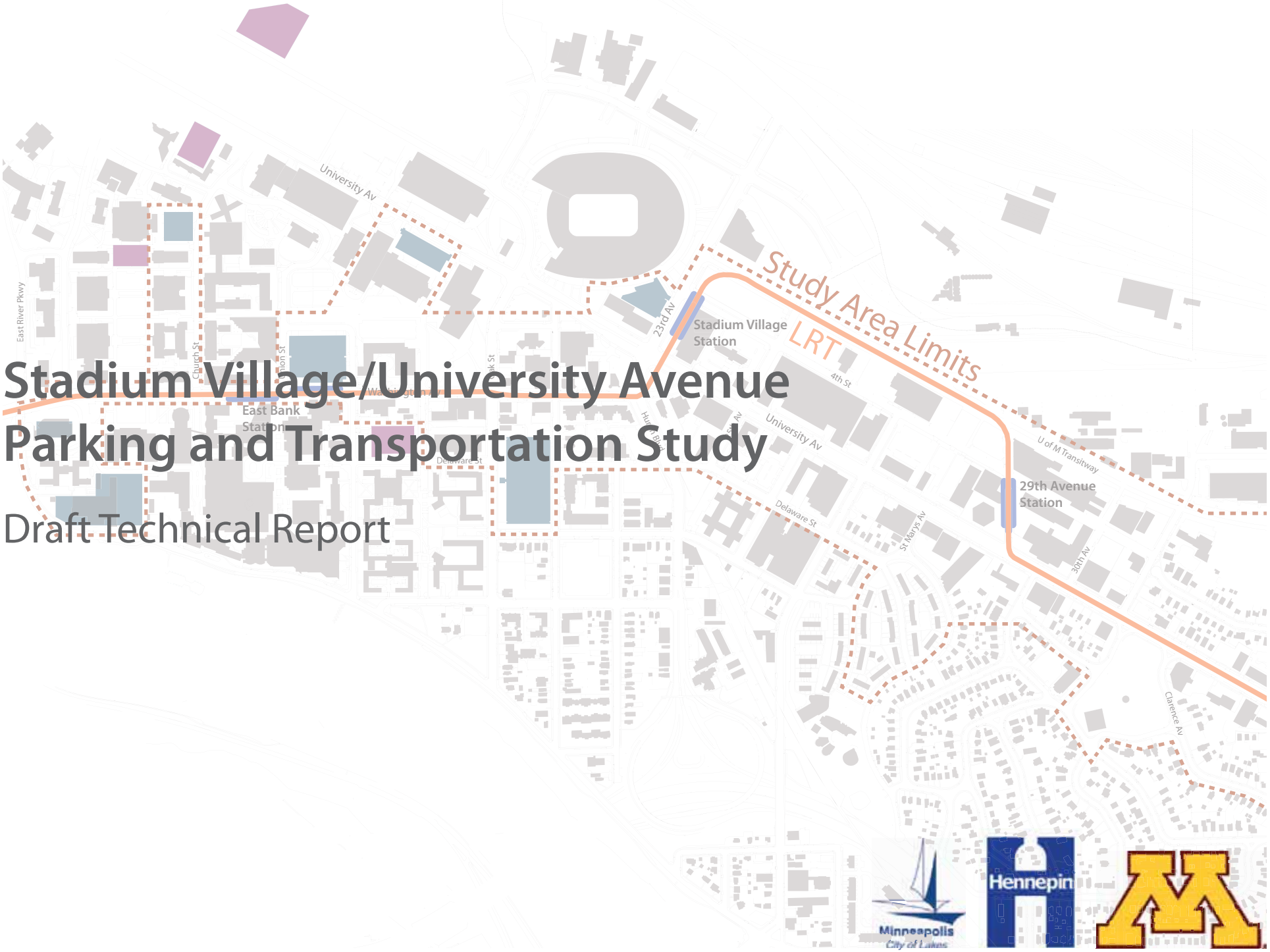
Stadium Village/University Avenue Parking and Transportation Study

Draft Technical Report



February 18, 2012

BIKO ASSOCIATES INCORPORATED

Stadium Village/University Avenue Parking and Transportation Study

Prepared for:

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1.0 Introduction

Background

This technical report documents analyses that were conducted to prepare the Stadium Village/University Avenue Parking and Transportation Study. As illustrated on the following page, the study area for this project is largely within the City of Minneapolis but extends just east beyond the Minneapolis/ Saint Paul border. The study area includes four Central Corridor Light Rail Transit (CCLRT) stations, which are, from west to east:

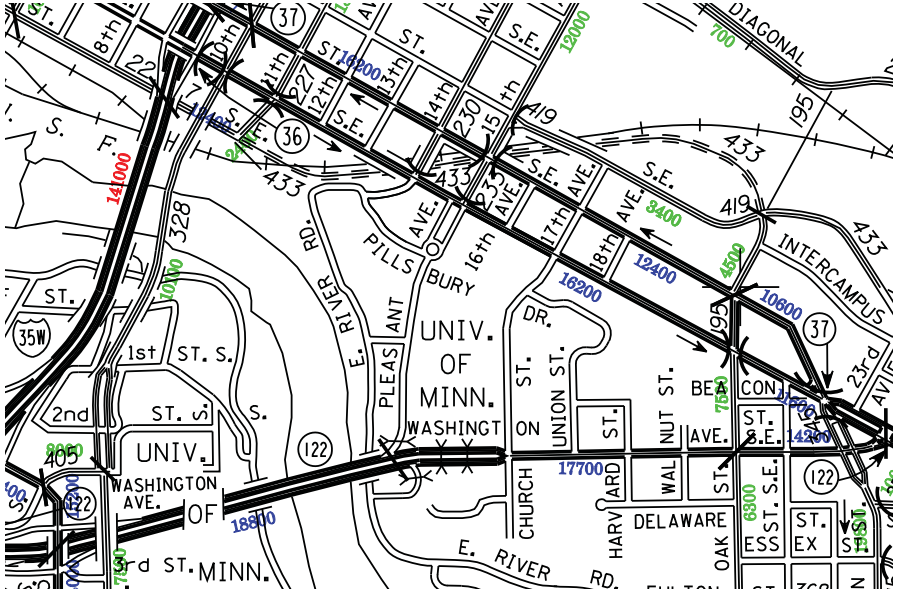
- East Bank Station, on Washington Avenue between Harvard and Church Streets
- Stadium Village Station, on 23rd Avenue between 4th Street and University Avenue
- 29th Avenue Station, on 29th Avenue between University Avenue and 4th Street
- Westgate Station, on University Avenue between Curfew and Emerald Streets

Although the Westgate Station is in the City of Saint Paul, the westbound station platform terminates at Emerald Street (the border between Saint Paul and Minneapolis). Because of this proximity to Minneapolis, its associated parking and transportation issues will affect Minneapolis.

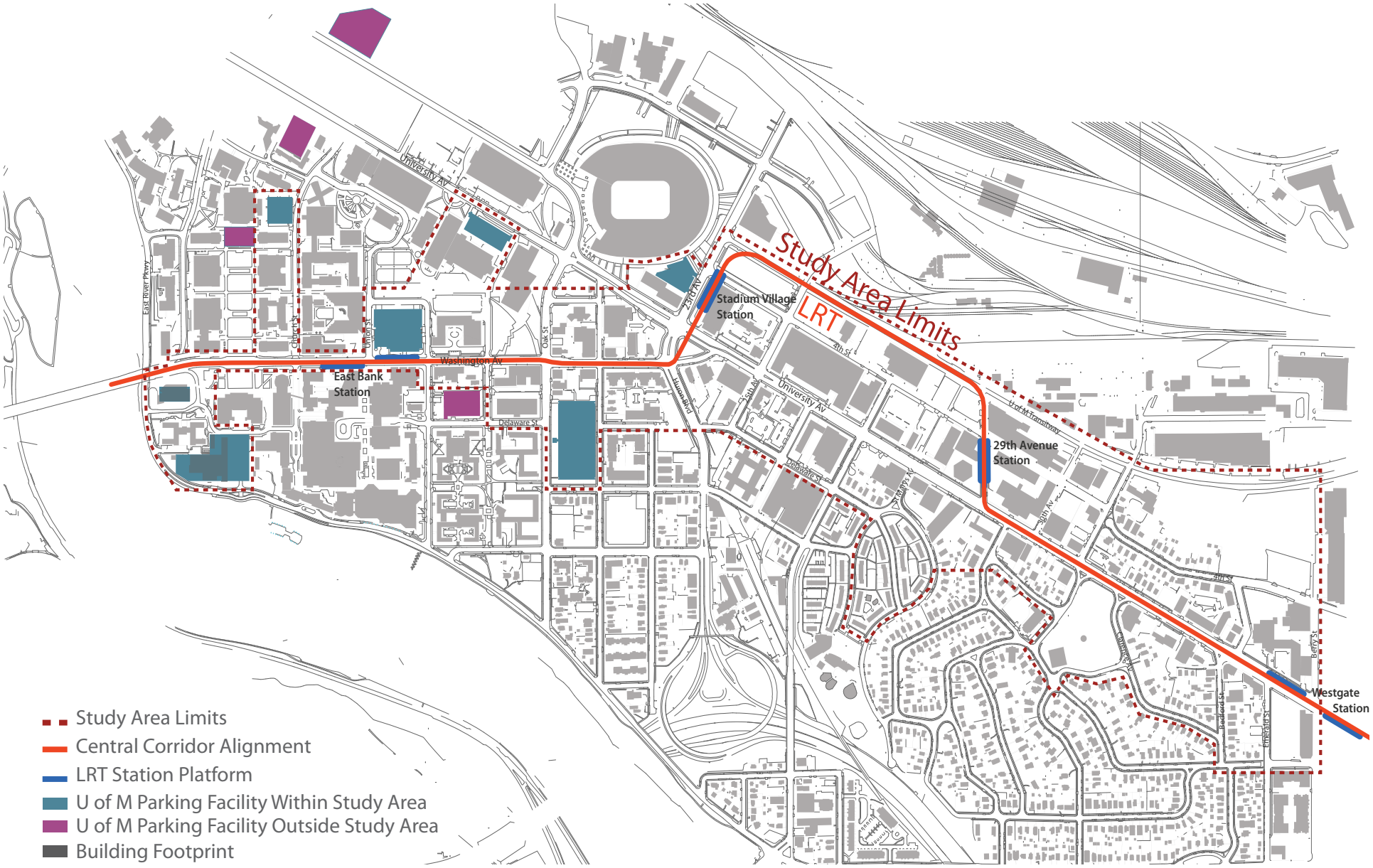
The CCLRT alignment will impact existing parking and traffic operations throughout the study area. One of the design goals for the LRT alignment was to leave existing general (moving) traffic lanes unaffected. Therefore, the alignment's design (which includes two LRT tracks within a semi-protected right-of-way) requires the elimination of existing on-street parking spaces in order to maintain four general traffic lanes on University Avenue and two lanes on 29th and Washington Avenues. In addition, the design includes a barrier that will prevent motorists from crossing the tracks (accomplishing U-turns and left-turns) at uncontrolled locations. Compared to the existing condition where motorists can accomplish U-turns and left-turns almost anywhere along the affected streets, the future condition will only permit these turns to be made at signalized intersections.

These two, post-LRT physical conditions (the elimination of on-street parking and the prohibition of U-turns and left-turns at unsignalized intersections) are the major reasons the Stadium Village/University Avenue Parking and Transportation Study was commissioned. At the same time, it was recognized that even today there are parking and transportation issues within the study area.

The study area is home to the University of Minnesota, with almost 52,000 students and nearly 17,100 employees. The campus itself is an urban setting and shares the study area with a compact and densely developed mix of uses including commercial offices, retail establishments, institutional uses, and residential neighborhoods. Finally, the two major streets serving the study area, Washington and University Avenues, either directly or indirectly provide access to some of the region's largest trip generators. Beyond providing access to jobs, educational services, businesses, and residences, these two streets have regional significance by virtue of their geographic locations and functional classifications. Washington Avenue (County State Aid Highway (CSAH)) 122 is one of the bridges over the Mississippi River, and University Avenue is CSAH 36 in the vicinity of Stadium Village. Both streets are "A" Minor Arterial relievers in the Twin Cities Metropolitan Highway Plan, and, therefore, carry significant through traffic volumes.



Study Area Map



Purpose

The Stadium Village/University Avenue Parking and Transportation Study was commissioned by the City of Minneapolis, Hennepin County, and the University of Minnesota to address three purposes. The first was to look at short-term impacts, which will occur at a point in the future where LRT will have been implemented, but not so far into the future that anticipated Transit-Oriented Development projects will have occurred. Thus, the focus on the short-term was to permit an analysis of existing parking issues with an eye toward maximizing the efficiency of the area's existing public and private parking supplies. Measures of efficiency for this study were defined as "layout and utilization."

The second purpose was to address parking in the future, under a long-term scenario where LRT infrastructure and operations will have helped catalyze Transit-Oriented Development projects and a reshaping of the Stadium Village area. The LRT cross-section will result in the almost total elimination of on-street parking on University, 29th, and Washington Avenues, and the tracks themselves will result in reduced U-turn and left-turn opportunities for traffic. These changes necessitate a response to determine how to configure existing and future parking facilities to accommodate existing parking demand displaced from existing supplies and future demand that will be generated by future, planned developments.

The third purpose concerns both the existing and future conditions but is mostly focused on the long-term. This purpose was to provide guidance on infrastructure and traffic circulation improvements that will facilitate:

- Safe and efficient accessibility to/from parking supplies for both automobiles and pedestrians
- Safety and efficiency of the overall transportation system serving the area

Recommendations developed for the second and third purposes will be incorporated in the Stadium Village Station Area Plan, a planning document that will be jointly prepared by the City of Minneapolis, Hennepin County, and the University of Minnesota. The Station Area Plan will proactively position the public and private sectors to optimize benefits from LRT implementation and operations and minimize potentially negative impacts.

Study Area Definition

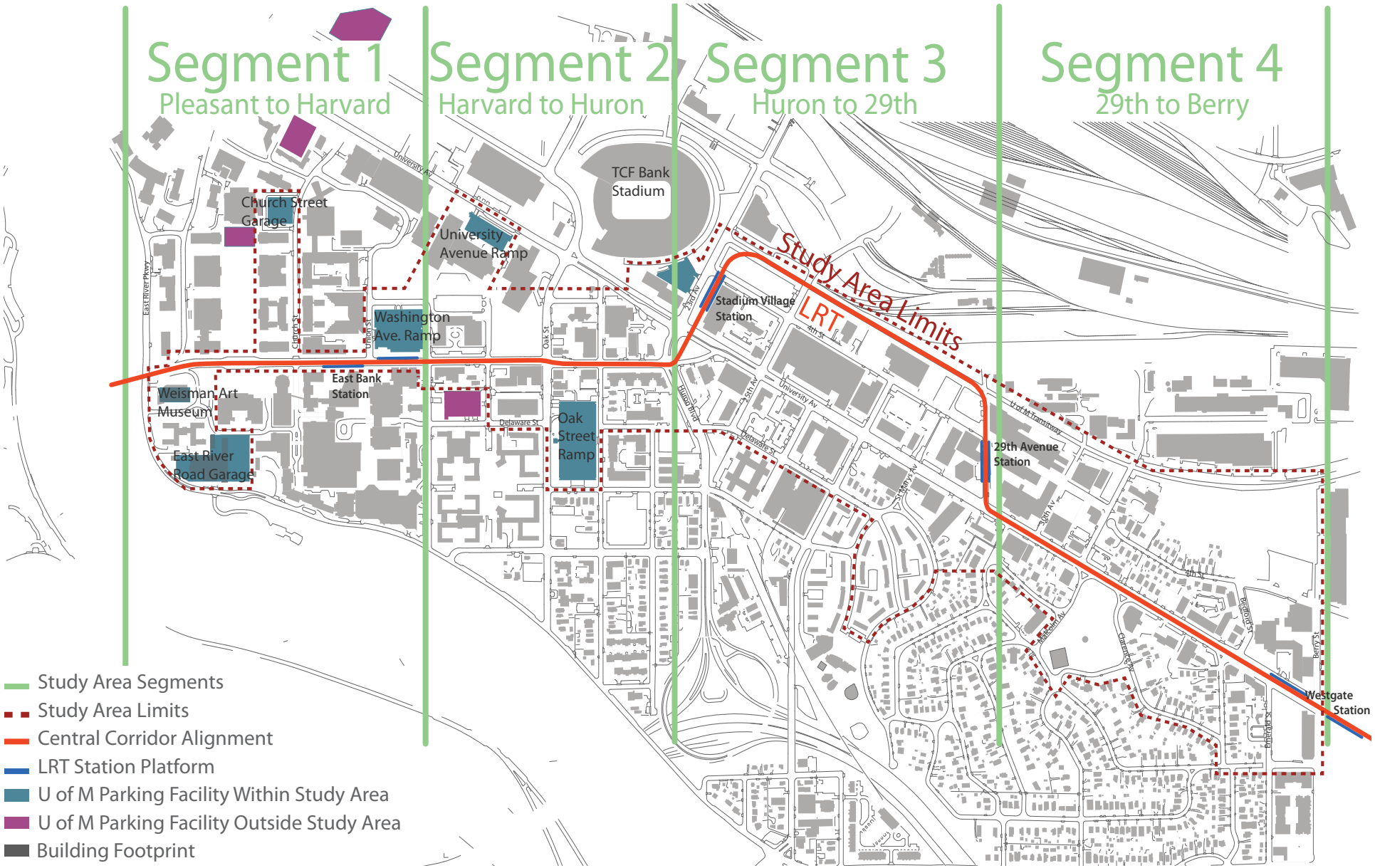
The definition of the project study area was informed by a number of factors. Among these were:

- The CCLRT alignment design, which will require the elimination of on-street parking and the elimination of U-turns and left-turns at uncontrolled locations along impacted streets.
- Discussions with stakeholders (residents, business owners/operators, the City of Minneapolis, and University of Minnesota Parking and Transportation Services) to understand existing parking and transportation issues as well as those anticipated to occur with LRT implementation.
- Monthly Steering Committee meetings with representatives from the city, county, and University and Stadium Village community members.
- Inventory of land use destinations.
- Research and discussions with the project's Technical Advisory Committee (TAC) on the locations and extent of future parking supply reductions, existing parking demand, existing parking markets, and parking behavior that is dependent on factors such as cost, trip purpose and intended duration of parking, distance between the parking supply and the destination, and characteristics of the pedestrian environment between the parking supply and the parker's destination, etc.
- Locations where excess parking capacity may be found, within a reasonable walking distance from destinations

The study area is shown to extend west to east from Pleasant Street on the western edge of the University of Minnesota's East Bank Campus to Berry Street in Saint Paul. The northern border of the study area is the University of Minnesota Transitway from 23rd Avenue to Berry Street. West of 23rd Avenue, the northern border is generally Beacon Street. The southern study area boundary is generally one block off University Avenue, following Delaware and Essex Streets and, moving toward the western edge of the campus, East River Parkway.

Study Area Segments

The study area was divided into four segments based on the physical location of CCLRT tracks and stations, an assessment of land uses adjacent to the tracks, and expected travel/parking behavior. From west to east the four study area segments are:



Segment 1 — Pleasant to Harvard Street:
The CCLRT tracks in Segment 1 will be in the center of Washington Avenue, and the East Bank Station will be constructed as staggered (or split side) platforms on either side of Union Street. Land use within this segment consists of University of Minnesota classroom buildings, lecture halls, and the student union building. There are four University of Minnesota parking facilities in Segment 1 that provide hourly parking for "transients" (visitors to the Stadium Village Area and/or non-contract parkers). These are the Church Street Garage (CSG), and the Washington Avenue Ramp (WAR), on the north side of Washington Avenue and the East River Road Garage (ERRG), and the Weisman Art Museum Garage (AMG) on the south side. The CSG has 237 stalls for transients, the WAR has 571 stalls, the ERRG has 500 stalls, and the AMG has 120 stalls.

There are no on-street parking spaces within this segment of the study area, aside from park board controlled meters along East River Parkway, south of Washington Avenue. Therefore, LRT implementation will not result in the elimination of any on-street parking capacity. The design for LRT in Segments 1 and 2 includes the total elimination of general traffic from Washington Avenue (between Pleasant Street and 23rd Avenue). Consequently, direct automobile accessibility between Washington Avenue and the University of Minnesota parking ramps in Segments 1 and 2 will not be allowed, and motorists will have to approach these ramps from other streets.

The market of parkers in Segment 1 includes:
- University of Minnesota students, faculty, and staff
- transients: who are visitors to University facilities and shops along Washington Avenue.

Segment 2 — Harvard to Huron Street:
On-street, metered parking is currently permitted along Washington Avenue, between Harvard and Huron Streets in Segment 2. With implementation of LRT, where the tracks will be located in the center of Washington Avenue, all on-street parking will be eliminated. Land use within Segment 2 includes the Radisson Hotel and the McNamara Alumni Center on the north side of Washington Avenue between Harvard and Oak Streets. Remaining uses within this segment consist of University of Minnesota Hospitals, and residential (Dinnaken House, a student housing development) on the south side of Washington Avenue and commercial/retail on both sides of Washington Avenue.

Metered parking is provided in a plaza-like, off-street parking lot in front of the Radisson Hotel on the north side of Washington Avenue. Dinnaken House provides on-site parking for its tenants, and while many of the commercial/retail uses do not have off-street parking lots, some do have small, off-street parking lots along the side or to the rear of buildings.

These are the University Avenue Ramp (UAR) with 145 transient stalls and the Oak Street Ramp (OSR) with 350 transient stalls. Two University of Minnesota parking ramps in Segment 2 accommodate University of Minnesota students, faculty, and staff and transients. Patrons of businesses use on-street spaces and parking spaces in private parking lots that are located behind or along side businesses. Some of the parking lots associated with businesses do not provide spaces for customers but, instead, employees and delivery operations.




Examples of Parking Supplies within Segment 2.

Segment 3 — Huron Street to 29th Avenue:
The CCLRT tracks in Segment 3 will run along the east side of 23rd Avenue, between Washington Avenue and the University of Minnesota Transitway, and in the center of 29th Avenue. The Stadium Village Station, which will be constructed as side-by-side platforms, will be located on 23rd Avenue between 4th Street and University Avenue. The 29th Avenue Station will be constructed as a single center platform on 29th Avenue between 4th Street and University Avenue. As a result of LRT implementation, on-street parking, which is currently permitted on the west side of 29th Avenue, will be eliminated.

The University of Minnesota/TCF Bank Stadium, at the intersection of 23rd Avenue and the University of Minnesota Transitway, is the dominant land use within Segment 3. University of Minnesota surface parking lots surround the stadium on its northeast side. One of the surface lots is the Gopher (GOPH) lot, which provides 55 stalls for transient parkers.

Segment 3 further includes uses with front doors on 4th Street and back doors on the Transitway. These uses include University of Minnesota research facilities such as the Thompson Center for Environmental Management and the Mast Laboratories; University Landcare Facilities and Operations Building; and the University Business Center. Mixed in with these University of Minnesota uses are privately owned industrial businesses, which also front on 4th Street. The Transitway is an exclusive bus and bicycle facility. No automobiles are allowed access, and, thus, there is no parking along the Transitway.

Located at the eastern end of Segment 3, where 29th Avenue intersects 4th Street, are more industrial uses that extend along 4th Street to the east. A privately owned, surface parking lot is located in the northwest quadrant of the 29th Avenue/4th Street intersection, and the University Plaza office building (and its associated parking ramp) are located on the west side of 29th Avenue between 4th Street and University Avenue. On-street parking is permitted along the west side of 29th Avenue between 4th Street and University Avenue. Unmetered, time-unlimited parallel parking is permitted along 4th Street throughout most of Segment 3.

Segment 3 also includes the Glendale Townhomes and single family residential on the south side of University Avenue. On-street parking is time-regulated in these areas.

The market of parkers on the north side of University Avenue within Segment 3 consists of attendees at University of Minnesota/TCF Bank Stadium; University of Minnesota students, faculty, and staff, and transient parkers; employees and customers at industrial uses along 4th Street; and employees who park at the University Plaza office building; and patrons of the Textile Center who park at the University Plaza parking ramp.

Examples of Parking Supplies within Segment 3.

Segment 4 — 29th Avenue to Berry Street:

The CCLRT tracks will be located in the center of University Avenue within Segment 4, which will result in the elimination of all on-street parking on University Avenue except for two locations where parking bays will be constructed. These two locations are on the north and south sides of University Avenue between Clarence and Bedford Streets.

Land uses within Segment 4 include commercial/retail and institutional uses that front both sides of University Avenue. There is also a mix of residential uses on both sides of University Avenue, and a condominium development on the south side of University Avenue. The predominant use along both sides of University Avenue is commercial/retail; some of which is located in large developments like the Prospect Park Business Center, the Teamsters' Building, and Tierney Brothers. The large commercial/retail developments provide on-site parking that appears to be adequately sized to meet demand. The smaller commercial/retail developments, such as the Textile Center, either have small off-street parking lots or none at all. In either case, the smaller establishments rely on on-street parking to meet some or all of their parking demand.

The M-Flats condominium development on the south side of University provides on-site parking for its residents. The student-oriented, multi-family residential uses along the north and south sides of University Avenue have driveways off University Avenue, and residents park their cars in the driveways, occasionally on the front lawns, and in on-street spaces on University Avenue.

The Prospect Park neighborhood is located on the north and south sides of University Avenue within Segment 4. Land uses within Prospect Park are predominantly single family and duplex residential. Parking in the Prospect Park neighborhood is accommodated both on-street and in private residential driveways. Time restrictions are posted on some of the streets (e.g., Malcom and Emerald) in Prospect Park. A Critical Parking Area (CPA) has recently been created in the Prospect Park Neighborhood to address residential parking needs by restricting on-street parking privileges to parking permit holders.

Examples of Parking Supplies within Segment 4.

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2.0 Field Scoping and Parking Supply Inventory

Findings from the field scoping and inventory are presented by study area segment in this section of the report. Tables 1 through 4, which follow, detail on-street and off-street parking supplies within the study area. The on-street supplies described in the tables only include those parking spaces that are along the LRT alignment. The off-street supplies only include those spaces that are available for public parking. The term "public" refers to spaces allocated for transient parkers at University of Minnesota parking facilities and public parking spaces that are provided in association with a building, such as a commercial office or retail building. The table does not include off-street, private parking; i.e., off-street parking spaces that are reserved for residents of student housing facilities or condominiums, employees of a business, or loading operations.

Segment 1 — Pleasant to Harvard

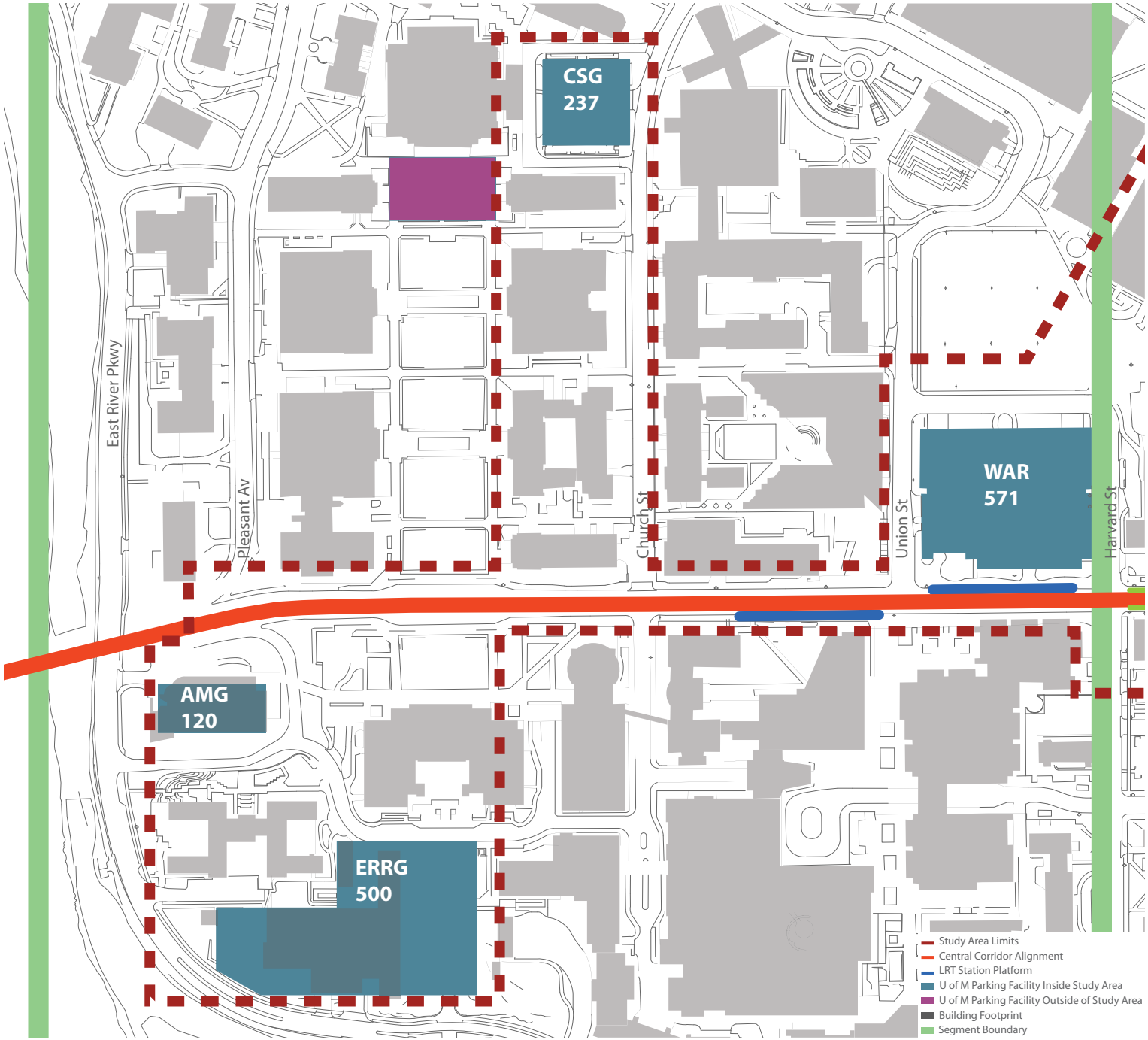
As shown in Table 1, there are no on-street parking spaces along Washington Avenue in Segment 1, and the total number of off-street parking stalls available to the public in Segment 1 is 1,428. These spaces are available for transient parkers in four University of Minnesota parking facilities. As LRT implementation will not impact off-street parking in Segment 1, there will be no reduction in parking supply in this segment.

Table 1: Segment 1 Parking Supply Inventory

	On-Street		Off-Street	
Location	Existing	Post-LRT	Existing	Post LRT
North side of Washington: Pleasant to Church	0	0	237	237
South side of Washington: Pleasant to Church	0	0	620	620
North side of Washington: Church to Union	0	0	0	0
South side of Washington: Church to Union	0	0	0	0
North side of Washington: Union to Harvard	0	0	571	571
South side of Washington: Union to Harvard	0	0	0	0
Total	**0**	**0**	**1428**	**1428**

Source: Biko Associates Inc., May 18, 2011

Map 1: Parking Inventory Pleasant to Harvard



Segment 2 — Harvard to Huron

The LRT alignment design will require the elimination of all on-street parking in Segment 2 and the elimination of automobile traffic between Pleasant and Harvard Streets. Motorists will be allowed to drive on Washington Avenue east of Harvard Street, but driving across the tracks will not be permitted. One hundred-thirty-five (135) on-street parking spaces were inventoried along Washington Avenue and the north/south cross streets in Segment 2, and all of these will be eliminated. Twenty-two on-street spaces along the north/south streets will remain available in Segment 2.

The inventory of off-street stalls found a total of 850 stalls in Segment 2, and none of this supply will be reduced by LRT implementation. Of this total 495 University of Minnesota stalls, designated for transient parkers, are located in two parking ramps. In addition, there are 354 stalls in 14 small lots. Each of the 14 lots is a private lot where stalls are available for public use, except the private lot in the alley behind Sally's, which has 26 stalls. Sixteen of the 26 stalls are reserved for University of Minnesota use.

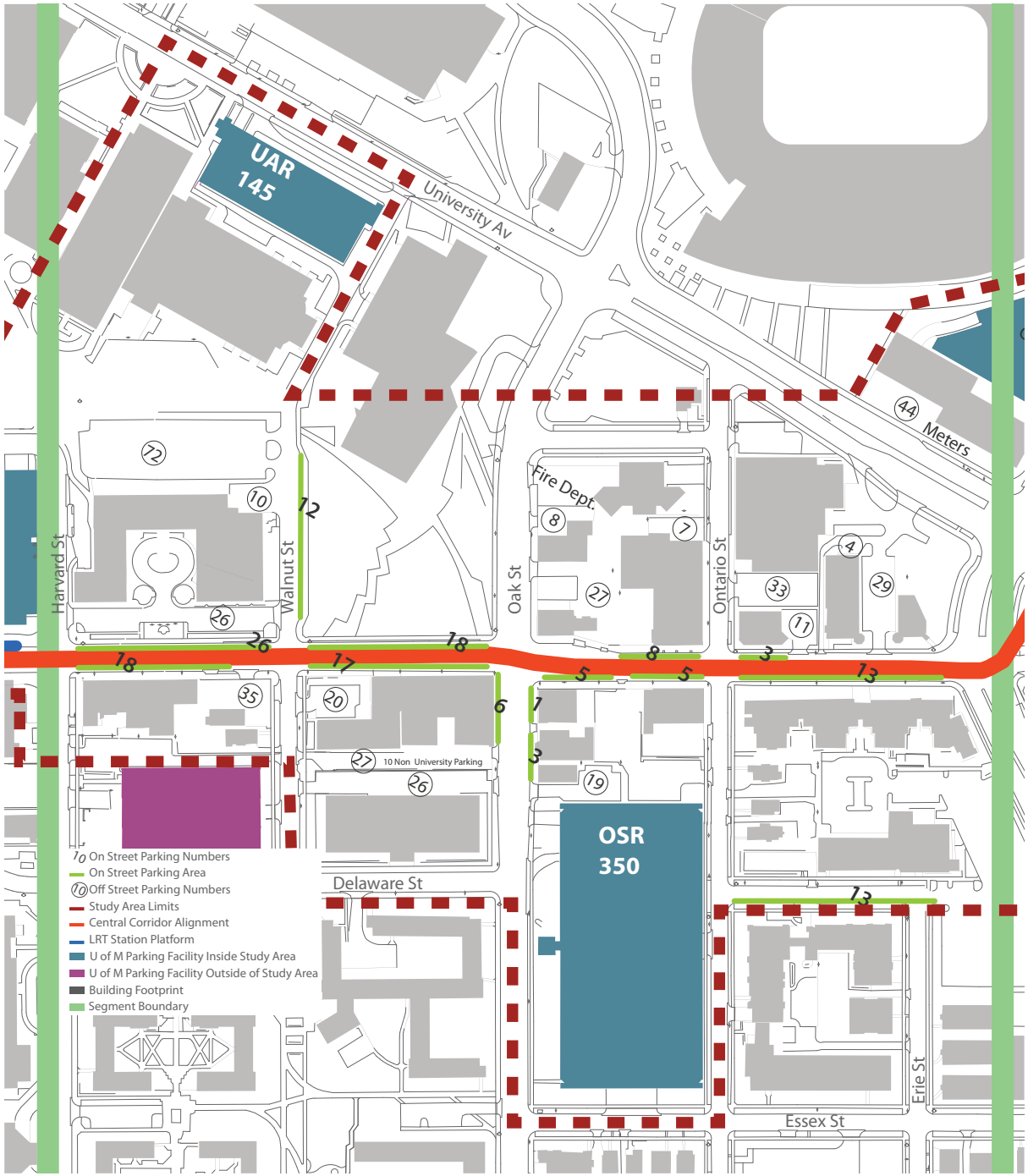
Direct accessibility between the off-street lots and Washington Avenue will be affected by LRT implementation. Circuitous routing will be required to access the two University of Minnesota ramps in Segment 2 and two of the 14 surface lots, which currently have a driveway on Washington Avenue.

Table 2: Segment 2 Parking Supply Inventory

	On-Street		Off-Street	
Location	Existing	Post-LRT	Existing	Post LRT
North side of Washington: Harvard to Walnut	26	0	253	253
South side of Washington: Harvard to Walnut	18	0	35	35
North side of Washington: Walnut to Oak	18	0	0	0
South side of Washington: Walnut to Oak	17	0	74	74
North side of Washington: Oak to Ontario	8	0	42	42
South side of Washington: Oak to Ontario	10	0	369	369
North side of Washington: Ontario to Huron	3	0	77	77
South side of Washington: Ontario to Huron	13	0	0	0
East side of Oak: Washington to Delaware	4	4	-	-
West side of Oak: Washington to Delaware	6	6	-	-
East side of Walnut: Washington to Beacon	12	12	-	-
Total	**135**	**22**	**850**	**850**

Source: Biko Associates Inc., May 18, 2011

Map 2: Parking Inventory Harvard to Huron



Segment 3 — Huron Street to 29th Avenue

The LRT tracks within Segment 3 will run along the eastern side of 23rd Avenue and along the south side of the University of Minnesota Transitway. As a result, on-street parking within this segment of the study area will not be as severely impacted as it will in others. Only eight of 236 on-street parking spaces in Segment 3 will be eliminated as a result of LRT implementation. These eight on-street spaces are along the west side of 29th Avenue between 4th Street and University Avenue.

Off-street spaces in segment 3 include the University of Minnesota Gopher (GOPH) surface lot (with 48 contract stalls and 55 transient stalls), a surface lot in the northwest quadrant of the 29th Avenue/4th Street intersection (with 88 stalls), and a parking ramp that is associated with the University Park Plaza office building (with 350 stalls). Remaining off-street facilities are contract lots that are not available to transient parkers.

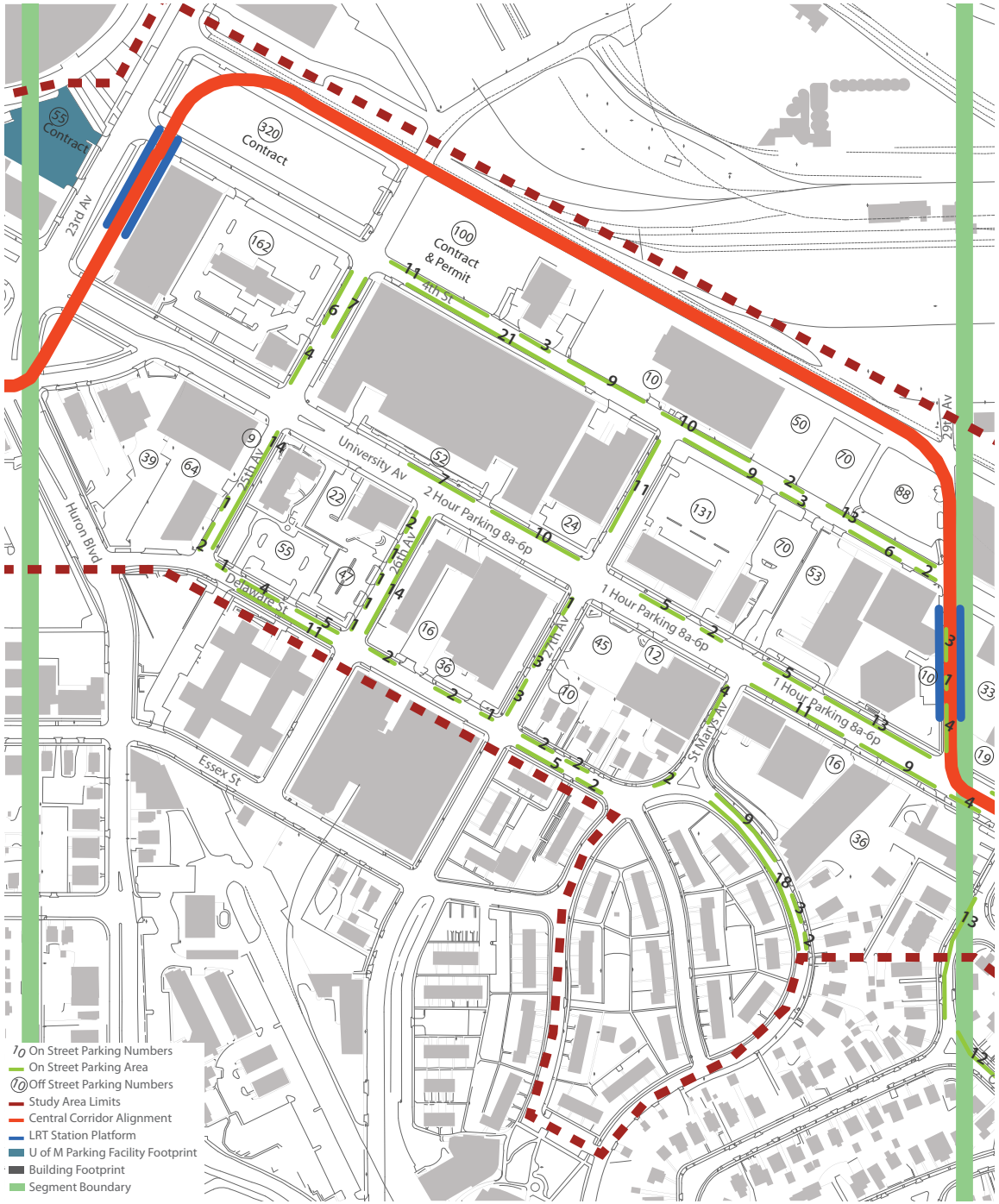
As shown in Table 3, none of the off-street parking supply, which is all contract parking, will be affected by LRT.

Table 3: Segment 3 Parking Supply Inventory

	On-Street		Off-Street	
Location	Existing	Post LRT	Existing	Post LRT
North side of University: 23rd to 25th	0	0	482	482
South side of University: Huron to 25th	0	0	112	112
North side of University: 25th to 27th	17	17	186	186
South side of University: 25th to 26th	0	0	124	124
South side of University: 26th to 27th	0	0	52	52
North side of University: 27th to 29th	25	25	822	822
South side of University: 27th to St. Marys	0	0	67	67
Southside of University: St. Marys to Arthur	20	20	48	48
East side of 25th Avenue: 4th to University	10	10	-	-
West side of 25th Avenue: 4th to University	6	6	-	-
East side of 25th Avenue: University to Delaware	14	14	-	-
West side of 25th Avenue: University to Delaware	3	3	-	-
North side of 4th Street: 25th to 27th	23	23	-	-
South side of 4th Street: 25th to 27th	21	21	-	-
North side of 4th Street: 27th to 29th	25	25	-	-
South side of 4th Street: 27th to 29th	20	20	-	-
East side of 26th Avenue: University to Delaware	14	14	-	-
West side of 26th Avenue: University to Delaware	6	6	-	-
West side of 27th Avenue: University to Delaware	7	7	-	-
West side of 27th Avenue: University to 4th	11	11	-	-
St. Marys Avenue:	6	6	-	-
West side of 29th Avenue: University to 4th	8	0	-	-
Total	**236**	**228**	**1893**	**1893**

Source: Biko Associates Inc. June 2011

Map 3: Parking Inventory Huron Street to 29th Avenue



Segment 4 — 29th Avenue to Berry Street

The inventory showed that there are 85 on-street parking spaces along University Avenue in Segment 4. As shown in Table 4, these are all within the City of Minneapolis. All but 15 of these will be eliminated when LRT is implemented. Also within Segment 4 are 695 off-street parking stalls. Fifty-two (52) of these will be eliminated where the LRT tracks will turn from University Avenue to 29th Avenue and will cut off the southern and western portions of the Prospect Park Business Center's parking lot.

The off-street stalls in Segment 4 are located in parking facilities that are generally not open for all-day public use. Instead, they are associated with a specific building or land use. Therefore, it would not be acceptable to use these off-street facilities, to absorb demand that will be lost when LRT is implemented, and 70 on-street spaces are eliminated.

The LRT alignment in Segment 4 will be constructed in the center of University Avenue, and traffic will only be able to cross the tracks at controlled (signalized) intersections. This will make access to some of the off-street parking lots in Segment 4 less convenient than it is today, where left-turns and U-turns are permitted anywhere along University Avenue.

Table 4: Segment 4 Parking Supply Inventory

	On-Street		Off-Street	
Location	Existing	Post-LRT	Existing	Post LRT
North side of University: 29th to Arthur	3	0	52	0
South side of University: 29th to Arthur	4	0	0	0
North side of University: Arthur to 30th	9	0	93	93
South side of University: Arthur to 30th	8	0	29	29
North side of University: 30th to Malcolm	8	0	106	106
South side of University: 30th to Malcolm	8	0	36	36
North side of University: Malcolm to Clarence	6	0	31	31
South side of University: Malcolm to Clarence	5	0	0	0
North side of University: Clarence to Bedford	19	5	97	97
South side of University: Clarence to Bedford	15	10	94	94
North side of University: Bedford to Eustis	0	0	122	122
South side of University: Bedford to Eustis	0	0	84	84
North side of University: Eustis to Berry	0	0	75	75
South side of University: Eustis to Berry	0	0	0	0
Total	**85**	**15**	**819**	**767**

Source: Biko Associates Inc. June 2011

Map 4: Parking Inventory 29th Avenue to Berry Street

Parking Supply Inventory Observations

The supply of parking within the study area is 5,446 spaces. These can be broken out into 456 on-street parking spaces and 4,990 off-street parking stalls. The off-street parking supply includes:

- Hourly parking for transients in University of Minnesota parking facilities
- Free customer parking associated with a retail/commercial building or industrial facility
- Paid public parking where anyone can park on a time limited basis; fees are paid in a "Pay Box" on the honor system
- Private and/or contract parking where stalls are reserved for approved users

Table 5 further quantifies these types, by study area segment.

Table 5:
Description of Study Area Parking Supply by Study Area Segment

Location in Study Area	Off-Street Parking					Total On-Street Parking	Total Parking Supply by Study Area Segment
	University of Minnesota Transient Parking	Free Customer Parking	Paid Public Parking	Private Contract Parking	Total Off-Street Parking		
Segment 1	1428	0	0	0	1428	0	1428
Segment 2	495	147	105	103	850	135	985
Segment 3	55	191	133	1514	1893	236	2129
Segment 4	0	158	0	661	819	85	904
Total by Type of Parking	**1978**	**496**	**238**	**2278**	**4990**	**456**	**5446**

Source: Biko Associates Inc. June 2011

Table 6 details the total supply of 6,393 parking stalls within University of Minnesota parking facilities that permit transient parking. As shown in Table 6, approximately 30 percent of total stalls in these facilities are allocated to transient parkers, who pay an hourly rate.

Table 6:
University Parking Supply in Facilities that Permit Transient Parking

University of Minnesota Parking Facility	Study Area Segment	Contract Spaces	Transient Spaces	Total Spaces Available in Facility
Church Street Garage	1	0	237	237
Washington Avenue Ramp	1	723	571	1294
East River Road Garage	1	1419	500	1919
Art Museum Garage	1	3	120	123
University Avenue Ramp	2	385	145	530
Oak Street Ramp	2	1837	350	2187
Gopher Lot	3	48	55	103
Total Spaces		**4415**	**1978**	**6393**

Source: Biko Associates Inc. June 2011

A major concern is the impact LRT will have on the existing parking supply. It was found that none of the off-street supply will be impacted except for 52 off-street stalls located at the Prospect Park Business Center, on the northeast corner of 29th/University Avenue. All other off-street facilities will continue to provide the same supply they provide today. Access to/from some of these facilities will be impacted, however, because the LRT alignment can only be crossed at signalized (controlled) intersections. This will eliminate left-turn and U-turn movements that are used now for accessibility between the adjacent street system and many of the parking facilities. Therefore, accessing the parking facilities will, in some situations result in circuitous traffic flow patterns.

In addition to impacting 52 off-street parking stalls, LRT implementation will affect the supply of on-street parking. Analysis showed that 42 percent of the study areas's on-street parking supply will be affected by LRT implementation. Table 7, on the next page shows this in further detail.

Table 7:
Parking Supply Lost to LRT Implementation

Location in the Study Area	On-Street				Off-Street			
	Existing Supply	Supply Post-LRT	Supply lost to LRT	Percentage Lost to LRT	Existing Supply	Supply Post-LRT	Suppy Lost to LRT	Percentage Lost to LRT
Segment 1	0	0	0	0%	1428	1428	0	0%
Segment 2	135	22	113	84%	893	893	0	0%
Segment 3	236	228	7	4%	1893	1893	0	0%
Segment 4	85	15	70	82%	819	767	52	6%
Total	**456**	**266**	**190**	**42%**	**4990**	**4938**	**52**	**1%**

Source: Biko Associates Inc. June 2011

Table 7 shows that while an overall 42 percent of the study area's on-street parking supply will be lost to LRT implementation, more than 80 percent of the on-street supply will be lost in both Segments 2 and 4. Segments 2 and 4 are the two study area segments where parking demand is at its highest due to the presence of retail and commercial uses.

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3.0 Parking Supply Utilization

Background

Parking supply utilization was inventoried during March 2011, when: a) the University of Minnesota was in regular session (Spring Semester), b) snow was falling and had accumulated on streets and sidewalks, and c) various special events were taking place on the East Bank Campus. The inventories were conducted on the following days, time periods, and conditions.

Table 8
Parking Supply Utilization Inventory Schedule

Day/Date	Special Condition or Activity	AM	Midday	PM
Wednesday, March 9	No precipitation. 33 degress. Over 9 inches of snow accumulation • MMF All-Staff Meeting from 8:30 AM - 10:30 AM • Community Health Charities from 5 PM - 8 PM	8 - 10	1 - 3	5 - 7
Thursday, March 10	• Hazardous driving conditions due to snow accumulation along curbs. No precipitation. 33 degrees. • MSHL Boys' Hockey from 6 AM to 3 PM • College of Veterinary Medicine Conference from 8 AM to 5 PM • NCAA Zone E Diving from 1 AM to 3 PM • Van Vleck Dinner from 5 PM to 8:30 PM	8 - 10	1 - 3	5 - 7
Tuesday, March 15	Hazardous driving conditions due to snow accumulation along curbs. No precipitation. 38 degrees. No special events scheduled	8 - 10	1 - 3	5 -7
Wednesday, March 23	Very hazardous driving conditions due to snowfall/ice and increased traffic volume. Over 10 inches of snow accumulation; narrowed outside general traffic lane and parking lane. 30 degrees. • Football Alumni Event from 7 AM to 8 AM • MSHSL Boys' Basketball from 10 AM to 10 PM	No count	3 - 5	7 - 9
Thursday, March 24	Very Hazardous driving conditions due to snowfall/ice and increased traffic volume. Over 12 inches of snow accumulation; narrowed outside general traffic lane and parking lane. 28 degrees. • MSHSL Boys' Basketball from 11 AM to 7 PM • NCAA Mens' Swimming Championships from 12 PM to 9 PM • NCAA Division 3 Hockey Banquet from 5 PM to 8 PM • Creative Writing Program Event from 6:30 PM to 9:45 PM	No count	3 - 5	7 - 9

Non-event days: No scheduled events or only minor events scheduled
Event days: Major events scheduled

The inventories showed that a high percentage of available parking spaces was almost always occupied during these critical time periods. The maps that follow present average parking supply utilization, on a study segment basis, under two conditions: a) average non-event weekday and b) average event day. The legends on the maps describe parking utilization as:

- Green — 0 to 40 percent occupied, with 60 percent to 100 percent available capacity.
- Yellow — 41 to 75 percent occupied, with 25 percent to 59 percent available capacity.
- Red — 76 to 100 percent occupied, where available capacity ranged between 0 and 24 percent.

Segment-by-Segment Parking Utilization

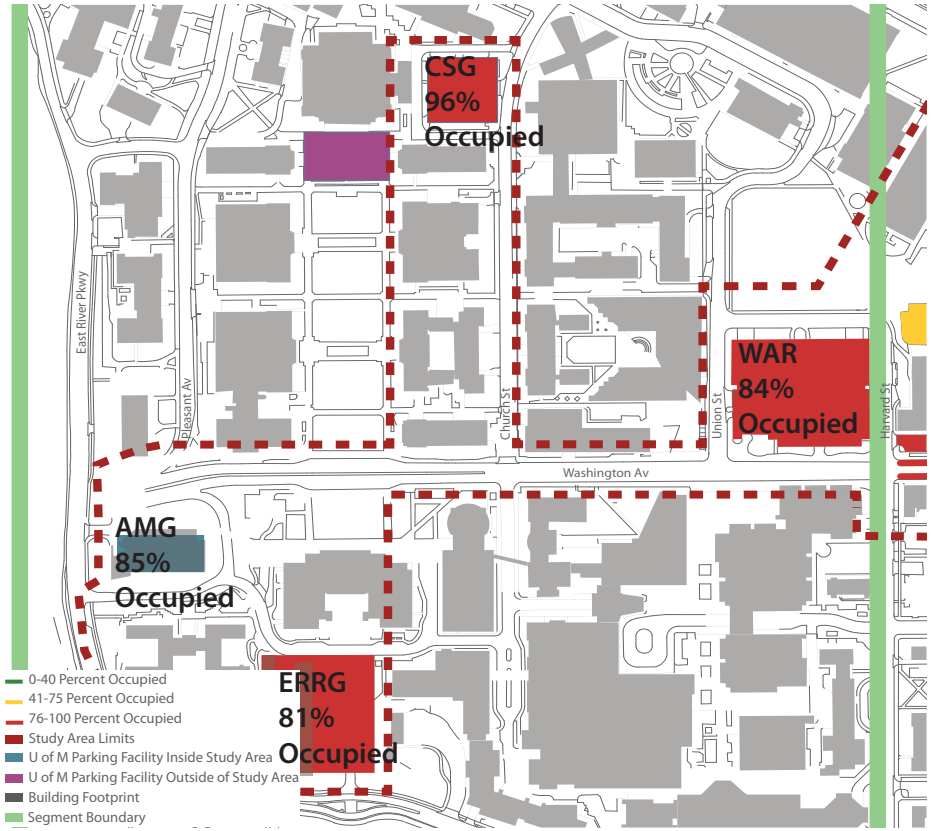
Segment 1 — Pleasant to Harvard Street:

Segment 1, which represents the study area between Pleasant and Harvard Streets, is not shown in the following parking utilization maps. Segment 1 does not include on-street parking under the existing condition; thus, there were no on-street utilization counts. The University of Minnesota's parking ramp utilization statistics show that occupancy in the Segment 1 ramps ranges between 80 percent and 95 percent occupied on non-event days and 95 to 100 percent occupied on event days.

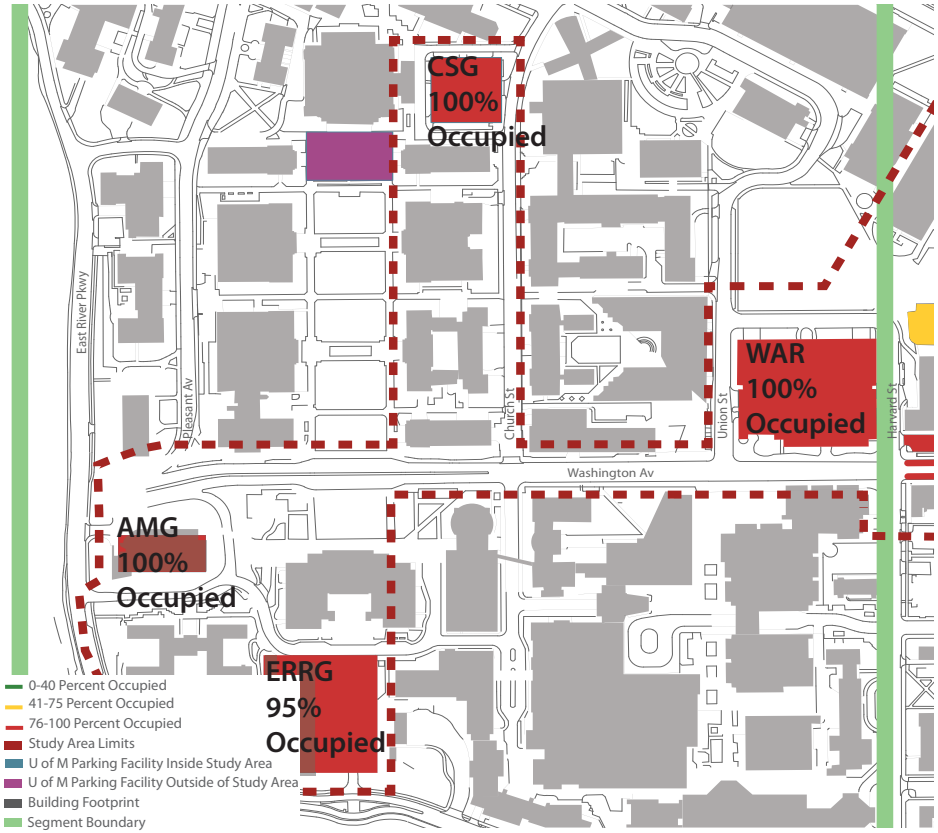
Segment 2— Harvard to Huron Street:

As shown on the following two parking supply utilization maps for Segment 2, parking occupancy is generally the same on event days and non-event days. Under either condition, available on-street capacity ranges between 0 and 24 percent, and the available off-street capacity can be as high as 50 percent. The two University of Minnesota ramps within Segment 2, Oak Street Ramp and University Avenue Ramp, are completely occupied on event days and are between 88 percent and 91 percent occupied on days where no major events are scheduled.

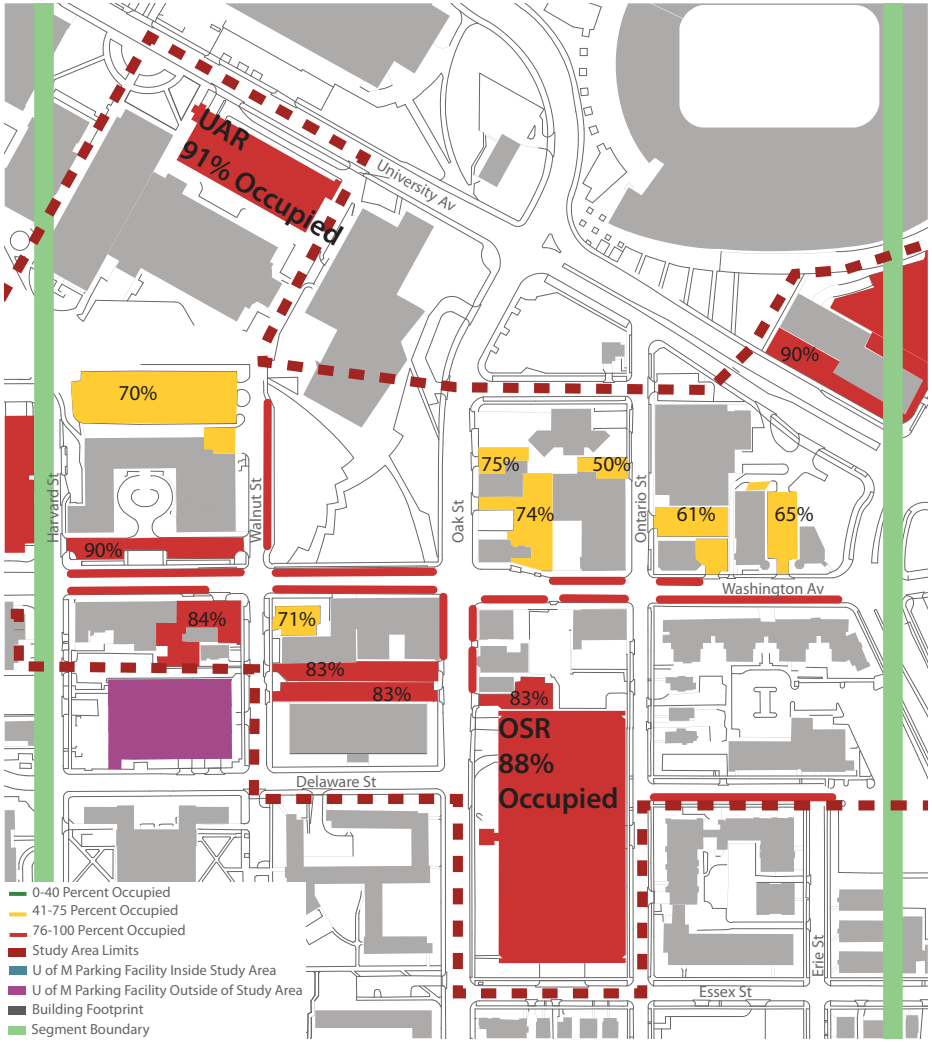
Average Non-Event Parking Utilization - Segment 1



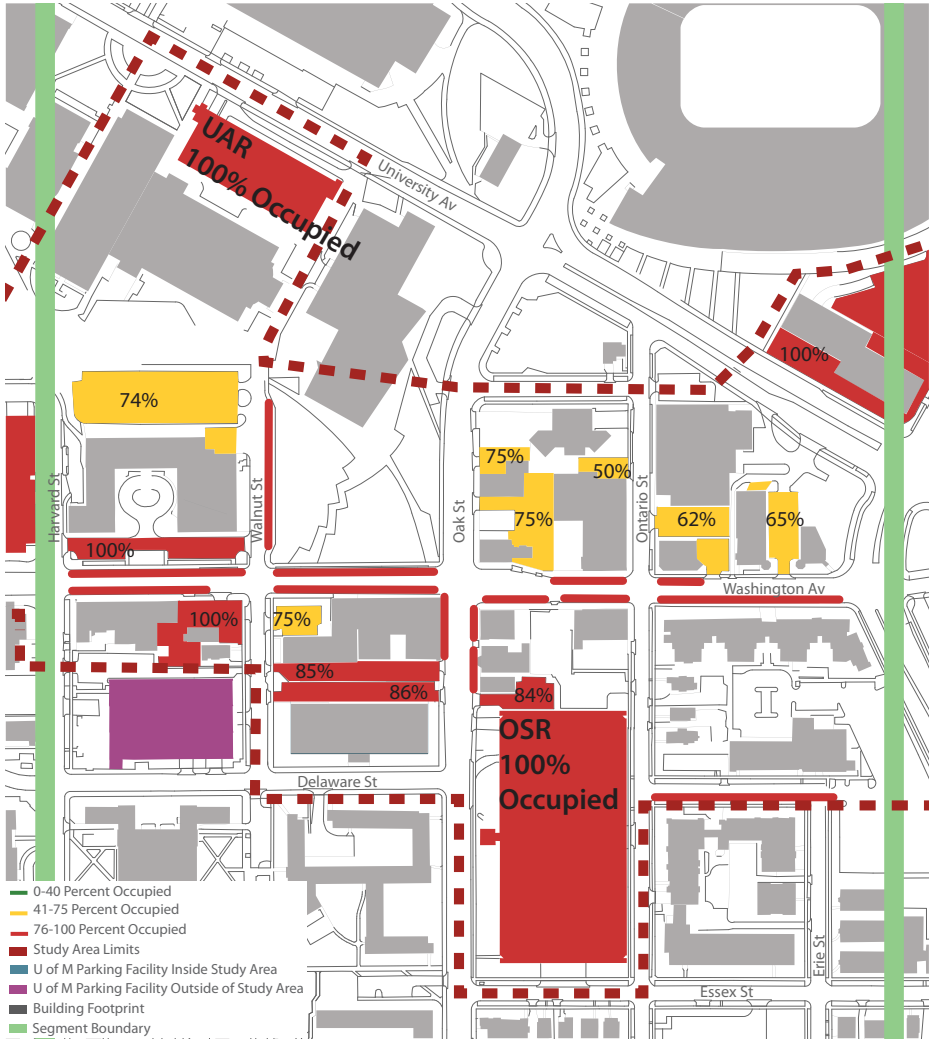
Average Event Parking Utilization - Segment1



Average Non-Event Parking Utilization - Segment 2



Average Event Parking Utilization - Segment 2



Segment 3 — Huron Street to 29th Avenue:

Whether it is a non-event day or an event day, the on-street parking within Segment 3 is nearly always heavily occupied, and the available capacity of on-street parking spaces ranges between 0 and 24 percent. As shown, the University of Minnesota's Gopher surface parking lot is typically 91 percent occupied on non-event days and 100 percent occupied on event days. The University permits event-related parking to take place in its contract lot on the northeast corner of 4th Street and 23rd Avenue. On non-event days, this contract lot is 41 percent to 75 percent occupied. On event days, this lot is 100 percent occupied.

On non-event days, parking stalls in the Days Inn Hotel surface lot at the intersection of 24th Avenue/University Avenue are provided for hotel parking and parking at the Tea House restaurant. On event days, stalls not occupied by hotel and restaurant patrons (on the north side of the hotel building) are set aside for event parkers. As shown on the Segment 3 maps, this lot has 25 percent to 59 percent excess capacity on non-event days and 0 to 24 percent excess capacity on event days.

Average Non Event Parking Utilization - Segment 3

Average Event Day Parking Utilization - Segment 3

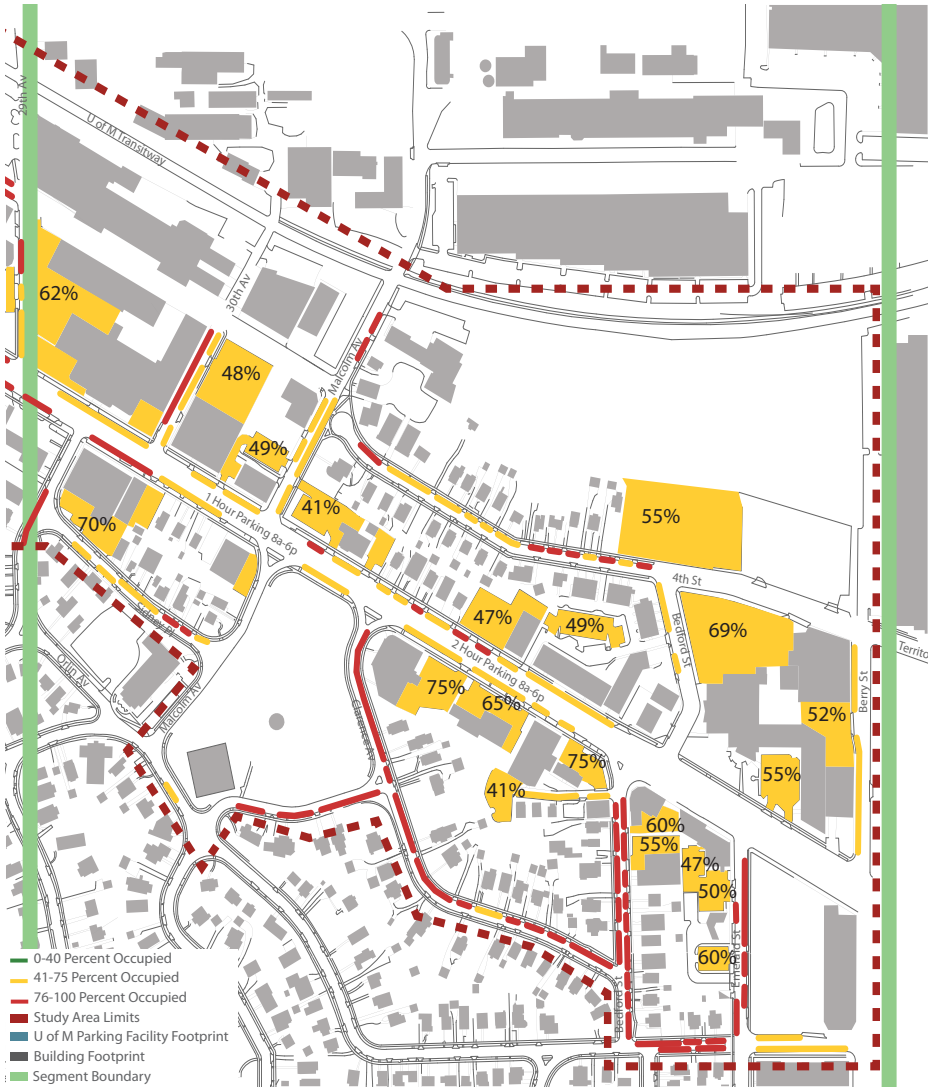
Segment 4 — 29th Avenue to Berry Street:

As shown on the following two maps, the level of on-street parking utilization is the key difference between non-event day and event day parking in Segment 4. On non-event days, on-street parking utilization along most of the streets in Segment 4 is generally between 41 percent and 75 percent, leaving 25 percent to 59 percent of on-street stalls available. On event days, all of the on-street stalls in Segment 4 are occupied.

As shown on the two maps, on-street parking occurs at a high level in the Prospect Park neighborhood on the south side of University Avenue, both under non-event and even conditions.

The surface parking lots in Segment 4 are associated with adjacent buildings and are provided for parkers who are conducting business in the buildings. Thus, there is no change in parking utilization in the surface lots between non-event days and event days.

Average Non-Event Parking Utilization - Segment 4



Average Event Day Parking Utilization - Segment 4

Parking Utilization Observations,

The on-street parking utilization matrix, Table 9, shown to the upper right, illustrates the following:

- No on-street parking located in Segment 1
- Consistently high on-street parking in Segments 2 and 3, regardless of event or non-event days
- Moderate to high on-street parking in Segment 4 on non-event days
- High on-street parking in Segment 4 on event days

The off-street parking utilization matrix, shown to the lower right in Table 10 does not include University of Minnesota parking facilities that provide stalls for transient parkers. The matrix reports parking utilization in: a) off-street parking facilities that are not owned by the University and b) two University-owned contract lots that only allow non-contract parking on event days.

As shown, most of the lots described in the matrix have excess capacity, both on non-event days and event days. This is because most of the parking lots included in the matrix are associated with a building or land use, and parking is only allowed for patrons of the businesses that are associated with the parking lots. Within Segment 3 there are three exceptions:

- Two University of Minnesota contract lots, along 4th street, near 23rd Avenue, that allow event day parking
- The Days Inn Hotel, which allows non-hotel patrons to park on event days

The data collected on event days suggest that adequate capacity exist in non-University off-street lots to accommodate future, post-LRT event day parking demand, after a total of 190 existing on-street parking spaces will have been eliminated. As shown in table 10 to the right, non-University, off-street parking facilities in study area Segments 2, 3, and 4 currently have between 25 percent, and 59 percent excess capacity on event days. With a total post-LRT supply of 2,760 non-University owned, off-street stalls in Segments 2, 3, and 4, at least 690 stalls (25 percent of the total) could be available on event days.

Results from this analysis show that additional parking, beyond existing supplies in University of Minnesota ramps and lots and other private facilities, need no be provided for event day parkers.

Table 9. On-Street Parking Utilization Matrix

	Segment 1 Pleasant to Harvard	Segment 2 Harvard to 23rd	Segment 3 23rd to 29th	Segment 4 29th to Berry
Non-Event Day Parking Utilization	NA			
Event Day Parking Utilization	NA			

0 to 40 percent occupied; up to 60 percent excess capacity
41 to 75 percent occupied; between 25 and 59 percent excess capacity
76 to 100 percent occupied; up to 24 percent excess capacity

Table 10. Off-Street Parking Utilization Matrix

	Segment 1 Pleasant to Harvard	Segment 2 Harvard to 23rd	Segment 3 23rd to 29th	Segment 4 29th to Berry
Non-Event Day Parking Utilization	NA			
Event Day Parking Utilization	NA			

0 to 40 percent occupied; up to 60 percent excess capacity
41 to 75 percent occupied; between 25 and 59 percent excess capacity
76 to 100 percent occupied; up to 24 percent excess capacity

[1] The Minneapolis Municipal Code only permits event-day parking in two locations within the study area. The Code would need to be revised to permit event-day parking at all privately owned parking lots within the study area to realize a supply of at least 690 off-street stalls.

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4.0 Parking Management Toolbox

Introduction

In the time leading up to LRT implementation and after LRT is implemented, parking conditions in Stadium Village and along University Avenue will be affected by a reduction in the current parking supply, new roadway geometries and traffic movement regulations, and new parking demands. Major concerns of this study are to predict future parking demand and related traffic patterns in order to proactively develop site-specific and system wide measures to accommodate anticipated changes. Toward this end, the second phase of the Stadium Village/University Avenue Parking and Transportation study included development of a "toolbox" of parking recommendations. The toolbox, which is presented in the following matrix, shows what is referred to as a universe of alternative parking management measures. The toolbox measures were developed based on evaluation of supply, demand, location, time, and pricing and can be used as a reference when determining ways in which to address short-term and long-term:

- Parking supply issues,
- Parking efficiency issues,
- Convenience of parking, and
- Traffic safety, particularly when accessing traffic lots and ramps.

Overview

An overview of the measures shown in the following parking solutions matrix is provided to ensure a base-level understanding of the goals of each toolbox measure. As shown the parking solutions can be divided into five types of tools:

1. **Demand Tools (DT)** mitigate or reduce the demand for parking.

2. **Location Tools (LT)** are strategies that can: a) move demand away from the'core' areas (with high demand and comparatively low supply) into areas with excess parking supply and b) clearly locate or define where parking is available for users.

3. **Pricing Tools (PT)** provide a wide range of flexibility. When appropriately calibrated, these tools can reduce occupancy in high-demand areas and create a market for off-street parking.

4. **Supply Tools (ST)** evaluate the availability of the existing parking supply and work to optimize its use to the maximum extent possible before building/developing new supply.

5. **Time Tools (TT)** introduce or modify time restrictions to encourage turnover and better use of parking spaces. Influencing factors include surrounding land uses, time of day, and availability of supply.

Parking Solutions Matrix

Tool Type	Measure	Description	Applicability
DT	High First Hour Rate Parking	This type of parking is typically located in off-street lots and garages. Parking with a relatively high first hour or half hour charge and then significantly lower rate for subsequent hours encourages people to park once and rewards them for this behavior by offering value for a long stay. Typically, this type of parking is somewhat less convenient to a destination than high fixed hourly rate parking.	• Encourages people to park once and walk to various destinations • Encourages long-term/daily parking
DT	Low First Hour Rate Parking	This type of parking is typically located in off-street lots and garages. Parking with a relatively low first (or second) hour rate and increasing hourly rates thereafter encourages shorter term parking and ensures that parking is available throughout the day by creating turnover. This type of parking can be used as an alternative to high fixed hourly rate parking.	• Encourages short to midterm parking duration
DT	Low Daily Rate Parking	This type of parking is typically provided in less convenient locations and larger facilities than higher rate parking. This type of parking is intended to serve longer term parkers (employees and visitors).	• Adds parking supply for long term parkers (such as visitors or employees) • Decreases demand for on-street parking spaces
DT	Valet Service	Valet service involves the parking of vehicles by an attendant (valet) in a parking lot or garage. This service is typically offered for a premium fee (above the cost of self-parking at a facility). Vehicles parked in valet-designated areas are often double (or more) parked, which can allow a normally self-parked facility to accommodate a much higher number of vehicles in the same space.	• Provides the convenience of "front door" parking but uses less attractive off-street parking spaces
DT	Area Permit Parking	This type of parking offers permit holders a specific set of privileges over non-permit holders. Privileges for permit holders typically include unrestricted parking by time and location. Non-permit holders parking in the same area are often duration and time-of-day restricted. Most often permit parking is used in neighborhoods adjoining retail and employment areas to prevent on-street parking spaces from being consumed by visitors. Time limits of one to four hours are typical of permit zones. In many permit zones, parking is not allowed by non-permit holders during evening and early morning hours.	• Shares use of parking spaces • Protects residents' parking
DT	Transit Service	When provided at an appropriate frequency (short enough headway), transit can extend the reach of parking facilities. Appropriate headways for services need to be determined on an area-specific basis; however, headways of less than 15 minutes are generally desirable. Transit services operating within a specific district are often subsidized by businesses within the area in order to reduce the burden on the locality, offer a low fare (or no fare), and increase service frequency. Some residential parking permits prohibit non-permit parking entirely.	• Extends the reach of parking facilities
DT	Free or Reduced Price Transit Passes	This measure can be used to reduce parking demand. By offering employees and/or visitors reduced transit fares or free rides, often, longer term parking demand can be reduced at a primary destination.	• Reduces parking demand • Increases transit attractiveness
DT	Bicycle Parking	Bicycle parking is most effective when it is provided convenient to destinations in a secure location. Short-term bike parking should be located where it is convenient to the front door of a facility. Comparatively longer term bike parking can be located in conjunction with parking structures or lots in secure off-street locations.	• Reduces vehicle parking demand
LT	Parking Way finding	Parking way finding or signage systems provide information on the location and type of parking in an area. Typically, parking way finding is combined with other destination-oriented signage in an area in a standardized format. Way finding signage should clearly communicate the location of parking, the name and type of the parking facility, whether it is public or private, its hours of operation, and its fee structure and methods of payment. Way finding signage should be located on key ingress routes in an area. Typically, the level of information provided increases as proximity to a parking facility decreases. For example, in the outskirts of an area, way finding may only provide directional guidance to public parking, whereas in the immediate vicinity of a facility, the name (ex. City Center Parking Garage), use (Public), and rate (daily, hourly, free, etc.) may also be provided. Parking way finding is typically used in conjunction with parking facility branding and can be combined with elements of a parking guidance system.	• Reduces extraneous traffic circulation • Informs unfamiliar visitors of parking locations

Tool Type	Measure	Description	Applicability
LT	Parking Facility Branding	Parking facility branding is used to standardize the way in which a facility's use and availability is communicated to the public. In most parking systems, the nearly universally recognized "P" is used to communicate a facility's status as entirely or partially publicly accessible. Parking branding is often used in conjunction with parking way finding and guidance systems; however, parking branding can be successful without the presence of a comprehensive way finding system.	• Encourages and reinforces use of off-street public parking • Identifies publicly available parking
LT	Facility Signage Parking	Parking facilities should have signage that clearly indicates use, hours of operation, and whether parking is free or if a fee is charged. Ideally, signage for facilities of similar use (i.e. Public or Private) should be similar. Parking facility signage is an essential element of parking way finding systems and is a key part of parking facility branding.	
LT	Parking Guidance System	Parking guidance systems are used to provide travelers information on the availability of parking within a system and within individual facilities. These systems are typically composed of dynamic information delivery devices that convey information about the system and individual parking facilities and standard static signage. Traditionally, guidance systems have been designed to deliver information through dynamic message signs and highway advisory radio and similar broadcast technologies. More recently, information is being delivered through 311/511 and similar telephone-based systems and through the internet via hand-held mobile devices. When implemented comprehensively, parking guidance systems can maximize utilization and increase overall system occupancy by 5 to 10 percent. Parking guidance systems are typically used to supplement way finding and branding.	• Reduces extraneous traffic circulation on streets • Informs people of available parking • Optimizes parking system • Event management • Parking system monitoring
LT	Shared Parking	Shared parking involves making all or a designated number of spaces within a parking facility available for use by a designated group of parkers (employees, residents, shoppers, visitors, etc.). Sharing parking increases a facility's overall utilization during more periods of the day, thereby maximizing the parking system and reducing the number of new spaces that would otherwise be constructed for a single use.	• Maximizes parking system
LT	Remote Parking	In instances where sufficient parking cannot be provided within a high demand area, remote parking can be a viable option. Simply providing adequate parking at the periphery of an area is not typically enough to attract parkers. It is often necessary to offer remote parking at a reduced rate (as compared to more convenient parking) and with accompanying transit services (typically free) to connect with the local area.	• Adds parking supply to an area where land is expensive for difficult to provide • Shifts parking demand
PT	High Fixed Hourly Rate Parking	Whether provided on-street or in a parking garage, the intent of high fixed hourly rate parking is to encourage turn-over and discourage long-term parking. High hourly rate parking is typically located along prime sections of retail streets and is typically the most convenient parking to a destination. The rate for this type of parking should be noticeably higher than other parking facilities. High hourly rate parking discourages parking by employees in areas where high turnover is important.	• Encourages turnover and discourages long-term parking
PT	Multi Space Meters (Pay-and-Display)	Multi-space meters are a relatively recent advance in parking technology. Instead of a single parking meter for each space, one machine can be used to control six to 10 parking spaces. The machines are generally solar powered, using an internal battery, and accept credit cards, coins, and bills. Where parking rates are higher, many transactions have been found to be completed with credit cards. This has been shown to improve the security of cash management. Multi-space meters have the ability to offer different rates at different times of the day and on different days of the week. Multi-space meters can be used to simplify enforcement and can be used with mobile phone technology to allow a person to check on the status of their parking limit and add additional time if needed. Multi-space meters can help clean-up pedestrian spaces by allowing for the removal of the multitude of single-space meters. One unintended drawback to the installation of multi space meters has been the loss of meters that were used to lock bikes.	• Increased on-street parking supply • Simplifies enforcement • Improves cash management security • Provides flexibility in on-street parking management
PT	Single-Space Meters	Typically coin or park card operated, single-space meters are simple to install and relatively easy to manage. They offer a place to securely lock a bicycle, even though this is not their intended purpose. Some localities are experimenting with the use of single-space meters to control parking and offer electricity to plug-in vehicles.	• Simple way to collect parking cost • Easily understood by public
PT	Credit Card Payment Acceptance	Offering credit card transactions at parking facilities can improve an area's ability to raise parking rates without shifting parkers to other facilities. As parking rates increase, cash payment becomes less and less attractive and is problematic from a collection, management, and security perspective.	• Improves cash management • Supportive of higher parking rate structures

Tool Type	Measure	Description	Applicability
PT	Parking Rates by Time-of-Day/Day-of-week	In areas with different weekday, weekend, and evening parking characteristics, it is often beneficial to establish parking rates/time limits by day of the week and time of the day. For example, in an area with few daytime retailers, it may be beneficial to allow longer duration street parking at a relatively low rate during business hours and then to increase the parking rate and reduce the duration during evening hours to ensure that employees vacate parking that is most valuable for customers. Conversely, in areas with a significant retail presence, it may be advisable to establish short duration (30 minutes to one hour maximum), high rate curb parking during normal business hours and then somewhat longer duration (one to two hour maximum) high rate curb parking during a portion of the evening hours.	• Manages parking demand at different times of day and days of the week
PT	Pay-on-Foot	This method of parking revenue collection (payment) is integrated with a parking revenue control system for lots and garages. Pay-on-foot involves a parker driving into a parking facility and receiving a ticket at a gate, parking and taking the ticket with them, and then paying at a machine at the exit, in the lot, or in the garage (typically in an elevator lobby or stairwell on a landing) for the parking based on time spent in the facility. Pay-on-foot machines operate like pay-and-display machines in that they accept coins, bills, and credit transactions. Pay-on-foot machines also can operate time-of-day and day-of-week programs to offer a range of parking rates to suit localized conditions. When used in parking lots or garages, pay-on-foot technology allows facilities to be operated and suitably enforced without an attendant. Typically, entrance and exit transactions are monitored through the use of CCTV cameras.	• Reduces need for parking attendants • Provides for alternative payment methods • Allows for flexible facility operations
ST	Head-in Angle Parking	This type of parking involves a vehicle pulling forward into a curb space and parking at a set angle, typically 30, 45, or 60 degrees. In this arrangement, vehicles reverse into intersecting traffic. Reversing out of a parking space can be problematic due to sight distance limitations and the speed and volume of intersecting traffic. This type of parking can double the number of on-street spaces in the same distance as parallel on-street parking, but requires approximately 20 feet of street width.	• Provides more parking spaces than parallel parking
ST	Reverse in (Back in) Angle Parking	This type of parking involves a vehicle driving past and then reversing into a curb space at a set angle, typically 30, 45, or 60 degrees. Studies have shown that this type of parking is easier for vehicles to enter into and depart from than parallel parking. When leaving a parking space, vehicles pull forward into intersecting traffic. Compared to the reverse movement needed to depart from head-in angle parking, the movement out of a reverse-in angle parking space is safe and easy. This type of parking can double the number of on-street spaces in the same distance as parallel on-street parking, but requires approximately 20 feet of street width.	• Provides more parking spaces than parallel parking • Safer than head-in angle parking
ST	Street Reconfiguration	Where parking is at a premium and there is the ability to reallocate space between curbs on a street, the reduction in the number of travel lanes has the ability to create space for new or reconfigured on-street parking. Where sufficient width is available, parallel parking could be converted to head-in or reverse-in angle parking.	• May reduce street width for vehicle travel lanes
ST	Structured Parking	Parking structures vary in size, configuration, and construction method. They generally include ramped vertical circulations systems for vehicles and elevators and stairs for pedestrians. Parking structures can be free-standing or can be incorporated into buildings above or below ground.	• Increases parking supply
ST	Free Parking	Free parking is typically not provided in core areas of urban places since it tends to increase parking demand. It is more frequently provided in remote facilities.	• Encourages parking
ST	Mechanical/ Automated Parking Solutions	Mechanical parking solutions include the wide range of mechanical and automated stacked parking systems. These systems are effective in space-constrained situations and where traditional parking solutions would be inefficient.	• Increases parking supply on constrained sites
TT	Real-Time Parking Facility Information	Modern parking revenue control systems in parking facilities can provide information to users as to the number and location of parking spaces within individual facilities. They can let users know how many and where spaces are available or that a facility is full.	• Reduces extraneous traffic circulation • Informs people of available parking • Optimizes parking system • Event management • Parking system monitoring

Other Measures

The measures listed below are ancillary measures that would be combined with those listed in the above matrix.

- Improve an area's walkability and hospitality to pedestrians
- Restripe existing stalls to gain capacity
- Develop parking structures so that additional levels can be added if they are needed.
- Develop overflow parking plans to account for unexpected demand (at an event, for example)
- Control parking passes
- Provide financial incentives to commuters to encourage reductions in parking demand
- Control/manage access to/from a parking facility

Guidance on Parking Meters

Parking meters are tools for enforcing on-street policies and traffic and mobility management policies. Meters accomplish this purpose by providing motorist the "right" to park in a particular spot for a limited amount of time. Thus, location and pricing are the two most important factors, and determining where meters should be installed within the study area and appropriate pricing levels are critical concerns in Stadium Village.

The study area includes both metered and unmetered parking supplies. Meters have been installed in Segment 2 of the study area, and Segments 1,3, and 4 are without meters. No on-street parking is allowed in Segment 1; therefore, meters are not considered. Segment 2 includes the Washington Avenue commercial area between Harvard and Huron Streets. Meters within this segment are utilized to ensure an acceptable turnover of parked cars and, thus, an optimum availability of parking for customers of the businesses.

A large number of land uses in Segment 3 (along 4th Street) and Segment 4 (along University Avenue) are businesses that provide parking in off-street lots. Consequently, on-street parking demand generated by business patrons is not as high in these segments of the study area as it is in Segment 2 where off-street parking lots associated with the businesses are either small or non-existent.

Implementation of LRT will drastically reduce the on-street parking supply in Segments 2 and 4 and will drive on-street parkers in these segments to other locations. Some of the on-street parkers in Segment 2 will find available parking in University of Minnesota parking ramps. Some of the on-street parkers in Segment 4 will find available on-street parking spaces along 4th Street in Segment 3.

Research conducted by Donald Shoup, PhD, a widely-regarded expert in the economics and availability of parking, identifies parking as a key link between transportation and land use, with important consequences for cities, the economy, and the environment. His research popularized the theory that an 85 percent occupancy rate of on-street parking spaces would be the most efficient use of public parking. According to Shoup, when cars at any given destination in a city (a block or a group of blocks) occupy more than 85 percent of on-street parking spaces, cars arriving at that destination are forced to circle the block for a few minutes in order to find an unoccupied parking space.[1] This small search time per car creates a surprisingly large amount of traffic congestion, because typically, many cars are searching for parking simultaneously during peak driving times. This wastes time and fuel and increases air pollution.

Whether 85 percent is the correct level of occupancy to prevent traffic congestion and reduce air pollution is debatable. Clear, however, is the idea that time-related pricing is critical to ensuring turnover that will benefit adjacent land uses. Therefore, in order to ensure optimum turnover:

- Meters should be installed where parking demand is so high that it will likely not be met in off-street parking lots
- Meters should be timed and priced appropriately to encourage parkers to complete short-term trip purposes in a reasonable amount of time.

As a rule, on-street parking is the highest value parking and should be timed and priced accordingly. Therefore, the parking meters in Segment 2 should have a time limit that would permit parkers to complete trips to the adjacent businesses. With the large number of restaurants in Segment 2, the time limit for meters might be a maximum of 2 hours. These meters should be priced so that they are equal to or exceed, the fee that is charged to park in a University of Minnesota parking ramp for 2 hours. The amount of time permitted on the meter should be increased for the meters that are farther away from the businesses in Segment 2, and the time-related price to park should be decreased.

Meters in Segment 3, along 4th Street, will be used by students whose current, unmetered parking stalls will be eliminated in Segment 4. These students are known to park along University Avenue in Segment 4 and then catch a bus to attend classes on the West and East Bank Campuses. If turnover is not ensured along 4th Street, these displaced parkers will circulate while searching for a parking space and contribute to congestion and air pollution. Thus, meters should be installed along 4th Street that:

- Allow a maximum time period of 2 to 4 hours; enough time for students to catch a bus, arrive at a classroom destination, attend class, and catch a bus for the return trip to the parked car
- Are priced at a level that is equal to or exceeds the fee that would be charged for 2 to 4 hours of parking in a University of Minnesota parking ramp.

5.0 Refined Parking Solutions - Applying the Toolbox

Introduction:

Parking measures listed in the previous "toolbox" were reviewed to determine their applicability in the study area under two scenarios:

1. The short-term timeframe where LRT will have been implemented, but not enough time will have passed for the study area to be redeveloped with a large number of Transit-Oriented Developments (TODs). It is felt that the short-term will be between 2014 and 2020.
2. The long-term where LRT will have been implemented, and, with the passage of time, TOD redevelopment will have occurred and transformed the study area. The long-term is anticipated to begin in 2021.

Under the short-term scenario, the LRT will be operating, and its mode share will be significant. At the same time, only a small percentage of anticipated redevelopment will have occurred, existing businesses will not have had enough time to re-orient their operating models to serve transit riders, and a large percentage of trips to/from the Stadium Village study area will continue to be accomplished in private autos. Thus, the area's supply of parking will still be a major issue.

Under the long-term scenario, these conditions will have changed. Plans under development in the Stadium Village Station Area Plan will have guided the area to a stronger transit-oriented position. Some of today's single use buildings will have been replaced with multi-use buildings, the pedestrian and bicycle environments will have been enhanced, and businesses will have re-oriented their operating models and product lines to better serve transit- and pedestrian-oriented markets. Under this scenario, the need for parking will be less important than it will be in the short-term but, because of the study area's regional appeal, will still be a necessary component of the area's infrastructure.

Short-Term Solutions:

Parking solutions for the short-term are described below by study area segment.

Segment 1:

- Install wayfinding signage to direct parkers to available "transient" stalls in the University's four ramps and pedestrians to businesses.
- Install changeable message boards to notify parkers of available parking stalls in the ramps, especially during events.

Segment 2:

- Install wayfinding signage to direct parkers to available "transient" stalls in the University's two ramps and other surface lots.
- Install changeable message boards to notify parkers of available parking stalls in the ramps.
- Enter into discussions with owners of existing parking facilities (e.g., Mercil's Auto Repair at the intersection of Washington Avenue/ Walnut Street and the Radisson Hotel) to identify ways existing parking services might be modified to facilitate higher turnover and cooperative arrangements with adjacent businesses. The owners of private lots, such as the Mercil's lot, may be interested in participating in the development of a parking lot if the surrounding businesses are willing to join them as co-financers/co-operators.
- Initiate a parking validation program where the University sets aside a block of stalls in the Washington Avenue Ramp for the exclusive use of business patrons who will be able to validate their tickets with local businesses and receive reduced rate parking. for example: the first 30 minutes at no cost and/or a reduced rate for short term parking.
- Discuss with the University the possibility of establishing reduced rates for business patrons that would go into effect during off-peak time periods.
- Discuss with the Radisson Hotel the possibility of allowing business patrons and employees to use parking stalls in the surface lot that is behind the hotel building. Business patrons might be allowed to use this surface lot when parking demand is not high at the hotel; e.g., during the evening.

- Install meters and allow on-street parking on the east side of Ontario Street between Fulton and Essex Streets and on the north side of Essex Street between Ontario and Huron.
- Implement the meter additions currently under discussion by the city and the University (See page 56.)

Segment 3:

- Stricter enforcement of the City's ordinance on extended parking on 4th Street and tow violators.
- Improve unimproved segments of 4th Street with new curb, gutter, pavement, pedestrian scale lighting, and landscaping.
- Consider adjusting the parking along the south side of 4th street to be reconfigured for angle parking.
- Install parking meters along 4th Street between 23rd and 29th Avenue. Do not permit on-street parking along the north side of 4th Street between 23rd and 25th Avenues. If metering along 4th Street in Segment 3 isn't approved, mark on-street stalls with consistent dimensions to maximize the number of available stalls.
- The parking supply around Glendale Townhomes appears to be sufficient for weekday demand during both the AM and PM. Establishing time-limited parking, with exemptions for local residents who would be issued permits, should prevent non-residents from occupying these spaces, especially on days when events are being held.

Segment 4:

- Stricter enforcement of the City's ordinance on extended parking on 4th Street and tow violators.
- Improve unimproved segments of 4th Street with new curb, gutter, pavement, pedestrian scale lighting, and landscaping between 29th and Malcolm Avenue.
- Install meters along 4th Street between 29th and Malcolm Avenue.
- If metering along 4th Street in Segment 4 isn't approved, mark on-street stalls with consistent dimensions to maximize the number of available stalls.
- Allow metered parking along 30th Avenue between University Avenue and 4th Street. Investigate the potential to implement angled parking on 30th Avenue.
- Allow metered parking on east side of Malcolm between University Avenue and 5th Street (the temporary Transitway detour)
- Monitor impacts in the Prospect Park neighborhood. If problems become worse, expand the newly established Critical Parking Area.
- Develop shared parking at Alliance Clinic (Fraser) lot and/or Spire lot.
- Permit development of a temporary surface lot at the Hubbard Broadcasting site, between the Transitway and 4th Street, for use by the Fraser Family Center.

Example of parking along a north south cross street in Segment 4

Overall Short-Term Solutions:

- Implement a remote parking program in privately owned parking facilities, north, east, south, and west of the study area. Remote parking facilities should have excess capacity and should be located along transit routes that serve the study area.
- Develop a consistent, universal signage directing motorists to public parking locations, and pedestrians to businesses and other attractions. Locate at each cross street along University to guide to parking destinations.

Current Construction Orange signange designating the locations of parking facilities

- Develop a University of Minnesota web page that identifies available parking supplies in real time.
- Provide parking assistance to the public via a "311" system.
- Because a Pedestrian Oriented Overlay District is in effect in Segment 4, the city's Interim Use Permit for Temporary Parking Lots will have to be implemented. The interim use permit would not be allowed for a general "commercial" parking lot, but only for a parking lot that serves the needs of a particular use in the immediate area.
- Allow event day parking in privately owned parking lots. The Days Inn Hotel in Segment 3 is currently permitted to provide parking stalls on event days. This should be extended to other privately owned lots in the study area., assuming proper permits and approvals are obtained.
- Businesses with off-street lots should ensure lots are visibly striped and if possible restriped for optimization and efficiency.

Three examples of businesses with off street lots which could be striped for standardized parking stalls

- University of Minnesota contract surface lots in Segments 2 and 3 should convert from contract parking during weekdays to public parking during weeknights
- Install additional metered spaces in the study area per City of Minneapolis Public Works recommendations. (See page 56.)

Long-Term Solutions:

Segment 1:

- Install permanent signage directing motorists traveling eastbound on University Avenue to University of Minnesota parking facilities (ERRG, AMG, CSG, WAR, and OSG).

Segment 2:

- As the south side of Washington Avenue, between Harvard and Walnut Streets, is redeveloped, integrate off-street parking with the redevelopment. This parking could be constructed as a deck over the Mercil's lot, assuming it has become a district parking lot as suggested in the short-term solutions. It could also be configured as underground parking beneath the redevelopment and surface parking behind a liner of ground-level commercial uses.

Essex Street

Segment 3:

- Acquire underutilized uses for redevelopment and develop surface parking lots, parking ramps, or underground parking garages that would be associated with a block's redevelopment. Candidate redevelopment areas might include;
  a) selected sites on the block defined by Beacon Street, Ontario Street, Washington Avenue, and Oak Street
  b) the block defined by Washington Avenue, 25th Avenue, Delaware Street, and Huron Boulevard
- Allow metered parking on east side of Arthur Avenue between Sidney and University
- Allow metered parking on 27th Avenue between University Avenue and 4th Street.

Segment 4:

- A candidate redevelopment site in Segment 4 might be the existing Prospect Park Business Center, which is located immediately east of the 29th Avenue station.
- Consistent with mixed-use TOD redevelopment in Segment 4, develop centralized district parking facilities that are integrated within the TOD. The physical design/layout of the integrated parking facilities should permit all uses in the redevelopment convenient, efficient, and safe access.

Overall Long-Term Solutions:

- Install universal "P" signs at strategic locations along University and side streets directing motorists to public parking.
- Identify all lots providing public parking with clearly visible universal "P" sign designations.
- Develop district parking consistent with any redevelopment. The district parking concept would provide off-street parking for patrons of the uses within a district redevelopment.

6.0 Case Studies

Introduction:

This section of the Stadium Village/University Avenue Parking and Transportation Study presents case studies that demonstrate how parking solutions outlined in the previous section might be implemented. It should be mentioned that the parking solutions that are presented as case studies are conceptual treatments, and private property owners whose properties are included were not consulted during the development of the parking solution concepts.

Also addressed in this final report section are:

- Examples of how improved signage might be used in the study area to assist motorists as they attempt to access off-street parking supplies in the study area.
- Traffic circulation improvements.

Five Case Studies:

Five case studies were prepared for this report. The five case studies are described below and are pinpointed on the locator map on the next page. They are fully illustrated on pages 44 through 50.

Case Study 1: Repositioning of parking operations in the rear Radisson Hotel surface lot.

The existing surface lot on the north (rear) side of the Radisson Hotel has a supply of 72 stalls. The stalls are provided for staff and guests, and it was reported that the lot is seldom fully occupied. Reconnaissance activities conducted for this study found the lot to be 70 percent full (with approximately 18 stalls available).

It is recommended that operations at this lot might be repositioned to permit customers of area businesses to use stalls not occupied by the hotel's staff and guests. In order not to negatively impact the hotel, access to the lot by business patrons would be denied on days of the week (or during times of the day) where hotel parking needs are known to be high.

Terms and conditions related to the Implementation of this concept would need to be discussed with the hotel's managers.

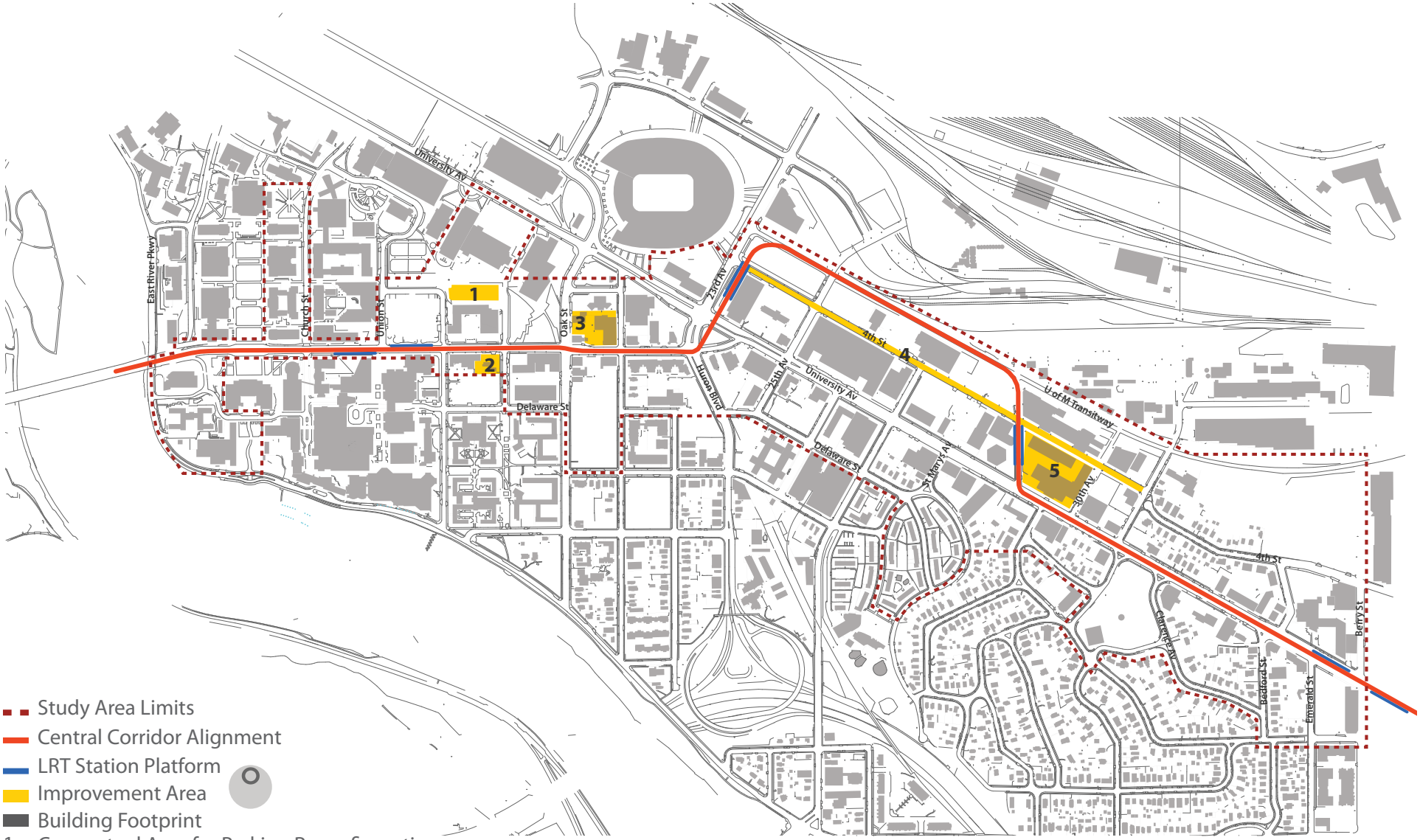
Case Study 2: Conceptual development of a parking lot expansion and pricing adjustment to facilitate turnover.

Under this conceptual treatment, which was developed as a short-term solution, it is recommended that discussions should take place between the owners of Mercil's Auto Repair Shop (intersection of Washington Avenue and Walnut Street) and area businesses. Mercil's currently operates an auto repair shop and has on-site 35 parking stalls. Of the 35 stalls, up to 10 are typically occupied by cars that are being serviced, and the remainder are provided to the general public for a fee.

The discussions could focus on three topics:

- Increasing the supply of parking. A conceptual plan was developed that shows how Mercil's could increase its supply by 19 stalls if the garage were razed.
- Changing the pricing structure so that time limits were imposed.
- Opportunities for area businesses to collaborate with the owners of the garage to develop a privately operated district parking facility.

Solution Examples Locator Map



- Study Area Limits
- Central Corridor Alignment
- LRT Station Platform
- Improvement Area
- Building Footprint

1: Conceptual Area for Parking Reconfiguration
2: Conceptual District Parking
3: Conceptual Mixed Use Redevelopment North of Washington
4: Conceptual Enhanced Traffic, Parking, and Pedestrian Experience on 4th Street SE
5: Conceptual District Parking and Development as Proposed by Prospect Park

Case Study 3: Conceptual mixed use redevelopment on an underutilized parcel north of Washington Avenue between Oak and Ontario Streets.

Under a long-term condition where redevelopment within the study area will have begun in earnest, existing uses on the parcel described above will be viewed as prime redevelopment sites. The concept developed for this report includes two mixed use buildings where a small surface lot (accessible from Oak Street) would be provided for deliveries, short-term parking, and circulation for garbage trucks. In the concept that is illustrated, the majority of the parking supply would be provided in an underground garage (accessible from Ontario Street).

The mix of uses was conceptualized to include ground level retail and dwelling units on the second and third floors of the two buildings.

Case Study 4: Conceptual streetscape improvements along 4th Street between 23rd Avenue and Malcolm Avenue.

This conceptual improvement would be recommended for immediate implementation. Segments of 4th Street exist today as a street without sidewalks, curbs, well-defined parking areas, and other amenities that contribute to safe traffic flow, efficient parking, and a pleasant pedestrian environment. Fourth Street today operates as a back door in the study area but, with implementation of LRT along the south side of the University of Minnesota Transitway, will become a more prominent street where parkers displaced from University Avenue will find an available supply of on-street parking spaces. Three concepts are illustrated. Both include new sidewalks, boulevards, street trees, pedestrian-scale lighting and traffic-oriented lighting, and parking meters to ensure turnover. One concept shows parallel parking on both the north and south sides of 4th Street. This concept results in 191 parking spaces. The second shows angle parking on the south side and no parking on the north side, resulting in 145 stalls. Finally, the third concept shows angle angle parking on the south side of 4th street and parallel parking on the north side. This concept yields 247 stalls.

Whichever parking configuration is implemented, it is recommended that on-street parking should not be allowed on the north side of 4th Street between 23rd and 25th Avenues, as this segment will be used by the University of Minnesota as a staging area for campus buses.

Case Study 5: Conceptual development of parking districts associated with new development along University Avenue

There aren't many opportunities to dvelop new parking lots in the study area. At least one such opportunity does exist along University Avenue at the location of the existing Prospect Park Business Center. The owner of this use has worked closely with neighborhood residents in Prospect Park to discuss the potential for redeveloping his site as a high density, transit-oriented development (TOD). As shown, this site is immediately east of the 29th Avenue LRT station platforms. These plans are consistent existing plans for the area where the city sees the University Avenue/29th Avenue station area becoming a transit-oriented, mixed use area.

The redevelopment concept calls for consolidated parking for all the users in the TOD. Thus, individual uses included in the development would not provide their own parking supply. Instead, all users would collectively supply parking in an on-site reservoir of parking; likely a parking structure.

This would be a long term solution that is recommended for implementation where there is an opportunity for redeveloping an existing land use along University Avenue.

An additional district parking concept for Segment 4 envisions land uses that are not necessarily components of a single development and, therefore, may not be on the same site. Under this concept, the land uses could either be existing uses or new developments and could be stand-alone uses that are adjacent to each other or within the same district. [1] It is further conceived that a parking reservoir (either a surface lot or a garage) could be developed within the district to serve land uses in the district.

[1]This is an unlikely occurrence for new development in Segment 4, because the city envisions TODs in this area where, as in the earlier district parking discussion, a high intensity mix of uses would be developed on a single parcel, and parking for the entire TOD would be provided on-site.

The goals of this concept would be to strategically consolidate the district's parking supply in one location (or several locations) in order to:

- Improve parking accessibility, convenience, and efficiency by eliminating the need for drivers to circulate through the district in search of a parking stall
- Eliminate the need for each land use to provide its own, on-site parking supply and thus:
  - enable a developer to more effectively use his/her site to develop leasable space instead of parking
  - more easily facilitate shared parking strategies and, perhaps, eliminate the need to build all the Code-required parking stalls.

This conceptual approach to district parking is already allowed in Minneapolis in areas where the Zoning Code permits new developments to meet some or all of their parking supply off-site, so long as the off-street supply is within 500 feet of the development's front door. Examples of where the Code permits this approach are Dinkytown, Uptown, Saint Anthony Main, Seven Corners, Lyn-Lake, and downtown. Under this approach, where no one steps forward to build a district parking lot or garage, an existing parking facility (either surface lot or parking garage) must first have excess capacity, and the owner must be willing to lease or sell stalls. Next the owner of the new development must demonstrate to the city that his/her Code-required parking supply is effectively met in the off-site parking facility.

While there are positive aspects associated with this approach to parking districts, there are also obstacles that could potentially stand in the way of their implementation and success in Segment 4. The first is the urban environment in which the parking district would be developed. The evidence leads one to believe that successful parking district strategies are implemented in compactly developed urban areas; e.g., Uptown Minneapolis and Stadium Village where blocks and walk distances are comparatively short, the level of pedestrian activity is high, buildings are at the human scale and have zero set-backs, and the level of visual interest between the parking reservoir and the final destination is high.

The second obstacle is based on city participation, ownership, and financial concerns. The City of Minneapolis has historically not expressed interest in developing, owning, or operating parking facilities without participation from property owners who will benefit.

In 2008, the city sold a parking ramp that was available for district parking at the intersection of University Avenue/2nd Avenue. This ramp, which was intended to serve as a reservoir for parkers in the Saint Anthony Main district, was never fully utilized, despite the area's recent increase in businesses and other attractions, and the city's cost were never met. Similarly, the Seven Corners Ramp was sold despite density and high levels of student-oriented pedestrian activity.

The Code, however, does allow the city to develop and operate parking facilities within parking districts and collect revenues to cover associated expenses. These revenues are collected in two ways: 1) through fees paid by parkers and 2) through assessments levied against participating property owners to cover obligations that are in excess of revenues realized through the fees. By Code, all property owners within the district must agree to this arrangement in order to implement the parking district.

Without city participation, the parking district in Segment 4 could be developed privately. Changes in the Zoning Code would be required to allow such a facility to be constructed in Segment 4, because current provisions prohibit the development of parking facilities not associated with a land use in Segment 4. Assuming a revision to the Code, there are financial concerns that would confront the developer of a private sector parking facility and the developer(s) of land uses that would use the parking facility. Some of these concerns would be:

- **Ability to accurately quantify the needed supply of parking for uses within the district.** The total number of parking stalls required in the district may change depending on the types and sizes of businesses that occupy buildings within the district. Additionally, implementing a shared parking strategy based on a given mix of tenants could result in an under-supply of parking if the mix of tenants changes.

  Consequently, the developer of the district parking facility would, for practical purposes, not be able to benefit by building fewer parking stalls, based on a shared parking strategy. Doing so would put their in a possible position where an adequate number of stalls, to meet Code, would not be available if the mix of tenants changed, and the potential to successfully implement shared parking no longer existed.

- **Ability to attract tenants**. While the developer of land uses that would park in the district parking reservoir would be able to effectively maximize density on their property, would he/she have difficulty attracting tenants? With the district's parking reservoir presumably remotely located from the businesses it serves, a leasing agent could have difficulty attracting tenants once it is known that customers would have to walk potentially unacceptable distances between the parking reservoir and the front door of the business.

- **Ability to maintain tenants.** Tenants dissatisfied with the performance of the parking district could possibly want to opt out of their obligations. Would the owner of the parking reservoir be able to prevent participating businesses from leaving? Would there be a legal obligation to prevent them from leaving? If they were to leave, how would the loss of expected revenues be handled? Would tenants be required to participate in the district parking arrangement, even if their customers chose to park in locations that are, presumably, closer to the business?

Summary

Research conducted for this report shows that implementing a privately owned and operated district parking strategy in Segment 4 is not feasible, because there are too many risks for the developers. Consequently, it is recommended that district parking in Segment 4 should be implemented with participation from the City of Minneapolis. Considerations in implementing district parking, which is a three- to five-year process, are outlined below:

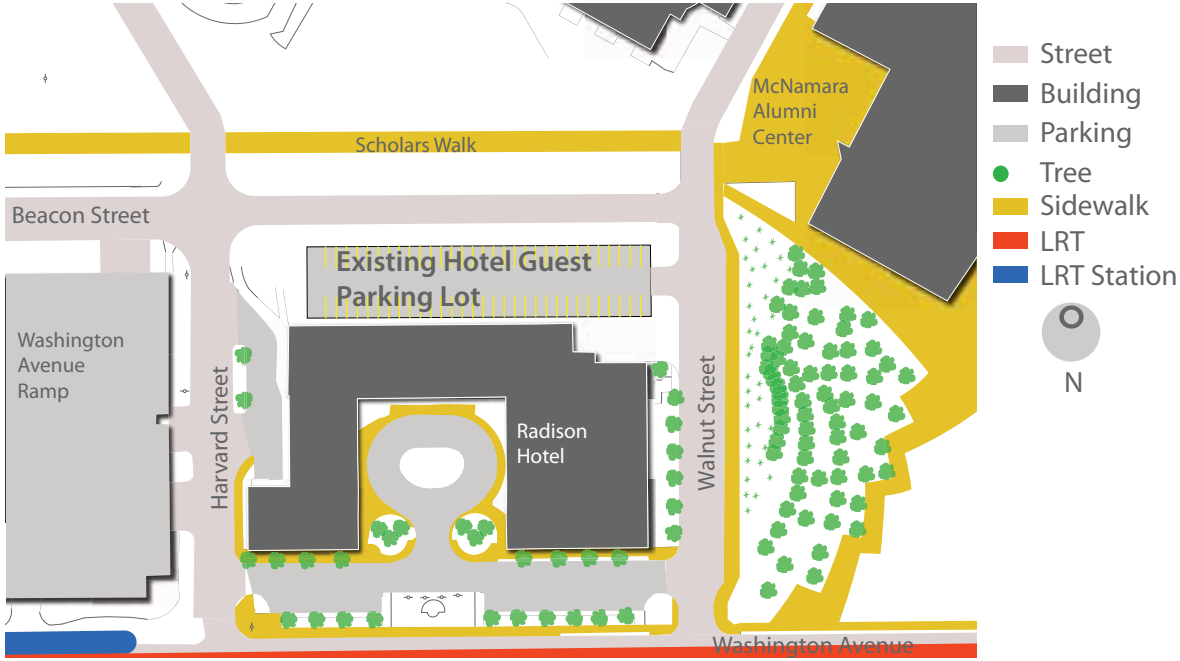
1. Conduct a parking study to determine needs of the land uses (developments and/or redevelopments) that will participate in the district parking.
2. Identify a location(s) within the area that can conveniently serve commercial parking needs.
3. Determine the costs of developing the district parking facility. Determine the costs of operating and maintaining the facility. These are costs that the city will bear and will cover through the collection of parking fees and a 20-year assessment to property owners within the district. There is an option that would permit a one-time payment so that the 20-year assessment can be avoided.
4. Determine if property owners will want to participate in the district parking program. Even one dissenting vote will prevent the district from being developed.
5. Determine if revenues will be adequate to cover the city's costs.
6. A formula is used to allocate financial requirements among the property owners. The formula takes the following factors into consideration:
    - The businesses' Code-required parking supplies
    - Distance between the front door of the business and the parking supply
    - Area (GSF) of the business devoted to commercial use
    - Area (GSF) of the parcel on which the business is built
    - Market valuation of participating properties.
7. Create a Parking District Advisory Board comprised of:
    - Council member
    - Property owners in the parking district
    - Public Works staff
8. Assemble properties for development and redevelopment.

Strategic Signage Installations

As mentioned, the LRT alignment will require motorists to accomplish left-turn and U-turn movements at signalized intersections. These turning movements will be prohibited at all other locations along the alignment. As a result, new travel patterns will be established in order to access parking lots and garages within the study area. As discussed in the previous report section, the installation of informational signage can assist motorists by indicating the safest and most convenient travel routes.

The following maps identify safe and convenient travel routes for traffic accessing University of Minnesota parking garages in study area Segments 1, 2, 3, and 4. The routes have been identified to direct motorists to the signalized intersections, which will be the only locations where left-turns and U-turns can be accomplished.

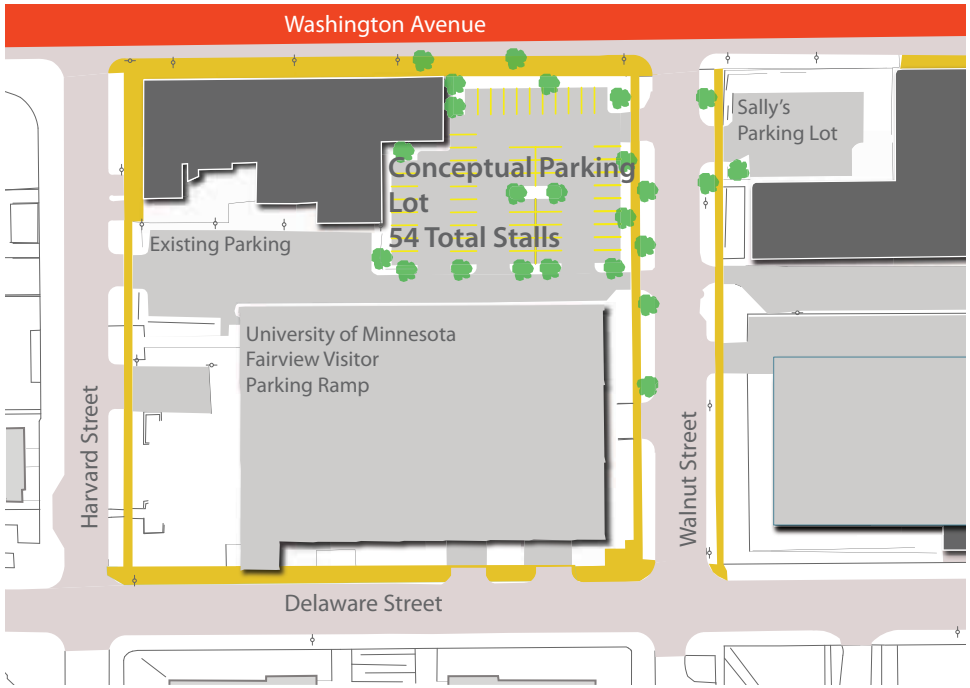
1. Proposed Retooling of Existing Parking Supply



Plan: Radisson Hotel and Parking Areas

Aerial: Current Parking Conditions at the Radisson Hotel

2. Conceptual Replacement of the Auto Repair Shop with District Parking



Conceptual Plan: Proposed District Parking Lot

Existing Conditions

Doesn't meet code:
- Size of stalls
- Landscaping
- Fencing

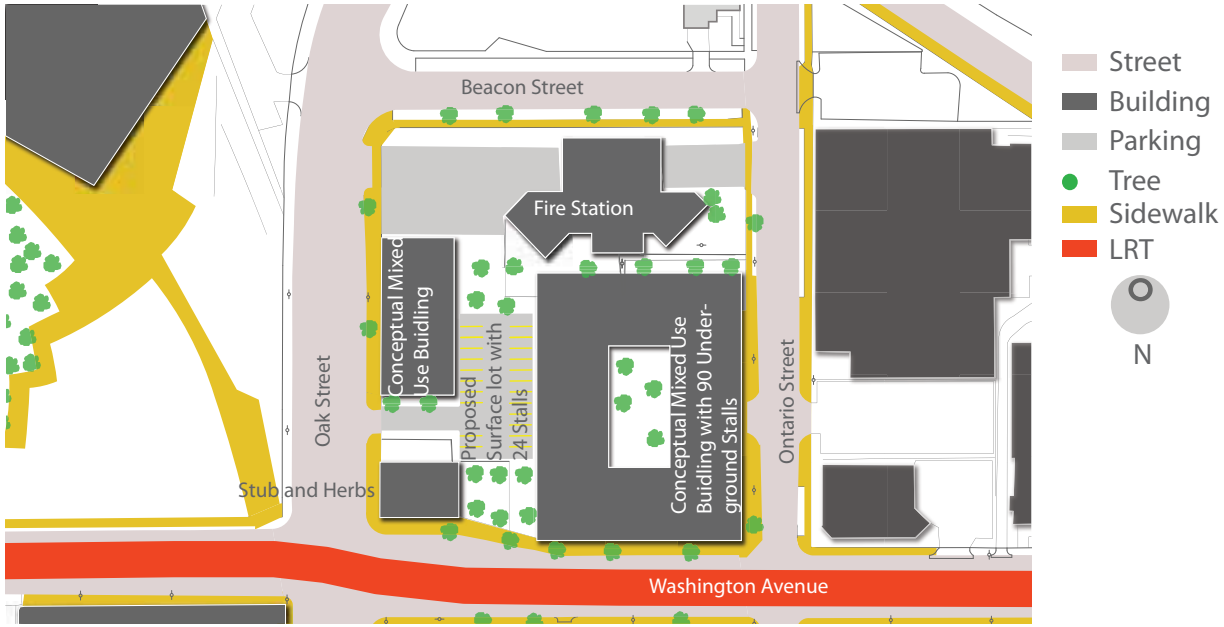
Existing Parking Supply:
- 10 Auto Repair Spots
- 25 for business parking

Pedestrian Access Point

Pedestrian Access Point

Conceptual Elevation: Looking South at the District Parking Lot from Washington Avenue

3: Conceptual Infill Development Along Washington Between Ontario and Oak



Conceptual Plan: Infill Development

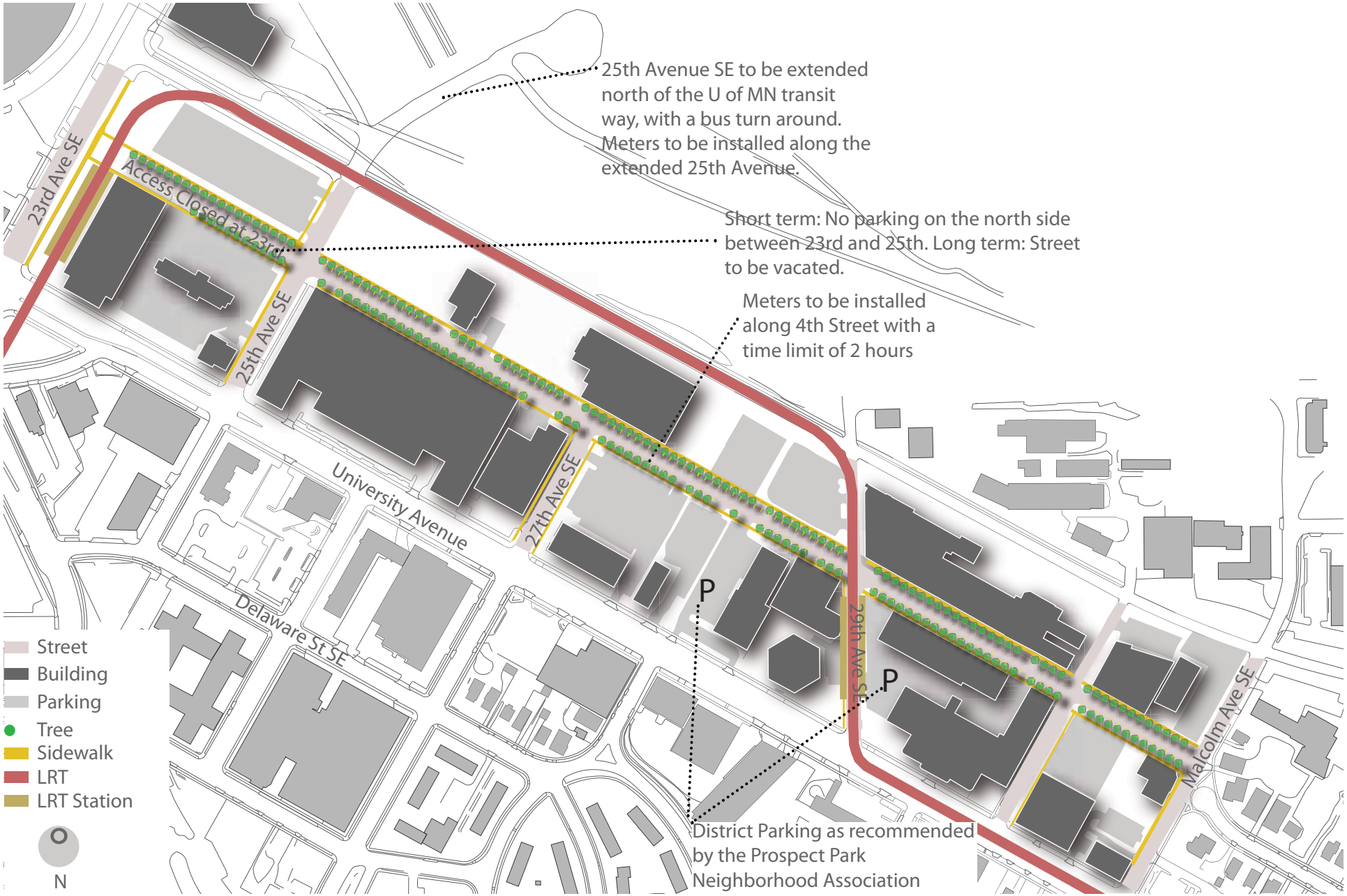
Aerial: Existing Conditions

Washington Avenue

Underground Parking Entrance

Conceptual Elevation: Looking West from Ontario at the Proposed Mixed Use Building

4. Conceptual Streetscape Enhancements along 4th Street

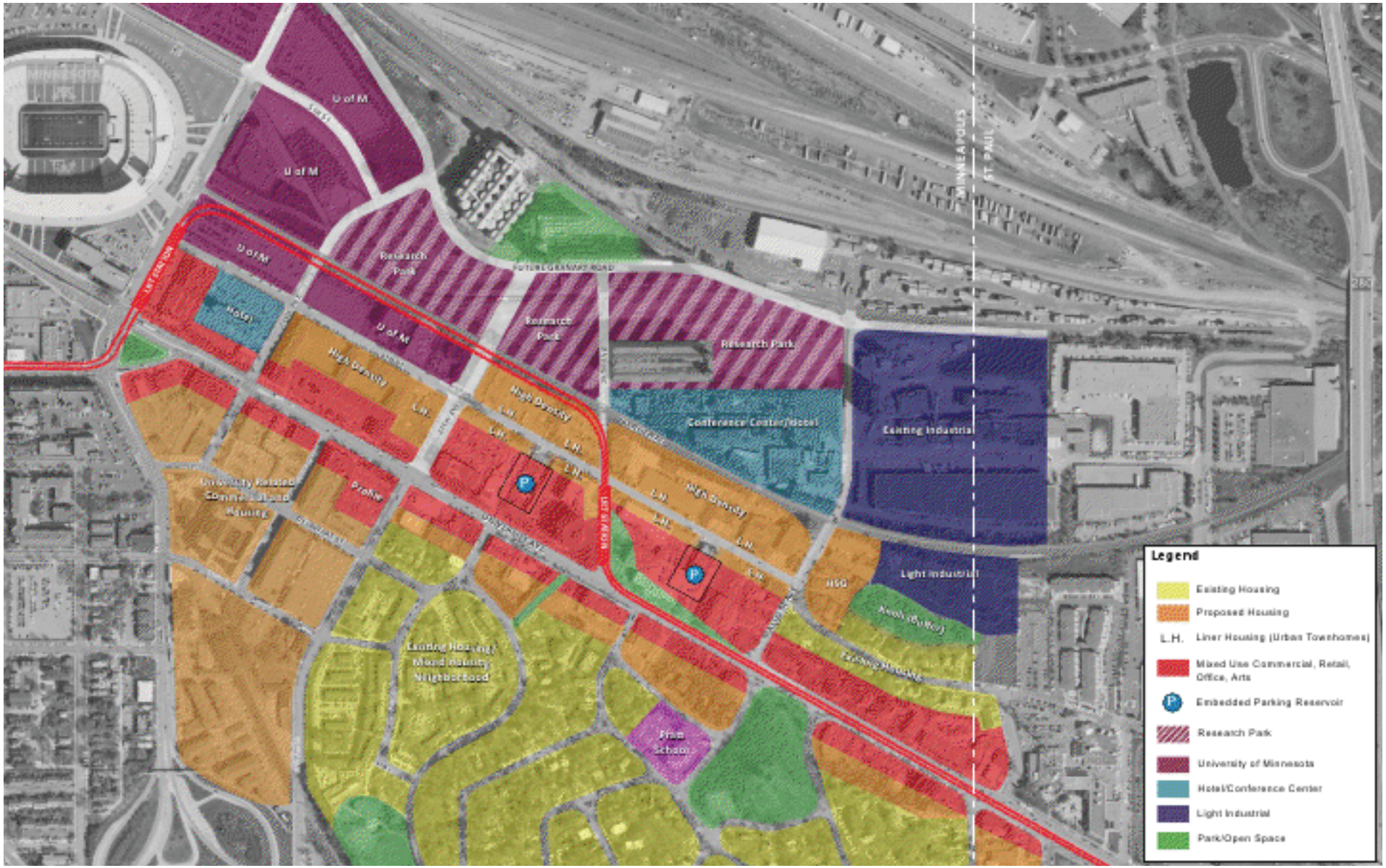


Existing Section: Looking West on 4th Street SE

Conceptual Section: Parallel Parking on the North sides of 4th Street SE Looking West.

Conceptual Section: Angle Parking on the South Side and Parallel Parking on the North Side. Looking West on 4th Street SE

Conceptual TOD with District Parking along University Avenue



Graphic Courtesy of SRF, ESG, and McComb Group. LTD. From the Prospect Park/ 29th Avenue LRT Station and University Gateway Areas Plan

Strategic Signage Installations

As mentioned, the LRT alignment will require motorists to accomplish left-turn and U-turn movements at signalized intersections. These turning movements will be prohibited at all other locations along the alignment. As a result, new travel patterns will be established in order to access parking lots and garages within the study area. As discussed in the previous report section, the installation of informational signage can assist motorists by indicating the safest and most convenient travel routes.

The following maps identify safe and convenient travel routes for traffic accessing University of Minnesota parking garages in study area Segments 1, 2, 3, and 4. The routes have been identified to direct motorists to the signalized intersections, which will be the only locations where left-turns and U-turns can be accomplished.

Strategic Placement of Signage To Direct Traffic in Segments 1 and 2

1: Exit here for public parking and access to Stadium Village businesses

2: Turn right for access to the Weisman Art Museum and Church Street Garages. Turn left for access to Washington Avenue businesses/ U of MN Hospitals, Washington Avenue Ramp, and the East River Road Garage

3: Turn right for access to the Church Street Garage

4: Turn left for access to the Church Street Garage

5: Turn right for access to the Church Street Garage

6: Turn left for access to the Washington Avenue Ramp

7: Turn left for access to the Oak Street Ramp, Gopher Lot and Washington Avenue Businesses

8: Turn right for access to the Gopher Lot

Strategic Placement of Signage To Direct Traffic to Available U of MN and Public Parking Facilities

Building
Other Parking
U of MN Parking Facility
Sign Location
Suggested Path

1: Turn here for public parking along 4th Street SE when approaching from the west

2: Turn here for public parking along 4th Street SE when approaching from the east

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7.0 Observations, Conclusions, and Final Recommendations

Observations on Existing Conditions:

Implementation of LRT in the Stadium Village study area will affect traffic circulation and on-street and off-street parking. As discussed in earlier sections of this report, traffic circulation will be impacted because of restrictions on left-turn and U-turn movements. These can currently be accomplished almost anywhere but will be limited to signalized intersection locations once LRT is implemented. In comparison to the current condition, implementation of LRT will lead to indirect travel patterns.

Previous sections of this report also stated that on-street parking will be affected more by LRT implementation than off-street parking. It was found that most of the on-street parking impacts will occur in Study Area Segments 2 and 4, two areas where on-street parking is needed to accommodate parking for commercial land uses.

The parking supply inventory and the parking utilization counts showed that:

- Segment 1 — No on-street parking is provided in Segment 1. Additionally, none of the off-street stalls in Segment 1 will be affected by LRT.
- Segment 2 — 113 on-street spaces will be lost in Segment 2. No off-street stalls will be lost in Segment 2.
- Segment 3 — Eight on-street spaces will be lost in Segment 3, and no off-street stalls will be lost.
- Segment 4 — 70 on-street spaces will be lost in Segment 4, and 52 off-street stalls will be lost.
- In total, 190 on-street (42 percent of 456 spaces) will be lost, and 52 off-street stalls (1 percent of 4,990 stalls) will be lost due to LRT implementation.
- The biggest and most significant losses in parking supply will be in Segments 2 and 4, two locations in the study area where commercial uses are located, and parking is needed to meet the highest levels of demand. On-street parking utilization in Segments 2 and 4 was found to be high, where typically 75 percent or more of the parking spaces were occupied.
- Segment 2, today with 135 on-street spaces will lose 113 spaces, a loss of 84 percent. Segment 4, today with 85 on-street spaces will lose 70 spaces; a loss of 82 percent.
- 266 on-street spaces will remain in the study area after LRT is implemented. Twenty-two on-street spaces will remain in Segment 2, and 15 on-street spaces will remain in Segment 4.

A comparison of non-event day and event day parking showed that the occupancy of on-street spaces was generally consistent, with very little change between non-event and event day utilization rates. The majority of event day parking takes place in University of Minnesota parking ramps near the event venues and in Dinkytown. This leads to the conclusion that on-street parking is not as significant a factor on event days as previously thought.

Further analysis showed that, based on current event-day occupancy rates, the existing non-University surface parking lots in study area Segments 2, 3, and 4 have a combined excess capacity of at least 690 stalls. This capacity would more than make up for the 190 on-street stalls that will be lost to LRT implementation. It is therefore a recommendation of this report that consideration should be given to allowing privately owned parking lots in Segments 2, 3, and 4 to engage in event day parking operations. Criteria could be established to determine which of the lots would be able to participate in the program. These might include:

- minimum lot sizes
- acceptable access driveway geometrics
- acceptable on-site circulation
- acceptable security measures to help ensure users' safety

Short-Term Parking Solutions for Segments 2 and 4

As described above and in Table 7, there will be losses of 266 on-street parking spaces and 52 off-street stalls due to LRT implementation, throughout the entire study area. More daunting is the fact that the majority of the losses (95 percent) will occur in Segments 2 and 4, which, as explained, are the two commercial areas. Within Segment 2, the area between Harvard and Huron Streets, the existing supply of 135 on-street spaces will be reduced to 22 spaces with LRT implementation.

Within Segment 4, which lies between 29th Avenue and Berry Street, 85 on-street spaces will be reduced to 15 spaces, and 819 off-street stalls will be reduced to 767 stalls. These data suggest that primary attention should be brought to ensuring that the on-street parking supply lost to LRT in Segments 2 and 4.

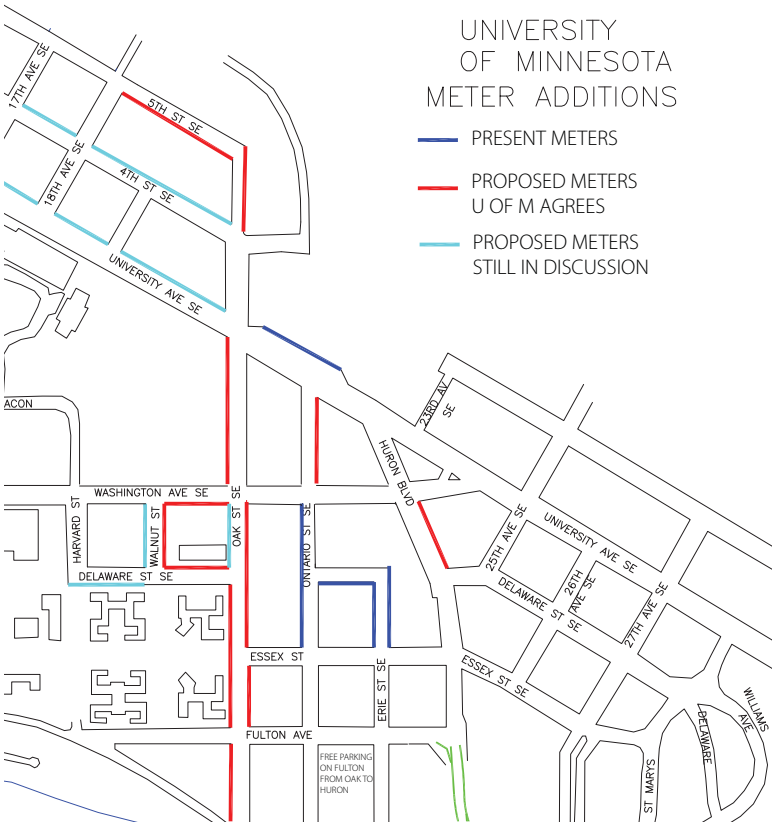
Segment 2:

Under a worst case condition, it is suspected that implementation of LRT in the short-term will not have a significant impact on travel patterns in the Stadium Village study area, and the current distribution across travel modes will change, but only slightly. It is hoped that the shift to transit modes will be significant in the short-term, but conservative planning requires a more cautious approach, as it is felt that time will need to pass before people can reorient their transportation choices and businesses can reorient their business models. This conservative approach would lead one to, at least, replace the on-street parking in Segment 2 that will be lost to LRT implementation; roughly 115 parking spaces.

Included in the short-term parking solutions in Chapter 5.0 of this report are the following:

- Enter into discussions with the University of Minnesota Office of Parking and Transportation Services to determine the feasibility of setting aside a block of parking stalls that would be reserved for use by the patrons of area businesses. Businesses might then validate their customers' parking tickets so that they can park at discounted rates in the Washington Avenue Ramp, for example.
- Install wayfinding signage to direct parkers to available "transient" stalls in the University's two ramps and other surface lots.
- Install changeable message boards to notify parkers of available parking stalls in the ramps.
- Enter into discussions with owners of existing parking facilities (e.g., Mercil's Auto Repair at the intersection of Washington Avenue/Walnut Street) to identify ways existing parking services might be modified to facilitate higher turnover and cooperative arrangements with adjacent businesses.
- Enter into discussions with the Radisson Hotel to determine the feasibility of using available stalls in the parking lot on the north side of the hotel when they are not being used by hotel employees and guests.
- Install parking meters to encourage turnover along strategic street segments. These locations are already being discussed by the City of Minneapolis and the University and are shown on the illustration.
  - Delaware Street, between Harvard and Walnut Streets,
  - Delaware Street, between Ontario and Erie Streets,
  - Walnut Street, between Washington Avenue and Delaware Street,
  - University Avenue, between 17th Avenue and Oak Street,
  - 4th Street, between 17th Avenue and Oak Street,
  - Ontario Street, between University Avenue and Essex Street, and
  - Erie Street, between Delaware and Essex Streets.

Combined, these solutions should address the 113 parking space reduction in Segment 2.



Source: City of Minneapolis Public Works Department

Segment 4:

The short-term solutions for Segment 4 include the following.

- Enforce City's ordinance on extended parking on 4th Street and tow violators.
- Improve unimproved segments of 4th Street with new curb, gutter, pavement, pedestrian scale lighting, and landscaping between 29th and Malcolm Avenue.
- Install meters along 4th Street between 29th and Malcolm Avenue.
- If metering along 4th Street in Segment 4 isn't approved, mark on-street stalls with consistent dimensions to maximize the number of available stalls.
- Allow parking along 29th, 30th and Malcolm Avenues, between University Avenue and 4th Street.
-
- Allow metered parking on east side of Malcolm between University Avenue and 5th Street (the temporary Transitway detour)
- Monitor impacts in Prospect Park. If problems become worse, establish a Critical Parking Area.
- Develop shared parking at Alliance Clinic (Fraser) lot and/or Spire lot.
- Permit development of a temporary surface lot at the Hubbard Broadcasting site, between the Transitway and 4th Street, for use by the Fraser Family Center.

Event Day Parking:

Event parking, as mentioned is largely accommodated in University of Minnesota parking ramps, and the level of parking utilization at on-street parking spaces was not observed to significantly change between non-event days and event days. If, however, it is learned that the reduction in on-street parking spaces leads more people to park in residential areas, two solutions are recommended. First, consider implementation of Critical Parking Areas. Two residential locations should consider CPA implementation; Prospect Park and Glendale Townhomes.

The second solution would require the city to allow event day parking to occur in privately owned parking lots. Today the Days Inn Hotel is permitted to charge event day parkers a fee to park. It is recommended that the city should allow others who own private parking lots in the study area to do the same.

Future Parking Demand in the Long-Term

Observations From Across the Nation:

Research was conducted to identify North American cities with higher education campuses that are served by LRT. In total 16 North American cities were found. Of these, four cities have "legacy" LRT systems that serve campuses; Boston, Philadelphia, New Orleans, and San Francisco.

The remaining 12 cities have "new generation" LRT systems that have recently been constructed with station stops in campus areas. The "new generation" systems are more like the LRT system that will be constructed in the Central Corridor. The cities and the campuses are identified in Table 11.

Table 11
North American "New Generation" LRT Systems Serving Campus Areas

City	Transit Operator	Campus
Canadian Systems		
Calgary	Calgary Transit	University of Calgary
Edmonton	Edmonton Transit System	University of Alberta
Toronto	Toronto Transit Commission	University of Toronto Ontario College of Art & Design
US Systems		
Baltimore	Mass Transportation Administration	University of Baltimore Maryland Institute College of Art
Dallas	Dallas Area Rapid Transit	Dallas County Community College
Denver	Regional Transit District	Community College of Denver Auraria University of Denver Health Sciences Center Metropolitan State College of Denver University of Colorado
Houston	Houston Metro	University of Houston Rice University
Portland	Tri Met	Portland State University
Sacramento	Regional Transit Authority	Sacramento City College
Saint Louis	Bi-State Development Agency	University of Missouri Saint Louis College of Pharmacy Washington University Medical School
Salt Lake City	Utah Transit Authority	University of Utah Salt Lake Community College Meadowbrook Campus
San Diego	Metropolitan Transit System	San Diego State University

Source: Biko Associates Inc. October, 2011

Nationwide Experiences with LRT on Campuses:

Research was conducted to identify North American cities with higher education campuses that are served by LRT. In total 16 North American cities were found. Of these, four cities have "legacy" LRT systems that serve the campuses; Boston, Philadelphia, New Orleans, and San Francisco.

The remaining 12 cities have "new generation" LRT systems that have recently been constructed with station stops in campus areas. The "new generation" systems are more like the LRT system that will be constructed in the Central Corridor. The cities and the campuses are identified in Table 9.

Each of the institutions of higher education listed in Table 9, except one, claimed that LRT's introduction has resulted in reduced automobile usage on campus. Sacramento City College, the only exception, claimed that auto usage has not been affected at any significant level and that student parking permits are being sold at the same pre-LRT rate. Four of the institutions commented that the reduced reliance on automobiles has resulted in significant decreases in revenues to support on-campus parking programs and that new strategies for recouping the losses are being considered.

Community College of Denver, which is located near the Denver Bronco's football stadium, reported that its parking facilities have historically been made available for fans on game days, and, as a result of LRT, revenues from game-day parking have been down by 20 percent. According to the director of Parking and Transportation Services, LRT has resulted in a five percent loss in average daily parking revenues.

All of institutions listed in Table 9 have programs, similar to the University of Minnesota's U-Pass Program, where students pay a fee that entitles them to unlimited rides on buses and LRT. The success of LRT in these campus environments is partially attributed to these programs.

San Diego State University reported that prior to the implementation of the Green Line, which has a station on the campus, only 425 students had voluntarily purchased transit passes. After the Green Line was implemented, that number climbed to over 4,000 passes, and on-campus parking lots, which had historically been full, had excess capacity. Most notable at San Diego State University is reduced parking demand when large athletic events are held.

Other factors contributing to the success of LRT on the campuses are:

- Convenience of not having to drive
- Avoidance of parking fees
- Proximity of LRT stations to important campus destinations

While six of the campuses share station stops with adjacent commercial/retail businesses, none of these is similar to Stadium Village, because on-street parking serving the businesses was not eliminated when the LRT alignment was constructed. Thus, both the campuses and the businesses have experienced overall positive impacts from LRT implementation.

Reduced Reliance on Autos in the Study Area:

According to the Final Environmental Impact Statement (FEIS) for the Central Corridor LRT project (Metropolitan Council, June 2009) by 2030 there will be 64,940 daily transit (bus and LRT) boardings in the Central Corridor. If LRT were not implemented in the Central Corridor there would be 55,790 daily transit (bus only) boardings in the corridor. This represents an increase of 9,150 daily transit boardings (plus 16 percent) in the Central Corridor with LRT implementation, and with a 1.2 auto occupancy (average number of people per auto in the Central Corridor), it is estimated that there will be 7,625 fewer autos each day in the Central Corridor as a result of increased reliance on transit.

Data taken from the FEIS show that in 2030 daily boardings at LRT stations in the Stadium Village study area will account for almost 24 percent of total daily LRT boardings in the Central Corridor. It is forecast that there will be 9,740 daily boardings at the four study area stations, compared to 41,690 daily boardings within the corridor. Although there isn't a strict one-to-one relationship, it can be estimated that approximately 24 percent of the reduced daily auto trips can be allocated to the study area. Thus, it is estimated that there will be 1,830 (0.24 x 7,625) fewer daily auto trips in the study area (and therefore, a concomitant reduction in daily parking demand).

2030 Forecast Reduction in Auto Usage in the Study Area:

According to the Final Environmental Impact Statement (FEIS) for the Central Corridor LRT project (Metropolitan Council, June 2009) by 2030 there will be 64,940 daily transit (bus and LRT) boardings in the Central Corridor. If LRT were not implemented in the Central Corridor there would be 55,790 daily transit (bus only) boardings in the corridor. This represents an increase of 9,150 daily transit boardings (plus 16 percent) in the Central Corridor with LRT implementation, and with a 1.2 auto occupancy (average number of people per auto in the Central Corridor), it is estimated that there will be 7,625 fewer autos each day in the Central Corridor as a result of increased reliance on transit.

Data taken from the FEIS show that in 2030 daily boardings at LRT stations in the Stadium Village study area will account for almost 24 percent of total daily LRT boardings in the Central Corridor. It is forecast that there will be 9,740 daily boardings at the four study area stations, compared to 41,690 daily boardings within the corridor. Although there isn't a strict one-to-one relationship, it can be estimated that approximately 24 percent of the reduced daily auto trips can be allocated to the study area. Thus, it is estimated that there will be 1,830 (0.24 x 7,625) fewer daily auto trips in the study area (and therefore, a concomitant reduction in daily parking demand).

It is estimated that the PM peak hour factor for the study area approaches 20 percent. Therefore there could be as many as 370 fewer cars on the campus during the late afternoon and early evening peak period. This can be directly translated into a lower demand for parking during this time of day.

Long-Term Parking Solutions

As described in Table 7, the study area's parking supply will be reduced by 191 on-street parking spaces and 52 off-street parking stalls after LRT is implemented, leaving 266 on-street spaces and 4,938 off-street stalls. .

With the forecast reduction in auto usage and planning guidance toward mixed-use redevelopment, it would appear that by 2030, parking will not be a major concern, when looking at the study area as a whole. There will, however, continue to be automobile use within the study area, and accommodations will need to be assured for parking. Therefore, the following long-term parking solutions were developed.

- Install permanent signage directing motorists traveling eastbound on University Avenue to University of Minnesota parking facilities (ERRG, AMG, CSG, WAR, and OSG).
- As the south side of Washington Avenue, between Harvard and Walnut Streets, is redeveloped, integrate off-street parking with the redevelopment. This parking could be constructed as a deck over the Mercil's lot, assuming it has become a district parking lot as suggested in the short-term solutions. It could also be configured as underground parking beneath the redevelopment and surface parking behind a liner of ground-level commercial uses.
- Acquire underutilized uses for redevelopment and develop surface parking lots, parking ramps, or underground parking garages that would be associated with a block's redevelopment. Redevelopments should provide parking on-site for all uses, including commercial/retail and residential. The parking ratio used to calculate the required number of on-site stalls can be adjusted down to account for the area's strong future reliance on transit modes.
- Consistent with mixed-use TOD redevelopment in Segment 4, develop centralized district parking facilities that are integrated within the TOD. The physical design/layout of the integrated parking facilities should permit all uses in the redevelopment convenient, efficient, and safe access.
- Allow metered parking on east side of Arthur Avenue between Sidney and University
- Allow metered parking on 27th Avenue between University Avenue and 4th Street.

Conclusion

It is necessary to note that the recommendations in this report will not "cure" parking problems in the Stadium Village/University Avenue area. But rather the recommendations are tools to be utilized in conjunction with transit improvements, station area redevelopment, and transit incentives in order to reduce the demand for parking within the area. There are a variety of positive outcomes that can result from the implementation of the recommendations in this report. Under proper management, residents, businesses and visitors to the area will positively impact the sustainability, desirability, and usability of the area.