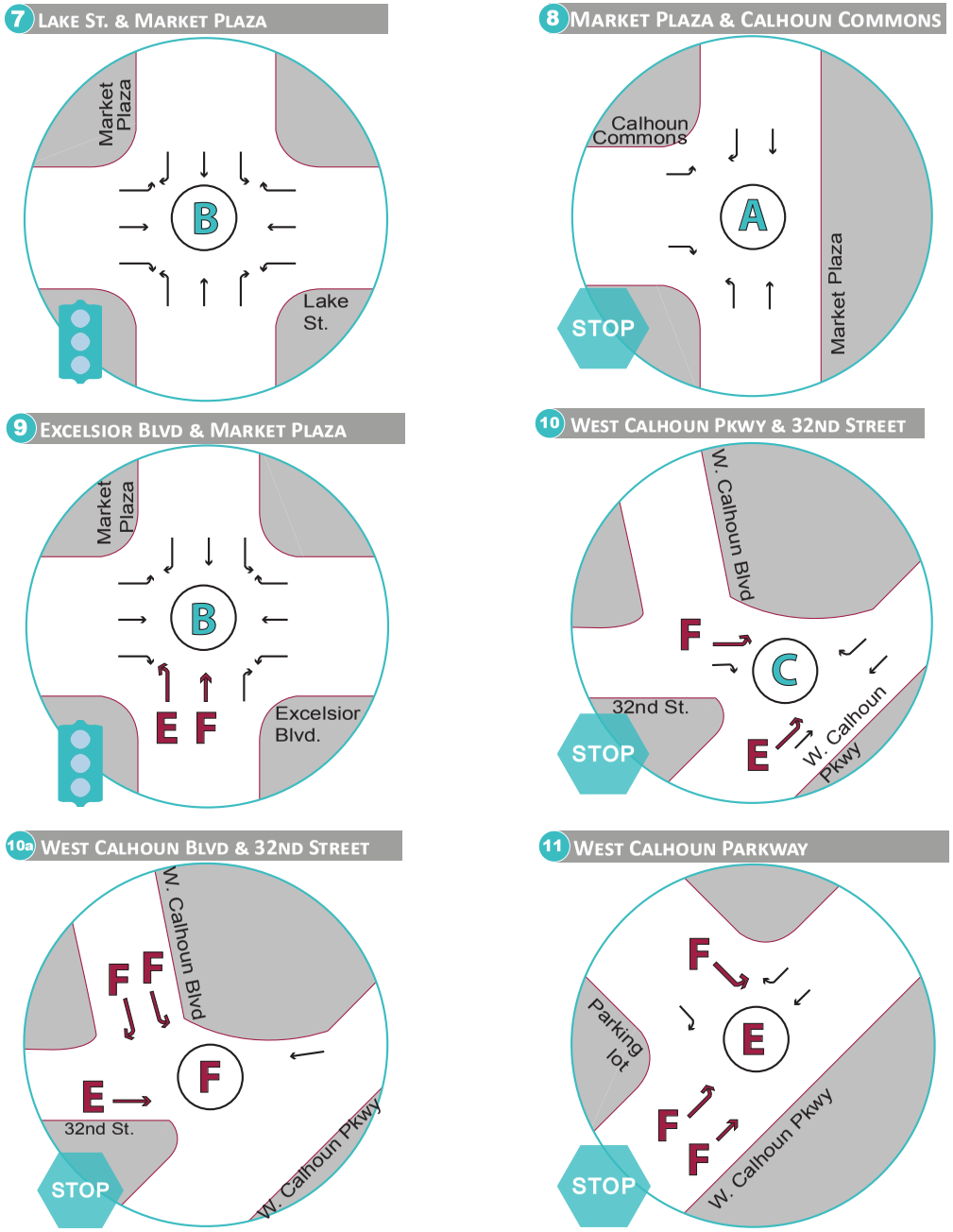




### KEY

**AM INTERSECTION DATA**

- E — OVERALL INTERSECTION LEVEL OF SERVICE
- E — MOVEMENT LEVEL OF SERVICE: LOS E OR LOS F
- VEHICLE MOVEMENT

# FIGURE 7-3
## EXISTING AM INTERSECTION OPERATIONS: AUTO LEVEL OF SERVICE (LOS)



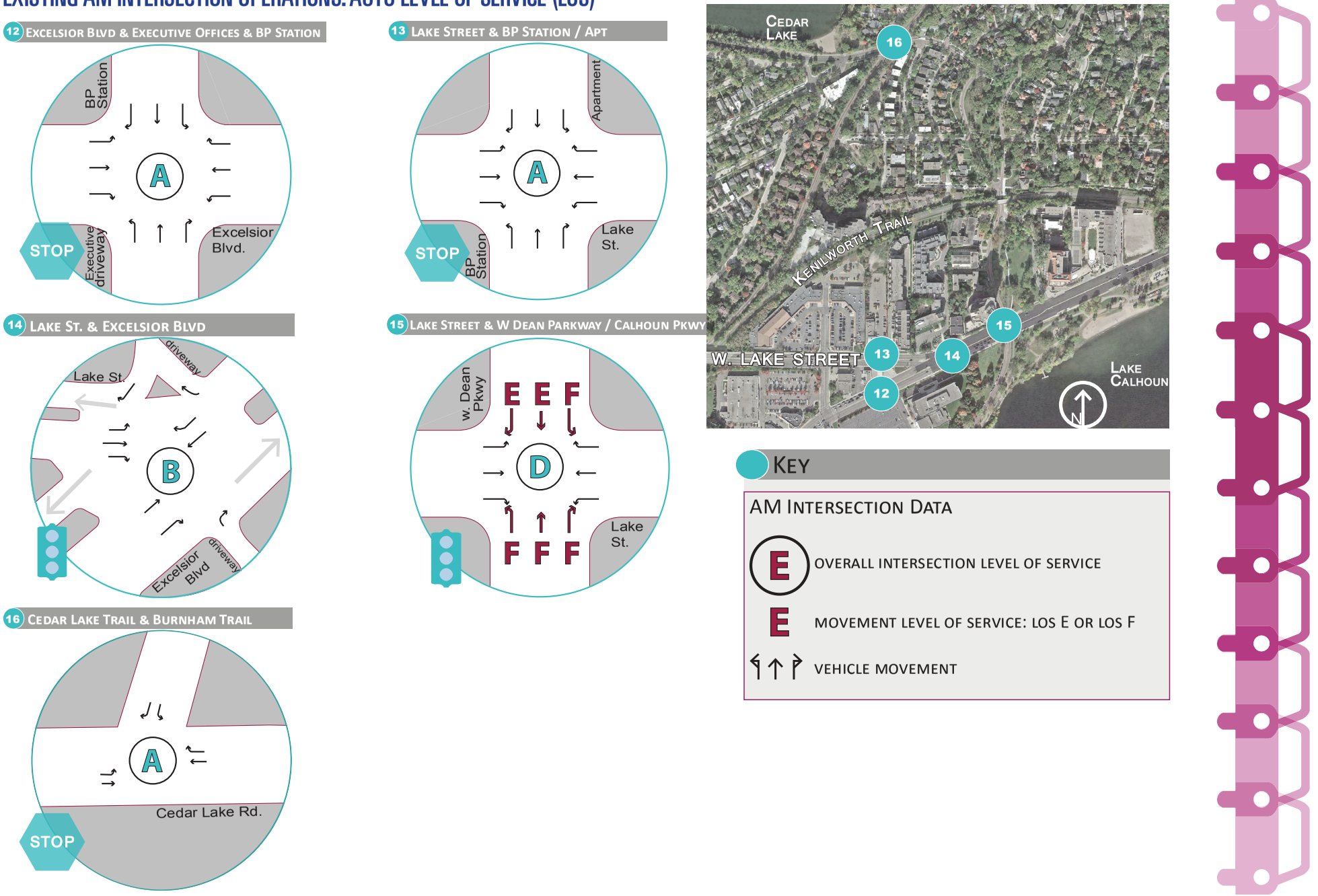


### KEY

**AM INTERSECTION DATA**

- E — OVERALL INTERSECTION LEVEL OF SERVICE
- E — MOVEMENT LEVEL OF SERVICE: LOS E OR LOS F
- VEHICLE MOVEMENT

# FIGURE 7-4
## EXISTING AM INTERSECTION OPERATIONS: AUTO LEVEL OF SERVICE (LOS)



# FIGURE 7-5
# EXISTING AM INTERSECTION OPERATIONS: AUTO LEVEL OF SERVICE (LOS)

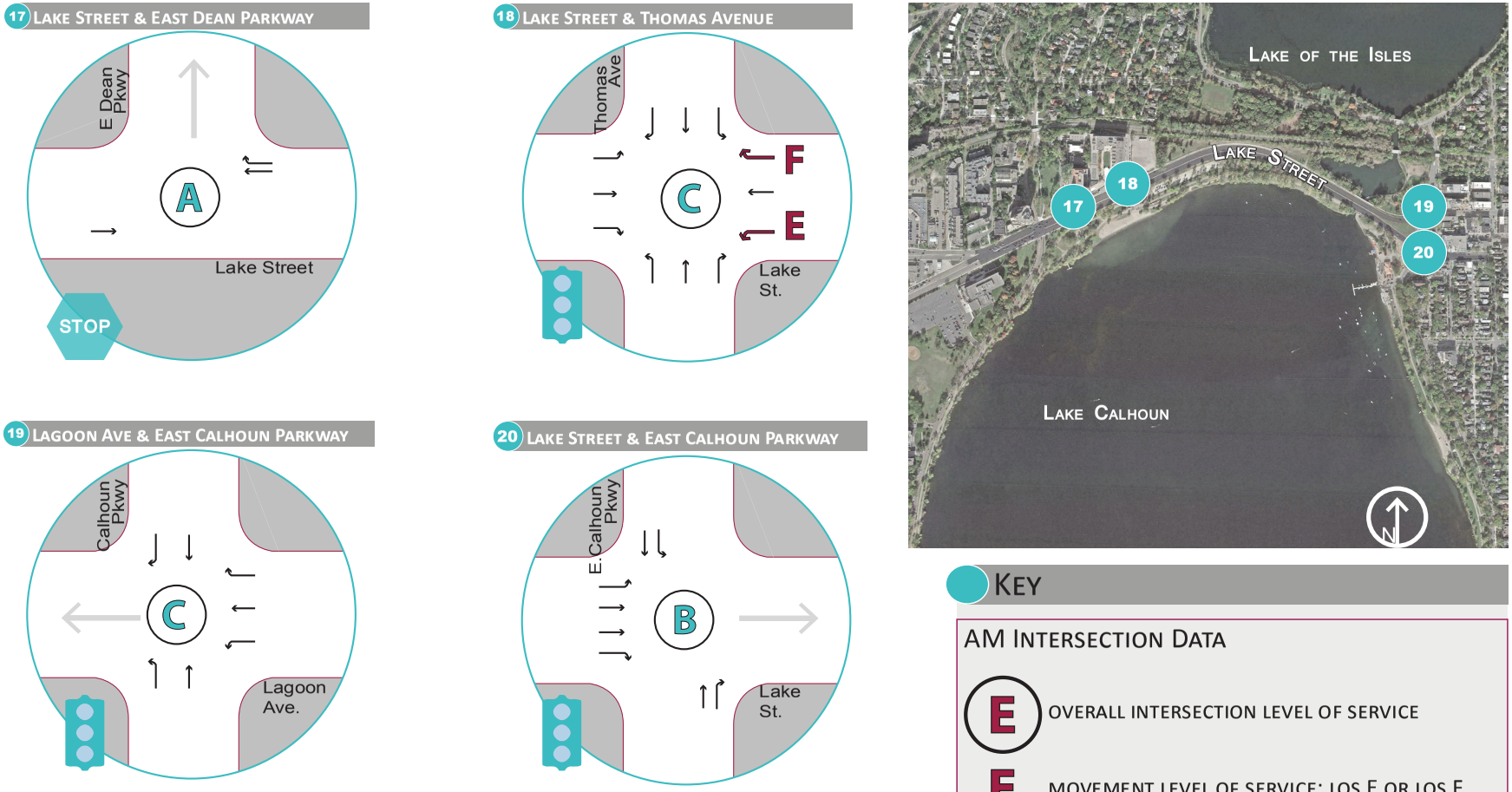
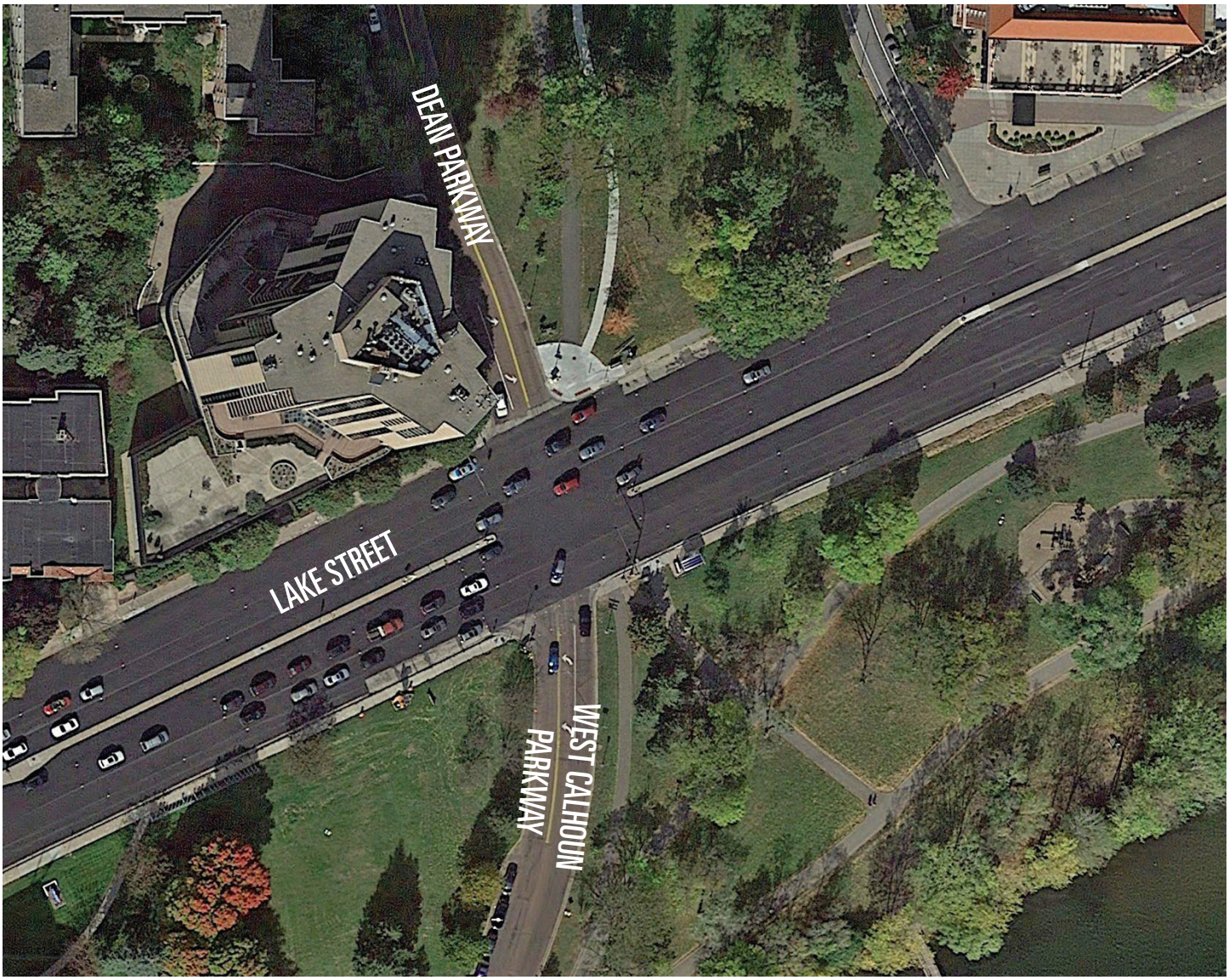


Table 7-1 shows that during the AM peak hour the intersections analyzed along Lake Street and Excelsior Boulevard operate at LOS D or better. While the intersections overall operate at LOS D, the primary operational issues were found on the northbound and southbound approaches to the Dean Parkway/West Calhoun Parkway intersection with Lake Street which operate at LOS F (Intersection 15). The traffic signal timing at this location provides approximately one third of the green signal time to the northbound and southbound approaches with no protected phase (no green arrow) for the left turns on these legs. The left turn lanes for the southbound and northbound approaches are 60 and 70 feet in length and Table 7-1 shows that the average and maximum left turn queues exceed the available storage. This creates blocking of the shared through/right-turn lane increasing the delay to those movements, which may increase risk-taking behavior by motorists adversely impacting bicyclist and pedestrians. The maximum queues for northbound and southbound approaches extend 818 feet and 572 feet, respectively. The average queues extend 626 feet and 310 feet, respectively.



# TABLE 7-1
# EXISTING AM PEAK HOUR TRAFFIC OPERATIONS ANALYSIS MEASURES OF EFFECTIVENESS

| # | Intersection | Approach | Level of Service | | | | | | Queing Information (feet) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Movement LOS | | | | LOS By Intersection | | Through | | | Left Turn | | |
| | | | L | T | R | R2 | Delay (S/Veh) | LOS | Link Length | Avg. | Max | Storage | Avg. | Max |
| 1 | Lake & France (Signal) | NB | D | D | B | | 26.5 | C | 198 | 48 | 134 | 0 | 24 | 79 |
| | | SB | E | D | C | | | | 230 | 87 | 212 | 30 | 48 | 55 |
| | | EB | F | B | A | | | | 465 | 206 | 463 | 250 | 222 | 320 |
| | | WB | E | B | A | | | | 584 | 204 | 448 | 160 | 22 | 156 |
| 2 | Lake & Drew (Signal) | NB | C | D | A | | 4.0 | A | 446 | 21 | 55 | 0 | | 0 |
| | | SB | F | A | B | | | | 412 | 7 | 38 | 0 | | 0 |
| | | EB | A | A | A | | | | 584 | 24 | 162 | 0 | | 0 |
| | | WB | A | A | A | | | | 1381 | 42 | 219 | 0 | | 0 |
| 3 | Excelsior & 32nd (Signal) | NB | B | A | A | A | 12.8 | B | 1018 | 104 | 217 | 60 | 5 | 75 |
| | | SB | A | B | A | A | | | 304 | 72 | 160 | 0 | | 0 |
| | | EB | D | A | A | C | | | 444 | 86 | 216 | 0 | | 0 |
| | | WB | A | D | F | A | | | 566 | 21 | 92 | 64 | 27 | 85 |
| | | NW | E | A | E | A | | | 539 | 20 | 75 | 0 | | 0 |
| 4 | Excelsior & Abbott | NB | A | A | A | | 2.0 | A | 304 | 1 | 22 | 0 | | 0 |
| | | SB | A | A | A | | | | 369 | | 6 | 0 | | 0 |
| | | EB | C | A | A | | | | 0 | 37 | 101 | 0 | | 0 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |
| 5 | Excelsior & Calhoun Commons (Signal) | NB | D | A | A | | 1.7 | A | 369 | 5 | 56 | 80 | 12 | 47 |
| | | SB | A | A | A | | | | 86 | 20 | 92 | 0 | | 0 |
| | | EB | E | A | A | | | | 0 | | | 90 | 11 | 66 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |
| 6 | Excelsior and Calhoun Commons- Unsignalized | NB | A | A | A | | 1.1 | A | 86 | 3 | 38 | 0 | | 0 |
| | | SB | A | A | A | | | | 147 | | 4 | 0 | | 0 |
| | | EB | A | A | A | | | | 0 | | | 0 | | 0 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |
| 7 | Lake & Market (Signal) | NB | D | C | B | | 12.6 | B | 88 | 31 | 87 | 0 | 85 | 97 |
| | | SB | D | D | B | | | | 401 | 31 | 95 | 150 | 14 | 59 |
| | | EB | B | B | B | | | | 1381 | 95 | 249 | 250 | 19 | 63 |
| | | WB | B | A | A | | | | 271 | 108 | 228 | 110 | 41 | 135 |
| 8 | Market and Shopping Access | NB | A | A | - | | 6.0 | A | 35 | 32 | 68 | 0 | | 0 |
| | | SB | - | A | A | | | | 88 | 27 | 91 | 0 | | 0 |
| | | EB | C | - | A | | | | 0 | | | 0 | 21 | 54 |
| 9 | Excelsior & Market (Signal) | NB | E | F | C | | 14.2 | B | 461 | 34 | 102 | 0 | | 0 |
| | | SB | C | B | A | | | | 35 | 33 | 61 | 0 | | 0 |
| | | EB | B | A | A | | | | 147 | 67 | 162 | 90 | 46 | 128 |
| | | WB | B | C | A | | | | 231 | 126 | 237 | 125 | 3 | 47 |
| 10 | W Calhoun Pkwy & W 32nd Street | NB | E | D | A | | 21.4 | C | 726 | 124 | 341 | 0 | | 0 |
| | | SB | A | A | A | | | | 606 | lady power | 4 | 0 | | 0 |
| | | EB | F | A | A | | | | 0 | 17 | 39 | 0 | | 0 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |
| 10a | W Calhoun Blvd & W 32nd Street | NB | A | A | A | | 96.8 | F | 0 | | | 0 | | 0 |
| | | SB | F | A | F | | | | 0 | 71 | 183 | 0 | | 0 |
| | | EB | A | E | A | | | | 216 | 1 | 12 | 0 | | 0 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |
| 11 | W Calhoun Pkwy & Parking Lot | NB | F | F | A | | 38.3 | E | 606 | 233 | 531 | 0 | | 0 |
| | | SB | A | A | A | | | | 867 | 1 | 33 | 0 | | 0 |
| | | EB | F | A | A | | | | 0 | 9 | 44 | 0 | | 0 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |
| 12 | Excelsior & Parking Lot | NB | A | B | A | | 2.2 | A | 244 | 3 | 31 | 0 | | 0 |
| | | SB | B | A | A | | | | 91 | 11 | 31 | 0 | | 0 |
| | | EB | A | A | A | | | | 231 | 2 | 24 | 0 | | 0 |
| | | WB | A | A | A | | | | 202 | 11 | 83 | 0 | | 0 |
| 13 | Lake & Shopping Access | NB | C | A | D | | 4.2 | A | 56 | 2 | 23 | 0 | | 0 |
| | | SB | D | A | B | | | | 295 | 24 | 79 | 0 | | 0 |
| | | EB | D | A | A | | | | 271 | 62 | 208 | 62 | 2 | 18 |
| | | WB | D | A | A | | | | 129 | 20 | 203 | 0 | | 0 |
| 14 | Excelsior & Lake (Signal) | NB | A | A | C | A | 17.8 | B | 202 | 61 | 188 | 0 | | 0 |
| | | SB | A | C | A | A | | | 350 | 106 | 266 | 0 | | 0 |
| | | EB | C | C | B | A | | | 129 | 204 | 245 | 45 | 199 | 234 |
| | | WB | A | A | A | A | | | 13 | 6 | 34 | 0 | | 0 |
| | | SE | A | A | A | A | | | 0 | | | 0 | | 0 |
| 15 | Lake & Dean Pkwy/W Calhoun Pkwy (Signal) | NB | F | F | F | | 48.7 | D | 867 | 626 | 818 | 60 | 73 | 85 |
| | | SB | F | E | E | | | | 564 | 310 | 572 | 70 | 78 | 129 |
| | | EB | D | C | B | | | | 350 | 249 | 406 | 185 | 101 | 284 |
| | | WB | B | C | C | | | | 203 | 180 | 246 | 130 | 29 | 94 |
| 16 | Cedar Lake & Burnham | NB | A | A | A | | 1.7 | A | 0 | | | 0 | | 0 |
| | | SB | B | A | A | | | | 0 | 5 | 29 | 0 | | 0 |
| | | EB | A | A | A | | | | 1094 | 30 | 105 | 0 | | 0 |
| | | WB | A | A | A | | | | 722 | 1 | 23 | 0 | | 0 |
| 17 | Lake & Unsignalized Dean Pkwy | NB | A | A | A | | 6.6 | A | 0 | | | 0 | | 0 |
| | | SB | A | A | A | | | | 0 | | | 0 | | 0 |
| | | EB | A | A | A | | | | 203 | 2 | 56 | 0 | | 0 |
| | | WB | A | A | B | | | | 400 | 151 | 438 | 0 | | 0 |
| 18 | Lake & Thomas (Signal) | NB | D | D | A | | 29.1 | C | 190 | 2 | 32 | 0 | | 0 |
| | | SB | C | A | C | | | | 352 | 20 | 78 | 0 | | 0 |
| | | EB | D | A | A | | | | 400 | 105 | 192 | 340 | 28 | 77 |
| | | WB | E | D | F | | | | 1960 | 450 | 800 | 0 | | 0 |
| 19 | Lagoon & E Calhoun Pkwy (Signal) | NB | D | D | A | | 24.3 | C | 165 | 76 | 171 | 0 | 115 | 186 |
| | | SB | A | C | A | | | | 560 | 16 | 77 | 0 | | 0 |
| | | EB | A | A | A | | | | 0 | | | 0 | | 0 |
| | | WB | C | C | A | | | | 1144 | 224 | 354 | 0 | | 0 |
| 20 | Lake & E Calhoun Pkwy (Signal) | NB | A | D | B | | 16.0 | B | 667 | 168 | 321 | 0 | | 0 |
| | | SB | D | C | A | | | | 165 | 17 | 76 | 0 | 28 | 91 |
| | | EB | A | A | A | | | | 360 | 106 | 289 | 0 | | 0 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |

As a result of the operation and extended traffic queues described at the intersection of Lake Street with Dean Parkway/West Calhoun Parkway, West Calhoun Parkway intersections to the south are adversely impacted. The northbound queue on West Calhoun Parkway extends upstream to the Executive Center Driveway and also to West 32nd Street in the model. These queues block the two intersections resulting in poor LOS at each intersection as shown in Table 7-1.

- The Executive Center Driveway intersection at West Calhoun Parkway (Intersection 11) operates at LOS E with the northbound and eastbound movements operating at LOS F.
- The West 32nd Street intersection at West Calhoun Parkway (Intersection 10) operates at LOS C with the northbound approach at LOS D and the eastbound left turn operating at LOS F.
- The blocking which occurs at the West 32nd Street intersection with West Calhoun Parkway impacts the Calhoun Boulevard intersection with West 32nd Street just 60-feet to the west (Intersection 10a). As a result the intersection operates at a LOS F. The southbound approach is unable to turn onto West 32nd in either direction as it is blocked by the eastbound approach to the parkway (LOS F at the southbound right and left).

Because several intersections along West Calhoun Parkway are impacted by the operations at the Dean Parkway/ West Calhoun Parkway intersection with Lake Street, future conditions analysis will be conducted to determine if traffic signal or geometric modifications yield improved operations and reduce the extended queues.

**Other Intersections**

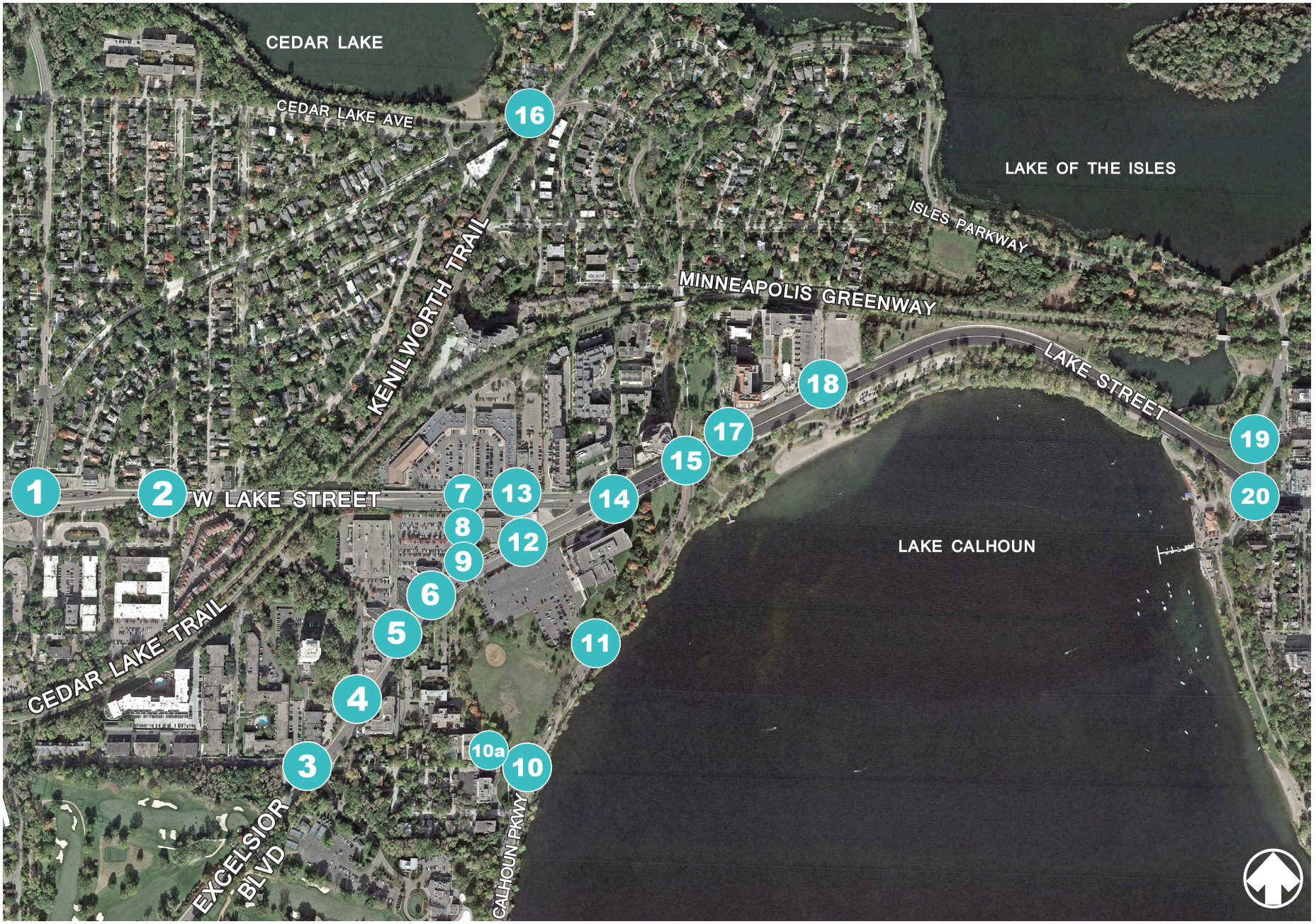
At the intersection of Lake Street and France Avenue the eastbound left turn experiences LOS F with over 125 seconds of delay per vehicle (Intersection 1, Appendix A). This left turn is served with a protected signal phase (green arrow) and there were 199 left turns recorded during data collection.

Traffic signal timing and spot geometric improvements may yield improved operations for the left turns and the side street approaches.

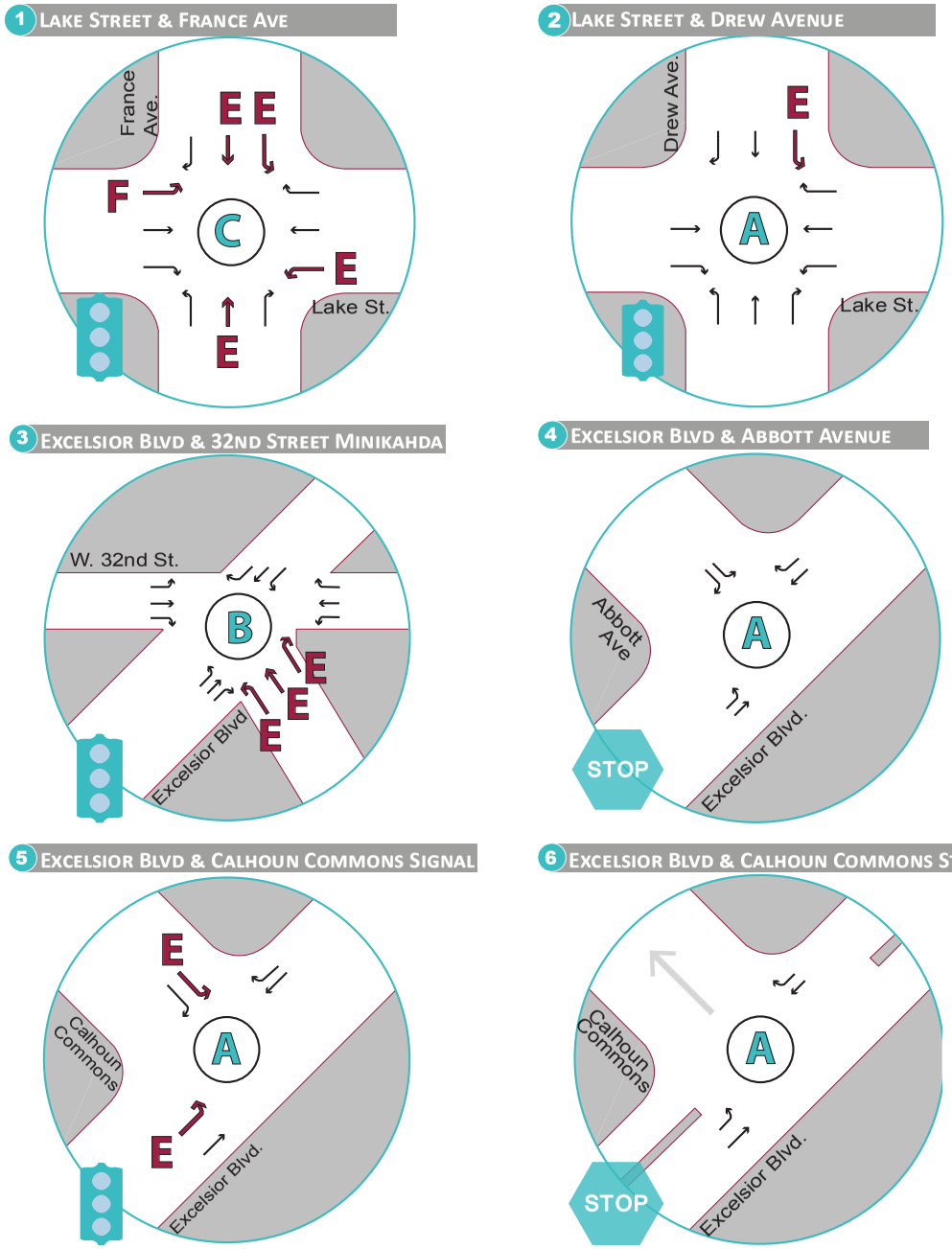

**PM Peak Hour**

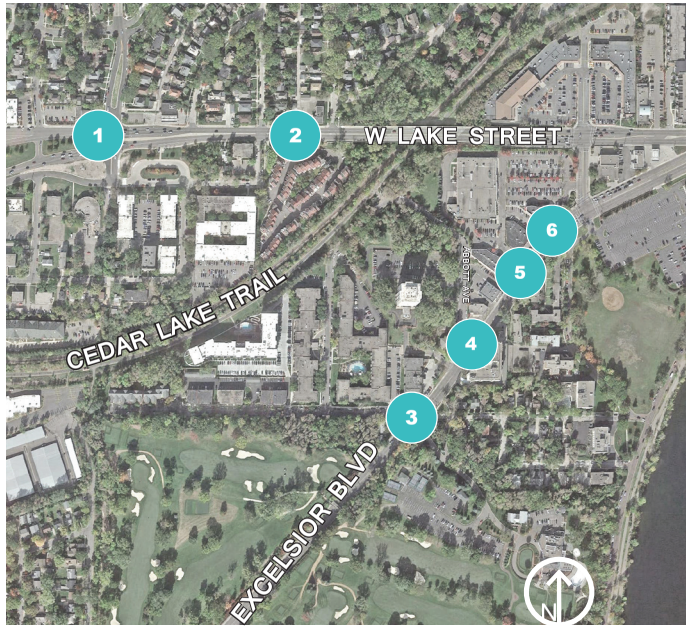
The operations analysis results during the PM peak hour are summarized in Figures 7-6 through 7-10 which display the overall intersection LOS and highlight the specific movements with LOS E or F. The detailed results of the analysis are also tabulated in Appendix B.

# FIGURE 7-6
## KEY MAP - EXISTING PM INTERSECTION OPERATIONS: AUTO LEVEL OF SERVICE (LOS)



# FIGURE 7-7
## EXISTING PM INTERSECTION OPERATIONS: AUTO LEVEL OF SERVICE (LOS)



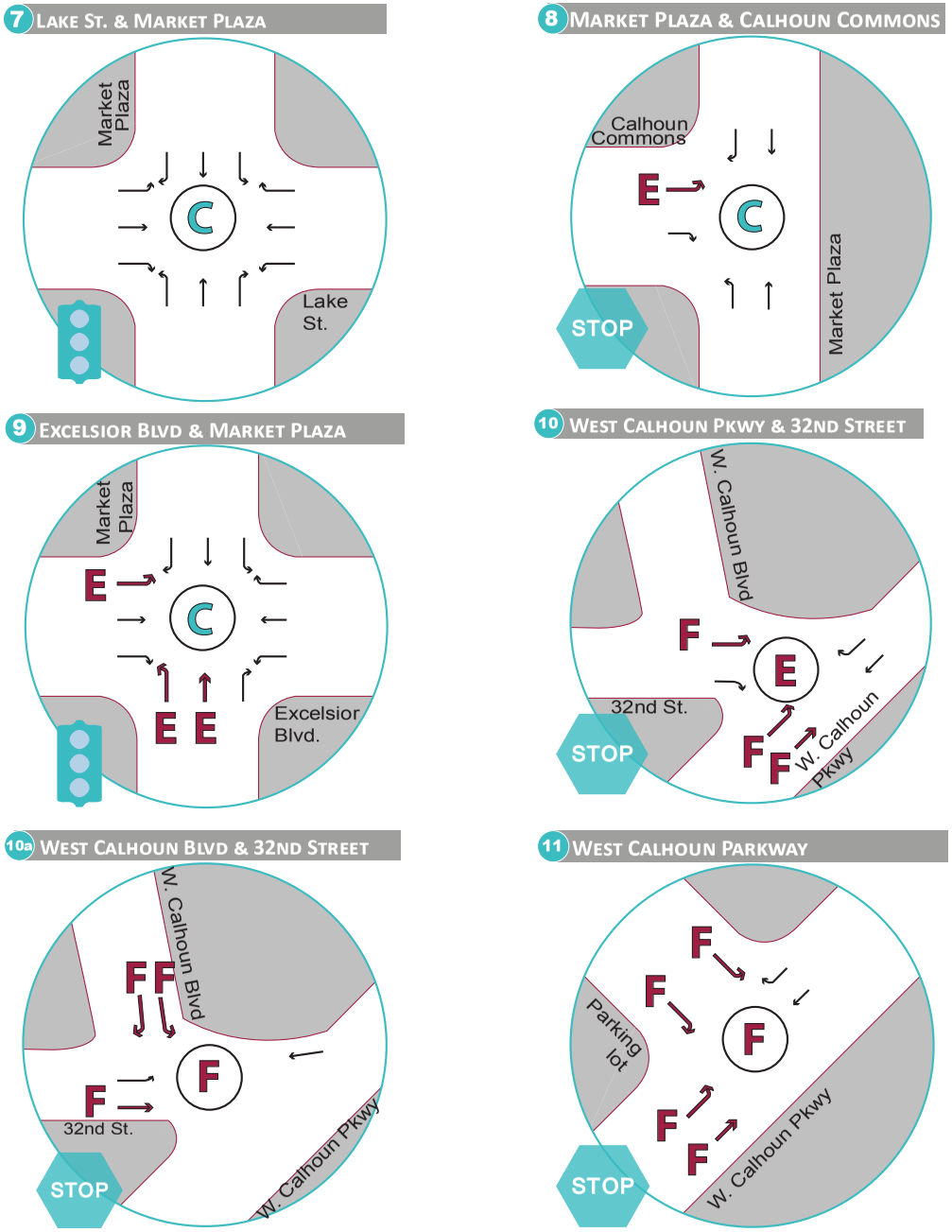




### KEY

**AM INTERSECTION DATA**

- E — OVERALL INTERSECTION LEVEL OF SERVICE
- E — MOVEMENT LEVEL OF SERVICE: LOS E OR LOS F
- VEHICLE MOVEMENT

# FIGURE 7-8
## EXISTING PM INTERSECTION OPERATIONS: AUTO LEVEL OF SERVICE (LOS)



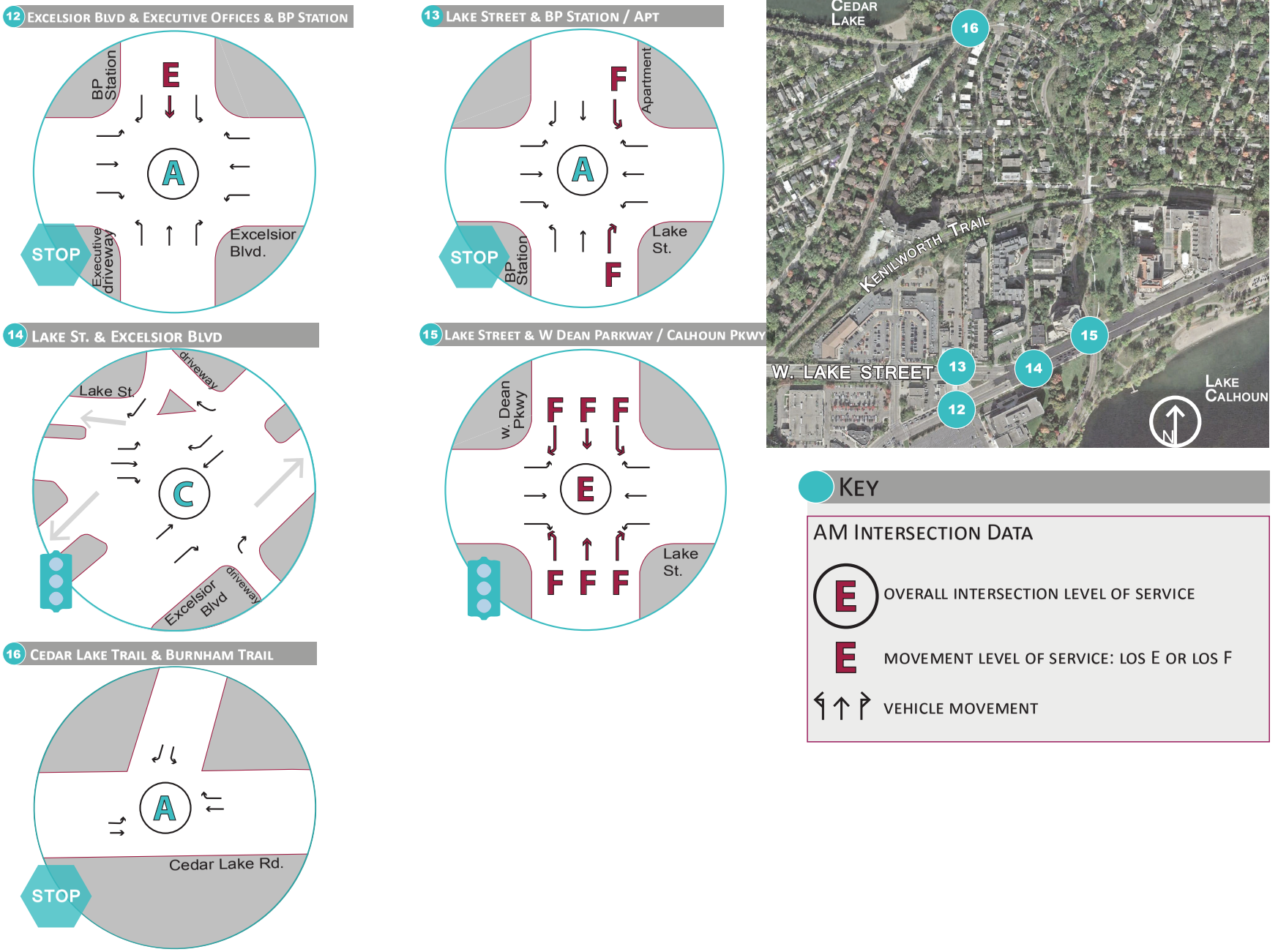


### KEY

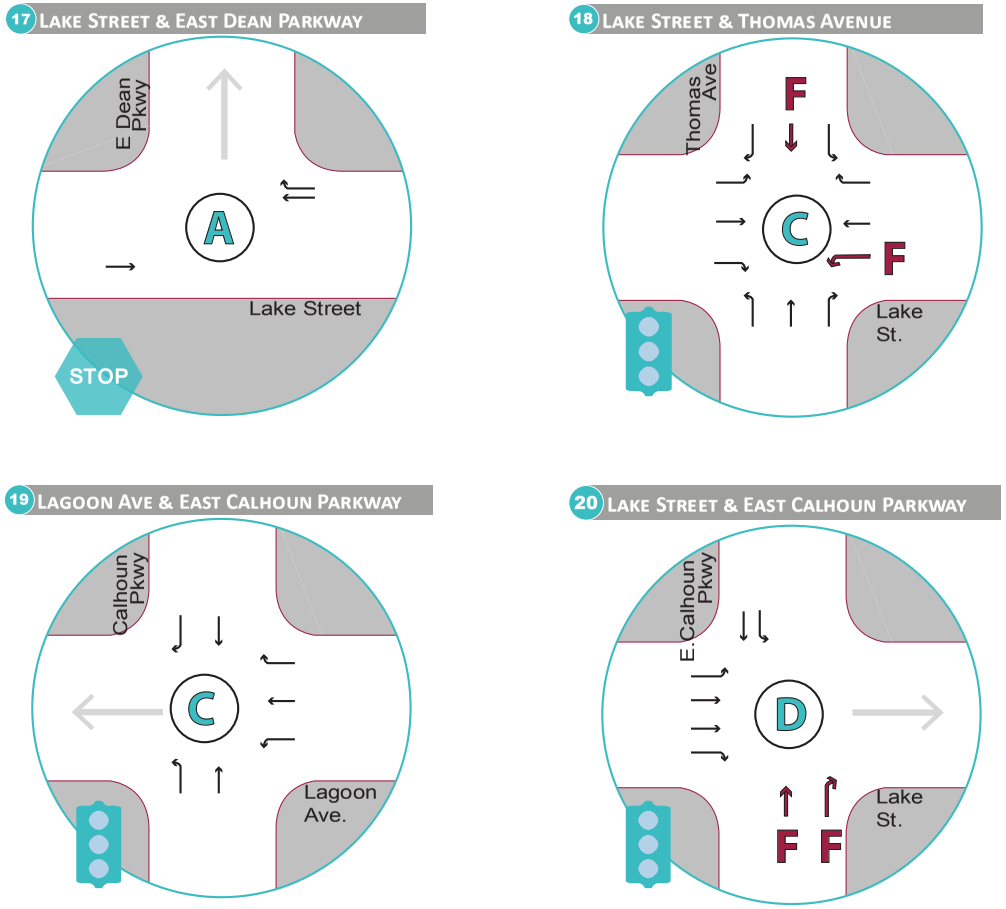
AM INTERSECTION DATA

- E — OVERALL INTERSECTION LEVEL OF SERVICE
- E — MOVEMENT LEVEL OF SERVICE: LOS E OR LOS F
- VEHICLE MOVEMENT

# FIGURE 7-9
## EXISTING PM INTERSECTION OPERATIONS: AUTO LEVEL OF SERVICE (LOS)



# FIGURE 7-10
## EXISTING PM INTERSECTION OPERATIONS: AUTO LEVEL OF SERVICE (LOS)





**KEY**

AM INTERSECTION DATA

- E — OVERALL INTERSECTION LEVEL OF SERVICE
- E — MOVEMENT LEVEL OF SERVICE: LOS E OR LOS F
- VEHICLE MOVEMENT

The operations analysis results for the study area intersections during the PM peak hour are summarized in Table 7-2. The table shows that all of the Lake Street and Excelsior Boulevard intersections operate at LOS D or better, with the exception of the Dean Parkway/West Calhoun Parkway intersection which operates at LOS E (Intersection 15). Similar to the AM peak hour, the primary operational issues were found on the northbound and southbound approaches to the Dean Parkway/West Calhoun Parkway intersection which operate at LOS F with delays in excess of 180 seconds per vehicle, or 3 minutes (Appendix B).

The traffic signal timing at this location provides approximately one third of the green signal time to the northbound and southbound approaches with no protected phase (no green arrow) for the left turns on these legs. The left turn lanes for the southbound and northbound approaches are 60 and 70 feet in length and Table 7-2 shows that the average and maximum left turn queues exceed the available storage. This creates blocking of the shared through/right-turn lane increasing the delay to those movements, which may increase risk-taking behavior by motorists adversely impacting bicyclist and pedestrians. The maximum queues for northbound and southbound approaches extend 881 feet and 580 feet, respectively. The average queues extend 682 feet and 580 feet, respectively.

# TABLE 7-2
# EXISTING PM PEAK HOUR TRAFFIC OPERATIONS ANALYSIS MEASURES OF EFFECTIVENESS

| # | Intersection | Approach | Level of Service | | | | | | Queing Information (feet) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Movement LOS | | | | LOS By Intersection | | Through | | | Left Turn | | |
| | | | L | T | R | R2 | Delay (S/Veh) | LOS | Link Length | Avg. | Max | Storage | Avg. | Max |
| 1 | Lake & France (Signal) | NB | D | E | D | | 32.0 | C | 198 | 71 | 184 | 0 | 17 | 72 |
| | | SB | E | E | C | | | | 230 | 167 | 245 | 30 | 53 | 55 |
| | | EB | F | C | A | | | | 465 | 354 | 488 | 250 | 272 | 330 |
| | | WB | E | C | A | | | | 584 | 151 | 288 | 160 | 46 | 147 |
| 2 | Lake & Drew (Signal) | NB | D | A | B | | 9.0 | A | 446 | 20 | 63 | 0 | | 0 |
| | | SB | E | D | B | | | | 412 | 19 | 70 | 0 | | 0 |
| | | EB | A | A | A | | | | 584 | 100 | 343 | 0 | | 0 |
| | | WB | D | A | A | | | | 1381 | 110 | 334 | 0 | | 0 |
| 3 | Excelsior & 32nd (Signal) | NB | D | B | A | A | 18.5 | B | 1018 | 242 | 478 | 60 | 3 | 47 |
| | | SB | A | C | B | A | | | 304 | 97 | 194 | 0 | | 0 |
| | | EB | D | A | D | B | | | 444 | 29 | 84 | 0 | | 0 |
| | | WB | A | D | D | B | | | 566 | 27 | 104 | 64 | 32 | 83 |
| | | NW | E | E | E | A | | | 539 | 22 | 75 | 0 | | 0 |
| 4 | Excelsior & Abbott | NB | B | A | A | | 2.7 | A | 304 | 17 | 144 | 0 | | 0 |
| | | SB | A | A | A | | | | 370 | 1 | 22 | 0 | | 0 |
| | | EB | D | A | A | | | | 0 | 24 | 69 | 0 | | 0 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |
| 5 | Excelsior & Calhoun Commons (Signal) | NB | E | A | A | | 7.9 | A | 370 | 63 | 257 | 80 | 77 | 158 |
| | | SB | A | A | A | | | | 86 | 68 | 156 | 0 | | 0 |
| | | EB | E | A | A | | | | 0 | | | 90 | 45 | 102 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |
| 6 | Excelsior and Calhoun Commons- Unsignalized | NB | A | A | A | | 2.2 | A | 86 | 28 | 148 | 0 | | 0 |
| | | SB | A | A | A | | | | 147 | 3 | 67 | 0 | | 0 |
| | | EB | A | A | A | | | | 0 | 1 | 24 | 0 | | 0 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |
| 7 | Lake & Market (Signal) | NB | D | D | C | | 34.8 | C | 88 | 64 | 97 | 0 | 90 | 100 |
| | | SB | D | D | C | | | | 401 | 85 | 221 | 150 | 51 | 166 |
| | | EB | C | D | D | | | | 1381 | 435 | 678 | 250 | 100 | 329 |
| | | WB | D | C | B | | | | 271 | 270 | 358 | 110 | 81 | 180 |
| 8 | Market and Shopping Access | NB | A | B | - | | 16.1 | C | 35 | 42 | 55 | 0 | | 0 |
| | | SB | - | B | A | | | | 88 | 52 | 111 | 0 | | 0 |
| | | EB | E | - | D | | | | 0 | | | 0 | 80 | 197 |
| 9 | Excelsior & Market (Signal) | NB | E | E | D | | 23.0 | C | 461 | 83 | 205 | 0 | | 0 |
| | | SB | C | C | A | | | | 35 | 38 | 46 | 0 | | 0 |
| | | EB | E | B | A | | | | 147 | 142 | 234 | 90 | 92 | 140 |
| | | WB | C | C | D | | | | 231 | 162 | 288 | 125 | 19 | 132 |
| 10 | W Calhoun Pkwy & W 32nd Street | NB | F | F | A | | 43.8 | E | 726 | 242 | 609 | 0 | | 0 |
| | | SB | A | A | A | | | | 606 | 9 | 82 | 0 | | 0 |
| | | EB | F | A | A | | | | 0 | 22 | 32 | 0 | | 0 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |
| 10a | W Calhoun Blvd & W 32nd Street | NB | A | A | A | | 60.4 | F | 0 | | | 0 | | 0 |
| | | SB | F | A | F | | | | 0 | 84 | 180 | 0 | | 0 |
| | | EB | A | F | A | | | | 216 | 3 | 16 | 0 | | 0 |
| | | WB | A | A | A | | | | 12 | | 4 | 0 | | 0 |
| 11 | W Calhoun Pkwy & Parking Lot | NB | F | F | A | | 91.4 | F | 606 | 303 | 528 | 0 | | 0 |
| | | SB | A | A | A | | | | 867 | 11 | 71 | 0 | | 0 |
| | | EB | F | A | F | | | | 0 | 121 | 203 | 0 | | 0 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |
| 12 | Excelsior & Parking Lot | NB | D | A | A | | 3.2 | A | 244 | 13 | 49 | 0 | | 0 |
| | | SB | A | E | B | | | | 91 | 13 | 42 | 0 | | 0 |
| | | EB | B | A | A | | | | 231 | 6 | 75 | 0 | | 0 |
| | | WB | B | A | A | | | | 202 | 13 | 124 | 0 | | 0 |
| 13 | Lake & Shopping Access | NB | A | A | F | | 7.9 | A | 0 | | | 0 | | 0 |
| | | SB | F | A | D | | | | 295 | 12 | 76 | 0 | | 0 |
| | | EB | B | A | A | | | | 271 | 68 | 336 | 62 | 11 | 109 |
| | | WB | A | A | A | | | | 129 | 19 | 114 | 0 | | 0 |
| 14 | Excelsior & Lake (Signal) | NB | A | A | C | A | 20.5 | C | 202 | 122 | 268 | 0 | | 0 |
| | | SB | A | C | A | A | | | 350 | 168 | 363 | 0 | | 0 |
| | | EB | B | C | B | A | | | 129 | 181 | 238 | 45 | 179 | 232 |
| | | WB | A | A | A | B | | | 13 | 17 | 49 | 0 | | 0 |
| | | SE | A | A | A | A | | | 0 | | | 0 | | 0 |
| 15 | Lake & Dean Pkwy/W Calhoun Pkwy (Signal) | NB | F | F | F | | 57.6 | E | 867 | 682 | 881 | 60 | 77 | 85 |
| | | SB | F | F | F | | | | 564 | 580 | 580 | 70 | 92 | 130 |
| | | EB | D | C | B | | | | 350 | 443 | 567 | 185 | 142 | 285 |
| | | WB | D | A | B | | | | 203 | 87 | 199 | 130 | 50 | 130 |
| 16 | Cedar Lake & Burnham | NB | A | A | A | | 2.2 | A | 0 | | | 0 | | 0 |
| | | SB | C | A | A | | | | 0 | 4 | 29 | 0 | | 0 |
| | | EB | A | A | A | | | | 1094 | 41 | 165 | 0 | | 0 |
| | | WB | A | A | A | | | | 722 | 1 | 29 | 0 | | 0 |
| 17 | Lake & Unsignalized Dean Pkwy | NB | A | A | A | | 5.6 | A | 0 | | | 0 | | 0 |
| | | SB | A | A | A | | | | 0 | | | 0 | | 0 |
| | | EB | A | A | A | | | | 203 | 21 | 177 | 0 | | 0 |
| | | WB | A | A | A | | | | 400 | 41 | 401 | 0 | | 0 |
| 18 | Lake & Thomas (Signal) | NB | C | A | A | | 25.7 | C | 190 | 3 | 27 | 0 | | 0 |
| | | SB | D | F | C | | | | 352 | 14 | 82 | 0 | | 0 |
| | | EB | C | C | A | | | | 400 | 324 | 424 | 340 | 33 | 78 |
| | | WB | F | C | D | | | | 1960 | 345 | 662 | 0 | | 0 |
| 19 | Lagoon & E Calhoun Pkwy (Signal) | NB | C | C | A | | 22.0 | C | 165 | 164 | 205 | 0 | 112 | 185 |
| | | SB | A | D | A | | | | 560 | 101 | 218 | 0 | | 0 |
| | | EB | A | A | A | | | | 0 | | | 0 | | 0 |
| | | WB | B | C | B | | | | 1144 | 216 | 322 | 0 | | 0 |
| 20 | Lake & E Calhoun Pkwy (Signal) | NB | A | F | F | | 41.6 | D | 667 | 490 | 634 | 0 | | 0 |
| | | SB | D | D | A | | | | 165 | 94 | 175 | 0 | 64 | 135 |
| | | EB | B | B | B | | | | 360 | 232 | 418 | 0 | | 0 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |

As a result of the operation and extended traffic queues described above at the intersection of Lake Street with Dean Parkway/West Calhoun Parkway, West Calhoun Parkway intersections to the south are adversely impacted. The northbound queue on West Calhoun Parkway extends upstream to the Executive Center Driveway and also to West 32nd Street in the model. These queues block the two intersections resulting in poor LOS at each intersection as shown in Table 7-2.

- The Executive Center Driveway intersection at West Calhoun Parkway (Intersection 11) operates at LOS F with the northbound and eastbound movements operating at LOS F.
- The West 32nd Street intersection at West Calhoun Parkway (Intersection 10) operates at LOS E with the northbound approach at LOS F and the eastbound left turn operating at LOS F.
- The blocking which occurs at the West 32nd Street intersection with West Calhoun Parkway impacts the Calhoun Boulevard intersection with West 32nd Street just 60-feet to the west (Intersection 10a). As a result the intersection operates at a LOS F. The southbound approach is unable to turn onto West 32nd in either direction as it is blocked by the eastbound approach to the parkway (LOS F at the eastbound through and southbound right and left).

Because several intersections along West Calhoun Parkway are impacted by the operations at the Dean Parkway/ West Calhoun Parkway intersection with Lake Street, future conditions analysis will be conducted to determine if traffic signal or geometric modifications yield improved operations and reduce the extended queues.

**Other Intersections**

The intersection of Market Plaza and the Calhoun Commons Driveway operates at LOS C, as do the intersections immediately to the north and south at Lake Street and Excelsior Boulevard, respectively. The full access driveway intersection is located along a 200-foot segment (stop bar to stop bar distance) of Market Plaza resulting in several movements occurring within a short distance. The eastbound left does experience some difficulty entering Market Plaza with an LOS E for the movement (Intersection 8). Routing traffic differently within the site may improve this operation and motorists experiencing delay may select another option if made aware of the other site access locations.

At the intersection of Lake Street and France Avenue the eastbound left turn experiences LOS F with over 114 seconds of delay per vehicle. This left turn is served with a protected signal phase (green arrow) and there were 279 left turns recorded during data collection (Intersection 1, Appendix B).

Analysis at the Lake Street intersection with East Calhoun Parkway showed that the intersection operates at LOS D. The northbound approach including 258 through vehicles and 41 right-turns experiences LOS F with average delay of 198 seconds per vehicle (3 minutes 18 seconds). The eastbound Lake Street approach, which has a volume over 2,000 vehicles during the PM peak, operates at LOS B (Intersection 20, Appendix B).

Traffic signal timing and spot geometric improvements may yield improved operations for the left turns and the side street approaches at these Lake Street intersections.

## 2040 TRAFFIC OPERATIONS ANALYSIS – NO BUILD

Analysis of future conditions for auto traffic was conducted at intersections within the West Lake Study Area. The analysis was conducted using future traffic volumes under existing conditions, or in other words, without improvements or changes to the street network. The following describes the results obtained from the analysis. Traffic operations analysis was performed for 20 intersections in the study area, primarily along Lake Street and Excelsior Boulevard to understand and document how effectively automobiles will be able to navigate through the study area in the future and to provide a metric for comparison as proposed recommendations are tested.

The automobile traffic operations analysis includes several factors:

- The number of autos at each intersection (2040 Forecast Traffic Volumes)
- The existing geometry at each intersection (Number of Lanes)
- The amount of time autos spend at each intersection (Delay)
- How much space waiting autos need (Queuing Distances)
- The existing traffic signal cycle lengths
  - AM peak hour – 130-seconds
  - PM peak hour – 140-seconds

The traffic signal offsets and phasing splits were optimized to provide more green time to heavier movements and encourage progression. Generally, the overall system experienced benefit from the optimized splits and off sets used in the 2040 analysis despite the higher traffic volumes.

## SYNCHRO/SIMTRAFFIC ANALYSIS RESULTS – 2040

**AM Peak Hour**

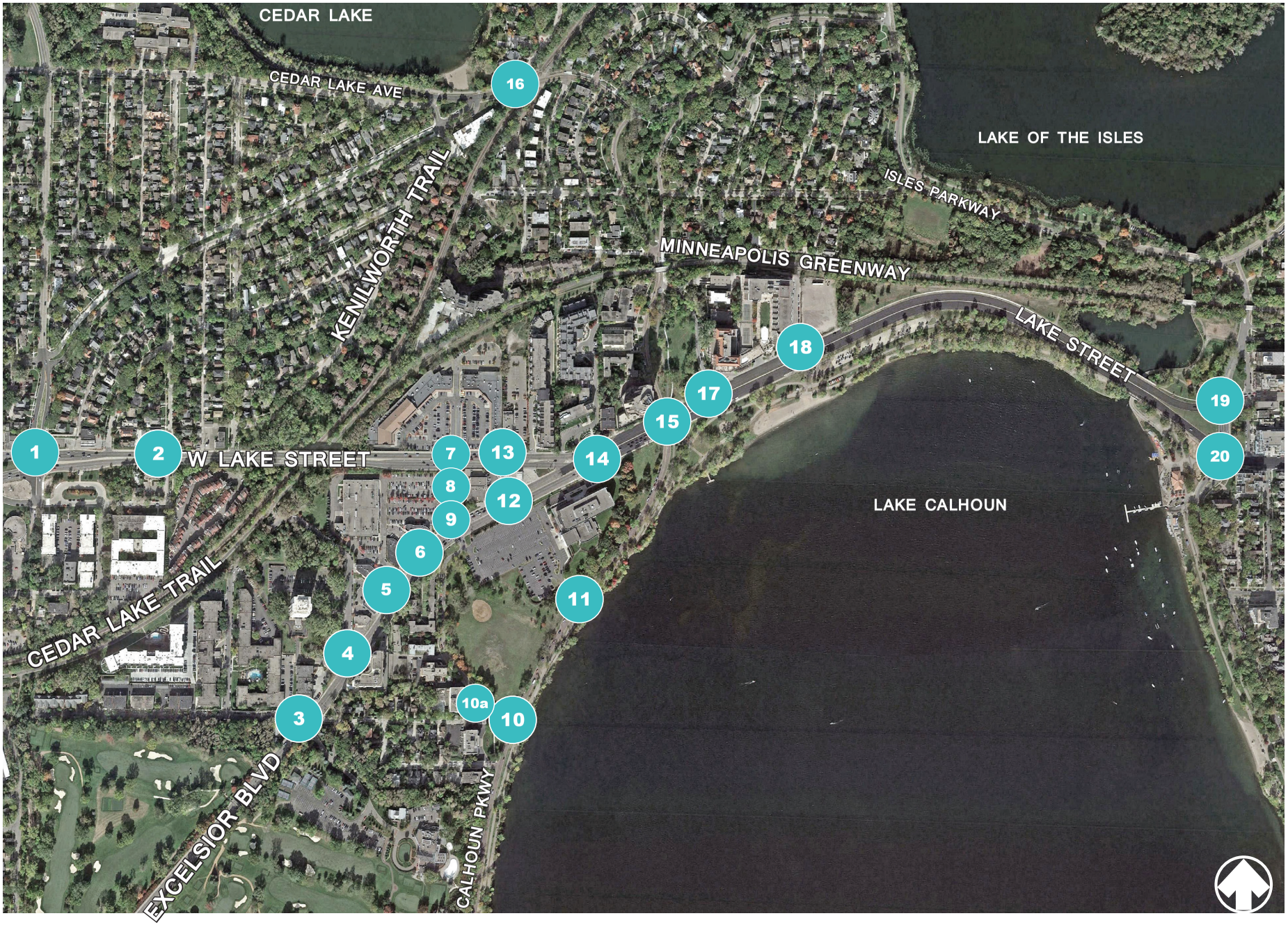
The operations analysis results during the AM peak hour are summarized in Figures 7-11 through 7-15 which display the overall intersection LOS and highlights the specific movements with LOS E or F. The detailed results of the analysis are also tabulated in Appendix B.

Table 7-3 shows that during the AM peak hour the intersections analyzed along Lake Street and Excelsior Boulevard operate at LOS D or better with the exception of Lake Street at Thomas Avenue which operates at LOS E. The westbound movements at this intersection operate at LOS E or F, which impacts the overall intersection operation (Intersection 18).

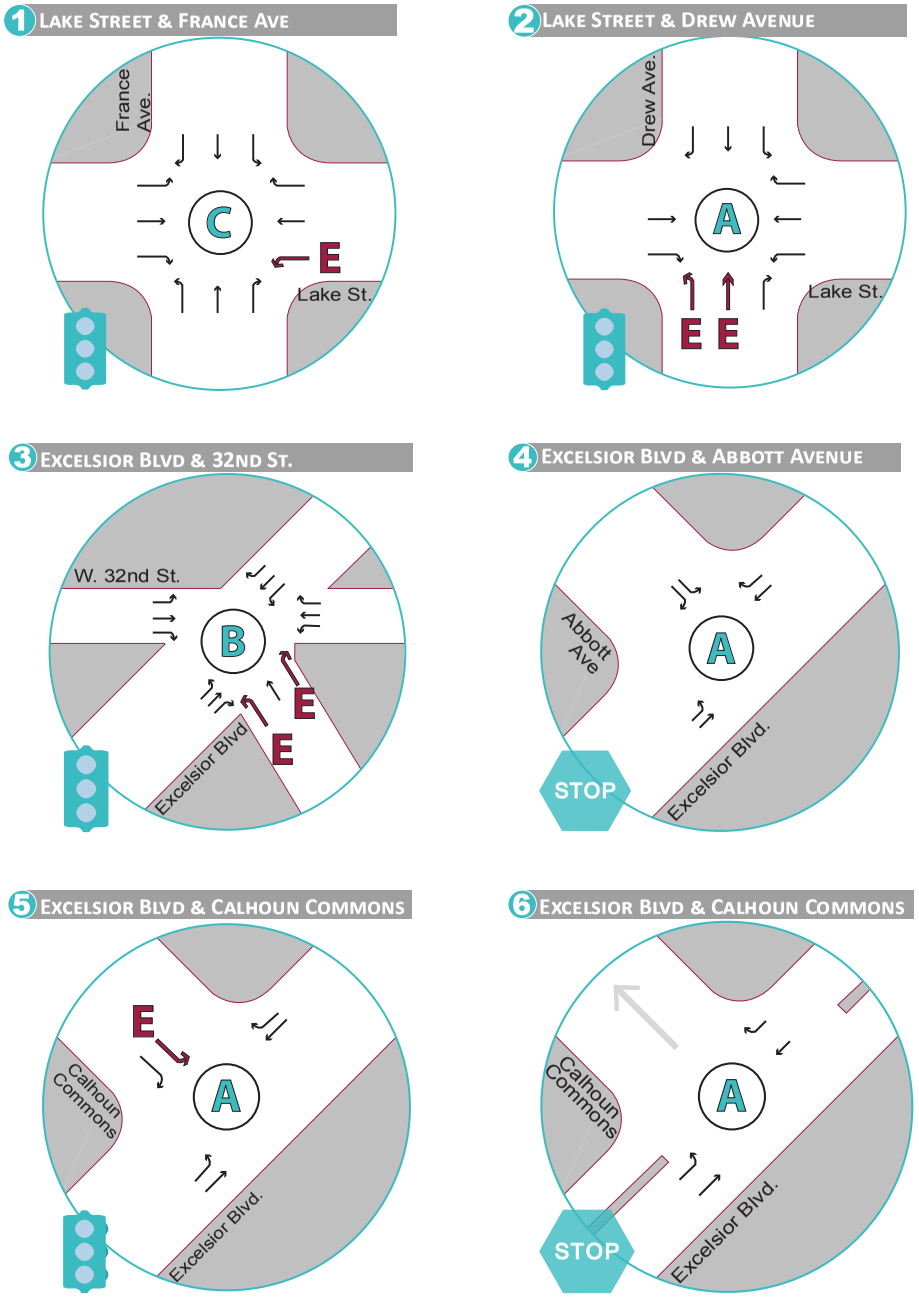
While the Dean Parkway/West Calhoun Parkway intersection overall operates at LOS D, the primary operational issues were found on the northbound and southbound approaches to the intersection which operate at LOS F (Intersection 15). The traffic signal at this location does not have protected phases for the northbound and southbound left turns (no green arrow) which impacts the through and right turn movements as well. The left turn lanes for the southbound and northbound approaches are 60 and 70 feet in length and Table 7-3 shows that the average and maximum left turn queues exceed the available storage. This creates blocking of the shared through/right-turn lane increasing the delay to those movements. The maximum queues for northbound and southbound approaches extend 783 feet and 562 feet, respectively. The average queues extend 380 feet and 359 feet, respectively.

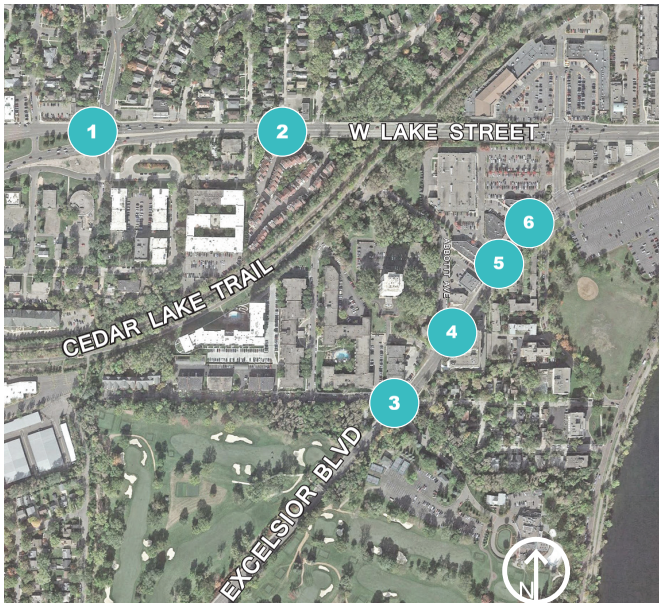
This extended queue issue at the Dean Parkway/West Calhoun Parkway intersection with Lake Street was identified in the analysis of existing conditions as well. Analysis will be conducted as part of the recommendations development phase to determine if traffic signal or geometric yield improved operations and reduce the extended queues.

# FIGURE 7-11
## KEY MAP - 2040 NO BUILD AM INTERSECTION OPERATIONS: AUTO LEVEL OF SERVICE (LOS)



# FIGURE 7-12
## 2040 NO BUILD AM INTERSECTION OPERATIONS: AUTO LEVEL OF SERVICE (LOS)



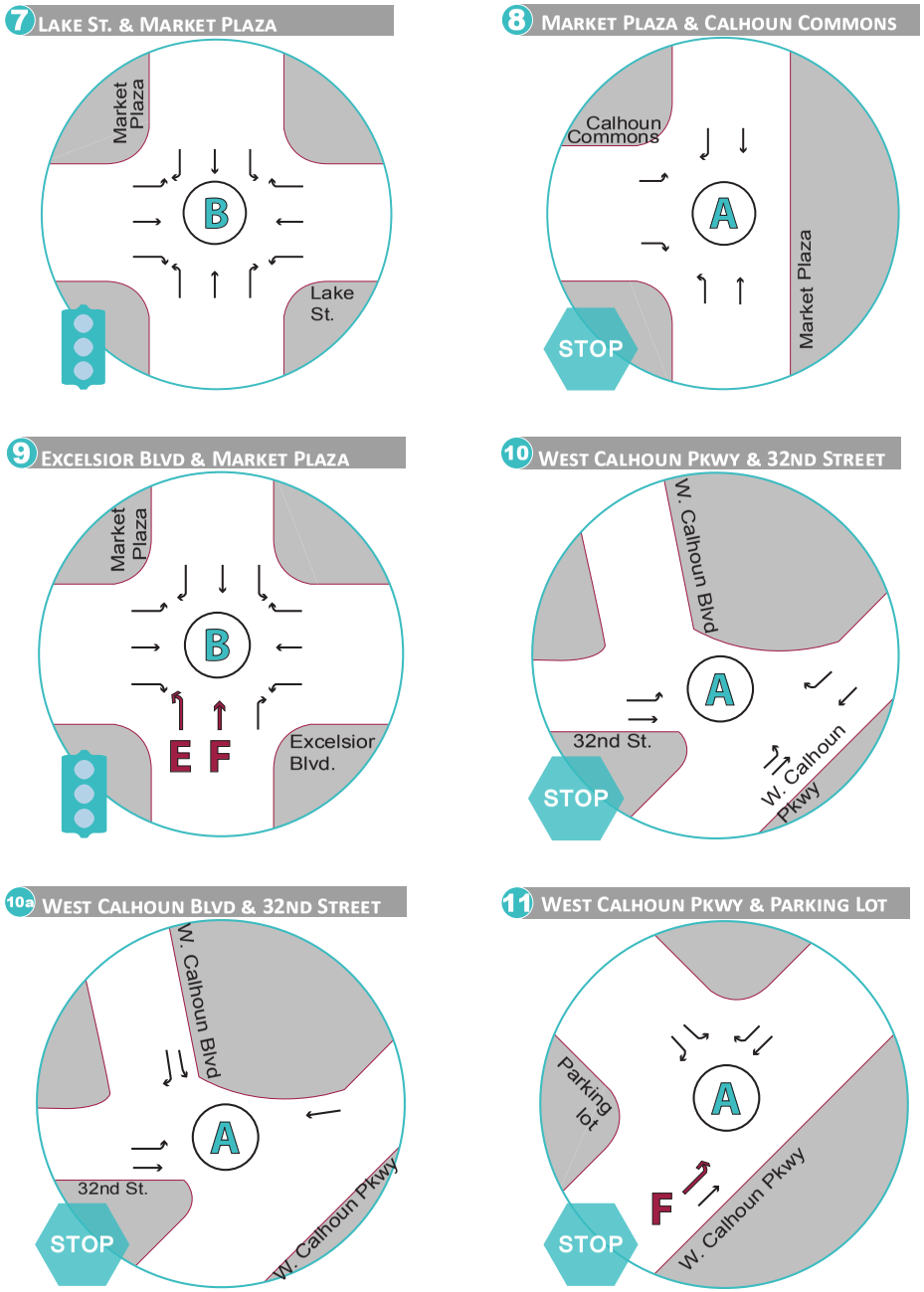




**KEY**

AM INTERSECTION DATA

- E — OVERALL INTERSECTION LEVEL OF SERVICE
- E — MOVEMENT LEVEL OF SERVICE: LOS E OR LOS F
- VEHICLE MOVEMENT

# FIGURE 7-13
## 2040 NO BUILD AM INTERSECTION OPERATIONS: AUTO LEVEL OF SERVICE (LOS)



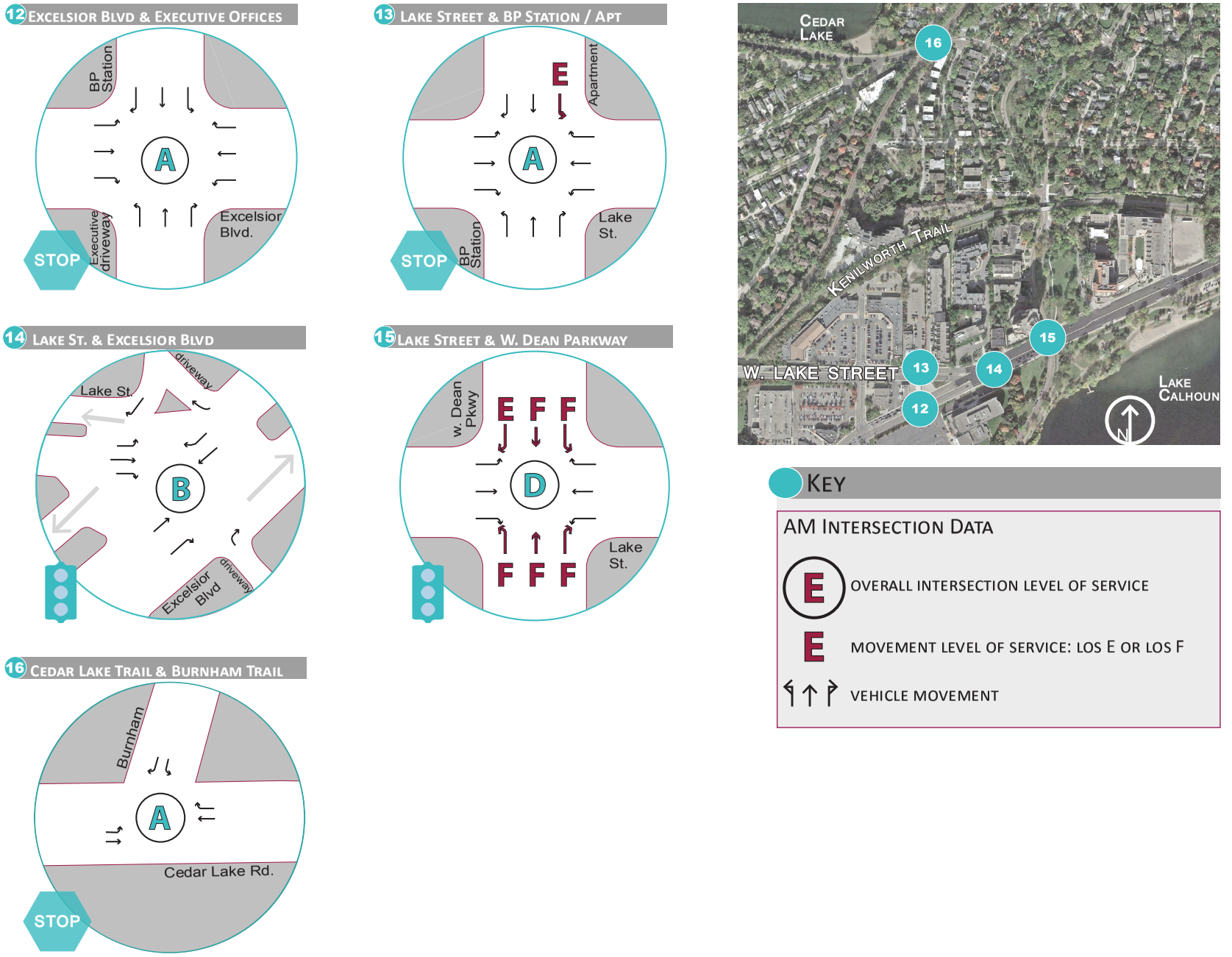


### KEY

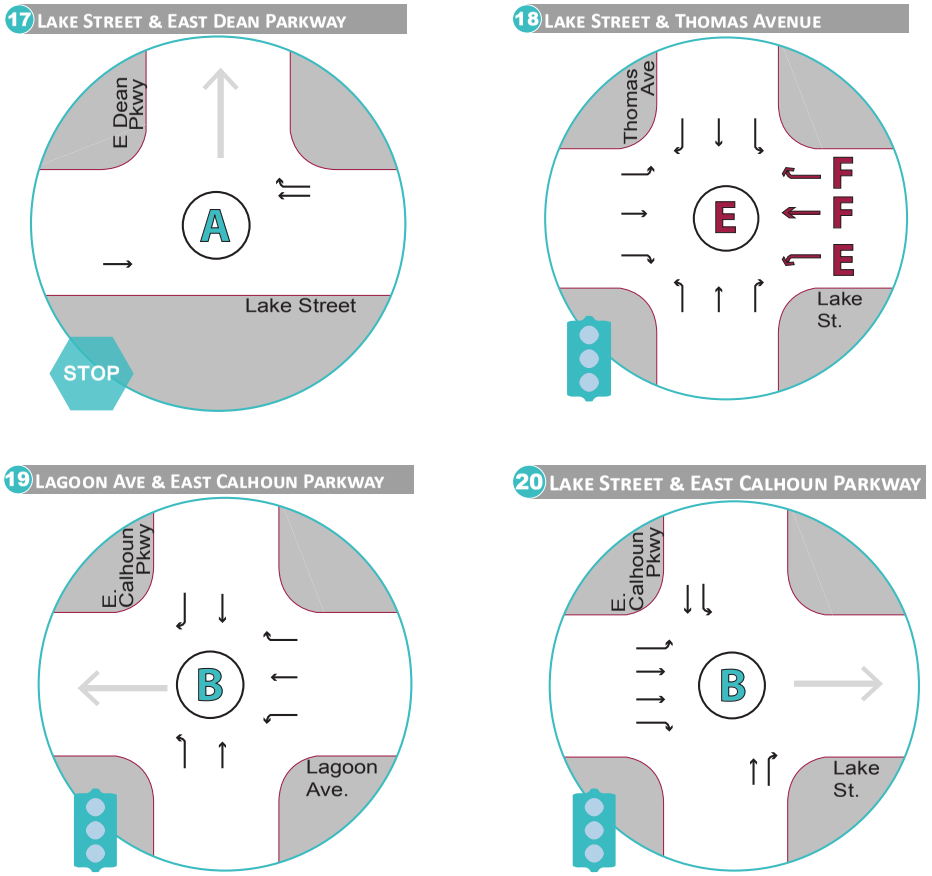
**AM INTERSECTION DATA**

- E — OVERALL INTERSECTION LEVEL OF SERVICE
- E — MOVEMENT LEVEL OF SERVICE: LOS E OR LOS F
- VEHICLE MOVEMENT

# FIGURE 7-14
## 2040 NO BUILD AM INTERSECTION OPERATIONS: AUTO LEVEL OF SERVICE (LOS)



# FIGURE 7-15
## 2040 NO BUILD AM INTERSECTION OPERATIONS: AUTO LEVEL OF SERVICE (LOS)





**KEY**

AM INTERSECTION DATA

E — OVERALL INTERSECTION LEVEL OF SERVICE

E — MOVEMENT LEVEL OF SERVICE: LOS E OR LOS F

VEHICLE MOVEMENT

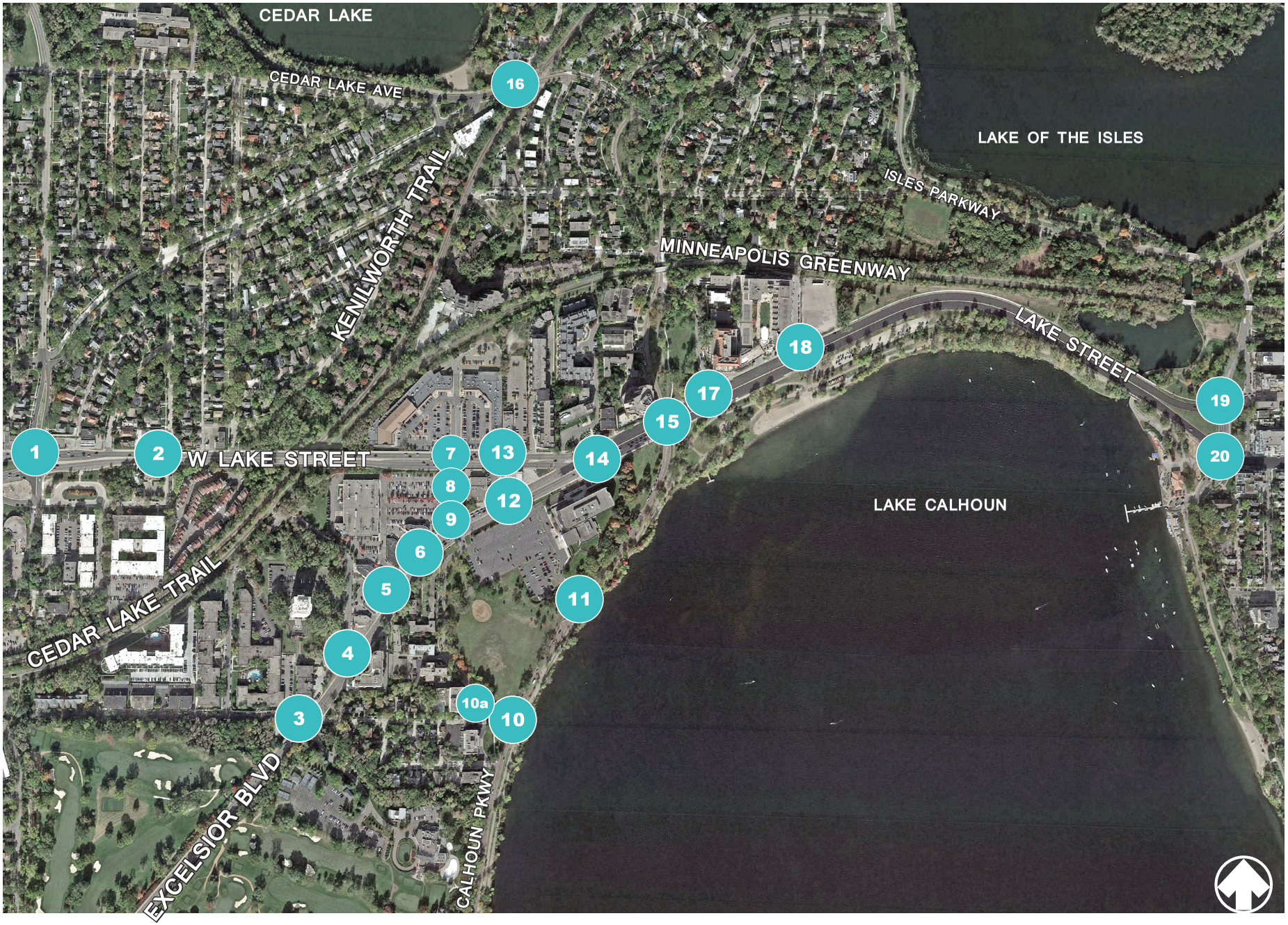
# TABLE 7-3
# 2040 NO BUILD AM PEAK HOUR TRAFFIC OPERATIONS ANALYSIS MEASURES OF EFFECTIVENESS

| # | Intersection | Approach | Level of Sevice | | | | | | Queing Information (feet) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Movement LOS | | | | LOS By Intersection | | Through | | | Left Turn | | |
| | | | LOS | LOS | LOS | LOS | Delay (S/Veh) | LOS | Link Length | Avg. | Max | Storage | Avg. | Max |
| 1 | Lake & France (Signal) | NB | D | D | C | | | | 198 | 56 | 138 | 0 | 30 | 99 |
| | | SB | D | D | C | | 22.4 | C | 230 | 78 | 194 | 30 | 48 | 55 |
| | | EB | D | B | A | | | | 465 | 150 | 345 | 250 | 159 | 308 |
| | | WB | E | B | A | | | | 584 | 170 | 357 | 160 | 27 | 112 |
| 2 | Lake & Drew (Signal) | NB | E | E | B | | | | 446 | 31 | 102 | 0 | | 0 |
| | | SB | D | A | C | | 4.6 | A | 412 | 11 | 72 | 0 | | 0 |
| | | EB | A | A | A | | | | 584 | 43 | 169 | 0 | | 0 |
| | | WB | A | A | A | | | | 1381 | 43 | 150 | 0 | | 0 |
| 3 | Excelsior & 32nd (Signal) | NB | D | B | A | A | | | 1018 | 187 | 322 | 60 | 7 | 77 |
| | | SB | A | D | B | A | 16.5 | B | 304 | 68 | 238 | 0 | | 0 |
| | | EB | D | A | A | C | | | 444 | 86 | 210 | 0 | | 0 |
| | | WB | A | D | C | A | | | 566 | 20 | 78 | 64 | 25 | 74 |
| | | NW | E | A | E | A | | | 539 | 24 | 108 | 0 | | 0 |
| 4 | Excelsior & Abbott | NB | A | A | A | | | | 304 | 7 | 90 | 0 | | 0 |
| | | SB | A | A | A | | 3.3 | A | 369 | 3 | 72 | 0 | | 0 |
| | | EB | C | A | B | | | | 0 | 43 | 120 | 0 | | 0 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |
| 5 | Excelsior & Calhoun Commons (Signal) | NB | D | A | A | | | | 369 | 9 | 84 | 80 | 16 | 65 |
| | | SB | A | A | A | | 3.9 | A | 86 | 81 | 178 | 0 | | 0 |
| | | EB | E | A | A | | | | 0 | | | 90 | 12 | 63 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |
| 6 | Excelsior & Calhoun Commons (Unsignalized) | NB | A | A | A | | | | 86 | 23 | 135 | 0 | | 0 |
| | | SB | A | A | A | | 2.1 | A | 147 | 14 | 128 | 0 | | 0 |
| | | EB | A | A | A | | | | 0 | | 6 | 0 | | 0 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |
| 7 | Lake & Market (Signal) | NB | D | C | B | | | | 88 | 32 | 87 | 0 | 87 | 100 |
| | | SB | D | D | C | | 12.7 | B | 401 | 37 | 147 | 150 | 19 | 89 |
| | | EB | C | B | B | | | | 1381 | 121 | 306 | 250 | 31 | 108 |
| | | WB | B | A | A | | | | 271 | 84 | 177 | 110 | 43 | 142 |
| 8 | Market & Shopping Access | NB | A | A | A | | | | 35 | 35 | 57 | 0 | | 0 |
| | | SB | A | A | A | | 6.7 | A | 88 | 29 | 98 | 0 | | 0 |
| | | EB | C | A | C | | | | 0 | | | 0 | 25 | 60 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |
| 9 | Excelsior & Market (Signal) | NB | E | F | D | | | | 461 | 57 | 204 | 0 | | 0 |
| | | SB | C | B | A | | 12.5 | B | 35 | 35 | 66 | 0 | | 0 |
| | | EB | B | B | A | | | | 147 | 156 | 248 | 90 | 72 | 140 |
| | | WB | A | A | A | | | | 231 | 42 | 210 | 125 | 3 | 45 |
| 10a | W Calhoun Blvd & W 32nd Street | NB | A | A | A | | | | 0 | | | 0 | | 0 |
| | | SB | A | A | A | | 3.3 | A | 0 | 20 | 52 | 0 | | 0 |
| | | EB | A | A | A | | | | 216 | 1 | 12 | 0 | | 0 |
| | | WB | A | A | A | | | | 12 | | 4 | 0 | | 0 |
| 10 | W Calhoun Pkwy & W 32nd Street | NB | A | A | A | | | | 726 | 11 | 110 | 0 | | 0 |
| | | SB | A | A | A | | 1.4 | A | 0 | | | 0 | | 0 |
| | | EB | A | A | A | | | | 0 | 19 | 36 | 0 | | 0 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |
| 11 | W Calhoun Pkwy & Parking Lot | NB | A | A | A | | | | 606 | 39 | 280 | 0 | | 0 |
| | | SB | A | A | A | | 5.4 | A | 867 | 1 | 14 | 0 | | 0 |
| | | EB | F | A | A | | | | 0 | 17 | 57 | 0 | | 0 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |
| 12 | Excelsior & Parking Lot | NB | C | D | A | | | | 244 | 14 | 53 | 0 | | 0 |
| | | SB | C | A | A | | 3.7 | A | 91 | 16 | 49 | 0 | | 0 |
| | | EB | A | A | A | | | | 231 | 6 | 72 | 0 | | 0 |
| | | WB | B | A | A | | | | 202 | 26 | 146 | 0 | | 0 |
| 13 | Lake & Shopping Access | NB | C | A | B | | | | 56 | 5 | 43 | 0 | | 0 |
| | | SB | E | A | C | | 3.8 | A | 295 | 38 | 104 | 0 | | 0 |
| | | EB | D | A | A | | | | 271 | 12 | 110 | 62 | 17 | 82 |
| | | WB | B | A | A | | | | 129 | 23 | 185 | 0 | | 0 |
| 14 | Excelsior & Lake (Signal) | NB | A | A | C | A | | | 202 | 66 | 216 | 0 | | 0 |
| | | SB | A | D | A | A | 17.9 | B | 350 | 182 | 330 | 0 | | 0 |
| | | EB | C | B | A | A | | | 129 | 120 | 225 | 45 | 100 | 211 |
| | | WB | A | A | A | B | | | 13 | 8 | 44 | 0 | | 0 |
| | | SE | A | A | A | A | | | 0 | | | 0 | | 0 |
| 15 | Lake & Dean Pkwy/W Calhoun Pkwy (Signal) | NB | F | F | F | | | | 867 | 380 | 783 | 60 | 61 | 85 |
| | | SB | F | F | E | | 45.4 | D | 564 | 359 | 562 | 70 | 96 | 129 |
| | | EB | D | C | B | | | | 350 | 313 | 490 | 185 | 141 | 284 |
| | | WB | D | C | C | | | | 215 | 221 | 262 | 130 | 40 | 136 |
| 16 | Cedar Lake & Burnham | NB | A | A | A | | | | 0 | | | 0 | | 0 |
| | | SB | D | A | A | | 3.3 | A | 0 | 10 | 52 | 0 | | 0 |
| | | EB | B | A | A | | | | 1094 | 51 | 284 | 0 | | 0 |
| | | WB | A | A | A | | | | 722 | 3 | 60 | 0 | | 0 |
| 17 | Lake & Unsignalized Dean Pkwy | NB | A | A | A | | | | 0 | | | 0 | | 0 |
| | | SB | A | A | A | | 8.8 | A | 0 | | | 0 | | 0 |
| | | EB | A | A | A | | | | 215 | 1 | 36 | 0 | | 0 |
| | | WB | A | B | C | | | | 400 | 316 | 458 | 0 | | 0 |
| 18 | Lake & Thomas (Signal) | NB | C | D | A | | | | 188 | 9 | 61 | 0 | | 0 |
| | | SB | C | A | C | | 79.1 | E | 352 | 20 | 112 | 0 | | 0 |
| | | EB | D | B | A | | | | 400 | 161 | 310 | 340 | 27 | 93 |
| | | WB | E | F | F | | | | 1959 | 1007 | 1404 | 0 | | 0 |
| 19 | Lagoon & E Calhoun Pkwy (Signal) | NB | A | A | A | | | | 165 | 13 | 59 | 0 | 22 | 88 |
| | | SB | A | D | A | | 17.2 | B | 560 | 23 | 74 | 0 | | 0 |
| | | EB | A | A | A | | | | 0 | | | 0 | | 0 |
| | | WB | B | B | A | | | | 1144 | 231 | 346 | 0 | | 0 |
| 20 | Lake & E Calhoun Pkwy (Signal) | NB | A | D | B | | | | 667 | 178 | 332 | 0 | | 0 |
| | | SB | C | B | A | | 15.1 | B | 165 | 8 | 40 | 0 | 24 | 97 |
| | | EB | A | A | A | | | | 360 | 119 | 320 | 0 | | 0 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |

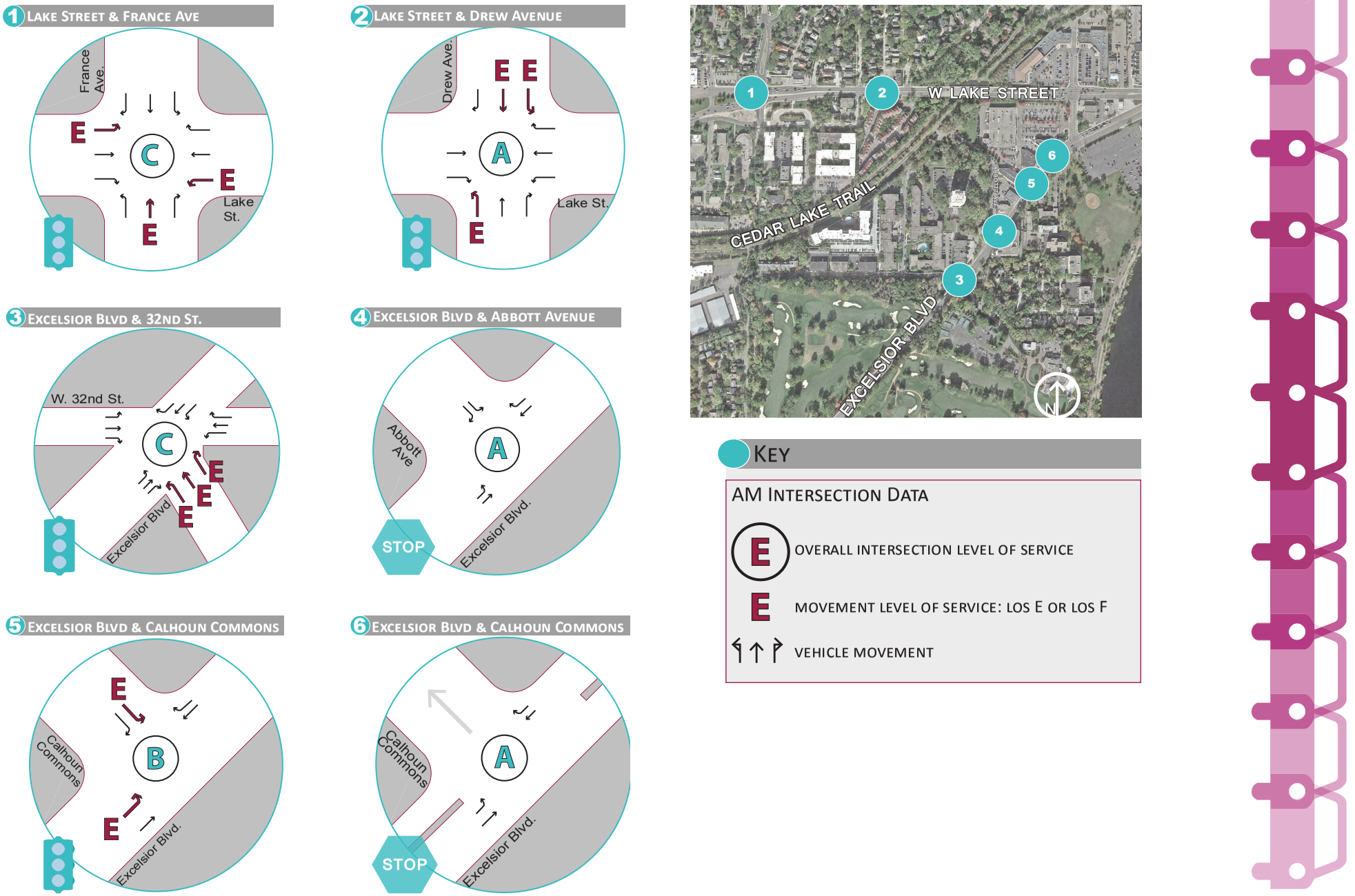
**PM Peak Hour**

The operations analysis results during the PM peak hour are summarized in Figures 7-16 through 7-20 which display the overall intersection LOS and highlights the specific movements with LOS E or F. The detailed results of the analysis are also tabulated in Appendix B.

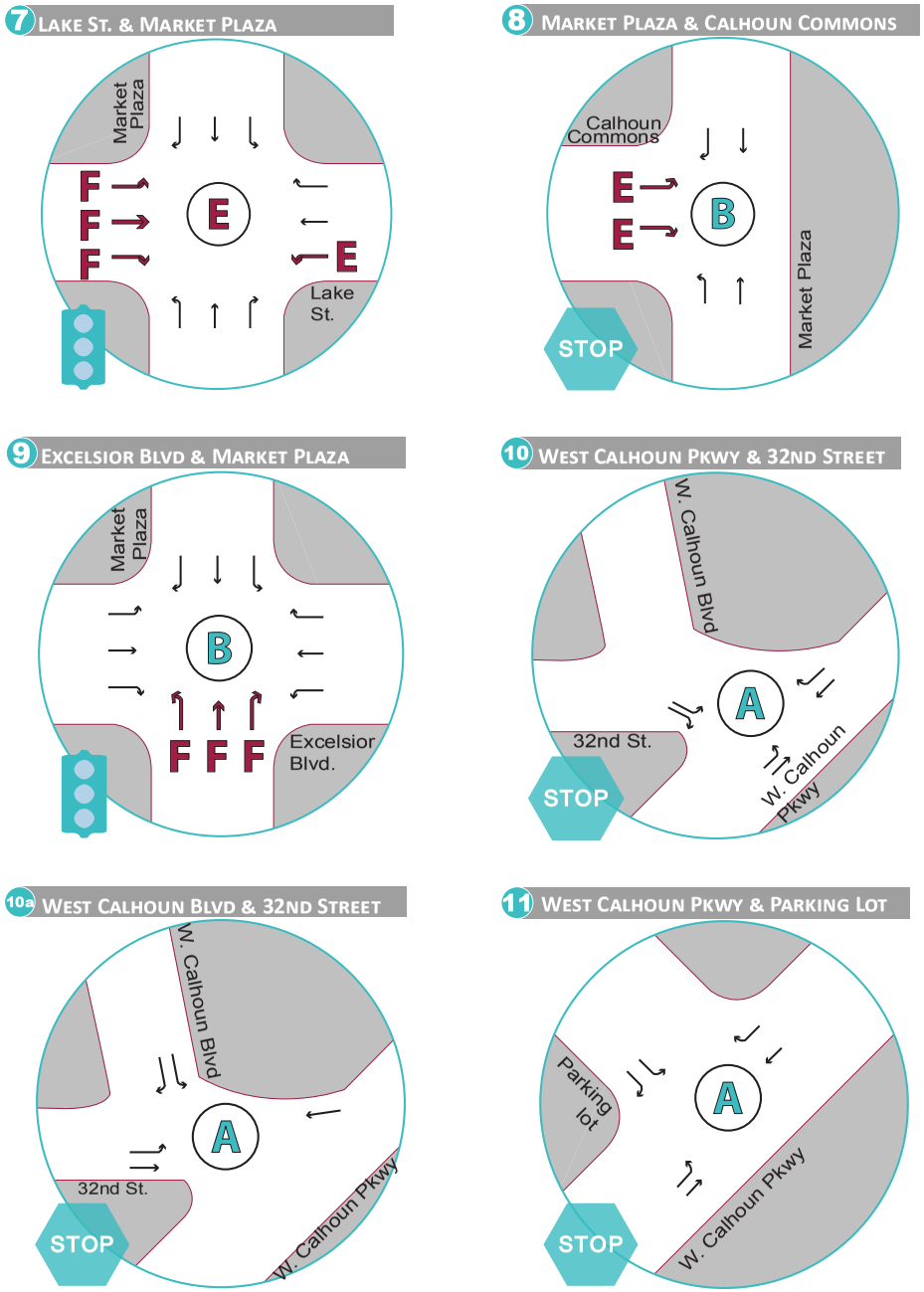
# FIGURE 7-16
## KEY MAP - 2040 NO BUILD PM INTERSECTION OPERATIONS: AUTO LEVEL OF SERVICE (LOS)



# FIGURE 7-17
## 2040 NO BUILD PM INTERSECTION OPERATIONS: AUTO LEVEL OF SERVICE (LOS)



# FIGURE 7-18
## 2040 NO BUILD PM INTERSECTION OPERATIONS: AUTO LEVEL OF SERVICE (LOS)



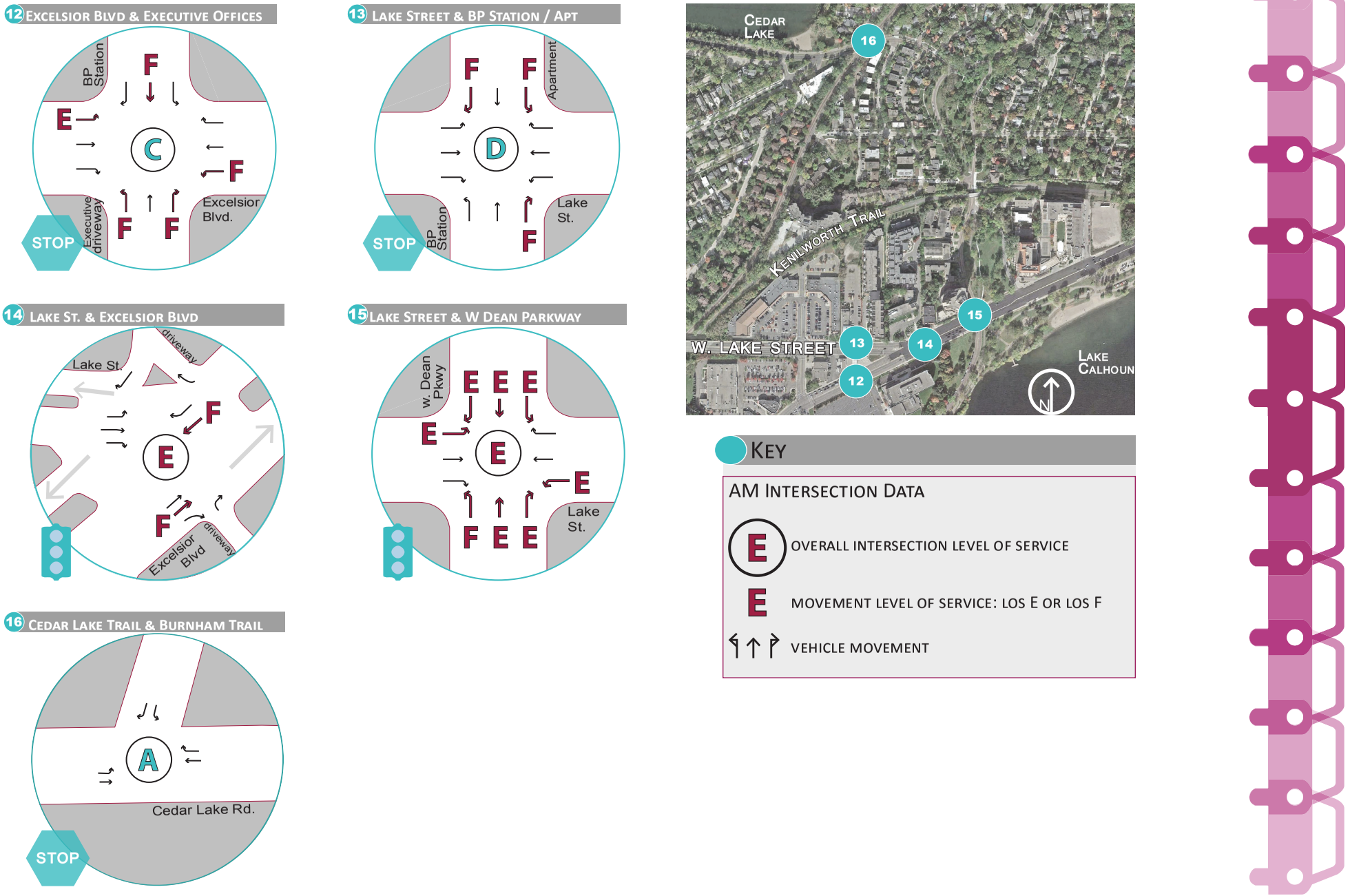


**KEY**

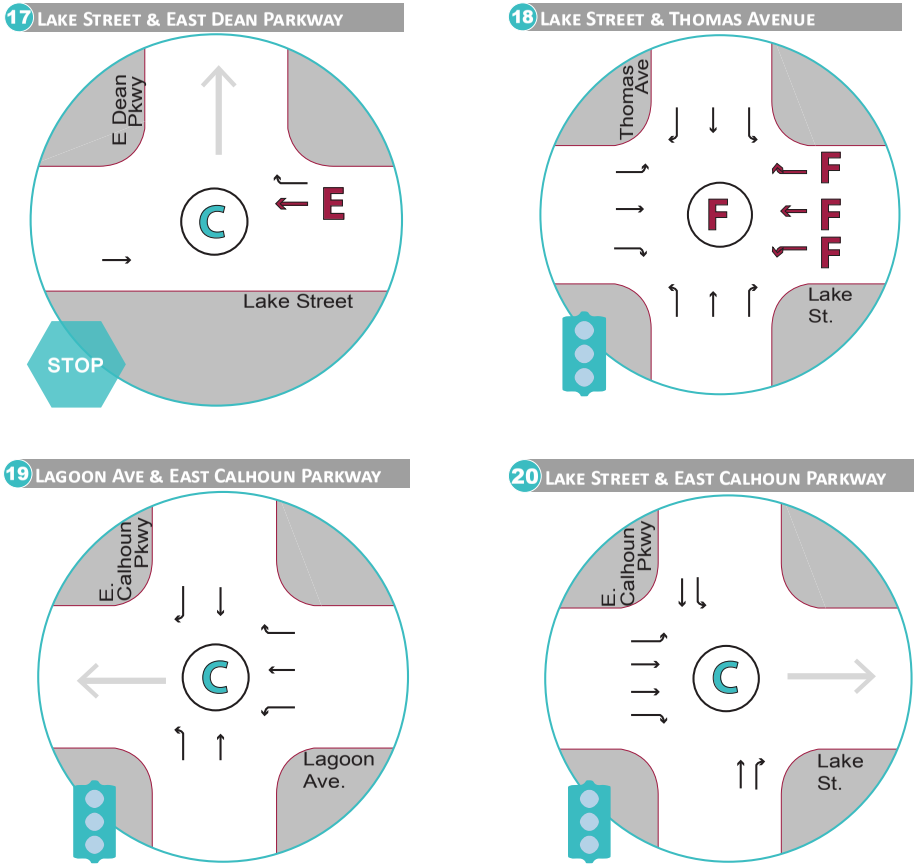
AM INTERSECTION DATA

- E — OVERALL INTERSECTION LEVEL OF SERVICE
- E — MOVEMENT LEVEL OF SERVICE: LOS E OR LOS F
- VEHICLE MOVEMENT

# FIGURE 7-19
## 2040 NO BUILD PM INTERSECTION OPERATIONS: AUTO LEVEL OF SERVICE (LOS)



# FIGURE 7-20
## 2040 NO BUILD PM INTERSECTION OPERATIONS: AUTO LEVEL OF SERVICE (LOS)





**KEY**

AM INTERSECTION DATA

E — OVERALL INTERSECTION LEVEL OF SERVICE

E — MOVEMENT LEVEL OF SERVICE: LOS E OR LOS F

VEHICLE MOVEMENT

The operations analysis results for the intersections along Lake Street and Excelsior Boulevard during the PM peak hour are summarized in Table 7-4. The table shows that four of these intersections operate at LOS E or F with the others operating at LOS D or better. The four intersections include:

- Intersection 7 - Lake Street and Market Plaza – LOS E
- Intersection 14 - Excelsior Boulevard and Lake Street – LOS E
- Intersection 15 - Lake Street and Dean Parkway/W. Calhoun Parkway – LOS E
- Intersection 18 - Lake Street and Thomas Avenue – LOS F

A primary issue with these intersections is congestion that results in the traffic operations model being unable to completely serve the vehicle demand. At-capacity conditions in this area of closely spaced intersections are difficult to replicate within the Synchro/SimTraffic model (19 model runs were required to obtain 5 acceptable runs from which to average data). However, the model results still allowed for identification of certain vehicle turning movements and signal phasing modifications that could positively impact future traffic operations as part of the project recommendations. For example, signal phasing changes might be used to address issues experienced along Lake Street and also the cross streets which receive limited green time and have no physical space within the right-of-way for additional lane capacity. This analysis will be conducted for the development and evaluation of potential recommendations.

Similar to the AM peak hour, operational issues were found on the northbound and southbound approaches to the Dean Parkway/West Calhoun Parkway intersection which operate at LOS F and E with delays in excess of 180 seconds per vehicle, or 3 minutes (Appendix B). The traffic signal timing at this location provides no protected phase (no green arrow) for the left turns on these legs. The left turn lanes for the southbound and northbound approaches are 60 and 70 feet in length and Table 7-4 shows the average and maximum left turn queues exceed the available storage. This creates blocking of the shared through/right-turn lane increasing the delay to those movements.

The intersection of Market Plaza and the Calhoun Commons Driveway operates at LOS B, as does the intersection immediately to the south at Excelsior Boulevard. The full access driveway intersection is located along a 200- foot segment (stop bar to stop bar distance) of Market Plaza resulting in several movements occurring within a short distance. The eastbound left and right turns do experience difficulty entering Market Plaza with LOS E for both movements (Intersection 8). This leads to maximum queues into the parking lot of 178 and 144-feet respectively. Routing traffic differently within the site may improve this operation and motorists experiencing delay may select another option if made aware of the other site access locations. Options to address future issues at the intersection will be explored further and discussed in the Final Recommendations Report.

# TABLE 7-4
# 2040 PM PEAK HOUR TRAFFIC OPERATIONS ANALYSIS MEASURES OF EFFECTIVENESS

| # | Intersection | Approach | Level of Sevice | | | | | | Queing Information (feet) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Delay (s/veh) | | | | LOS By Intersection | | Through | | | Left Turn | | |
| | | | LOS | LOS | LOS | LOS | Delay (S/Veh) | LOS | Link Length | Avg. | Max | Storage | Avg. | Max |
| 1 | Lake & France (Signal) | NB | D | E | C | | | | 198 | 76 | 180 | 0 | 18 | 75 |
| | | SB | D | D | C | | 34.6 | C | 230 | 155 | 245 | 30 | 52 | 55 |
| | | EB | E | C | A | | | | 465 | 335 | 491 | 250 | 251 | 330 |
| | | WB | E | D | B | | | | 584 | 322 | 518 | 160 | 77 | 289 |
| 2 | Lake & Drew (Signal) | NB | E | A | C | | | | 446 | 31 | 92 | 0 | | 0 |
| | | SB | E | E | B | | 9.9 | A | 412 | 30 | 90 | 0 | | 0 |
| | | EB | A | B | A | | | | 584 | 96 | 343 | 0 | | 0 |
| | | WB | C | A | A | | | | 1381 | 52 | 199 | 0 | | 0 |
| 3 | Excelsior & 32nd (Signal) | NB | D | C | A | A | | | 1018 | 318 | 679 | 60 | 1 | 17 |
| | | SB | A | D | B | A | 23.5 | C | 304 | 116 | 237 | 0 | | 0 |
| | | EB | D | A | A | C | | | 444 | 67 | 177 | 0 | | 0 |
| | | WB | A | D | D | C | | | 566 | 36 | 111 | 64 | 42 | 93 |
| | | NW | E | E | E | A | | | 539 | 22 | 74 | 0 | | 0 |
| 4 | Excelsior & Abbott | NB | B | A | A | | | | 304 | 24 | 206 | 0 | | |
| | | SB | A | A | A | | 3.6 | A | 370 | 2 | 44 | 0 | | |
| | | EB | D | A | C | | | | 0 | 27 | 78 | 0 | | |
| | | WB | A | A | A | | | | 0 | | | 0 | | |
| 5 | Excelsior & Calhoun Commons (Signal) | NB | E | A | A | | | | 370 | 115 | 326 | 80 | 90 | 159 |
| | | SB | A | B | B | | 13.0 | B | 86 | 140 | 176 | 0 | | 0 |
| | | EB | E | A | B | | | | 0 | | | 90 | 55 | 104 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |
| 6 | Excelsior & Calhoun Commons (Unsignalized) | NB | D | A | A | | | | 86 | 30 | 157 | 0 | | 0 |
| | | SB | A | A | A | | 2.8 | A | 147 | 27 | 110 | 0 | | 0 |
| | | EB | A | A | A | | | | 0 | 1 | 12 | 0 | | 0 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |
| 7 | Lake & Market (Signal) | NB | C | C | C | | | | 88 | 67 | 94 | 0 | 84 | 100 |
| | | SB | D | D | D | | 60.6 | E | 401 | 121 | 272 | 150 | 60 | 174 |
| | | EB | F | F | F | | | | 1381 | 695 | 1192 | 250 | 174 | 330 |
| | | WB | E | B | A | | | | 271 | 134 | 319 | 110 | 72 | 179 |
| 8 | Market & Shopping Access | NB | A | A | A | | | | 35 | 36 | 55 | 0 | | 0 |
| | | SB | A | B | A | | 13.0 | B | 88 | 58 | 106 | 0 | | 0 |
| | | EB | E | A | E | | | | 0 | | | 0 | 69 | 178 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |
| 9 | Excelsior & Market (Signal) | NB | F | F | F | | | | 461 | 157 | 332 | 0 | | 0 |
| | | SB | C | C | A | | 19.6 | B | 35 | 39 | 49 | 0 | | 0 |
| | | EB | C | B | A | | | | 147 | 119 | 237 | 90 | 81 | 140 |
| | | WB | C | B | B | | | | 231 | 62 | 168 | 125 | 13 | 104 |
| 10a | W Calhoun Blvd & W 32nd Street | NB | A | A | A | | | | 0 | | | 0 | | 0 |
| | | SB | A | A | A | | 5.9 | A | 0 | 33 | 91 | 0 | | 0 |
| | | EB | A | A | A | | | | 216 | 1 | 12 | 0 | | 0 |
| | | WB | A | A | A | | | | 12 | 1 | 15 | 0 | | 0 |
| 10 | W Calhoun Pkwy & W 32nd Street | NB | A | A | A | | | | 726 | 25 | 100 | 0 | | 0 |
| | | SB | A | A | A | | 2.3 | A | 606 | 9 | 83 | 0 | | 0 |
| | | EB | B | A | A | | | | 0 | 24 | 25 | 0 | | 0 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |
| 11 | W Calhoun Pkwy & Parking Lot | NB | A | A | A | | | | 606 | 29 | 187 | 0 | | 0 |
| | | SB | A | A | A | | 4.2 | A | 867 | 12 | 75 | 0 | | 0 |
| | | EB | B | A | A | | | | 0 | 36 | 109 | 0 | | 0 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |
| 12 | Excelsior & Parking Lot | NB | F | A | F | | | | 244 | 43 | 144 | 0 | | 0 |
| | | SB | A | F | C | | 19.1 | C | 91 | 23 | 87 | 0 | | 0 |
| | | EB | E | C | A | | | | 231 | 132 | 309 | 0 | | 0 |
| | | WB | F | B | A | | | | 202 | 61 | 242 | 0 | | 0 |
| 13 | Lake & Shopping Access | NB | A | A | F | | | | 0 | | | 0 | | 0 |
| | | SB | F | A | F | | 33.1 | D | 295 | 176 | 304 | 0 | | 0 |
| | | EB | C | D | D | | | | 271 | 268 | 375 | 62 | 58 | 147 |
| | | WB | A | A | A | | | | 129 | 5 | 94 | 0 | | 0 |
| 14 | Excelsior & Lake (Signal) | NB | A | A | F | A | | | 202 | 251 | 290 | 0 | | 0 |
| | | SB | A | F | A | A | 60.0 | E | 350 | 373 | 404 | 0 | | 0 |
| | | EB | C | D | C | A | | | 129 | 215 | 238 | 45 | 216 | 248 |
| | | WB | A | A | A | C | | | 13 | 23 | 73 | 0 | | 0 |
| | | SE | A | A | A | A | | | 0 | | | 0 | | 0 |
| 15 | Lake & Dean Pkwy/W Calhoun Pkwy (Signal) | NB | F | E | E | | | | 867 | 245 | 671 | 60 | 61 | 85 |
| | | SB | E | E | E | | 56.2 | E | 564 | 352 | 577 | 70 | 85 | 130 |
| | | EB | E | D | C | | | | 350 | 550 | 573 | 185 | 176 | 285 |
| | | WB | E | D | C | | | | 215 | 215 | 259 | 130 | 75 | 214 |
| 16 | Cedar Lake & Burnham | NB | A | A | A | | | | 0 | | | 0 | | 0 |
| | | SB | C | A | A | | 3.0 | A | 0 | 5 | 30 | 0 | | 0 |
| | | EB | A | A | A | | | | 1094 | 58 | 273 | 0 | | 0 |
| | | WB | A | A | A | | | | 722 | 1 | 31 | 0 | | 0 |
| 17 | Lake & Unsignalized Dean Pkwy | NB | A | A | A | | | | 0 | | | 0 | | 0 |
| | | SB | A | A | A | | 22.1 | C | 0 | | | 0 | | 0 |
| | | EB | A | A | A | | | | 215 | 46 | 248 | 0 | | 0 |
| | | WB | A | E | C | | | | 400 | 313 | 460 | 0 | | 0 |
| 18 | Lake & Thomas (Signal) | NB | D | A | C | | | | 188 | 6 | 42 | 0 | | 0 |
| | | SB | D | C | C | | 91.0 | F | 355 | 15 | 64 | 0 | | 0 |
| | | EB | D | C | A | | | | 400 | 380 | 430 | 340 | 46 | 331 |
| | | WB | F | F | F | | | | 1939 | 924 | 2021 | 0 | | 0 |
| 19 | Lagoon & E Calhoun Pkwy (Signal) | NB | C | B | A | | | | 198 | 94 | 182 | 0 | 80 | 156 |
| | | SB | A | D | B | | 30.8 | C | 560 | 107 | 231 | 0 | | 0 |
| | | EB | A | A | A | | | | 0 | | | 0 | | 0 |
| | | WB | C | D | C | | | | 1144 | 294 | 678 | 0 | | 0 |
| 20 | Lake & E Calhoun Pkwy (Signal) | NB | A | D | C | | | | 641 | 209 | 363 | 0 | | 0 |
| | | SB | C | B | A | | 20.4 | C | 198 | 26 | 80 | 0 | 64 | 156 |
| | | EB | B | B | B | | | | 370 | 236 | 431 | 0 | | 0 |
| | | WB | A | A | A | | | | 0 | | | 0 | | 0 |

## OPERATIONS ANALYSIS FOR BICYCLING, WALKING , & SHARED USE PATHS

To understand the current intersection and trail operations for bicycling and walking, the project team undertook several different analyses. The following presents the methodology and results of analyses of bicycle and pedestrian intersection operations and trail level of service.

### TABLE 7-5
### ANALYSIS APPROACH FOR BICYCLE & PEDESTRIAN INTERSECTIONS & PATHS

| Mode | Location | Metric |
|---|---|---|
| Pedestrian | Intersection | Pedestrian Level of Service |
| Bicycle | Intersection | Bicycle Level of Traffic Stress |
| Both | Point | Trail Level of Service |

The findings show that, while conditions vary across locations, there are many opportunities to reduce stress and delay, and improve the overall bicycle and pedestrian level of service.

## BICYCLE INTERSECTION LEVEL OF STRESS

**Methodology**

A Level of Traffic Stress (LTS) analysis assigns a rating from LTS 1 to LTS 4 to each segment of road, intersection approach, and roadway crossing in a transportation network to gauge the ease or stressfulness of bicycling that section. The Level of Traffic Stress methodology used in this analysis was established by Mekuria, et al, in "Low-Stress Bicycling and Network Connectivity" for the Mineta Transportation Institute[1]. The LTS ratings are defined in table 2. LTS 2 or better is considered a reasonable goal for bicycle infrastructure.

### TABLE 7-6
### LEVEL OF TRAFFIC STRESS RATINGS

| LTS rating: | Generally comfortable for: |
|---|---|
| **LTS-1** | Children on bicycles. |
| **LTS-2** | Adults who are interested in bicycling but concerned about safety. |
| **LTS-3** | Adults who are enthusiastic and confident in their bicycling ability. |
| **LTS-4** | Adults who consider themselves strong and fearless bicyclists. |

[1] Mekuria, Maaza, Peter Furth, and Hilary Nixon, "Low-Stress Bicycling and Network Connectivity," the Mineta Transportation Institute, May 2012.

The goal of the intersection LTS analysis was to rate each intersection approach in the study area to evaluate its impact on bicycling conditions. The stress level is determined by factors related to the intersection approach itself, as well as the characteristics of the street being crossed.

A traffic stress assessment operates on the weakest link principle; each score is composed of several elements and the worst score is the one assigned for the whole. The intersection score combines with the mid-block score to create an overall LTS score for a road segment (as used in the bicycle connectivity analysis), with the most stressful score dictating the overall rating.

The intersection approach score has two primary factors: the experience on the approach to the intersection and the experience of crossing the intersecting street. These two factors can be broken down into individual criteria. Under the weakest link logic, a single element of an intersection leg that heightens the stress of bicycling will negatively affect the score, even if all other elements are considered comfortable.

Factors that affect the stress of an intersection approach include the speed of traffic, the number of travel lanes, the length of the right turn auxiliary lane (if one exists), and the placement of bike lanes (if they exist). The posted speed limit on the roadway is typically used to represent the speed of traffic in the absence of more precise speed

information. If a bike lane is dropped at the intersection or jogs to make way for travel lanes it is considered a more stressful facility. Lengthy right turn auxiliary lanes or wide turning radii increase the stress level. A long right turn lane can place bicyclists between two streams of passing traffic, through traffic on the left and turning traffic on the right. Similarly, a curb radius that permits right turns at high speed will also result in passing streams on both sides of a bicyclist (Table 7-7).

## TABLE 7-7
## FACTORS AFFECTING THE STRESS OF AN INTERSECTION APPROACH

| Configuration | LTS Rating |
|---|---|
| Single right-turn lane with length < 75 ft. and intersection angle and curb radius limit turning speed to 15 mph. | No effect |
| Single right-turn lane with length between 75 and 150 ft., and intersection angle and curb radius limit turning speed to 15 mph. | LTS 3 |
| Otherwise. | LTS 4 |

Factors that affect the stress of crossing a street include the speed limit and number of lanes of the street being crossed. Roadways with lower speeds and fewer lanes, are considered lower stress and roadways with higher speeds and more lanes are considered higher stress. Six lanes at any speed or four lanes with a speed of 35 mph or greater are considered a barrier for most adults (LTS 4). Median refuges lower the level of stress. Signalized intersections are not considered barriers to bicycling. For each intersection crossing, the project team applied the Level of Traffic Stress at Intersections methodology.

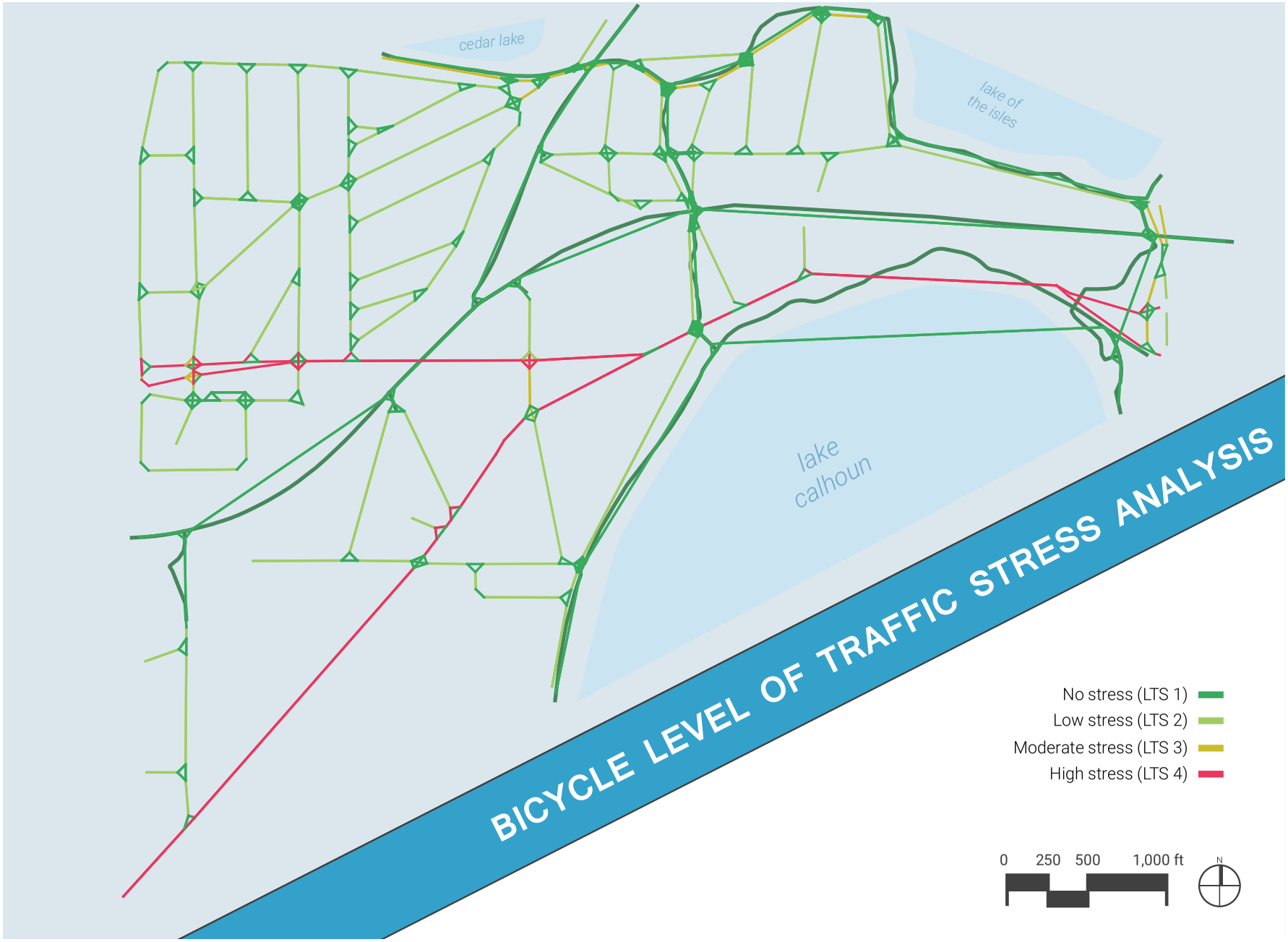
**Results**

The project team developed ratings for each intersection and illustrated them with a color-coded map shown in Figure 7-21[1].

The majority of the intersections received "no stress" ratings, either because of low speeds and few lanes or because the intersection was signalized. The low stress neighborhood streets typically had no stress or low stress crossings. The high stress corridors were more likely to have high stress crossings. At each intersection, each crossing is rated. Thus an intersection may have different ratings for the different approaches.

[1] Note that the map is a schematic map of links and nodes in the study area and does not follow roadway curvature

# FIGURE 7-21
## PROJECT AREA BICYCLE LEVEL OF TRAFFIC STRESS



## TABLE 7-8
## BICYCLE INTERSECTION LEVEL OF TRAFFIC STRESS

| Intersection | Approach | | | |
|---|---|---|---|---|
| | North | South | East | West |
| 1. France Ave & Lake St | LTS 3 | LTS 2 | LTS 4 | LTS 4 |
| 2. Drew Ave & Lake St | LTS 2 | LTS 2 | LTS 4 | LTS 4 |
| 3. Market Plaza & Lake St | LTS 2 | LTS 3 | LTS 4 | LTS 4 |
| 4. Excelsior Blvd & 32nd St W | LTS 4 | LTS 4 | LTS 2 | LTS 2 |
| 5. Excelsior Blvd & Calhoun Common | LTS 4 | LTS 4 | N/A | N/A |
| 6. Excelsior Blvd & Market Plaza | LTS 3 | LTS 2 | LTS 4 | LTS 4 |
| 7. Excelsior Blvd & Lake St | N/A | LTS 4 | LTS 4 | LTS 4 |
| 8. Calhoun Pkwy & Lake St | LTS 2 | LTS 2 | LTS 4 | LTS 4 |
| 9. Thomas Ave & Lake St | LTS 2 | N/A | LTS 4 | LTS 4 |
| 10. Lake Calhoun Pkwy & Lagoon Ave | LTS 4 | LTS 3 | LTS 4 | N/A |
| 11. Lake Calhoun Pkwy & Lake St | LTS 3 | LTS 3 | N/A | LTS 4 |

## PEDESTRIAN INTERSECTION LEVEL OF SERVICE (LOS)

### Methodology

The pedestrian intersection conditions analysis in this study uses the methodology for evaluating pedestrian level of service (LOS) at signalized intersections established in the Highway Capacity Manual 2010[2]. The project team analyzed all 11 signalized intersections in the study area. Unsignalized intersections were not included in the analysis. The analysis was based on the following traffic characteristics: vehicle demand flow rate based on weekday peak-hour volumes, right-turn-on-red flow rate, permitted left-turn flow rate and posted speed limit. Signal control data were also included, including the duration of the pedestrian walk setting, the pedestrian clearance interval (flash don't walk), the cycle length, phase duration, the yellow change interval, and the red clearance interval.

The model used these inputs to calculate LOS factors for vehicle counts, pedestrian delay, vehicle speed, vehicle volumes, and the cross-section characteristics. Using these factors, each crossing at the intersection was assigned a pedestrian LOS score and grade. The overall intersection grade is based on the worst grade assigned to any of the crossings.

## TABLE 7-9
## PEDESTRIAN INTERSECTION LOS SCORES

| LOS | Score |
|---|---|
| A | Less than 2 |
| B | 2 - 2.75 |
| C | 2.75 - 3.5 |
| D | 3.5 - 4.25 |
| E | 4.25 - 5 |
| F | Greater than 5 |

[2] Highway Capacity Manual 2010, Transportation Research Board, Washington, DC, 2010.

**Results**

Table 7-10 displays the results for the 11 intersections, reporting the average pedestrian delay and the LOS score and grade for each crossing, as well as the overall intersection grade based on the most difficult crossing. The longest average pedestrian delay was 60.4 seconds at each of the crossings at Excelsior Boulevard and Lake Street, which has a separate pedestrian phase at a high traffic volume, skewed intersection with long crossing distances. The second longest average delay was 59.4 seconds at Thomas Ave and Lake Street. The shortest average delay was 6.8 seconds at Drew Ave and Lake Street for those crossing Drew Ave. Appendix A shows the location of the signals in the study area.

As described in the methodology, the pedestrian LOS scores and grades account for additional factors related to geometric design and motor vehicle conditions. The pedestrian LOS scores in the West Lake Study area ranged from 2.09 (the best score) at the crosswalk on the north leg of Drew Ave and Lake Street to 3.78 (the worst score) at the east crosswalk at Thomas Ave and Lake Street. The Pedestrian LOS grades, which are based on these scores, range from LOS B to LOS D. Of the 40 crossings in the dataset[3], 21 received a grade of B, 17 received a C, and 3 were operating at LOS D. Based on the worse crossing at each intersection, 8 of the 11 intersections are operating at LOS C; two at LOS D; and one intersection, East Lake Calhoun Parkway and Lake Street, is operating at LOS B. Note that the delay calculations from these results are used as part of the connectivity analysis found in the Circulation, Gaps, and Connectivity section of this report.

## TABLE 7-10
## PEDESTRIAN INTERSECTION LEVEL OF SERVICE ANALYSIS RESULTS

| | | Existing Conditions | | |
|---|---|---|---|---|
| **1. France Ave & Lake St.** | **Movement** | **Delay (sec)** | **LOS Score** | **LOS** |
| | North Crosswalk | 36.4 | 2.56 | B |
| | South Crosswalk | 36.4 | 2.76 | C |
| | East Crosswalk | 59.0 | 3.22 | C |
| | **Worst Score** | 59.0 | 3.22 | C |

| | | Existing Conditions | | |
|---|---|---|---|---|
| **7. Excelsior Blvd & Lake St.** | **Movement** | **Delay (sec)** | **LOS Score** | **LOS** |
| | North Crosswalk | 60.4 | 2.39 | B |
| | South Crosswalk | 60.4 | 3.04 | C |
| | East Crosswalk | 60.4 | 3.25 | C |
| | West Crosswalk | 60.4 | 3.25 | C |
| | **Worst Score** | 60.4 | 3.25 | C |

| | | | | |
|---|---|---|---|---|
| **2. Drew Ave & Lake St** | **Movement** | **Delay (sec)** | **LOS Score** | **LOS** |
| | North Crosswalk | 6.76 | 2.09 | B |
| | South Crosswalk | 6.76 | 2.24 | B |
| | East Crosswalk | 57.6 | 2.84 | C |
| | West Crosswalk | 57.6 | 3.07 | C |
| | **Worst Score** | 57.6 | 3.07 | C |

| | | | | |
|---|---|---|---|---|
| **8. Calhoun Pkwy & Lake St** | **Movement** | **Delay (sec)** | **LOS Score** | **LOS** |
| | North Crosswalk | 24.9 | 2.69 | B |
| | South Crosswalk | 24.9 | 2.57 | B |
| | East Crosswalk | 57.6 | 3.78 | D |
| | West Crosswalk | 57.6 | 2.72 | D |
| | **Worst Score** | 57.6 | 3.78 | D |

| | | | | |
|---|---|---|---|---|
| **3. Market Plaza & Lake St** | **Movement** | **Delay (sec)** | **LOS Score** | **LOS** |
| | North Crosswalk | 30.6 | 2.47 | B |
| | South Crosswalk | 30.6 | 2.59 | B |
| | East Crosswalk | 58.1 | 3.11 | C |
| | West Crosswalk | 58.1 | 2.9 | C |
| | **Worst Score** | 58.1 | 3.11 | C |

| | | | | |
|---|---|---|---|---|
| **9. Thomas Ave & Lake St** | **Movement** | **Delay (sec)** | **LOS Score** | **LOS** |
| | North Crosswalk | 19.0 | 2.42 | B |
| | South Crosswalk | 19.6 | 2.54 | B |
| | East Crosswalk | 59.4 | 3.43 | C |
| | West Crosswalk | 59.4 | 3.68 | D |
| | **Worst Score** | 59.4 | 3.68 | D |

[3] Not all of the eleven intersections have four crossings.

# PEDESTRIAN INTERSECTION LEVEL OF SERVICE ANALYSIS RESULTS, CONTINUED

| 4. Excelsior Blvd & 32nd St W | Movement | Delay (sec) | LOS Score | LOS |
|---|---|---|---|---|
| | North Crosswalk | 58.5 | 2.74 | B |
| | South Crosswalk | 58.5 | 3.21 | C |
| | East Crosswalk | 24.3 | 2.53 | B |
| | West Crosswalk | 24.3 | 2.18 | B |
| | **Worst Score** | 58.5 | 3.21 | C |

| 5. Excelsior Blvd & Calhoun Common | Movement | Delay (sec) | LOS Score | LOS |
|---|---|---|---|---|
| | North Crosswalk | 55.4 | 2.76 | C |
| | South Crosswalk | 55.4 | 2.97 | C |
| | West Crosswalk | 22.0 | 2.18 | B |
| | **Worst Score** | 55.4 | 2.97 | C |

| 6. Excelsior Blvd & Market Plaza | Movement | Delay (sec) | LOS Score | LOS |
|---|---|---|---|---|
| | North Crosswalk | 25.2 | 2.46 | B |
| | South Crosswalk | 25.2 | 2.16 | B |
| | East Crosswalk | 56.3 | 2.96 | C |
| | West Crosswalk | 56.3 | 2.95 | C |
| | **Worst Score** | 56.3 | 2.96 | C |

| 10. Lake Calhoun Pkwy & Lagoon Ave | Movement | Delay (sec) | LOS Score | LOS |
|---|---|---|---|---|
| | North Crosswalk | 27.3 | 2.47 | B |
| | South Crosswalk | 27.3 | 2.37 | B |
| | East Crosswalk | 36.8 | 3.15 | C |
| | **Worst Score** | 36.8 | 3.15 | C |

| 11. Lake Calhoun Pkwy & Lake St | Movement | Delay (sec) | LOS Score | LOS |
|---|---|---|---|---|
| | North Crosswalk | 18.5 | 2.52 | B |
| | South Crosswalk | 18.5 | 2.59 | B |
| | East Crosswalk | 58.1 | 2.29 | B |
| | **Worst Score** | 58.1 | 2.59 | B |

## TRAIL LEVEL OF SERVICE (LOS)

### Methodology

The trail LOS was calculated using a shared-use path flow analysis, a model that analyses user volumes across different modes, average speeds, and trail characteristics to evaluate the likely user experience. The project team used the Trail Level of Service Calculator developed by North Carolina State University and Toole Design Group, based on Federal Highway Administration (FHWA) shared-use path research. The team entered trail count data for bicyclists and pedestrians from five trail locations selected to represent the different non-motorized conditions in the study area. The model assumes that bicyclists will pass all trail users that are traveling less than average bicyclist speed of 12.8 mph. The tool estimates the likely share of runners and children bicyclists based on those counts and the estimated user speeds and then calculates passing delays and conflicts to produce a LOS rating for the path segment. A level of service of C or better is usually considered acceptable.

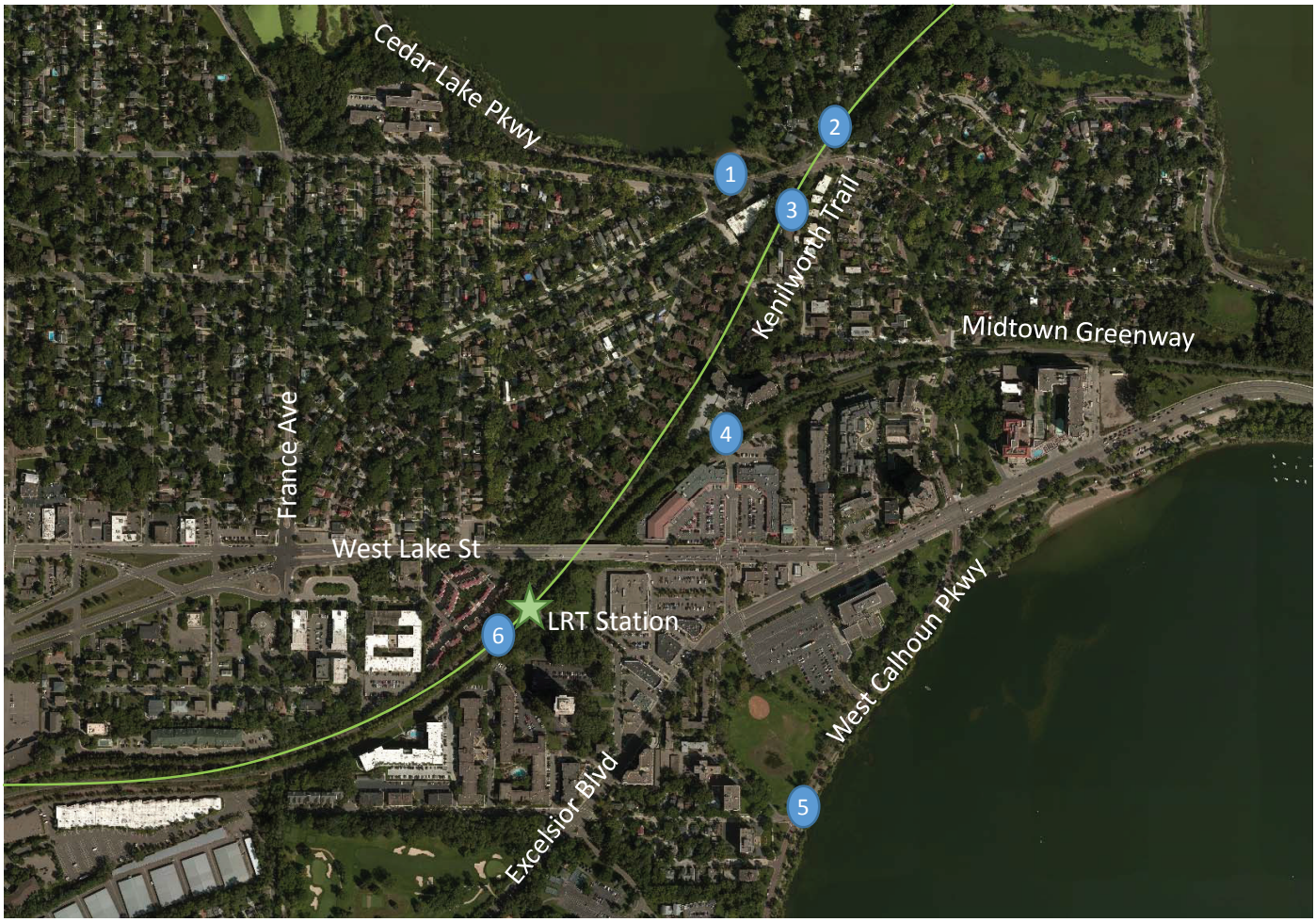
The trail segments analyzed consist of a bi-directional trail with a center line (the bicycle portion). A pedestrian path (the pedestrian portion) borders the path, with no buffer in between the two. The LOS was calculated in two ways:

1. Using the full combined width of the bike portion and the pedestrian portion to generate a bicycle and pedestrian LOS
2. Using only the bicycle portion width and bicycle volumes to generate a bike-only level of service.


### Results

Two sets of results were produced for the trail level of service analysis: a bicycle and pedestrian LOS and a bicycle-only LOS. The bicycle and pedestrian LOS was based on the full combined width of the bicycle and pedestrian portions of the trail and trail counts for both people on bike and people on foot. These widths vary from 12 feet on the Cedar Lake Trail to 20 feet on the Midtown Greenway. The combined bicycle and pedestrian hourly volumes for users traveling in one direction ranged from 124 on the Cedar Lake Parkway Trail to 335 on the Midtown Greenway. The LOS varied from C on both examined sections of the Cedar Lake Trail to A on the Kenilworth Trail south of Cedar Lake Parkway. The Kenilworth Trail (north) and Midtown Greenway segments received an LOS grade of B.

## FIGURE 7-22
## BICYCLE AND PEDESTRIAN TRAIL LEVEL OF SERVICE LOCATIONS




## TABLE 7-11
## BICYCLE AND PEDESTRIAN TRAIL LEVEL OF SERVICE

| Segment Name | Path Width | Volume | Level of Service | |
|---|---|---|---|---|
| Name | Width (ft) | One-Way (per hour) | LOS Score | LOS Grade |
| 1 Cedar Lake Parkway Trail at Burnham Road | 12.0 | 124 | **3.23** | **C** |
| 2 Kenilworth Trail north of Cedar Lake Pkwy | 18.0 | 263 | **3.88** | **B** |
| 3 Kenilworth Trail south of Cedar Lake Pkwy | 18.0 | 198 | **4.03** | **A** |
| 4 Midtown Greenway at Calhoun Village | 20.0 | 335 | **3.62** | **B** |
| 5 West Calhoun Parkway Trail at 32nd Street | na | na | **na** | **na** |
| 6 Cedar Lake LRT Regional Trail at Chowen Ave | 12.0 | 291 | **3.06** | **C** |

The bicycle analysis used the width of the trail marked for bicyclists and used only bicycle volume counts. The results of the bicycle-only analysis were more consistent across the trail segments than the combined bicycle and pedestrian results. The widths ranged from 8 feet on the Cedar Lake Trail segment to 13 feet on the Midtown Greenway segment. The one-way bicycle counts ranged from 73 per hour on the Cedar Lake Parkway Trail at Burnham Road to 303 per hour on the West Calhoun Parkway Trail. Four of the five segments are operating at LOS B. The West Calhoun Parkway Trail operates at LOS A. The West Calhoun Parkway trail was not included in the combined bicycle and pedestrian analysis because it is marked for bicycles only.

## TABLE 7-12
## BICYCLE-ONLY TRAIL LEVEL OF SERVICE

| | Segment Name | Path Width | Volume | Trail Level of Service | |
|---|---|---|---|---|---|
| | Name | Width (ft) | One-Way (per hour) | LOS Score | LOS Grade |
| 1 | Cedar Lake Parkway Trail at Burnham Road | 8.0 | 73 | **3.50** | **B** |
| 2 | Kenilworth Trail north of Cedar Lake Pkwy | 12.0 | 241 | **3.65** | **B** |
| 3 | Kenilworth Trail south of Cedar Lake Pkwy | 12.0 | 184 | **3.71** | **B** |
| 4 | Midtown Greenway at Calhoun Village | 13.0 | 278 | **3.71** | **B** |
| 5 | West Calhoun Parkway Trail at 32nd Street | 10.0 | 303 | **4.47** | **A** |
| 6 | Cedar Lake LRT Regional Trail at Chowen Ave | na | na | **na** | **na** |

The Cedar Lakes LRT Regional Trail at Chowen Ave was not included in the bicycle-only analysis because it does not include a bike-only section; there are no marking to distinguish between modes at this trail section.

Comparing these two analyses reveals relatively high levels of pedestrian trail use on the Cedar Lake Parkway Trail at Burnham Road. This mix of modes results in a lower level of service. It also shows quite low pedestrian use (relative to bicycle use) on the Kenilworth Trail that results in a high bicycle and pedestrian LOS for that segment.

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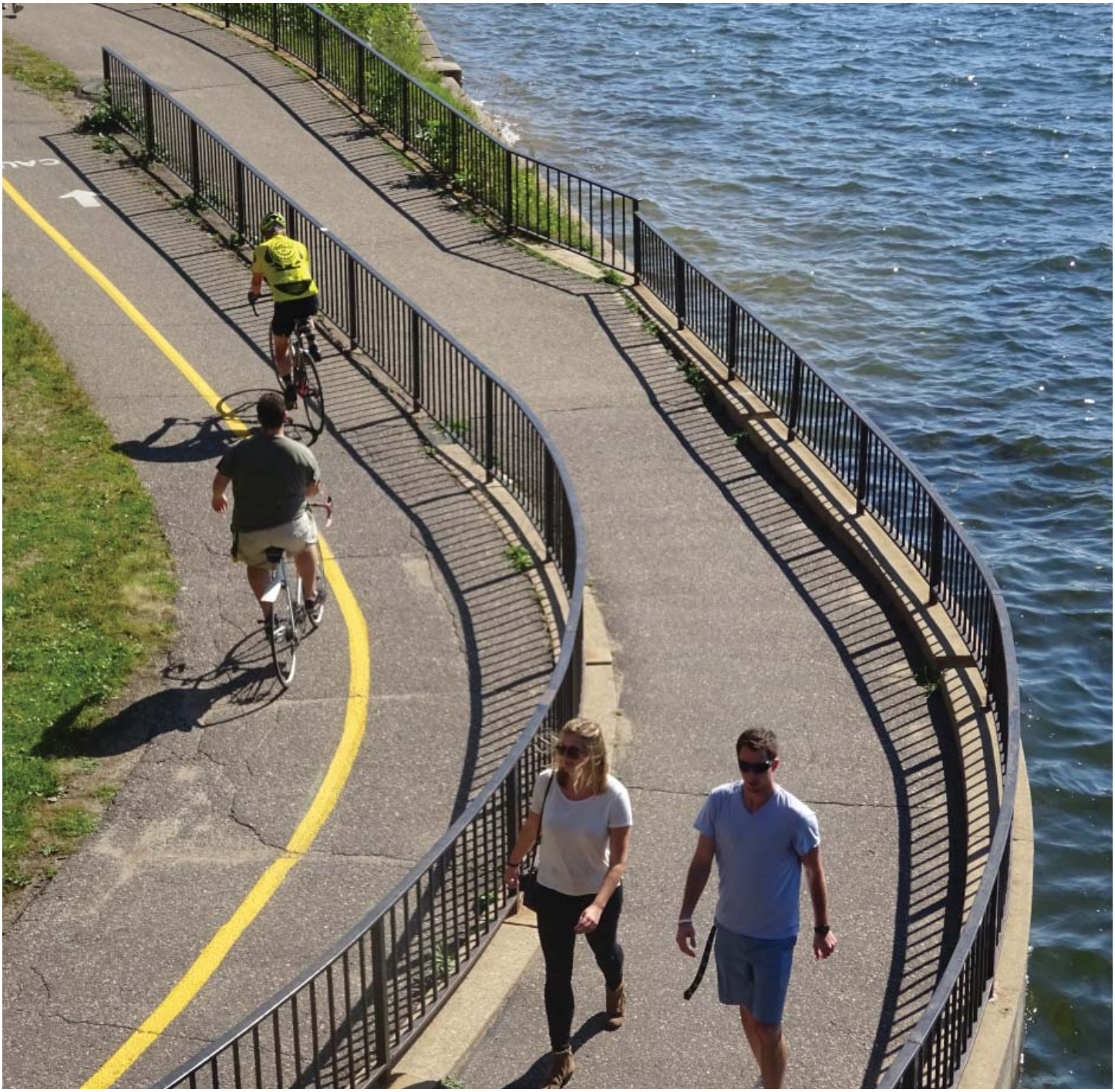
# 8. CIRCULATION, GAPS, & CONNECTIVITY



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## CIRCULATION, GAPS, & CONNECTIVITY

Bicycle and pedestrian connectivity within the study area were analyzed to assist with the identification of system gaps and potential improvement options.

## DESTINATIONS FOR CONNECTIVITY ANALYSIS

To analyze the bicycle and pedestrian connectivity of the West Lake study area, the project team processed input from community stakeholders and worked with members of the project Technical Advisory Committee to identify the ten key locations that people on bike and foot would likely want to access. The locations were selected based on community input using a WikiMap, during community meetings, walking tours and workshops, and based on neighborhood significance. By determining the ease or difficulty of walking and biking between these locations, the overall effectiveness of the non-motorized transportation network – and key barriers to connectivity – would become evident.

The destinations evaluated for the project area:

- Planned West Lake LRT Station
- Calhoun Yacht Club/Tin Fish Restaurant
- Lake Calhoun North Beach
- West Calhoun Parkway
- Whole Foods Market
- Calhoun Village Shopping Center
- Lake Calhoun Executive Center
- Lake of the Isles Park
- Dean Parkway and Cedar Lake Ave
- NW Residential Neighborhood

# BICYCLE CONNECTIVITY

## METHODOLOGY

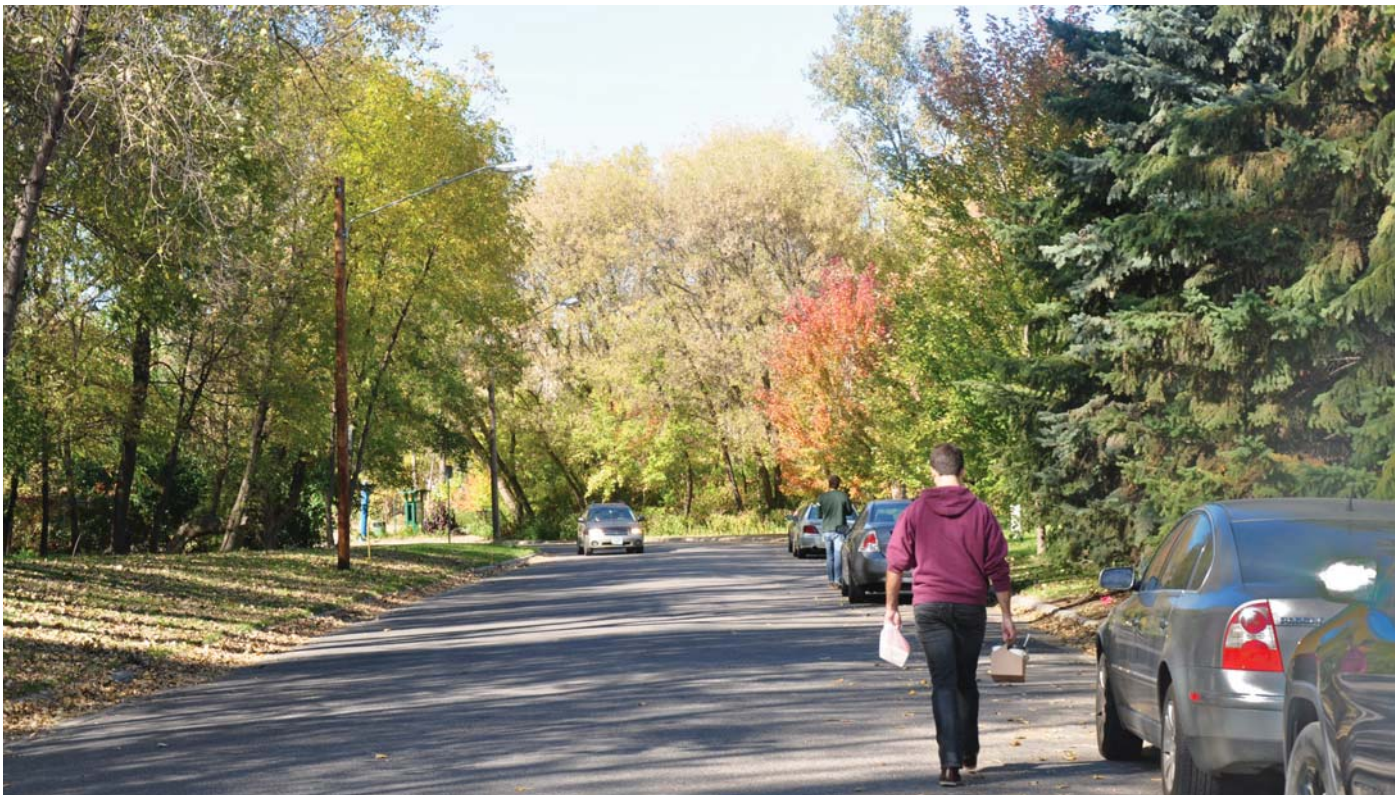
The quality of bicycle connectivity in the study area was determined using a Level of Traffic Stress (LTS) analysis and bicycling route comparisons. The project team compared routes between ten destinations to compare the difference in length between the most direct route and an entirely low stress route. The relationship (ratio) between the length of the most direct route and the low stress route is a measure of bicycle network connectivity.

Detailed information about the road and bicycle network were entered into GIS-based software called Network X, which analyzes transportation networks. The road network and trail network were combined into a single data set with information on connections and length of links. The software identified the shortest path connecting each of the ten locations in the study area. It then filtered out any links that required riding on a high stress segment or intersection.

As described in the methodology section for the bicycle intersection level of stress section, LTS analysis rates each segment of a network on a scale from LTS 1, which means the route is comfortable for most children, to LTS 4, which means the route exceeds the tolerance of all but the most committed bicyclists[1]. The network analysis examined traffic stress for segments, intersection approaches, and crossings. Factors that affect the stress of segments between intersections include the number of traffic lanes, presence of on-street parking, right turn lanes, traffic volume (ADT), traffic speed, and bike lanes. The methodology for the latter two is discussed in the bicycle intersection level of stress section.

## RESULTS

The network analysis resulted in two data tables (Tables 8-1 and 8-2). The first contained the length, in feet, of the shortest link between each of the destinations. The second contained the length of the shortest link that could be completed on low stress (LTS 1 and 2) routes.



[1] Mekuria, Maaza, Peter Furth, and Hilary Nixon, "Low-Stress Bicycling and Network Connectivity," the Mineta Transportation Institute, May 2012.

## TABLE 8-1
## BICYCLE CONNECTIVITY RESULTS MATRIX – MOST DIRECT ROUTE (MEASURED IN FEET)

| Most Direct Route | Calhoun Village Shopping Center | Calhoun Yacht Club - Tin Fish Restaurant | Dean Parkway and Cedar Lake Ave | Lake Calhoun Executive Center (Office building) | Lake Calhoun North Beach | Lake of the Isles Park | NW Residential neighborhood | West Calhoun Parkway | West Lake Station | Whole Foods Market |
|---|---|---|---|---|---|---|---|---|---|---|
| Calhoun Village Shopping Center | | 5,054 | 2,611 | 1,308 | 2,317 | 4,303 | 3,281 | 1,960 | 1,950 | 770 |
| Calhoun Yacht Club - Tin Fish Restaurant | 5,054 | | 5,100 | 4,157 | 2,728 | 2,699 | 7,310 | 4,959 | 6,570 | 4,956 |
| Dean Parkway and Cedar Lake Ave | 2,611 | 5,119 | | 2,228 | 2,382 | 2,704 | 2,230 | 3,296 | 3,412 | 2,947 |
| Lake Calhoun Executive Center (Office building) | 1,308 | 4,157 | 2,209 | | 1,420 | 3,901 | 3,721 | 1,728 | 2,665 | 874 |
| Lake Calhoun North Beach | 2,317 | 2,728 | 2,363 | 1,420 | | 4,705 | 4,573 | 2,222 | 3,833 | 2,219 |
| Lake of the Isles Park | 4,473 | 2,699 | 2,704 | 4,090 | 4,705 | | 4,914 | 5,158 | 5,347 | 4,809 |
| NW Residential neighborhood | 3,617 | 7,329 | 2,230 | 4,057 | 4,592 | 4,914 | | 4,709 | 4,523 | 3,519 |
| West Calhoun Parkway | 2,972 | 4,959 | 3,277 | 1,703 | 2,222 | 4,969 | 5,385 | | 2,733 | 2,538 |
| West Lake Station | 1,950 | 6,570 | 3,412 | 2,665 | 3,833 | 5,177 | 4,523 | 3,317 | | 2,286 |
| Whole Foods Market | 770 | 4,956 | 2,947 | 874 | 2,219 | 4,639 | 3,183 | 1,526 | 2,286 | |

# TABLE 8-2
## BICYCLE CONNECTIVITY RESULTS MATRIX – MOST DIRECT LOW STRESS ROUTE (MEASURED IN FEET)

| Most Direct Low Stress Route | Calhoun Village Shopping Center | Calhoun Yacht Club - Tin Fish Restaurant | Dean Parkway and Cedar Lake Ave | Lake Calhoun Executive Center (Office building) | Lake Calhoun North Beach | Lake of the Isles Park | NW Residential neighborhood | West Calhoun Parkway | West Lake Station | Whole Foods Market |
|---|---|---|---|---|---|---|---|---|---|---|
| Calhoun Village Shopping Center | | 6,094 | 2,611 | 3,420 | 3,357 | 4,303 | 4,195 | 4,271 | 1,950 | *no route* |
| Calhoun Yacht Club - Tin Fish Restaurant | 6,094 | | 5,100 | 4,374 | 2,728 | 2,699 | 7,367 | 4,959 | 6,968 | *no route* |
| Dean Parkway and Cedar Lake Ave | 2,611 | 5,119 | | 2,445 | 2,382 | 2,704 | 2,267 | 3,296 | 3,412 | *no route* |
| Lake Calhoun Executive Center (Office building) | 3,420 | 4,374 | 2,426 | | 1,637 | 4,118 | 4,693 | 1,728 | 3,873 | *no route* |
| Lake Calhoun North Beach | 3,357 | 2,728 | 2,363 | 1,637 | | 4,705 | 4,630 | 2,222 | 4,231 | *no route* |
| Lake of the Isles Park | 4,473 | 2,699 | 2,704 | 4,307 | 4,705 | | 4,971 | 5,158 | 5,347 | *no route* |
| NW Residential neighborhood | 4,195 | 7,386 | 2,267 | 4,712 | 4,649 | 4,971 | | 5,563 | 4,535 | *no route* |
| West Calhoun Parkway | 4,265 | 4,959 | 3,277 | 1,703 | 2,222 | 4,969 | 5,544 | | 3,023 | *no route* |
| West Lake Station | 1,950 | 6,968 | 3,412 | 4,294 | 4,231 | 5,177 | 4,535 | 5,145 | | *no route* |
| Whole Foods Market | *no route* | *no route* | *no route* | *no route* | *no route* | *no route* | *no route* | *no route* | *no route* | |

The project team then divided the length of the low stress route by the length of the more direct route to generate a ratio. If the result was a 1, then the two routes were the same distance and the more direct route is also the low stress route. If the result was 2, that indicates that the low stress route is twice the distance of the most direct route, meaning a bicyclists were have to travel twice as far to remain on comfortable roads and trails.

## TABLE 8-3
## RELATIONSHIP BETWEEN THE MOST DIRECT ROUTE AND THE MOST DIRECT LOW STRESS ROUTE, CALHOUN VILLAGE EXAMPLE

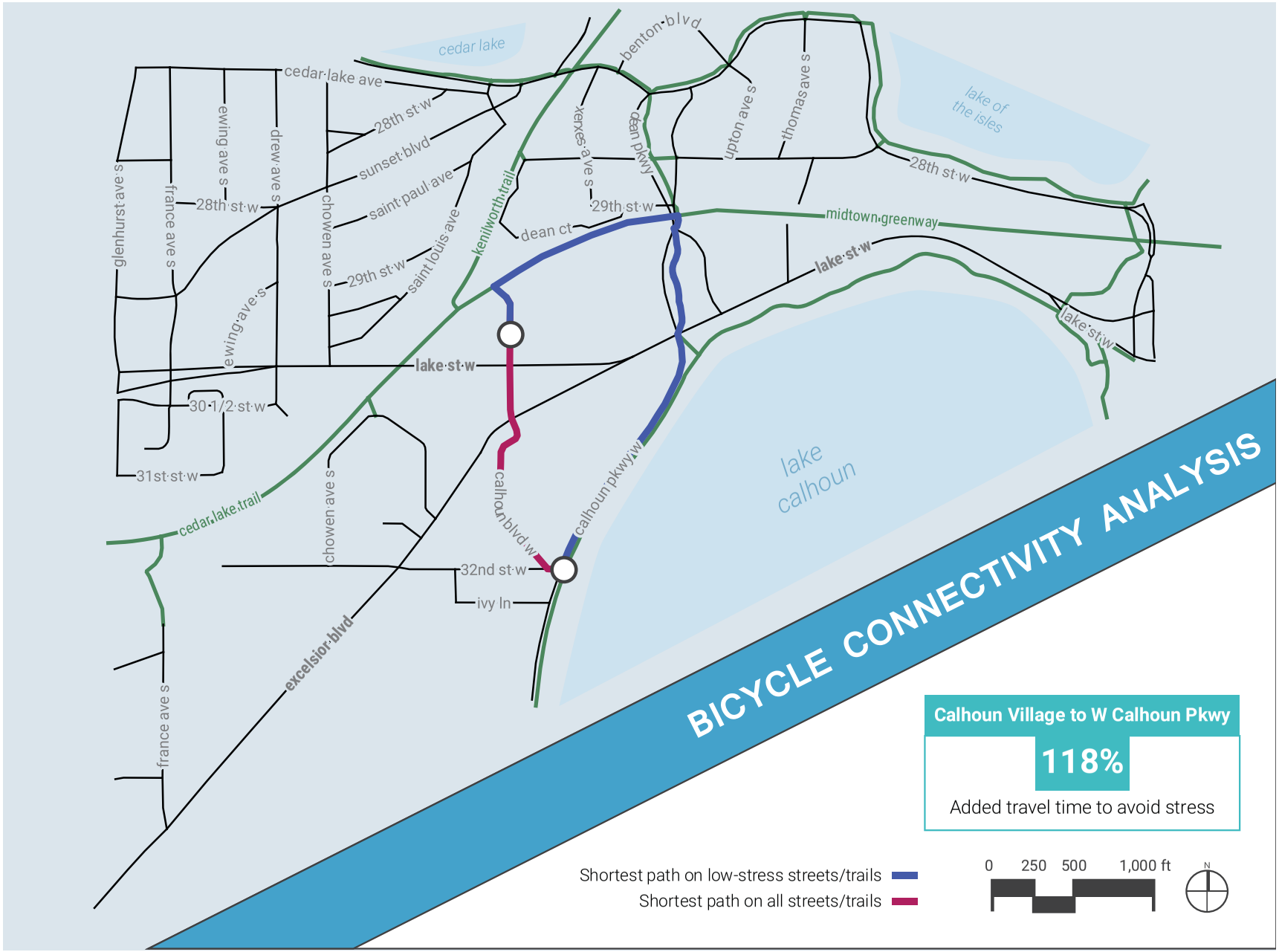
| | Calhoun Village Shopping Center |
|---|---|
| Calhoun Village Shopping Center | |
| Calhoun Yacht Club/Tin Fish Restaurant | 1.21 |
| Dean Parkway and Cedar Lake Ave | 1.00 |
| Lake Calhoun Executive Center (Office building) | 2.61 |
| Lake Calhoun North Beach | 1.45 |
| Lake of the Isles Park | 1.00 |
| NW Residential neighborhood | 1.16 |
| West Calhoun Parkway | 1.44 |
| West Lake Station | 1.00 |
| Whole Foods Market | *no route* |

Table 8-3 provides an example comparison between the most direct route and the most direct low stress route to the Calhoun Village Shopping Center from the other nine destinations. The impact of taking only low stress routes to the Calhoun Village Shopping Center varies depending on the origin:

- The routes from three locations – Dean Parkway and Cedar Lake Ave, Lake of the Isles Park, West Lake Station – are not affected at all, meaning the shortest route is also the lowest stress route.
- The route from the northwest residential neighborhoods is only slightly (16 percent) longer on low stress routes.
- The low stress routes from Lake Calhoun North Beach and the West Calhoun Parkway add 45 and 44 percent to the trip distance, respectively.

In this example, the most significant impact is from the Lake Calhoun Executive Center, which increases the length of the trip by more than two and a half times. Because informal connections between Whole Foods Market and the Cedar Lake Trail were not considered to be part of the network, no trip to or from Whole Foods Market can be completed on a low stress route.

# FIGURE 8-1
## EXAMPLE BICYCLE CONNECTIVITY ANALYSIS MAP. CALHOUN VILLAGE TO WEST CALHOUN PARKWAY



Note that the impact of traveling on low stress routes between two locations can change based on the direction traveling. For example, in the case of the Calhoun Village Shopping Center, the low stress route from the West Calhoun Parkway to the shopping center adds 44 percent to the most direct route. However, the return trip from the West Calhoun Parkway to the shopping center more than doubles the direct route – a ratio of 2.18, 118 percent added to the trip (Figure 8-1). This difference is due to one-way streets.

The overall finding is that some trips in the area require bicyclists to go far out of their way to stay on low stress routes. By making one connection to a regional trail the connectivity and travel time can be improved.

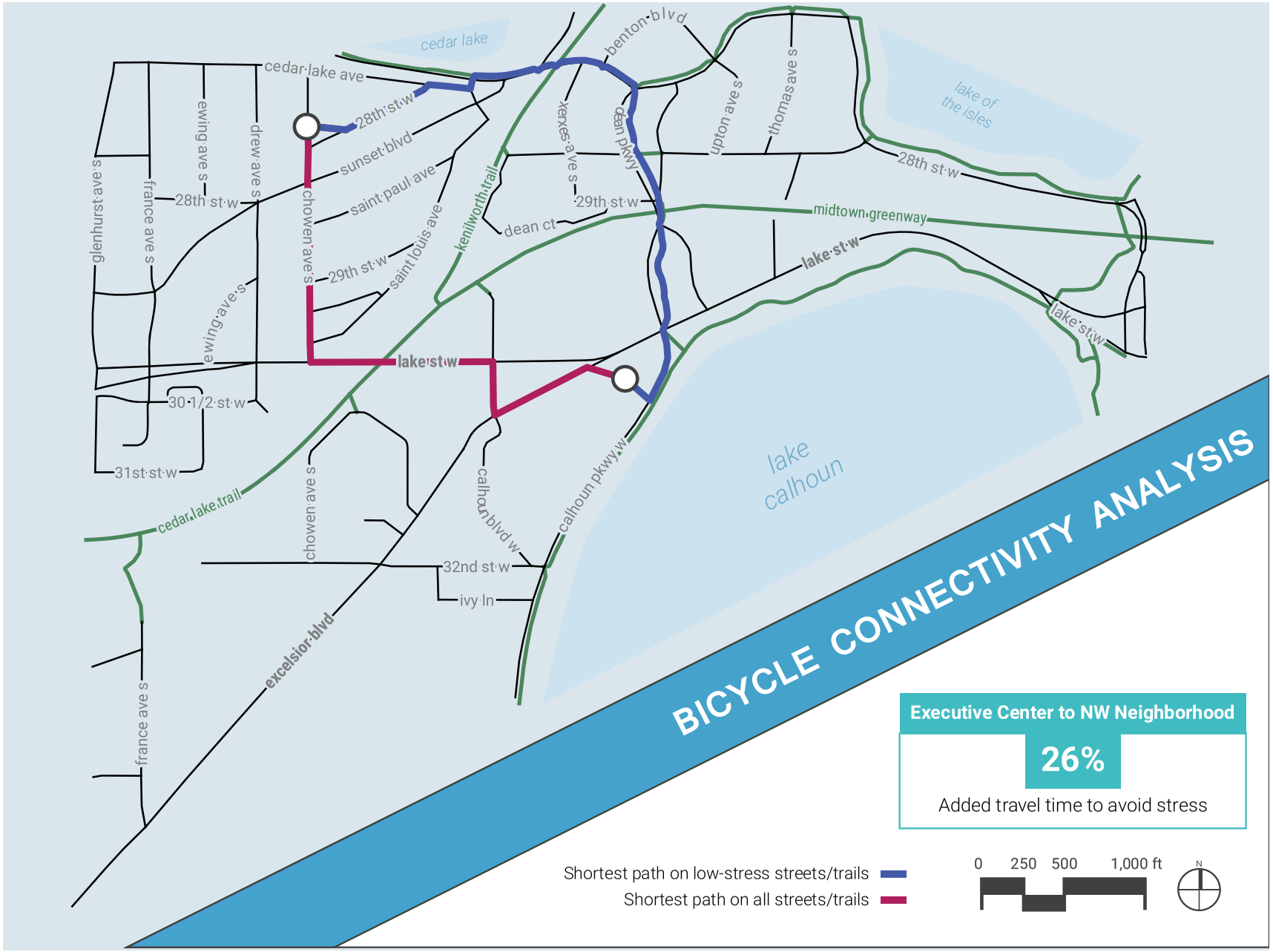
Table 8-4 shows the bicycle connectivity analysis results for all ten destinations in the study area.

Figures 8-2 and 8-3 are sample maps illustrating routes assumed for the bicycle connectivity analysis for two origin and destination combinations.

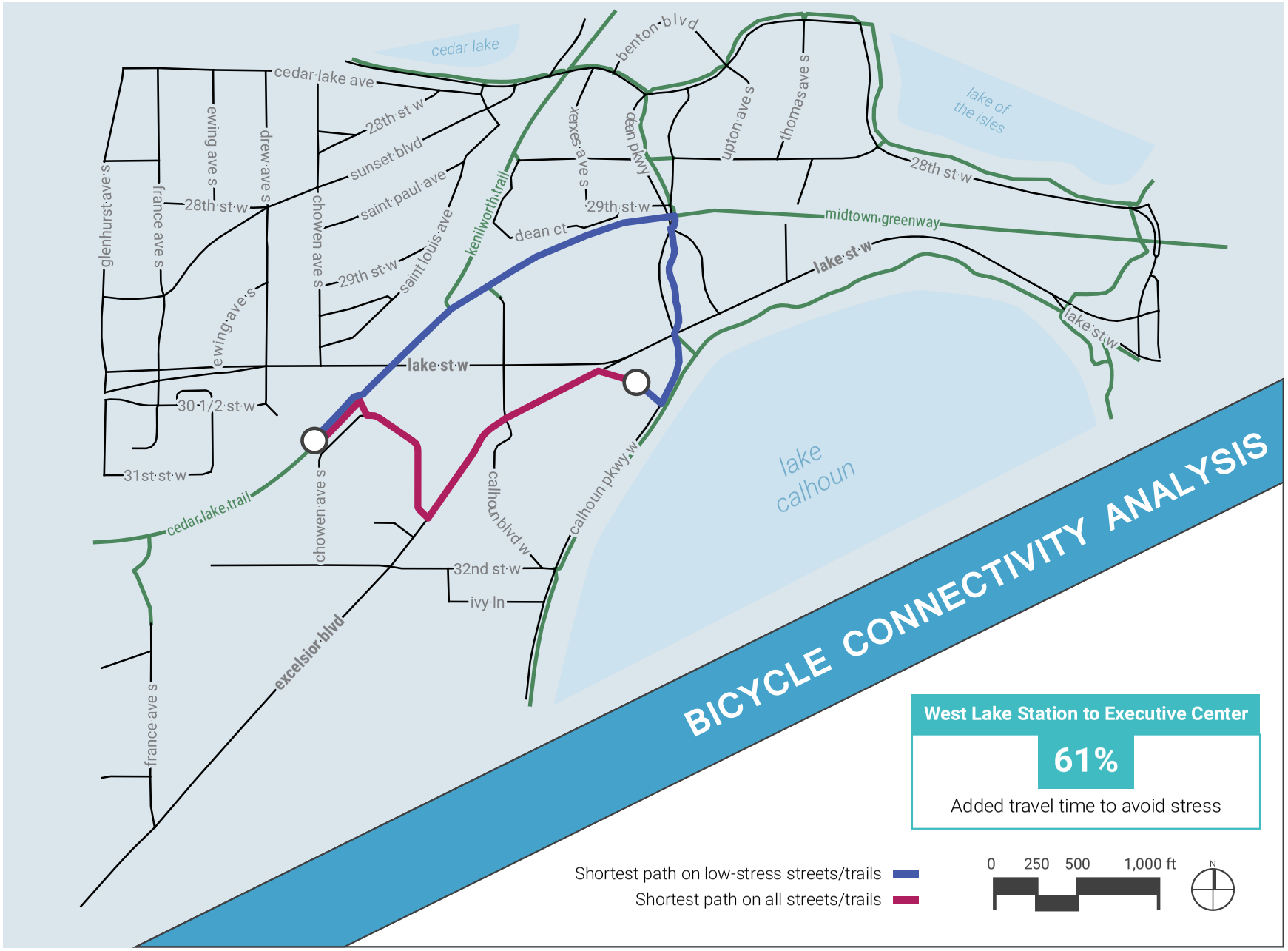
# TABLE 8-4
## RELATIONSHIP BETWEEN THE MOST DIRECT ROUTE AND THE MOST DIRECT LOW STRESS ROUTE

| Relationship Between the Most Direct Route and the Most Direct Low Stress Route | Calhoun Village Shopping Center | Calhoun Yacht Club/Tin Fish Restaurant | Dean Parkway and Cedar Lake Ave | Lake Calhoun Executive Center (Office building) | Lake Calhoun North Beach | Lake of the Isles Park | NW Residential neighborhood | West Calhoun Parkway | West Lake Station | Whole Foods Market |
|---|---|---|---|---|---|---|---|---|---|---|
| Calhoun Village Shopping Center | | 1.21 | 1.00 | 2.61 | 1.45 | 1.00 | 1.28 | 2.18 | 1.00 | *no route* |
| Calhoun Yacht Club/Tin Fish Restaurant | 1.21 | | 1.00 | 1.05 | 1.00 | 1.00 | 1.01 | 1.00 | 1.06 | *no route* |
| Dean Parkway and Cedar Lake Ave | 1.00 | 1.00 | | 1.10 | 1.00 | 1.00 | 1.02 | 1.00 | 1.00 | *no route* |
| Lake Calhoun Executive Center (Office building) | 2.61 | 1.05 | 1.10 | | 1.15 | 1.06 | 1.26 | 1.00 | 1.45 | *no route* |
| Lake Calhoun North Beach | 1.45 | 1.00 | 1.00 | 1.15 | | 1.00 | 1.01 | 1.00 | 1.10 | *no route* |
| Lake of the Isles Park | 1.00 | 1.00 | 1.00 | 1.05 | 1.00 | | 1.01 | 1.00 | 1.00 | *no route* |
| NW Residential neighborhood | 1.16 | 1.01 | 1.02 | 1.16 | 1.01 | 1.01 | | 1.18 | 1.00 | *no route* |
| West Calhoun Parkway | 1.44 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.03 | | 1.11 | *no route* |
| West Lake Station | 1.00 | 1.06 | 1.00 | 1.61 | 1.10 | 1.00 | 1.00 | 1.55 | | *no route* |
| Whole Foods Market | *no route* | *no route* | *no route* | *no route* | *no route* | *no route* | *no route* | *no route* | *no route* | |

# FIGURE 8-2
## EXAMPLE BICYCLE CONNECTIVITY ANALYSIS MAP – EXECUTIVE CENTER TO NW NEIGHBORHOOD



# FIGURE 8-3
## EXAMPLE BICYCLE CONNECTIVITY ANALYSIS MAP – WEST LAKE STATION TO EXECUTIVE CENTER



# PEDESTRIAN CONNECTIVITY

## METHODOLOGY

The project team analyzed the pedestrian network to determine the total travel time required to access the key destinations in the study area. Travel time was estimated using two factors: distance traveled and average delays at intersections. Network X software evaluated the shortest distance between each of the ten locations on the pedestrian network. A speed of 3.5 feet per second was applied to the trip distances to calculate travel time.

The program was able to determine which intersections a pedestrian would cross through. The average intersection delays calculated for the pedestrian intersection level of service analysis were added to the model for each intersection crossing.

For each origin and destination pair, the travel time and the intersection delay were added together to calculate the total trip time.

## RESULTS

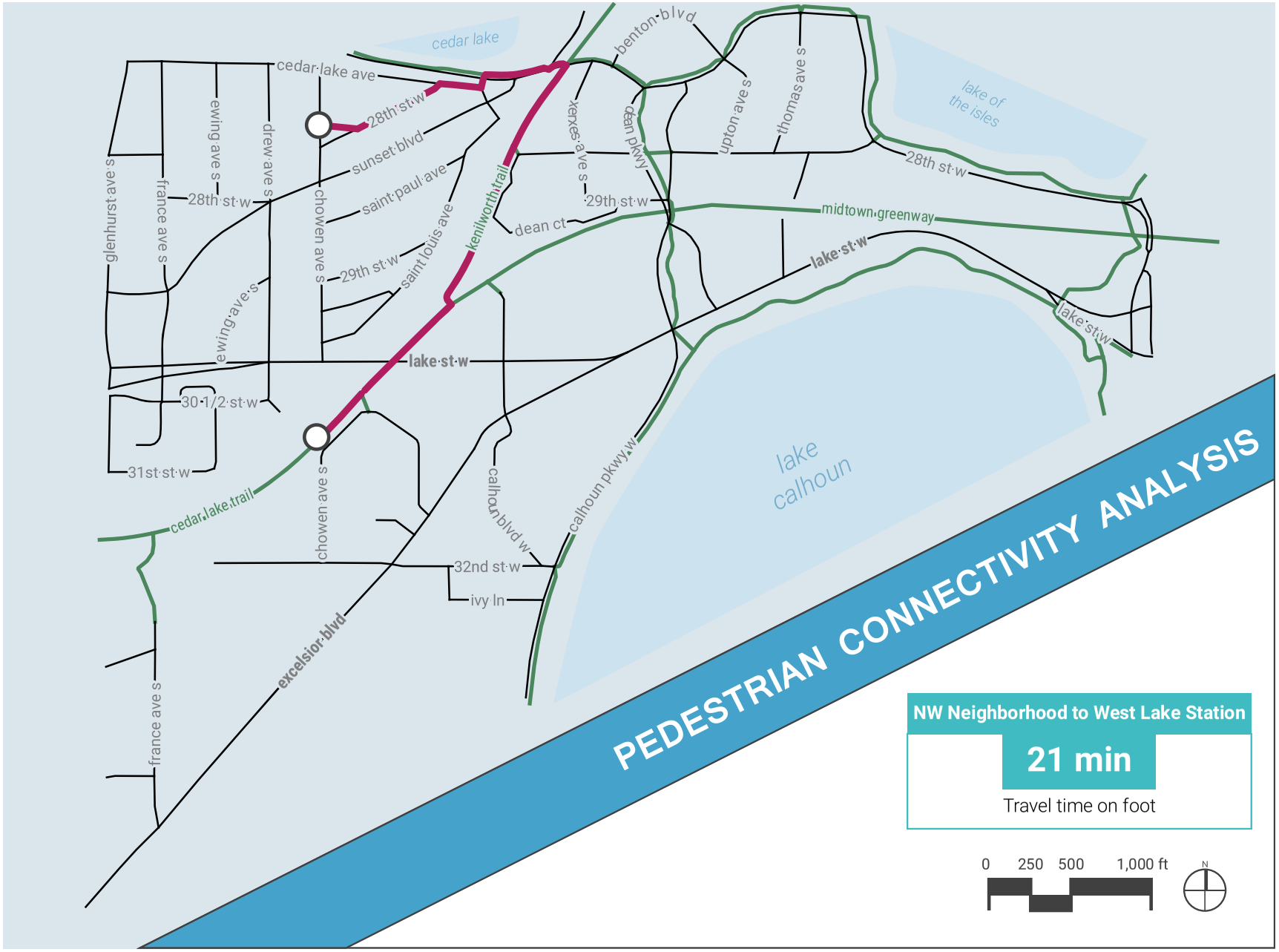
Table 8-5 shows the estimated travel times between each of the two destinations in the study area. The times range from 4.6 minutes on the short end to 34 minutes on the long end. One-way streets do not impact pedestrian travel, therefore the times for each origin and destination pair are typically the same for each direction. However, the signal timings may result in slightly different travel times may be different based on the direction.

Figures 8-4 and 8-5 are pedestrian travel time maps illustrating the routes for sample origins and destinations and the associated travel time.

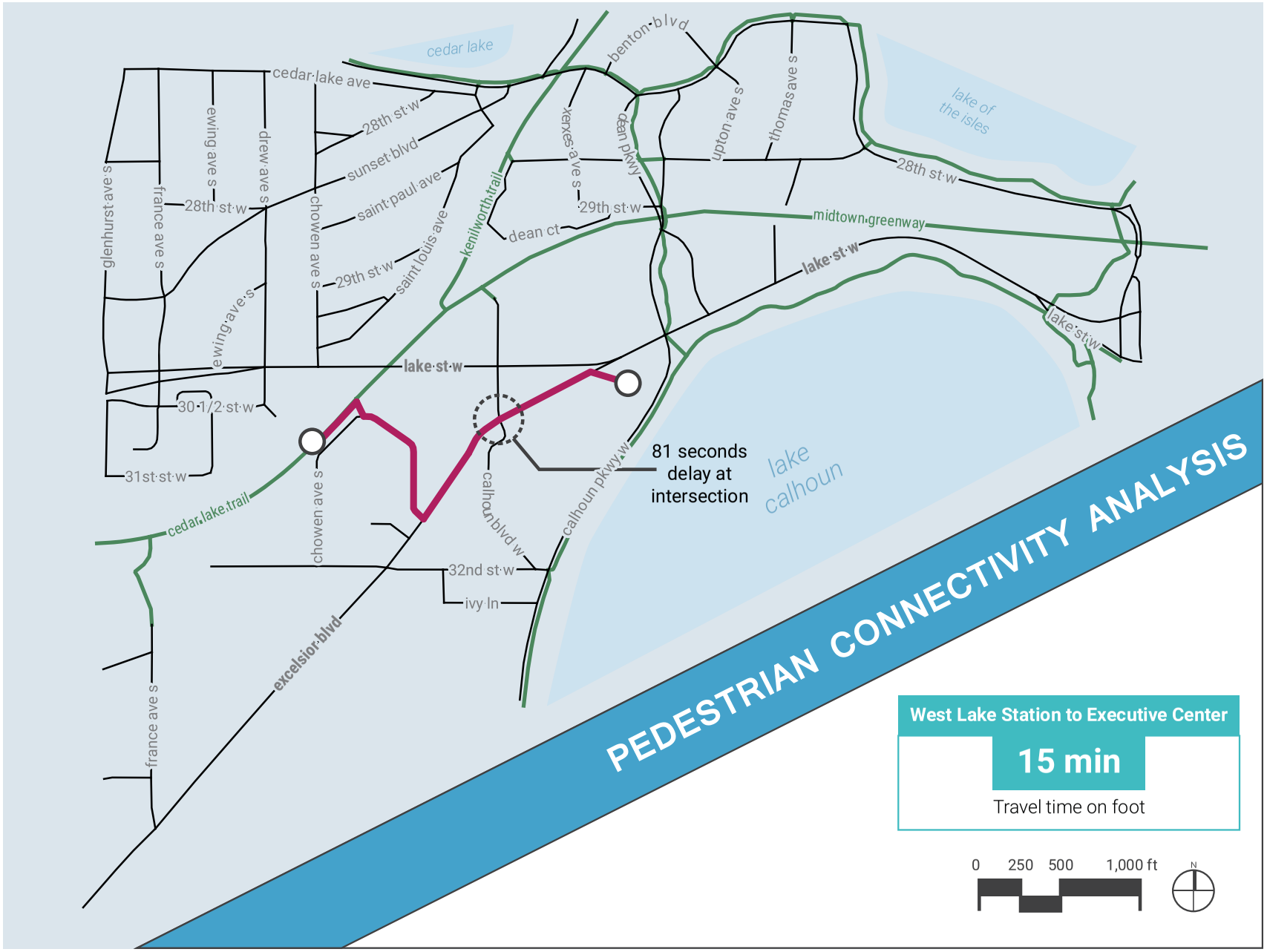
## TABLE 8-5
## PEDESTRIAN TRAVEL TIME BETWEEN DESTINATIONS (MINUTES)

| Pedestrian Connectivity | Calhoun Village Shopping Center | Calhoun Yacht Club/Tin Fish Restaurant | Dean Parkway and Cedar Lake Ave | Lake Calhoun Executive Center (Office building) | Lake Calhoun North Beach | Lake of the Isles Park | NW Residential neighborhood | West Calhoun Parkway | West Lake Station |
|---|---|---|---|---|---|---|---|---|---|
| Calhoun Village Shopping Center | | 23.1 | 11.0 | 8.8 | 11.2 | 19.4 | 13.8 | 10.6 | 7.9 |
| Calhoun Yacht Club/Tin Fish Restaurant | 23.5 | | 24.0 | 20.1 | 11.9 | 10.3 | 34.0 | 22.3 | 31.0 |
| Dean Parkway and Cedar Lake Ave | 11.0 | 24.0 | | 13.1 | 12.1 | 13.3 | 10.0 | 16.6 | 16.3 |
| Lake Calhoun Executive Center (Office building) | 8.8 | 20.1 | 13.1 | | 8.2 | 21.5 | 19.7 | 5.6 | 15.4 |
| Lake Calhoun North Beach | 11.6 | 11.9 | 12.1 | 8.2 | | 20.5 | 22.1 | 10.4 | 19.1 |
| Lake of the Isles Park | 19.4 | 10.3 | 13.3 | 21.5 | 20.5 | | 23.3 | 25.0 | 25.1 |
| NW Residential neighborhood | 13.8 | 34.0 | 10.0 | 19.7 | 22.1 | 23.3 | | 21.6 | 21.1 |
| West Calhoun Parkway | 10.6 | 22.3 | 16.6 | 5.6 | 10.4 | 25.0 | 21.6 | | 14.1 |
| West Lake Station | 7.9 | 31.1 | 16.3 | 14.9 | 19.2 | 25.1 | 21.1 | 14.1 | |
| Whole Foods Market | 4.6 | 23.4 | 15.6 | 7.5 | 11.5 | 24.0 | 15.6 | 8.9 | 10.3 |

# FIGURE 8-4
## SAMPLE PEDESTRIAN CONNECTIVITY MAP – NW NEIGHBORHOOD TO WEST LAKE STATION



# FIGURE 8-5
## SAMPLE PEDESTRIAN CONNECTIVITY MAP – WEST LAKE STATION TO EXECUTIVE CENTER



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# 9. STUDY AREA ISSUE IDENTIFICATION

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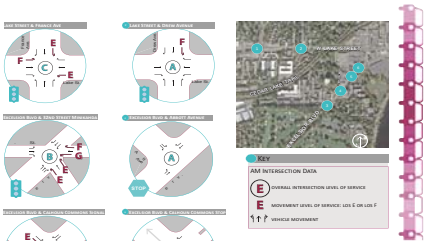
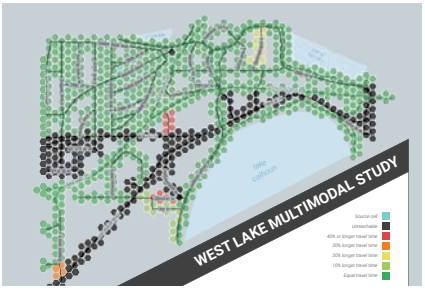
# ISSUE IDENTIFICATION

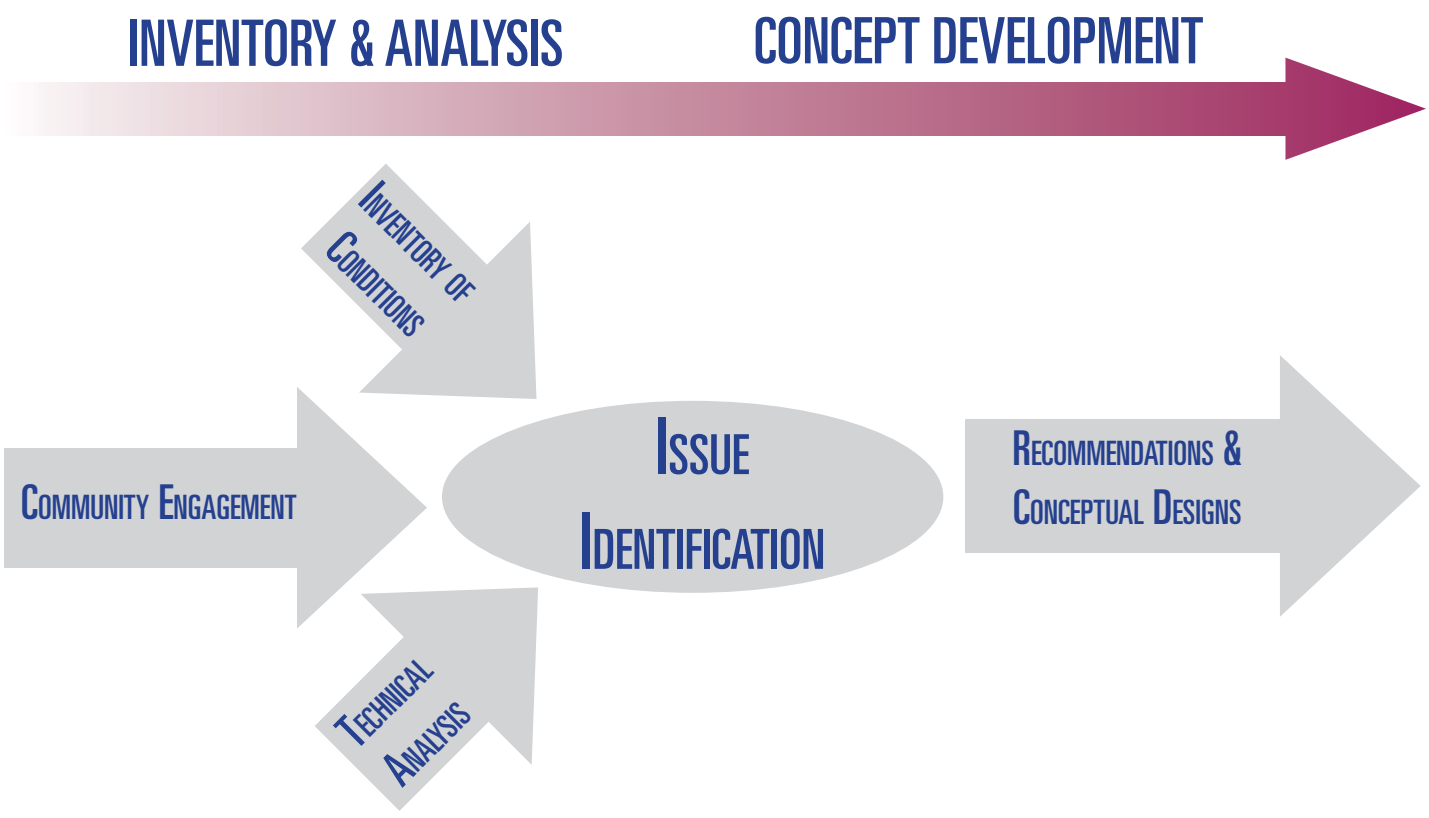
The primary outcome of the Inventory and Analysis Phase of the study is a comprehensive list of identified issues within the study area. The issue identification process included many layers of data, feedback, and technical analysis, including:

- Community Engagement and Public Workshops
- Online Survey and Mapping Exercise
- Technical Field Reviews and Study Area Reconnaissance
- Walking Tour with Community Members and Project Partners
- Site Visits with Individual Property Owners and Businesses
- Review of Previous/Ongoing Planning Efforts
- Auto, Bicycle and Pedestrian Volume Data
- Crash Analysis and Safety Review
- Multimodal Traffic Operations
- Connectivity and Travel Time Analysis
- Future Traffic Forecasts and Analysis
- Wayfinding and Navigation






In total, the Inventory and Analysis phase of the study revealed more than 60 issues within the study area. The next phase of the study, Concept Development, will explore and develop draft concept designs and recommendations to improve or address each identified issue.



## COMMUNITY ENGAGEMENT THEMES

The preceding chapters of this report have summarized the existing conditions and technical analysis performed for the study area. The community engagement efforts are summarized in a stand-alone report titled Community Engagement Summary #1, which can be found in its entirety in the Final Study documents. The full community engagement summary report identifies all of the issues from the first round of community engagement and field reviews. Throughout the entire inventory and analysis phase of the project, several reoccurring themes emerged from community engagement activities and outreach events. The following key themes, in no specific order, are issues that were brought up repeatedly by different participants during engagement activities:

- **Market Plaza Intersections:** Narrow sidewalks, short walk signals, fast driving cars, no buffers between sidewalk and roadway, unfriendly to pedestrians. This includes Market Plaza at Lake Street, Excelsior, and commercial driveways
- **Lake Street Bridge:** Narrow sidewalks, poorly maintained in winter months, inhospitable to pedestrians and bicyclists
- **Cedar Lake Trail:** Potential for bicyclist and pedestrian conflicts along the Cedar Lake trail at pedestrian crossings to the proposed LRT station area
- **LRT to Lake Calhoun:** No clear connection between Lake Calhoun and the proposed LRT station
- **LRT to Neighborhoods:** Lack of connectivity between neighborhoods north of Lake Street and the proposed LRT station, commercial areas, and the lakes
- **Lake Street and Excelsior Boulevard intersection:** Large, confusing, and potentially dangerous for bicyclists and pedestrians
- **Freight Rail Crossing:** Freight tracks are a major barrier to connectivity across the study area, and the addition of the LRT station will increase the need for people to be able to cross
- **France Avenue Freight Rail Crossing:** North-south connection between France Avenue and Cedar Lake Trail is unclear; connecting France Avenue across the freight rail could improve connectivity in the study area
- **LRT Platform to Lake Street Bridge Connection:** Stairs, elevators, and other connections are needed
- **New Residential and Commercial Development:** Additional traffic in the already congested area
- **Signal Timing for Pedestrians:** Study area intersection signal timings cause pedestrian delay and do not provide enough time for comfortable crossing
- **Crowded Trails:** Calhoun Parkway, Cedar Lake Trail, and Midtown Greenway crowded at peak times
- **Excelsior Boulevard:** South side lacks a sidewalk, hinders pedestrian connectivity

## INVENTORY & FIELD REVIEWS

Following the first round of community outreach and feedback, project staff performed additional follow up field investigations by walking, biking, and driving the study area to look for and assess the noted issues.

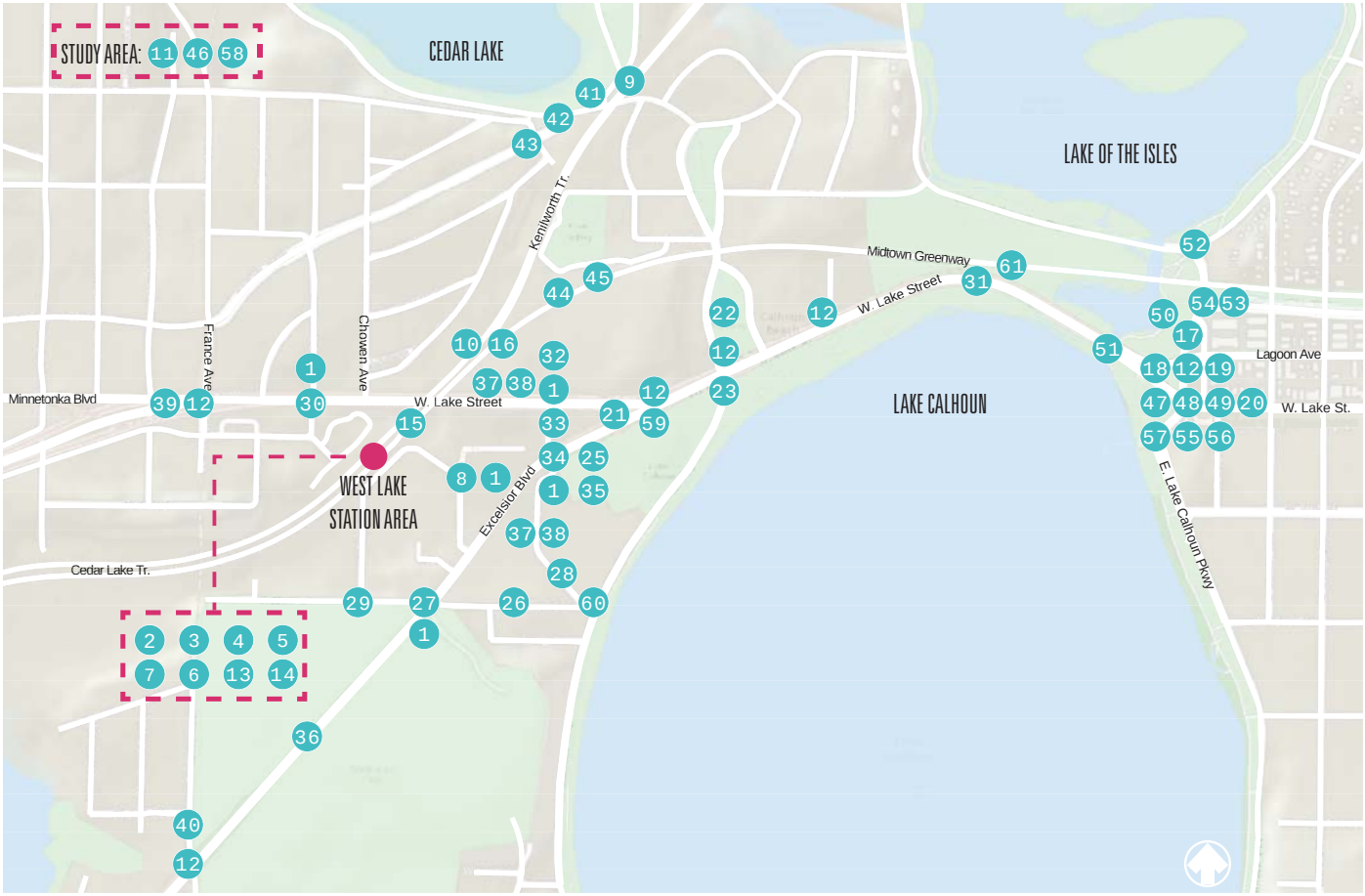
*Walking tour with community stakeholders.*


*Consulting with Minneapolis Fire Department, Station 22 staff.*

## STUDY AREA ISSUE SUMMARY

The extensive community engagement, field and data inventory and technical analysis ultimately revealed more than 60 issues that are identified and summarized in the following Study Area Issues Map and Matrix:

### FIGURE 9-1
### IDENTIFIED ISSUES MAP



## STUDY AREA ISSUE SUMMARY

The extensive community engagement, field and data inventory and technical analysis ultimately revealed more than 60 issues that are identified and summarized in the following Study Area Issues Matrix:

### TABLE 9-1
### IDENTIFIED ISSUES MATRIX

| # | LOCATION | ISSUE |
|---|---|---|
| 1 | 5 Signalized Intersections (SPO):<br>- Lake & Drew<br>- Lake & Market<br>- Excelsior & 32nd<br>- Excelsior & Commons Driveway<br>- Excelsior & Market | Intersection character, pedestrian safety, pedestrian presence not highlighted, pavement markings wear quickly with traffic volumes |
| 2 | West Lake Station | Safety for trail user and station patrons at crossing |
| 3 | West Lake Station | Potential need for bike parking at station |
| 4 | West Lake Station | Need for facilities at key trailhead and LRT station |
| 5 | West Lake Station | Separation of trail and LRT patron needed |
| 6 | West Lake Station | Need for pedestrian facilities at key trailhead and LRT station |
| 7 | West Lake Station | Wayfinding needs |
| 8 | 31st/Abbott Intersection | Need connection between station/trail and Calhoun Commons |
| 9 | Cedar Lake Pkwy/Kenilworth Trail | Conflicts between modes, unclear yield condition for trail users/cars, sight distance issues |
| 10 | Midtown/Kenilworth Trail Intersection | Challenging intersection geometry and channelization for bicyclists and pedestrians |
| 11 | Study Area | Improve operation of traffic signals |
| 12 | 7 Signalized Intersections in Study Area: Lake/France, Excelsior/France, Lake/Excelsior, Lake/Dean Pkwy, Lake/Thomas, Lake/E Calhoun Pkwy, Lagoon/E Calhoun Pkwy | Intersection character, pedestrian safety, pedestrian presence not highlighted, pavement markings wear quickly with traffic volumes |
| 13 | West Lake Station | Safety for trail user and station patrons at crossing |
| 14 | West Lake Station | Lack of space and facilities at key trailhead and LRT station |

## IDENTIFIED ISSUES MATRIX, CONTINUED

| # | LOCATION | ISSUE |
|---|---|---|
| 15 | West Lake Station Area | Lack of designated route where there is demand to cross freight and LRT route, existing "goat paths" |
| 16 | Midtown/Kenilworth Trail Intersection | Dark intersection feels unsafe |
| 17 | East Calhoun Pkwy/Lagoon Intersection | Pedestrians cannot cross all legs |
| 18 | East Calhoun Pkwy between Lake and Lagoon | No sidewalk/trail where there is demand - existing "goat paths" along west side |
| 19 | East Calhoun Pkwy at Lake and Lagoon Intersections | Lack of pedestrian lighting across intersection and along "goat path" |
| 20 | East Calhoun Pkwy/Lake Intersection | Pedestrians cannot cross all legs |
| 21 | Excelsior and Lake - Between Thomas and Market Intersection | Safety, congestion |
| 22 | Lake/Dean Pkwy Intersection | Congestion related crashes, risk taking behavior, heavy pedestrian route, Nice Ride station |
| 23 | Lake/Dean Pkwy Intersection | Heavily traveled pedestrian crossings and lack of accommodation |
| 24 | Calhoun Commons/Market Plaza driveway | Several motorist conflict points on short Market Plaza segment, lack of storage for left turn movements |
| 25 | Market Plaza/Excelsior Intersection | Traffic queues extend beyond short eastbound left-turn lane (striped) |
| 26 | 32nd Street east of Excelsior | Lack of designated bicycle and pedestrian route between station and Lake Calhoun |

ISSUE 16

*"Goat paths" show demand for pedestrian rail crossing.*

ISSUE 19

*Sidewalk gap at East Calhoun Parkway/Lake Street.*

## IDENTIFIED ISSUES MATRIX, CONTINUED

| # | LOCATION | ISSUE |
|---|---|---|
| 27 | 32nd/Excelsior Intersection | Lack of planned bicycle and pedestrian route between station and Lake Calhoun |
| 28 | 32nd/Calhoun Blvd. Intersection | Off-set intersection with wide turning radius near Calhoun Pkwy at a primary entrance node to Lake |
| 29 | 31st/Chowen/32nd Loop | Lack of designated bicycle and pedestrian route between station and Lake Calhoun |
| 30 | Drew/Lake | Long, exposed crossing distance |
| 31 | Lake Street - East Calhoun Parkway to Thomas Ave | Street character is out of context for this recreational urban area. Vehicle speeds are too high. Bike and pedestrian pinch-point at channel bridge, lacks buffer |

ISSUE 24

*Heavily used pedestrian crossing with poor conditions.*

ISSUE 32A

*Street character encourages higher vehicular speeds.*

ISSUE 32B

*Pedestrian pinch point at channel bridge.*

ISSUE 32C

*Minimal buffer between cars and pedestrians.*

## IDENTIFIED ISSUES MATRIX, CONTINUED

| # | LOCATION | ISSUE |
|---|---|---|
| 32 | Market Plaza through Calhoun Village | Lack of designated bicycle and pedestrian route between Midtown Greenway/Kenilworth Trail area and Lake Calhoun |
| 33 | Market Plaza | Lack of designated bicycle and pedestrian route between Midtown Greenway/Kenilworth Trail area and Lake Calhoun |
| 34 | Market Plaza/Excelsior Intersection | Intersection not pedestrian friendly for access across Excelsior |
| 35 | Area between Excelsior and Lake Calhoun | Lack of designated bicycle and pedestrian route |
| 36 | Excelsior - Lake to France | Sidewalk on north side is small and has no buffer, there is no sidewalk on south side |
| 37 | Excelsior and Lake - In coordination with improvements over time | Infrastructure (poles, hydrants, etc) located in walk path on sidewalk |
| 38 | Excelsior and Lake - In coordination with improvements over time | Inconsistent pedestrian lighting of sidewalk and crossings |
| 39 | France/Lake Intersection | Street and intersection design out of context, pedestrian safety, need to highlight pedestrian presence, reduce motorist speeds. |
| 40 | France/Excelsior Intersection | Intersection design out of context, pedestrian safety, need to highlight pedestrian presence |
| 41 | Cedar Lake Pkwy/Sunset/Cedar Lake Rd | Confusing and redundant intersection movements |
| 42 | Cedar Lake Pkwy/Sunset/Cedar Lake Rd | Lack of connectivity between on-street bike lane and Cedar Lake Pkwy trail |
| 43 | St. Paul/Sunset near Cedar Lake Pkwy | Sidewalk gap |
| 44 | Midtown Greenway - Dean - Calhoun Village | Lack of connectivity between high density residential and Midtown Greenway |

*Lack of connectivity between the Midtown Greenway and nearby high density residential.*

ISSUE 45

## IDENTIFIED ISSUES MATRIX, CONTINUED

| # | LOCATION | ISSUE |
|---|---|---|
| 45 | Midtown Greenway - Dean - Calhoun Village | Lack of connectivity between high density residential & Retail center |
| 46 | Study Area | Pedestrian and bicycle routes between key destinations unclear |
| 47 | East Lake Calhoun Area | Unclear pedestrian/bicycle routing at high demand trailhead area and lack of consistent lighting |
| 48 | E Calhoun area (Tin Fish, Boat Launch) | Unclear pedestrian/bicycle routing |
| 49 | Trail intersection and alignment near Wheel Fun Rental | Unclear pedestrian/bicycle routing |
| 50 | North side of Channel | Feels unsafe at night, poor lighting |
| 51 | Channel Bridge | Feels unsafe at night, poor lighting |
| 52 | Wayfinding | Bike routes unclear |
| 53 | The Mall at E Lake Calhoun Pkwy | Pedestrian connectivity |
| 54 | Bike trail along E Lake Calhoun Pkwy between Knox and Lagoon | Pedestrian connectivity |
| 55 | Bike trail crossing of Boat Launch driveway | Crossing visibility |
| 56 | South leg of E Calhoun Pkwy and Boat launch driveway | Crossing visibility |
| 57 | West side of E Calhoun Pkwy | Pedestrian connectivity |
| 58 | Implement Planned Minneapolis Bikeways - France, Burnham, Sunset Blvd, and Ewing | Existing bicycle system lacks connectivity |
| 59 | Lake/Excelsior Intersection | Confusing pedestrian crossing and inhospitable intersection |
| 60 | 32nd/W Calhoun Pkwy Intersection | Bicycle and pedestrian connectivity across intersection needs improvement |
| 61 | Lake/Thomas Intersection to W. Lake of the Isles Parkway | No direct connection between Lake of the Isles and Lake Calhoun |

## IDENTIFIED ISSUES MATRIX, CONTINUED

### ISSUE 61A

*Minimal treatments at major Lake Calhoun entry.*

### ISSUE 61B

*Pedestrian trail connection needed at Lake Calhoun near 32nd Street.*

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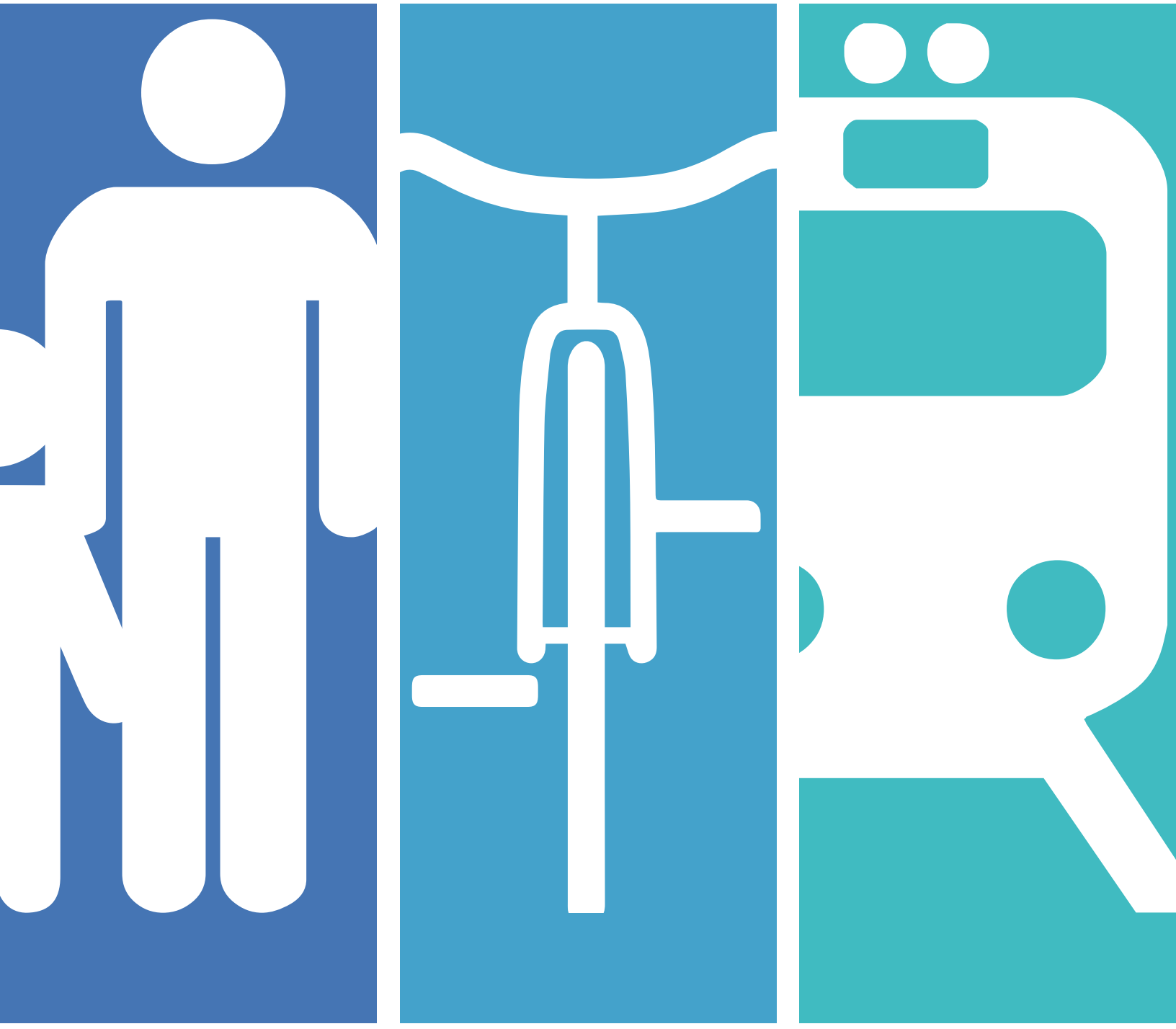
# APPENDIX A - TRAFFIC FORECAST MEMORANDUM



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# MEMORANDUM

TO: Nathan Koster, City of Minneapolis

FROM: Haifeng Xiao, PE

DATE: October 26, 2015

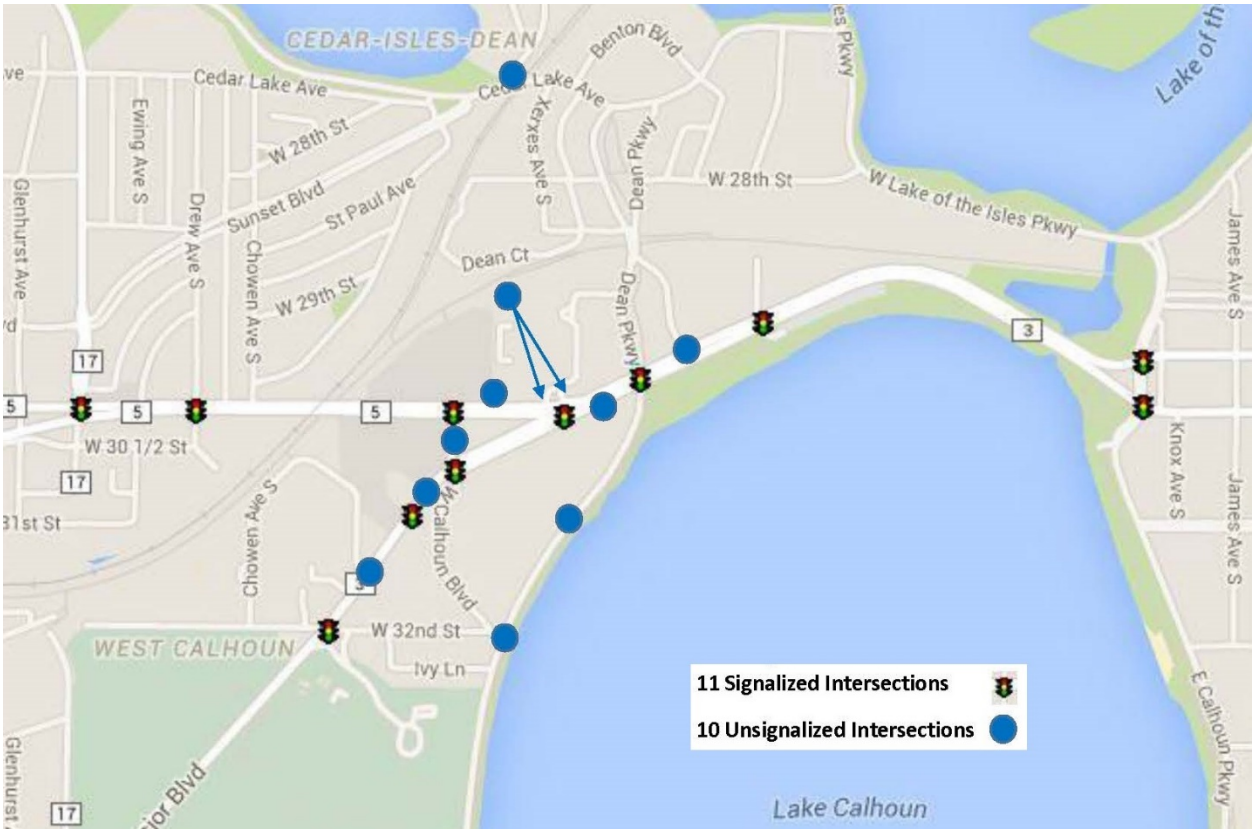
RE: West Lake Multimodal Transportation Study
Traffic Forecast Memorandum
SEH No. Mnpls 132317 2.00

## 1. INTRODUCTION

The purpose of this memorandum is to document the travel demand forecasts for the West Lake Multimodal Transportation Study. The memorandum includes a summary of the traffic forecast development methodology, assumptions and results.

The study area for traffic forecasts includes major roadway segments and intersections bounded by Cedar Lake Parkway on the north, E Calhoun Parkway on the east, West 32nd Street on the south and France Avenue on the west. **Figure 1** below illustrates the study intersections.

**Figure 1**
**West Lake Multimodal Transportation Study Intersections**



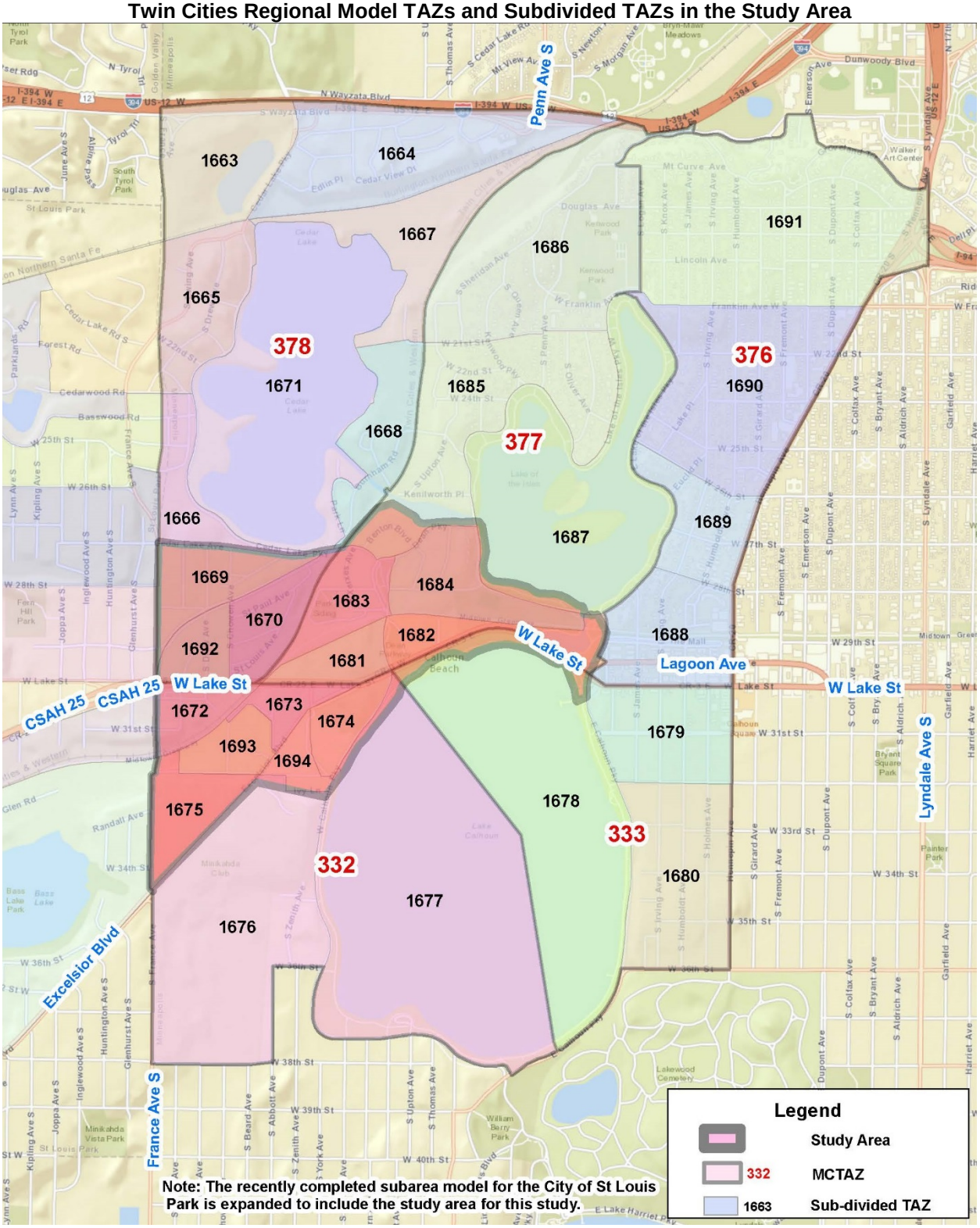
## 2. TRAFFIC FORECAST METHODOLOGY AND STEPS

Daily and peak hour traffic forecasts for this project were developed largely based on the utilization of the 2040 SWLRT model obtained from the SPO, which was based on the most current Twin Cities Regional Travel Demand Model (TCRTD model). The Metropolitan Council Transportation Analysis Zones (TAZs) were refined in the study area to better characterize trip patterns. The use of the TCRTD Model adheres to 2006 MnDOT Memo "Revised Guidelines for Twin City Travel Demand Forecasts Prepared for the Metropolitan District".

The daily traffic forecasts for major roadway segments and peak hour turning movements for the study intersections in the study area were developed using the following steps:

1. The 2010 and 2040 models for the SWLRT project were reviewed and the 2040 socioeconomic data (SE data) in the study area were refined to reflect the latest land use updates from the City of Minneapolis.
2. The 2040 SWLRT model was rerun with the updated 2040 SE data to produce vehicle Origin/Destination (OD) tables for all trip purposes. Traffic assignment was then conducted to develop auto traffic forecasts using the subarea model developed for this study. It is noted that the transit assignment, instead of highway assignment, was conducted to develop transit ridership forecasts in its post-processing steps to meet SWLRT project's needs by SPO.
3. The subarea model development included refining the TAZs and the roadway networks in the study area bounded by I-394 on the north, Hennepin Avenue on the east, 38$^{th}$ Street/36$^{th}$ Street on the south and France Avenue on the west. **Figure 2** shows the TCRTD model TAZs and their subdivided TAZs in the study area (It is noted that the recently completed subarea model for the City of St Louis Park was expanded to include the TAZs for this study). The vehicle trip tables for those subdivided TAZs were split based on their socio-economic data before they were assigned to the refined network. No changes were made to the TAZs outside of the subdivided TAZs. This subarea model development methodology will ensure that the overall trips for each TAZ in the TCRTD model remain unchanged while using more detailed socio-economic distributions for the TAZs within the study area.
4. The base existing and 2040 subarea models were run and their daily outputs for major roadway segments were adjusted to develop daily traffic forecasts based on the actual counts, base year model outputs and forecast model outputs. An additional sensitivity test assuming a connection of France Avenue between Lake Street and Excelsior Boulevard was conducted to analyze the impacts of the connection on the roadways in the study area.
5. The peak hour turning movements for the study intersections were developed based on the daily traffic growth and they were further adjusted to account for peak hour spreading and balance different growth for different approaches.

**Figure 2**
**Twin Cities Regional Model TAZs and Subdivided TAZs in the Study Area**



## 3. 2040 MODEL NETWORK AND SOCIONOMIC DATA ASSUMPTIONS SUMMARY

The 2040 SWLRT model network includes the following regional transit and freeway improvement projects:

- METRO Blue Line Extension (LRT)
- METRO Green Line Extension (LRT)
- METRO Gold Line (BRT)
- METRO Orange Line (BRT)
- A Line Arterial BRT
- Penn Arterial BRT
- Chicago Emerson/Fremont Arterial BRT
- I-35W/Lake Street Access project including a new northbound I-35W exit ramp to 28th Street, a new southbound I-35W exit ramp to Lake Street and new southbound I-35W MnPASS lanes from 26th Street to 46th Street

The TCRTD Model utilizes the traditional four-step modeling process which includes trip generation, trip distribution, mode choice, and trip assignment. The SE data, including population and employment, is one of the most important inputs for the travel demand model. The 2040 SE data from the SWLRT model was reviewed and the data in the study area were revised to reflect the City's latest land use plan. **Table 1.1** below summarizes the SE data for the study area, City of Minneapolis and Metro Council Metropolitan area. **Table 1.2** summarizes the SE data for subdivided TAZs in the study area and they are graphically illustrated in **Appendix 1A, 1B and 1C.**

**Table 1.1**
**Study Area, City of Minneapolis and Metropolitan Area Socio-Economic Data Summary**

| Area | Year | Population | Households | Retail Employment | Non-Retail Employment | Total Employment |
|---|---|---|---|---|---|---|
| Subarea Model Study Area | 2010 | 16,070 | 8,836 | 2,406 | 3,618 | 6,024 |
| | 2040 | 23,312 | 12,008 | 2,696 | 5,186 | 7,882 |
| | Annual Growth(%) | 1.25% | 1.03% | 0.38% | 1.21% | 0.90% |
| City of Minneapolis | 2010 | 383,159 | 163,892 | 33,123 | 247,387 | 280,510 |
| | 2040 | 467,572 | 203,668 | 48,946 | 309,536 | 358,482 |
| | Annual Growth(%) | 0.67% | 0.73% | 1.31% | 0.75% | 0.82% |
| Metro Total | 2010 | 2,849,546 | 1,117,741 | 263,625 | 1,277,179 | 1,540,804 |
| | 2040 | 3,676,082 | 1,510,009 | 382,076 | 1,720,103 | 2,102,179 |
| | Annual Growth(%) | 0.85% | 1.01% | 1.24% | 1.00% | 1.04% |

**Table 1.2**
**Study Area Sub-divided TAZ Socio-Economic Data Summary**

| MCTAZ | SubTAZ | 2010 | | | | 2040 | | | | Increase from existing | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Population | Household | Retail | Non-Retail | Population | Household | Retail | Non-Retail | Population | Household | Retail | Non-Retail |
| 332 | 1672 | 614 | 412 | 0 | 1 | 1,444 | 712 | 24 | 22 | 830 | 300 | 24 | 21 |
| | 1673 | 0 | 0 | 382 | 36 | 702 | 350 | 332 | 89 | 702 | 350 | -50 | 53 |
| | 1674 | 0 | 0 | 0 | 557 | 0 | 0 | 24 | 874 | 0 | 0 | 24 | 317 |
| | 1675 | 23 | 12 | 0 | 0 | 44 | 17 | 0 | 0 | 21 | 5 | 0 | 0 |
| | 1676 | 100 | 42 | 0 | 146 | 152 | 47 | 0 | 178 | 52 | 5 | 0 | 32 |
| | 1677 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1693 | 642 | 465 | 0 | 25 | 1,297 | 690 | 24 | 30 | 655 | 225 | 24 | 5 |
| | 1694 | 381 | 263 | 196 | 0 | 618 | 313 | 0 | 0 | 237 | 50 | -196 | 0 |
| | **subtotal** | **1,760** | **1,194** | **578** | **765** | **4,257** | **2,129** | **404** | **1,193** | **2,497** | **935** | **-174** | **428** |
| 333 | 1678 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1679 | 1,149 | 623 | 253 | 365 | 1,365 | 823 | 357 | 471 | 216 | 200 | 104 | 106 |
| | 1680 | 1,308 | 638 | 30 | 49 | 1,313 | 713 | 43 | 88 | 5 | 75 | 13 | 39 |
| | **subtotal** | **2,457** | **1,261** | **283** | **414** | **2,678** | **1,536** | **400** | **559** | **221** | **275** | **117** | **145** |
| 376 | 1688 | 1,318 | 884 | 517 | 230 | 1,967 | 1,234 | 630 | 256 | 649 | 350 | 113 | 26 |
| | 1689 | 648 | 349 | 268 | 135 | 1,189 | 599 | 325 | 143 | 541 | 250 | 57 | 8 |
| | 1690 | 1,713 | 842 | 315 | 231 | 2,484 | 1,142 | 384 | 247 | 771 | 300 | 69 | 16 |
| | 1691 | 2,985 | 1,752 | 20 | 401 | 3,280 | 1,802 | 50 | 480 | 295 | 50 | 30 | 79 |
| | **subtotal** | **6,664** | **3,827** | **1,120** | **997** | **8,920** | **4,777** | **1,389** | **1,126** | **2,256** | **950** | **269** | **129** |
| 377 | 1681 | 547 | 401 | 157 | 328 | 1,275 | 801 | 187 | 419 | 728 | 400 | 30 | 91 |
| | 1682 | 450 | 333 | 208 | 263 | 667 | 423 | 159 | 336 | 217 | 90 | -49 | 73 |
| | 1683 | 428 | 287 | 0 | 33 | 517 | 297 | 0 | 24 | 89 | 10 | 0 | -9 |
| | 1684 | 177 | 73 | 0 | 3 | 220 | 78 | 0 | 0 | 43 | 5 | 0 | -3 |
| | 1685 | 879 | 352 | 18 | 46 | 1,068 | 367 | 18 | 0 | 189 | 15 | 0 | -46 |
| | 1686 | 641 | 250 | 0 | 41 | 793 | 265 | 0 | 52 | 152 | 15 | 0 | 11 |
| | 1687 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **subtotal** | **3,122** | **1,696** | **383** | **714** | **4,540** | **2,231** | **364** | **831** | **1,418** | **535** | **-19** | **117** |
| 378 | 1663 | 0 | 0 | 0 | 28 | 0 | 0 | 0 | 1,081 | 0 | 0 | 0 | 1,053 |
| | 1664 | 513 | 219 | 0 | 307 | 1,247 | 594 | 61 | 157 | 734 | 375 | 61 | -150 |
| | 1665 | 276 | 131 | 0 | 18 | 280 | 133 | 0 | 0 | 4 | 2 | 0 | -18 |
| | 1666 | 254 | 69 | 0 | 309 | 261 | 71 | 0 | 234 | 7 | 2 | 0 | -75 |
| | 1667 | 13 | 6 | 0 | 0 | 13 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1668 | 113 | 46 | 0 | 0 | 120 | 49 | 0 | 0 | 7 | 3 | 0 | 0 |
| | 1669 | 333 | 129 | 42 | 17 | 310 | 134 | 42 | 0 | -23 | 5 | 0 | -17 |
| | 1670 | 290 | 144 | 0 | 25 | 332 | 184 | 0 | 0 | 42 | 40 | 0 | -25 |
| | 1671 | 78 | 26 | 0 | 2 | 78 | 26 | 0 | 0 | 0 | 0 | 0 | -2 |
| | 1692 | 197 | 88 | 0 | 22 | 276 | 138 | 36 | 5 | 79 | 50 | 36 | -17 |
| | **subtotal** | **2,067** | **858** | **42** | **728** | **2,917** | **1,335** | **139** | **1,477** | **850** | **477** | **97** | **749** |
| **Total** | | **16,070** | **8,836** | **2,406** | **3,618** | **23,312** | **12,008** | **2,696** | **5,186** | **7,242** | **3,172** | **290** | **1,568** |

## 4. 2040 TRAFFIC FORECASTS RESULTS

Based on the methodology and the network and socio-economic assumptions, the 2040 daily traffic forecasts were developed for major roadway study segments under 2040 Base Scenario and France Avenue Connection Scenario. The daily traffic forecast results are illustrated in **Appendix 2A** and **Appendix 2B.**

Existing turning movement traffic data was collected for 21 study intersections during weekday peak periods. The existing AM and PM peak hour turning movement traffic counts are illustrated in **Appendix 3A - 3E.**

The peak hour turning movement forecasts for the 2040 base scenario are illustrated in **Appendix 4A - 4E**.

The daily traffic forecast results in **Appendix 2A** show that traffic volumes on Lake Street are expected to grow at an annual rate varying from 0.46% east of Thomas Avenue, 0.41% between Market Place and Dean Parkway, and 0.54% west of Market Place in the study area. The traffic growth on Excelsior Boulevard is expected to growth at a slightly higher annual rate at 0.85%. The AM (and PM) peak hour annual growth rates are respectively 0.34% (0.22%), 0.32% (0.21%), 0.44% (0.3%), and 0.72% (0.58%) at above four locations, slightly lower than the daily growth rates due to peak spreading. All major roadway segments in the study area are expected to experience annual growth rates that are less than 1%.

The daily traffic forecast results in **Appendix 2B** indicate that a potential France Avenue connection between Lake Street and Excelsior Boulevard is not expected to have significant impacts on Lake Street east of Excelsior Boulevard traffic volumes in the City of Minneapolis, however it would draw a substantial amount of traffic from Beltline Boulevard in the City of St. Louis Park, which is outside of this study scope. If France Avenue were connected, it would be the only north-south arterial street between TH 100 and Lyndale Avenue that runs from TH 62 to I-394 and beyond. However, due to the limited benefit of this option to the study area, significant right-of-way constraints, environmental impacts, and a lack of support in both St. Louis Park and Minneapolis, this option was not tested further and is not under consideration.

HX

Attachments
cc: Heather Kienitz, Project Manager, SEH

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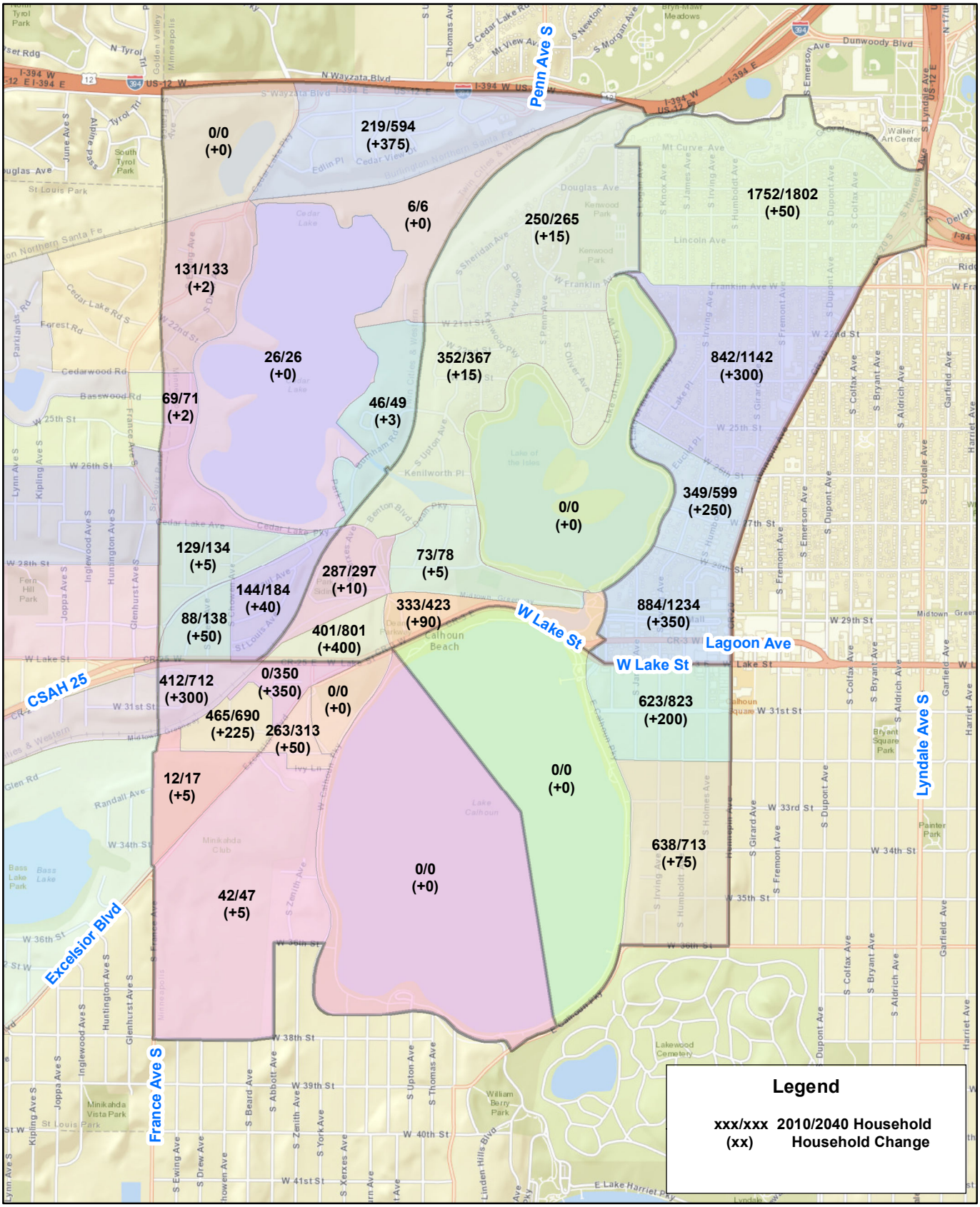
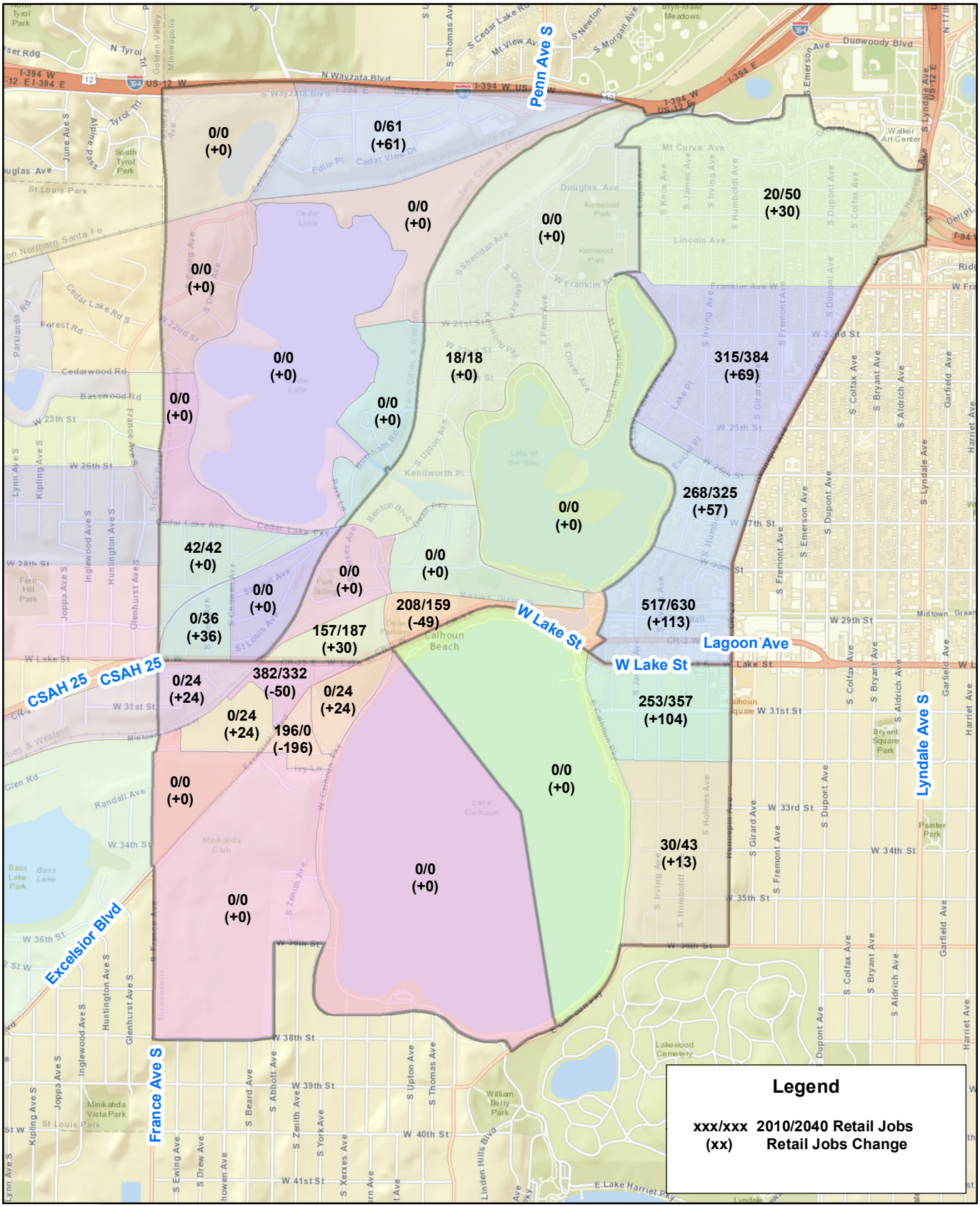
# Appendix 1




**Twin Cities Regional Model Socio-Economic Data in the Study Area**
**Existing and 2040 Households**

**West Lake Multimodal Transportation Study**
**City of Minneapolis**

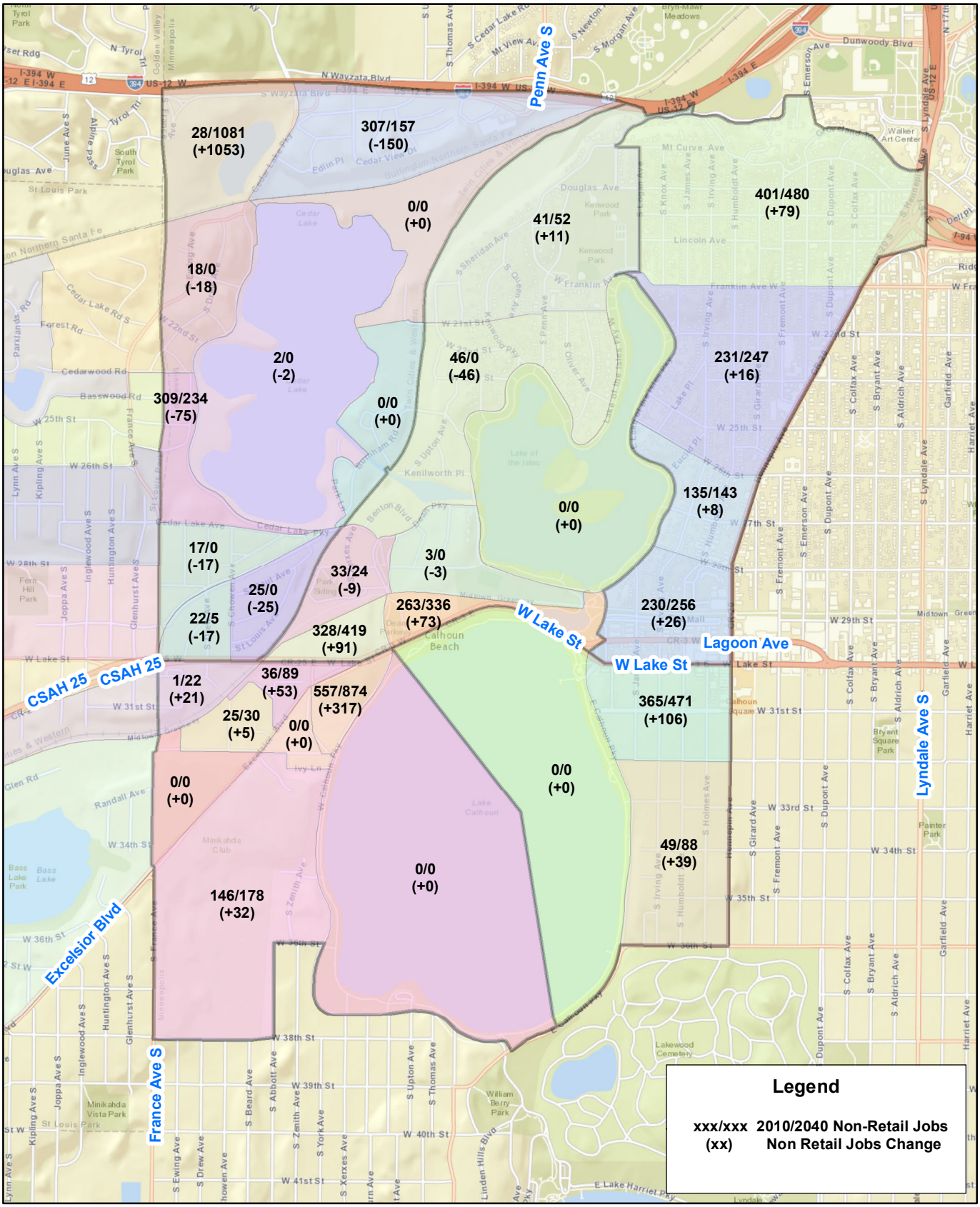
**Appendix 1A**




**Twin Cities Regional Model Socio-Economic Data in the Study Area**
**Existing and 2040 Retail Jobs**

**West Lake Multimodal Transportation Study**
**City of Minneapolis**

**Appendix 1B**

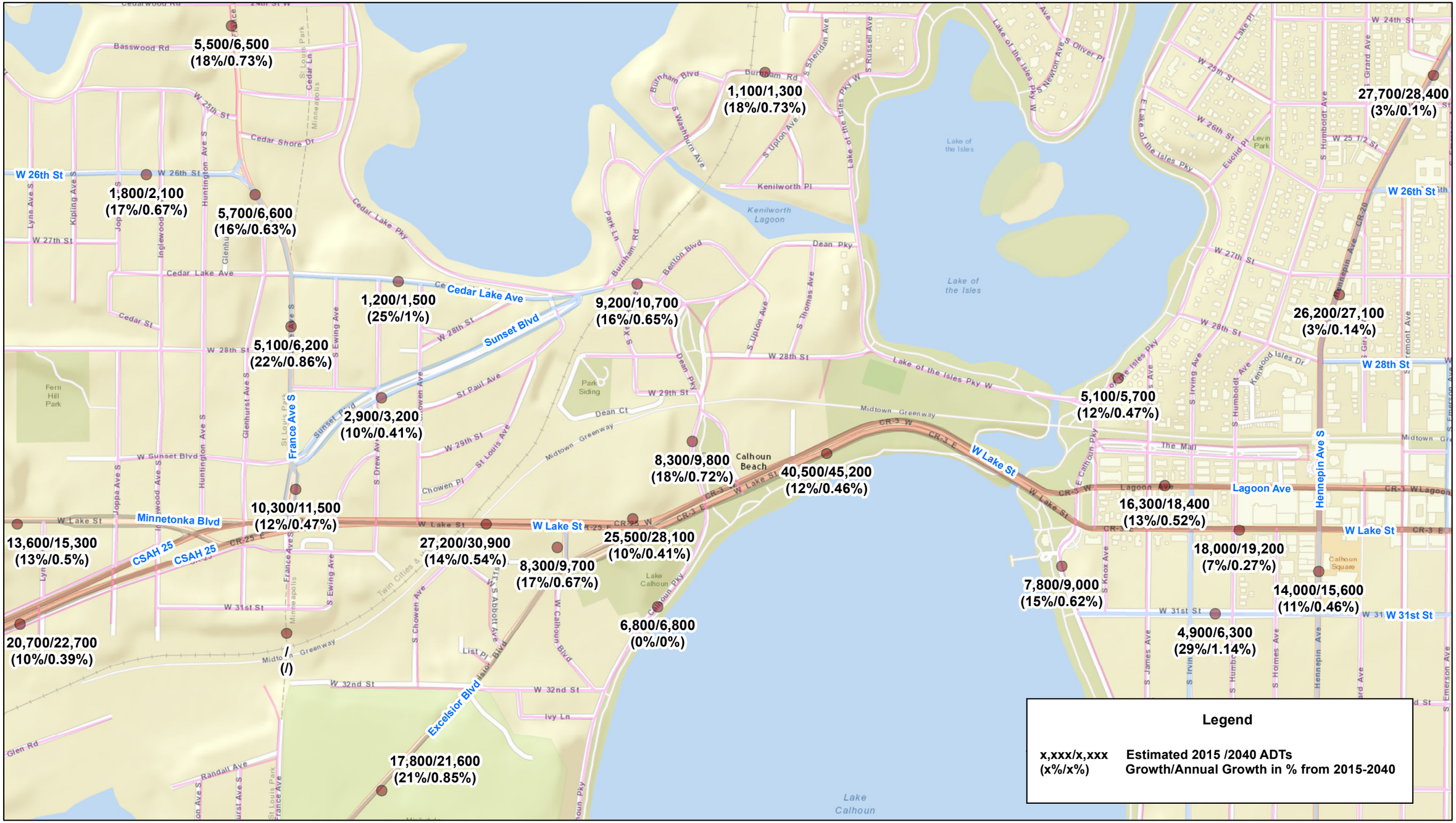



**Twin Cities Regional Model Socio-Economic Data in the Study Area**
**Existing and 2040 Non-Retail Jobs**

**West Lake Multimodal Transportation Study**
**City of Minneapolis**

**Appendix 1C**

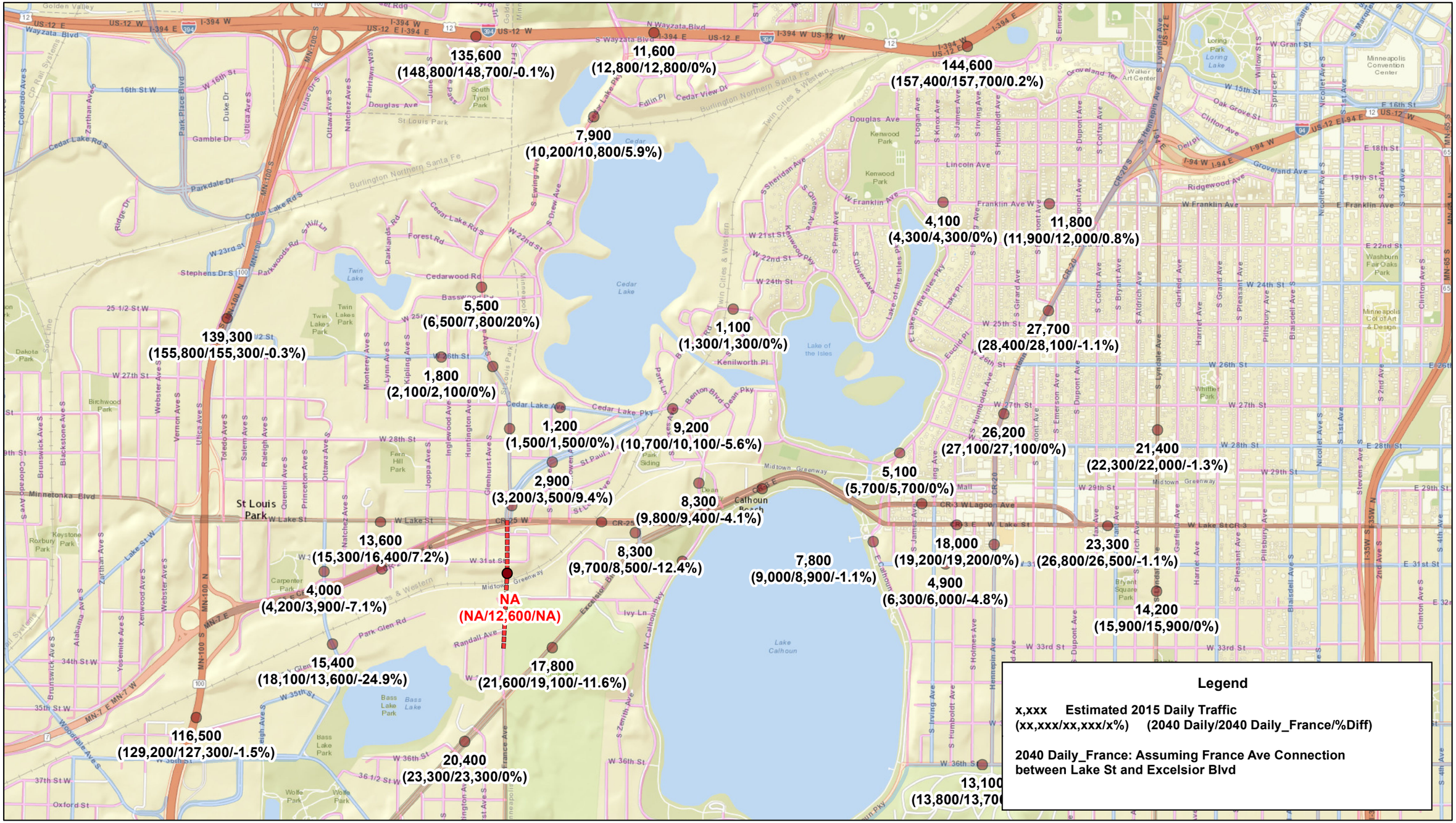
# Appendix 2




Existing and 2040 Daily Traffic Forecasts ( 8/7/2015)
in the Study Area

West Lake Multimodal Transportation Study
City of Minneapolis

Appendix
2A



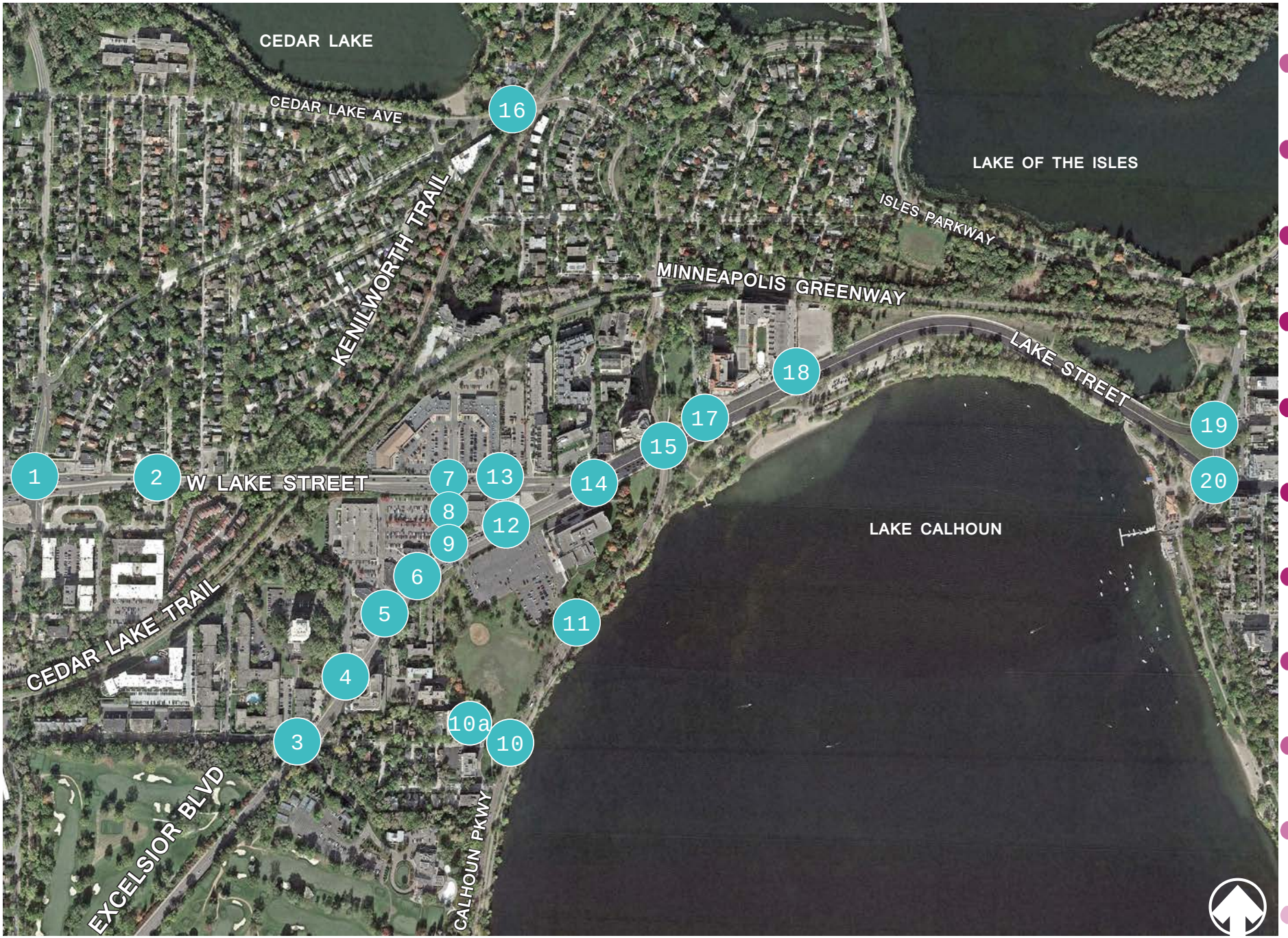

Existing and 2040 Daily Traffic Forecasts Without/With France Ave Connection in the Study Area (Sensitivity Test, 8/19/2015)

West Lake Multimodal Transportation Study
City of Minneapolis

Appendix
2B

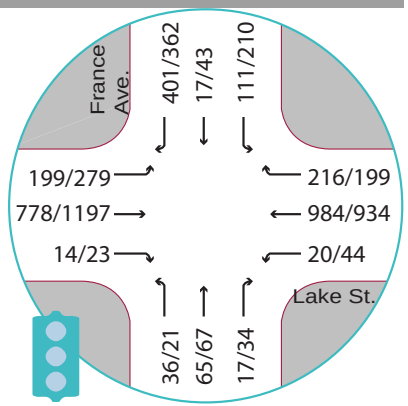
# Appendix 3

# 2015 INTERSECTION TURNING MOVEMENTS, appendix 3a

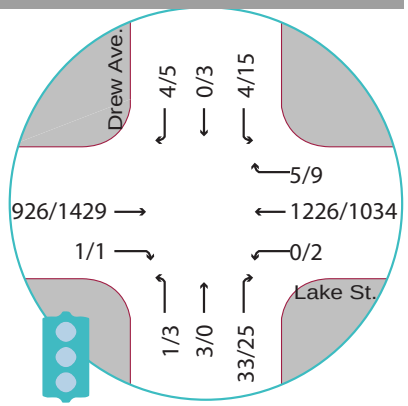


# 2015 INTERSECTION TURNING MOVEMENTS, appendix 3b

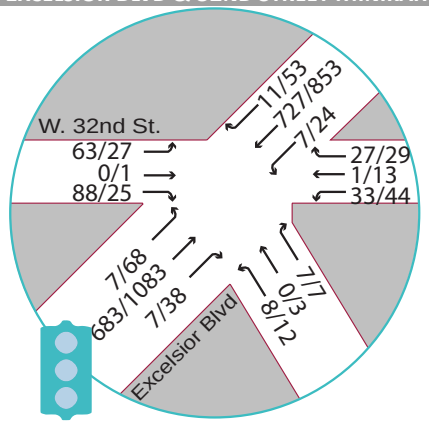
## 1 Lake Street & France Ave



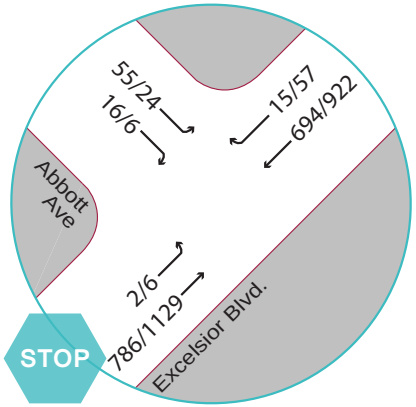

## 2 Lake Street & Drew Avenue



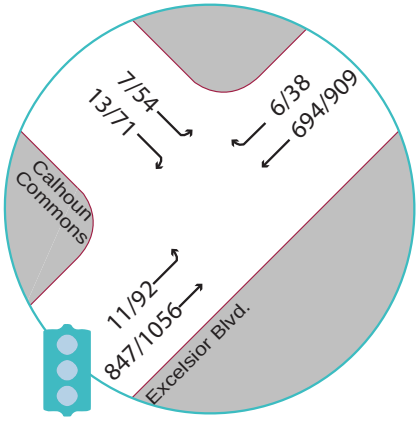

## 3 Excelsior Blvd & 32nd Street Minikahda



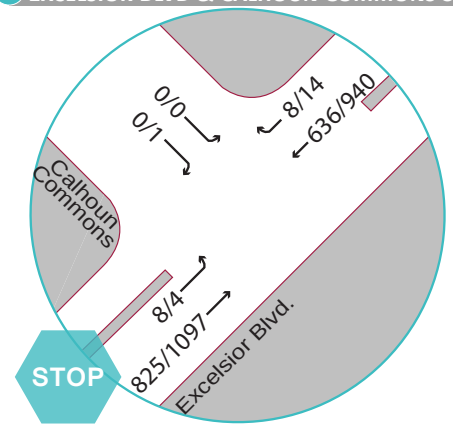

## 4 Excelsior Blvd & Abbott Avenue




## 5 Excelsior Blvd & Calhoun Commons Signal




## 6 Excelsior Blvd & Calhoun Commons Stop





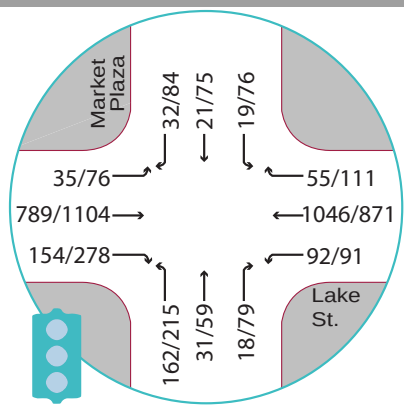
## Key

**Peak Traffic Volume: AM / PM**

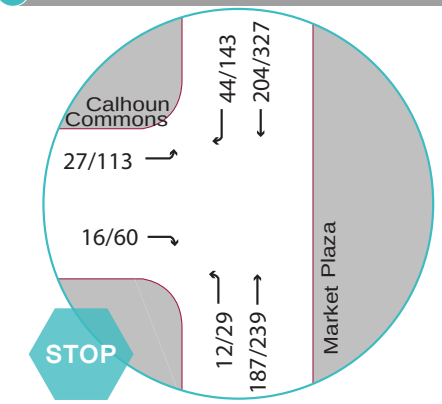
- Data point location
- Signalized intersection
- STOP — Unsignalized intersection
- Vehicle movement

# 2015 INTERSECTION TURNING MOVEMENTS, appendix 3c

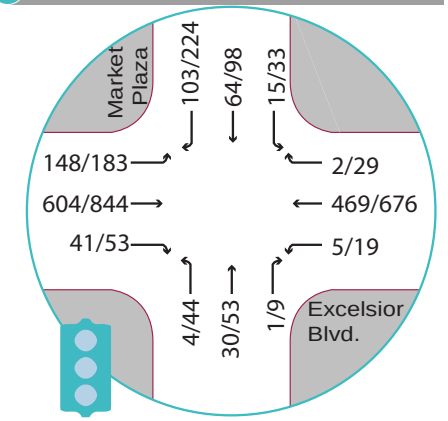
## 7 Lake St. & Market Plaza



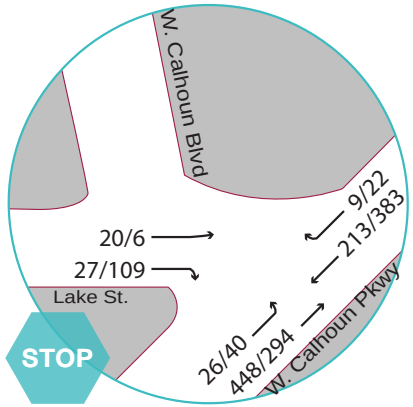

## 8 Market Plaza & Calhoun Commons



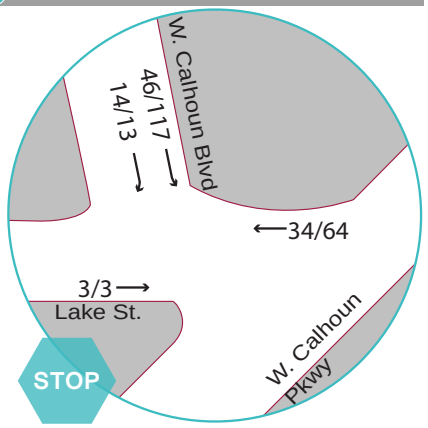

## 9 Excelsior Blvd & Market Plaza



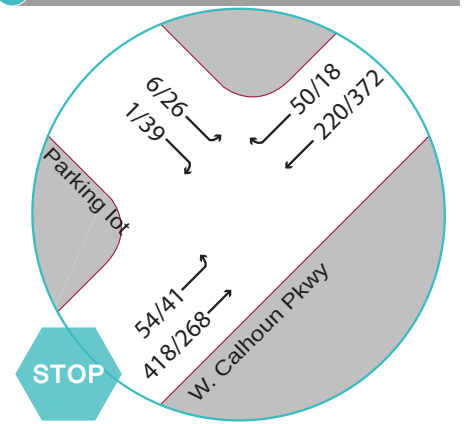

## 10 West Calhoun Pkwy & 32nd Street




## 10a West Calhoun Blvd & 32nd Street




## 11 West Calhoun Parkway





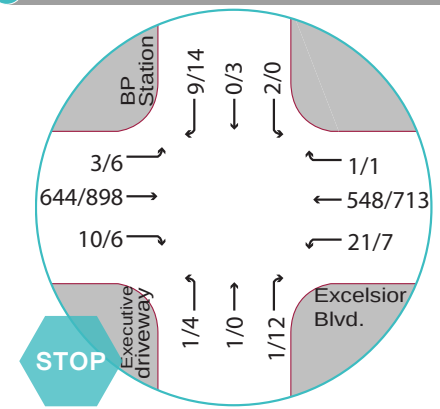
## Key

**Peak Traffic Volume: AM / PM**

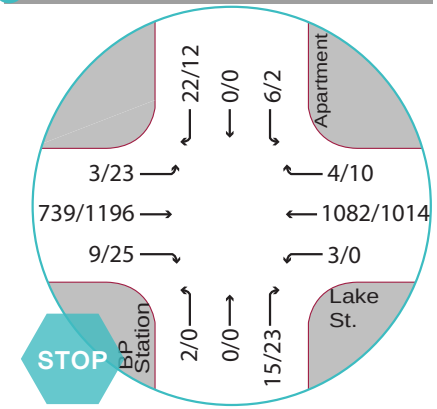
- Data point location
- Signalized intersection
- STOP — Unsignalized intersection
- Vehicle movement

# 2015 INTERSECTION TURNING MOVEMENTS, appendix 3d

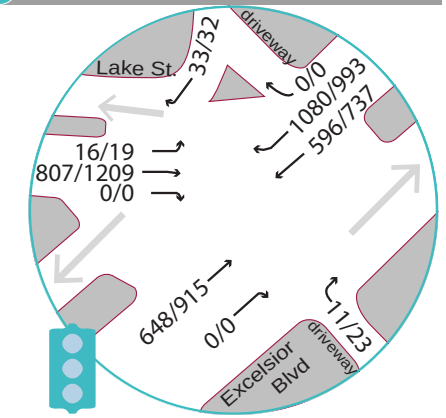
## 12 Excelsior Blvd & Executive Offices & BP Station



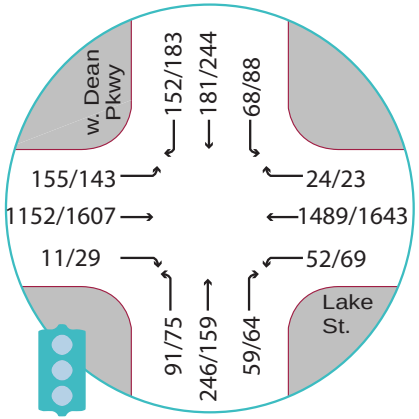

## 13 Lake Street & BP Station / Apt



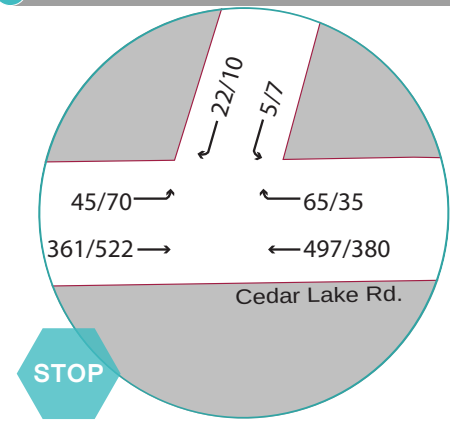

## 14 Lake St. & Excelsior Blvd




## 15 Lake Street & W Dean Parkway / Calhoun Pkwy




## 16 Cedar Lake Trail & Burnham Trail





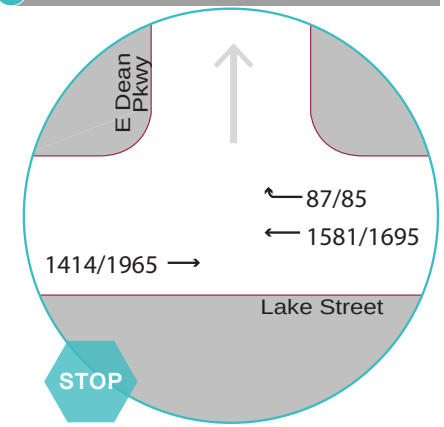
## Key

**Peak Traffic Volume: AM / PM**

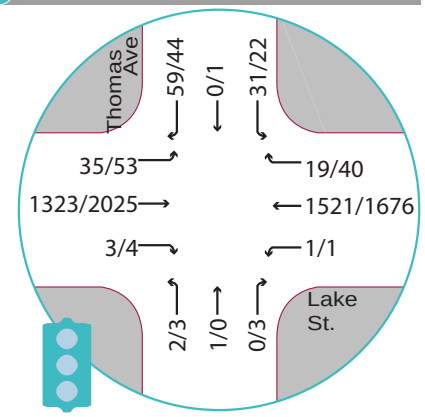
- Data point location
- Signalized intersection
- STOP — Unsignalized intersection
- Vehicle movement

# 2015 INTERSECTION TURNING MOVEMENTS, appendix 3e

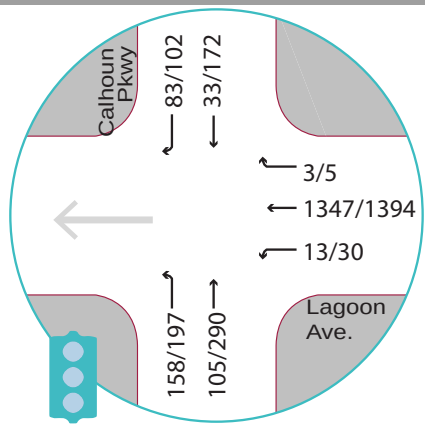
## 17 Lake Street & East Dean Parkway



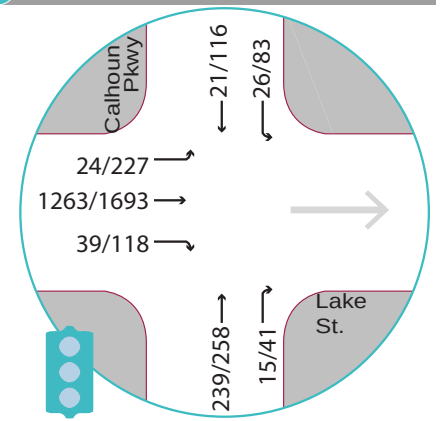

## 18 Lake Street & Thomas Avenue




## 19 Lagoon Ave & East Calhoun Parkway




## 20 Lake Street & East Calhoun Parkway





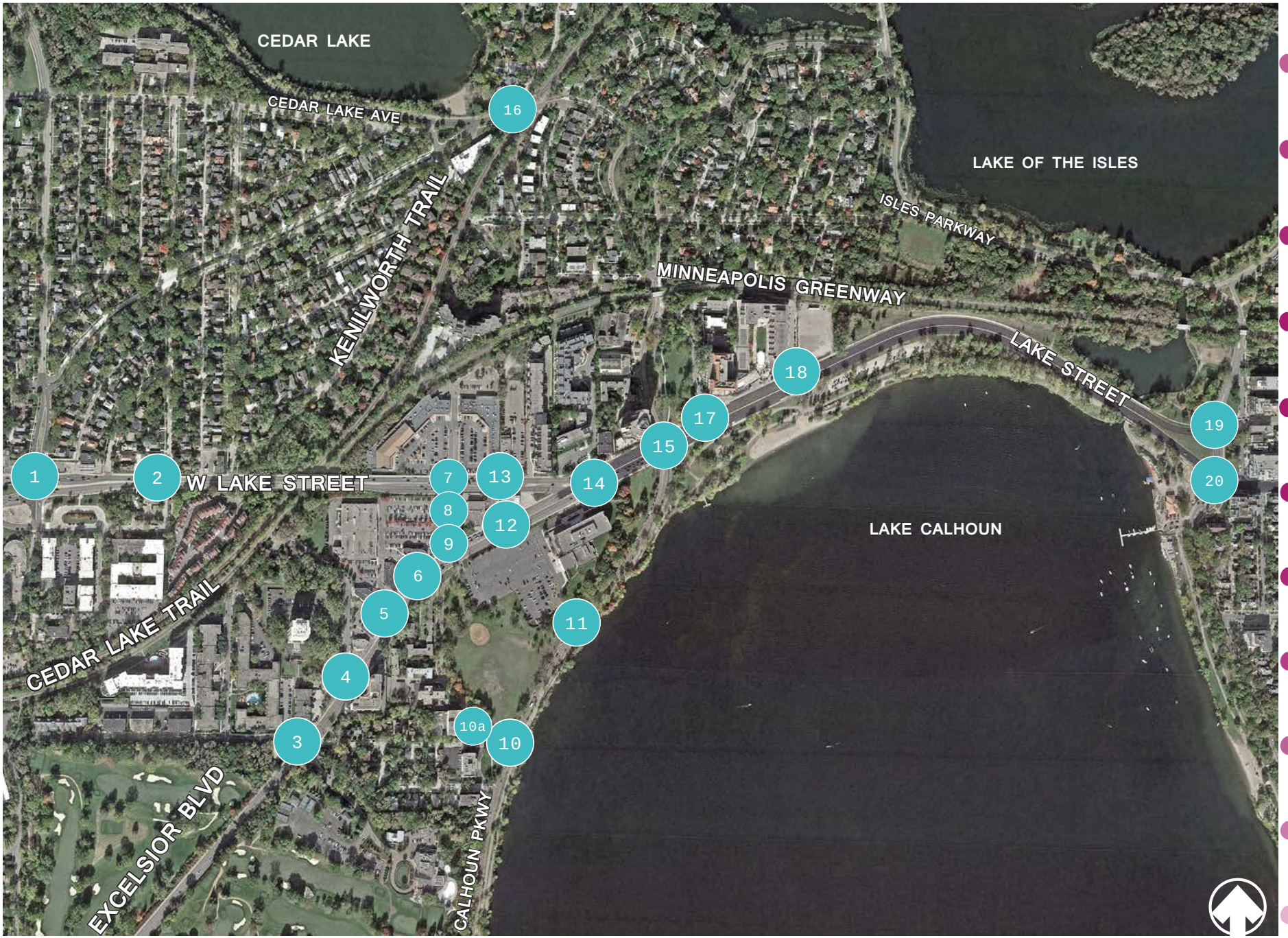
## Key

**Peak Traffic Volume: AM / PM**

- Data point location
- Signalized intersection
- STOP Unsignalized intersection
- Vehicle movement

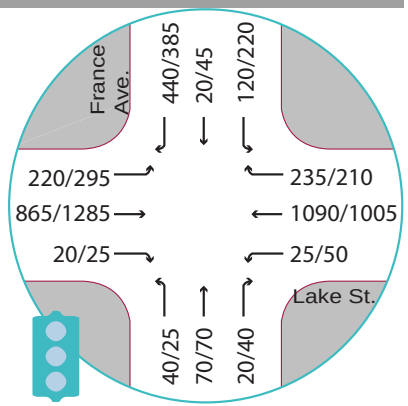
# Appendix 4

# 2040 FORECAST INTERSECTION TURNING MOVEMENTS, appendix 4a

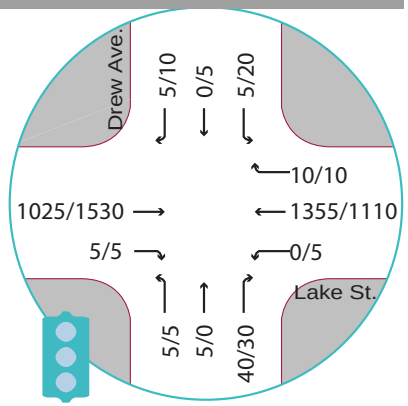


# 2040 FORECAST INTERSECTION TURNING MOVEMENTS, appendix 4b

## 1 Lake Street & France Ave

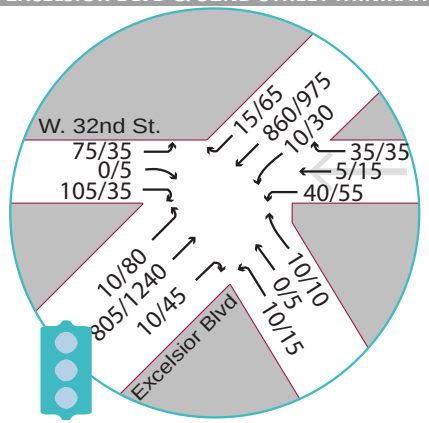



## 2 Lake Street & Drew Avenue

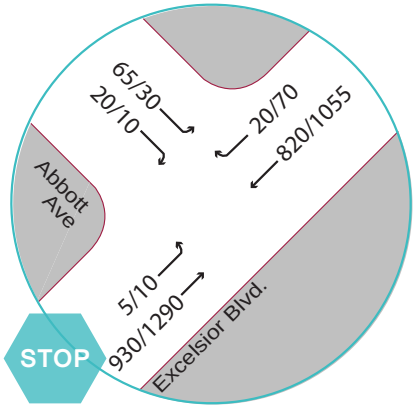




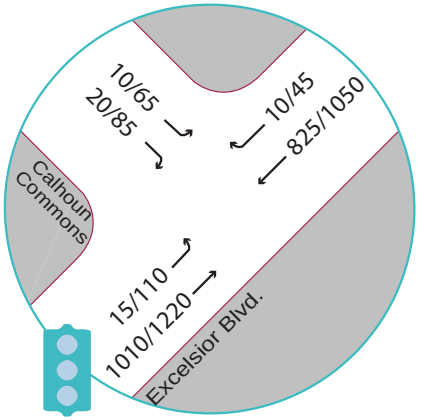
## 3 Excelsior Blvd & 32nd Street Minikahda



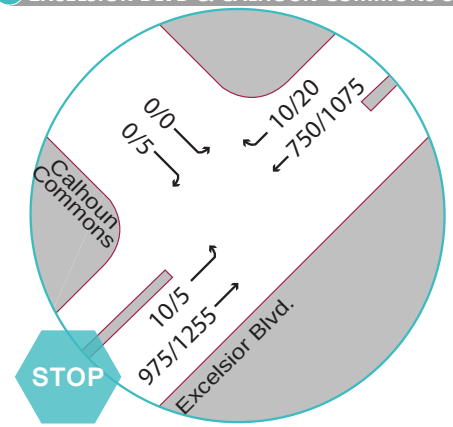

## 4 Excelsior Blvd & Abbott Avenue




## 5 Excelsior Blvd & Calhoun Commons Signal




## 6 Excelsior Blvd & Calhoun Commons Stop



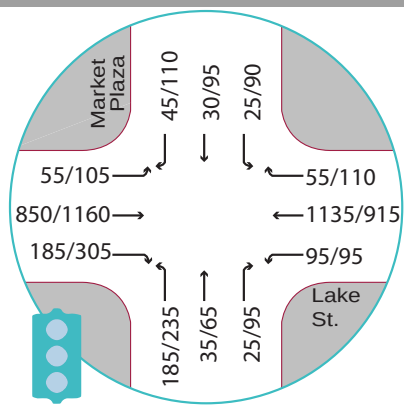

## Key

### 2040 Peak Hour Traffic Volume: AM / PM

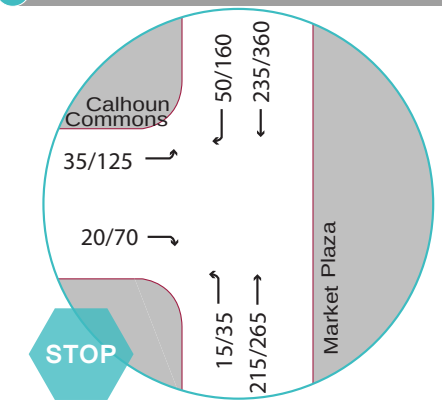
- Data point location
- Signalized intersection
- STOP — Unsignalized intersection
- Vehicle movement

# 2040 FORECAST INTERSECTION TURNING MOVEMENTS, appendix 4c

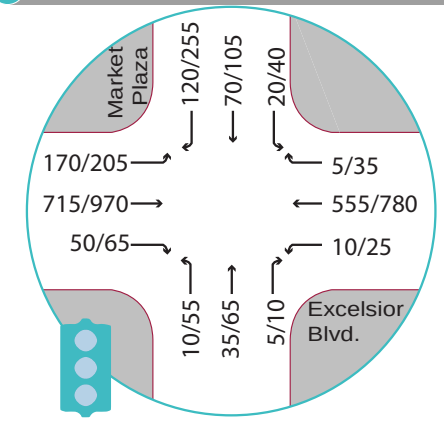
## 7 Lake St. & Market Plaza



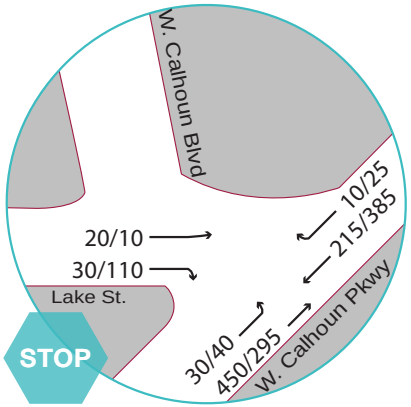

## 8 Market Plaza & Calhoun Commons



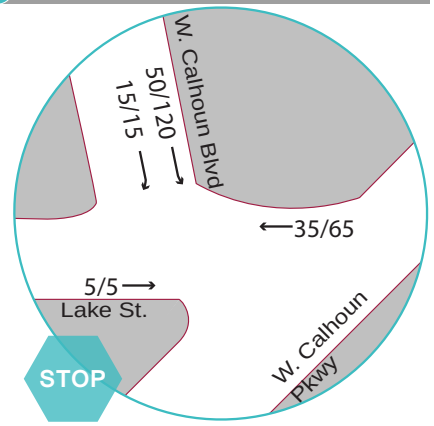

## 9 Excelsior Blvd & Market Plaza



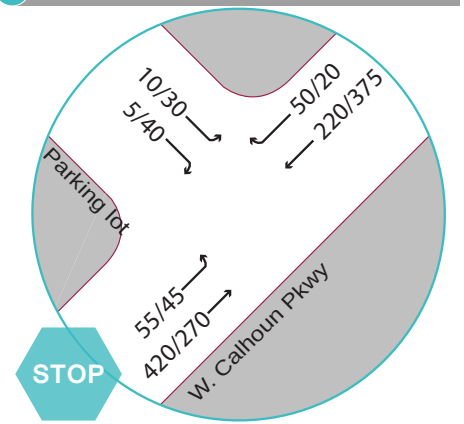

## 10 West Calhoun Pkwy & 32nd Street




## 10a West Calhoun Blvd & 32nd Street




## 11 West Calhoun Parkway





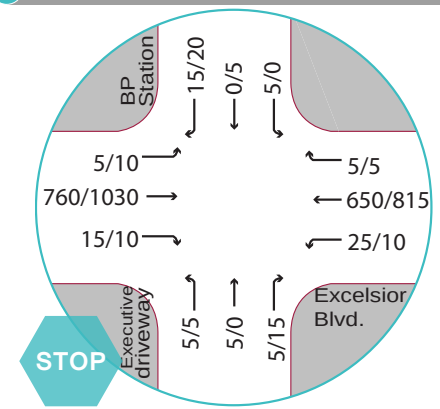
## Key

2040 Peak Hour Traffic Volume: AM / PM

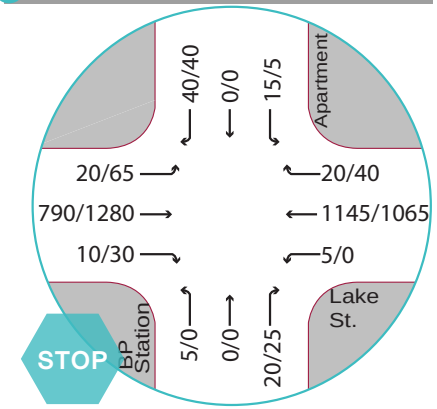
- Data point location
- Signalized intersection
- STOP — Unsignalized intersection
- Vehicle movement

# 2040 FORECAST INTERSECTION TURNING MOVEMENTS, appendix 4d

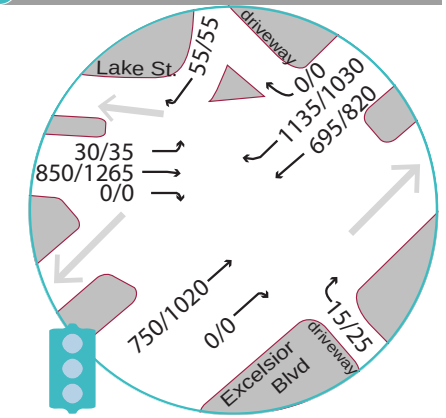
## 12 Excelsior Blvd & Executive Offices & BP Station



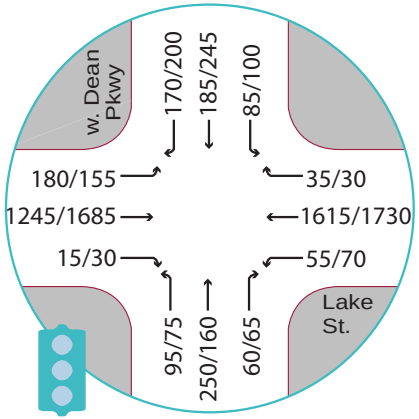

## 13 Lake Street & BP Station / Apt



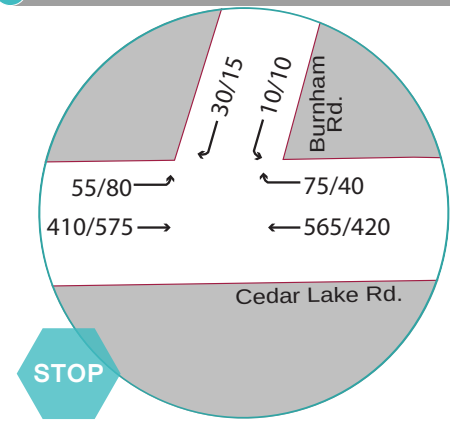

## 14 Lake St. & Excelsior Blvd




## 15 Lake Street & W Dean Parkway / Calhoun Pkwy




## 16 Cedar Lake Trail & Burnham Trail





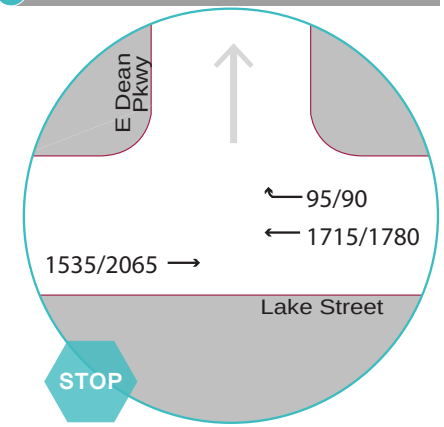
## Key

### 2040 Peak Hour Traffic Volume: AM / PM

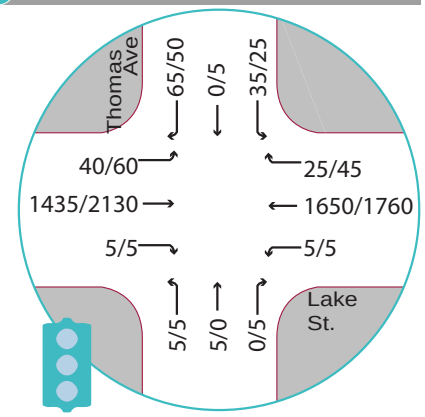
- Data point location
- Signalized intersection
- STOP Unsignalized intersection
- Vehicle movement

# 2040 FORECAST INTERSECTION TURNING MOVEMENTS, appendix 4e

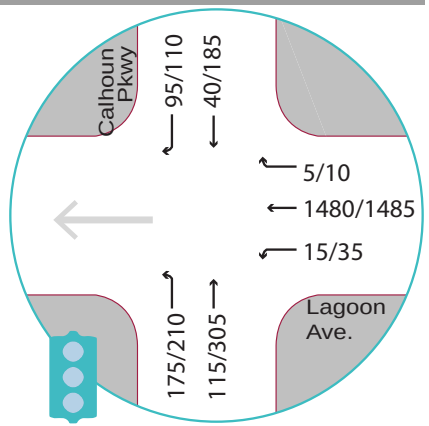
## 17 Lake Street & East Dean Parkway



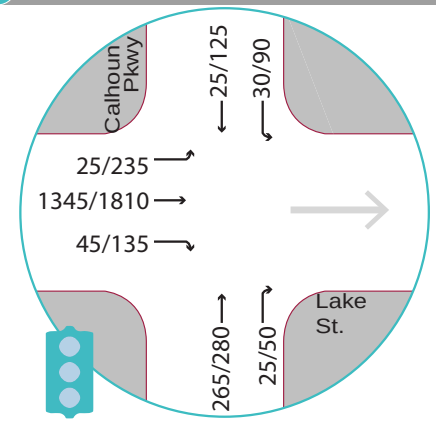

## 18 Lake Street & Thomas Avenue




## 19 Lagoon Ave & East Calhoun Parkway




## 20 Lake Street & East Calhoun Parkway





## Key

**2040 Peak Hour Traffic Volume: AM / PM**

- Data point location
- Signalized intersection
- STOP — Unsignalized intersection
- Vehicle movement

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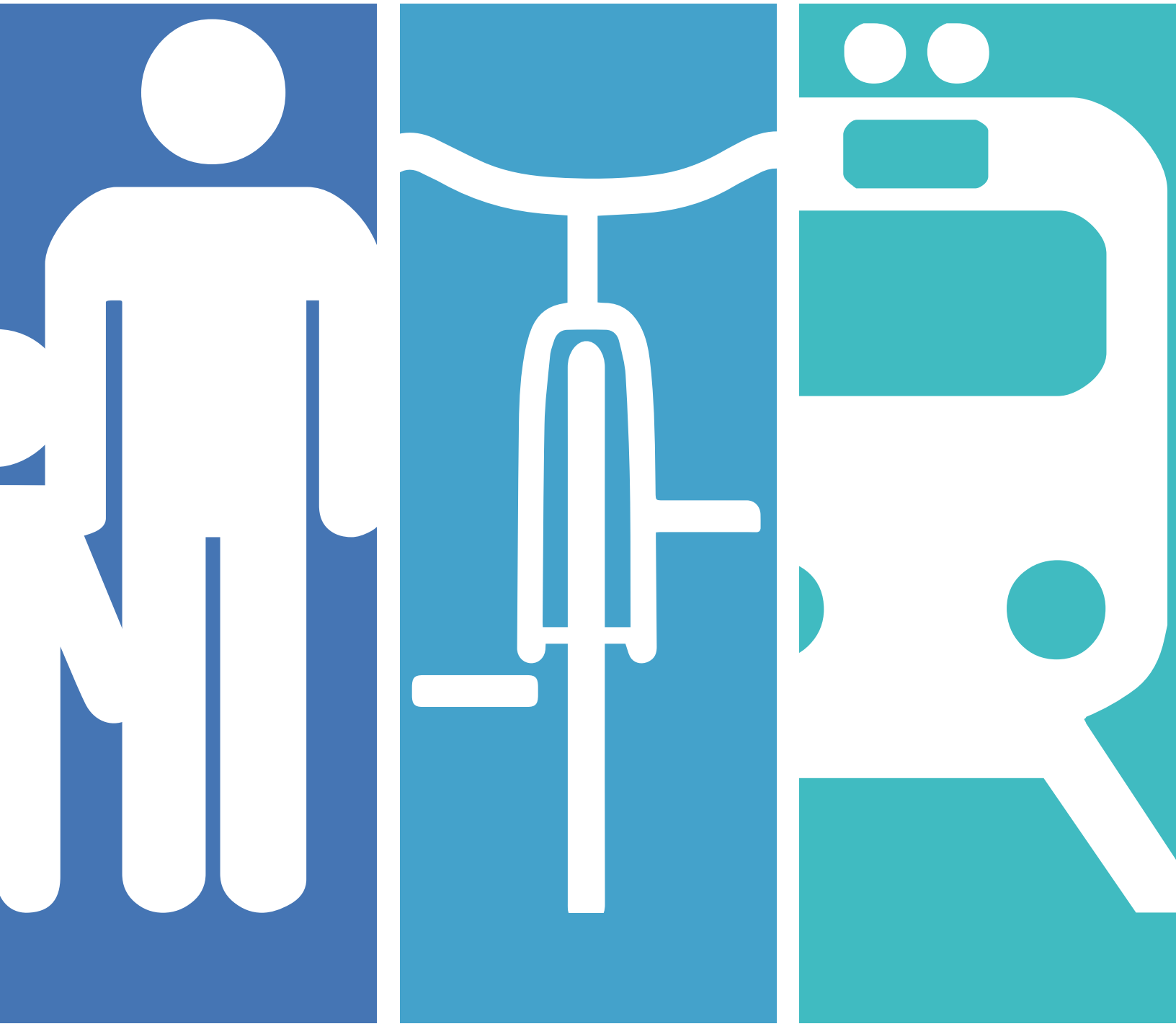
# APPENDIX B - TRAFFIC OPERATIONS ANALYSIS



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# TABLE B-1
# EXISTING AM PEAK HOUR TRAFFIC OPERATIONS ANALYSIS - DETAILED MEASURES OF EFFECTIVENESS

| Intersection | Approach | Level of Service | | | | | | | | | | | | Queing Information (feet) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Delay (s/veh) | | | | | | | | LOS By Approach | | LOS By Intersection | | Through | | | Left Turn | | | Right Turn | | | Right Turn2 | | |
| | | L | LOS | T | LOS | R | LOS | R2 | LOS | Delay (S/Veh) | LOS | Delay (S/Veh) | LOS | Link Length | Avg. | Max | Storage | Avg. | Max | Storage | Avg. | Max | Storage | Avg. | Max |
| Lake & France (Signal) | NB | 43.4 | D | 43.0 | D | 19.8 | B | | | 39.7 | D | | | 198 | 48 | 134 | 0 | **24** | 79 | 0 | | | | | |
| | SB | 57.0 | **E** | 39.5 | D | 24.5 | C | | | 32.4 | C | 26.5 | C | 230 | 87 | **212** | 30 | **48** | **55** | 0 | **146** | **244** | | | |
| | EB | 125.4 | **F** | 10.9 | B | 2.3 | A | | | 33.4 | C | | | 465 | 206 | **463** | 250 | **222** | **320** | 150 | 5 | 74 | | | |
| | WB | 69.1 | **E** | 18.2 | B | 8.5 | A | | | 17.2 | B | | | 584 | 204 | **448** | 160 | 22 | **156** | 120 | **93** | **240** | | | |
| Lake & Drew (Signal) | NB | 30.9 | C | 49.2 | D | 8.6 | A | | | 10.5 | B | | | 446 | 21 | 55 | 0 | | 0 | 0 | | | | | |
| | SB | 90.9 | **F** | 0.0 | A | 14.4 | B | | | 47.2 | D | 4.0 | A | 412 | 7 | 38 | 0 | | 0 | 0 | | | | | |
| | EB | 0.0 | A | 2.7 | A | 1.2 | A | | | 2.7 | A | | | 584 | 24 | 162 | 0 | | 0 | 0 | | | | | |
| | WB | 0.0 | A | 4.5 | A | 2.7 | A | | | 4.5 | A | | | 1381 | 42 | 219 | 0 | | 0 | 0 | | | | | |
| Lake & Market (Signal) | NB | 38.9 | D | 27.1 | C | 11.7 | B | | | 34.5 | C | | | 88 | 31 | **87** | 0 | **85** | 97 | 0 | | | | | |
| | SB | 50.3 | D | 46.5 | D | 17.9 | B | | | 34.0 | C | 12.6 | B | 401 | 31 | 95 | 150 | 14 | 59 | 0 | | | | | |
| | EB | 19.9 | B | 10.9 | B | 10.5 | B | | | 11.2 | B | | | 1381 | 95 | 249 | 250 | 19 | 63 | 210 | 44 | **166** | | | |
| | WB | 15.3 | B | 8.2 | A | 2.0 | A | | | 8.4 | A | | | 271 | 108 | **228** | 110 | 41 | **135** | 70 | 15 | **116** | | | |
| Lake & Shopping Access | NB | 18.0 | C | 0.0 | A | 25.5 | D | | | 25.0 | D | | | 56 | 2 | 23 | 0 | | 0 | 0 | **16** | **65** | | | |
| | SB | 34.4 | D | 0.0 | A | 10.6 | B | | | 16.2 | C | 4.2 | A | 295 | 24 | 79 | 0 | | 0 | 0 | | | | | |
| | EB | 25.7 | D | 5.8 | A | 6.3 | A | | | 5.9 | A | | | 271 | 62 | **208** | 62 | 2 | 18 | 0 | | | | | |
| | WB | 29.5 | D | 2.3 | A | 1.3 | A | | | 2.4 | A | | | 129 | 20 | **203** | 0 | | 0 | 0 | | | | | |
| Excelsior & Lake (Signal) | NB | 0.0 | A | 0.0 | A | 23.3 | C | 0.0 | A | 23.3 | C | | | 202 | 61 | **188** | 0 | | 0 | 0 | | | 0 | | |
| | SB | 0.0 | A | 20.3 | C | 6.8 | A | 0.0 | A | 11.9 | B | 17.8 | B | 350 | 106 | **266** | 0 | | 0 | 0 | **71** | **264** | 0 | **71** | **264** |
| | EB | 30.3 | C | 26.9 | C | 15.8 | B | 0.0 | A | 26.9 | C | | | 129 | **204** | **245** | 45 | **199** | **234** | 0 | | | 0 | | |
| | WB | 0.0 | A | 0.0 | A | 0.0 | A | 4.3 | A | 4.3 | A | | | 13 | 6 | **34** | 0 | | 0 | 0 | | | 0 | | |
| | SE | 0.0 | A | 0.0 | A | 0.0 | A | 0.4 | A | 0.4 | A | | | 0 | | | 0 | | 0 | 0 | | | 0 | | |
| Lake & Dean Pkwy/W Calhoun Pkwy (Signal) | NB | 280.2 | **F** | 188.0 | **F** | 208.8 | **F** | | | 210.7 | **F** | | | 867 | 626 | **818** | 60 | **73** | **85** | 0 | | | | | |
| | SB | 140.2 | **F** | 71.6 | **E** | 65.9 | **E** | | | 80.1 | **F** | 48.7 | D | 564 | 310 | **572** | 70 | **78** | **129** | 0 | | | | | |
| | EB | 36.0 | D | 22.8 | C | 12.8 | B | | | 24.1 | C | | | 350 | 249 | **406** | 185 | 101 | **284** | 0 | | | | | |
| | WB | 19.4 | B | 21.3 | C | 25.8 | C | | | 21.3 | C | | | 203 | **180** | **246** | 130 | 29 | 94 | 0 | | | | | |
| Lake & Unsignalized Dean Pkwy | NB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| | SB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | 6.6 | A | 0 | | | 0 | | 0 | 0 | | | | | |
| | EB | 0.0 | A | 2.9 | A | 0.0 | A | | | 2.9 | A | | | 203 | 2 | 56 | 0 | | 0 | 0 | | | | | |
| | WB | 0.0 | A | 9.3 | A | 14.2 | B | | | 9.6 | A | | | 400 | 151 | **438** | 0 | | 0 | 0 | | | | | |
| Lake & Thomas (Signal) | NB | 46.3 | D | 38.3 | D | 0.0 | A | | | 42.3 | D | | | 190 | 2 | 32 | 0 | | 0 | 0 | | | | | |
| | SB | 34.2 | C | 0.0 | A | 21.6 | C | | | 26.4 | C | 29.1 | C | 352 | 20 | 78 | 0 | | 0 | 50 | 20 | **71** | | | |
| | EB | 41.1 | D | 7.8 | A | 1.2 | A | | | 8.6 | A | | | 400 | 105 | 192 | 340 | 28 | 77 | 0 | **1** | **32** | | | |
| | WB | 62.6 | **E** | 46.6 | D | 83.2 | **F** | | | 47.1 | D | | | 1960 | 450 | 800 | 0 | | 0 | 0 | | | | | |
| Lake & E Calhoun Pkwy (Signal) | NB | 0.0 | A | 48.2 | D | 15.7 | B | | | 46.2 | D | | | 667 | 168 | 321 | 0 | | 0 | 85 | 14 | **135** | | | |
| | SB | 54.2 | D | 28.6 | C | 0.0 | A | | | 40.7 | D | 16.0 | B | 165 | 17 | 76 | 0 | **28** | 91 | 0 | | | | | |
| | EB | 9.5 | A | 9.2 | A | 7.0 | A | | | 9.1 | A | | | 360 | 106 | **289** | 0 | | 0 | 0 | | | | | |
| | WB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| Lagoon & E Calhoun Pkwy (Signal) | NB | 42.6 | D | 36.6 | D | 0.0 | A | | | 40.0 | D | | | 165 | 76 | **171** | 0 | **115** | 186 | 0 | | | | | |
| | SB | 0.0 | A | 32.4 | C | 7.4 | A | | | 13.9 | B | 24.3 | C | 560 | 16 | 77 | 0 | | 0 | 100 | 17 | 54 | | | |
| | EB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| | WB | 24.7 | C | 22.0 | C | 8.7 | A | | | 22.0 | C | | | 1144 | 224 | 354 | 0 | | 0 | 0 | | | | | |
| Excelsior & 32nd (Signal) | NB | 16.2 | B | 9.0 | A | 0.0 | A | 3.3 | A | 9.0 | A | | | 1018 | 104 | 217 | 60 | 5 | **75** | 0 | | | 0 | | |
| | SB | 0.0 | A | 17.0 | B | 9.3 | A | 6.5 | A | 9.3 | A | 12.8 | B | 304 | 72 | 160 | 0 | | 0 | 0 | | | 0 | | |
| | EB | 50.7 | D | 0.0 | A | 0.0 | A | 25.6 | C | 35.8 | D | | | 444 | 86 | 216 | 0 | | 0 | 0 | | | 0 | | |
| | WB | 0.0 | A | 46.2 | D | 81.1 | **F** | 8.0 | A | 29.4 | C | | | 566 | 21 | 92 | 64 | 27 | **85** | 0 | | | 0 | | |
| | NW | 68.2 | **E** | 0.0 | A | 65.1 | **E** | 0.0 | A | 66.8 | **E** | | | 539 | 20 | 75 | 0 | | 0 | 0 | | | 0 | | |
| Excelsior & Calhoun Commons (Signal) | NB | 53.8 | D | 0.7 | A | 0.0 | A | | | 1.4 | A | | | 369 | 5 | 56 | 80 | 12 | 47 | 0 | | | | | |
| | SB | 0.0 | A | 1.2 | A | 0.4 | A | | | 1.2 | A | 1.7 | A | 86 | 20 | **92** | 0 | | 0 | 0 | | | | | |
| | EB | 69.2 | **E** | 0.0 | A | 6.5 | A | | | 26.5 | C | | | 0 | | | 90 | 11 | 66 | 0 | **12** | **40** | | | |
| | WB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| Excelsior and Calhoun Commons- Unsignalized | NB | 2.7 | A | 0.5 | A | 0.0 | A | | | 0.5 | A | | | 86 | 3 | 38 | 0 | | 0 | 0 | | | | | |
| | SB | 0.0 | A | 1.8 | A | 1.4 | A | | | 1.8 | A | 1.1 | A | 147 | | 4 | 0 | | 0 | 0 | | | | | |
| | EB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| | WB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| Excelsior & Market (Signal) | NB | 60.2 | **E** | 93.1 | **F** | 26.7 | C | | | 87.9 | **F** | | | 461 | 34 | 102 | 0 | | 0 | 0 | | | | | |
| | SB | 29.6 | C | 19.7 | B | 4.3 | A | | | 13.4 | B | 14.2 | B | 35 | **33** | **61** | 0 | | 0 | 0 | **21** | **57** | | | |
| | EB | 12.2 | B | 6.6 | A | 4.4 | A | | | 7.5 | A | | | 147 | 67 | **162** | 90 | 46 | **128** | 0 | | | | | |
| | WB | 13.0 | B | 20.5 | C | 6.5 | A | | | 20.4 | C | | | 231 | 126 | **237** | 125 | 3 | 47 | 0 | | | | | |
| Excelsior & Parking Lot | NB | 8.8 | A | 13.8 | B | 1.6 | A | | | 9.5 | A | | | 244 | 3 | 31 | 0 | | 0 | 0 | | | | | |
| | SB | 11.7 | B | 0.0 | A | 5.6 | A | | | 6.8 | A | 2.2 | A | 91 | 11 | 31 | 0 | | 0 | 0 | | | | | |
| | EB | 3.8 | A | 1.4 | A | 0.7 | A | | | 1.4 | A | | | 231 | 2 | 24 | 0 | | 0 | 0 | | | | | |
| | WB | 5.9 | A | 2.8 | A | 3.0 | A | | | 2.9 | A | | | 202 | 11 | 83 | 0 | | 0 | 0 | | | | | |
| Market and Shopping Access | NB | 3.1 | A | 6.3 | A | 0.0 | A | | | 6.1 | A | | | 35 | **32** | **68** | 0 | | 0 | 0 | | | | | |
| | SB | 0.0 | A | 5.3 | A | 0.8 | A | | | 4.6 | A | 6.0 | A | 88 | 27 | **91** | 0 | | 0 | 0 | | | | | |
| | EB | 16.8 | C | 0.0 | A | 9.0 | A | | | 14.0 | B | | | 0 | | | 0 | **21** | 54 | 0 | **11** | **32** | | | |
| | WB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| W Calhoun Blvd & W 32nd Street | NB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| | SB | 167.6 | **F** | 0.0 | A | 129.2 | **F** | | | 158.0 | **F** | 96.8 | **F** | 0 | **71** | **183** | 0 | | 0 | 0 | | | | | |
| | EB | 0.0 | A | 49.2 | **E** | 0.0 | A | | | 49.2 | **E** | | | 216 | 1 | 12 | 0 | | 0 | 0 | | | | | |
| | WB | 0.0 | A | 0.3 | A | 0.0 | A | | | 0.3 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| W Calhoun Pkwy & W 32nd Street | NB | 48.0 | **E** | 31.1 | D | 0.0 | A | | | 31.9 | D | | | 726 | 124 | 341 | 0 | | 0 | 0 | | | | | |
| | SB | 0.0 | A | 1.0 | A | 1.0 | A | | | 1.0 | A | 21.4 | C | 606 | | 4 | 0 | | 0 | 0 | | | | | |
| | EB | 50.0 | **F** | 0.6 | A | 3.4 | A | | | 20.6 | C | | | 0 | **17** | **39** | 0 | | 0 | 0 | | | | | |
| | WB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| W Calhoun Pkwy & Parking Lot | NB | 57.5 | **F** | 58.7 | **F** | 0.0 | A | | | 58.6 | **F** | | | 606 | 233 | **531** | 0 | | 0 | 0 | | | | | |
| | SB | 0.0 | A | 2.7 | A | 2.3 | A | | | 2.6 | A | 38.3 | **E** | 867 | 1 | 33 | 0 | | 0 | 0 | | | | | |
| | EB | 179.5 | **F** | 0.0 | A | 4.7 | A | | | 150.4 | **F** | | | 0 | **9** | **44** | 0 | | 0 | 0 | | | | | |
| | WB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| Cedar Lake & Burnham | NB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| | SB | 14.3 | B | 0.0 | A | 4.6 | A | | | 6.4 | A | 1.7 | A | 0 | **5** | **29** | 0 | | 0 | 0 | | | | | |
| | EB | 6.6 | A | 1.6 | A | 0.0 | A | | | 2.1 | A | | | 1094 | 30 | 105 | 0 | | 0 | 0 | | | | | |
| | WB | 0.0 | A | 1.2 | A | 0.9 | A | | | 1.2 | A | | | 722 | 1 | 23 | 0 | | 0 | 0 | | | | | |
| Excelsior & Abbott | NB | 3.8 | A | 1.5 | A | 0.0 | A | | | 1.5 | A | | | 304 | 1 | 22 | 0 | | 0 | 0 | | | | | |
| | SB | 0.0 | A | 0.9 | A | 0.8 | A | | | 0.9 | A | 2.0 | A | 369 | | 6 | 0 | | 0 | 0 | | | | | |
| | EB | 21.6 | C | 0.0 | A | 7.8 | A | | | 18.6 | C | | | 0 | **37** | **101** | 0 | | 0 | 0 | | | | | |
| | WB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |

# TABLE B-2
# EXISTING PM PEAK HOUR TRAFFIC OPERATIONS ANALYSIS - DETAILED MEASURES OF EFFECTIVENESS

| Intersection | Approach | Level of Service | | | | | | | | | | | | Queing Information (feet) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Delay (s/veh) | | | | | | | | LOS By Approach | | LOS By Intersection | | Through | | | Left Turn | | | Right Turn | | | Right Turn2 | | |
| | | L | LOS | T | LOS | R | LOS | R2 | LOS | Delay (S/Veh) | LOS | Delay (S/Veh) | LOS | Link Length | Avg. | Max | Storage | Avg. | Max | Storage | Avg. | Max | Storage | Avg. | Max |
| Lake & France (Signal) | NB | 40.2 | D | 55.6 | E | 39.5 | D | | | 48.4 | D | 32.0 | C | 198 | 71 | 184 | 0 | 17 | 72 | 0 | | | | | |
| | SB | 55.8 | E | 56.4 | E | 21.0 | C | | | 35.2 | D | | | 230 | 167 | 245 | 30 | 53 | 55 | 0 | 140 | 249 | | | |
| | EB | 114.2 | F | 22.2 | C | 9.6 | A | | | 38.9 | D | | | 465 | 354 | 488 | 250 | 272 | 330 | 150 | 10 | 117 | | | |
| | WB | 67.4 | E | 20.3 | C | 6.8 | A | | | 19.8 | B | | | 584 | 151 | 288 | 160 | 46 | 147 | 120 | 44 | 170 | | | |
| Lake & Drew (Signal) | NB | 50.7 | D | 0.0 | A | 13.9 | B | | | 15.3 | B | 9.0 | A | 446 | 20 | 63 | 0 | | 0 | 0 | | | | | |
| | SB | 55.0 | E | 46.8 | D | 17.3 | B | | | 43.6 | D | | | 412 | 19 | 70 | 0 | | 0 | 0 | | | | | |
| | EB | 0.0 | A | 7.9 | A | 9.7 | A | | | 7.9 | A | | | 584 | 100 | 343 | 0 | | 0 | 0 | | | | | |
| | WB | 36.7 | D | 9.6 | A | 7.3 | A | | | 9.6 | A | | | 1381 | 110 | 334 | 0 | | 0 | 0 | | | | | |
| Lake & Market (Signal) | NB | 37.9 | D | 39.6 | D | 25.5 | C | | | 35.6 | D | 34.8 | C | 88 | 64 | 97 | 0 | 90 | 100 | 0 | | | | | |
| | SB | 40.2 | D | 48.7 | D | 27.5 | C | | | 38.0 | D | | | 401 | 85 | 221 | 150 | 51 | 166 | 0 | | | | | |
| | EB | 32.4 | C | 41.2 | D | 43.3 | D | | | 41.2 | D | | | 1381 | 435 | 678 | 250 | 100 | 329 | 210 | 223 | 270 | | | |
| | WB | 36.6 | D | 24.6 | C | 12.5 | B | | | 24.4 | C | | | 271 | 270 | 358 | 110 | 81 | 180 | 70 | 78 | 160 | | | |
| Lake & Shopping Access | NB | 0.0 | A | 0.0 | A | 111.3 | F | | | 111.3 | F | 7.9 | A | 0 | | | 0 | | 0 | 0 | 34 | 71 | | | |
| | SB | 138.2 | F | 0.0 | A | 27.8 | D | | | 36.3 | E | | | 295 | 12 | 76 | 0 | | 0 | 0 | | | | | |
| | EB | 13.6 | B | 9.7 | A | 8.4 | A | | | 9.7 | A | | | 271 | 68 | 336 | 62 | 11 | 109 | 0 | | | | | |
| | WB | 0.0 | A | 2.8 | A | 1.0 | A | | | 2.8 | A | | | 129 | 19 | 114 | 0 | | 0 | 0 | | | | | |
| Excelsior & Lake (Signal) | NB | 0.0 | A | 0.0 | A | 28.1 | C | 0.0 | A | 28.1 | C | 20.5 | C | 202 | 122 | 268 | 0 | | 0 | 0 | | | 0 | | |
| | SB | 0.0 | A | 20.2 | C | 6.7 | A | 0.0 | A | 13.2 | B | | | 350 | 168 | 363 | 0 | | 0 | 0 | 75 | 284 | 0 | 75 | 284 |
| | EB | 16.0 | B | 26.6 | C | 13.7 | B | 0.0 | A | 26.1 | C | | | 129 | 181 | 238 | 45 | 179 | 232 | 0 | | | 0 | | |
| | WB | 0.0 | A | 0.0 | A | 0.0 | A | 12.0 | B | 12.0 | B | | | 13 | 17 | 49 | 0 | | 0 | 0 | | | 0 | | |
| | SE | 0.0 | A | 0.0 | A | 0.0 | A | 0.5 | A | 0.5 | A | | | 0 | | | 0 | | 0 | 0 | | | 0 | | |
| Lake & Dean Pkwy/W Calhoun Pkwy (Signal) | NB | 633.9 | F | 382.5 | F | 416.0 | F | | | 448.7 | F | 57.6 | E | 867 | 682 | 881 | 60 | 77 | 85 | 0 | | | | | |
| | SB | 193.8 | F | 182.7 | F | 170.9 | F | | | 180.7 | F | | | 564 | 580 | 580 | 70 | 92 | 130 | 0 | | | | | |
| | EB | 50.8 | D | 25.8 | C | 11.4 | B | | | 27.4 | C | | | 350 | 443 | 567 | 185 | 142 | 285 | 0 | | | | | |
| | WB | 51.9 | D | 9.9 | A | 11.7 | B | | | 11.6 | B | | | 203 | 87 | 199 | 130 | 50 | 130 | 0 | | | | | |
| Lake & Unsignalized Dean Pkwy | NB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | 5.6 | A | 0 | | | 0 | | 0 | 0 | | | | | |
| | SB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| | EB | 0.0 | A | 4.8 | A | 0.0 | A | | | 4.8 | A | | | 203 | 21 | 177 | 0 | | 0 | 0 | | | | | |
| | WB | 0.0 | A | 6.4 | A | 7.8 | A | | | 6.5 | A | | | 400 | 41 | 401 | 0 | | 0 | 0 | | | | | |
| Lake & Thomas (Signal) | NB | 31.4 | C | 0.0 | A | 3.0 | A | | | 17.2 | B | 25.7 | C | 190 | 3 | 27 | 0 | | 0 | 0 | | | | | |
| | SB | 36.0 | D | 84.1 | F | 24.0 | C | | | 28.6 | C | | | 352 | 14 | 82 | 0 | | 0 | 50 | 17 | 66 | | | |
| | EB | 33.8 | C | 20.1 | C | 1.4 | A | | | 20.4 | C | | | 400 | 324 | 424 | 340 | 33 | 78 | 0 | 1 | 22 | | | |
| | WB | 97.8 | F | 31.8 | C | 38.0 | D | | | 32.0 | C | | | 1960 | 345 | 662 | 0 | | 0 | 0 | | | | | |
| Lake & E Calhoun Pkwy (Signal) | NB | 0.0 | A | 204.4 | F | 158.7 | F | | | 198.5 | F | 41.6 | D | 667 | 490 | 634 | 0 | | 0 | 85 | 46 | 135 | | | |
| | SB | 52.8 | D | 49.1 | D | 0.0 | A | | | 50.5 | D | | | 165 | 94 | 175 | 0 | 64 | 135 | 0 | | | | | |
| | EB | 15.6 | B | 17.8 | B | 17.3 | B | | | 17.5 | B | | | 360 | 232 | 418 | 0 | | 0 | 0 | | | | | |
| | WB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| Lagoon & E Calhoun Pkwy (Signal) | NB | 20.0 | C | 21.7 | C | 0.0 | A | | | 21.0 | C | 22.0 | C | 165 | 164 | 205 | 0 | 112 | 185 | 0 | | | | | |
| | SB | 0.0 | A | 45.5 | D | 7.6 | A | | | 30.9 | C | | | 560 | 101 | 218 | 0 | | 0 | 100 | 26 | 185 | | | |
| | EB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| | WB | 18.7 | B | 20.7 | C | 15.0 | B | | | 20.6 | C | | | 1144 | 216 | 322 | 0 | | 0 | 0 | | | | | |
| Excelsior & 32nd (Signal) | NB | 36.8 | D | 19.9 | B | 0.0 | A | 5.1 | A | 20.3 | C | 18.5 | B | 1018 | 242 | 478 | 60 | 3 | 47 | 0 | | | 0 | | |
| | SB | 0.0 | A | 33.9 | C | 11.8 | B | 9.7 | A | 12.2 | B | | | 304 | 97 | 194 | 0 | | 0 | 0 | | | 0 | | |
| | EB | 48.6 | D | 0.0 | A | 41.4 | D | 15.2 | B | 32.7 | C | | | 444 | 29 | 84 | 0 | | 0 | 0 | | | 0 | | |
| | WB | 0.0 | A | 48.8 | D | 49.5 | D | 15.8 | B | 37.4 | D | | | 566 | 27 | 104 | 64 | 32 | 83 | 0 | | | 0 | | |
| | NW | 71.1 | E | 64.1 | E | 71.1 | E | 0.0 | A | 70.5 | E | | | 539 | 22 | 75 | 0 | | 0 | 0 | | | 0 | | |
| Excelsior & Calhoun Commons (Signal) | NB | 67.9 | E | 3.3 | A | 0.0 | A | | | 8.6 | A | 7.9 | A | 370 | 63 | 257 | 80 | 77 | 158 | 0 | | | | | |
| | SB | 0.0 | A | 4.2 | A | 1.6 | A | | | 4.1 | A | | | 86 | 68 | 156 | 0 | | 0 | 0 | | | | | |
| | EB | 59.0 | E | 0.0 | A | 7.8 | A | | | 28.6 | C | | | 0 | | | 90 | 45 | 102 | 0 | 33 | 83 | | | |
| | WB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| Excelsior and Calhoun Commons- Unsignalized | NB | 9.6 | A | 2.2 | A | 0.0 | A | | | 2.2 | A | 2.2 | A | 86 | 28 | 148 | 0 | | 0 | 0 | | | | | |
| | SB | 0.0 | A | 2.2 | A | 1.2 | A | | | 2.2 | A | | | 147 | 3 | 67 | 0 | | 0 | 0 | | | | | |
| | EB | 0.0 | A | 0.0 | A | 5.7 | A | | | 5.7 | A | | | 0 | 1 | 24 | 0 | | 0 | 0 | | | | | |
| | WB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| Excelsior & Market (Signal) | NB | 59.8 | E | 61.7 | E | 37.3 | D | | | 59.0 | E | 23.0 | C | 461 | 83 | 205 | 0 | | 0 | 0 | | | | | |
| | SB | 33.6 | C | 25.9 | C | 5.3 | A | | | 14.8 | B | | | 35 | 38 | 46 | 0 | | 0 | 0 | 30 | 48 | | | |
| | EB | 58.3 | E | 11.4 | B | 8.3 | A | | | 18.8 | B | | | 147 | 142 | 234 | 90 | 92 | 140 | 0 | | | | | |
| | WB | 25.7 | C | 28.5 | C | 35.8 | D | | | 28.7 | C | | | 231 | 162 | 288 | 125 | 19 | 132 | 0 | | | | | |
| Excelsior & Parking Lot | NB | 34.8 | D | 0.0 | A | 4.8 | A | | | 10.1 | B | 3.2 | A | 244 | 13 | 49 | 0 | | 0 | 0 | | | | | |
| | SB | 0.0 | A | 36.4 | E | 13.1 | B | | | 16.4 | C | | | 91 | 13 | 42 | 0 | | 0 | 0 | | | | | |
| | EB | 10.8 | B | 2.3 | A | 1.0 | A | | | 2.3 | A | | | 231 | 6 | 75 | 0 | | 0 | 0 | | | | | |
| | WB | 11.2 | B | 3.8 | A | 1.2 | A | | | 3.9 | A | | | 202 | 13 | 124 | 0 | | 0 | 0 | | | | | |
| Market and Shopping Access | NB | 8.5 | A | 10.3 | B | 0.0 | A | | | 10.1 | B | 16.1 | C | 35 | 42 | 55 | 0 | | 0 | 0 | | | | | |
| | SB | 0.0 | A | 12.0 | B | 2.0 | A | | | 9.0 | A | | | 88 | 52 | 111 | 0 | | 0 | 0 | | | | | |
| | EB | 48.9 | E | 0.0 | A | 31.8 | D | | | 43.2 | E | | | 0 | | | 0 | 80 | 197 | 0 | 37 | 105 | | | |
| | WB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| Excelsior & Abbott | NB | 12.3 | B | 2.8 | A | 0.0 | A | | | 2.9 | A | 2.7 | A | 304 | 17 | 144 | 0 | | 0 | 0 | | | | | |
| | SB | 0.0 | A | 1.7 | A | 1.8 | A | | | 1.7 | A | | | 370 | 1 | 22 | 0 | | 0 | 0 | | | | | |
| | EB | 27.3 | D | 0.0 | A | 7.2 | A | | | 23.5 | C | | | 0 | 24 | 69 | 0 | | 0 | 0 | | | | | |
| | WB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |

# TABLE B-3
## 2040 NO BUILD AM PEAK HOUR TRAFFIC OPERATIONS ANALYSIS - DETAILED MEASURES OF EFFECTIVENESS

| # | Intersection | Approach | Level of Sevice | | | | | | | | | | | | Queing Information (feet) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Delay (s/veh) | | | | | | | | LOS By Approach | | LOS By Intersection | | Through | | | Left Turn | | | Right Turn | | | Right Turn2 | | |
| | | | L | LOS | T | LOS | R | LOS | R2 | LOS | Delay (S/Veh) | LOS | Delay (S/Veh) | LOS | Link Length | Avg. | Max | Storage | Avg. | Max | Storage | Avg. | Max | Storage | Avg. | Max |
| 1 | Lake & France (Signal) | NB | 42.1 | D | 42.6 | D | 23.4 | C | | | 39.7 | D | | | 198 | 56 | 138 | 0 | 30 | 99 | 0 | | | | | |
| | | SB | 50.5 | D | 46.8 | D | 33.0 | C | | | 37.0 | D | 22.4 | C | 230 | 78 | 194 | 30 | 48 | 55 | 0 | 194 | 269 | | | |
| | | EB | 52.2 | D | 12.6 | B | 2.7 | A | | | 20.3 | C | | | 465 | 150 | 345 | 250 | 159 | 308 | 150 | 7 | 115 | | | |
| | | WB | 77.3 | E | 16.9 | B | 7.3 | A | | | 16.3 | B | | | 584 | 170 | 357 | 160 | 27 | 112 | 120 | 66 | 240 | | | |
| 2 | Lake & Drew (Signal) | NB | 60.5 | E | 64.5 | E | 12.4 | B | | | 19.7 | B | | | 446 | 31 | 102 | 0 | | 0 | 0 | | | | | |
| | | SB | 50.0 | D | 0.0 | A | 24.6 | C | | | 38.3 | D | 4.6 | A | 412 | 11 | 72 | 0 | | 0 | 0 | | | | | |
| | | EB | 0.0 | A | 3.7 | A | 2.8 | A | | | 3.7 | A | | | 584 | 43 | 169 | 0 | | 0 | 0 | | | | | |
| | | WB | 0.0 | A | 4.4 | A | 5.2 | A | | | 4.4 | A | | | 1381 | 43 | 150 | 0 | | 0 | 0 | | | | | |
| 3 | Excelsior & 32nd (Signal) | NB | 37.1 | D | 18.6 | B | 0.0 | A | 4.4 | A | 18.6 | B | | | 1018 | 187 | 322 | 60 | 7 | 77 | 0 | | | 0 | | |
| | | SB | 0.0 | A | 39.1 | D | 10.1 | B | 6.5 | A | 10.3 | B | 16.5 | B | 304 | 68 | 238 | 0 | | 0 | 0 | | | 0 | | |
| | | EB | 36.5 | D | 0.0 | A | 0.0 | A | 21.6 | C | 27.3 | C | | | 444 | 86 | 210 | 0 | | 0 | 0 | | | 0 | | |
| | | WB | 0.0 | A | 38.2 | D | 33.5 | C | 7.6 | A | 24.0 | C | | | 566 | 20 | 78 | 64 | 25 | 74 | 0 | | | 0 | | |
| | | NW | 68.9 | E | 0.0 | A | 66.7 | E | 0.0 | A | 67.8 | E | | | 539 | 24 | 108 | 0 | | 0 | 0 | | | 0 | | |
| 4 | Excelsior & Abbott | NB | 9.9 | A | 2.5 | A | 0.0 | A | | | 2.5 | A | | | 304 | 7 | 90 | 0 | | 0 | 0 | | | | | |
| | | SB | 0.0 | A | 2.4 | A | 1.6 | A | | | 2.4 | A | 3.3 | A | 369 | 3 | 72 | 0 | | 0 | 0 | | | | | |
| | | EB | 24.6 | C | 0.0 | A | 10.0 | B | | | 21.4 | C | | | 0 | 43 | 120 | 0 | | 0 | 0 | | | | | |
| | | WB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| 5 | Excelsior & Calhoun Commons (Signal) | NB | 44.2 | D | 1.7 | A | 0.0 | A | | | 2.4 | A | | | 369 | 9 | 84 | 80 | 16 | 65 | 0 | | | | | |
| | | SB | 0.0 | A | 4.9 | A | 3.1 | A | | | 4.9 | A | 3.9 | A | 86 | 81 | 178 | 0 | | 0 | 0 | | | | | |
| | | EB | 65.1 | E | 0.0 | A | 7.7 | A | | | 22.5 | C | | | 0 | | | 90 | 12 | 63 | 0 | 18 | 49 | | | |
| | | WB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| 6 | Excelsior & Calhoun Commons (Unsignalized) | NB | 5.8 | A | 1.9 | A | 0.0 | A | | | 1.9 | A | | | 86 | 23 | 135 | 0 | | 0 | 0 | | | | | |
| | | SB | 0.0 | A | 2.3 | A | 1.3 | A | | | 2.3 | A | 2.1 | A | 147 | 14 | 128 | 0 | | 0 | 0 | | | | | |
| | | EB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | 6 | 0 | | 0 | 0 | | | | | |
| | | WB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| 7 | Lake & Market (Signal) | NB | 36.7 | D | 24.1 | C | 13.2 | B | | | 32.1 | C | | | 88 | 32 | 87 | 0 | 87 | 100 | 0 | | | | | |
| | | SB | 42.8 | D | 37.9 | D | 21.2 | C | | | 31.5 | C | 12.7 | B | 401 | 37 | 147 | 150 | 19 | 89 | 0 | | | | | |
| | | EB | 25.7 | C | 12.5 | B | 13.3 | B | | | 13.3 | B | | | 1381 | 121 | 306 | 250 | 31 | 108 | 210 | 72 | 248 | | | |
| | | WB | 15.9 | B | 6.1 | A | 1.8 | A | | | 6.6 | A | | | 271 | 84 | 177 | 110 | 43 | 142 | 70 | 6 | 54 | | | |
| 8 | Market & Shopping Access | NB | 3.2 | A | 6.8 | A | 0.0 | A | | | 6.5 | A | | | 35 | 35 | 57 | 0 | | 0 | 0 | | | | | |
| | | SB | 0.0 | A | 5.3 | A | 0.8 | A | | | 4.5 | A | 6.7 | A | 88 | 29 | 98 | 0 | | 0 | 0 | | | | | |
| | | EB | 21.4 | C | 0.0 | A | 15.8 | C | | | 19.3 | C | | | 0 | | | 0 | 25 | 60 | 0 | 14 | 56 | | | |
| | | WB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| 9 | Excelsior & Market (Signal) | NB | 70.5 | E | 86.0 | F | 53.0 | D | | | 79.6 | E | | | 461 | 57 | 204 | 0 | | 0 | 0 | | | | | |
| | | SB | 34.2 | C | 16.4 | B | 4.9 | A | | | 12.5 | B | 12.5 | B | 35 | 35 | 66 | 0 | | 0 | 0 | 23 | 55 | | | |
| | | EB | 18.5 | B | 11.8 | B | 8.7 | A | | | 12.8 | B | | | 147 | 156 | 248 | 90 | 72 | 140 | 0 | | | | | |
| | | WB | 7.9 | A | 5.7 | A | 3.3 | A | | | 5.7 | A | | | 231 | 42 | 210 | 125 | 3 | 45 | 0 | | | | | |
| 10a | W Calhoun Blvd & W 32nd Street | NB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| | | SB | 6.3 | A | 0.0 | A | 2.6 | A | | | 5.5 | A | 3.3 | A | 0 | 20 | 52 | 0 | | 0 | 0 | | | | | |
| | | EB | 0.0 | A | 1.3 | A | 0.0 | A | | | 1.3 | A | | | 216 | 1 | 12 | 0 | | 0 | 0 | | | | | |
| | | WB | 0.0 | A | 0.2 | A | 0.0 | A | | | 0.2 | A | | | 12 | | 4 | 0 | | 0 | 0 | | | | | |
| 10 | W Calhoun Pkwy & W 32nd Street | NB | 3.3 | A | 1.1 | A | 0.0 | A | | | 1.2 | A | | | 726 | 11 | 110 | 0 | | 0 | 0 | | | | | |
| | | SB | 0.0 | A | 0.9 | A | 0.9 | A | | | 0.9 | A | 1.4 | A | 0 | | | 0 | | 0 | 0 | | | | | |
| | | EB | 8.6 | A | 0.6 | A | 3.4 | A | | | 5.0 | A | | | 0 | 19 | 36 | 0 | | 0 | 0 | | | | | |
| | | WB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| 11 | W Calhoun Pkwy & Parking Lot | NB | 8.3 | A | 5.6 | A | 0.0 | A | | | 5.9 | A | | | 606 | 39 | 280 | 0 | | 0 | 0 | | | | | |
| | | SB | 0.0 | A | 2.7 | A | 2.3 | A | | | 2.6 | A | 5.4 | A | 867 | 1 | 14 | 0 | | 0 | 0 | | | | | |
| | | EB | 60.6 | F | 0.0 | A | 3.7 | A | | | 39.3 | E | | | 0 | 17 | 57 | 0 | | 0 | 0 | | | | | |
| | | WB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| 12 | Excelsior & Parking Lot | NB | 23.8 | C | 25.5 | D | 3.4 | A | | | 17.2 | C | | | 244 | 14 | 53 | 0 | | 0 | 0 | | | | | |
| | | SB | 22.7 | C | 0.0 | A | 5.3 | A | | | 9.7 | A | 3.7 | A | 91 | 16 | 49 | 0 | | 0 | 0 | | | | | |
| | | EB | 6.8 | A | 2.6 | A | 1.1 | A | | | 2.6 | A | | | 231 | 6 | 72 | 0 | | 0 | 0 | | | | | |
| | | WB | 11.5 | B | 4.1 | A | 3.3 | A | | | 4.4 | A | | | 202 | 26 | 146 | 0 | | 0 | 0 | | | | | |
| 13 | Lake & Shopping Access | NB | 24.5 | C | 0.0 | A | 11.6 | B | | | 14.7 | B | | | 56 | 5 | 43 | 0 | | 0 | 0 | 17 | 61 | | | |
| | | SB | 36.5 | E | 0.0 | A | 15.3 | C | | | 20.9 | C | 3.8 | A | 295 | 38 | 104 | 0 | | 0 | 0 | | | | | |
| | | EB | 28.2 | D | 3.7 | A | 2.1 | A | | | 4.3 | A | | | 271 | 12 | 110 | 62 | 17 | 82 | 0 | | | | | |
| | | WB | 14.4 | B | 2.5 | A | 2.0 | A | | | 2.5 | A | | | 129 | 23 | 185 | 0 | | 0 | 0 | | | | | |
| 14 | Excelsior & Lake (Signal) | NB | 0.0 | A | 0.0 | A | 20.8 | C | 0.0 | A | 20.8 | C | | | 202 | 66 | 216 | 0 | | 0 | 0 | | | 0 | | |
| | | SB | 0.0 | A | 41.2 | D | 4.5 | A | 0.0 | A | 19.1 | B | 17.9 | B | 350 | 182 | 330 | 0 | | 0 | 0 | 14 | 66 | 0 | 14 | 66 |
| | | EB | 33.8 | C | 13.5 | B | 2.6 | A | 0.0 | A | 14.1 | B | | | 129 | 120 | 225 | 45 | 100 | 211 | 0 | | | 0 | | |
| | | WB | 0.0 | A | 0.0 | A | 0.0 | A | 10.3 | B | 10.3 | B | | | 13 | 8 | 44 | 0 | | 0 | 0 | | | 0 | | |
| | | SE | 0.0 | A | 0.0 | A | 0.0 | A | 0.5 | A | 0.5 | A | | | 0 | | | 0 | | 0 | 0 | | | 0 | | |
| 15 | Lake & Dean Pkwy/W Calhoun Pkwy (Signal) | NB | 146.5 | F | 88.1 | F | 86.0 | F | | | 100.5 | F | | | 867 | 380 | 783 | 60 | 61 | 85 | 0 | | | | | |
| | | SB | 126.4 | F | 81.9 | F | 75.7 | E | | | 88.4 | F | 45.4 | D | 564 | 359 | 562 | 70 | 96 | 129 | 0 | | | | | |
| | | EB | 53.5 | D | 32.5 | C | 15.0 | B | | | 34.7 | C | | | 350 | 313 | 490 | 185 | 141 | 284 | 0 | | | | | |
| | | WB | 37.2 | D | 30.0 | C | 31.4 | C | | | 30.3 | C | | | 215 | 221 | 262 | 130 | 40 | 136 | 0 | | | | | |
| 16 | Cedar Lake & Burnham | NB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| | | SB | 26.1 | D | 0.0 | A | 8.3 | A | | | 12.0 | B | 3.3 | A | 0 | 10 | 52 | 0 | | 0 | 0 | | | | | |
| | | EB | 12.0 | B | 3.9 | A | 0.0 | A | | | 4.8 | A | | | 1094 | 51 | 284 | 0 | | 0 | 0 | | | | | |
| | | WB | 0.0 | A | 1.8 | A | 1.5 | A | | | 1.8 | A | | | 722 | 3 | 60 | 0 | | 0 | 0 | | | | | |
| 17 | Lake & Unsignalized Dean Pkwy | NB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| | | SB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | 8.8 | A | 0 | | | 0 | | 0 | 0 | | | | | |
| | | EB | 0.0 | A | 3.6 | A | 0.0 | A | | | 3.6 | A | | | 215 | 1 | 36 | 0 | | 0 | 0 | | | | | |
| | | WB | 0.0 | A | 13.0 | B | 18.8 | C | | | 13.3 | B | | | 400 | 316 | 458 | 0 | | 0 | 0 | | | | | |
| 18 | Lake & Thomas (Signal) | NB | 32.2 | C | 47.2 | D | 0.0 | A | | | 39.0 | D | | | 188 | 9 | 61 | 0 | | 0 | 0 | | | | | |
| | | SB | 32.7 | C | 0.0 | A | 21.7 | C | | | 25.3 | C | 79.1 | E | 352 | 20 | 112 | 0 | | 0 | 50 | 25 | 69 | | | |
| | | EB | 38.9 | D | 11.9 | B | 0.9 | A | | | 12.5 | B | | | 400 | 161 | 310 | 340 | 27 | 93 | 0 | 2 | 40 | | | |
| | | WB | 74.2 | E | 140.0 | F | 273.6 | F | | | 141.6 | F | | | 1959 | 1007 | 1404 | 0 | | 0 | 0 | | | | | |
| 19 | Lagoon & E Calhoun Pkwy (Signal) | NB | 7.1 | A | 4.8 | A | 0.0 | A | | | 6.0 | A | | | 165 | 13 | 59 | 0 | 22 | 88 | 0 | | | | | |
| | | SB | 0.0 | A | 43.9 | D | 7.8 | A | | | 18.4 | B | 17.2 | B | 560 | 23 | 74 | 0 | | 0 | 100 | 18 | 72 | | | |
| | | EB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| | | WB | 19.5 | B | 19.3 | B | 5.5 | A | | | 19.3 | B | | | 1144 | 231 | 346 | 0 | | 0 | 0 | | | | | |
| 20 | Lake & E Calhoun Pkwy (Signal) | NB | 0.0 | A | 43.3 | D | 15.9 | B | | | 40.9 | D | | | 667 | 178 | 332 | 0 | | 0 | 85 | 23 | 135 | | | |
| | | SB | 29.0 | C | 11.6 | B | 0.0 | A | | | 19.5 | B | 15.1 | B | 165 | 8 | 40 | 0 | 24 | 97 | 0 | | | | | |
| | | EB | 7.9 | A | 9.8 | A | 7.5 | A | | | 9.7 | A | | | 360 | 119 | 320 | 0 | | 0 | 0 | | | | | |
| | | WB | 0.0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |

# TABLE B-4
## 2040 NO BUILD PM PEAK HOUR TRAFFIC OPERATIONS ANALYSIS - DETAILED MEASURES OF EFFECTIVENESS

| # | Intersection | Approach | Level of Sevice | | | | | | | | | | | | Queing Information (feet) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Delay (s/veh) | | | | | | | | LOS By Approach | | LOS By Intersection | | Through | | | Left Turn | | | Right Turn | | | Right Turn2 | | |
| | | | L | LOS | T | LOS | R | LOS | R2 | LOS | Delay (S/Veh) | LOS | Delay (S/Veh) | LOS | Link Length | Avg. | Max | Storage | Avg. | Max | Storage | Avg. | Max | Storage | Avg. | Max |
| 1 | Lake & France (Signal) | NB | 45 | D | 60 | E | 34 | C | | | 49 | D | | | 198 | 76 | 180 | 0 | 18 | 75 | 0 | | | | | |
| | | SB | 51 | D | 51 | D | 20 | C | | | 32 | C | 34.6 | C | 230 | 155 | 245 | 30 | 52 | 55 | 0 | 134 | 236 | | | |
| | | EB | 68 | E | 28 | C | 10 | A | | | 35 | D | | | 465 | 335 | 491 | 250 | 251 | 330 | 150 | 19 | 230 | | | |
| | | WB | 65 | E | 36 | D | 14 | B | | | 34 | C | | | 584 | 322 | 518 | 160 | 77 | 289 | 120 | 155 | 240 | | | |
| 2 | Lake & Drew (Signal) | NB | 56 | E | 0 | A | 25 | C | | | 30 | C | | | 446 | 31 | 92 | 0 | | 0 | 0 | | | | | |
| | | SB | 57 | E | 70 | E | 17 | B | | | 46 | D | 9.9 | A | 412 | 30 | 90 | 0 | | 0 | 0 | | | | | |
| | | EB | 0 | A | 12 | B | 6 | A | | | 12 | B | | | 584 | 96 | 343 | 0 | | 0 | 0 | | | | | |
| | | WB | 30 | C | 6 | A | 5 | A | | | 6 | A | | | 1381 | 52 | 199 | 0 | | 0 | 0 | | | | | |
| 3 | Excelsior & 32nd (Signal) | NB | 46 | D | 26 | C | 0 | A | 7 | A | 27 | C | | | 1018 | 318 | 679 | 60 | 1 | 17 | 0 | | | 0 | | |
| | | SB | 0 | A | 52 | D | 13 | B | 6 | A | 14 | B | 23.5 | C | 304 | 116 | 237 | 0 | | 0 | 0 | | | 0 | | |
| | | EB | 54 | D | 0 | A | 0 | A | 24 | C | 31 | C | | | 444 | 67 | 177 | 0 | | 0 | 0 | | | 0 | | |
| | | WB | 0 | A | 48 | D | 48 | D | 21 | C | 39 | D | | | 566 | 36 | 111 | 64 | 42 | 93 | 0 | | | 0 | | |
| | | NW | 71 | E | 59 | E | 63 | E | 0 | A | 66 | E | | | 539 | 22 | 74 | 0 | | 0 | 0 | | | 0 | | |
| 4 | Excelsior & Abbott | NB | 13 | B | 3.6 | A | 0.0 | A | | | 3.7 | A | | | 304 | 24 | 206 | 0 | | | 0 | | | | | |
| | | SB | 0 | A | 2.5 | A | 2.2 | A | | | 2.5 | A | 3.6 | A | 370 | 2 | 44 | 0 | | | 0 | | | | | |
| | | EB | 32 | D | 0.0 | A | 17.9 | C | | | 28.1 | D | | | 0 | 27 | 78 | 0 | | | 0 | | | | | |
| | | WB | 0 | A | 0.0 | A | 0.0 | A | | | 0.0 | A | | | 0 | | | 0 | | | 0 | | | | | |
| 5 | Excelsior & Calhoun Commons (Signal) | NB | 67 | E | 7 | A | 0 | A | | | 12 | B | | | 370 | 115 | 326 | 80 | 90 | 159 | 0 | | | | | |
| | | SB | 0 | A | 12 | B | 11 | B | | | 12 | B | 13.0 | B | 86 | 140 | 176 | 0 | | 0 | 0 | | | | | |
| | | EB | 69 | E | 0 | A | 12 | B | | | 35 | C | | | 0 | | | 90 | 55 | 104 | 0 | 44 | 156 | | | |
| | | WB | 0 | A | 0 | A | 0 | A | | | 0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| 6 | Excelsior & Calhoun Commons (Unsignalized) | NB | 25 | D | 3 | A | 0 | A | | | 3 | A | | | 86 | 30 | 157 | 0 | | 0 | 0 | | | | | |
| | | SB | 0 | A | 2 | A | 2 | A | | | 2 | A | 2.8 | A | 147 | 27 | 110 | 0 | | 0 | 0 | | | | | |
| | | EB | 0 | A | 0 | A | 7 | A | | | 7 | A | | | 0 | 1 | 12 | 0 | | 0 | 0 | | | | | |
| | | WB | 0 | A | 0 | A | 0 | A | | | 0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| 7 | Lake & Market (Signal) | NB | 30 | C | 30 | C | 22 | C | | | 28 | C | | | 88 | 67 | 94 | 0 | 84 | 100 | 0 | | | | | |
| | | SB | 37 | D | 54 | D | 35 | D | | | 41 | D | 60.6 | E | 401 | 121 | 272 | 150 | 60 | 174 | 0 | | | | | |
| | | EB | 80 | F | 101 | F | 98 | F | | | 99 | F | | | 1381 | 695 | 1192 | 250 | 174 | 330 | 210 | 209 | 270 | | | |
| | | WB | 56 | E | 14 | B | 5 | A | | | 17 | B | | | 271 | 134 | 319 | 110 | 72 | 179 | 70 | 34 | 160 | | | |
| 8 | Market & Shopping Access | NB | 4 | A | 6 | A | 0 | A | | | 5 | A | | | 35 | 36 | 55 | 0 | | 0 | 0 | | | | | |
| | | SB | 0 | A | 10 | B | 3 | A | | | 8 | A | 13.0 | B | 88 | 58 | 106 | 0 | | 0 | 0 | | | | | |
| | | EB | 37 | E | 0 | A | 35 | E | | | 36 | E | | | 0 | | | 0 | 69 | 178 | 0 | 48 | 144 | | | |
| | | WB | 0 | A | 0 | A | 0 | A | | | 0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| 9 | Excelsior & Market (Signal) | NB | 134 | F | 164 | F | 99 | F | | | 145 | F | | | 461 | 157 | 332 | 0 | | 0 | 0 | | | | | |
| | | SB | 29 | C | 24 | C | 6 | A | | | 14 | B | 19.6 | B | 35 | 39 | 49 | 0 | | 0 | 0 | 33 | 56 | | | |
| | | EB | 30 | C | 12 | B | 8 | A | | | 15 | B | | | 147 | 119 | 237 | 90 | 81 | 140 | 0 | | | | | |
| | | WB | 20 | C | 11 | B | 12 | B | | | 11 | B | | | 231 | 62 | 168 | 125 | 13 | 104 | 0 | | | | | |
| 10a | W Calhoun Blvd & W 32nd Street | NB | 0 | A | 0 | A | 0 | A | | | 0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| | | SB | 9 | A | 0 | A | 4 | A | | | 9 | A | 5.9 | A | 0 | 33 | 91 | 0 | | 0 | 0 | | | | | |
| | | EB | 0 | A | 1 | A | 0 | A | | | 1 | A | | | 216 | 1 | 12 | 0 | | 0 | 0 | | | | | |
| | | WB | 0 | A | 0 | A | 0 | A | | | 0 | A | | | 12 | 1 | 15 | 0 | | 0 | 0 | | | | | |
| 10 | W Calhoun Pkwy & W 32nd Street | NB | 6 | A | 1 | A | 0 | A | | | 2 | A | | | 726 | 25 | 100 | 0 | | 0 | 0 | | | | | |
| | | SB | 0 | A | 2 | A | 1 | A | | | 2 | A | 2.3 | A | 606 | 9 | 83 | 0 | | 0 | 0 | | | | | |
| | | EB | 14 | B | 1 | A | 5 | A | | | 6 | A | | | 0 | 24 | 25 | 0 | | 0 | 0 | | | | | |
| | | WB | 0 | A | 0 | A | 0 | A | | | 0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| 11 | W Calhoun Pkwy & Parking Lot | NB | 9 | A | 4 | A | 0 | A | | | 4 | A | | | 606 | 29 | 187 | 0 | | 0 | 0 | | | | | |
| | | SB | 0 | A | 3 | A | 3 | A | | | 3 | A | 4.2 | A | 867 | 12 | 75 | 0 | | 0 | 0 | | | | | |
| | | EB | 14 | B | 0 | A | 8 | A | | | 11 | B | | | 0 | 36 | 109 | 0 | | 0 | 0 | | | | | |
| | | WB | 0 | A | 0 | A | 0 | A | | | 0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| 12 | Excelsior & Parking Lot | NB | 245 | F | 0 | A | 168 | F | | | 187 | F | | | 244 | 43 | 144 | 0 | | 0 | 0 | | | | | |
| | | SB | 0 | A | 268 | F | 21 | C | | | 52 | F | 19.1 | C | 91 | 23 | 87 | 0 | | 0 | 0 | | | | | |
| | | EB | 45 | E | 19 | C | 6 | A | | | 19 | C | | | 231 | 132 | 309 | 0 | | 0 | 0 | | | | | |
| | | WB | 156 | F | 11 | B | 5 | A | | | 12 | B | | | 202 | 61 | 242 | 0 | | 0 | 0 | | | | | |
| 13 | Lake & Shopping Access | NB | 0 | A | 0 | A | 1416 | F | | | 1416 | F | | | 0 | | | 0 | | 0 | 0 | 49 | 63 | | | |
| | | SB | 2210 | F | 0 | A | 1156 | F | | | 1357 | F | 33.1 | D | 295 | 176 | 304 | 0 | | 0 | 0 | | | | | |
| | | EB | 18 | C | 29 | D | 27 | D | | | 29 | D | | | 271 | 268 | 375 | 62 | 58 | 147 | 0 | | | | | |
| | | WB | 0 | A | 3 | A | 2 | A | | | 3 | A | | | 129 | 5 | 94 | 0 | | 0 | 0 | | | | | |
| 14 | Excelsior & Lake (Signal) | NB | 0 | A | 0 | A | 100 | F | 0 | A | 100 | F | | | 202 | 251 | 290 | 0 | | 0 | 0 | | | 0 | | |
| | | SB | 0 | A | 105 | F | 7 | A | 0 | A | 53 | D | 60.0 | E | 350 | 373 | 404 | 0 | | 0 | 0 | 50 | 378 | 0 | 50 | 378 |
| | | EB | 29 | C | 42 | D | 24 | C | 0 | A | 41 | D | | | 129 | 215 | 238 | 45 | 216 | 248 | 0 | | | 0 | | |
| | | WB | 0 | A | 0 | A | 0 | A | 28 | C | 28 | C | | | 13 | 23 | 73 | 0 | | 0 | 0 | | | 0 | | |
| | | SE | 0 | A | 0 | A | 0 | A | 1 | A | 1 | A | | | 0 | | | 0 | | 0 | 0 | | | 0 | | |
| 15 | Lake & Dean Pkwy/W Calhoun Pkwy (Signal) | NB | 142 | F | 74 | E | 66 | E | | | 89 | F | | | 867 | 245 | 671 | 60 | 61 | 85 | 0 | | | | | |
| | | SB | 71 | E | 66 | E | 63 | E | | | 66 | E | 56.2 | E | 564 | 352 | 577 | 70 | 85 | 130 | 0 | | | | | |
| | | EB | 69 | E | 50 | D | 28 | C | | | 51 | D | | | 350 | 550 | 573 | 185 | 176 | 285 | 0 | | | | | |
| | | WB | 77 | E | 53 | D | 31 | C | | | 53 | D | | | 215 | 215 | 259 | 130 | 75 | 214 | 0 | | | | | |
| 16 | Cedar Lake & Burnham | NB | 0 | A | 0 | A | 0 | A | | | 0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| | | SB | 22 | C | 0 | A | 5 | A | | | 11 | B | 3.0 | A | 0 | 5 | 30 | 0 | | 0 | 0 | | | | | |
| | | EB | 8 | A | 4 | A | 0 | A | | | 4 | A | | | 1094 | 58 | 273 | 0 | | 0 | 0 | | | | | |
| | | WB | 0 | A | 1 | A | 1 | A | | | 1 | A | | | 722 | 1 | 31 | 0 | | 0 | 0 | | | | | |
| 17 | Lake & Unsignalized Dean Pkwy | NB | 0 | A | 0 | A | 0 | A | | | 0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| | | SB | 0 | A | 0 | A | 0 | A | | | 0 | A | 22.1 | C | 0 | | | 0 | | 0 | 0 | | | | | |
| | | EB | 0 | A | 7 | A | 0 | A | | | 7 | A | | | 215 | 46 | 248 | 0 | | 0 | 0 | | | | | |
| | | WB | 0 | A | 42 | E | 22 | C | | | 41 | E | | | 400 | 313 | 460 | 0 | | 0 | 0 | | | | | |
| 18 | Lake & Thomas (Signal) | NB | 47 | D | 0 | A | 24 | C | | | 37 | D | | | 188 | 6 | 42 | 0 | | 0 | 0 | | | | | |
| | | SB | 44 | D | 33 | C | 25 | C | | | 31 | C | 91.0 | F | 355 | 15 | 64 | 0 | | 0 | 50 | 22 | 69 | | | |
| | | EB | 35 | D | 25 | C | 1 | A | | | 25 | C | | | 400 | 380 | 430 | 340 | 46 | 331 | 0 | 1 | 27 | | | |
| | | WB | 269 | F | 171 | F | 287 | F | | | 174 | F | | | 1939 | 924 | 2021 | 0 | | 0 | 0 | | | | | |
| 19 | Lagoon & E Calhoun Pkwy (Signal) | NB | 20 | C | 16 | B | 0 | A | | | 18 | B | | | 198 | 94 | 182 | 0 | 80 | 156 | 0 | | | | | |
| | | SB | 0 | A | 38 | D | 13 | B | | | 29 | C | 30.8 | C | 560 | 107 | 231 | 0 | | 0 | 100 | 33 | 187 | | | |
| | | EB | 0 | A | 0 | A | 0 | A | | | 0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |
| | | WB | 31 | C | 36 | D | 27 | C | | | 36 | D | | | 1144 | 294 | 678 | 0 | | 0 | 0 | | | | | |
| 20 | Lake & E Calhoun Pkwy (Signal) | NB | 0 | A | 49 | D | 21 | C | | | 45 | D | | | 641 | 209 | 363 | 0 | | 0 | 85 | 42 | 135 | | | |
| | | SB | 29 | C | 13 | B | 0 | A | | | 19 | B | 20.4 | C | 198 | 26 | 80 | 0 | 64 | 156 | 0 | | | | | |
| | | EB | 16 | B | 17 | B | 15 | B | | | 17 | B | | | 370 | 236 | 431 | 0 | | 0 | 0 | | | | | |
| | | WB | 0 | A | 0 | A | 0 | A | | | 0 | A | | | 0 | | | 0 | | 0 | 0 | | | | | |

End of Report