

MEMORANDUM

TO: Barbara G. Thomson, AICP, Planning Manager
City of Plymouth

FROM: John Hagen, PE, PTOE, Senior Associate
Emily Gross, Engineer

DATE: September 29, 2011

SUBJECT: TRAFFIC STUDY OF THE ILLUSTRATIVE REDEVELOPMENT SCENARIOS OF THE FOUR SEASONS MALL SITE

EXECUTIVE SUMMARY

The City of Plymouth requested a traffic study be completed for the various redevelopment design scenarios developed as part of the on-going Livable Communities Grant Study for the Four Seasons Mall site, located in the southeast quadrant of Rockford Road and Lancaster Lane/Nathan Lane. The main objective of the traffic study was to determine the potential traffic-related impacts to the existing roadway system associated with each redevelopment design scenario.

It is understood that the *Four Seasons Mall Traffic Study: Existing Conditions Analysis* dated January 31, 2011 will be used as a basis to evaluate the various redevelopment design scenarios. The study results are summarized in the following paragraphs, with detailed information provided in the body of the memorandum.

Potential Redevelopment: For the purposes of this analysis, each illustrative redevelopment scenario was assumed to be constructed in the year 2012, including the removal of the existing mall and relocation of the transit station currently located at Cub Foods, north of Rockford Road and Lancaster Lane/Nathan Lane.

- For Concept 1, the redevelopment consists of a free standing discount superstore and a park and ride transit station. It is estimated that this concept would generate 245 trips during the a.m. peak hour; 493 trips during the p.m. peak hour; and 5,337 trips on a daily basis.
- Concept 2 includes a senior living facility, with senior adult housing, assisted living, memory care, a medical office building, local retail commercial development, and a park and ride transit station. It is estimated that this concept would generate 148 trips during the a.m. peak hour; 217 trips during the p.m. peak hour, and 2,238 trips on a daily basis.

- Concept 3 consists of a senior living facility, with assisted living and memory care, a medical office building, two neighborhood retail commercial developments, a pharmacy, a sit-down restaurant, and a park and ride transit station. This concept is estimated to generate 268 trips during the a.m. peak hour; 414 trips during the p.m. peak hour, and 4,053 trips on a daily basis.
- Concept 4 consists of general office space, a medical office building, local retail commercial development, a pharmacy, a sit-down restaurant, a specialized grocery store, and a park and ride transit station. It is estimated that this concept would generate 323 trips during the a.m. peak hour; 522 trips during the p.m. peak hour; and 5,018 trips on a daily basis.

Conceptual Site Access Review: Current access to the site is proposed to remain the same for all four concepts. The north and south driveways along Lancaster Lane will remain full access in the existing location. No additional access driveways are proposed.

Future No Build Conditions: An operations analysis was completed to assess the traffic operations of the key intersections under the year 2012 no build conditions (assuming the existing Four Seasons Mall continues to function under the current land uses and occupancy rate that existed in the fall of 2010). The analysis results for year 2012 no build conditions indicate that all intersections are expected to operate at an acceptable LOS D or better during the peak hours with existing geometrics and signal timing.

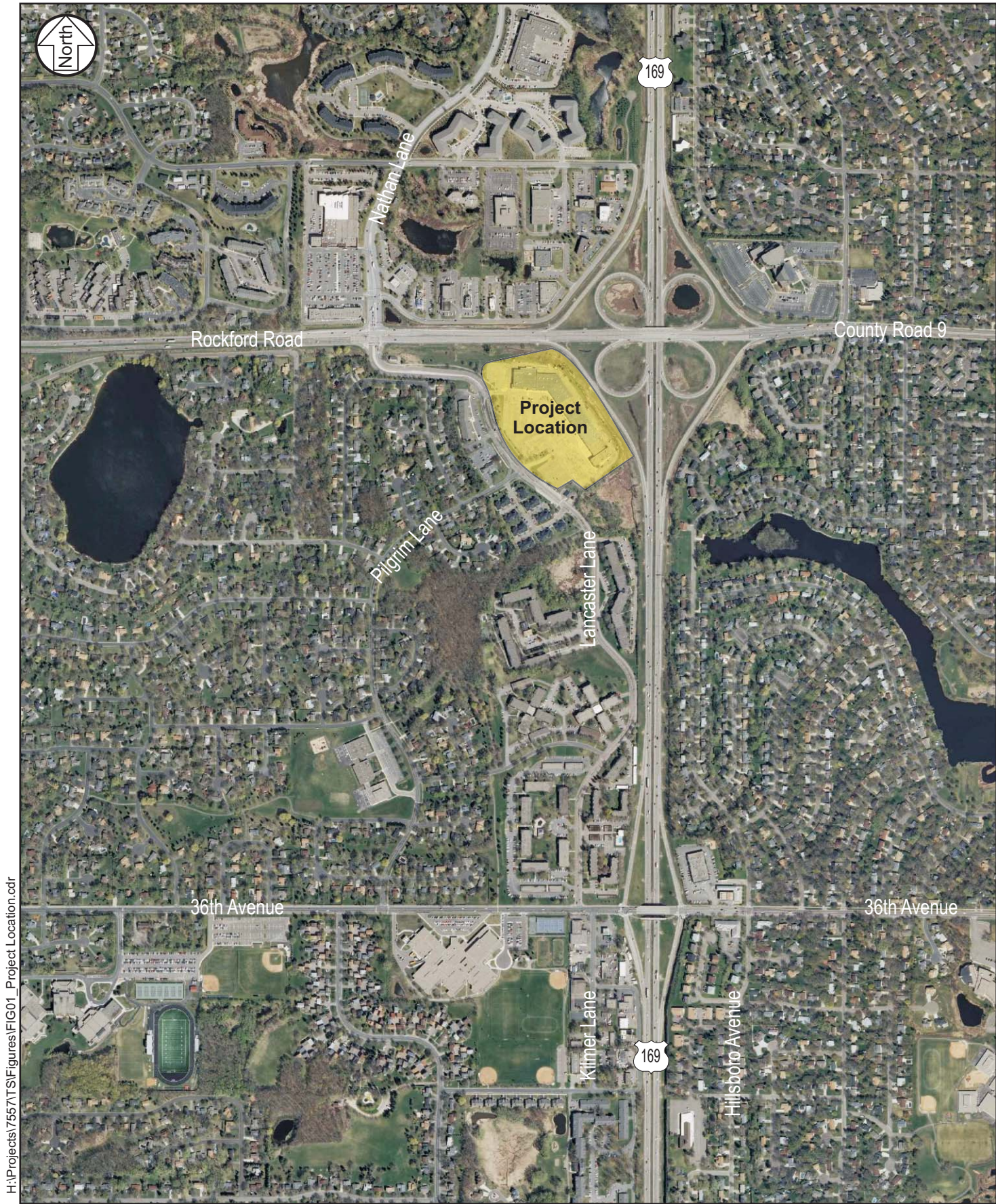
Future Build Conditions: An operations analysis was completed to assess the traffic impacts from the illustrative redevelopment scenarios. The analysis results for year 2012 build conditions indicate that all intersections are expected to continue to operate at an acceptable LOS D or better during the peak hours with existing geometrics and signal timing, with the exception of Rockford Road/Lancaster Lane/Nathan Lane. Modification of the signal timing at this intersection during the p.m. peak hour would improve operations back to the acceptable levels experienced under the year 2012 no build conditions.

Conclusions/Recommendations: Based on the analysis, each of the illustrative redevelopment design scenarios can be accommodated by the existing roadway system provided that the traffic signal timing is optimized at the intersection of Rockford Road/Lancaster Lane/Nathan Lane. Since Rockford Road is a county roadway (CSAH 9), discussions with Hennepin County need to occur to determine the feasibility of implementing these recommended signal timing improvements.

REDEVELOPMENT AND SITE ACCESS REVIEW

The potential redevelopment site is located in the southeast quadrant of Rockford Road and Lancaster Lane/Nathan Lane (see Figure 1: Project Location). Each of the illustrative redevelopment design scenarios would replace the existing mall and relocate the park and ride transit station from Cub Foods (located north of the intersection of Rockford Road and Lancaster Lane/Nathan Lane) to the redeveloped mall site. For purposes of this analysis, redevelopment is assumed to be constructed in the year 2012. Figures 2 through 5 display the four conceptual site plans.

- Concept 1 consists of an 89,000 square foot free standing discount superstore and a park and ride transit station with 135 parking spaces. For this concept, the southern driveway along Lancaster Lane is the primary access for the discount superstore and the northern driveway is the primary access for the park and ride transit station.
- Concept 2 includes a 155 unit senior-living facility, with 80 units of senior adult housing, 50 units of assisted living, and 25 memory care units. Additionally, a 12,000 square foot medical office building, two neighborhood retail commercial developments totaling approximately 24,500 square feet, and a park and ride transit station with 114 parking spaces are included. The senior living facility is located at the south end of the site. Vehicles entering and exiting the facility would use the south driveway along Lancaster Lane as the primary access. It is expected that vehicles entering and exiting the local retail commercial developments, medical office building, and park and ride transit station will use the north driveway as the primary access.
- Concept 3 consists of a 75 unit senior living facility, with 50 units of assisted living and 25 memory care units, an approximately 30,000 square foot medical office building, approximately 19,200 square foot of neighborhood retail commercial development, a 13,000 square foot pharmacy, a 9,000 square foot sit-down restaurant , and a park and ride transit station with 100 parking spaces. Under Concept 3, the north driveway is the primary access point for the pharmacy, transit station, and medical office building. The south driveway is the primary access point for the senior living facility and restaurant. Vehicles entering and exiting the local retail development will use the north and south access approximately equally.
- Concept 4 consists of 30,000 square feet of general office space, a 25,000 square foot medical office building, approximately 17,500 square feet of neighborhood retail commercial development, a 13,000 square foot pharmacy, a 9,000 square foot sit down restaurant, a 12,000 square foot specialized grocery store, and a park and ride transit station with 100 parking spaces. Under Concept 4, the north driveway is the primary access point for the pharmacy, neighborhood retail commercial development, restaurant, and general office space. The south driveway is the primary access for the specialty grocery store, medical office building, and park and ride transit station.



H:\Projects\7557\TSIFigures\FIG01 Project Location.cdr



Project Location

Four Season's Mall Redevelopment Scenarios Traffic Study
City of Plymouth

Figure 1



Key Elements:

- Single Retail User
- One building facing Lancaster Lane with service and loading facing Highway 169
- Transit (Park & Ride Lot) located on northern portion of site
- Rainwater Garden amenity, buffer and trail run along Lancaster Lane

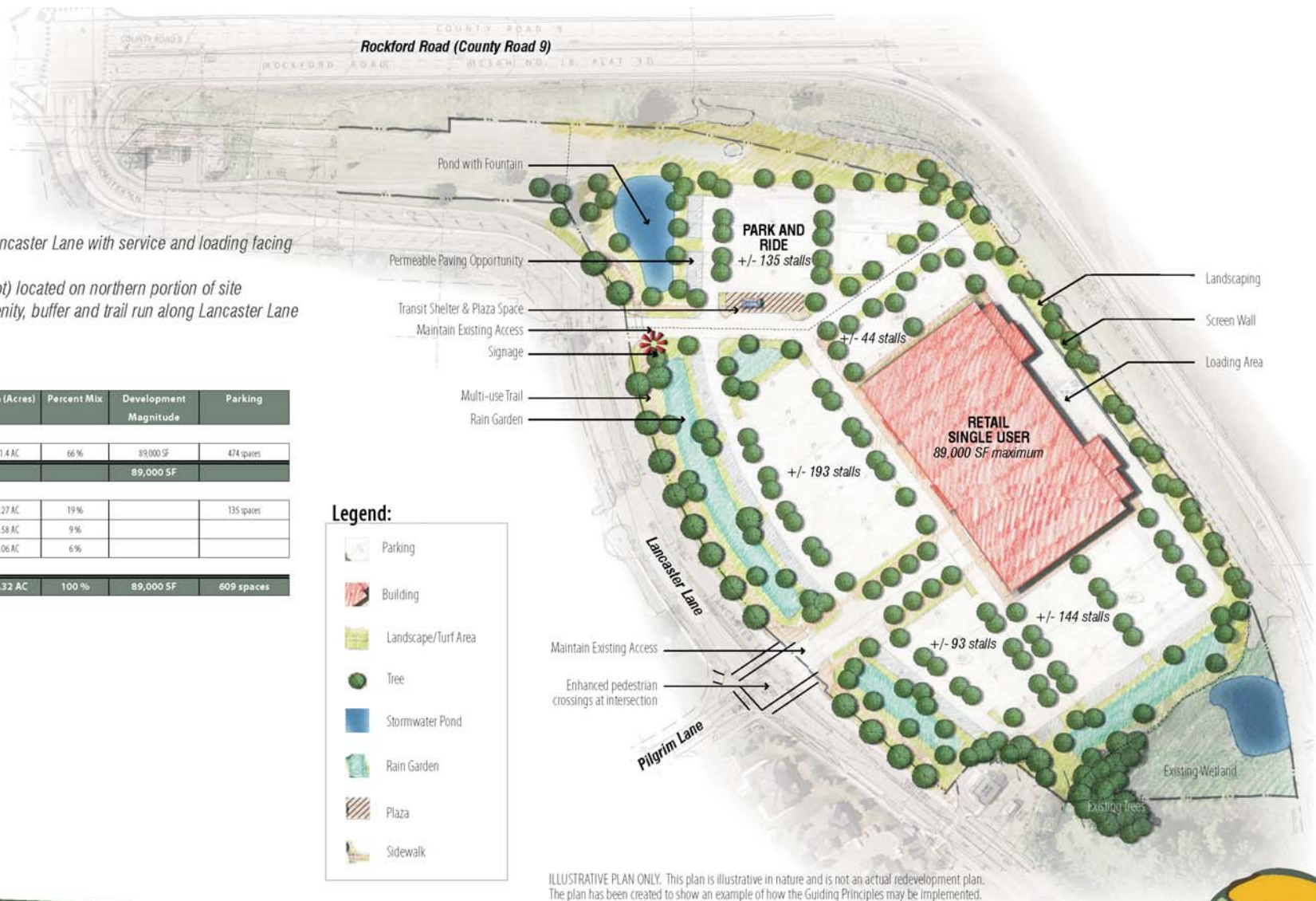
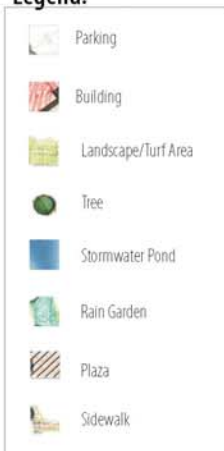
Development Yield:

Land Use Pattern	Area (Acres)	Percent Mix	Development Magnitude	Parking
Retail	11.4 AC	66 %	89,000 SF	474 spaces
Commercial Total			89,000 SF	

Transit	3.27 AC	19 %		135 spaces
Open Space	1.58 AC	9 %		
ROW	1.06 AC	6 %		

Grand Total	17.32 AC	100 %	89,000 SF	609 spaces
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Legend:



ILLUSTRATIVE PLAN ONLY. This plan is illustrative in nature and is not an actual redevelopment plan. The plan has been created to show an example of how the Guiding Principles may be implemented.

City of Plymouth
Four Seasons Mall Site
Redevelopment Scenarios

Scenario 1: Development Plan

September 22, 2011

Hoisington Koezler Group Inc.
Planning, Landscape Architecture & Urban Design

Bolton & Menk
Engineering & Surveying

RMF Group
Development Services





Key Elements:

- Senior Housing predominant use on site
- Retail, Mixed Use and Transit integrated at northern portion of site
- Rain Garden amenity, buffer and multi-use trail along Lancaster Lane

Development Yield:

Land Use Pattern	Corridor Area (Acres)	Percent Mix	Development Magnitude	Parking
Senior Residential - Memory Care			25 units	
Senior Residential - Assisted Living			50 units	
Senior Residential - Independent Living			80 units	
Residential Total	9.07 AC	52 %	155 units	209 spaces

Retail - Stand Alone			12,500 SF	70 spaces
Retail - Mixed Use			12,000 SF	45 spaces
Office - Mixed Use			12,000 SF	45 spaces
Commercial Total	2.91 AC	17 %	36,500 SF	160 spaces

Transit	2.7 AC	16 %		114 spaces
Open Space	1.58 AC	9 %		
Wetland	1.06 AC	6 %		

Grand Total	17.32 AC	100.0%		483 spaces
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Legend:



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City of Plymouth
Four Seasons Mall Site
Redevelopment Scenarios

Scenario 2: Development Plan

September 22, 2011

Hoisington Koegler Group Inc.
Planning • Landscapes Architecture • Urban Design

Bolton & Menk
Engineers & Surveyors

RMF Group
Development Advisor



Conceptual Site Plan - Concept 2

Four Season's Mall Redevelopment Scenarios Traffic Study
City of Plymouth



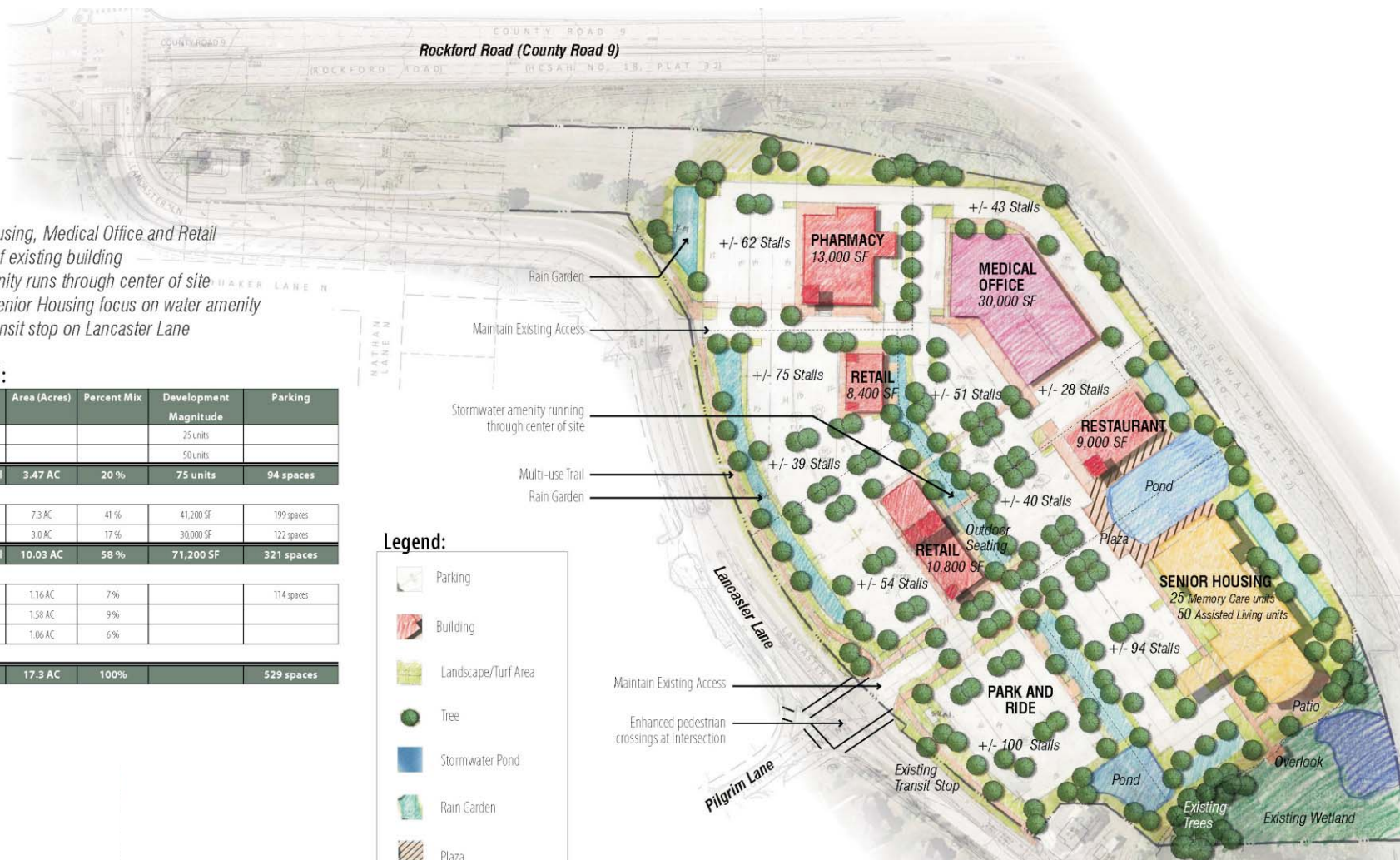
Key Elements:

- Mix of Senior Housing, Medical Office and Retail
- Adaptive re-use of existing building
- Rain Garden amenity runs through center of site
- Restaurant and Senior Housing focus on water amenity
- Utilize existing transit stop on Lancaster Lane

Development Yield:

Land Use Pattern	Area (Acres)	Percent Mix	Development Magnitude	Parking
Senior Residential: Memory Care			25 units	
Senior Residential: Assisted Living			50 units	
Residential Total	3.47 AC	20 %	75 units	94 spaces
Retail	7.3 AC	41 %	41,200 SF	199 spaces
Medical Office	3.0 AC	17 %	30,000 SF	122 spaces
Commercial Total	10.03 AC	58 %	71,200 SF	321 spaces
Transit	1.16 AC	7 %		114 spaces
Open Space	1.58 AC	9 %		
Wetland	1.06 AC	6 %		
Grand Total	17.3 AC	100%		529 spaces

Legend:



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City of Plymouth
Four Seasons Mall Site
Redevelopment Scenarios

Scenario 3: Development Plan

September 22, 2011

Hoisington Koenig Group Inc.
Planning • Landscape Architecture • Urban Design
Bolton & Menk
Engineers & Surveyors
RMF Group
Development Advisor



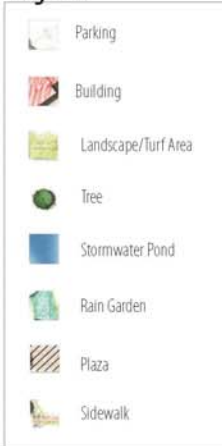
Key Elements:

- Mix of Retail and Office uses
- Adaptive re-use of portions of existing building
- Structured Parking for office and retail uses at north end of site
- Utilize existing Transit Stop on Lancaster Lane
- Central Green amenity adjacent to retail and office uses

Development Yield:

Land Use Pattern	Corridor Area (Acres)	Percent Mix	Development Magnitude	Parking
Retail	6.26 AC	36%	36,000 SF	223 spaces
Medical Office	3.35 AC	19%	25,000 SF	100 spaces
Mixed Use Retail	3.39 AC	20%	15,500 SF	228 spaces
Mixed Use General Office			30,000 SF	
Commercial Total	12.92 AC		106,500 SF	551 spaces
Transit	1.75 AC	10%		100 spaces
Open Space	1.58 AC	9%		
Wetland	1.06 AC	6%		
Grand Total	17.32 AC	100.0%		651 spaces

Legend:



Rockford Road (County Road 9)



ILLUSTRATIVE PLAN ONLY. This plan is illustrative in nature and is not an actual redevelopment plan. The plan has been created to show an example of how the Guiding Principles may be implemented.

City of Plymouth
Four Seasons Mall Site
Redevelopment Scenarios

Scenario 4: Development Plan

September 22, 2011

Hixington Kogler Group Inc.
Planning + Landscape Architecture + Urban Design
Bolton & Menk
Engineers & Surveyors
RMF Group
Development Advisor



Conceptual Site Plan - Concept 4

Four Season's Mall Redevelopment Scenarios Traffic Study
City of Plymouth

0117557
September 2011

Figure 5

TRAFFIC FORECASTS

Since the potential redevelopment of the Four Seasons Mall is assumed to be constructed in the year 2012, future no build and build traffic volumes were developed for the year 2012.

Year 2012 No Build Traffic Volumes

Future year 2012 no build conditions assume the existing Four Seasons Mall continues to function under its current land uses and occupancy rate that existed in the fall of 2010. Year 2012 no build traffic volumes were developed by applying a one-percent yearly growth rate to the existing traffic volumes. This one-percent growth rate was used to account for growth in background traffic volumes on all roadways within the study area, which is consistent with past studies in the area. The resultant year 2012 no build traffic volumes are shown in Figure 6.

Year 2012 Build Traffic Volumes

For each concept, the future year 2012 build conditions assume that the existing Four Seasons Mall is removed and the park and ride facility is relocated from Cub Foods to the redevelopment site. Year 2012 build traffic volumes were developed by first removing the existing traffic generated by the current Four Seasons Mall and Cub Foods park and ride transit station from the year 2012 no build traffic volumes, and then adding the redevelopment-related traffic to the adjacent roadway system. The traffic associated with potential redevelopment was determined using ITE trip generation estimates for the varying land uses and sizes for each concept.

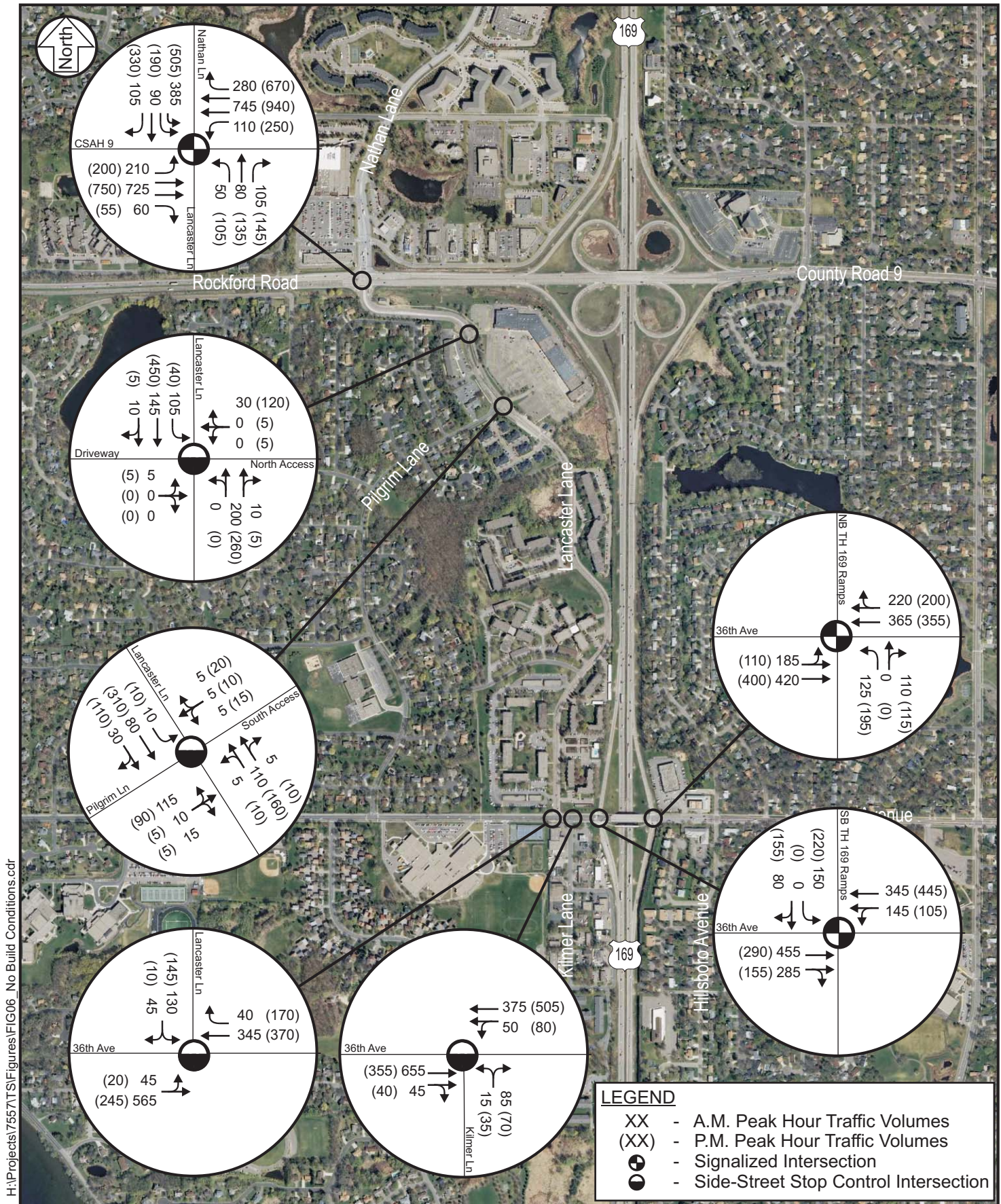
Trip Generation

Trip generation estimates for the a.m. and p.m. peak periods and on a daily basis were calculated for each concept. The trip generation estimates were generated based on the land use type and size using the 2008 Institute of Transportation Engineers (ITE) *Trip Generation* report. For each concept, multi-purpose trip reduction and pass-by/diverted link trip reductions were applied to the land uses when appropriate. The pass-by and diverted link trip reduction account for vehicle trips already using Rockford Road and Lancaster Lane. Because each concept's land uses varied, the reduction rates are different for each concept. These reductions were applied to the trip generation rates developed from 2008 ITE *Trip Generation* report and are shown in Tables 1 through 4 for Concepts 1 through 4, respectively.

Table 1
Trip Generation Estimates – Concept 1

Land Use	Size	Daily Trips	A.M. Peak		P.M. Peak	
			In	Out	In	Out
Free-Standing Discount Superstore	89 KSF	4,729	83	65	201	209
Park and Ride lot with Bus Service	135 spaces	608	79	18	19	64
Total		5,337	162	83	220	273

* KSF represents 1,000 square feet.



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As shown in Table 1, Concept 1 would generate approximately 5,337 trips on an average weekday, 245 trips during the a.m. peak hour (with 162 inbound and 83 outbound trips), and 493 trips during the p.m. peak hour (with 220 inbound and 273 outbound trips) using the 2008 ITE trip generation rates.

No multi-use reduction was assumed for the free standing discount superstore and the park and ride transit facility. Since the potential redevelopment consists of retail uses, a pass-by trip reduction was applied to account for vehicles already on the adjacent roadways that would stop at the site. Based on information from the 2004 ITE *Trip Generation Handbook* and recommended ITE practices, a pass-by reduction of 28 percent was applied to the trips generated by the free standing discount superstore (no pass-by reduction was applied to the park and ride transit station).

Table 2
Trip Generation Estimates – Concept 2

Land Use	Size	Daily Trips	A.M. Peak		P.M. Peak	
			In	Out	In	Out
Senior Adult Housing	80 units	244	3	6	7	4
Assisted Living	50 units	121	5	2	7	6
Memory Care	25 units	50	3	1	2	4
Medical-Dental Office Building	12 KSF	382	19	5	10	27
Retail	24.5 KSF	928	13	9	39	41
Park and Ride lot with Bus Service	114 spaces	513	67	15	16	55
Total		2,238	110	38	81	136

* KSF represents 1,000 square feet.

Concept 2, as shown in Table 2, would generate approximately 2,238 trips on an average weekday, 148 trips during the a.m. peak hour (with 110 inbound and 38 outbound trips), and 217 trips during the p.m. peak hour (with 81 inbound and 136 outbound trips) using the 2008 ITE trip generation rates.

For Concept 2, an average multi-purpose trip reduction of 12 percent was applied to the trip generation estimates in Table 2 (except the park and ride transit station) to account for internal trips that will be made between the various land uses on-site using the internal roadway system. Based on information from the 2004 ITE *Trip Generation Handbook* and recommended ITE practices, a pass-by reduction of 34 percent was applied to the trips generated by the local retail commercial development (no pass-by reduction was applied to the senior living facility, medical office, and park and ride transit station).

Table 3
Trip Generation Estimates – Concept 3

Land Use	Size	Daily Trips	A.M. Peak		P.M. Peak	
			In	Out	In	Out
Assisted Living	50 units	112	5	2	7	6
Memory Care	25 units	48	2	1	2	3
Medical-Dental Office Building	30 KSF	889	45	12	23	62
Pharmacy/Drugstore	13 KSF	939	16	12	55	55
Retail	19.2 KSF	676	9	6	29	30
High-Turnover (Sit-Down) Restaurant	9 KSF	939	45	41	49	33
Park and Ride lot with Bus Service	100 spaces	450	58	14	14	48
Total		4,053	180	88	177	237

* KSF represents 1,000 square feet.

Results of the ITE trip generation rates shown in Table 3 show Concept 3 would generate approximately 4,053 trips on an average weekday, 268 trips during the a.m. peak hour (with 180 inbound and 88 outbound trips), and 414 trips during the p.m. peak hour (with 177 inbound and 237 outbound trips).

For Concept 3, an average multi-purpose trip reduction of 18 percent was applied to the trip generation estimates in Table 3 (except the park and ride transit station) to account for internal trips that will be made between the various land uses on-site using the internal roadway system. In addition, various pass-by and diverted link trip reductions were applied to the trips generated by the retail (34 percent), restaurant uses (25 percent) and pharmacy (49 percent) to account for vehicles already traveling along Rockford Road and Lancaster Lane that will stop at the site. No pass-by reduction was applied to trips generated by the senior living facility, medical office, or park and ride transit facility.

Table 4
Trip Generation Estimates – Concept 4

Land Use	Size	Daily Trips	A.M. Peak		P.M. Peak	
			In	Out	In	Out
Specialty Grocery	12 KSF	1,020	21	14	53	51
General Office Building	30 KSF	274	34	5	6	31
Medical-Dental Office Building	25 KSF	750	38	10	19	52
Pharmacy/Drugstore	13 KSF	951	16	12	55	55
Retail	17.5 KSF	624	9	6	27	27
High-Turnover (Sit-Down) Restaurant	9 KSF	949	45	41	49	35
Park and Ride lot with Bus Service	100 spaces	450	58	14	14	48
Total		5,018	221	102	223	299

* KSF represents 1,000 square feet.

Results of the ITE trip generation rates shown in Table 4 show Concept 4 would generate approximately 5,018 trips on an average weekday, 323 trips during the a.m. peak hour (with 221 inbound and 102 outbound trips), and 522 trips during the p.m. peak hour (with 223 inbound and 299 outbound trips).

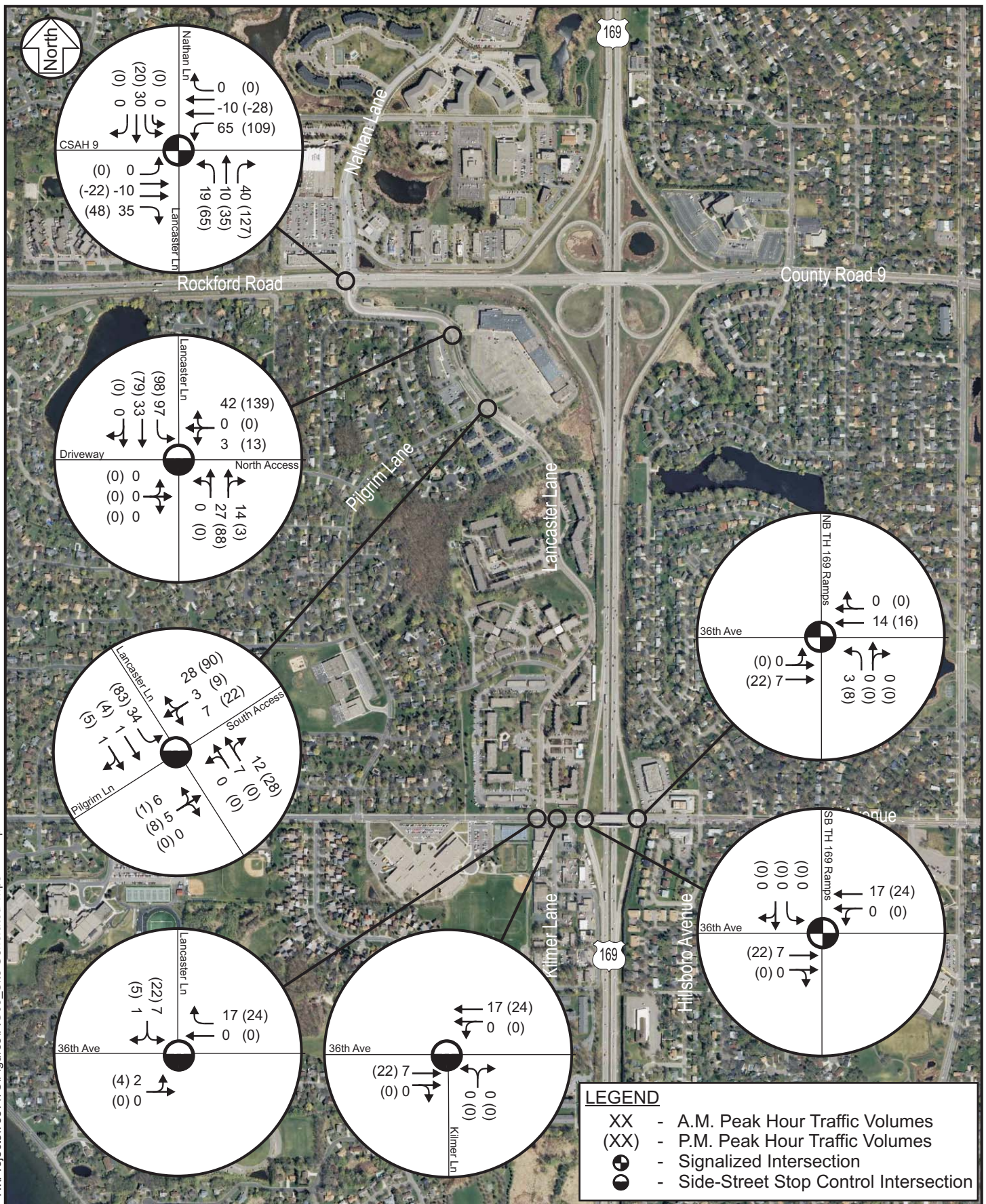
A multi-purpose trip reduction of 17 percent was applied to the Concept 4 trip generation estimates in Table 5 (no multi-purpose reduction was applied to the park and ride transit station). This reduction accounts for internal trips that will be made between the various land uses on-site using the internal roadway system. In addition, pass-by and diverted link trips were applied to the respective land uses. The reduction was applied to the various land uses, neighborhood retail commercial development (34 percent), restaurant (25 percent), pharmacy (49 percent), and supermarket (23 percent), to account for vehicles already traveling along Rockford Road and Lancaster Lane that will stop at the site. No pass-by reduction was applied to trips generated by the medical office or park and ride transit facility.

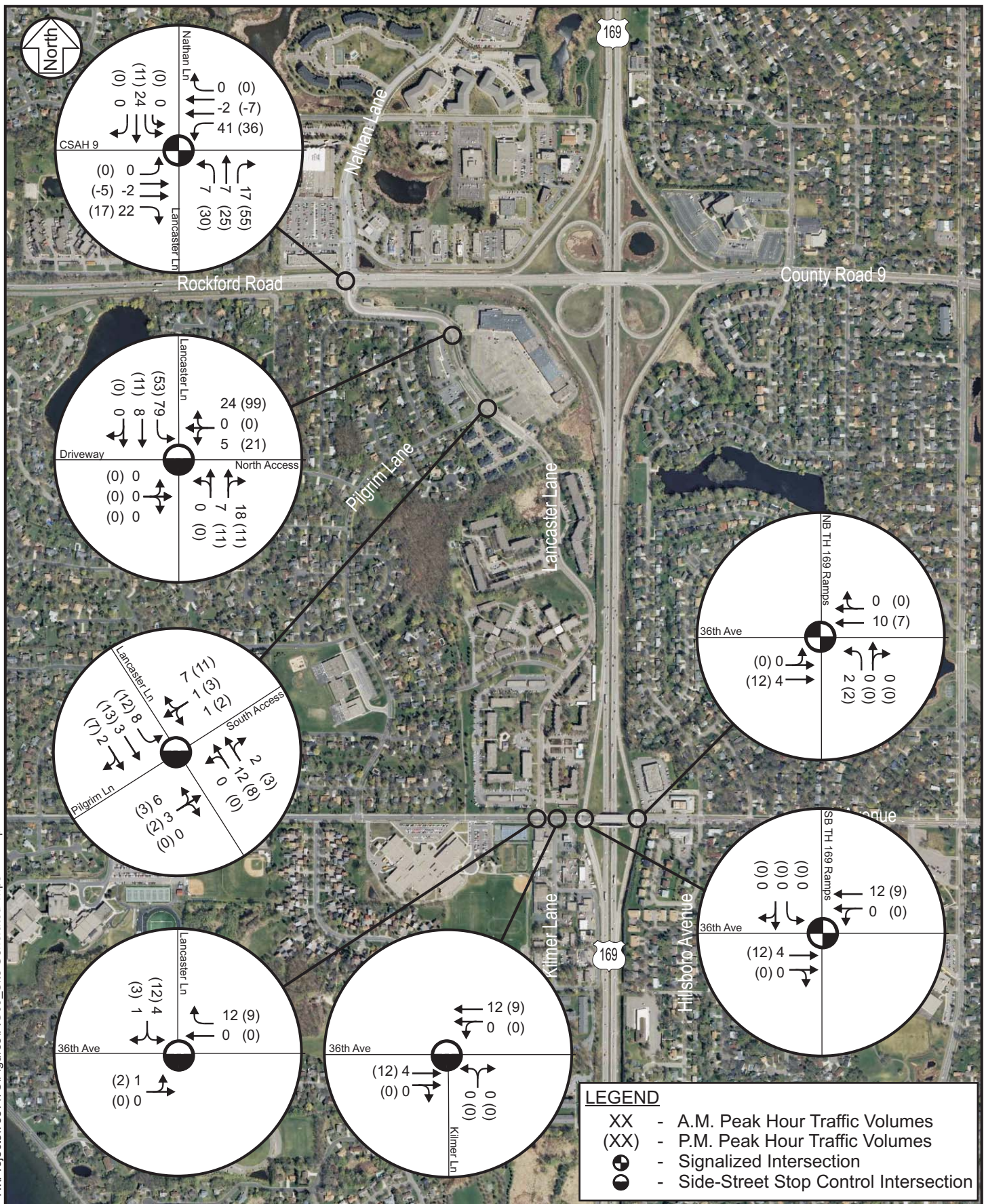
The trips were assigned to the adjacent roadway system using the directional distribution shown in Figure 7. Three directional distributions were developed for the various land uses. The directional distributions were based on current local travel patterns in the study area and the expected travel patterns of trips generated to the site. A localized neighborhood distribution was developed for the land uses expected to generate traffic from the neighborhood population. This distribution was applied to neighborhood retail and the restaurants. A regional distribution was developed for land uses assumed to generate traffic on a community scale. This distribution was applied to the free standing discount superstore, senior living facilities, medical office building, and the pharmacy. The third distribution was developed for the park and ride transit facility. The park and ride trip distribution was developed from the *Plymouth Transit Ridership (Spring 2010)* provided by the City, which shows the current origin and destinations of transit users in the Plymouth area.

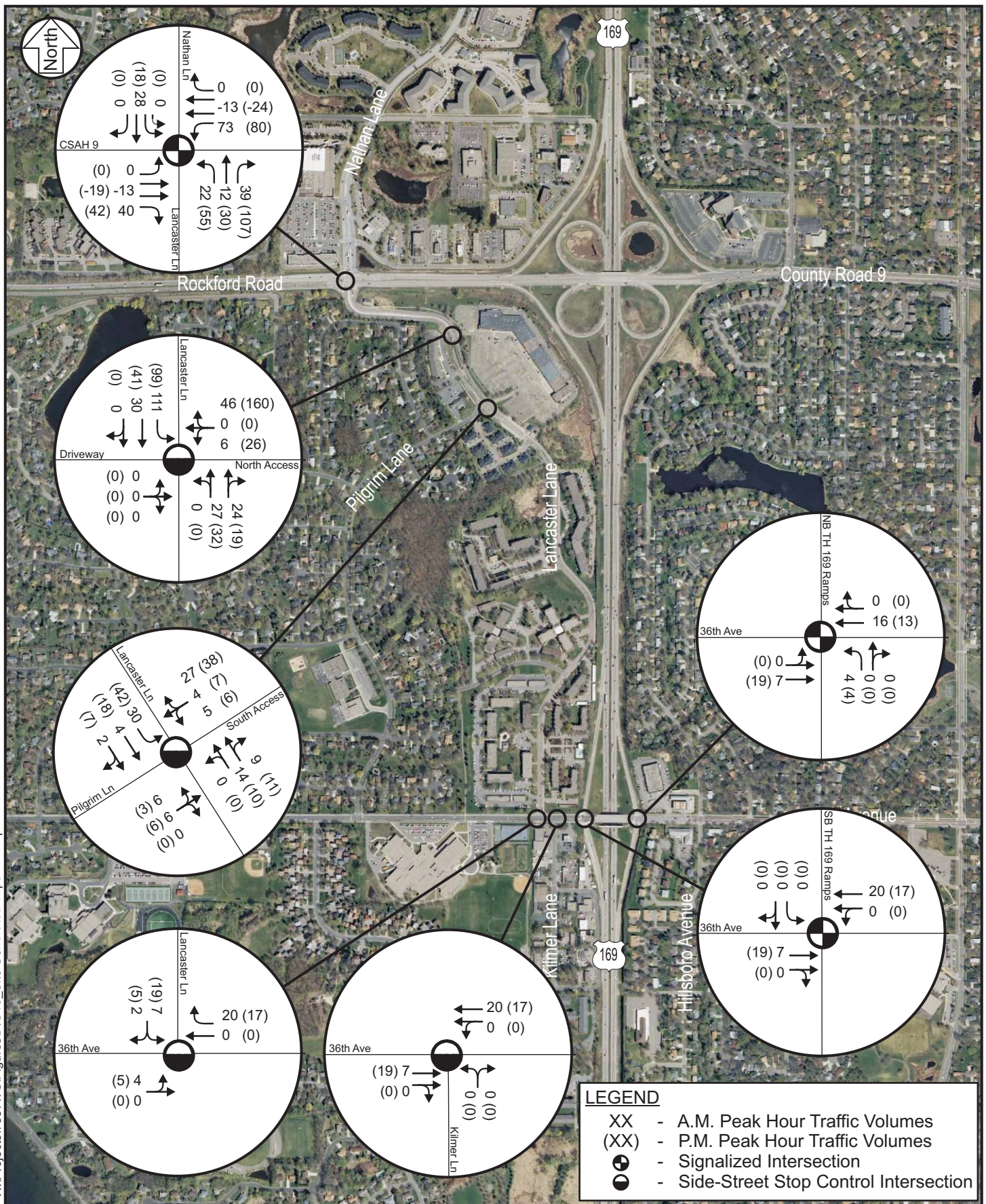
For each concept, site-generated traffic is shown in Figures 8 through 11. The combination of year 2012 no build traffic volumes and site-generated traffic (minus the trips associated with the existing mall and the trips generated by the park and ride transit station at Cub Foods) results in the year 2012 build traffic volumes shown on Figures 12 through 15.

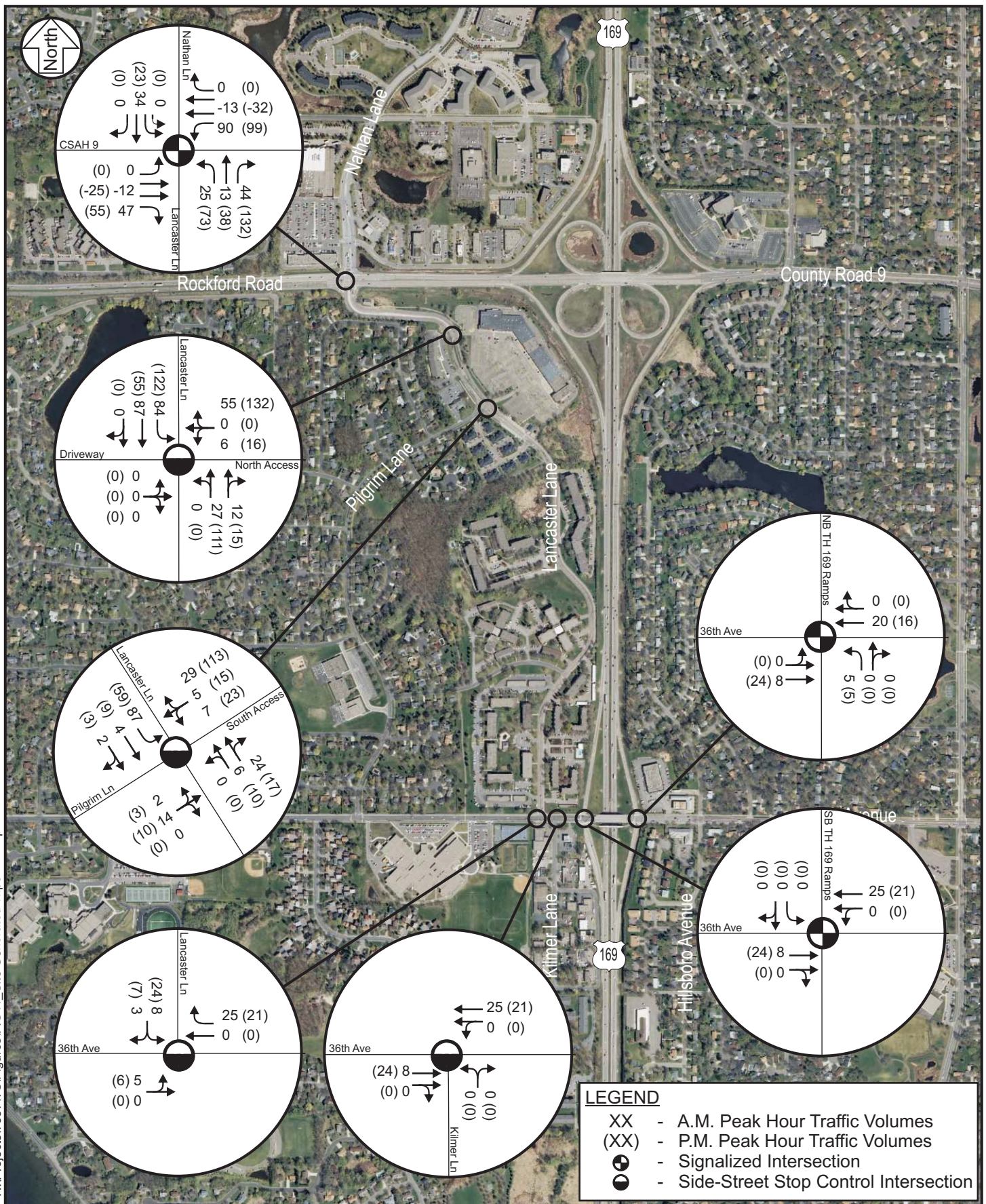


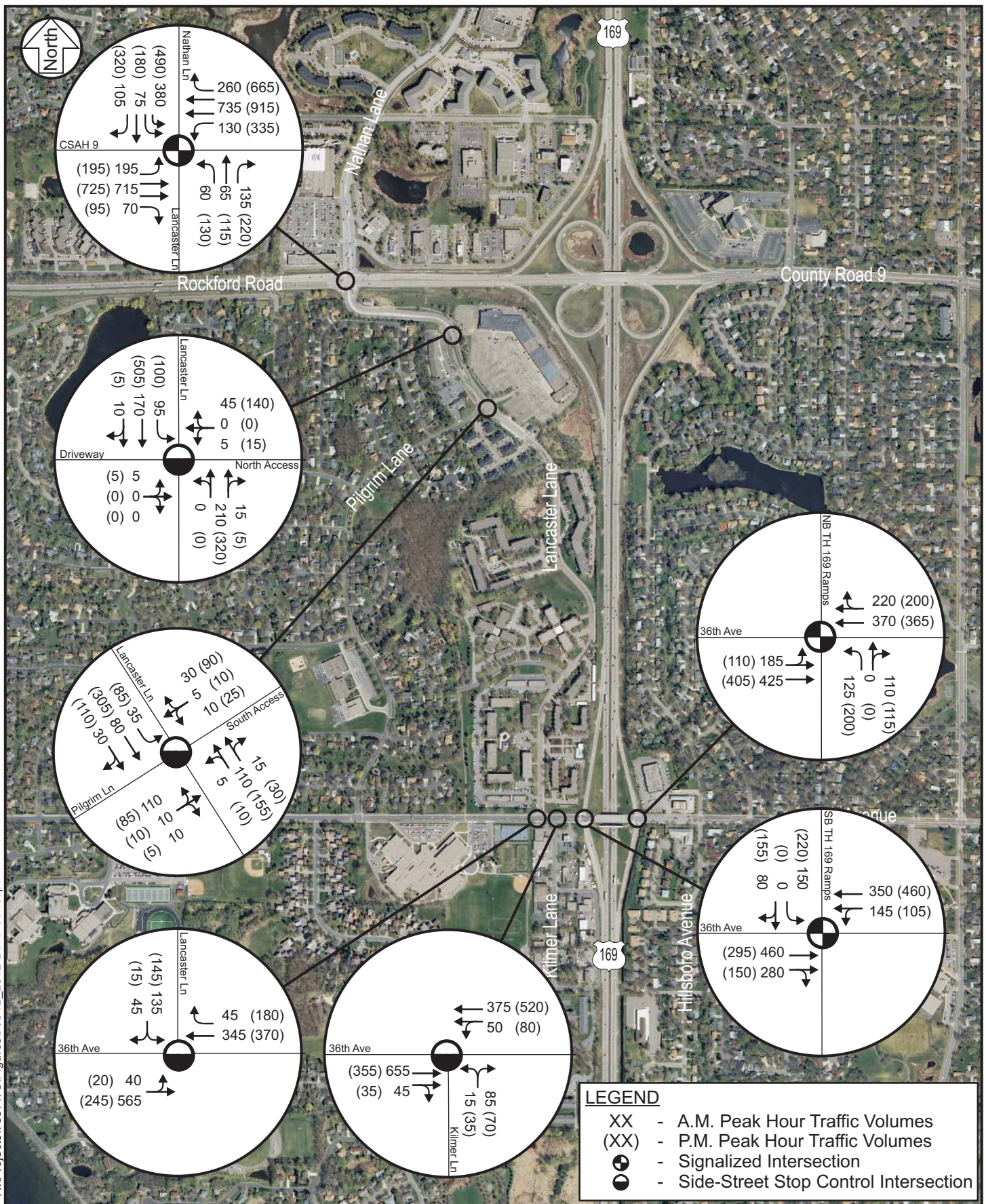
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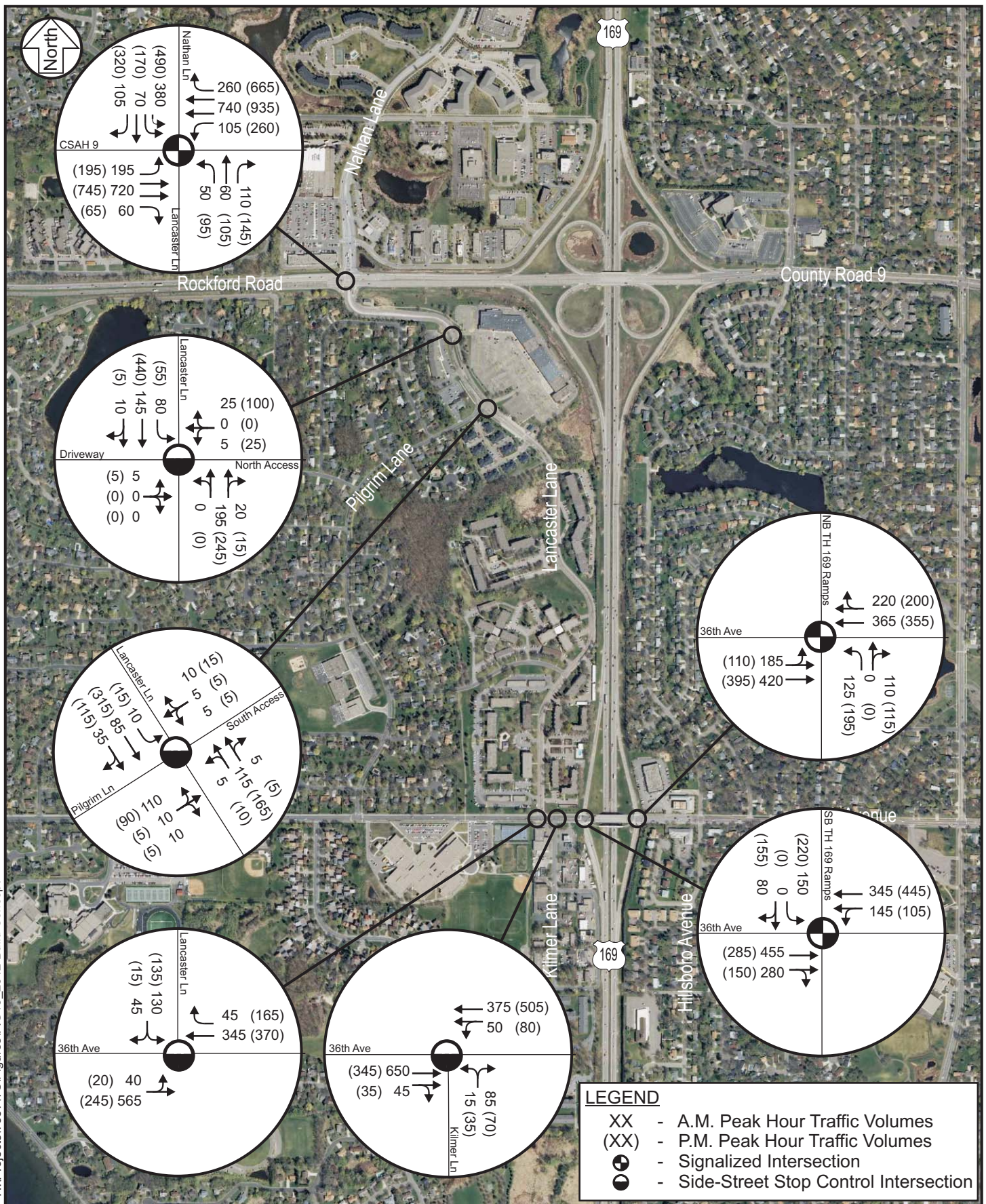


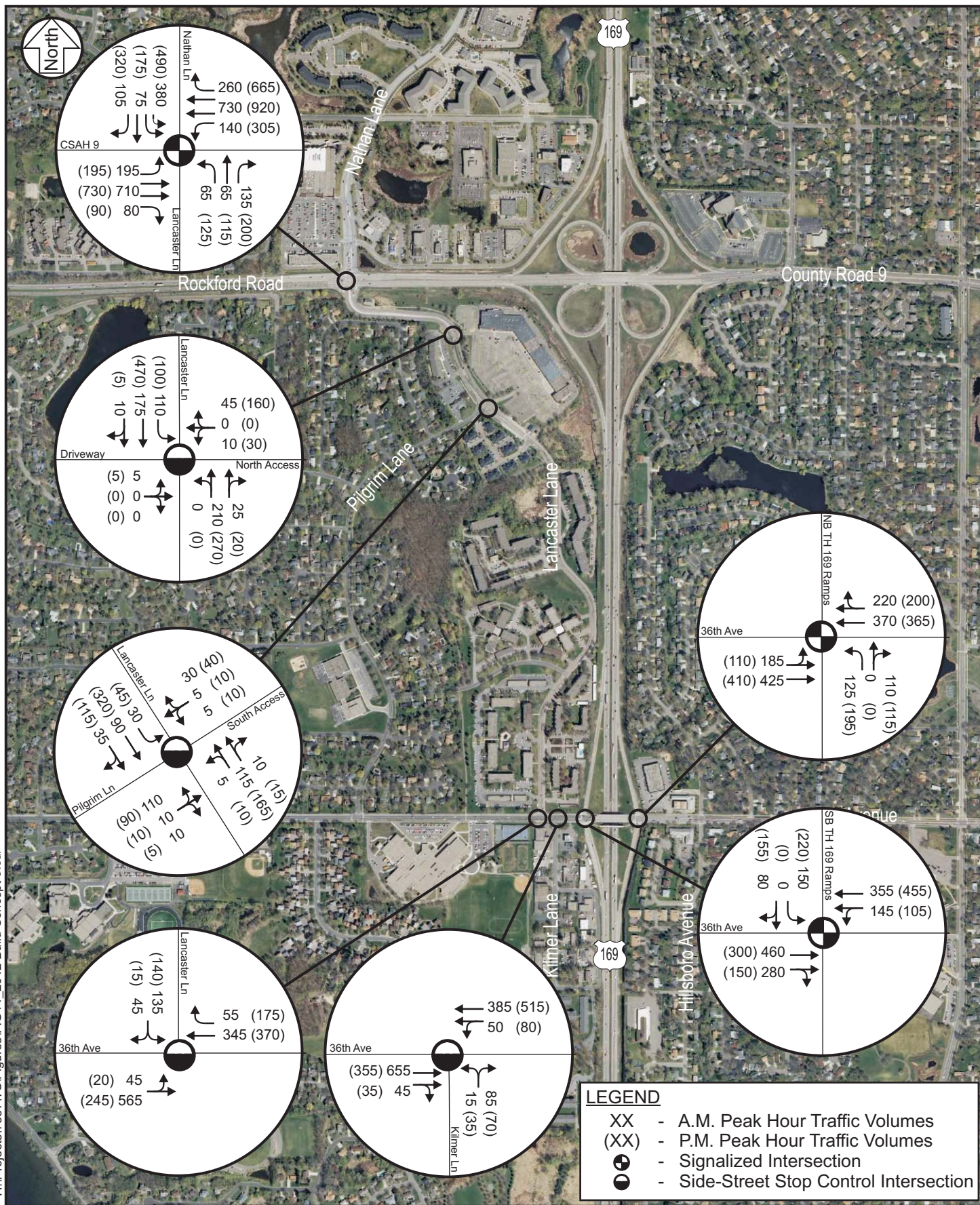


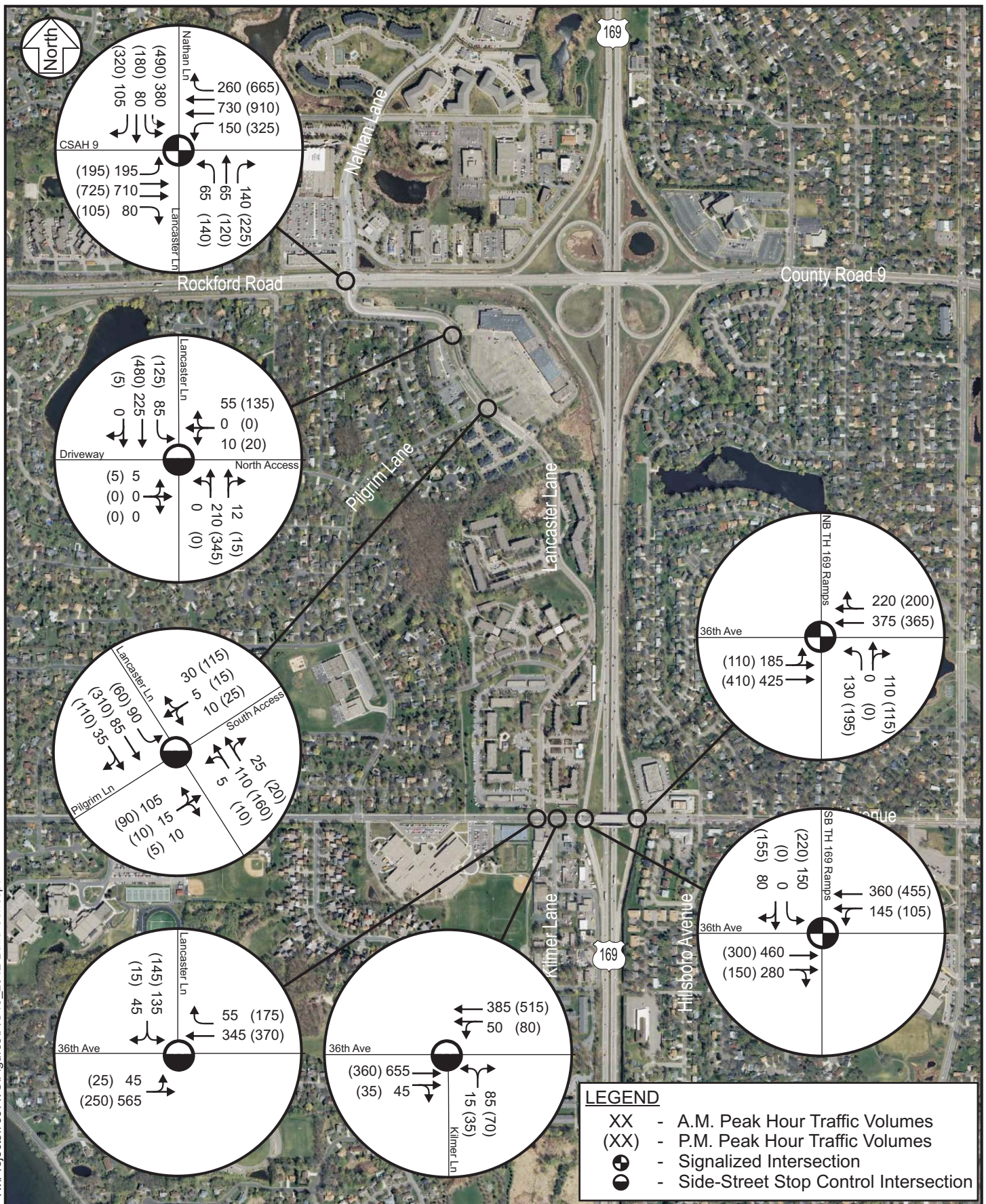












FUTURE CONDITIONS

To determine how well the existing and future roadway system would accommodate future traffic volumes, an a.m. and p.m. peak hour operations analysis was conducted for year 2012 no build and build conditions.

All key intersections were analyzed using the Synchro/SimTraffic software. Capacity analysis results identify a Level of Service (LOS), which indicates how well an intersection is operating. The LOS results are based on average delay per vehicle. Intersections are given a ranking from LOS A through LOS F. LOS A indicates the best traffic operation and LOS F indicates an intersection where demand exceeds capacity. In the Twin Cities metropolitan area, LOS A through D is generally considered acceptable by drivers.

For side-street stop controlled intersections, special emphasis is given to providing an estimate for the level of service of the minor approach. Traffic operations at unsignalized intersections 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 those 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 side-street approaches in most cases.

Year 2012 No Build Conditions

As shown in Table 5, all intersections are expected to continue to operate at an acceptable LOS D or better during the peak hours under year 2012 no build conditions with existing geometrics and signal timing.

Table 5
Year 2012 No Build Peak Hour Capacity Analysis
Level of Service Results

Intersection	Level of Service	
	A.M. Peak	P.M. Peak
	LOS	LOS
Rockford Road at Lancaster Lane/Nathan Lane	C	D
Lancaster Lane at North Access*	A/A	A/A
Lancaster Lane at Pilgrim Lane/South Access*	A/A	A/A
36th Avenue at East TH 169 Ramps	B	B
36th Avenue at West TH 169 Ramps	B	B
36th Avenue at Kilmer Lane*	A/A	A/A
36th Avenue at Lancaster Lane*	A/C	A/B

* Indicates an unsignalized intersection with side-street stop control. The overall LOS is followed by the worst approach LOS.

Year 2012 Build Conditions

As shown in Table 6 and 7, all intersections are expected to continue to operate at acceptable LOS D or better during the peak hours under year 2012 build conditions with existing geometrics and signal timing, with the exception of Rockford Road/Lancaster Lane/Nathan Lane.

Table 6
Year 2012 Build Peak Hour Capacity Analysis
Level of Service Results – Existing Geometrics and Signal Timing (A.M. Peak)

Intersection	Level of Service			
	Concept 1	Concept 2	Concept 3	Concept 4
	LOS	LOS	LOS	LOS
Rockford Road at Lancaster Lane/Nathan Lane	C	C	C	C
Lancaster Lane at North Access*	A/B	A/B	A/C	A/C
Lancaster Lane at Pilgrim Lane/South Access*	A/B	A/B	A/B	A/C
36th Avenue at East TH 169 Ramps	B	B	B	B
36th Avenue at West TH 169 Ramps	B	B	B	B
36th Avenue at Kilmer Lane*	A/B	A/B	A/B	A/B
36th Avenue at Lancaster Lane*	A/D	A/D	A/D	A/D

* Indicates an unsignalized intersection with side-street stop control. The overall LOS is followed by the worst approach LOS.

Table 7
Year 2012 Build Peak Hour Capacity Analysis
Level of Service Results – Existing Geometrics and Signal Timing (P.M. Peak)

Intersection	Level of Service			
	Concept 1	Concept 2	Concept 3	Concept 4
	LOS	LOS	LOS	LOS
Rockford Road at Lancaster Lane/Nathan Lane	E	D	D	E
Lancaster Lane at North Access*	A/D	A/C	A/D	A/E**
Lancaster Lane at Pilgrim Lane/South Access*	A/D	A/C	A/C	A/D
36th Avenue at East TH 169 Ramps	B	B	B	B
36th Avenue at West TH 169 Ramps	B	B	B	B
36th Avenue at Kilmer Lane*	A/B	A/B	A/B	A/B
36th Avenue at Lancaster Lane*	A/C	A/C	A/C	A/C

* Indicates an unsignalized intersection with side-street stop control. The overall LOS is followed by the worst approach LOS.

** The side street LOS E reported at this intersection is the Four Seasons Professional Building's driveway on the west side of Lancaster Lane, opposite of the north Four Seasons Mall access. The average side street delay for this driveway is approximately 35 seconds per vehicle during the p.m. peak hour. However, motorists leaving the Four Seasons Professional Building would likely avoid the delay at the northerly driveway and use their southern shared driveway with US Bank.

Modification of the signal timing at the Rockford Road/Lancaster Lane/Nathan Lane intersection during the p.m. peak hour would improve the traffic operations for each of the concepts back to similar levels experienced under the year 2012 no build conditions. Table 8 shows that all intersections are expected to operate at an acceptable LOS D or better during the peak hours under year 2012 build conditions with improved signal timing.

Table 8
Year 2012 Build Peak Hour Capacity Analysis
Level of Service Results – with Signal Timing Improvements (P.M. Peak)

Intersection	Level of Service			
	Concept 1	Concept 2	Concept 3	Concept 4
	LOS	LOS	LOS	LOS
Rockford Road at Lancaster Lane/Nathan Lane	D	D	D	D
Lancaster Lane at North Access*	A/D	A/C	A/D	A/E**
Lancaster Lane at Pilgrim Lane/South Access*	A/D	A/C	A/C	A/D
36th Avenue at East TH 169 Ramps	B	B	B	B
36th Avenue at West TH 169 Ramps	B	B	B	B
36th Avenue at Kilmer Lane*	A/B	A/B	A/B	A/B
36th Avenue at Lancaster Lane*	A/C	A/C	A/C	A/C

* Indicates an unsignalized intersection with side-street stop control. The overall LOS is followed by the worst approach LOS.

** The side street LOS E reported at this intersection is the Four Seasons Professional Building's driveway on the west side of Lancaster Lane, opposite of the north Four Seasons Mall access. The average side street delay for this driveway is approximately 35 seconds per vehicle during the p.m. peak hour. However, motorists leaving the Four Seasons Professional Building would likely avoid the delay at the northerly driveway and use their southern shared driveway with US Bank.

CONCLUSIONS AND RECOMMENDATIONS

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

- Under year 2012 no build conditions, all key intersections would operate at an acceptable LOS D or better during the a.m. and p.m. peak hours with existing traffic control and geometric layout.
- Under year 2012 build conditions, optimization of the signal timing at the intersection of Rockford Road/Nathan Lane during the p.m. peak hour is recommended in order to maintain the similar acceptable levels of service experienced under the year 2012 no build conditions at all key intersections for each of the illustrative redevelopment scenarios.