REQUEST FOR COUNCIL ACTION

Date:February 23, 2015
Item No.: 11.a

Department Approval	City Manager Approval

Item Description: Twin Lakes Area Traffic Study Update

BACKGROUND

In 2001, the Roseville City Council approved the Twin Lakes Business Park Alternative Urban Areawide Review (AUAR) and further updated the AUAR in 2007 as required by law. As part of the update to that document, a detailed traffic study of the Twin Lakes Area was conducted to provide insight into what the required transportation improvements would be in order to support the proposed levels of development.

Since then, the City has had some development occur in the area and upgraded the area transportation system in spots in accordance with the recommendations of the original and updated AUAR. Also, improvements to the overall regional system have occurred which were not modeled in the 2007 AUAR Update traffic study.

Recognizing the need to continue to provide improvements to the area transportation system to support pending development, in December of 2014, staff had asked the City Council to approve a design contract for the final phase of Twin Lakes Parkway from Prior Avenue to Fairview Avenue. Council considered the recommendation and took public comment on the subject.

At that meeting, and at subsequent public and neighborhood meetings related to the zoning and land use guidelines for the Twin Lakes Area, residents of Roseville, particularly those in the residential neighborhood north of Terrace Avenue, expressed concern over the impacts of traffic from the proposed development and most directly from the connection of Twin Lakes Parkway to Fairview Avenue. Recognizing that the traffic studies that were being referenced by staff to support the connection were at least seven years old, the City Council directed staff to update the 2007 Twin Lakes Area traffic study.

Over the last two months, staff has been working with SRF Consulting Group to collect updated traffic counts and to analyze the proposed developments and the connection of Twin Lakes Parkway to Fairview Avenue. The updated traffic study is attached.

Craig Vaughn from SRF Consulting Group will be presenting a summary of the traffic study to the City Council at this meeting.

POLICY OBJECTIVE

The recommendations outlined in the Twin Lakes Area Traffic Study are consistent with the Twin Lakes Area AUAR and the City's Transportation Plan, which is a component of the City's approved Comprehensive Plan.

FINANCIAL IMPACTS

There are no financial impacts directly related to the presentation tonight. Executing any of the recommended improvements of the overall transportation system would require additional discussion and direction at which time funding would be recommended and approved.

STAFF RECOMMENDATION

Staff recommends the Council receive the presentation from SRF Consulting Group summarizing the Twin Lakes Area Traffic Study.

REQUESTED COUNCIL ACTION

Receive the presentation from SRF Consulting Group summarizing the Twin Lakes Area Traffic Study.

Prepared by: Marc Culver, City Engineer
Attachments: A: Twin Lakes Area Traffic Study

SRF Consulting Group, Inc. | Engineers Planners Designers

Memorandum

SRF No. 0148737

To: Marc Culver, PE
Assistant Public Works Director/City Engineer
City of Roseville

From: Craig Vaughn, PE, PTOE, Principal
Emily Gross, Engineer

Date: February 12, 2015

Subject: Twin Lakes Redevelopment Area Traffic Study Update

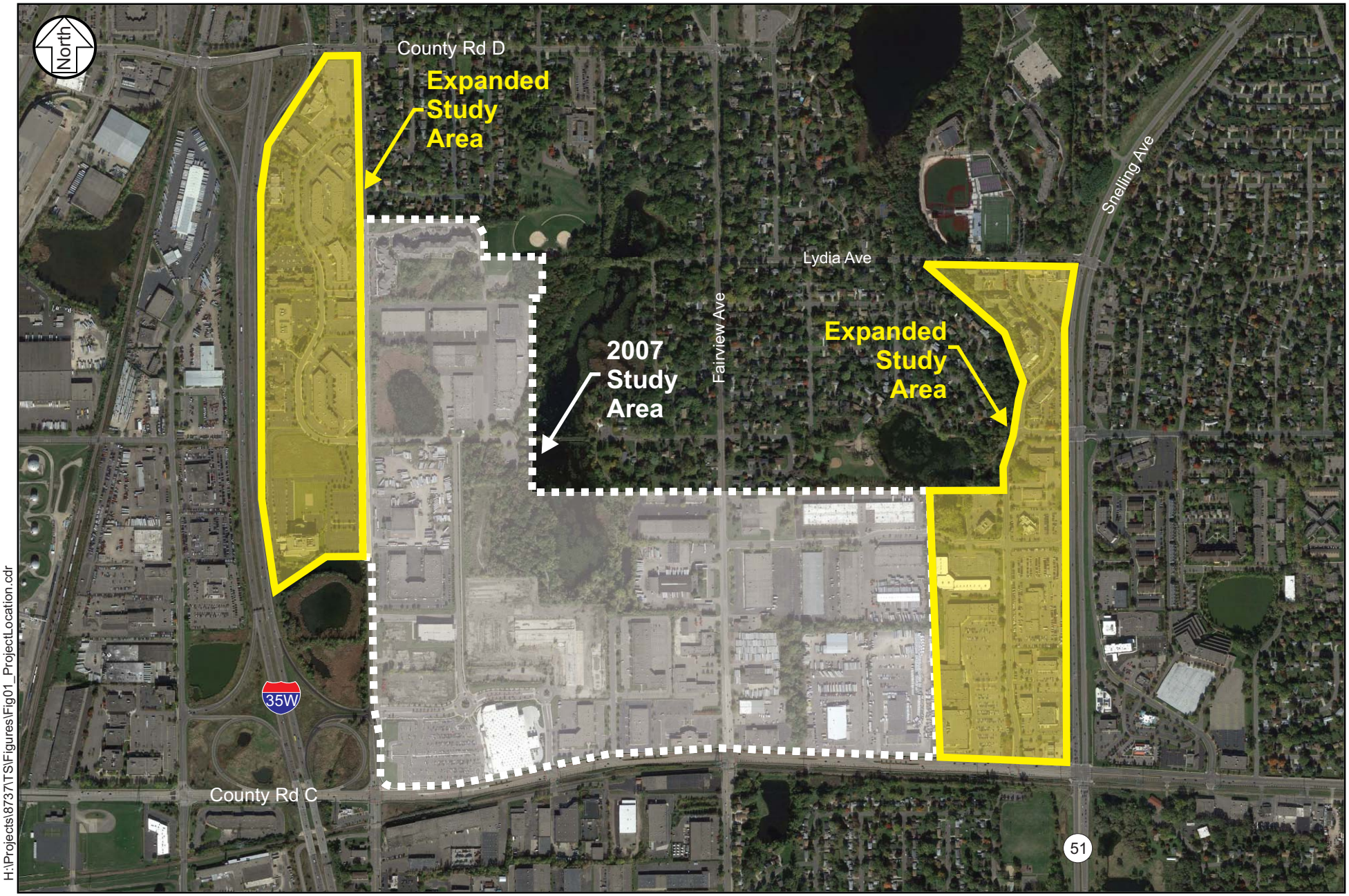
Introduction

As requested, SRF has completed an updated traffic operations analysis for the Twin Lakes Redevelopment area. This essentially updates the traffic analysis section of the *Twin Lakes Alternative Urban Areawide Review (AUAR) Update Technical Memorandum Traffic, Air and Noise Analysis,* dated July 3, 2007. The current analysis expands the study area to include the parcels west of Cleveland Avenue between County Road C and County Road D, as well as the parcels adjacent to Lincoln Drive between County Road C and Lydia Avenue. This expanded study area is shown in Figure 1; it is generally bounded by Snelling Avenue, Cleveland Avenue, County Road D, and County Road C in the City of Roseville.

To understand the impacts to the study area with the extension of the Twin Lakes Parkway to Fairview Avenue, the following three scenarios were reviewed under future conditions:

- *Scenario 1* – No build roadway condition with background traffic growth added
  - Twin Lakes Parkway ***not*** extended to Fairview Avenue, background traffic growth, and no additional development in the Twin Lakes area except currently planned land uses.
- *Scenario 2* – No build roadway condition with background traffic growth added and full build land use potential included
  - Twin Lakes Parkway ***not*** extended to Fairview Avenue, background traffic growth, and full build land use scenario for Twin Lakes area.
- *Scenario 3* –Build roadway condition with background traffic growth and full build land use potential included
  - Twin Lakes Parkway extended to Fairview Avenue, background traffic growth, and full build land use scenario for Twin Lakes area.

The main objectives of this study are to update the Twin Lakes area land use assumptions, traffic forecasts, and traffic operations, as well as quantify the impact of the Twin Lakes Parkway extension to Fairview Avenue. The following information provides the assumptions, analysis, and study recommendations offered for consideration.



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SRF Consulting Group, Inc.

Project Location

Twin Lakes Area Update
City of Roseville

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February 2015

Figure 1

Existing Conditions

The existing conditions were reviewed to establish a baseline to compare future conditions. The evaluation of existing conditions includes peak hour intersection turning movement counts, field observations, and an intersection capacity analysis.

Data Collection

Recently collected weekday p.m. peak period turning movement counts were reviewed at the following study intersections:

- County Road C and Cleveland Avenue
- County Road C and Prior Avenue
- County Road C and Fairview Avenue
- County Road C and Lincoln Drive
- County Road C and Snelling Avenue
- Twin Lakes Parkway and Mount Ridge Road
- Cleveland Avenue and NB I-35W Ramps/Twin Lakes Parkway
- Fairview Avenue and Terrace Drive
- Snelling Avenue and County Road C2
- Snelling Avenue and Lydia Avenue

Weekday p.m. peak period turning movement were collected by SRF on Thursday, January 22, 2015 at the remaining study intersections:

- Cleveland Avenue and Iona Lane
- Cleveland Avenue and County Road C2
- County Road D and NB I-35W Ramps
- County Road D and Cleveland Avenue
- County Road D and Fairview Avenue/New Brighton Road
- Fairview Avenue and Lydia Avenue

Observations

Field observations were completed to identify roadway characteristics within the study area (i.e. roadway geometry, posted speed limits, and traffic controls).

- **Cleveland Avenue** is primarily a four-lane undivided roadway with a posted speed limit of 40 miles per hour (mph).
- **Fairview Avenue** is a four-lane undivided roadway south of County Road C2 and a two-lane undivided roadway north of County Road C2 with a posted speed limit of 40 mph.

- **Snelling Avenue** is a four-lane divided roadway with a posted speed limit of 50 mph.
- **County Road C** is a four-lane divided roadway with a posted speed limit of 45 mph.
- **County Road D** is four-lane undivided roadway west of Wilder Street and a two-lane undivided roadway east of Wilder Street with a posted speed limit of 35 mph.
- **Twin Lakes Parkway**, which currently extends from Cleveland Avenue to Prior Avenue, is a two-lane divided roadway with a posted speed limit of 30 mph.
- The remaining study roadways are two-lane undivided roadways with a 30 mph speed limit.

Currently, all of the study intersections are controlled by traffic signals, with the exception of the following:

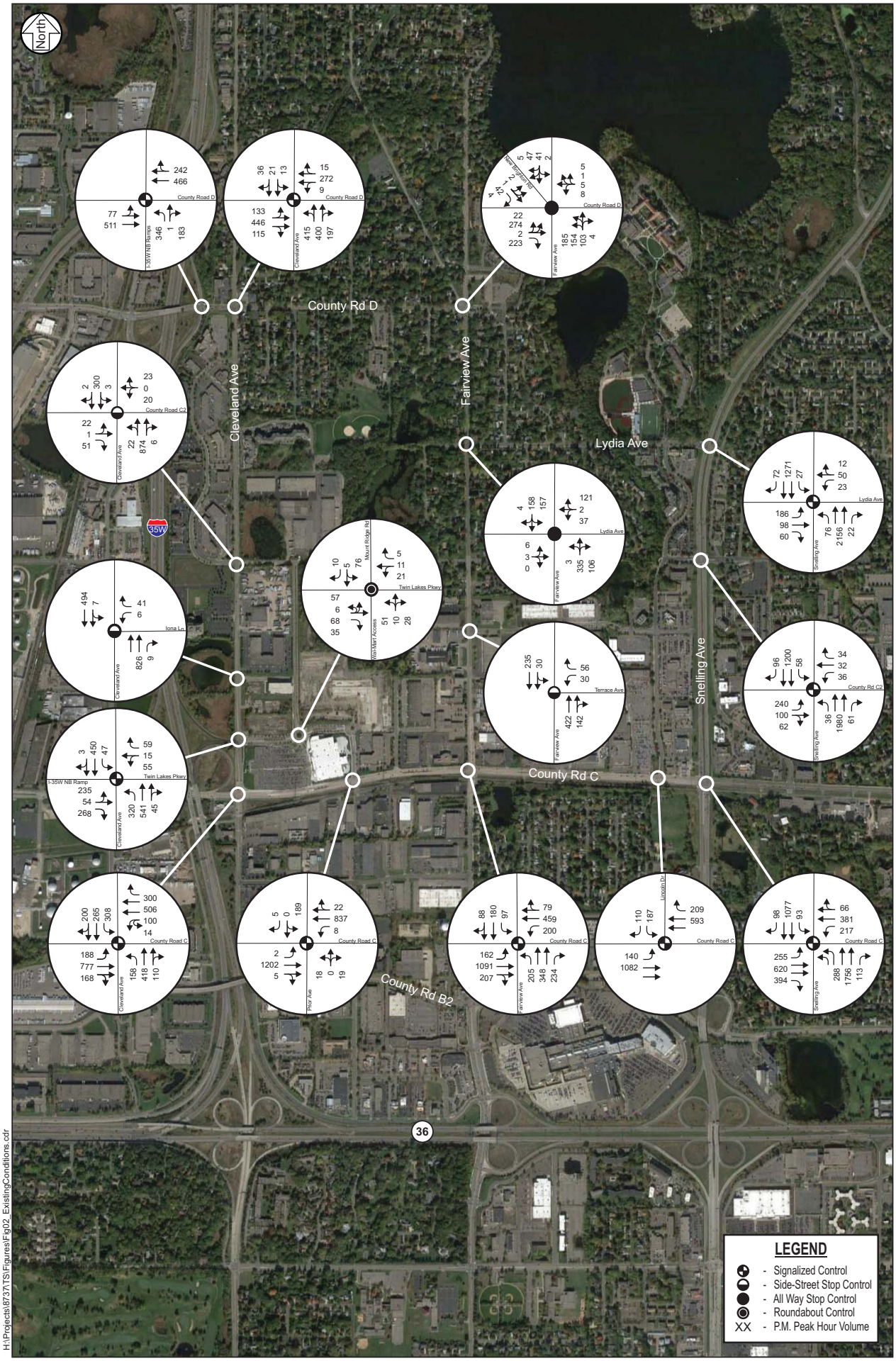
- Cleveland Avenue/Iona Lane, Cleveland Avenue/County Road C2, and Fairview Avenue/ Terrace Avenue are unsignalized with side-street stop control
- Fairview Avenue/Lydia Avenue and County Road D/Fairview Avenue/New Brighton Road intersections are unsignalized with all-way stop control
- Twin Lakes Parkway/Mount Ridge Road intersection is a single-lane roundabout

Existing geometrics, traffic controls, and volumes within the study area are shown in Figure 2.

Traffic Volume Comparison

The current study is the first comprehensive review of traffic operations and traffic volumes in the Twin Lakes area since the 2007 AUAR. There have been changes to the land use and regional transportation system that have affected traffic volumes within the study area. The following summarizes the pattern shifts observed when comparing the recently collected p.m. peak hour volumes with the year 2006 volumes reported in the 2007 AUAR:

- Traffic volumes and travel patterns have changed over the past eight years.
  - P.M. peak hour volumes along County Road D (between I-35W and Fairview Avenue) and along Fairview Avenue (between County Road D and Terrace Drive) have decreased approximately 10 to 15 percent.
  - P.M. peak hour volumes along County Road C have increased approximately 15 percent near Cleveland Avenue, 50 percent near Fairview Avenue, and 30 percent west of Snelling Avenue.
  - Eastbound approach volumes at the Cleveland Avenue and NB I-35W Ramps/Twin Lakes Parkway intersection have decreased 30 percent during the p.m. peak hour.



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Existing Conditions P.M. Peak Hour

Twin Lakes Area Update
City of Roseville

Figure 2

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February 2015

Intersection Capacity Analysis

An operations analysis was conducted to determine how traffic will operate at the study intersections under existing conditions. All intersections were analyzed using Synchro/SimTraffic software and the Highway Capacity Manual (HCM). Intersection operations analysis results identify a Level of Service (LOS) which indicates how well an intersection is operating. Intersections are ranked from LOS A through LOS F. The LOS results are based on average delay per vehicle, which correspond to the delay threshold values shown in Table 1. LOS A indicates the best traffic operation and LOS F indicates an intersection where demand exceeds capacity. Overall intersection LOS A through D is considered to be acceptable traffic flow conditions based on MnDOT guidelines.

Table 1. Level of Service Criteria for Signalized and Unsignalized Intersections

LOS Designation	Signalized Intersection Average Delay/Vehicle (seconds)	Unsignalized Intersection Average Delay/Vehicle (seconds)
A	≤ 10	≤ 10
B	> 10 - 20	> 10 – 15
C	> 20 - 35	> 15 – 25
D	> 35 - 55	> 25 – 35
E	> 55 - 80	> 35 – 50
F	> 80	> 50

For side-street stop controlled intersections, special emphasis is given to providing an estimate for the level of service of the minor approaches. Traffic operations at an unsignalized intersection with side-street stop control can be described in two ways. First, consideration is given to the overall intersection level of service. This takes into account the total number of vehicles entering the intersection and the capability of the intersection to support these volumes.

Second, it is important to consider the delay on the minor approach. Since the mainline does not have to stop, the majority of delay is attributed to the minor approaches. It is typical of intersections with higher mainline traffic volumes to experience increased levels of delay (i.e. poor levels of service) on the side-street approaches, but an acceptable overall intersection level of service during peak hour conditions.

Results of the existing operations analysis shown in Table 2 indicate that all study intersections currently operate at an acceptable overall LOS D or better during the p.m. peak hour with the existing geometric layout and traffic control, except along County Road C at the Lincoln Drive and Snelling Avenue intersections, which operate at LOS F.

Table 2. Existing P.M. Peak Hour Operations Analysis

Intersection	Level of Service
County Road C and Cleveland Avenue	C
County Road C and Prior Avenue	B
County Road C and Fairview Avenue	C
County Road C and Lincoln Drive	F
County Road C and Snelling Avenue	F
County Road D and NB I-35W Ramps	B
County Road D and Cleveland Avenue	C
County Road D and Fairview Avenue/New Brighton Road (2)	C
Twin Lakes Parkway and Mount Ridge Road (3)	A
Cleveland Avenue and NB I-35W Ramps/Twin Lakes Parkway	C
Cleveland Avenue and Iona Lane (1)	A/A
Cleveland Avenue and County Road C2 (1)	A/B
Fairview Avenue and Terrace Drive (1)	A/A
Fairview Avenue and Lydia Avenue (2)	B
Snelling Avenue and County Road C2	D
Snelling Avenue and Lydia Avenue	C

(1) Indicates an unsignalized intersection with side-street stop control where the overall LOS is shown followed by the worst approach LOS.

(2) Indicates an unsignalized intersection with all-way stop control.

(3) Indicates an unsignalized intersection with roundabout control.

The operational issues at the County Road C/Lincoln Drive intersection are a result of poor operations and significant eastbound queues at the County Road C/Snelling Avenue intersection. To mitigate this situation, modifications are necessary to the at-grade intersections along Snelling Avenue or additional capacity is needed along the Snelling Avenue corridor. For purposes of this analysis an additional lane in each direction is assumed under future conditions (six-lane Snelling Avenue facility).

Year 2030 Forecasts

Trip Generation

SRF worked with City staff to identify redevelopment opportunities in the study area. Parcels, which were not expected to redevelop or change in land use by the year 2030 were identified and are shown in Figure 3. The remaining parcels are expected to redevelop. City staff provided the appropriate land assumptions to use for the developable parcels to create a realistic land use plan. These land use assumptions are relatively consistent with Land Use Scenario C from the *Twin Lakes Alternative Urban Areawide Review (AUAR) Update Technical Memorandum Traffic, Air and Noise Analysis,* dated July 3, 2007.

While not yet approved or constructed, the City has received the following development proposal plans in the study area, which represent the known "planned" land uses for the study area:

- Mixed-used development at 2700 and 2750 Cleveland Avenue (Block 3)
  - 18,500 square foot grocery store, 14,000 square feet of retail space, and 205 hotel rooms
- Residential development at 2785 Fairview Avenue (Block 5)
  - 190 apartment units and 6,000 square feet of office/retail space

Trip generation estimates for both the current and future land uses were developed for the p.m. peak hour and on a daily basis using the *ITE Trip Generation Manual, 9th Edition*. Tables 3, 4 and 5 display a summary of the land use and trip generation estimates for each individual block and subarea as shown in Figure 3. The known planned land uses identified above are highlighted in red in the tables below. It should be noted that since p.m. peak hour driveway counts were not available for all of the current developments within the study area, this study assumes that the existing land uses generate at the ITE average rate.

Table 3. Trip Generation Estimate –Subarea I (Center)

Block	Land Use Type *(ITE Code)*	Existing				Year 2030 Land Use Plan			
		Size	P.M. In	P.M. Out	Daily	Size	P.M. In	P.M. Out	Daily
1A	Light Industrial *(110)*	48,485 SF	6	41	338	-	-	-	-
	General Office Building *(710)*	-	-	-	-	150,000 SF	38	186	1,655
1B	Apartment *(220)*	-	-	-	-	70 DU	28	15	466
	General Office Building *(710)*	-	-	-	-	150,000 SF	38	186	1,655
2	Apartment *(220)*	-	-	-	-	45 DU	18	10	299
	General Office Building (710)	-	-	-	-	295,000 SF	75	365	3,254
3A	Park-and-Ride *(90)*	460 spaces	71	214	2,070	460 spaces	71	214	2,070
	Hotel (310)	-	-	-	-	205 rooms	63	60	1675
3B	Shopping Center (820)	-	-	-	-	14,000 SF	25	27	598
	Supermarket (850)	-	-	-	-	18,500 SF	89	86	1891
4	Free Standing Discount Store *(813)*	160,000 SF	341	355	8,120	160,000 SF	341	355	8,120
	High-Turnover Restaurant (932)	-	-	-	-	13,200 SF	78	52	1678
5	Light Industrial *(110)*	43,220	5	37	301	-	-	-	-
	Apartment (220)	-	-	-	-	190 DU	77	41	1264
	Shopping Center (820)	-	-	-	-	6,000 SF	11	12	256
8	Light Industrial *(110)*	98,710 SF	14	92	769	-	-	-	-
	Townhomes (230)	-	-	-	-	10 DU	3	2	58
13	Light Industrial *(110)*	101,145 SF	23	9+	705	101,145 SF	23	9+	705
14	Light Industrial *(110)*	47,515 SF	6	41	331	47,515 SF	6	41	331
15	Light Industrial *(110)*	35,605 SF	4	30	248	35,605 SF	4	30	248
16	Medical Office Building *(720)*	45,365 SF	45	117	1,639	45,365 SF	45	117	1,639
17A	Light Industrial *(110)*	27,690 SF	3	24	193	27,690 SF	3	24	193
17B	General Office Building *(710)*	31,445 SF	8	39	347	31,445 SF	8	39	347
18	Light Industrial *(110)*	74,445 SF	9	64	519	74,445 SF	9	64	519
Center Subtotal			**535**	**1,054**	**15,580**		**1,053**	**1,926**	**28,921**

Note: Red text represents known planned developments

Table 4. Trip Generation Estimate –Subarea II (East)

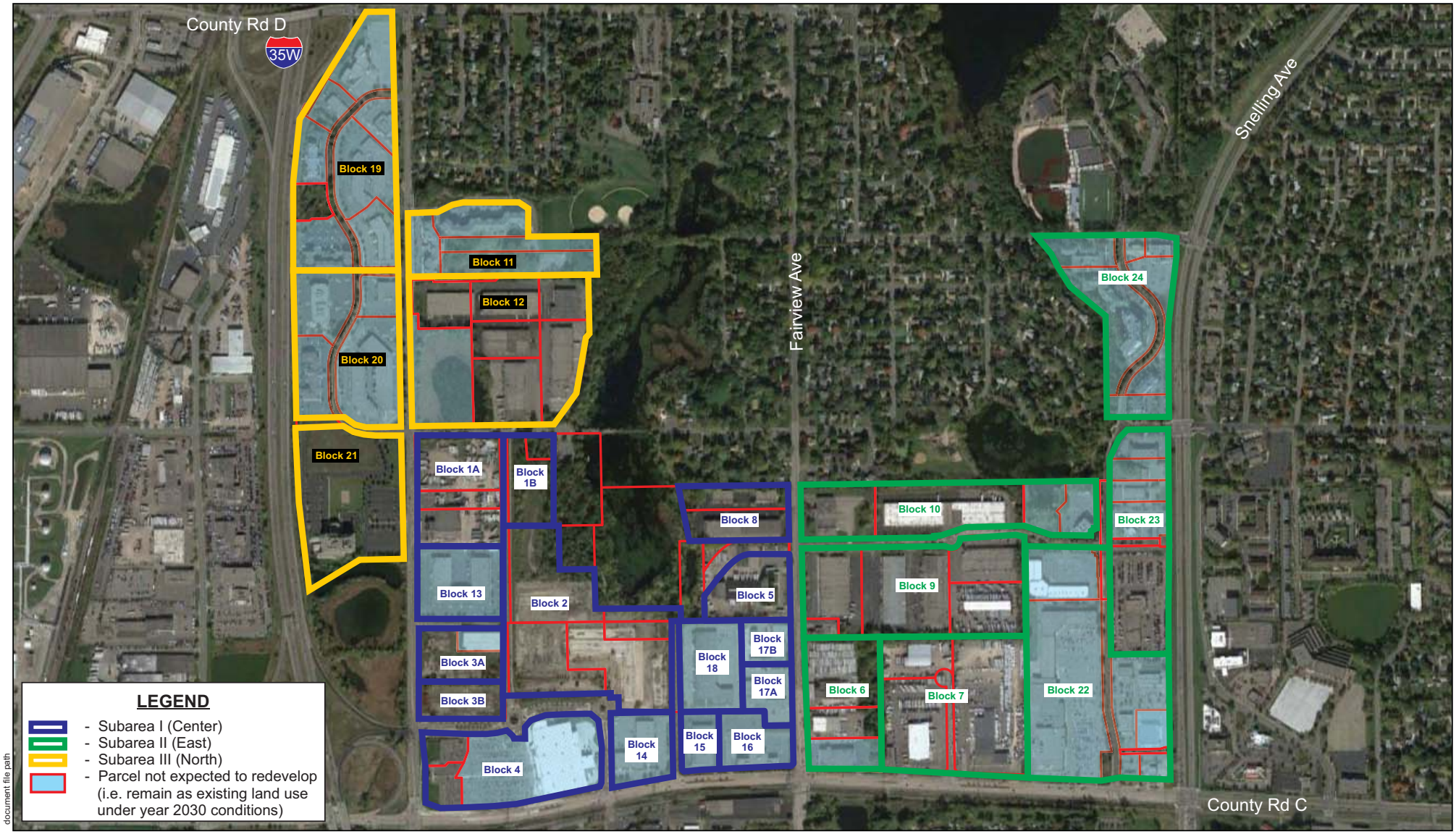
Block	Land Use Type *(ITE Code)*	Existing				Year 2030 Land Use Plan			
		Size	P.M. In	P.M. Out	Daily	Size	P.M. In	P.M. Out	Daily
6	Shopping Center *(820)*	29,670 SF	53	57	1,267	29,670 SF	53	57	1,267
	General Office Building (710)	-	-	-	-	100,000 SF	25	124	1,103
7	Light Industrial (110)	165,160 SF	19	141	1,151	-	-	-	-
	Shopping Center *(820)*	-	-	-	-	190,000 SF	341	355	8,120
	Fast-Food w/o Drive-Thru *(933)*	-	-	-	-	3,500 SF	47	45	2,506
	Gas Station *(945)*	-	-	-	-	8 FSP	54	54	1,302
9	Light Industrial *(110)*	293,695 SF	34	251	2,047	-	-	-	-
	General Office Building (710)	-	-	-	-	310,000 SF	79	383	3,419
10	Light Industrial *(110)*	160,700 SF	19	137	1,120	-	-	-	-
	Apartment (220)	-	-	-	-	115 DU	46	25	765
	General Office Building *(710)*	21,785 SF	6	27	240	21,786 SF	6	27	240
22	Shopping Center *(820)*	255,975 SF	456	494	10,930	255,976 SF	456	494	10,930
	Gas Station *(945)*	8 FPS	54	54	1,302	8 FPS	54	54	1,302
23	Medical Office Building *(720)*	9,875 SF	10	25	357	9,876 SF	10	25	357
	Shopping Center *(820)*	15,670 SF	28	30	669	90,670 SF	161	175	3872
	Auto Sales *(841)*	35,010 SF	37	55	1,131	-	-	-	-
	High-Turnover Restaurant *(932)*	16,025 SF	95	63	2,038	16,025 SF	95	63	2,038
24	Apartment *(220)*	275 DU	111	60	1,829	275 DU	111	60	1,829
	Hotel *(310)*	95 rooms	29	28	776	95 rooms	29	28	776
	General Office Building *(710)*	30,210 SF	8	37	333	30,210 SF	8	37	333
		East Subtotal	**959**	**1,459**	**25,190**		**1,575**	**2,006**	**40,159**

Note: Red text represents known planned developments

Table 5. Trip Generation Estimate –Subarea III (North)

Block	Land Use Type *(ITE Code)*	Existing				Year 2030 Land Use Plan			
		Size	P.M. In	P.M. Out	Daily	Size	P.M. In	P.M. Out	Daily
11	Apartment *(220)*	129 DU	52	28	858	129 DU	52	28	858
12	Light Industrial *(110)*	314,300 SF	37	268	2,191				
	Apartment (220)	-	-	-	-	130 DU	52	28	865
	General Office Building (710)	-	-	-	-	285,000 SF	72	352	3144
19	General Office Building *(710)*	162,995 SF	41	202	1,798	184,235 SF	47	228	2032
	Hotel *(310)*	245 rooms *	75	72	2,002	245 rooms *	75	72	2,002
20	General Office Building *(710)*	62,305 SF	16	77	687	62,305 SF	16	77	687
	Hotel *(310)*	135 rooms	41	40	1,103	135 rooms	41	40	1,103
	Light Industrial *(110)*	117,045 SF	14	100	816	117,045 SF	14	100	816
21	General Office Building *(710)*	166,980 SF	42	207	1842	288,980 SF	73	357	3187
		North Subtotal	**318**	**994**	**11,297**		**442**	**1,282**	**14,694**

* The number of rooms for the hotels in Block 19 were estimated based on building square foot information.



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SRF Consulting Group, Inc.

Twin Lakes Boundary Map

Arden Hills Residential Development Traffic Study

City of

00045162
September 2004

Figure 3

A summary of the existing and year 2030 trip generation estimates for each subarea is provided in Table 6. Assuming that the existing land uses generate at the average ITE trip rate, an additional 2,965 p.m. peak hour and 31,707 daily trips will be generated in the Twin Lakes Study Area under year 2030 full build conditions. Again, this takes into account the larger study area than what was previously reviewed in the 2007 AUAR.

Table 6. Trip Generation Estimate Summary

Subarea	Existing			Year 2030			Delta		
	P.M. In	P.M. Out	Daily	P.M. In	P.M. Out	Daily	P.M. In	P.M. Out	Daily
I	535	1,054	15,580	1,053	1,926	28,921	518	872	13,341
II	959	1,459	25,190	1575	2,006	40,159	616	547	14,969
III	318	994	11,297	442	1,282	14,694	124	288	3,397
Total	1,812	3,507	52,067	3,070	5,214	83,774	1,258	1,707	31,707

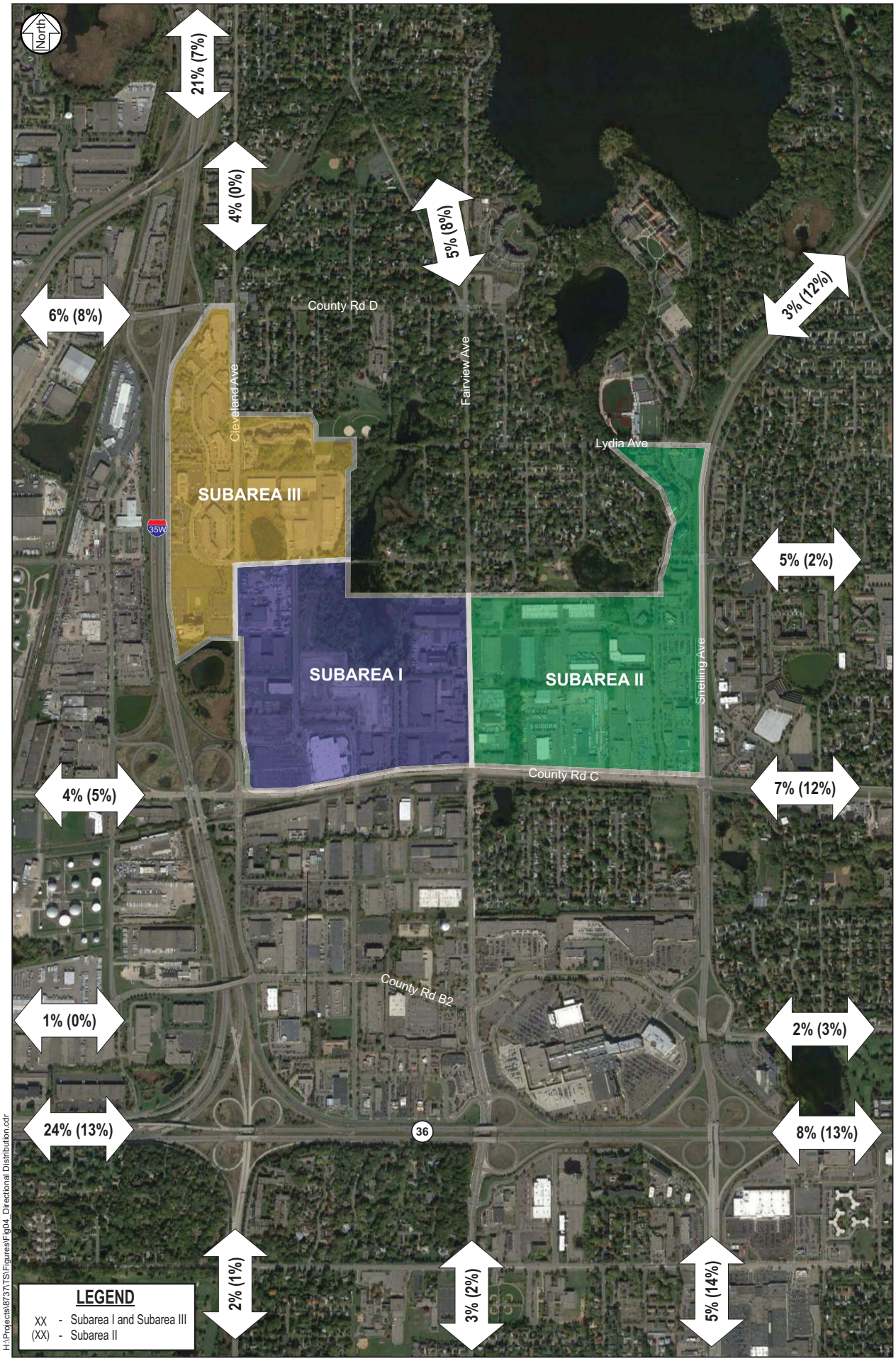
Regional Model

The Metropolitan Council regional travel demand model was refined to include the updated year 2030 land use information. The model was used to develop average daily traffic (ADT) volumes for the greater adjacent roadway network, directional distribution for the p.m. peak hour trip generation estimates, and to estimate the potential for a subregional travel pattern shift with the extension of Twin Lakes Parkway to Fairview Avenue (i.e. non-Twin Lakes area development trips diverting to Twin Lakes Parkway).

The following assumption changes are reflected in the travel demand model since the analysis completed in year 2007:

- I-35W Managed Lanes (dynamic toll lanes)
- Improvements to I-694/Snelling Avenue interchange area
- Recent background traffic volume changes
- Updated land use in Twin Lakes Study Area
- Refined development access assumptions in the Twin Lakes Study Area

The travel demand model was used to determine the origin/destination (i.e. directional distribution) of the trips entering/exiting the study area. Directional distribution percentages shown in Figure 4 were developed separately for Subarea I/Subarea III (west of Fairview Avenue) and Subarea II (east of Fairview Avenue). This is different from the 2007 AUAR, which applied the same directional distribution to the entire study area. The two directional distributions help to identify route patterns for the development trips. For example, vehicles traveling to/from the north are more likely to use I-35W for Subarea I/III and Snelling Avenue for Subarea II. This review also helped to estimate the percentage of vehicles that are expected to utilize more than one land use within the study area. To account for this a 15 percent multi-use reduction was applied to the trip generation estimates.



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Directional Distribution

Twin Lakes Area Update

City of Roseville

Figure 4

0158737

February 2015

A background growth rate of one-half percent was applied to the existing peak hour turning movement counts to develop year 2030 background traffic forecasts. This is consistent with recent studies completed in the area and the travel demand model forecasts

Year 2030 Scenarios

As previously mentioned, to understand the impacts to traffic volumes to the study area with the extension of the Twin Lakes Parkway from Prior Avenue to Fairview Avenue, traffic forecasts were developed for year 2030 conditions for the following three scenarios (shown in Figure 5):

- *Scenario 1* – No build roadway condition with background traffic growth added
  - Twin Lakes Parkway ***not*** extended to Fairview Avenue, background traffic growth, and no additional development in the Twin Lakes Area except currently planned land uses.
- *Scenario 2* – No build roadway condition with background traffic growth added and full build land use potential included
  - Twin Lakes Parkway ***not*** extended to Fairview Avenue, background traffic growth, and full build land use scenario for Twin Lakes Area.
- *Scenario 3* –Build roadway condition with background traffic growth and full build land use potential included
  - Twin Lakes Parkway extended to Fairview Avenue, background traffic growth, and full build land use scenario for Twin Lakes Area.

Year 2030 Conditions

Planned Roadway Improvements

Intersection improvements are planned at the Cleveland Avenue and NB I-35W Ramps/Twin Lakes Parkway intersection and are expected to be completed in the near future. The improvements include the following:

- Restriping the westbound approach of Twin Lakes Parkway to include a left-, through, and shared through/right-turn lane
- Modifying the eastbound approach to include a left-, two through and a right-turn lane.
- Modifying the northbound approach to include a second left-turn lane and a right-turn lane.
- Extending the southbound left-turn lane.

The City is also considering the extension of Twin Lakes Parkway to Fairview Avenue (analyzed under Scenario 3). This connection will provide access to current and future development in the Twin Lakes area, as well as an alternative route choice for motorists currently traveling through the Twin Lakes area. As part of the Twin Lakes Parkway extension, a traffic signal will be installed at the Fairview Avenue/Terrace Drive (Twin Lakes Parkway).

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SRF Consulting Group, Inc.

Year 2030 Estimated Daily Traffic Volumes

Twin Lakes Area Update
City of Roseville

0158737
February 2015

Figure 5

Intersection Operations Analysis

To determine if the roadway network can accommodate the year 2030 traffic forecasts, a detailed intersection capacity analysis was completed. The study intersections were analyzed using Synchro/SimTraffic software and the HCM. The intersection improvements identified at County Road C/Snelling Avenue under existing conditions (i.e. six-lane along Snelling Avenue) are included in the year 2030 analysis; as are the improvements identified at the NB I-35W Ramps/Twin Lakes Parkway intersection. Results of the year 2030 analysis shown in Table 7 indicate that there will be operational issues during the p.m. peak hour for all three scenarios under year 2030 conditions.

Table 7. Year 2030 P.M. Peak Hour Operations Analysis – Known Improvements Only

Intersection	Level of Service			
	Existing	Scenario 1	Scenario 2	Scenario 3
County Road C and Cleveland Avenue	C	D	D	D
County Road C and Prior Avenue	B	B	C	C
County Road C and Fairview Avenue	C	D	E **	D
County Road C and Lincoln Drive	F	C	C	C
County Road C and Snelling Avenue	F	E *	E *	E *
County Road D and NB I-35W Ramps	B	B	C	B
County Road D and Cleveland Avenue	C	B	D	C
County Road D and Fairview Avenue/New Brighton Road (2)	C	F	F	F
Twin Lakes Parkway and Mount Ridge Road (3)	A	A	A	B
Cleveland Avenue and NB I-35W Ramps/Twin Lakes Parkway	C	C	D	D
Cleveland Avenue and Iona Lane (1)	A/A	A/B	A/D	A/C
Cleveland Avenue and County Road C2 (1)	A/B	A/B	A/E	A/D
Fairview Avenue and Terrace Drive	A/A (1)	A/A (1)	A/B (1)	B
Fairview Avenue and Lydia Avenue (2)	B	C	F	C
Snelling Avenue and County Road C2	D	C *	C *	C *
Snelling Avenue and Lydia Avenue	C	C *	C *	C *

(1) Indicates an unsignalized intersection with side-street stop control where the overall LOS is shown followed by the worst approach LOS.

(2) Indicates an unsignalized intersection with all-way stop control.

(3) Indicates an unsignalized intersection with roundabout control.

* Assumes Snelling Avenue is a six-lane facility

** County Road C and Fairview Avenue intersection operates at a 75-80 second LOS E under Scenario 2 conditions

Recommended Roadway Improvements

To improve operations, the recommended roadway improvements outlined below should be considered. Unless noted, the improvements apply to all of the scenarios. The year 2030 traffic forecasts, recommended intersection improvements, and resultant level of service are graphically represented in Figures 6 – 8 for Scenarios 1 – 3, respectively.

County Road C and Cleveland Avenue

- Under Scenario 1 and Scenario 2, southbound queues extend through the NB I-35W Ramps/Twin Lakes Parkway intersection approximately three and six percent of the peak hour, respectively. Due to the short distance between these two intersections no improvements are recommended that can mitigate this situation.
    - Under Scenario 3, southbound queues do not extend through the I-35W Northbound Ramps/Twin Lakes Parkway intersection due to the travel pattern shift resulting from Twin Lakes Parkway being extended to Fairview Avenue.

County Road C and Fairview Avenue

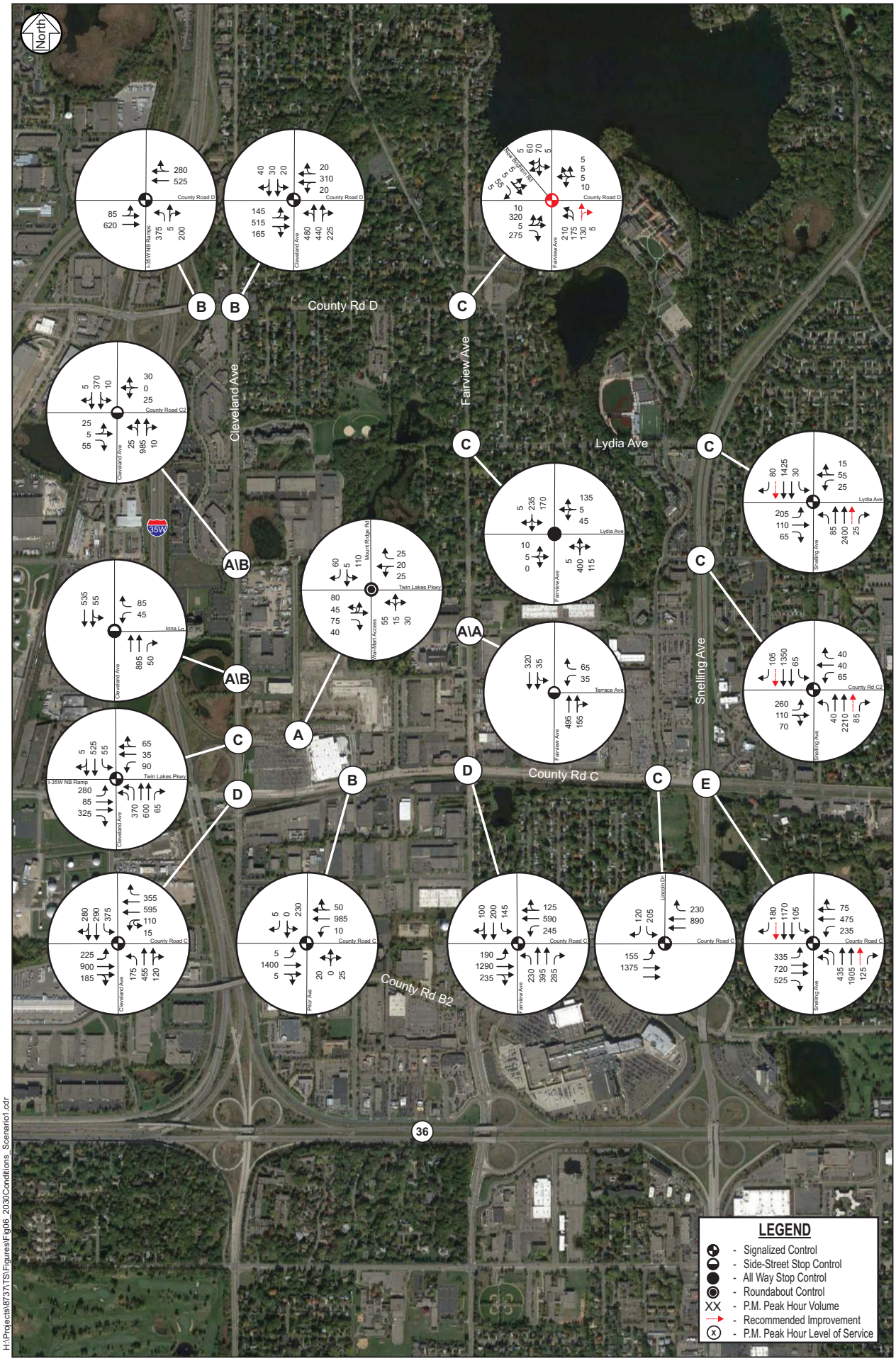
- Under Scenario 2 this intersection operates with a LOS E. Additional capacity is needed in the eastbound direction to improve operations; adjacent structures prevent expansion of this intersection (i.e. turn lanes). Therefore, no improvements are recommended to mitigate.

County Road D and Fairview Avenue/New Brighton Road

- Traffic control modification is recommended at this intersection. Further review is needed to determine proper traffic control, such as installation of a traffic signal or roundabout (traffic signal shown in Figures 6-8).
- Construct, or clearly delineate, a northbound through/right turn lane

Cleveland Avenue and County Road C2

- This intersection should be monitored as development occurs to ensure proper traffic control is installed. This is due to the varying land uses that could develop near this intersection.



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Year 2030 P.M. Peak Hour Conditions - Scenario 1

Twin Lakes Area Update
City of Roseville

Figure 6

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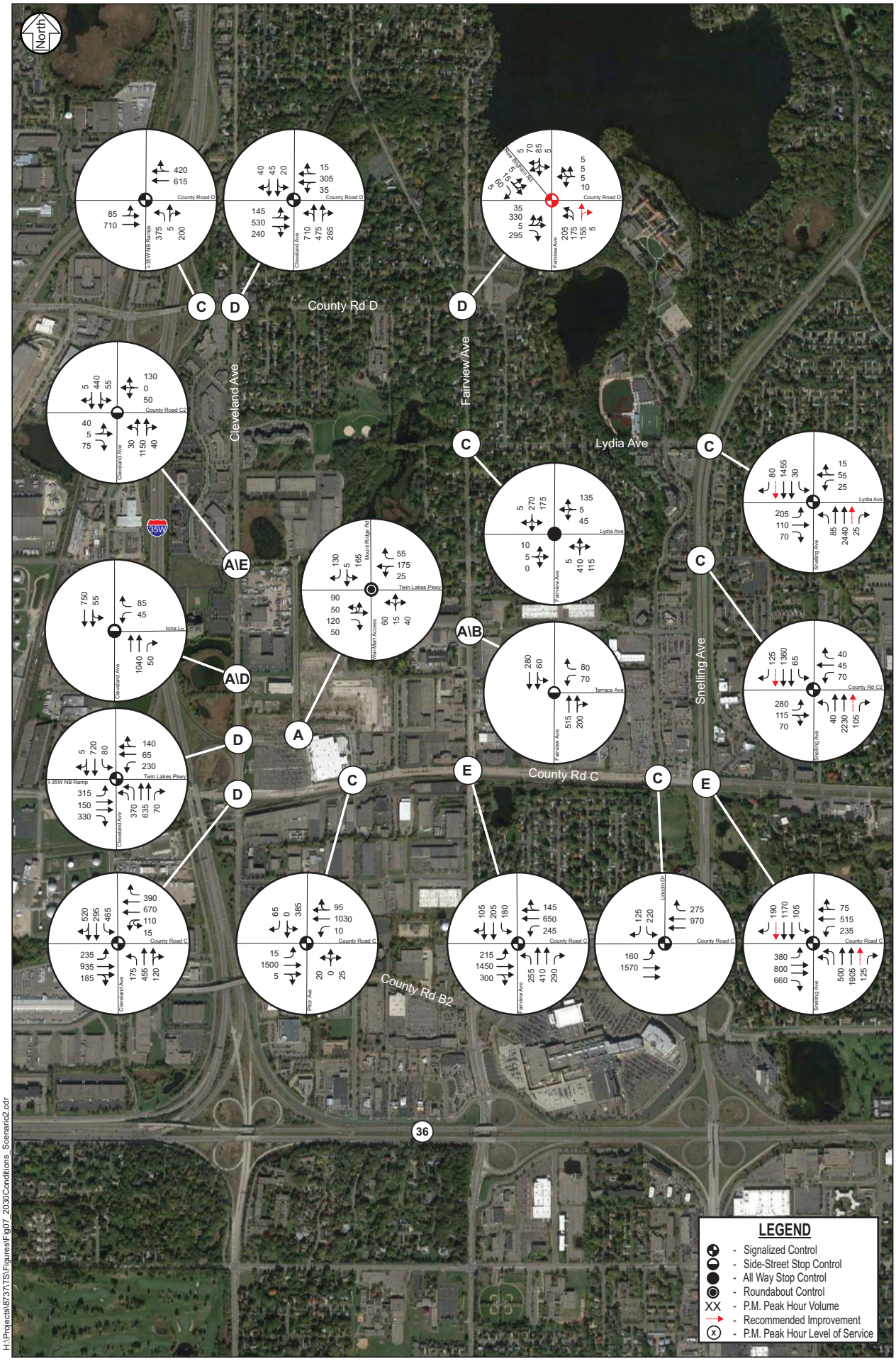

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Year 2030 P.M. Peak Hour Conditions - Scenario 2

Twin Lakes Area Update
City of Roseville

Figure 7

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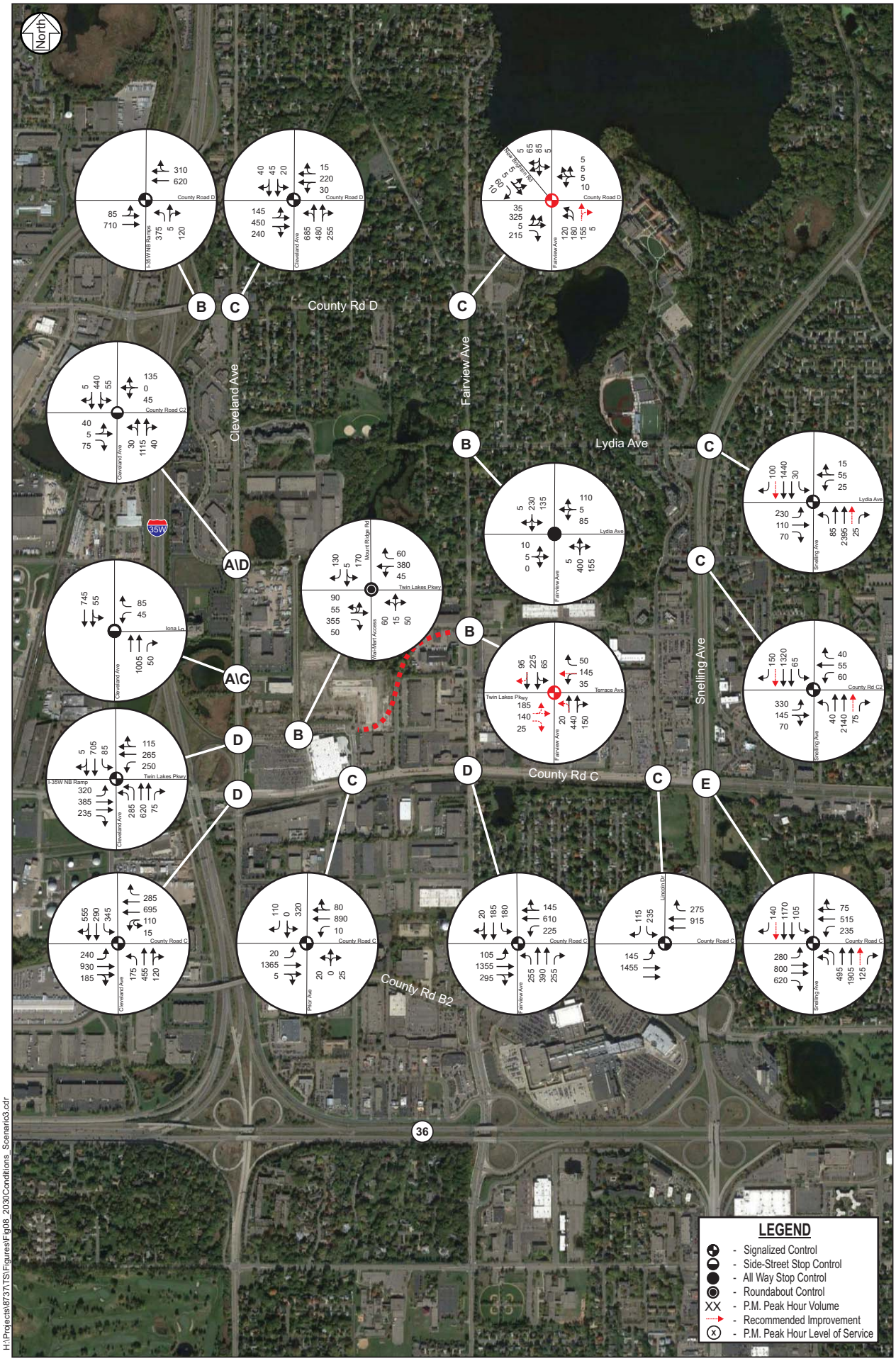

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Year 2030 P.M. Peak Hour Conditions - Scenario 3

Twin Lakes Area Update
City of Roseville

Figure 8

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Fairview Avenue and Lydia Avenue

- The operational issues under Scenario 2 are a result of northbound queues from the County Road D and Fairview Avenue/New Brighton Road intersection extending through Lydia Avenue. With the recommended traffic control and turn lane improvements at the Fairview Avenue/New Brighton Road intersection, the Fairview Avenue/Lydia Avenue intersection is expected to operate at an acceptable level of service.
    - The extension of Twin Lakes Parkway (Scenario 3) provides an alternative route to/from I-35W, which will reduce the number of vehicles that make a northbound left-turn at the County Road D and Fairview Avenue/New Brighton Road intersection. While northbound queues will be significant under Scenario 3, the queues are not expected to effect operations at the Fairview Avenue/Lydia Avenue intersection.
- Consider expanding Fairview Avenue to a three-lane facility north of County Road C2 to improve mobility and safety along the corridor.
- This intersection should be monitored under future conditions. If operational issues occur consider installation of a traffic signal or roundabout.

Snelling Avenue (Between County Road C and Lydia Avenue)

- Snelling Avenue is assumed as a six-lane facility under year 2030 conditions. This is due to the existing conditions operations analysis.
- Modifications are necessary to the at-grade intersections along Snelling Avenue or additional capacity is needed along the Snelling Avenue corridor to mitigate the capacity issues that are observed. If this does not occur it is anticipated that traffic will divert to other routes, including regionally, subregionally, and locally.

Other Considerations

Improvements to the Snelling Avenue/Lydia Avenue and Snelling Avenue/County Road C2 intersections were mentioned in association with the lack of capacity on Snelling Avenue (i.e., eastbound dual left-turn lanes). Further, with the completion of Twin Lakes Parkway between Prior Avenue and Fairview Avenue additional wayfinding, or trail blazing, can be implemented to encourage travelers destined for Snelling Avenue to use Terrace Drive as their route via Lincoln Drive. This will minimize the number of vehicles that use Twin Lakes Parkway to Lydia Avenue for similar trips. Additional intersection modifications may be necessary at the Terrace Drive/ Lincoln Drive and Snelling Avenue/County Road C2 intersections.

Effects of Twin Lakes Parkway

Based on the results of the year 2030 operations analysis, the extension of Twin Lakes Parkway to Fairview Avenue is expected to have the following effects on the Twin Lakes area:

- Provides an alternative route choice for the Twin Lakes area. With its extension, trips generated within the Twin Lakes area have more travel choice to access the area.
- Improves operations along the County Road C and County Road D corridors. Vehicles currently traveling along County Road C and/or County Road D have an alternative choice depending on their origin/destination.
  - County Road C/Fairview Avenue intersection:
    - Under Scenario 2 this intersection is expected to operate at an unacceptable LOS E. Due to right-of-way constraints at the intersection, geometric improvements, such as installation of additional turn lanes, are likely not feasible.
    - Under Scenario 3 (Twin Lakes Parkway extension) this intersection is expected to operate at an acceptable LOS D.
  - In case of an incident or poor weather conditions, when the regional system is congested, Twin Lakes Parkway could serve as an alternative route, providing relief to County Road C and County Road D.
- Direct access for developments along Twin Lakes Parkway reduces unnecessary circulation and improves travel time in the study area.
- The regional travel demand model suggests that few regional trips are expected to use Twin Lakes Parkway. The majority of trips have an origin/destination near the study area.
  - Due to future regional improvements to the surrounding transportation system, such as the managed lane along I-35W, more vehicles are expected to stay on the regional system rather than use Twin Lakes Parkway as previously expected.

Conclusions and Recommendations

Based on the analysis, the following conclusions and recommendations are offered for your consideration:

- To understand the impacts to the study area with the extension of the Twin Lakes Parkway to Fairview Avenue, the following three scenarios were reviewed under future conditions:
  - *Scenario 1* – No build roadway condition with background traffic growth added
  - *Scenario 2* – No build roadway condition with background traffic growth added and full build land use potential included
  - *Scenario 3* –Build roadway condition with background traffic growth and full build land use potential included

- Results of the existing operations analysis indicate that all study intersections currently operate at an acceptable overall LOS D or better during the p.m. peak hour with the existing geometric layout and traffic control, except along County Road C at the Lincoln Drive and Snelling Avenue intersections, which operate at LOS F.
  - To mitigate this situation, modifications are necessary to the at-grade intersections along Snelling Avenue or additional capacity is needed along the Snelling Avenue corridor.
- SRF worked with City staff to develop a year 2030 land use plan in the study area. Trip generation estimates for both the current and future land uses were developed for the p.m. peak hour and on a daily basis using the *ITE Trip Generation Manual, 9th Edition*.
  - Assuming that the existing land uses generate at the average ITE trip rate, an additional 2,965 p.m. peak hour and 31,707 daily trips will be generated in the Twin Lakes Study Area under year 2030 full build conditions.
- The Metropolitan Council regional travel demand model was used to develop average daily traffic (ADT) volumes for the greater adjacent roadway network, directional distribution for the p.m. peak hour trip generation estimates, and to estimate the potential for a subregional travel pattern shift with the extension of Twin Lakes Parkway to Fairview Avenue (i.e. non-Twin Lakes area development trips diverting to Twin Lakes Parkway).
- Results of the year 2030 analysis indicate that there will be operational issues during the p.m. peak hour for all three scenarios under year 2030 conditions.
- To improve operations, the following improvements should be considered.
  - County Road D and Fairview Avenue/New Brighton Road (all Scenarios)
    - Traffic control modification is recommended at this intersection. Further review is needed to determine proper traffic control, such as installation of a traffic signal or roundabout.
    - Construct or clearly delineate a northbound through/right turn lane.
  - Cleveland Avenue and County Road C2
    - This intersection should be monitored as development occurs to ensure proper traffic control is installed.
  - Fairview Avenue and Lydia Avenue
    - This intersection should be monitored under future conditions. If operational issues occur consider installation of a traffic signal or roundabout.
  - Snelling Avenue
    - Modifications are necessary to the at-grade intersections along Snelling Avenue or additional capacity is needed along the Snelling Avenue corridor to mitigate the capacity issues that are observed. If this does not occur it is anticipated that traffic will divert to other routes, including regionally, subregionally, and locally.

- Based on the results of the year 2030 operations analysis, the extension of Twin Lakes Parkway to Fairview Avenue is expected to have the following effects on the Twin Lakes area:
  - Provides an alternative route choice for the Twin Lakes area. With its extension, trips generated within the Twin Lakes area have more travel choice to access the area.
  - Improves operations along the County Road C and County Road D corridors. Vehicles currently traveling along County Road C and/or County Road D have an alternative choice depending on their origin/destination.
  - Direct access for developments along Twin Lakes Parkway reduces unnecessary circulation and improves travel time in the study area.
  - The regional travel demand model suggests that few regional trips are expected to use Twin Lakes Parkway. The majority of trips have an origin/destination near the study area.