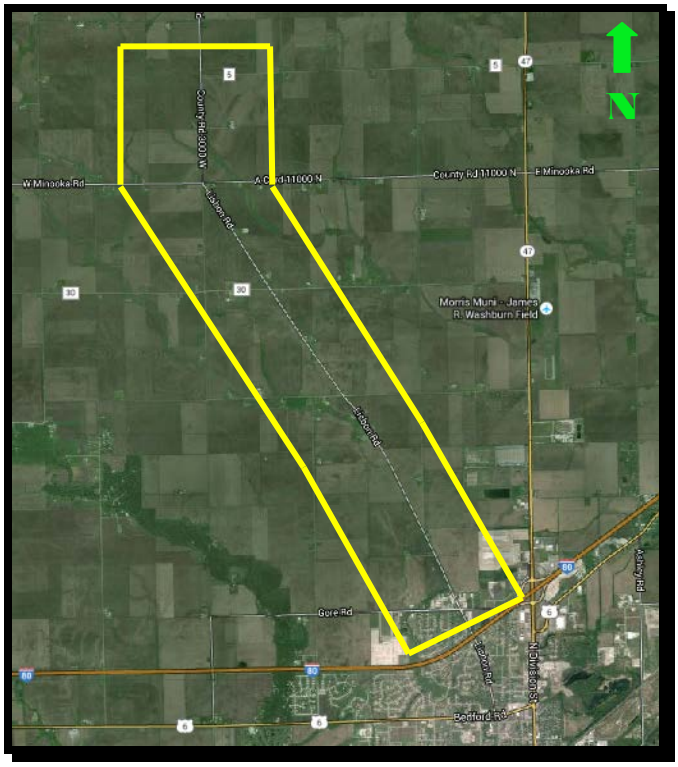
Lisbon Road
Corridor Access Study

Grundy County, Illinois



Prepared for

Grundy County Highway Department

Prepared by

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1.
Introduction

The Grundy County Highway Department retained the services of Kenig, Lindgren, O'Hara, Aboona, Inc. (KLOA, Inc.) to develop a corridor access plan for Lisbon Road in the City of Morris and unincorporated Grundy County, Illinois. Lisbon Road is an important County highway that connects U.S. Route 52 and Kendall County to the north with U.S. Route 6 and the City of Morris to the south.

The study limits for Lisbon Road extend over a 5.5-mile segment through Saratoga Township from Sherrill Road (Grundy County Line) on the north to Gore Road on the south. The majority of this segment of Lisbon Road, from Sherrill Road south to 896 feet north of the centerline of Gore Road, is located within unincorporated Grundy County and is under the jurisdiction of the Grundy County Highway Department. The roadway along this segment has a two-lane design with a rural cross-section (i.e., shoulders and drainage ditch). The remaining segment of Lisbon Road approaching Gore Road is located within the municipal limits of the City of Morris and is under the City's jurisdiction. The roadway along this segment widens to a three-lane design with an urban cross-section (i.e., curb and gutter).

The southern portion of the Lisbon Road corridor (south of Nelson Road) falls within the City of Morris' 1.5-mile planning area. The Morris Comprehensive Plan identifies Lisbon Road as an arterial roadway from Sherrill Road south to Minooka Road, and a collector roadway from Minooka Road south to Gore Road. Within the planning area, the Comprehensive Plan envisions the corridor developing with business park uses along the east side of the roadway, residential uses along the west side of the roadway, and commercial uses at the Gore Road and Nelson Road intersections. The Grundy County Comprehensive Plan envisions the land area to the north of Nelson Road remaining agricultural over the next 20 years and possibly beyond.

Prior to the Lisbon Road corridor becoming more developed, access and design guidelines are needed. As such, the purpose of this Corridor Access Study is to develop a roadway improvement plan that (1) accommodates the projected traffic levels generated by development growth that may occur along the corridor, (2) establishes future access points along the roadway, (3) defines the ultimate roadway cross-section, right-of-way requirements, intersection

geometrics and traffic controls, (4) achieves the County's functional and aesthetic vision of the roadway, and (5) attains consensus with the City of Morris on an acceptable roadway design.

Access management elements have been incorporated into the plan to balance mobility and access, so as to maintain an efficient movement of traffic while enhancing safe and efficient access to and from abutting properties. Since the current roadway grid along Lisbon Road is incomplete and to some degree spaced along the section lines at near one-mile intervals, the plan includes the locations of future connector roadways that will improve local traffic circulation, provide alternate means of property access, and can be constructed, in part or in total, by private developers as a condition of approval at the time that a subdivision or site plan is submitted to the governing agency for review.

2.
What Is Access Management?

"Access management is the systematic control of the location, spacing, design, and operations of driveways, median openings, interchanges, and street connections to a roadway."[1] Along busy commercial corridors, as Lisbon Road will eventually be, a well conceived access management plan serves to improve the movement of traffic while ensuring safe and efficient access to and from abutting properties. Some specific benefits of access management include:

- Safer and more efficient access to properties
- Fewer and less severe vehicle crashes
- Fewer vehicle/pedestrian conflicts
- Less traffic congestion
- Reduced travel delays
- Reduced fuel consumption and vehicle emissions
- Increased and preserved traffic capacity
- Enhanced corridor aesthetics

Access Management Elements

There are many access management techniques that can be used to improve traffic flow and enhance safety along a corridor. The primary elements of this corridor access study include: well-spaced and coordinated traffic signals and full access intersections, location of future connector roadways, landscaped medians, and auxiliary lanes. The objective is to accommodate most of the left-turn movements at the signalized intersections along the corridor.

Traffic Signal Spacing/Coordination and Connector Roads

The spacing of full access signalized and unsignalized intersections can have a dramatic influence on the safe and efficient movement of traffic along a corridor. Management of signal spacing includes planning for the frequency of signals, as well as the uniformity of their spacing.

[1] *Access Management Manual*, Transportation Research Board, Washington, D.C. 2003

The Grundy County Highway Access Regulation Ordinance (GCHARO) classifies Lisbon Road as an Access 3 roadway when defining access control standards. The minimum spacing of full access signalized and unsignalized intersections on Access 3 roadways is ¼-mile (1,320 feet). The Grundy County access standards are consistent with the standards of other nearby counties such as Will County and Kane County.

The most efficient location for the future infill of connector roadways and property access drives within the existing roadway grid along Lisbon Road is likely to occur by the extension of existing east-west roadways (i.e., Granville Road, Prologis Parkway) or at the ¼-mile point to maintain a proportional roadway grid. To maintain efficient traffic signal operations and traffic flow progression at this spacing standard, all future signals within the Lisbon Road corridor should be interconnected into a coordinated signal system.

Landscaped Center Median

A landscaped center median can be a very effective access management tool because it separates directional traffic flow, limits the locations of left-turn movements, provides a refuge area for pedestrians crossing the roadway, and enhances community appearance. Left-turn movements adversely impact traffic flow and are far more likely to be involved in vehicular crashes than right-turn movements. The installation of a landscaped median has the effect of restricting driveway and minor cross-street turning movements to right-turn movements only. In addition, vehicular-pedestrian crash rates are typically less than one-half that of roadways with a two-way left-turn lane.

Auxiliary Lanes

Deceleration lanes for left- and right-turns provide an effective way to limit the speed differential between turning vehicles and through vehicles. Left- and right-turn lanes are needed to maintain traffic progression on major signalized collector or arterial roadways. The GCHARO indicates that left-turn lanes “are mandatory for all major and minor use generators”, which would include intersections with significant collector and arterial roadways. The GCHARO further specifies that right-turn lanes “should be installed at an access on a County highway if the average daily two-way volume at the access is at least 1,000 vehicles and the average peak hour entering right-turn volume is at least 20 vehicles. Other factors such as the highway design speed, the number of highway approach lanes, composition of access traffic, and adjacent highway alignment should influence the need for a deceleration lane regardless of whether the volumes mentioned above are achieved.”

3.
Existing Traffic Conditions

Transportation conditions in the Lisbon Road corridor were inventoried to create a database for analyzing existing and projected future conditions. Three general components of existing conditions were considered, including:

1. Characteristics of the roadways, including lane configuration, intersection traffic controls, and speed limits
2. Existing weekday traffic volumes
3. Intersection operations

Corridor Study Limits

The study limits for the Lisbon Road corridor extend over a 5.5-mile segment through Saratoga Township from Sherrill Road on the north to Gore Road on the south. Six (6) intersections were evaluated and analyzed within the study limits, as follows:

1. Lisbon Road / Sherrill Road
2. Lisbon Road / Minooka Road / Saratoga Road
3. Lisbon Road / Airport Road
4. Lisbon Road / Nelson Road
5. Lisbon Road / Middle Road
6. Lisbon Road / Gore Road

Figure 1 shows the Lisbon Road corridor study area with respect to the surrounding roadway system. Figure 2 shows an aerial view of the corridor study area with the study intersections highlighted.

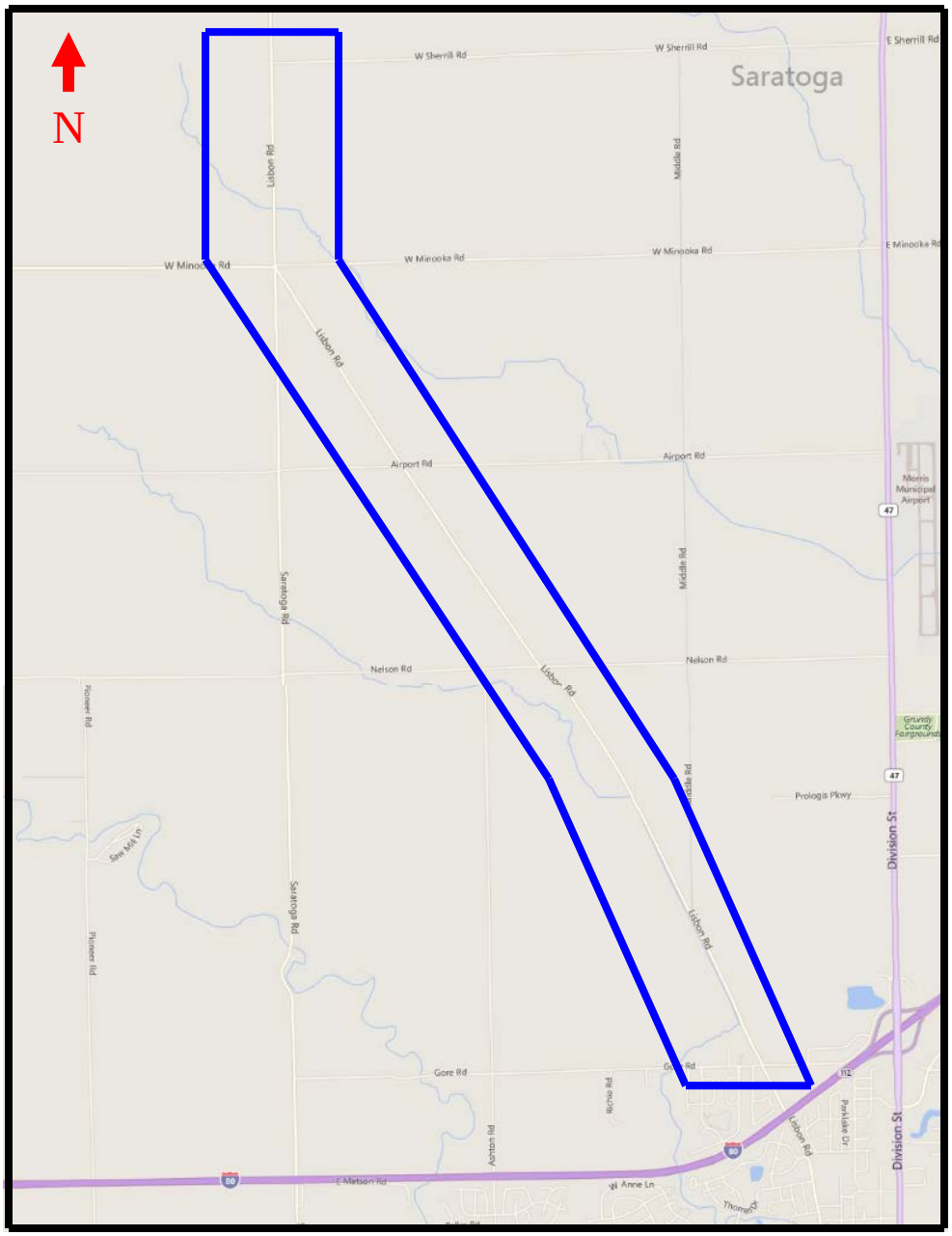


Figure 1
CORRIDOR STUDY LIMITS

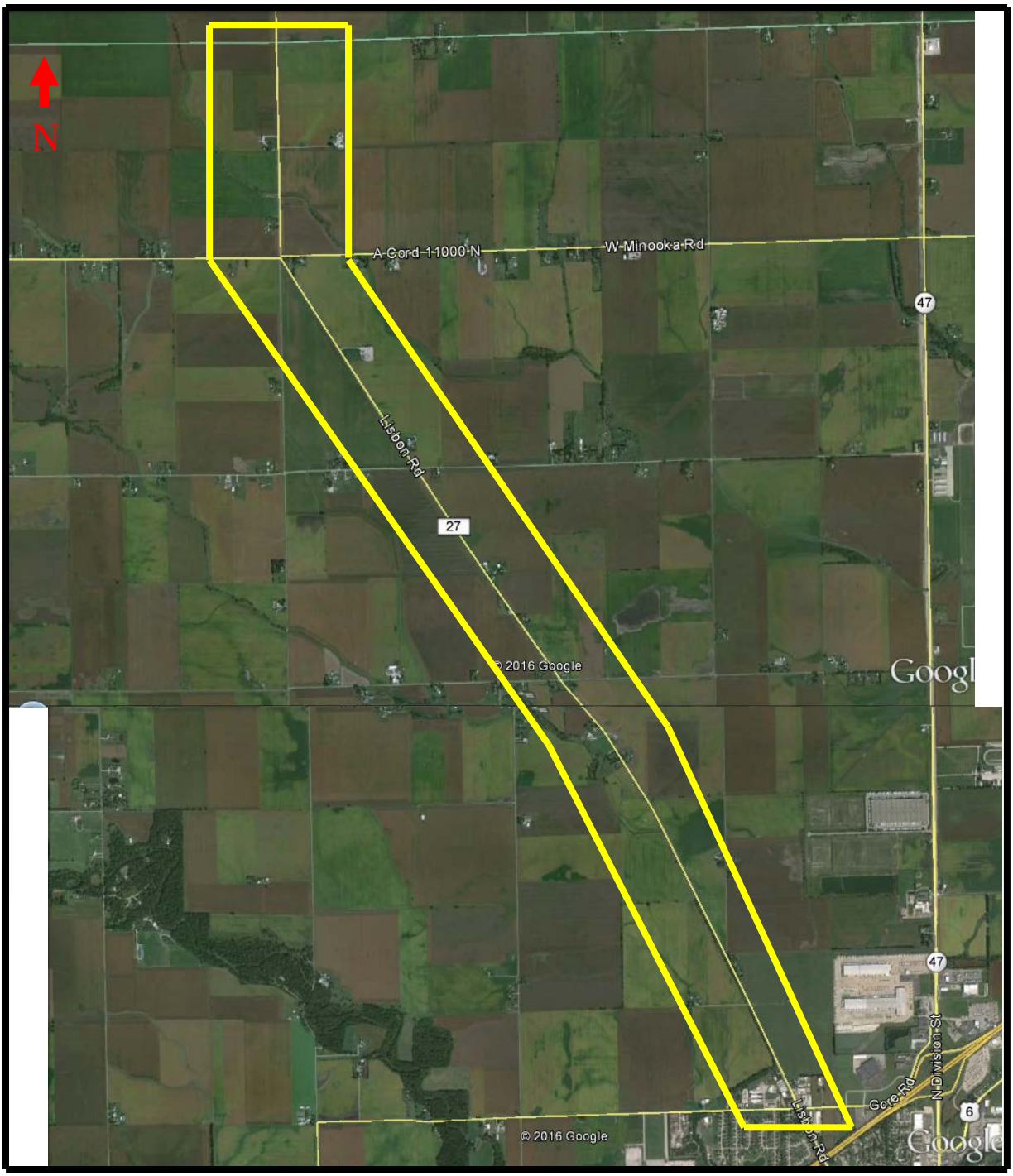


Figure 2
AERIAL VIEW OF CORRIDOR STUDY AREA

Existing Traffic Volumes

Traffic volume and vehicle classification data was collected or obtained by KLOA, Inc. as part of the corridor access study. The data was summarized on a 24-hour basis and for the weekday peak hours.

Average Daily (24-Hour) Traffic Volumes

Average daily traffic volume and vehicle classification data for the study area roadways was collected by KLOA, Inc. on Tuesday, January 12, 2016. The traffic volume data indicates that Lisbon Road presently carries from approximately 565 vehicles per day (vpd) at the north end of the corridor to approximately 1,345 vpd at the south end of the corridor, as shown in Table 1. The vehicle classification data indicates that approximately 3.5 to 7.8 percent of the daily traffic on Lisbon Road is comprised of heavy vehicles, including single unit trucks, multi-unit trucks, and buses. The traffic volume data is comparable to historic traffic volume data collected by the Illinois Department of Transportation (IDOT) in 2010, which indicated traffic levels ranging from 850 vehicles per day at the north end of the corridor to 1,450 vehicles per day at the south end.

Table 1
EXISTING DAILY (24-HOUR) TRAFFIC VOLUMES

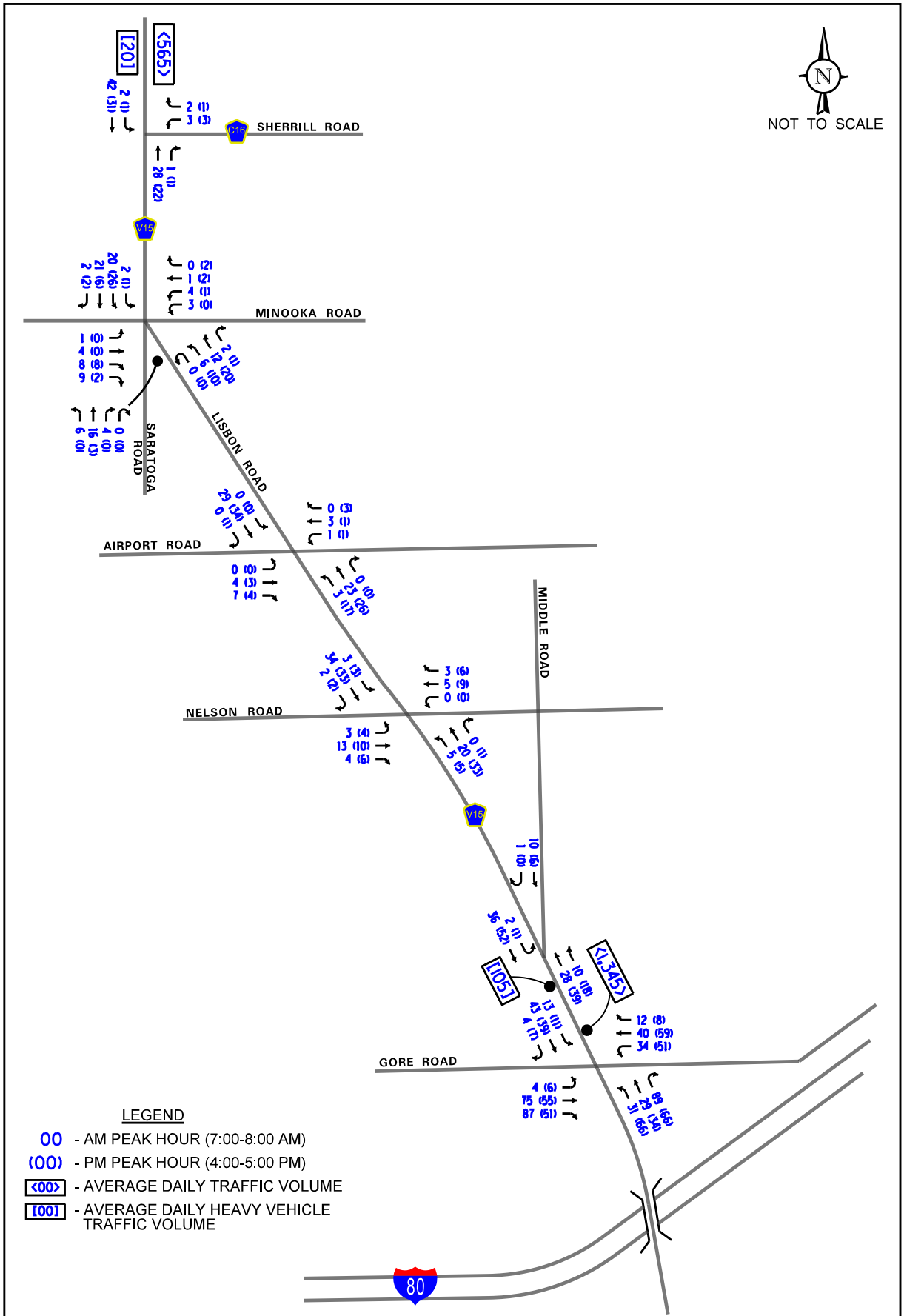
	Two-Way Traffic Volume			
Roadway Segment	Passenger Vehicles	Heavy Vehicles[1]	Total Vehicles	Percent Heavy Vehicles (%)
Lisbon Road (North of Sherrill Road)	545	20	565	3.5
Lisbon Road (North of Gore Road)	1,240	105	1,345	7.8

[1] Consists of single unit trucks, multi-unit trucks, and buses

Peak Hour Intersection Traffic Volumes

Traffic volumes were also collected at the six study intersections along Lisbon Road on Tuesday, January 12, 2016 during the weekday morning and evening commuter peak periods. From the traffic count data, the peak hours of traffic activity were determined to be 7:00-8:00 A.M. in the morning and 4:00-5:00 P.M. in the evening.

The existing peak hour traffic volumes and 24-hour volumes are shown in Figure 3.



PROJECT:	TITLE:	
Lisbon Road Corridor Access Study Grundy County, Illinois	EXISTING TRAFFIC VOLUMES	KLOA Job No: 16-008 Figure: 3

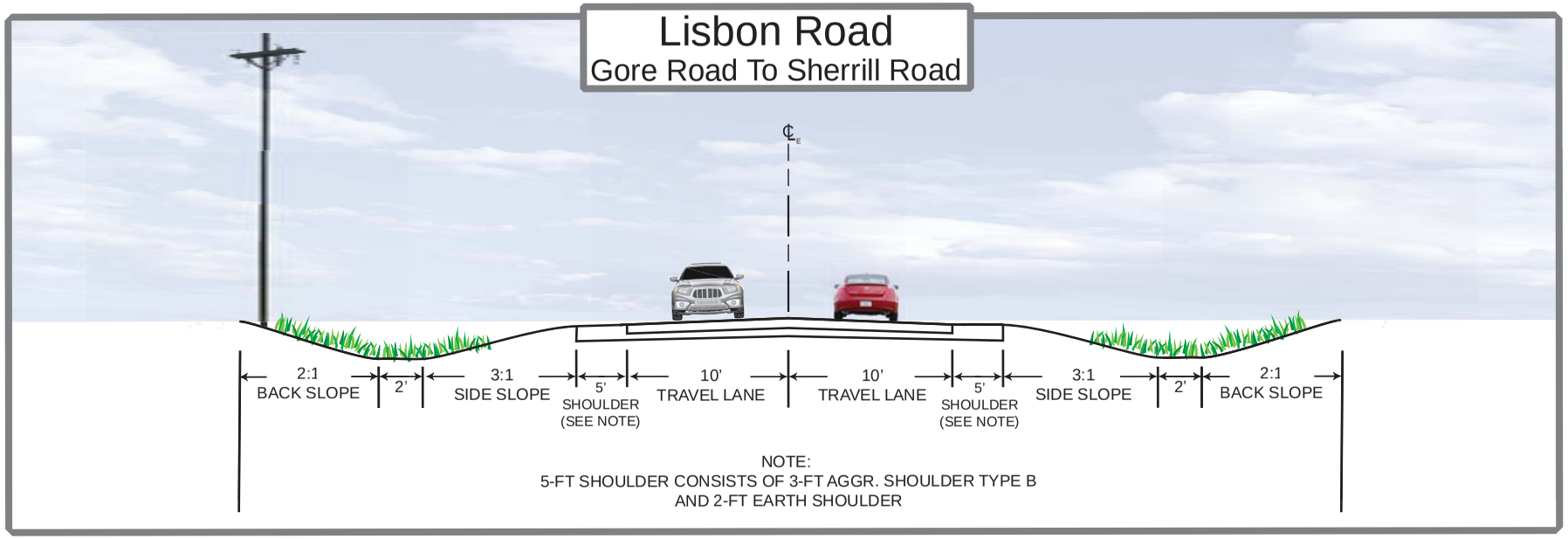
Existing Roadway Conditions

KLOA, Inc. obtained roadway design plans from the Grundy County Highway Department for the County's resurfacing project in 2000 and from the Costco Distribution Center's planned roadway widening and resurfacing project in 2016. KLOA then conducted an extensive field review of the corridor and the intersections in the study area to identify the physical and operational aspects of the roadway system.

Figure 4 illustrates the existing typical cross section of Lisbon Road outside of the Morris municipal limits. As shown, the roadway is designed to rural standards with aggregate/earth shoulders and open drainage swales, except for the segment of Lisbon Road within the Morris municipal limits which is designed to urban standards with curb and gutter. Grundy County has a prescriptive easement for Lisbon Road with no recorded public right-of-way as the private property lines extend to the centerline of the roadway.

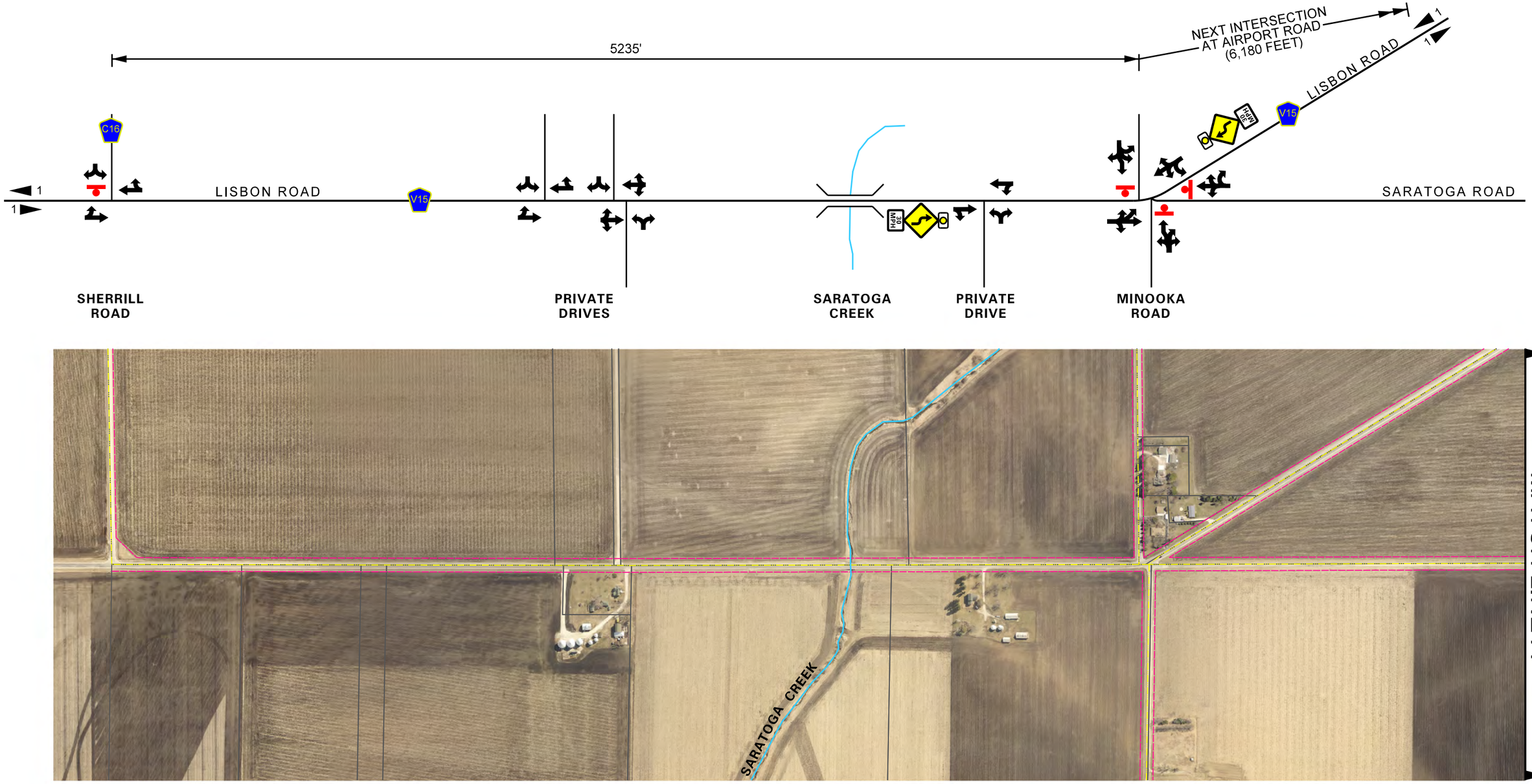
Figures 5, 6, 7 and 8 illustrate the existing property lines, lane geometrics, traffic controls, and intersection spacing along Lisbon Road. The following paragraphs describe Lisbon Road and the roadways that intersect Lisbon Road within the corridor.

Lisbon Road (County Highway V15) is an undivided, north/northwest to south/southeast roadway that extends approximately 8.75 miles from U.S. Route 52 in the Village of Lisbon on the north to U.S. Route 6 (Bedford Road) in the City of Morris on the south. The segment of Lisbon Road under study (Sherrill Road to Gore Road) is under the jurisdiction of the Grundy County Highway Department (GCHD) from Sherrill Road south to 896 feet north of the centerline of Gore Road and under City of Morris jurisdiction for the 896 feet leading up to Gore Road. The segment under Grundy County jurisdiction has a two-lane rural cross-section with shoulders and drainage ditch and the segment under Morris jurisdiction has a three-lane urban cross-section with curb and gutter. Lisbon Road is functionally classified by IDOT as a minor arterial road within the Morris urban area and a major collector road outside of the` Morris urban area. The Morris Comprehensive Plan identifies Lisbon Road as an arterial roadway from Sherrill Road south to Minooka Road and a collector roadway from Minooka Road south to Gore Road. Lisbon Road is also classified in the Grundy County Highway Access Regulation Ordinance (GCHARO) as an Access 3 roadway when defining intersection spacing and traffic control standards. There are no posted speed limits on Lisbon Road to the north of Gore Road and the roadway was observed to operate within the Illinois statutory maximum speed limit of 55 mph. The posted speed limit on Lisbon Road to the south of Gore Road is 25 mph.



℄E - EXISTING ROADWAY CENTERLINE

PROJECT:	TITLE:	
LISBON ROAD CORRIDOR ACCESS STUDY GRUNDY COUNTY, ILLINOIS	EXISTING TYPICAL CROSS SECTION	KLOA Job No: 16-008 Figure: 4



LEGEND

- INTERSECTION GEOMETRICS
- # NUMBER OF LANES
- STOP SIGN
- EXISTING TRAFFIC SIGNAL
- EXISTING CENTERLINE
- PRESCRIPTIVE EASEMENT
- PROPOSED RIGHT-OF-WAY
- PROPERTY LINE

N

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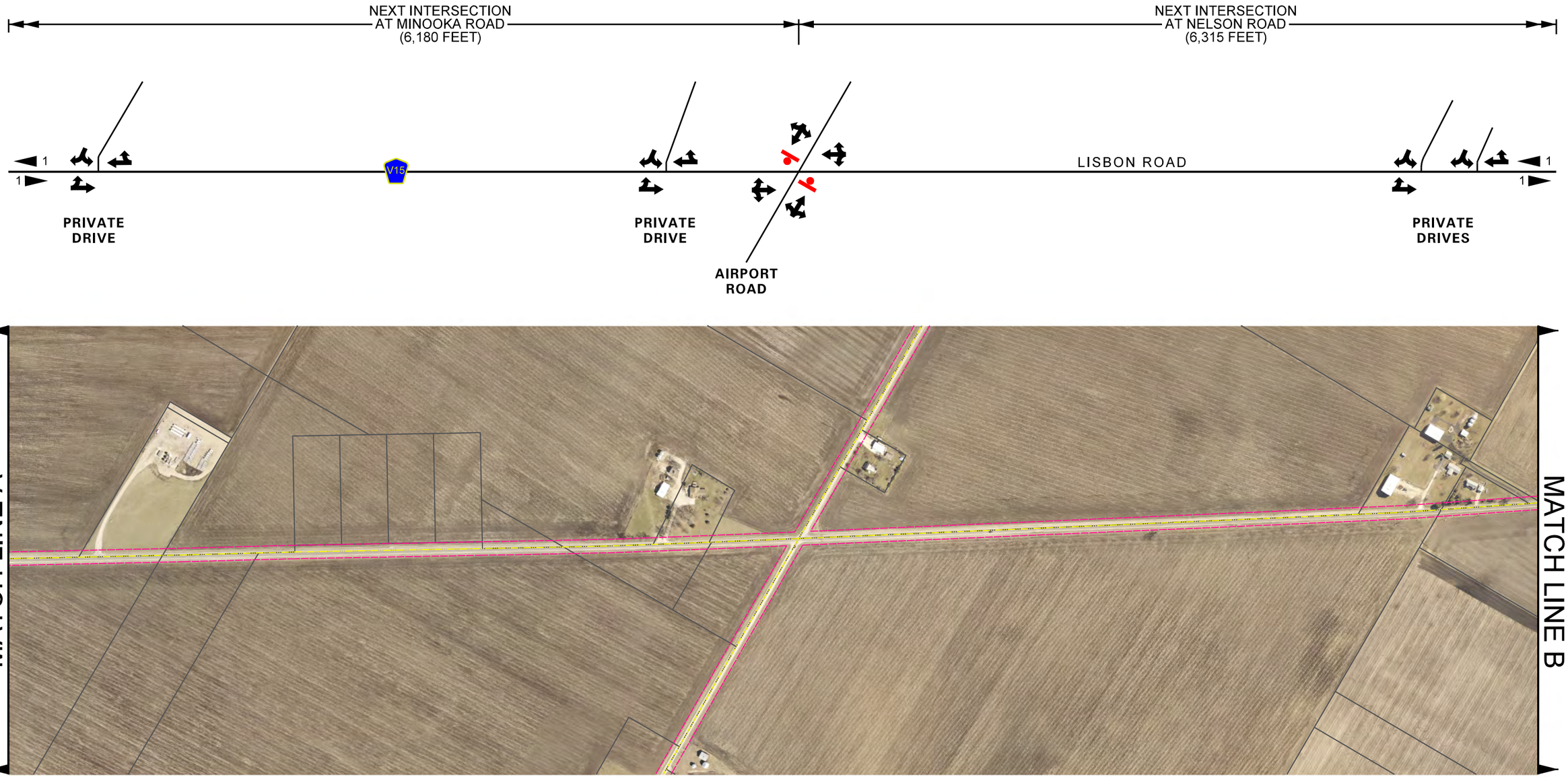
DESIGNED	-	EDR
DRAWN	-	MD
CHECKED	-	EDR
DATE	-	10-31-2016

SCALE: 1" = 500'
0' 500' 1000'

LISBON ROAD
CORRIDOR ACCESS STUDY
GRUNDY COUNTY, ILLINOIS

EXISTING CONDITIONS
LISBON ROAD: SHERRILL ROAD TO MINOOKA ROAD

FIGURE NO. 5



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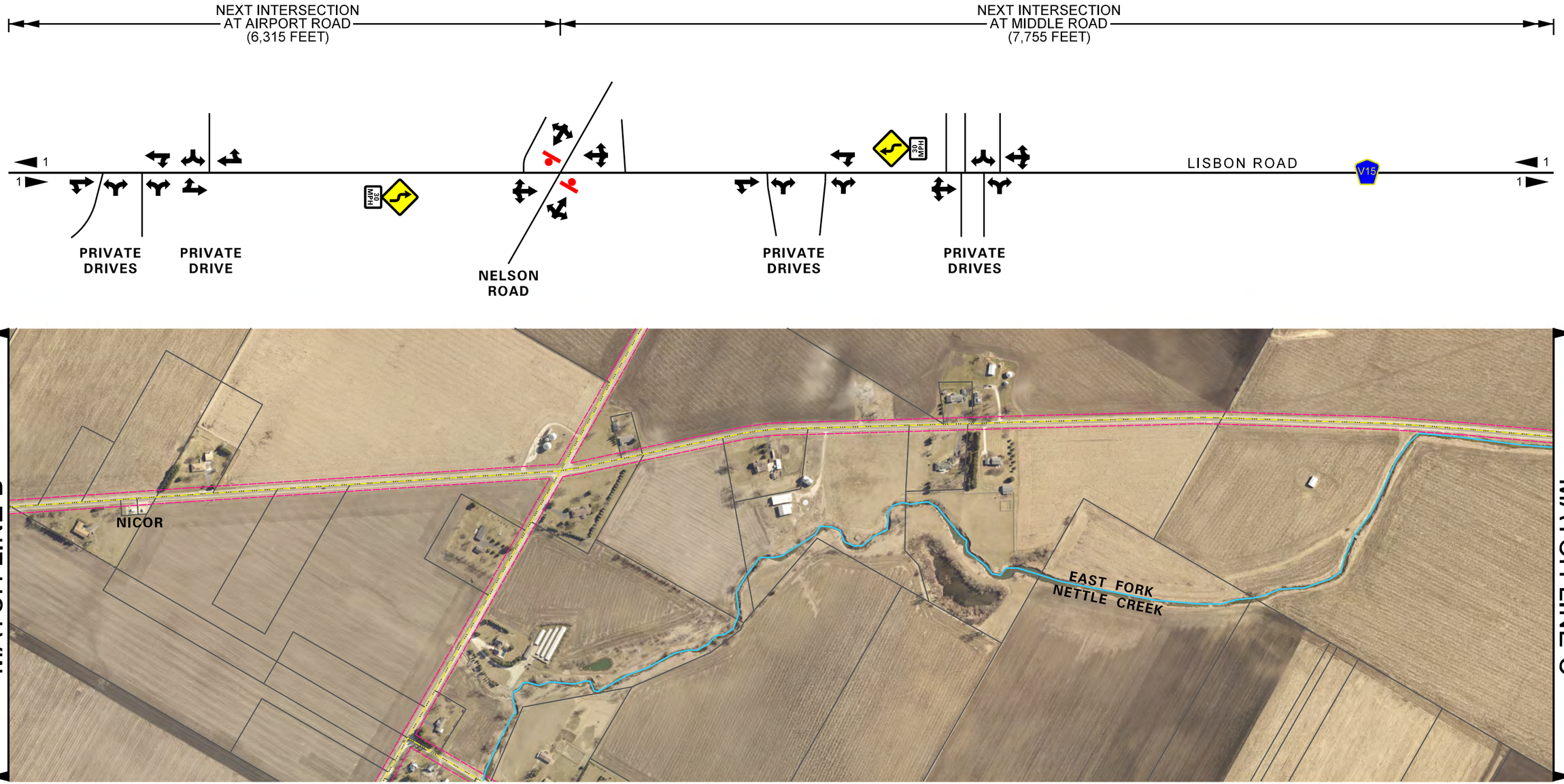
LISBON ROAD
CORRIDOR ACCESS STUDY
GRUNDY COUNTY, ILLINOIS

EXISTING CONDITIONS
LISBON ROAD: MINOOKA ROAD TO NELSON ROAD

FIGURE NO.
6



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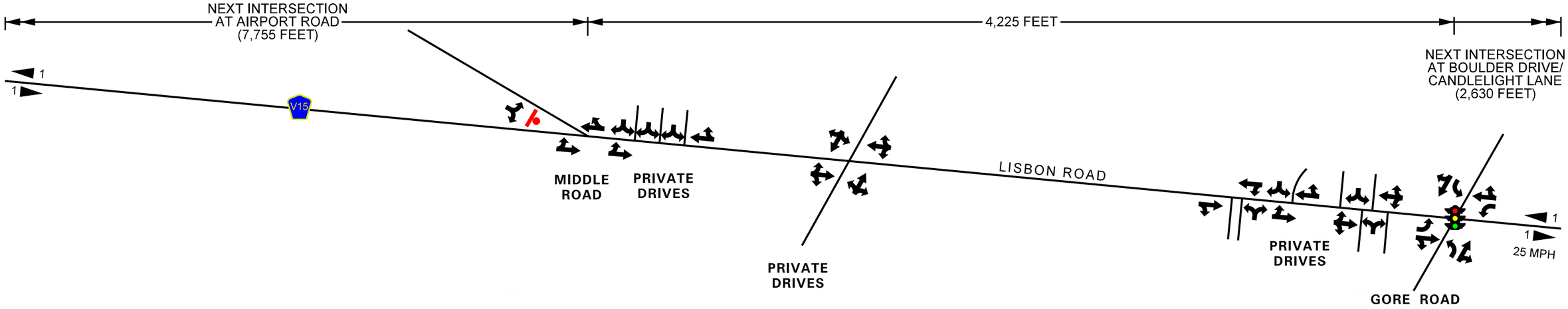
LISBON ROAD
CORRIDOR ACCESS STUDY
GRUNDY COUNTY, ILLINOIS

EXISTING CONDITIONS
LISBON ROAD: NELSON ROAD TO MIDDLE ROAD

FIGURE NO.
7



LEGEND

- INTERSECTION GEOMETRICS
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0' 500' 1000'

LISBON ROAD
CORRIDOR ACCESS STUDY
GRUNDY COUNTY, ILLINOIS

EXISTING CONDITIONS
LISBON ROAD: MIDDLE ROAD TO GORE ROAD

FIGURE NO. 8

Sherrill Road (County Highway C16) is a two-lane, undivided, east-west roadway that extends from Lisbin Road east to O'Brien Road in Aux Sable Township. Sherrill Road is under the jurisdiction of the GCHD from Lisbin Road to Ashley Road, and the Kendall County Highway Department (County Highway 5) from Ashley Road to O'Brien Road. Sherrill Road is classified as a local street by IDOT and a collector road by the City of Morris and Village of Channahon. Sherrill Road is also classified in the GCHARO as an Access 3 roadway. Sherrill Road has a rural cross-section and carries approximately 175 vehicles per day in the vicinity of Lisbon Road. The intersection of Sherrill Road with Lisbon Road is under stop control on Sherrill Road. There are no posted speed limits on Sherrill Road in the vicinity of Lisbon Road and the roadway was observed to operate within the Illinois statutory maximum speed limit of 55 mph.

Minooka Road is a two-lane, undivided, east-west roadway that extends from E. 27th Road in LaSalle County on the west to Ridge Road in Minooka on the east where it continues east as Mondamin Street. Minooka Road has a rural cross-section and is under the jurisdiction of Saratoga Township in the vicinity of Lisbon Road. Minooka Road is classified as a local road by IDOT and an arterial road by the City of Morris. The five-way intersection of Minooka Road with Lisbon Road and Saratoga Road is under stop control on Minooka Road and Saratoga Road. Minooka Road carries approximately 400 vpd to the west of Lisbon Road and approximately 300 vpd to the east of Lisbon Road. There are no posted speed limits on Minooka Road in the vicinity of Lisbon Road and the roadway was observed to operate within the Illinois statutory maximum speed limit of 55 mph.

*Saratoga Road i*s a two-lane, undivided, north-south roadway that extends from Lisbon Road/Minooka Road south to Old Stage Road. Saratoga Road has a rural cross-section and is under the jurisdiction of Saratoga Township in the vicinity of Lisbon Road. Saratoga Road is classified as a local road by IDOT and an arterial road by the City of Morris. The five-way intersection of Saratoga Road with Lisbon Road and Minooka Road is under stop control on Saratoga Road and Minooka Road. Saratoga Road carries approximately 325 vpd in the vicinity of Lisbon Road and there are no posted speed limits on the roadway.

Airport Road is a two-lane, undivided, east-west roadway that extends from LaSalle Road (LaSalle County line) on the west to IL Route 47 on the east. Airport Road has a rural cross-section and is under the jurisdiction of Saratoga Township in the vicinity of Lisbon Road. Airport Road is classified by IDOT as a major collector road within the Morris urban area to the west of IL 47 and a minor collector road to the west of the Morris urban area where the roadway crosses Lisbon Road. Airport Road is classified as a collector road by the City of Morris. The intersection of Airport Road with Lisbon Road is under stop control on Airport Road. Airport Road carries approximately 125 to 225 vpd in the vicinity of Lisbon Road and there are no posted speed limits on the roadway.

Nelson Road is a two-lane, undivided, east-west roadway that extends from Scott School Road on the west to IL Route 47 on the east. Nelson Road has a rural cross-section and is under the jurisdiction of Saratoga Township in the vicinity of Lisbon Road. Nelson Road is classified as a local road by IDOT and a collector road by the City of Morris. The intersection of Nelson Road with Lisbon Road is under stop control on Nelson Road. Nelson Road carries approximately 400 vpd in the vicinity of Lisbon Road and there are no posted speed limits on the roadway.

Middle Road is a two-lane, undivided, north-south roadway that extends from Lisbon Road north to Sherrill Road. Middle Road has a rural cross-section and is under the jurisdiction of Saratoga Township. Middle Road is classified as a local street by IDOT and as a collector road by the City of Morris. The intersection of Middle Road with Lisbon Road is under stop control on Middle Road. Middle Road carries approximately 100 vpd and there are no posted speed limits on the roadway.

Gore Road is an undivided, east-west roadway that extends from IL Route 47 (opposite Romines Drive) on the east in the City of Morris to Saratoga Road on the west in unincorporated Grundy County. In the vicinity of Lisbon Road, Gore Road has a three-lane, urban cross-section with one lane in each direction and a center left-turn lane. This segment of Gore Road is under the jurisdiction of the City of Morris. Gore Road is classified by IDOT as a minor arterial roadway between IL Route 47 and Ashton Road, and a local street west of Ashton Road. The City of Morris classifies Gore Road as a collector road. Gore Road is designated as a City truck route from IL Route 47 to approximately ½-mile west of Lisbon Road. Gore Road carries approximately 5,100 vpd to the east of Lisbon Road and approximately 1,950 vpd to the west of Lisbon Road. The intersection of Gore Road with Lisbon Road in under traffic signal control and there are no sidewalks, crosswalks or pedestrian signals at the intersection. The posted speed limit on Gore Road is 25 mph.

Public Transportation

There are presently no fixed-route transit services operating in the vicinity of the City of Morris. The only public transportation service currently available in the area is a dial-a-ride transit service provided by the Grundy Transit System (GTS) on weekdays between 6:00 A.M. and 6:00 P.M.

Non-Motorized Transportation

There are presently no bicycle or pedestrian facilities along Lisbon Road. The Morris Comprehensive Plan envisions bike paths along various segments of Gore Road, Ashton Road, and Minooka Road, and along Nettle Creek and the north-south utility corridor between Gore Road and Minooka Road.

Existing Intersection Operations

To evaluate existing traffic operations in the Lisbon Road corridor during the weekday peak-hour time periods, capacity analyses were conducted at all study intersections utilizing Synchro 8.0/Simtraffic computer software, which implements the Intersection Capacity Utilization (ICU) 2003 method and the methodologies outlined in the Transportation Research Board's *Highway Capacity Manual (HCM), 2010*. This software allows for the analysis of multiple interconnected traffic signal systems as well as independent signalized or unsignalized intersections. The methodologies utilize traffic controls, traffic volumes, heavy vehicle percentages, parking conditions, and other street characteristics to determine the average control delay, levels of service, and queuing of vehicles at an intersection.

The ability of an intersection to accommodate traffic flow is expressed in terms of Level of Service, which is assigned a letter grade from A to F based on the average control delay experienced by vehicles passing through the intersection. Control delay is that portion of the total delay attributed to the traffic signal or stop sign control operation, and includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Level of Service A is the highest grade (best traffic flow and least delay), Level of Service E represents saturated or at-capacity conditions, and Level of Service F is the lowest grade (oversaturated conditions, extensive delays). As indicated in the GCHARO, Level of Service C is the desired peak-hour service level for projected 20-year future traffic conditions.

For signal-controlled intersections, levels of service are calculated for lane groups, intersection approaches, and the intersection as a whole. For all-way stop controlled (AWSC) intersections, levels of service are calculated based on the weighted average of the delay on each of the approaches (the approach delay consists of the weighted average of the delay on each lane of the approach). For two-way stop controlled (TWSC) intersections, levels of service are only calculated for the approaches controlled by a stop sign (not for the intersection as a whole). Level of Service F at TWSC intersections occurs when there are not enough suitable gaps in the flow of traffic on the major (uncontrolled) street to allow minor-street traffic to safely enter the major street flow or cross the major street in a reasonable amount of time.

The *Highway Capacity Manual* definitions for levels of service and the corresponding control delay for signalized and unsignalized intersections are shown in the Appendix.

Table 2 summarizes the results of the capacity analyses for the existing weekday morning and afternoon peak-hour conditions, indicating the levels service and delay for the signalized intersection of Lisbon Road/Gore Road and the critical minor street movements at the remaining TWSC intersections. The capacity analysis worksheets are contained in the Appendix. The results indicate that all study area intersections along the Lisbon Road corridor presently operate at the highest level of service (A) under the existing traffic controls.

Table 2
CAPACITY ANALYSIS RESULTS – EXISTING TRAFFIC CONDITIONS

	Weekday AM Peak Hour		Weekday PM Peak Hour	
Intersection	LOS	Delay	LOS	Delay
Lisbon Road / Gore Road[1]	A	8.2	A	9.1
Lisbon Road / Sherrill Road[2]	A	9.6	A	8.7
Lisbon Road / Minooka Road / Saratoga Road[2]	A[3]	--	A[3]	--
Lisbon Road / Airport Road[2]	A	9.4	A	9.1
Lisbon Road / Nelson Road[2]	A	7.2	A	7.2
Lisbon Road / Middle Road[2]	A	9.0	A	9.1

Note: LOS = level of service Delay = seconds/vehicle

[1] Signalized intersection. LOS and average delay represents overall operating condition at the intersection.

[2] Unsignalized TWSC intersection. LOS and average delay shown for the critical approach under stop control.

[3] Because this intersection provides more than two approaches under stop sign control, an average vehicle delay cannot be determined in Synchro. Instead, the level of service of the intersection is based on a critical volume to saturation flow (v/s) evaluation also known as the Intersection Capacity Utilization (ICU) method.

4.
Future Land Use and Traffic Conditions

An assessment of future traffic conditions in the Lisbon Road corridor is an essential step in determining the ultimate design requirements for the roadway. The assessment was based on three key components: (1) the types and densities of land use anticipated to develop in the corridor, (2) the roadway system that will be developed to accommodate these land uses, and (3) the generation, distribution and assignment of the resulting traffic volumes from these land uses.

Based on a comparison of daily traffic volumes between that collected by KLOA, Inc. in 2016 and that published by IDOT in 2005, 2010 and 2015, Lisbon Road has not experienced a significant change in traffic over the past 10 years. This trend reflects a lack of growth along Lisbon Road during this period. The only significant volume change in the area is the doubling of traffic along Gore Road between Lisbon Road and IL 47 as new developments were constructed such as the Menards home improvement store. Most of the traffic growth on Gore Road though appears to be oriented to and from IL 47.

However, as land is developed along Lisbon Road over the next 20 years or more, the traffic volumes on the roadway and intersecting cross streets will increase. The aggregation of the traffic generated by these future developments with the existing traffic volumes comprise the projected traffic volumes utilized in this analysis. For the purpose of this study, a planning horizon of 24 years (i.e., Year 2040) was selected to coincide with the regional planning efforts of the Chicago Metropolitan Agency for Planning (CMAP), the horizon years of the Grundy County Comprehensive Plan and Morris Comprehensive Plan, and with the anticipated development of the land area within the corridor. In actuality, full buildout of the developable land in the Lisbon Road corridor may not occur for many years beyond 2040.

Future Development and Traffic Generation

Estimates of future development to the 2040 planning horizon were prepared by the City of Morris via a multi-step process based on the future land uses contained in the Morris Comprehensive Plan and the Grundy County Land Use Plan.

First the number of developable acres by land-use type was estimated based on an analysis of aerial mapping of the study area, existing land uses, existing property lines and rights-of-way, and natural (undevelopable) features. Next development ratios were determined based on development trends in the City. The development ratios are in units-per-acre for residential uses and floor-area-ratios (FAR) for industrial and commercial uses. Development ratios range from 3.0 to 6.0 units per acre for residential uses and from 0.2 to 0.35 FAR for industrial and commercial uses. Next, development densities were estimated by multiplying the developable acreage by the development ratios.

The future development densities were then utilized to calculate weekday peak-hour traffic volumes that would be generated by these developments using trip generation equations published by the Institute of Transportation Engineers (ITE) in the *Trip Generation Manual*, 9th Edition, 2012. Average daily (24-hour) traffic volumes were also calculated by dividing the peak-hour volumes by a nine percent peak-hour factor.

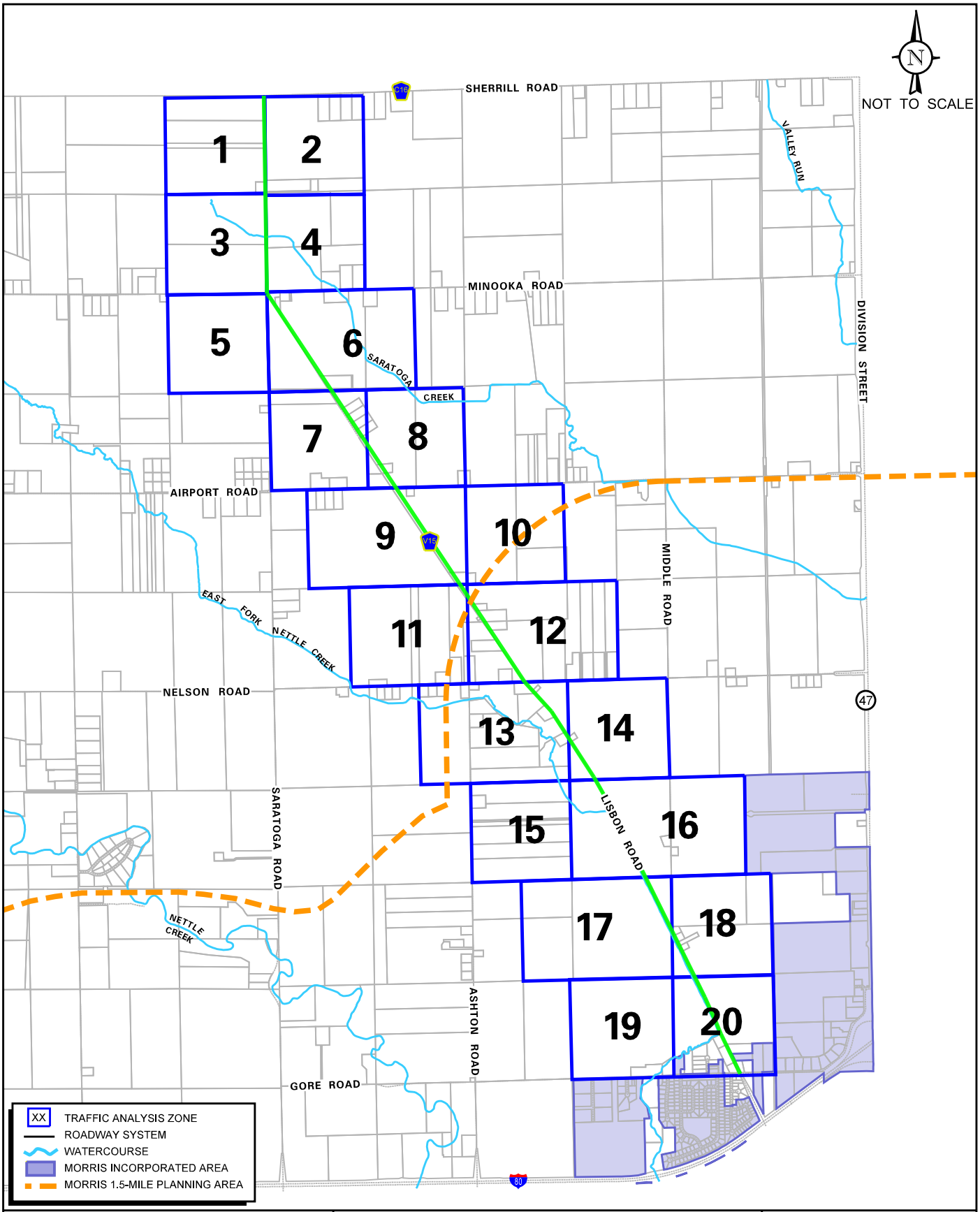
Due to the length of the Lisbon Road corridor (5.5 miles), the corridor was subdivided into 20 zones for traffic analysis purposes. Each zone has frontage on Lisbon Road, is generally equivalent in size (½-mile by ½-mile square), and is generally projected to contain parcels of similar land use. Figure 9 illustrates the boundaries of the traffic analysis zones (TAZs). A summary table of the future land-uses, developable acreage, development ratios, projected development densities, and weekday peak-hour traffic generation for each of the TAZs is contained in the Appendix.

Figures 10 illustrates where residential growth is anticipated to occur. Approximately 2,327 dwelling units are projected to be built along the west side of Lisbon Road between Gore Road and Nelson Road, split evenly between single-family housing units and multi-family apartment buildings.

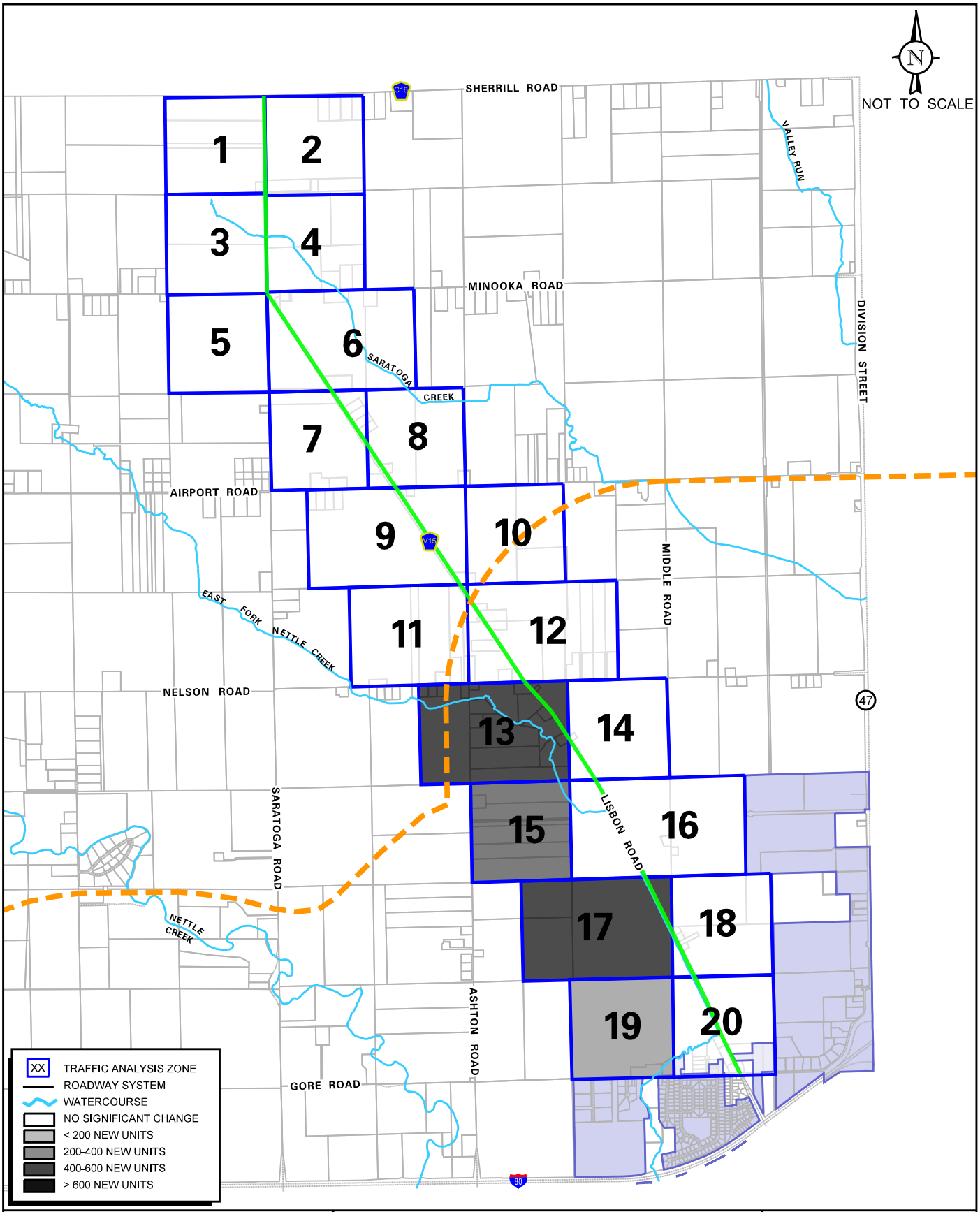
Figure 11 illustrates where retail growth is anticipated. Retail growth will occur in the form of neighborhood- and community-level centers around the Lisbon Road intersections with Gore Road and Nelson Road, and along Gore Road. Approximately 157,000 square feet of retail space is projected to develop in the future.

Figure 12 illustrates where industrial growth is anticipated. Approximately 5.6 million square feet of industrial space is projected to develop along the east side of Lisbon Road, between Gore Road and just north of Nelson Road, and on both sides of Lisbon Road at the Gore Road intersection. This growth would include the proposed Costco Meat Plant to the west/southwest of the existing Costco Depot along IL 47.

Figure 13 illustrates where office space is anticipated, generally in the form of a business park. Approximately 2.2 million square feet of space is projected to develop along the east side of Lisbon Road, between Gore Road and just north of Nelson Road, and on both sides of Lisbon Road at the Gore Road intersection.



PROJECT:	TITLE:	
Lisbon Road Corridor Access Study Grundy County, Illinois	TRAFFIC ANALYSIS ZONES	KLOA Job No: 16-008 Figure: 9

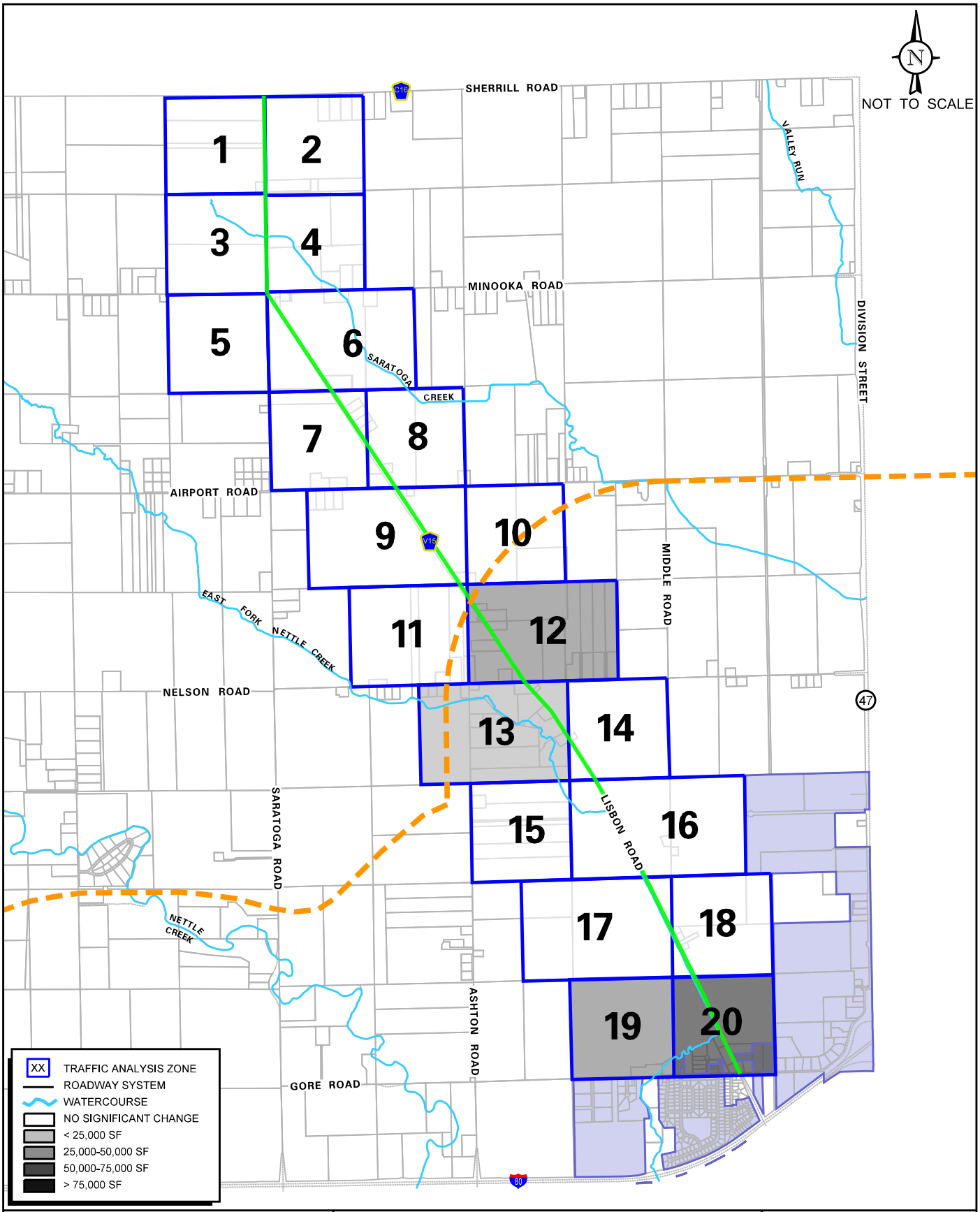


PROJECT:
Lisbon Road
Corridor Access Study
Grundy County, Illinois

TITLE:
RESIDENTIAL GROWTH TO 2040

KLOA
Job No: 16-008

Figure: 10

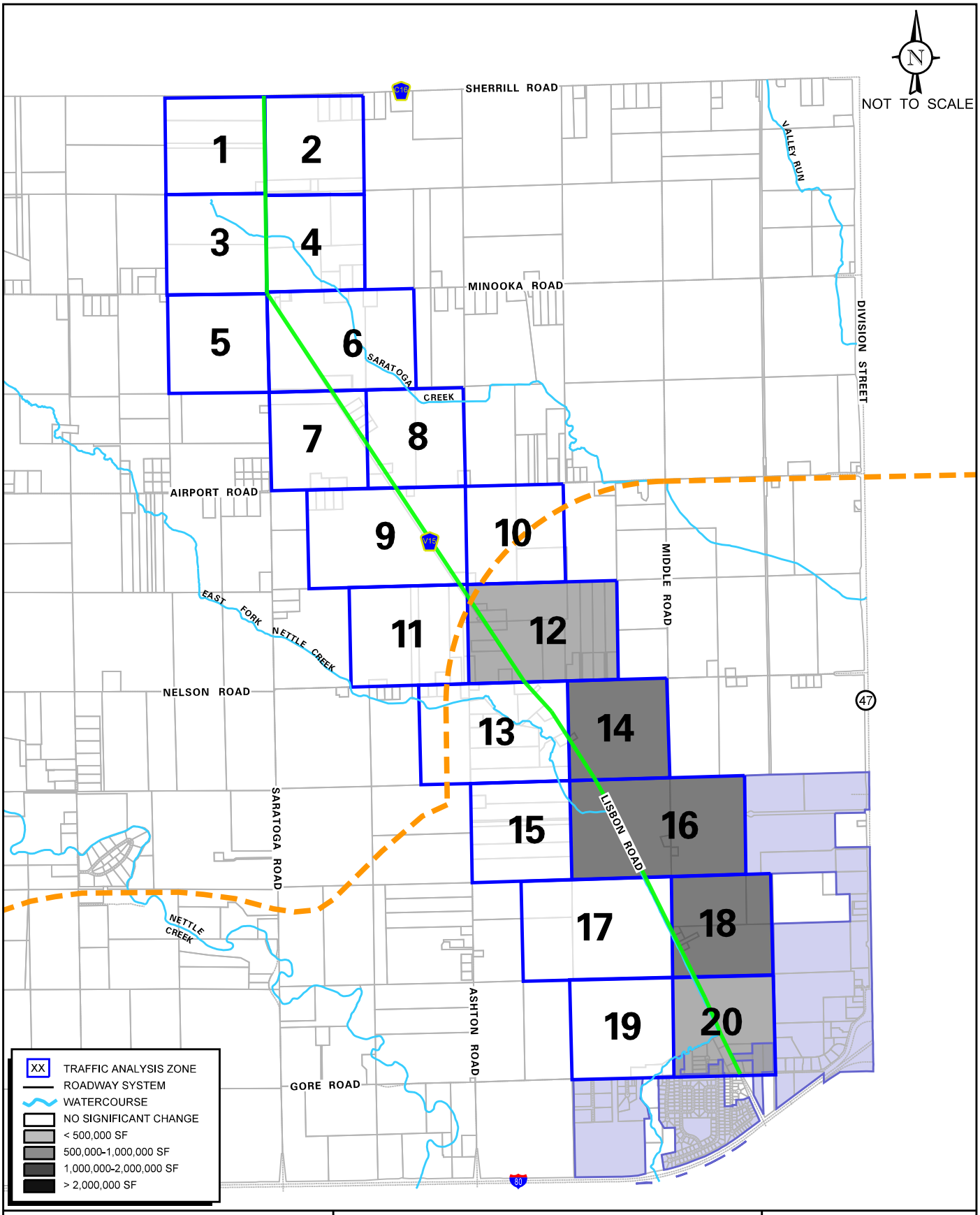


PROJECT:
Lisbon Road
Corridor Access Study
Grundy County, Illinois

TITLE:
RETAIL GROWTH TO 2040

KLOA
Job No: 16-008

Figure: 11

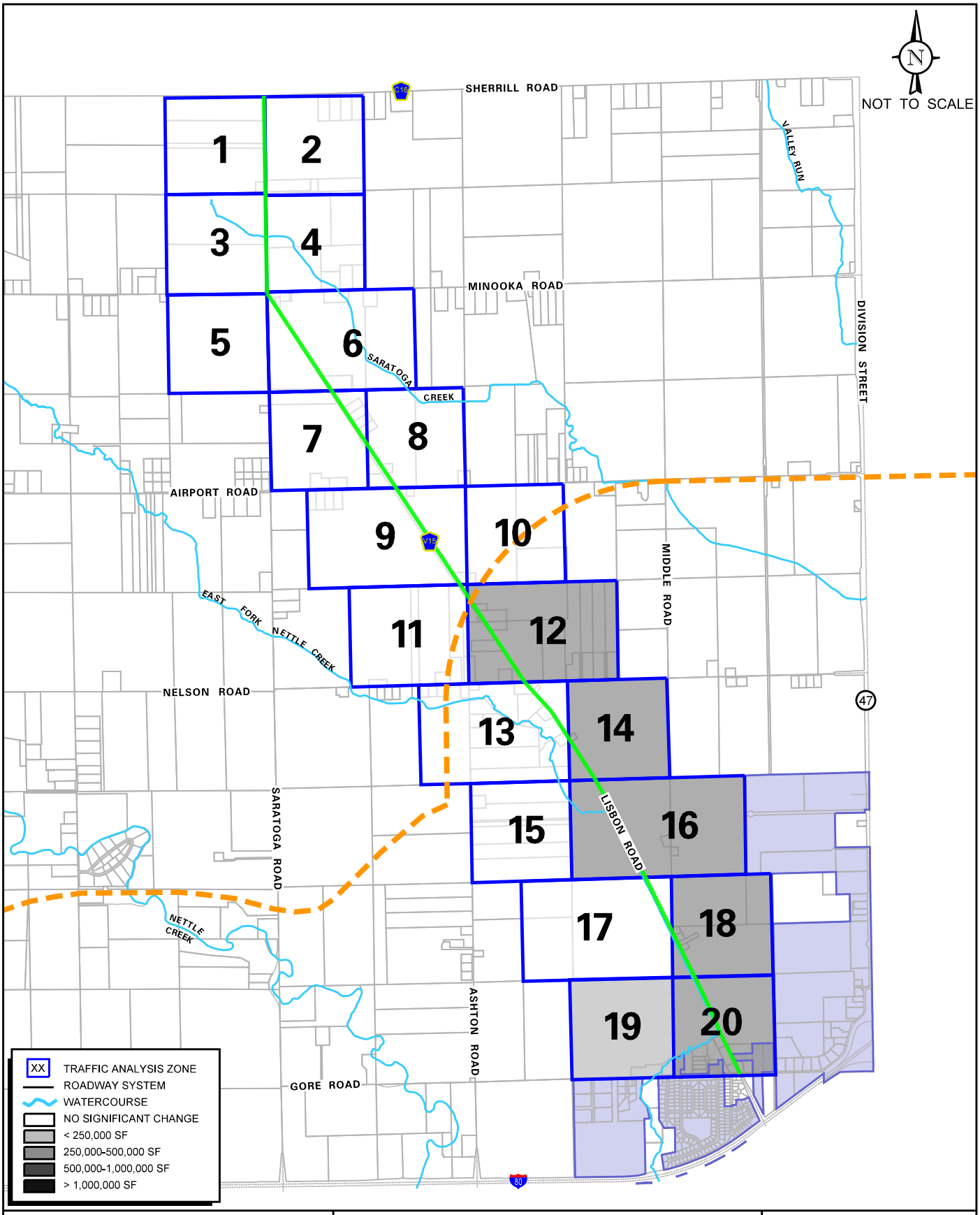


PROJECT:
Lisbon Road
Corridor Access Study
Grundy County, Illinois

TITLE:
INDUSTRIAL GROWTH TO 2040

KLOA
Job No: 16-008

Figure: 12



PROJECT:
Lisbon Road
Corridor Access Study
Grundy County, Illinois

TITLE:
OFFICE GROWTH TO 2040

KLOA
Job No: 16-008

Figure: 13

Future Roadway System

The roadway system that will serve future development in the Lisbon Road corridor will be an improvement over the current system with respect to local circulation within the study area and more direct access to the regional roadway system.

Locally, access to the Lisbon Road corridor may be improved in the future with the extensions of existing roadways, as documented in the Morris Comprehensive Plan. Potential roadway extensions include the westerly extension of Prologis Parkway from just west of IL 47 to Saratoga Road, the westerly extension of Granville Road from IL 47 to Ashton Road, and a new north-south connector road between Gore Road and the Granville Road extension. The Morris Comprehensive Plan also includes a cul-de-sac on Middle Road to the north of Lisbon Road and the Granville Road extension.

Regionally, these roadway extensions will offer a more direct connection to IL 47 and the I-80 interchange than the current roadway system which has a more circuitous route to IL 47 via Gore Road.

Distribution of Future Development Traffic

The distribution of traffic generated by future development within the traffic analysis zones was based on several factors. The first was existing traffic patterns on the roadways in the planning area. The second was an analysis of the distribution of existing households in the planning area as well as planned households, as noted in the Morris Comprehensive Plan. Lastly, consideration was given to the potential extensions of existing local roadways (i.e., Prologis Parkway and Granville Road).

Based on these factors, the directions from which future development traffic will approach and depart the study area were estimated. The directional distribution will vary by land use. Traffic generated by residential, industrial and office developments are more associated with the major travel corridors and regional roadway system. Traffic generated by retail developments will originate from the residential neighborhoods within the developments' market area. The market areas for neighborhood and community scale retail centers will be smaller and draw more local traffic than a larger regional shopping center.

Table 3 summarizes the estimated directional distribution of traffic for the various land uses along the Lisbon Road corridor.

Table 3
DIRECTIONAL DISTRIBUTION OF FUTURE STUDY AREA TRAFFIC

Direction To/From	Percentage of Traffic		
	Residential	Industrial/Office	Neighborhood/ Community Retail
North via Lisbon Road, Saratoga Rd	10%	15%	10%
South via Lisbon Road, Saratoga Road, Ashton Rd	30%	10%	30%
East via Gore Rd, Nelson Rd, Airport Rd, Minooka Rd, Sherrill Rd, Prologis Drive extended, Granville Rd extended	45%	65%	30%
West via Gore Rd, Nelson Rd, Airport Rd, Minooka Rd, Prologis Drive extended	15%	10%	30%
Total	100%	100%	100%

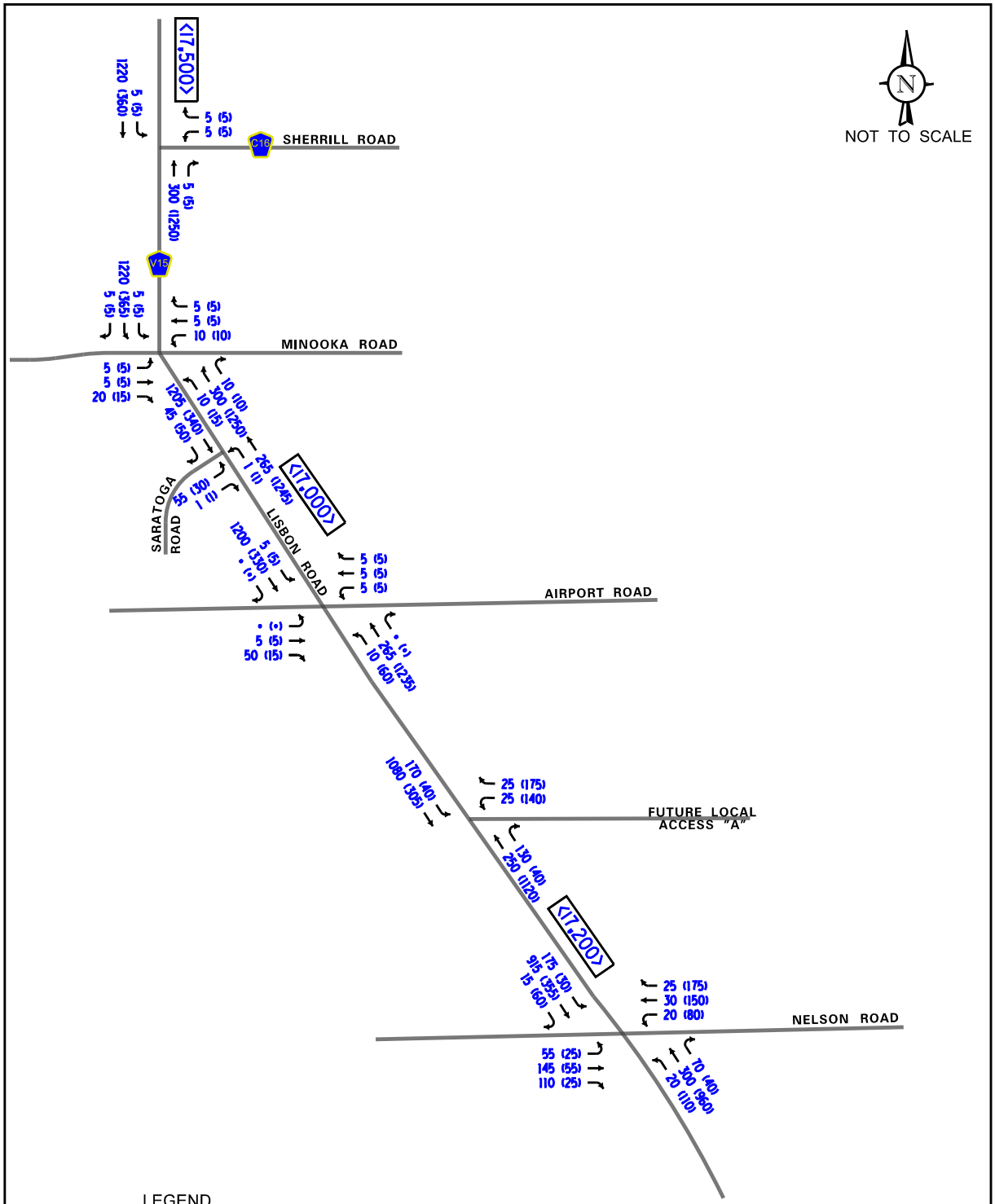
Assignment of Future Development Traffic

The weekday peak hour traffic generated by future development within the TAZ's was assigned to the roadway system based on the directional distributions shown in Table 4. The traffic assignment process was performed manually based on a modified gravity model methodology that considered all network roadway options and functional classifications.

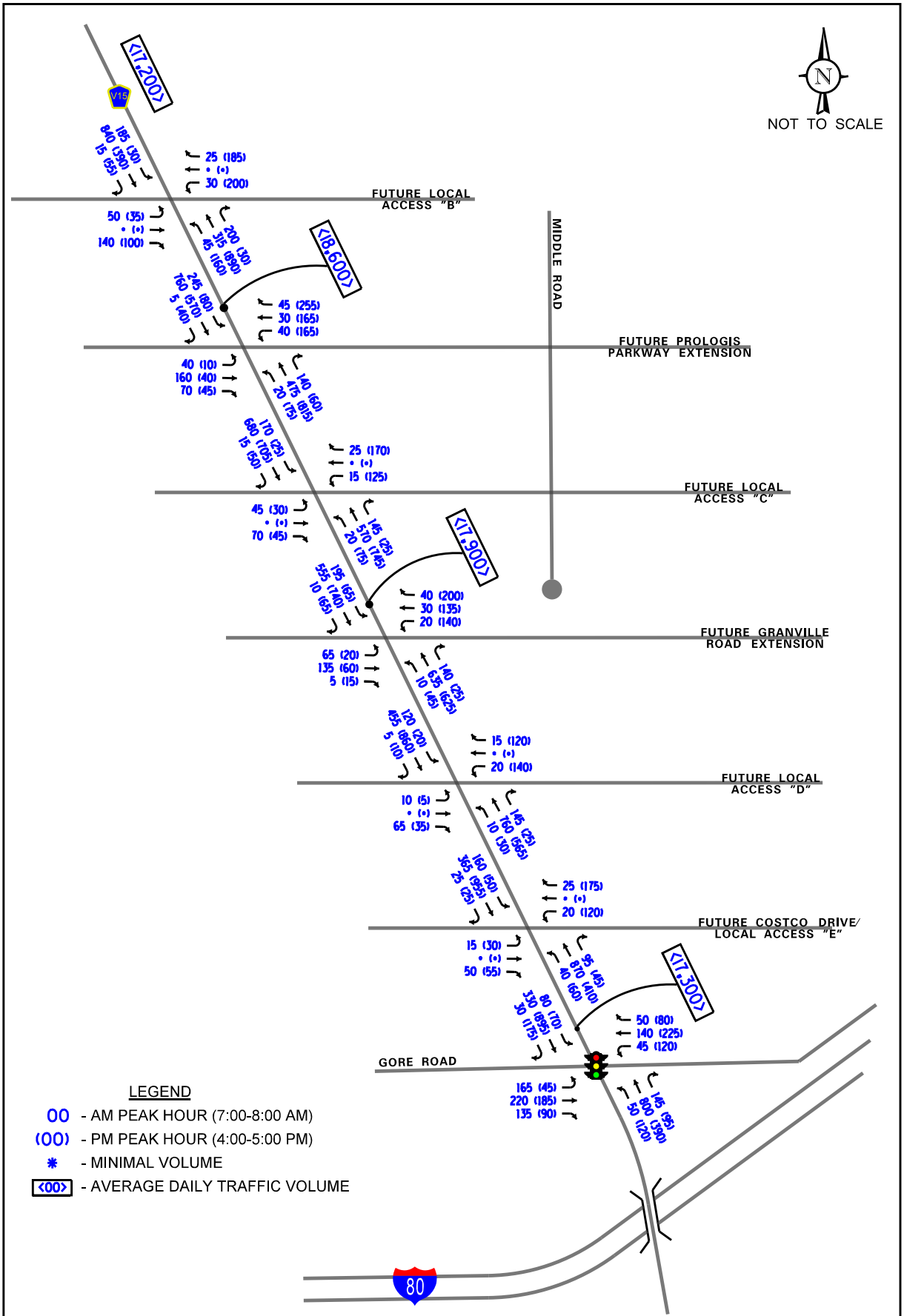
For future developments with Lisbon Road frontage, access was assumed from Lisbon Road as well as from the adjacent existing roadways and/or future roadway extensions and connector roads that may be built to support these developments. Consequently, only a portion of the traffic generated by these developments will travel on Lisbon Road. Traffic assignments were made for trips both originating in and destined to the study area and reflect the fact that a portion of the retail development traffic will be generated internal to the study area from existing and future residential subdivisions.

Year 2040 Projected Traffic Volumes

The assignment of future development peak hour traffic was combined with the existing peak hour traffic volumes (Figure 3) to obtain the projected 2040 peak hour traffic volumes, which are shown in Figures 14 and 15. Projected 2040 daily (24-hour) traffic volumes were also calculated utilizing the peak hour factor and are also shown in Figures 14 and 15. To plan for the ultimate design of Lisbon Road, it was assumed that all planned development would be completed by 2040. The KLOA projections for Lisbon Road range from 17,000-18,600 vpd.



PROJECT:	TITLE:	
Lisbon Road Corridor Access Study Grundy County, Illinois	PROJECTED 2040 TRAFFIC VOLUMES LISBON ROAD: SHERRILL ROAD TO NELSON ROAD	KLOA Job No: 16-008 Figure: 14



PROJECT:	TITLE:	
Lisbon Road Corridor Access Study Grundy County, Illinois	PROJECTED 2040 TRAFFIC VOLUMES LISBON ROAD: FUTURE LOCAL ACCESS "B" TO GORE ROAD	KLOA Job No: 16-008 Figure: 15

5.
Recommended Roadway Design

This chapter summarizes the recommended design of Lisbon Road within the corridor study area. The first step in this process is to understand the function that the roadway provides within the hierarchy of the Grundy County and City of Morris roadway system. The next step is to develop a roadway design that sustains that function and operates at the desired level of service given the volume of traffic it may ultimately carry. Recommendations and/or policies developed in this chapter address the roadway cross-section, geometric characteristics (right-of-way requirements, number of lanes), access control, traffic signal spacing, intersection geometrics, traffic controls, and intersection operations.

Roadway Classification and Function

Lisbon Road is functionally classified by IDOT as a minor arterial road within the Morris urban area and a major collector road outside of the Morris urban area. The City of Morris uses a similar functional classification for the roadway. Arterial roadways and major collector roads serve a similar function to promote a high degree of mobility with limited direct land access. They serve as the primary routes through urbanized areas connecting residential, employment, institutional, retail and recreational activities at the community level via the minor collector and local roadway system.

As such, the recommended Lisbon Road cross-sections and geometric characteristics were developed to meet the following criteria:

1. To provide sufficient capacity to accommodate the projected 2040 traffic volumes safely and efficiently, particularly regarding turning movements at major intersections.

2. To provide adequate right-of-way to accommodate potential future capacity improvements (additional through lanes or turn lanes) beyond the 24-year planning period.

3. To control access to the facility while maintaining sufficient spacing between traffic signals and full-access intersections.

4. To minimize “side friction” by prohibiting parking or loading on Lisbon Road.

5. To achieve an urban design standard (i.e., curb and gutter, sidewalks).

6. To develop an aesthetically-pleasing design that allows for streetscaping/landscaping opportunities within the median and/or parkways.

7. To encourage multimodal travel on separated off-street sidewalks and/or multi-use trails, which is a goal of the Grundy County Comprehensive Plan and is consistent with the Morris Comprehensive Plan, which includes bike paths along Gore Road, Ashton Road, Minooka Road, and Saratoga Road, which ultimately leads south to the I&M Canal State Trail.

Cross-Section and Geometric Characteristics

The section of Lisbon Road between Gore Road and Sherrill Road is presently adjoined by agricultural land, private industry, and a few residential lots, and is anticipated to eventually develop with residential, industrial, office, and retail uses. The roadway also runs parallel to and immediately east of the east fork of Nettle Creek from approximately ¼-mile north of Gore Road to approximately 2/3-mile north of Middle Road.

The road capacity necessary to accommodate the projected 2040 traffic volumes along this section of Lisbon Road will require a four-lane roadway with two through lanes in each direction plus a median accommodating a single left-turn lane at key intersections. Right-turn deceleration lanes are also recommended at the key intersections per GCHARO guidelines. The desired design for the four-lane roadway consists of an urban cross-section with a raised barrier median and curb and gutter, built within a 110-foot right-of-way, which would be established through a roadway dedication easement of 55 feet of land on each side of the roadway as development occurs.

The exception is along the segment of Lisbon Road that runs parallel to the east fork of Nettle Creek. Since a symmetrical road widening would impact the creek, all widening would need to be constructed on the east side of the creek. The centerline along this segment of Lisbon Road is recommended to shift 45 feet east of its current location, which would maintain a parkway along the west side of the road for a southbound right-turn lane to any connector roads or private driveways that may be needed to access property on the west side of the creek. The centerline shift would require a roadway dedication easement of 100 feet from the adjoining land owners on the east side of the road as development occurs. Less land dedication would be required from landowners in the transition areas between the existing and relocated centerlines.

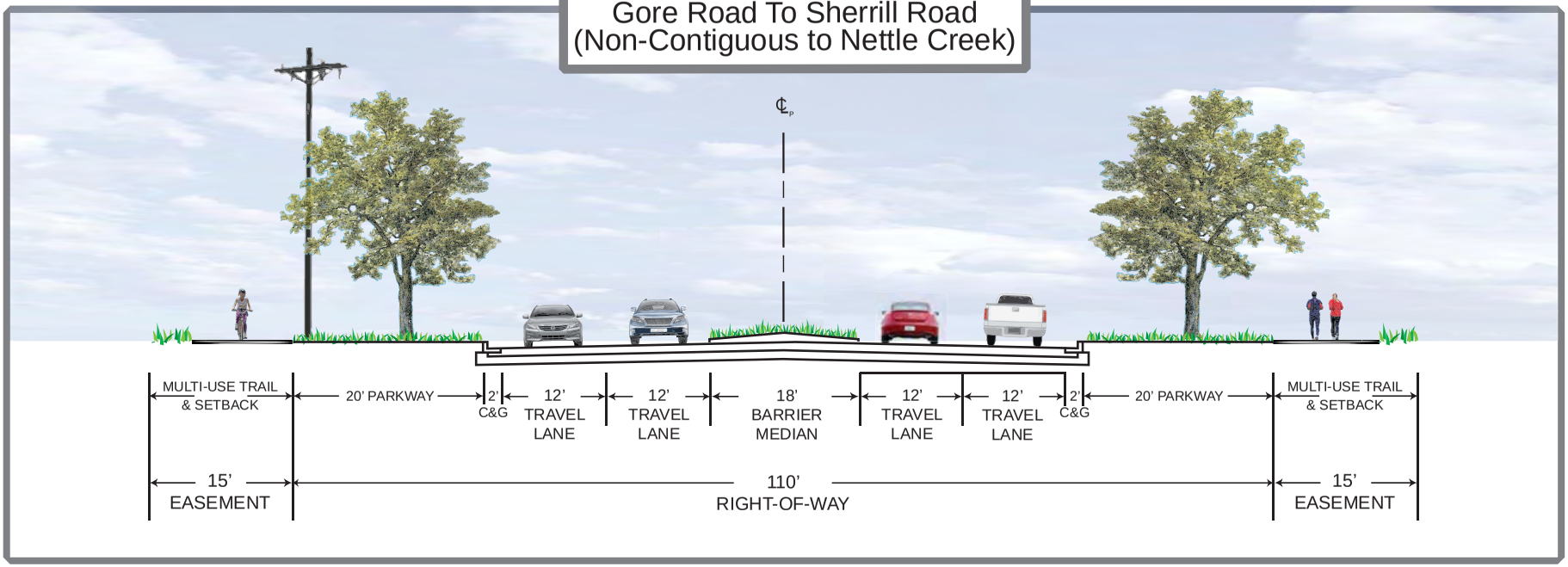
The four-lane cross-section of Lisbon Road would transition back to the existing two-lane rural cross-section to the north of Sherrill Road and to the south of Gore Road (between Gore Road and the I-80 overpass).

Figure 16 shows the recommended roadway design for the segments of Lisbon Road between Gore Road and Sherrill Road that do not parallel the east fork of Nettle Creek. A description of the recommended design for these segments of Lisbon Road follows:

- Two 12-foot wide through lanes in both the northbound and southbound directions.
- Curb and gutter on both sides of the roadway.
- An 18-foot wide raised barrier median, which can be turf or landscaped with shade trees and/or low-lying shrubs/flowers. The median would accommodate one 12-foot wide left-turn lane at key intersections. The median would not be opened at right-in/right-out driveways.
- A 20-foot wide landscaped parkway on both sides of the road. The parkway would accommodate a 12-foot wide right-turn lane at key intersections.
- A 6-foot wide sidewalk or 10-foot wide multi-use path within a 15-foot wide easement on both sides of the roadway.

Figure 17 shows the recommended roadway design for the segment of Lisbon Road that parallels the east fork of Nettle Creek. The description of this segment of Lisbon Road is the same as above with the exception that there would not be an adequate easement area along the west side of the roadway for the sidewalk/multi-use path. However, the easement for the sidewalk or multi-use path could be provided along the west side of the creek.

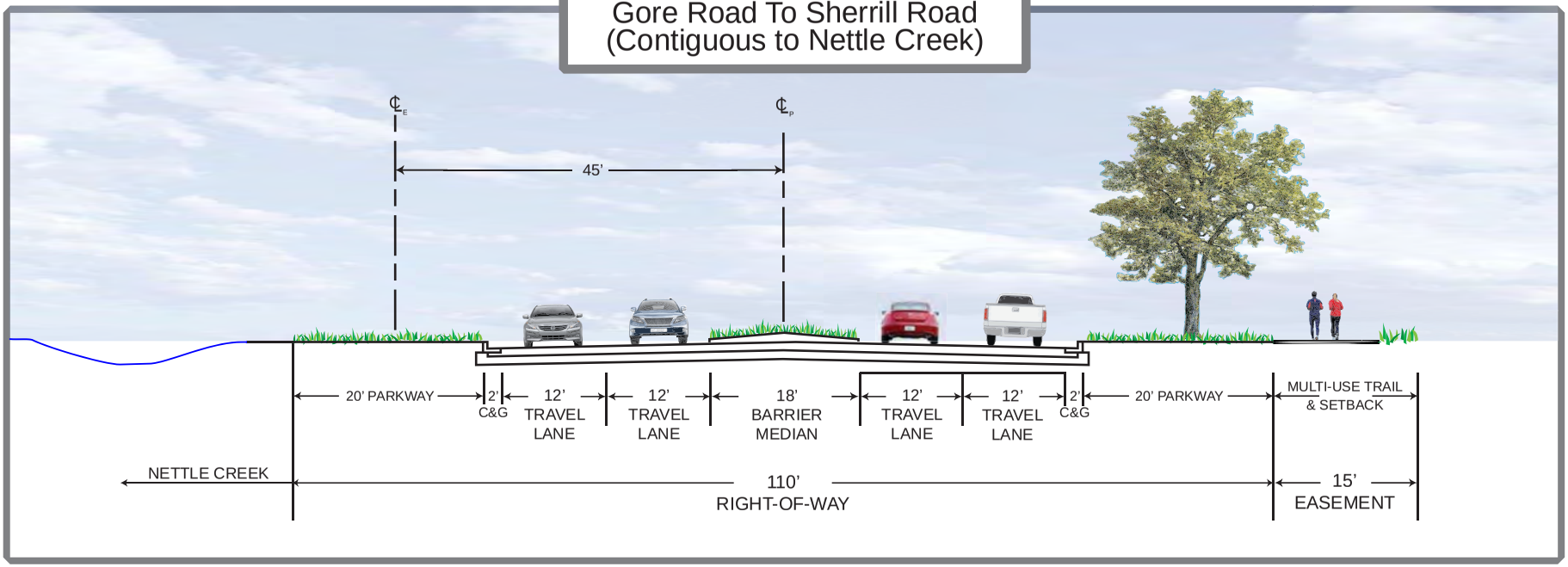
Lisbon Road
Gore Road To Sherrill Road
(Non-Contiguous to Nettle Creek)



℄E - EXISTING ROADWAY CENTERLINE

PROJECT:	TITLE:	
LISBON ROAD CORRIDOR ACCESS STUDY GRUNDY COUNTY, ILLINOIS	RECOMMENDED TYPICAL CROSS SECTION	KLOA Job No: 16-008 Figure: 16

Lisbon Road
Gore Road To Sherrill Road
(Contiguous to Nettle Creek)



℄E - EXISTING ROADWAY CENTERLINE

℄P - PROPOSED ROADWAY CENTERLINE

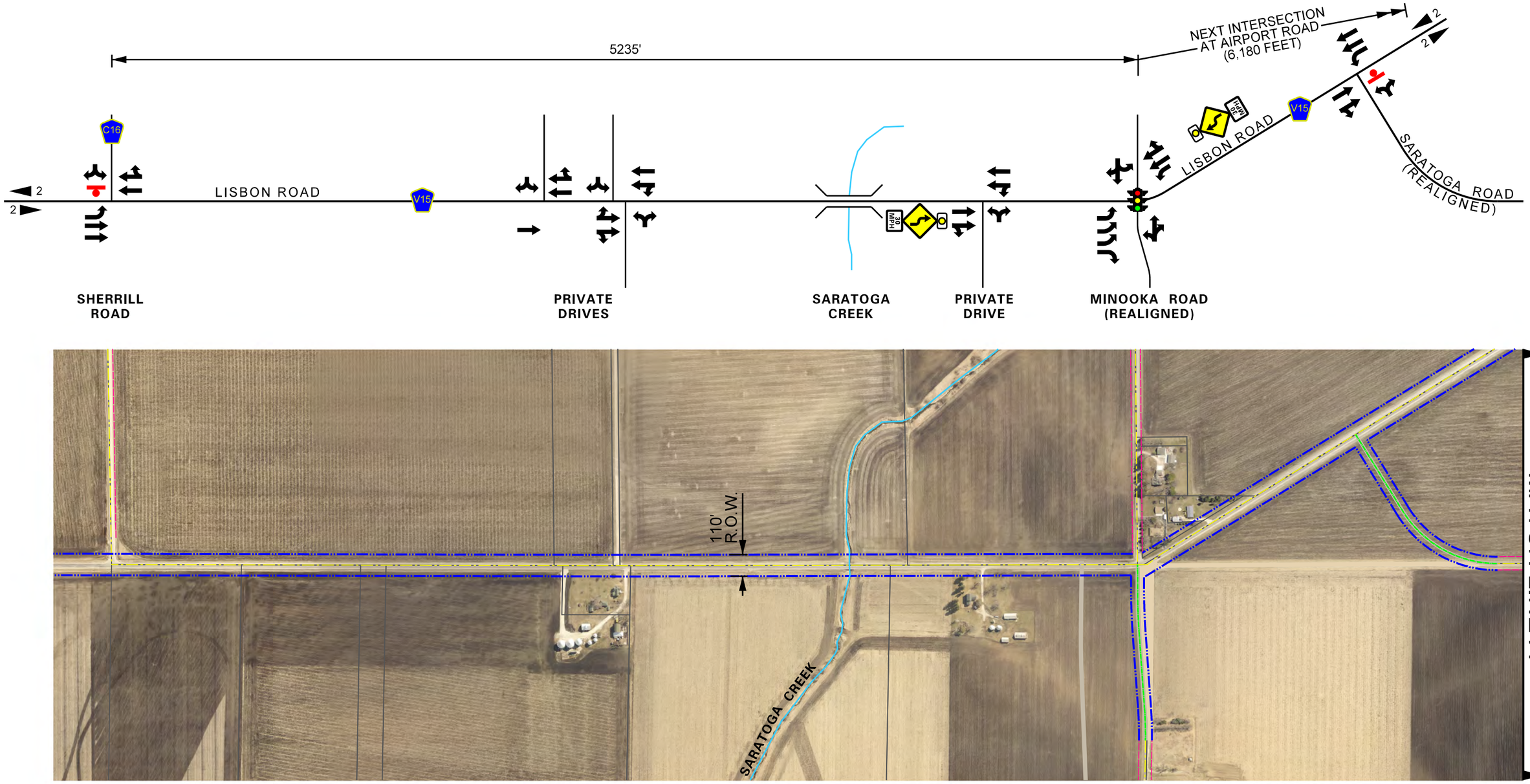
PROJECT:	TITLE:	
LISBON ROAD CORRIDOR ACCESS STUDY GRUNDY COUNTY, ILLINOIS	RECOMMENDED TYPICAL CROSS SECTION	KLOA Job No: 16-008 Figure: 17

Access Control and Traffic Signals

As noted above and discussed in Chapter 2, access control standards should be established and adhered to in order to maximize roadway capacity, maintain traffic flow efficiency, and enhance safety. Lisbon Road is classified in the Grundy County Highway Access Regulation Ordinance (GCHARO) as an Access 3 roadway, which is defined as a locally-significant facility where direct access to abutting land is controlled to maximize the through movement of traffic. The following access control standards are recommended for Lisbon Road:

- Access should be limited along Lisbon Road as defined by its Access 3 roadway status. The current minimum spacing of full access signalized and unsignalized intersections on Access 3 roadways is ¼-mile (1,320 feet) per the GCHARO.
- Restricted right-in/right-out (RIRO) access driveways should be spaced at a minimum of 500 feet with a desirable spacing of 1/8-mile (660 feet).
- As parcels are developed, consideration should be given to closing, relocating or consolidating existing driveways and/or limiting access at existing driveways to adhere to the minimum spacing guidelines.
- Access to adjoining parcels should be consolidated whenever possible.
- The raised barrier median should be extended across all RIRO driveways to reinforce the access restrictions by physically preventing left-turn entering and exiting movements.
- New full access driveways should be aligned opposite an existing full access driveway if it is reasonably close to meeting the minimum spacing requirements.
- The creation of offset intersections should be avoided.
- Development access should be required from adjoining cross streets to promote development access flexibility, encourage a more uniform distribution of development traffic, and reduce traffic volumes on Lisbon Road.
- To maintain efficient traffic signal operations and traffic flow progression, all future signals within the Lisbon Road corridor that are located within ½-mile of each other should be interconnected into a coordinated signal system.

Figures 18, 19, 20 and 21 illustrate the recommended future access locations along Lisbon Road.



LEGEND

- INTERSECTION GEOMETRICS
- # NUMBER OF LANES
- STOP SIGN
- FUTURE TRAFFIC SIGNAL
- EXISTING CENTERLINE
- PROPOSED CENTERLINE
- PRESCRIPTIVE EASEMENT
- PROPOSED RIGHT-OF-WAY
- PROPERTY LINE

N

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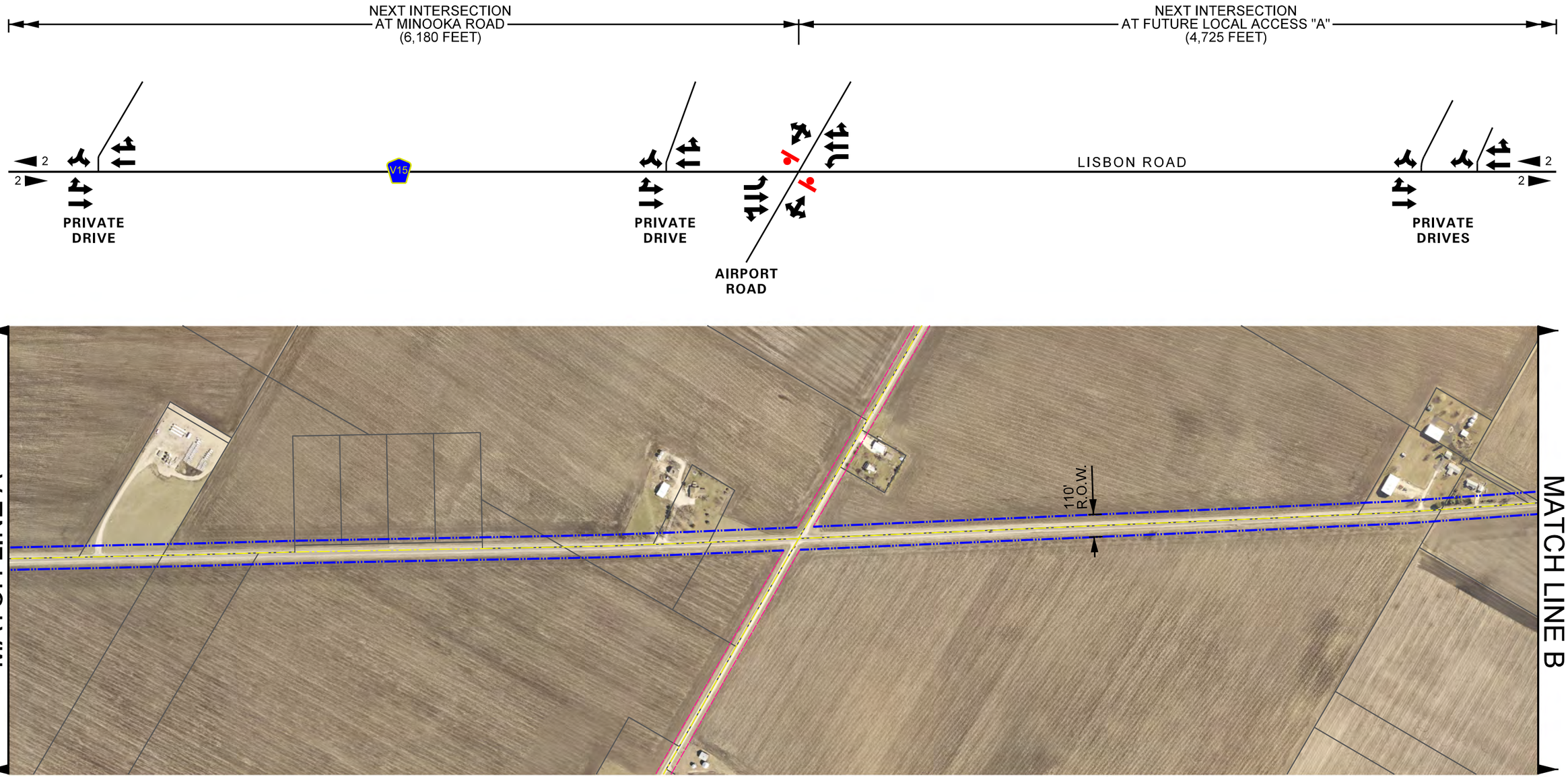
DRAWN	-	MD
CHECKED	-	EDR
DATE	-	10-31-2016

SCALE: 1" = 500'
0' 500' 1000'

LISBON ROAD
CORRIDOR ACCESS STUDY
GRUNDY COUNTY, ILLINOIS

RECOMMENDED ACCESS LOCATIONS/INTERSECTION GEOMETRICS
LISBON ROAD: SHERRILL ROAD TO MINOOKA ROAD

FIGURE NO. 18



LEGEND

- INTERSECTION GEOMETRICS
- # NUMBER OF LANES
- STOP SIGN
- FUTURE TRAFFIC SIGNAL
- EXISTING CENTERLINE
- PROPOSED CENTERLINE
- PRESCRIPTIVE EASEMENT
- PROPOSED RIGHT-OF-WAY
- PROPERTY LINE

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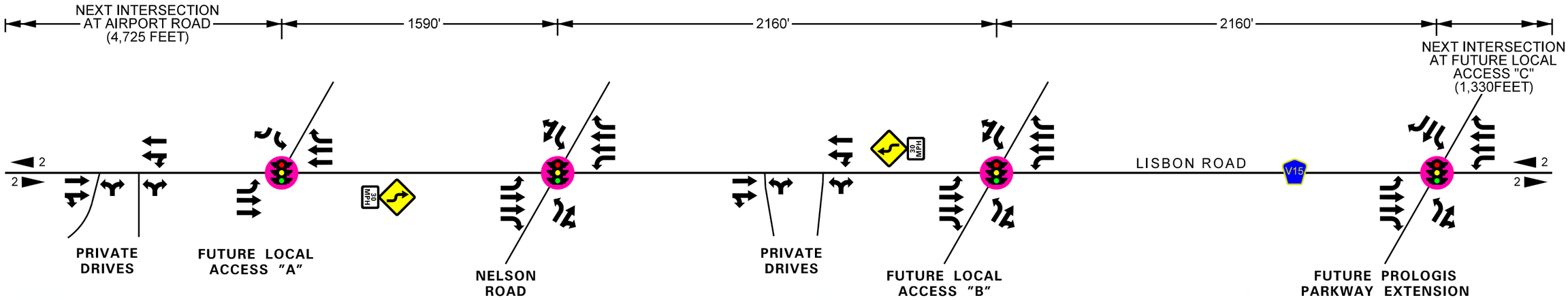
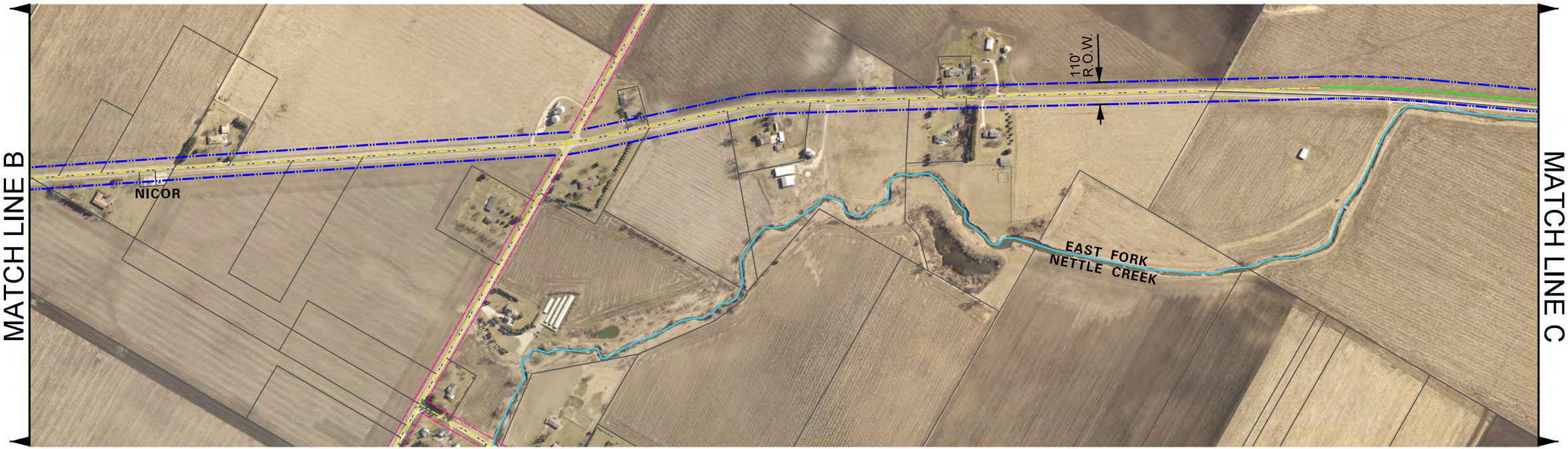
SCALE: 1" = 500'
0' 500' 1000'

LISBON ROAD
CORRIDOR ACCESS STUDY
GRUNDY COUNTY, ILLINOIS

RECOMMENDED ACCESS LOCATIONS/INTERSECTION GEOMETRICS
LISBON ROAD: MINOOKA ROAD TO FUTURE LOCAL ACCESS "A"

FIGURE NO.
19





LEGEND

- INTERSECTION GEOMETRICS
- # NUMBER OF LANES
- STOP SIGN
- FUTURE TRAFFIC SIGNAL
- EXISTING CENTERLINE
- PROPOSED CENTERLINE
- PRESCRIPTIVE EASEMENT
- PROPOSED RIGHT-OF-WAY
- PROPERTY LINE

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DATE	-	10-31-2016

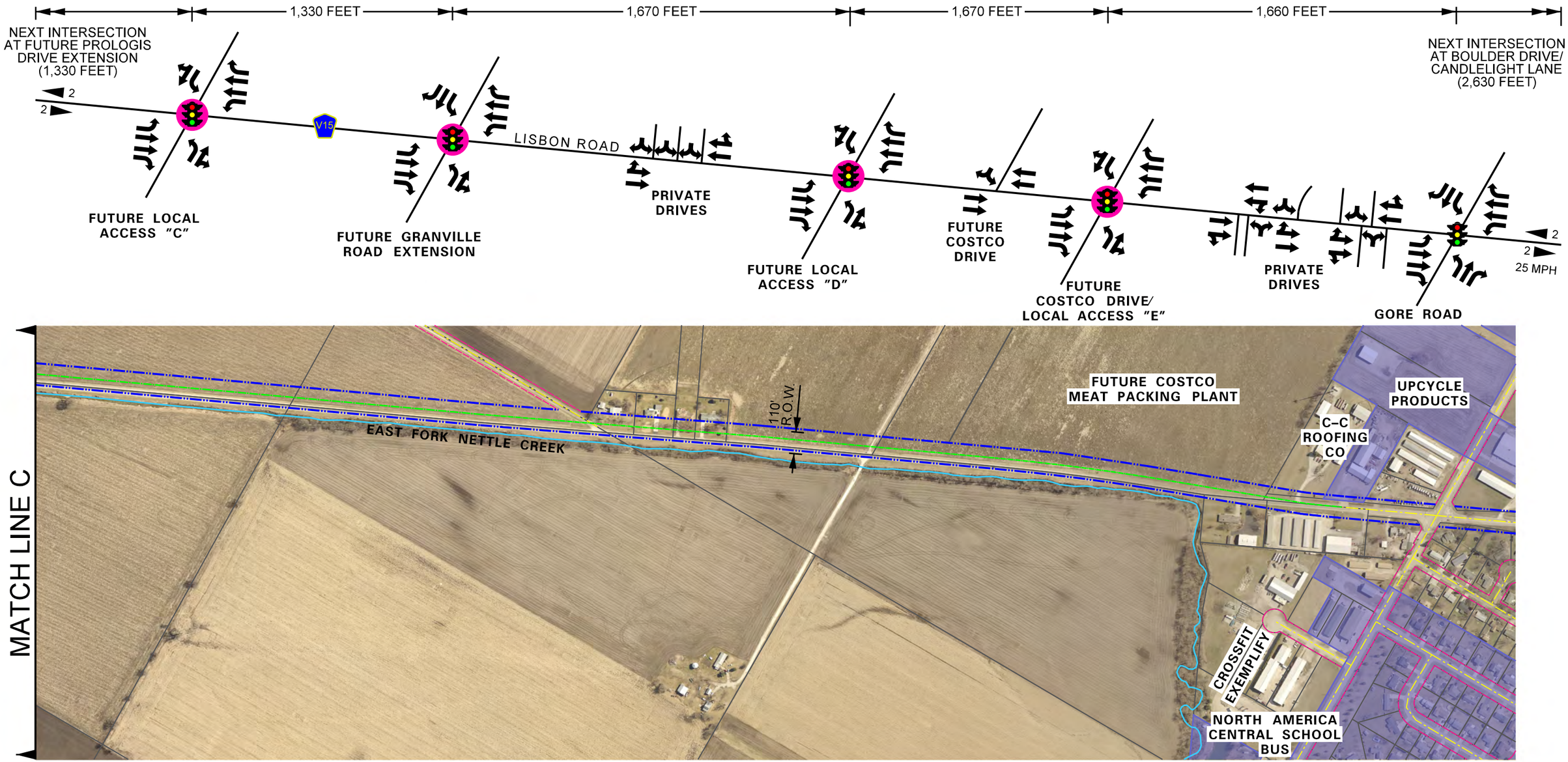
SCALE: 1" = 500'

0' 500' 1000'

LISBON ROAD
CORRIDOR ACCESS STUDY
GRUNDY COUNTY, ILLINOIS

RECOMMENDED ACCESS LOCATIONS/INTERSECTION GEOMETRICS
LISBON ROAD: FUTURE LOCAL ACCESS "A" TO FUTURE PROLOGIS PARKWAY EXTENSION

FIGURE NO. 20



LEGEND

- INTERSECTION GEOMETRICS
- # NUMBER OF LANES
- STOP SIGN
- FUTURE TRAFFIC SIGNAL
- EXISTING CENTERLINE
- PROPOSED CENTERLINE
- PRESCRIPTIVE EASEMENT
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0' 500' 1000'

LISBON ROAD
CORRIDOR ACCESS STUDY
GRUNDY COUNTY, ILLINOIS

RECOMMENDED ACCESS LOCATIONS/INTERSECTION GEOMETRICS
LISBON ROAD: FUTURE LOCAL ACCESS "C" TO GORE ROAD

FIGURE NO.
21

Intersection Geometrics and Traffic Control

Figures 18-21 also illustrate the recommended geometrics for each intersection within the Lisbon Road corridor for the ultimate design condition.

The four-lane cross-section would consist of two through lanes in each direction and a raised barrier median. At key intersections, the median would be reconstructed to accommodate a single left turn lane, and a separate right-turn lane would also be provided.

It should be noted that the purpose of the corridor access study is to identify general geometric requirements for Lisbon Road to accommodate the projected 2040 traffic demands. The actual design of the intersections (i.e., length of turn lanes and tapers, intersection radii, signal equipment locations, etc.) will be determined when Phase I Intersection Design Studies (IDS) are prepared for the future signalized intersections or when Phase II engineering plans are developed. The following describes the recommended roadway improvements that will be required at each of the major intersections in the corridor.

Lisbon Road with Sherrill Road

The Grundy County Comprehensive Plan and the Morris Comprehensive Plan both include the future extension of Sherrill Road from Lisbon Road west to Townhouse Road, which will convert this intersection from a three-leg "T" type intersection to a four-leg intersection. The intersection will not warrant signalization based on the projected 2040 traffic volumes, although it may further into the future when land is developed closer to the intersection. In the interim, stop signs should remain on the existing and future approaches of Sherrill Road.

The projected 2040 traffic volumes through this intersection will require greater road capacity on Lisbon Road, and the cross-section on both approaches of Lisbon Road should include two through lanes in each direction and a dedicated left-turn lane. When development reaches the area and results in higher right-turning volumes, separate right-turn lanes should be constructed on the Lisbon Road approaches. The recommended cross-section can be adequately provided with an urban design within the recommended 110-foot right-of-way. The current two-lane cross-section of Sherrill Road is adequate to accommodate the projected 2040 volumes. Crosswalks should be provided across the Sherrill Road approaches to accommodate pedestrian and bicycle movements from the future sidewalks or multi-use paths along Lisbon Road.

Lisbon Road with Minooka Road/Saratoga Road

The Morris Comprehensive Plan depicts an intersection improvement at this intersection. Currently the east and west approaches of Minooka Road are offset from each other by approximately 55 feet, and Saratoga Road terminates at the intersection at an acute angle. These alignment issues create turning conflicts and increase crash potential as the traffic volumes through this intersection increase in the future.

To improve traffic movements through the intersection, it is recommended that both approaches of Minooka Road be aligned with each other, and that Saratoga Road be realigned to intersect Lisbon Road approximately ¼-mile southeast of the intersection. This would create a more standard four-leg intersection and eliminate acute turning movements. The realigned intersections will not warrant signalization based on the projected 2040 traffic volumes, although they may further into the future when land is developed closer to the intersections. In the interim, stop signs should remain on the existing and realigned approaches of Minooka Road and Saratoga Road.

The projected 2040 traffic volumes through these intersections will require greater road capacity on Lisbon Road, and the cross-section on the Lisbon Road approaches should include two through lanes in each direction and a dedicated left-turn lane. When development reaches the area and results in higher right-turning volumes, separate right-turn lanes should be constructed on the Lisbon Road approaches. The recommended cross-section can be adequately provided with an urban design within the recommended 110-foot right-of-way. The current two-lane cross-sections of Minooka Road and Saratoga Road are adequate to accommodate the projected 2040 volumes. Crosswalks should be provided across the Minooka Road and Saratoga Road approaches to accommodate pedestrian and bicycle movements from the future sidewalks or multi-use paths along Lisbon Road.

An alternative design option that would not require a significant realignment of Minooka Road and Saratoga Road is the installation of a roundabout. However, most of the roundabouts installed by County transportation agencies in the greater Chicago area are single-lane roundabouts, such as the Lake County Division of Transportation's roundabout at Everett Road and Riverwoods Road in Mettawa. A roundabout on Lisbon Road would need to be a double-lane roundabout, which requires more space and can be more complicated when there is a significant volume of over-the-road truck traffic.

Lisbon Road with Airport Road

This intersection will not warrant signalization based on the projected 2040 traffic volumes, although it may further into the future when land is developed closer to the intersection. In the interim, stop signs should remain on both approaches of Airport Road. The projected 2040 volumes will require greater road capacity on Lisbon Road, and the cross-section on the Lisbon Road approaches should include two through lanes in each direction and a dedicated left-turn lane. When development reaches the area and results in higher right-turning volumes, separate right-turn lanes should be constructed on the Lisbon Road approaches. The recommended cross-section can be adequately provided with an urban design within the recommended 110-foot right-of-way. Crosswalks should be provided across the Airport Road approaches to accommodate pedestrian and bicycle movements from the future sidewalks or multi-use paths along Lisbon Road.

Lisbon Road with Future Intersection between Airport Road and Nelson Road

The intersection of Lisbon Road with a new local access road (referred to as Future Local Access "A") may develop at the approximate midpoint between Airport Road and Nelson Road to provide access to future development that is projected to initially occur on the east side of Lisbon Road. This intersection will require signalization to accommodate the projected 2040 traffic volumes. The signal should be installed when traffic volumes reach the level that signal warrants are satisfied.

The 2040 volumes through this intersection will require greater road capacity on Lisbon Road, and the cross-section on both approaches of Lisbon Road should include two through lanes in each direction with a southbound left-turn lane and a northbound right-turn lane. If development ultimately occurs on the west side of the road as well, additional turn lanes should be added to serve the west approach. The recommended cross-section can be adequately provided with an urban design within the recommended 110-foot right-of-way. The cross-section of the local access road will likely require separate left- and right-turn lanes based on the development projections. Crosswalks and pedestrian signals should be provided on all intersection approaches.

Lisbon Road with Nelson Road

The projected 2040 traffic volumes through this intersection will require traffic signal control. The signal should be installed when traffic volumes reach the level that signal warrants are satisfied. Further, the 2040 volumes will require greater road capacity on Lisbon Road, and the cross-section on the Lisbon Road approaches should include two through lanes in each direction, a separate left-turn lane, and a separate right-turn lane. The recommended cross-section can be adequately provided with an urban design within the recommended 110-foot right-of-way. The Nelson Road approaches to the intersection will likely require widening to provide separate left-turn lanes. Crosswalks and pedestrian signals should be provided on all intersection approaches.

Lisbon Road with Future Intersection between Nelson Rd and Prologis Parkway Extension

The intersection of Lisbon Road with a new local access road (referred to as Future Local Access "B") may develop at the approximate midpoint between Nelson Road and the future extension of Prologis Parkway to provide access to future development that is projected to occur on both sides of Lisbon Road. This intersection will require signalization to accommodate the projected 2040 traffic volumes. The signal should be installed when traffic volumes reach the level that signal warrants are satisfied.

The 2040 volumes through this intersection will require greater road capacity on Lisbon Road, and the cross-section on both approaches of Lisbon Road should include two through lanes in each direction, a separate left-turn lane, and a separate right-turn lane. The recommended cross-section can be adequately provided with an urban design within the recommended 110-foot right-of-way. The cross-section of the local access road will likely require separate left-turn lanes based on the development projections. Crosswalks and pedestrian signals should be provided on all intersection approaches.

Lisbon Road with Prologis Parkway Extension

The Morris Comprehensive Plan depicts a westerly extension of Prologis Parkway from just west of IL 47 to Saratoga Road. The extension would intersect with Lisbon Road and bridge over the east fork of Nettle Creek.

The projected 2040 traffic volumes through the intersection with Lisbon Road will require traffic signal control. The signal should be installed when traffic volumes reach the level that signal warrants are satisfied. Further, the 2040 volumes will require greater road capacity on Lisbon Road, and the cross-section on the Lisbon Road approaches should include two through lanes in each direction, a separate left-turn lane, and a separate right-turn lane. The recommended cross-section can be adequately provided with an urban design within the recommended 110-foot right-of-way. The approaches of the Prologis Parkway extension will likely require a through lane and a separate left-turn lane. The development projections further suggest that a separate right-turn lane may be necessary on the east approach of the extension. Crosswalks and pedestrian signals should be provided on both approaches of Lisbon Road and the east approach of the Prologis Parkway extension. This assumes that a sidewalk or multi-use path would not be installed along the west side of Lisbon Road due to the proximity of Nettle Creek.

Lisbon Road with Future Intersection between Prologis Parkway Extension and Granville Road Extension

The intersection of Lisbon Road with a new local access road (referred to as Future Local Access "C") may develop at the approximate midpoint between the future extension of Prologis Parkway and the future extension of Granville Road to provide access to future development that is projected to occur on both sides of Lisbon Road. Access to development on the west side of Lisbon Road would require the bridging of Nettle Creek. This intersection will require signalization to accommodate the projected 2040 traffic volumes. The signal should be installed when traffic volumes reach the level that signal warrants are satisfied.

The 2040 volumes through this intersection will require greater road capacity on Lisbon Road, and the cross-section on both approaches of Lisbon Road should include two through lanes in each direction, a separate left-turn lane, and a separate right-turn lane. The recommended cross-section can be adequately provided with an urban design within the recommended 110-foot right-of-way. The cross-section of the local access road will likely require separate left-turn lanes based on the development projections. Crosswalks and pedestrian signals should be provided on all intersection approaches.

Lisbon Road with Granville Road Extension

The Morris Comprehensive Plan depicts a westerly extension of Granville Road from IL 47 to Ashton Road. The extension would intersect with Lisbon Road and bridge over the east fork of Nettle Creek.

The projected 2040 traffic volumes through the intersection with Lisbon Road will require traffic signal control. The signal should be installed when traffic volumes reach the level that signal warrants are satisfied. Further, the 2040 volumes will require greater road capacity on Lisbon Road, and the cross-section on the Lisbon Road approaches should include two through lanes in each direction, a separate left-turn lane, and a separate right-turn lane. The recommended cross-section can be adequately provided with an urban design within the recommended 110-foot right-of-way. The approaches of the Granville Road extension will likely require a through lane and a separate left-turn lane. The development projections further suggest that a separate right-turn lane may be necessary on the east approach of the extension. Crosswalks and pedestrian signals should be provided on both approaches of Lisbon Road and the east approach of the Granville Road extension. This assumes that a sidewalk or multi-use path would not be installed along the west side of Lisbon Road due to the proximity of Nettle Creek.

Lisbon Road with Future Intersections between Granville Road Extension and Gore Road

The intersection of Lisbon Road with the proposed main access drive to the planned Costco Meat Packing Plant on the east side of Lisbon Road will be located approximately 1/3-mile north of Gore Road. Access to future development between the Costco plant and the future Granville Road extension (referred to as Future Local Access "D") should be located midway between the Costco main drive and the Granville Road extension or approximately 1/3-mile from each. Access to development on the west side of Lisbon Road would require the bridging of Nettle Creek and should be aligned with these two major access points. The access drive opposite the Costco main access drive is referred to as Future Local Access "E". These intersections will require signalization to accommodate the projected 2040 traffic volumes. The signals should be installed when traffic volumes reach the level that signal warrants are satisfied.

The 2040 volumes through these intersections will require greater road capacity on Lisbon Road than is currently provided or will be provided in the near future when road improvements at the Costco access drives are completed. The ultimate cross-section on the Lisbon Road approaches should include two through lanes in each direction, a separate left-turn lane, and a separate right-turn lane. The recommended cross-section can be adequately provided with an urban design within the recommended 110-foot right-of-way. The cross-section of the local access roads will likely require separate left-turn lanes based on the development projections, and a left-turn lane is planned for the Costco main access drive. Crosswalks and pedestrian signals should be provided on all Lisbon Road approaches and on the east approaches of the local access roads when the intersections are signalized and/or a sidewalk or multi-use path is extended along the east side of the roadway. This assumes that a sidewalk or multi-use path would not be installed along the west side of Lisbon Road due to the proximity of Nettle Creek.

Lisbon Road with Gore Road

The projected 2040 traffic volumes through this intersection will require greater road capacity on both Lisbon Road and Gore Road. The cross-section on both approaches of Lisbon Road would include two through lanes in each direction, a separate left-turn lane, and a separate right-turn lane. This cross-section can be adequately provided with an urban design within the

recommended 110-foot right-of-way. The east and west approaches of Gore Road will require a separate right-turn lane to improve traffic flow efficiency. Crosswalks and pedestrian signals should be provided on all intersection approaches. South of Gore Road, the cross-section of Lisbon Road would transition back to the existing two-lane section that carries over Interstate 80.

Projected Intersection Operations

Intersection capacity analyses were performed for the projected 2040 weekday peak hour traffic conditions with the recommended roadway design, intersection geometrics and traffic controls.

Table 4 summarizes the results of the capacity analyses for the projected 2040 weekday peak hour traffic conditions, including the level of service and average vehicle delay for vehicles under traffic signal or stop sign control. The capacity analysis worksheets are in the Appendix.

Table 4
CAPACITY ANALYSIS RESULTS – PROJECTED 2040 TRAFFIC CONDITIONS

	Weekday AM Peak Hour		Weekday PM Peak Hour	
Intersection	LOS	Delay	LOS	Delay
Lisbon Road / Gore Road[1]	C	20.1	C	20.2
Lisbon Road / Sherrill Road[2]	C	15.1	D	29.1
Lisbon Road / Realigned Minooka Road[2]	D	30.8	F	63.0
Lisbon Road / Realigned Saratoga Road[2]	F	63.4	C	24.6
Lisbon Road / Airport Road[2]	D	28.6	F	56.0
Lisbon Road / Future Local Access "A"[1]	A	6.3	A	9.0
Lisbon Road / Nelson Road[1]	B	19.1	B	16.6
Lisbon Road / Future Local Access "B"[1]	A	7.1	B	16.6
Lisbon Road / Future Prologis Drive Extension[1]	B	12.7	B	16.6
Lisbon Road / Future Local Access "C"[1]	A	6.1	B	11.5
Lisbon Road / Future Granville Road Extension[1]	B	11.3	B	19.1
Lisbon Road / Future Local Access "D"[1]	A	5.0	B	10.5
Lisbon Road / Costco Drive / Future Local Access "E"[1]	A	5.7	B	10.4

Note: LOS = level of service Delay = seconds/vehicle

[1] Signalized intersection. LOS and average delay represents overall operating condition at the intersection.

[2] Unsignalized TWSC intersection. LOS and average delay shown for the critical approach under stop control.

[3] Because this intersection provides more than two approaches under stop sign control, an average vehicle delay cannot be determined in Synchro. Instead, the level of service of the intersection is based on a critical volume to saturation flow (v/s) evaluation also known as the Intersection Capacity Utilization (ICU) method.

The recommended intersection geometrics for the major traffic signal controlled intersections were developed to maintain a Level of Service C or better for the overall intersection and for all traffic movements through the intersection, per the GCHARO guidelines.

A few of the intersections that are not projected to warrant traffic signal may experience longer delays and lower levels of service (i.e., E or F) than desirable on the minor cross streets that will remain under stop sign control. These intersections include Lisbon Road with realigned Minooka Road, realigned Saratoga Road, and Airport Road. This is not an uncommon peak hour situation in an urbanizing area for a stop-controlled local roadway along a more heavily travelled arterial or collector roadway like Lisbon Road may become. During the off-peak hours and on weekends, these motorists will experience considerably less delay accessing Lisbon Road.

Vehicle queuing and the overall progression of traffic along Lisbon Road can be managed efficiently through a system of signal interconnects that coordinate the signals along the corridor to create a platooning effect. It should be noted that the recommendations produced in this report are contingent upon the development of an east-west collector road system, including the extensions of Prologis Parkway and Granville Road, which would effectively divert some of the traffic burden away from Lisbon Road.

6.
Project Funding Options

The Illinois Road Improvement Impact Fee Law creates the authority for counties with a population over 400,000 and all home-rule municipalities to adopt and implement Road Improvement Impact Fee ordinances and resolutions designed to supplement other funding sources (i.e., Motor Fuel Taxes, Surface Transportation Program, Congestion Mitigation & Air Quality Program, Transportation Alternatives Program) so that the burden of paying for road improvements needed to accommodate new development can be allocated in a fair and equitable manner. These fees are levied or imposed by qualifying counties and municipalities as a condition to the issuance of a building permit or a certificate of occupancy and are pooled into an interest-bearing fund allowing for the corridor roadway improvements to be completed in a coordinated manner for efficiencies of scale and to minimize disruptions to the travelling public.

Presently DuPage County, Kane County and Lake County collect road impact fees to help fund roadway projects. Grundy County currently has a population of approximately 50,000 and does not presently meet the state statutes to impose road impact fees. However, as development growth occurs in the County and the residential population increases, the County will eventually be in a position to enact a Road Impact Fee Ordinance, which might be utilized for future improvements to Lisbon Road.

In the interim, Grundy County should work with the local municipalities that annex land along the Lisbon Road corridor, namely the City of Morris, to ensure that road impact fees or development impact fees are imposed on private development in the corridor (via annexation agreements, development agreements, etc.) to ensure that funds are set aside to improve Lisbon Road in a coordinated manner when traffic conditions warrant such improvements. These fees can be used for engineering and construction of “add-capacity” projects, including lane additions, turning lanes at intersections, acquisition of land or real property for the expansion of the roadway, and relocation of existing utilities or drainage in advance of new road capacity. They can also used for the design of new roadways, traffic signal interconnection, railroad grade crossing improvements, and bridge widening to accommodate new roadway capacity. Impact fee revenues must be encumbered for use within five years of payment.

7.
Conclusions

This Corridor Access Study serves many functions in the evaluation of Lisbon Road, an important County highway that connects the Village of Lisbon and U.S. Route 52 in Kendall County with U.S. Route 6 and the City of Morris. Firstly, it serves to identify the ultimate right-of-way, roadway cross-section and intersection geometrics that will be required to accommodate projected traffic volumes over the next 24 years (Year 2040) when approximately 2,700 acres of land will potentially be developed with approximately 2,327 dwelling units and 8 million square feet of commercial space. Secondly, this study establishes guidelines pertaining to access control and traffic signal spacing with consideration given to the location of future land uses that may develop in the corridor. Lastly, this study identifies potential funding mechanisms that Grundy County can utilize to enact an equitable public-private cost-sharing arrangement with private developers so that the Lisbon Road improvements can be constructed in a coordinated manner for efficiencies of scale and to minimize disruptions to the travelling public.

The Corridor Access Study is intended to serve as a guide for future decisions affecting Lisbon Road. Key findings from the study follow below:

- All study area intersections along Lisbon Road presently operate at a very good level of service (A) under existing traffic controls.

- The traffic volumes on Lisbon Road presently range from 565-1,345 vehicles per day (vpd) and are projected to increase to 17,000-18,600 vpd by the 2040 design year, which reflects buildout of the developable land in the corridor south of Nelson Road.

- To accommodate the projected 2040 traffic volumes at satisfactory levels of service, road capacity improvements will be necessary along Lisbon Road, which will require the dedication of sufficient public right-of-way in place of the existing prescriptive easement.

- The recommended ultimate design of Lisbon Road for the full length of the corridor, from Gore Road north to Sherrill Road, is an urban four-lane cross section with two through lanes in each direction, a raised 18-foot barrier median accommodating a single left-turn lane at

intersections, curb and gutter on both sides of the roadway, a 20-foot parkway that would accommodate right-turn lanes at key intersections, and a 6-foot sidewalk or 10-foot multi-use path within a 15-foot easement on at least one, and preferably both, sides of the road.

- The recommended ultimate design would be built within a 110-foot right-of-way, which would be established through a roadway dedication easement of 55 feet of land on each side of the roadway as development occurs.

- The exception is along the segment of Lisbon Road that runs parallel to the east fork of Nettle Creek where a symmetrical road widening would impact the creek. For this segment, the roadway centerline would shift 45 feet east of its current location, which would require a roadway dedication easement of 100 feet from the adjoining land owners on the east side of the road as development occurs. Less land dedication would be required from landowners in the transition areas between the existing and relocated centerlines. The easement for the sidewalk or multi-use path on the west side of the road may also need to be provided along the west side of the creek.

- The four-lane cross-section of Lisbon Road would transition back to the existing two-lane rural cross-section to the north of Sherrill Road and south of Gore Road (between Gore Road and the I-80 overpass).

- The public right-of-way needed along Lisbon Road should be dedicated as a contingency of development or acquired through other means to preserve the needed land area for the ultimate expansion of the roadway.

- Access control standards should be established for Lisbon Road to maximize road capacity and maintain traffic flow efficiency and safety. The following standards are recommended:

    - The minimum spacing between full access intersections, traffic-signal controlled or unsignalized, should be ¼-mile (1,320 feet) wherever possible.

    - Restricted right-in/right-out (RIRO) access driveways should be spaced at a minimum of 500 feet with a desirable spacing of 1/8-mile (660 feet).

    - As parcels are developed, existing driveways should be closed, relocated, consolidated or converted to RIRO to adhere to the minimum spacing standards.

    - Access to adjoining parcels should be consolidated whenever possible.

    - The raised barrier median should be extended across all RIRO driveways.

    - New full access driveways should be aligned opposite an existing full access driveway if it is reasonably close to meeting the minimum spacing requirements.

    - The creation of offset intersections should be avoided.

    - Development access should also be required from the adjoining cross streets.

- An improved east-west roadway grid that intersects with Lisbon Road should be supported to create a better distribution of local traffic to new land uses and to divert some of the traffic burden away from Lisbon Road. This would include existing roadway extensions (i.e., Prologis Parkway, Granville Road) and new local connector roads.
- Future traffic signals located within ½-mile of each other should be interconnected into a coordinated signal system.
- Left-turn lanes should be provided on Lisbon Road at all full access intersections.
- Right-turn lanes should be provided on Lisbon Road at all access intersections where peak-hour right-turning volumes exceed 20 vehicles per hour.
- Parking should be prohibited at all times on the roadway.
- Off-street pedestrian paths and/or multi-use trails should be provided within the corridor along both sides of the roadway, wherever possible.

- The actual design of the intersections (i.e., length of turn lanes and tapers, intersection radii, signal equipment locations, etc.) will be determined when Phase I Intersection Design Studies (IDS) are prepared for the future signalized intersections or when Phase II engineering plans are developed for the roadway.

- Funding for future capacity improvements to Lisbon Road should be borne, in part, by the developers of land that contribute significant volumes of traffic onto the roadway.

- Initially, Grundy County should work with the local municipalities that annex land along the Lisbon Road corridor, namely the City of Morris, to ensure that road impact fees or development impact fees are imposed on private development in the corridor (via annexation agreements, development agreements, etc.) to ensure that funds are set aside to improve Lisbon Road in an equitable and coordinated manner when traffic conditions warrant such improvements. These fees would be used for engineering and construction of "add-capacity" projects, including lane additions, turning lanes, land acquisition, utility relocation, signal installations/interconnect, and bridge widening.

- In addition, when the annexation agreements or development agreements are prepared, land developers along Lisbon Road should be required to dedicate the necessary right-of-way for the County to construct the ultimately roadway improvements described in this report.

- Eventually, as development growth occurs in Grundy County and the residential population reaches 400,000, the County should consider enacting a Road Improvement Impact Fee ordinance, which might be applied to future improvements of Lisbon Road.

Appendix

Future Land Use & Trip Generation

FUTURE LAND USE AND TRIP GENERATION

Zone #	Land Use (a)		Land Use Size					AM Peak Hour Trip Generation										PM Peak Hour Trip Generation									
			Residential		Industrial/Office/Retail/Other			Residential 1		Residential 2		Office		Industrial		Retail		Residential 1		Residential 2		Office		Industrial		Retail	
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(I)	(J)	(M)	(N)	(O)	(P)	(Q)	(R)	(S)	(T)	(Q)	(R)	(U)	(V)
		Developable Acres	Units/Acre	=(A)*(B) Total No. Units	=(A)*43560/1000 Square Footage (,000 sf)	Floor Area Ratio	=(D)*(E) Floor Area (,000 sf)	=(C)*.75*.25 Inbound Trips	=(C)*.75*.75 Outbound Trips	=(C)*.51*.2 Inbound Trips	=(C)*.51*.8 Outbound Trips	=(F)*1.56*.88 Inbound Trips	=(F)*1.56*.12 Outbound Trips	=(F)*.92*.88 Inbound Trips	=(F)*.92*.12 Outbound Trips	=(F)*.96*.62 Inbound Trips	=(F)*.96*.38 Outbound Trips	=(C)*1.0*.63 Inbound Trips	=(C)*1.0*.37 Outbound Trips	=(C)*.62*.65 Inbound Trips	=(C)*.62*.35 Outbound Trips	=(F)*1.49*.17 Inbound Trips	=(F)*1.49*.83 Outbound Trips	=(F)*.97*.12 Inbound Trips	=(F)*.97*.88 Outbound Trips	=(F)*3.71*.48 Inbound Trips	=(F)*3.71*.52 Outbound Trips
1	Agricultural	120																									
	SUBTOTAL	120		0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	Agricultural	120																									
	SUBTOTAL	120		0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	Agricultural	120																									
	SUBTOTAL	120		0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Agricultural	120																									
	SUBTOTAL	120		0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	Agricultural	120																									
	SUBTOTAL	120		0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	Agricultural	180																									
	SUBTOTAL	180		0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	Agricultural	111																									
	SUBTOTAL	111		0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	Agricultural	129																									
	SUBTOTAL	129		0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	Agricultural	142																									
	SUBTOTAL	142		0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Agricultural	173																									
	SUBTOTAL	173		0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	Agricultural	171																									
	SUBTOTAL	171		0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	Agricultural	68																									
	Office	45			1,960	0.25	490					673	92									124	606				
	Industrial	38			1,634	0.35	572							463	63									67	488		
	Retail	5			196	0.2	39									23	14									70	76
	SUBTOTAL	87		0	3,790		1,101	0	0	0	0	673	92	463	63	23	14	0	0	0	0	124	606	67	488	70	76
13	Residential 1	128	3.0	385				72	216									242	142								
	Residential 2	44	6.0	261						27	106									105	57						
	Retail	2			98	0.2	20									12	7									35	38
	SUBTOTAL	174		646	98		20	72	216	27	106	0	0	0	0	12	7	242	142	105	57	0	0	0	0	35	38
14	Office	38			1,634	0.25	408					561	76									103	505				
	Industrial	93			4,051	0.35	1,418							1,148	157									165	1,210		
	SUBTOTAL	131		0	5,685		1,826	0	0	0	0	561	76	1,148	157	0	0	0	0	0	0	103	505	165	1,210	0	0
15	Residential 1	168	3.0	504				95	284									318	186								
	Residential 2	14	6.0	86						9	35									34	19						
	SUBTOTAL	182		590	0		0	95	284	9	35	0	0	0	0	0	0	318	186	34	19	0	0	0	0	0	0
16	Office	38			1,634	0.25	408					561	76									103	505				
	Industrial	113			4,901	0.35	1,715							1,389	189									200	1,464		
	SUBTOTAL	150		0	6,534		2,124	0	0	0	0	561	76	1,389	189	0	0	0	0	0	0	103	505	200	1,464	0	0
17	Residential 2	120	6.0	720						73	294									290	156						
	SUBTOTAL	120		720	0		0	0	0	73	294	0	0	0	0	0	0	0	0	290	156	0	0	0	0	0	0
18	Office	38			1,634	0.25	408					561	76									103	505				
	Industrial	86			3,757	0.35	1,315							1,065	145									153	1,122		
	SUBTOTAL	124		0	5,391		1,723	0	0	0	0	561	76	1,065	145	0	0	0	0	0	0	103	505	153	1,122	0	0
19	Residential 1	77	3.0	232				43	130									146	86								
	Residential 2	23	6.0	140						14	57									56	30						
	Office	9			392	0.25	98					135	18									25	121				
	Retail	3			131	0.2	26									16	10									47	50
	SUBTOTAL	113		371	523		124	43	130	14	57	135	18	0	0	16	10	146	86	56	30	25	121	0	0	47	50
20	Office	38			1,634	0.25	408					561	76									103	505				
	Industrial	38			1,634	0.35	572							463	63									67	488		
	Retail	8			359	0.2	72									43	26									128	139
	SUBTOTAL	83		0	3,626		1,052	0	0	0	0	561	76	463	63	43	26	0	0	0	0	103	505	67	488	128	139
	TOTAL	**2,669**		**2,327**	**25,646**		**7,970**	**210**	**630**	**123**	**492**	**3,050**	**416**	**4,527**	**617**	**93**	**57**	**706**	**415**	**486**	**262**	**563**	**2,747**	**651**	**4,773**	**279**	**303**

Note: See Figure 1 for zone locations.

(a) - Residential 1 generally contains single-family detached units as defined by ITE Land Use Code 210.
Residential 2 generally contains multi-family apartment units as defined by ITE Land Use Code 220.
Office generally consists of general office buildings as defined by ITE Land Use Code 710.
Industrial generally consists of light industrial facilities as defined by ITE Land Use Code 110.
Retail generally consists of shopping center development as defined by ITE Land Use Code 820

Traffic Counts

Kenig Lindgren O'Hara Aboona, Inc.
9575 W. Higgins Rd., Suite 400

Rosemont, Illinois, United States 60018
(847)518-9990 rcasiello@kloainc.com

Count Name: Lisbon/Gore ADT
Site Code:
Start Date: 01/12/2016

Direction (Southbound)

Start Time	Lights	Buses	Single-Unit Trucks	Articulated Trucks	Bicycles on Road	Total
01/12/2016 12:00 AM	2	0	0	0	0	2
12:15 AM	0	0	0	0	0	0
12:30 AM	1	0	0	0	0	1
12:45 AM	0	0	0	0	0	0
1:00 AM	1	0	1	0	0	2
1:15 AM	0	0	0	0	0	0
1:30 AM	0	0	0	0	0	0
1:45 AM	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0
2:15 AM	0	0	0	0	0	0
2:30 AM	0	0	1	0	0	1
2:45 AM	0	0	0	0	0	0
3:00 AM	1	0	0	0	0	1
3:15 AM	0	0	0	0	0	0
3:30 AM	0	0	0	0	0	0
3:45 AM	1	0	0	0	0	1
4:00 AM	1	0	0	0	0	1
4:15 AM	1	0	0	0	0	1
4:30 AM	1	0	0	0	1	2
4:45 AM	2	0	0	0	0	2
5:00 AM	2	0	0	0	0	2
5:15 AM	2	0	0	0	0	2
5:30 AM	4	0	1	1	0	6
5:45 AM	9	0	0	0	0	9
6:00 AM	4	0	0	0	0	4
6:15 AM	5	0	0	0	0	5
6:30 AM	12	0	3	0	0	15
6:45 AM	9	0	2	0	0	11
7:00 AM	11	0	1	0	0	12
7:15 AM	18	0	2	0	0	20
7:30 AM	11	0	1	0	0	12
7:45 AM	17	0	0	1	0	18
8:00 AM	6	0	1	0	0	7
8:15 AM	15	0	0	1	0	16
8:30 AM	11	0	0	0	0	11
8:45 AM	11	0	1	0	0	12
9:00 AM	7	0	0	0	0	7
9:15 AM	7	0	0	0	0	7
9:30 AM	14	0	0	0	0	14

9:45 AM	7	0	0	0	0	7
10:00 AM	7	0	1	0	0	8
10:15 AM	11	0	1	0	0	12
10:30 AM	5	0	3	0	0	8
10:45 AM	7	0	3	0	0	10
11:00 AM	12	0	2	1	0	15
11:15 AM	8	0	0	0	0	8
11:30 AM	11	0	1	0	0	12
11:45 AM	12	0	0	0	0	12
12:00 PM	13	0	1	0	0	14
12:15 PM	9	0	1	0	0	10
12:30 PM	8	0	1	0	0	9
12:45 PM	6	0	2	0	0	8
1:00 PM	6	0	1	0	0	7
1:15 PM	7	0	0	1	0	8
1:30 PM	6	0	1	0	0	7
1:45 PM	10	0	0	0	0	10
2:00 PM	9	0	1	0	0	10
2:15 PM	9	0	1	0	0	10
2:30 PM	13	0	0	0	0	13
2:45 PM	9	0	0	0	0	9
3:00 PM	6	0	0	0	0	6
3:15 PM	16	1	1	0	0	18
3:30 PM	20	0	2	0	0	22
3:45 PM	17	0	0	0	0	17
4:00 PM	10	0	0	0	0	10
4:15 PM	20	0	0	0	0	20
4:30 PM	12	0	0	0	0	12
4:45 PM	14	0	2	0	0	16
5:00 PM	16	0	0	0	0	16
5:15 PM	16	0	0	0	0	16
5:30 PM	11	0	0	0	0	11
5:45 PM	9	0	0	0	0	9
6:00 PM	10	0	0	0	0	10
6:15 PM	9	0	0	0	0	9
6:30 PM	4	0	0	0	0	4
6:45 PM	10	0	0	0	0	10
7:00 PM	3	0	0	0	0	3
7:15 PM	4	0	0	0	0	4
7:30 PM	3	0	1	0	0	4
7:45 PM	3	0	0	0	0	3
8:00 PM	1	0	1	0	0	2
8:15 PM	10	0	0	0	0	10
8:30 PM	3	0	0	0	0	3
8:45 PM	6	0	0	0	0	6
9:00 PM	5	0	0	0	0	5
9:15 PM	1	0	1	0	0	2
9:30 PM	1	0	0	0	0	1
9:45 PM	3	0	0	0	0	3
10:00 PM	2	0	0	0	0	2
10:15 PM	0	0	0	0	0	0
10:30 PM	1	0	0	4	0	5

10:45 PM	1	0	0	0	0	1
11:00 PM	2	0	1	0	0	3
11:15 PM	1	0	0	0	0	1
11:30 PM	1	0	0	0	0	1
11:45 PM	1	0	0	0	0	1
Total	623	1	43	9	1	677
Total %	92.0	0.1	6.4	1.3	0.1	100.0
AM Times	7:00 AM	6:15 AM	10:15 AM	7:30 AM	3:45 AM	7:00 AM
AM Peaks	57	0	9	2	1	62
PM Times	3:15 PM	2:30 PM	12:00 PM	9:45 PM	4:30 PM	3:15 PM
PM Peaks	63	1	5	4	0	67

Kenig Lindgren O'Hara Aboona, Inc.
9575 W. Higgins Rd., Suite 400

Rosemont, Illinois, United States 60018
(847)518-9990 rcasiello@kloainc.com

Count Name: Lisbon/Gore ADT
Site Code:
Start Date: 01/12/2016

Direction (Northbound)

Start Time	Lights	Buses	Single-Unit Trucks	Articulated Trucks	Bicycles on Road	Total
01/12/2016 12:00 AM	0	0	0	0	0	0
12:15 AM	0	0	1	0	0	1
12:30 AM	0	0	0	0	0	0
12:45 AM	1	0	0	0	0	1
1:00 AM	2	0	0	0	0	2
1:15 AM	3	0	0	0	0	3
1:30 AM	0	0	0	0	0	0
1:45 AM	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0
2:15 AM	1	0	0	0	0	1
2:30 AM	0	0	0	0	0	0
2:45 AM	0	0	0	0	0	0
3:00 AM	1	0	0	0	0	1
3:15 AM	0	0	0	0	0	0
3:30 AM	0	0	0	0	0	0
3:45 AM	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0
4:15 AM	1	0	0	0	0	1
4:30 AM	1	0	0	0	0	1
4:45 AM	2	0	0	0	0	2
5:00 AM	0	0	0	0	0	0
5:15 AM	2	0	1	0	0	3
5:30 AM	3	0	0	0	0	3
5:45 AM	2	0	0	0	0	2
6:00 AM	4	0	0	0	0	4
6:15 AM	10	0	0	0	0	10
6:30 AM	14	0	3	0	0	17
6:45 AM	10	0	0	0	0	10
7:00 AM	14	1	1	0	0	16
7:15 AM	6	0	0	0	0	6
7:30 AM	12	0	3	2	0	17
7:45 AM	9	0	3	0	0	12
8:00 AM	5	0	1	0	0	6
8:15 AM	5	0	1	0	0	6
8:30 AM	6	0	0	0	0	6
8:45 AM	4	0	0	0	0	4
9:00 AM	7	0	0	0	0	7
9:15 AM	11	0	0	1	0	12
9:30 AM	8	0	2	0	0	10

9:45 AM	9	0	0	0	0	9
10:00 AM	12	0	0	0	0	12
10:15 AM	11	0	1	0	0	12
10:30 AM	5	0	0	1	0	6
10:45 AM	5	0	5	0	0	10
11:00 AM	4	0	0	0	0	4
11:15 AM	12	0	1	0	0	13
11:30 AM	11	0	0	0	0	11
11:45 AM	6	0	0	0	0	6
12:00 PM	19	0	1	0	0	20
12:15 PM	5	0	0	0	0	5
12:30 PM	13	0	0	0	0	13
12:45 PM	11	0	1	0	0	12
1:00 PM	8	0	0	1	0	9
1:15 PM	6	0	0	0	0	6
1:30 PM	12	0	0	0	0	12
1:45 PM	10	0	1	0	0	11
2:00 PM	15	0	0	0	0	15
2:15 PM	8	0	2	0	0	10
2:30 PM	9	0	0	0	0	9
2:45 PM	12	0	1	0	0	13
3:00 PM	14	0	0	0	0	14
3:15 PM	15	0	0	0	0	15
3:30 PM	12	0	1	0	0	13
3:45 PM	12	0	0	1	0	13
4:00 PM	12	0	0	0	0	12
4:15 PM	11	0	0	0	0	11
4:30 PM	9	0	0	0	0	9
4:45 PM	15	0	0	0	0	15
5:00 PM	13	0	1	0	0	14
5:15 PM	12	0	0	0	1	13
5:30 PM	13	0	0	1	0	14
5:45 PM	9	0	1	0	0	10
6:00 PM	9	0	0	0	0	9
6:15 PM	6	0	1	0	0	7
6:30 PM	11	0	0	0	0	11
6:45 PM	7	0	0	0	0	7
7:00 PM	8	0	0	0	0	8
7:15 PM	11	0	2	0	0	13
7:30 PM	2	0	0	0	0	2
7:45 PM	7	0	1	0	0	8
8:00 PM	2	0	1	0	0	3
8:15 PM	7	0	1	0	0	8
8:30 PM	8	0	1	0	0	9
8:45 PM	4	0	0	0	0	4
9:00 PM	7	0	2	0	0	9
9:15 PM	5	0	0	0	0	5
9:30 PM	4	0	1	0	0	5
9:45 PM	5	0	0	0	0	5
10:00 PM	9	0	0	0	0	9
10:15 PM	5	0	1	0	0	6
10:30 PM	2	0	0	0	0	2

10:45 PM	0	0	0	0	0	0
11:00 PM	2	0	0	0	0	2
11:15 PM	1	0	0	0	0	1
11:30 PM	1	0	0	0	0	1
11:45 PM	1	0	0	0	0	1
Total	618	1	43	7	1	670
Total %	92.2	0.1	6.4	1.0	0.1	100.0
AM Times	7:00 AM	6:15 AM	10:15 AM	7:30 AM	3:45 AM	7:00 AM
AM Peaks	41	1	6	2	0	51
PM Times	3:15 PM	2:30 PM	12:00 PM	9:45 PM	4:30 PM	3:15 PM
PM Peaks	51	0	2	0	1	53

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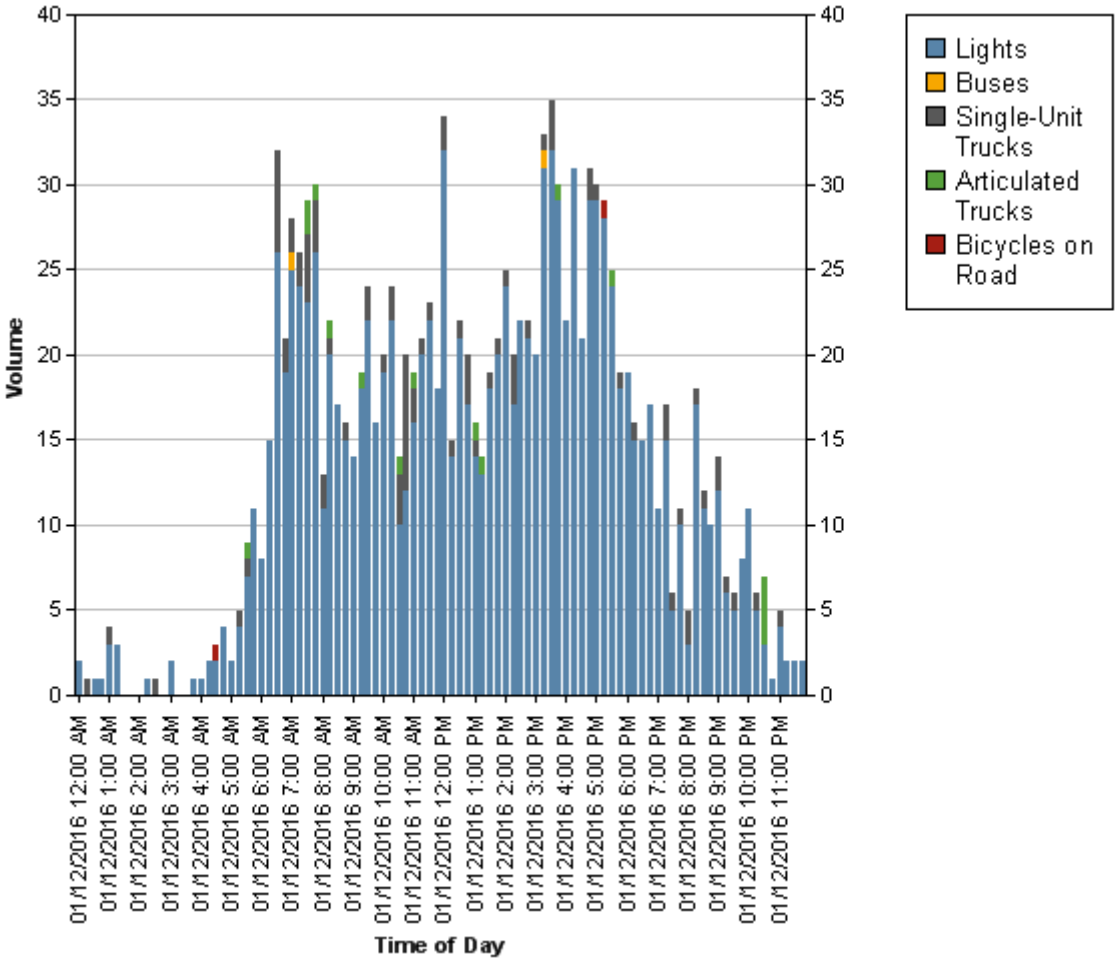
Count Name: Lisbon/Gore ADT
Site Code:
Start Date: 01/12/2016



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Rosemont, Illinois, United States 60018
(847)518-9990 rcasiello@kloainc.com

Count Name: Lisbon/Sherrill ADT
Site Code:
Start Date: 01/12/2016

Direction (Southbound)

Start Time	Lights	Buses	Single-Unit Trucks	Articulated Trucks	Bicycles on Road	Total
01/12/2016 12:00 AM	1	0	0	0	0	1
12:15 AM	0	0	0	0	0	0
12:30 AM	0	0	0	0	0	0
12:45 AM	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0
1:15 AM	1	0	0	0	0	1
1:30 AM	0	0	0	0	0	0
1:45 AM	1	0	0	0	0	1
2:00 AM	0	0	0	0	0	0
2:15 AM	0	0	0	0	0	0
2:30 AM	0	0	0	0	0	0
2:45 AM	1	0	0	0	0	1
3:00 AM	0	0	0	0	0	0
3:15 AM	0	0	0	0	0	0
3:30 AM	0	0	0	0	0	0
3:45 AM	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0
4:15 AM	1	0	0	0	0	1
4:30 AM	0	0	0	0	0	0
4:45 AM	1	0	0	0	0	1
5:00 AM	1	0	0	0	0	1
5:15 AM	2	0	0	0	0	2
5:30 AM	3	0	0	0	0	3
5:45 AM	5	0	0	0	0	5
6:00 AM	0	0	0	0	0	0
6:15 AM	7	0	0	0	0	7
6:30 AM	2	0	0	0	0	2
6:45 AM	7	0	0	0	0	7
7:00 AM	1	0	0	0	0	1
7:15 AM	8	0	0	0	0	8
7:30 AM	6	0	1	0	0	7
7:45 AM	7	0	0	0	0	7
8:00 AM	5	1	0	0	0	6
8:15 AM	6	0	0	0	0	6
8:30 AM	6	0	0	0	0	6
8:45 AM	6	0	1	0	0	7
9:00 AM	2	0	0	0	0	2
9:15 AM	4	0	0	0	0	4
9:30 AM	1	0	0	0	0	1

9:45 AM	1	0	0	0	0	1
10:00 AM	5	0	0	0	0	5
10:15 AM	3	0	0	0	0	3
10:30 AM	2	0	0	0	0	2
10:45 AM	2	0	0	0	0	2
11:00 AM	5	0	0	0	0	5
11:15 AM	5	0	0	0	0	5
11:30 AM	3	0	0	0	0	3
11:45 AM	7	0	0	0	0	7
12:00 PM	4	0	0	0	0	4
12:15 PM	3	0	0	0	0	3
12:30 PM	3	0	0	0	0	3
12:45 PM	6	0	0	0	0	6
1:00 PM	3	0	1	0	0	4
1:15 PM	1	0	0	0	0	1
1:30 PM	6	0	0	0	0	6
1:45 PM	3	0	0	0	0	3
2:00 PM	4	0	1	0	0	5
2:15 PM	2	0	0	0	0	2
2:30 PM	3	0	0	0	0	3
2:45 PM	5	0	0	0	0	5
3:00 PM	6	0	0	0	0	6
3:15 PM	8	0	0	0	0	8
3:30 PM	5	0	0	0	0	5
3:45 PM	8	1	0	0	0	9
4:00 PM	6	0	0	0	0	6
4:15 PM	7	0	0	0	0	7
4:30 PM	10	0	0	0	0	10
4:45 PM	8	0	0	0	0	8
5:00 PM	4	0	0	0	0	4
5:15 PM	3	0	1	0	0	4
5:30 PM	5	0	0	0	0	5
5:45 PM	4	0	0	0	0	4
6:00 PM	3	0	0	0	0	3
6:15 PM	2	0	0	0	0	2
6:30 PM	3	0	0	0	0	3
6:45 PM	4	0	0	0	0	4
7:00 PM	1	0	0	0	0	1
7:15 PM	1	0	0	0	0	1
7:30 PM	3	0	1	0	0	4
7:45 PM	0	0	0	0	0	0
8:00 PM	2	0	1	0	0	3
8:15 PM	3	0	0	0	0	3
8:30 PM	0	0	0	0	0	0
8:45 PM	1	0	0	0	0	1
9:00 PM	1	0	0	0	0	1
9:15 PM	0	0	0	0	0	0
9:30 PM	1	0	0	0	0	1
9:45 PM	1	0	0	0	0	1
10:00 PM	1	0	0	0	0	1
10:15 PM	1	0	0	0	0	1
10:30 PM	1	0	0	0	0	1

10:45 PM	0	0	0	0	0	0
11:00 PM	1	0	0	0	0	1
11:15 PM	0	0	0	0	0	0
11:30 PM	1	0	0	0	0	1
11:45 PM	1	0	0	0	0	1
Total	267	2	7	0	0	276
Total %	96.7	0.7	2.5	0.0	0.0	100.0
AM Times	7:15 AM	7:15 AM	8:45 AM	12:00 AM	12:00 AM	7:15 AM
AM Peaks	26	1	1	0	0	28
PM Times	4:00 PM	3:00 PM	12:30 PM	9:45 PM	12:00 PM	3:45 PM
PM Peaks	31	1	1	0	0	32

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Count Name: Lisbon/Sherrill ADT
Site Code:
Start Date: 01/12/2016

Direction (Northbound)

Start Time	Lights	Buses	Single-Unit Trucks	Articulated Trucks	Bicycles on Road	Total
01/12/2016 12:00 AM	0	0	0	0	0	0
12:15 AM	0	0	0	0	0	0
12:30 AM	0	0	0	0	0	0
12:45 AM	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0
1:15 AM	2	0	0	0	0	2
1:30 AM	0	0	0	0	0	0
1:45 AM	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0
2:15 AM	0	0	0	0	0	0
2:30 AM	0	0	0	0	0	0
2:45 AM	1	0	0	0	0	1
3:00 AM	0	0	0	0	0	0
3:15 AM	0	0	0	0	0	0
3:30 AM	1	0	0	0	0	1
3:45 AM	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0
4:15 AM	2	0	0	0	0	2
4:30 AM	0	0	0	0	0	0
4:45 AM	1	0	0	0	0	1
5:00 AM	0	0	0	0	0	0
5:15 AM	0	0	0	0	0	0
5:30 AM	0	0	0	0	0	0
5:45 AM	1	0	0	0	0	1
6:00 AM	2	0	0	0	0	2
6:15 AM	6	0	0	0	0	6
6:30 AM	4	0	0	0	0	4
6:45 AM	6	0	0	0	0	6
7:00 AM	2	0	0	0	0	2
7:15 AM	9	0	0	0	0	9
7:30 AM	2	0	0	0	0	2
7:45 AM	3	0	0	0	0	3
8:00 AM	8	1	0	0	0	9
8:15 AM	3	0	0	0	0	3
8:30 AM	2	0	0	0	0	2
8:45 AM	4	0	0	0	0	4
9:00 AM	5	0	1	0	0	6
9:15 AM	3	0	0	0	0	3
9:30 AM	4	0	2	0	0	6

9:45 AM	4	0	0	0	0	4
10:00 AM	3	0	0	0	0	3
10:15 AM	3	0	0	0	0	3
10:30 AM	1	0	0	0	0	1
10:45 AM	2	0	0	0	0	2
11:00 AM	2	0	1	0	0	3
11:15 AM	6	0	0	0	0	6
11:30 AM	4	0	0	0	0	4
11:45 AM	2	0	0	0	0	2
12:00 PM	2	0	0	0	0	2
12:15 PM	4	0	1	0	0	5
12:30 PM	4	0	0	0	0	4
12:45 PM	7	0	0	0	0	7
1:00 PM	3	0	0	0	0	3
1:15 PM	4	0	2	0	0	6
1:30 PM	2	0	0	0	0	2
1:45 PM	3	0	0	0	0	3
2:00 PM	5	0	0	0	0	5
2:15 PM	7	0	0	0	0	7
2:30 PM	2	0	1	0	0	3
2:45 PM	5	0	0	0	0	5
3:00 PM	4	0	1	0	0	5
3:15 PM	4	0	0	0	0	4
3:30 PM	6	0	0	0	0	6
3:45 PM	3	2	0	0	0	5
4:00 PM	4	0	0	0	0	4
4:15 PM	6	0	0	0	0	6
4:30 PM	7	0	0	0	0	7
4:45 PM	6	0	0	0	0	6
5:00 PM	5	0	0	0	0	5
5:15 PM	6	0	0	0	0	6
5:30 PM	6	0	0	0	0	6
5:45 PM	6	0	0	0	0	6
6:00 PM	10	0	0	0	0	10
6:15 PM	8	0	0	0	0	8
6:30 PM	4	0	0	0	0	4
6:45 PM	5	0	0	0	0	5
7:00 PM	2	0	0	0	0	2
7:15 PM	2	0	0	0	0	2
7:30 PM	2	0	0	0	0	2
7:45 PM	1	0	0	0	0	1
8:00 PM	4	0	0	0	0	4
8:15 PM	3	0	0	0	0	3
8:30 PM	5	0	0	0	0	5
8:45 PM	2	0	0	0	0	2
9:00 PM	5	0	0	0	0	5
9:15 PM	0	0	0	0	0	0
9:30 PM	2	0	0	0	0	2
9:45 PM	3	0	0	0	0	3
10:00 PM	3	0	0	0	0	3
10:15 PM	3	0	0	0	0	3
10:30 PM	1	0	0	1	0	2

10:45 PM	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0
11:15 PM	1	0	0	0	0	1
11:30 PM	1	0	0	0	0	1
11:45 PM	0	0	0	0	0	0
Total	276	3	9	1	0	289
Total %	95.5	1.0	3.1	0.3	0.0	100.0
AM Times	7:15 AM	7:15 AM	8:45 AM	12:00 AM	12:00 AM	7:15 AM
AM Peaks	22	1	3	0	0	23
PM Times	4:00 PM	3:00 PM	12:30 PM	9:45 PM	12:00 PM	3:45 PM
PM Peaks	23	2	2	1	0	22

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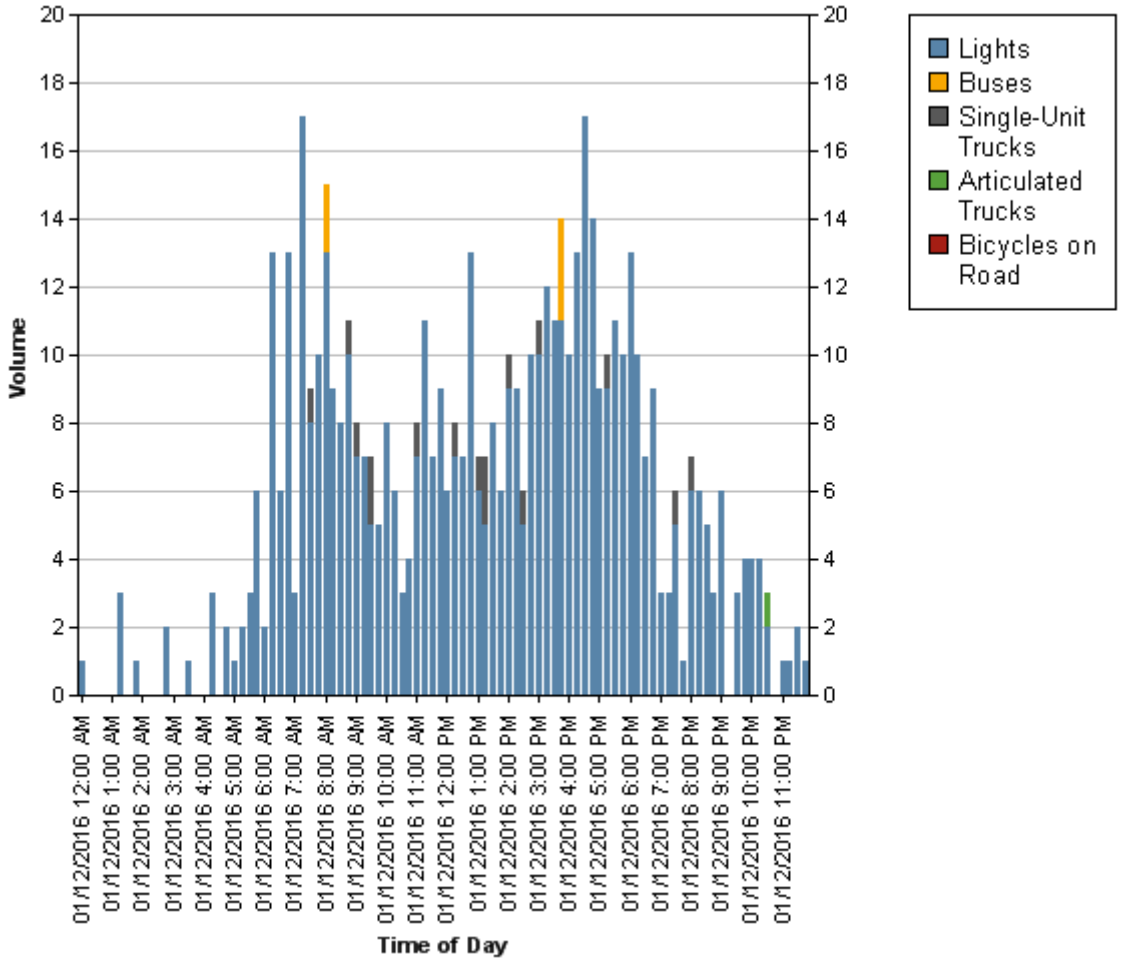
Count Name: Lisbon/Sherrill ADT
Site Code:
Start Date: 01/12/2016



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9575 W. Higgins Rd., Suite 400

Rosemont, Illinois, United States 60018
(847)518-9990

Count Name: Lisbon/Gore
Site Code:
Start Date: 01/12/2016

Turning Movement Data

Start Time	Gore Road Eastbound						Gore Road Westbound						Lisbon Road Northbound						Lisbon Road Southbound						Int. Total
	U-Turn	Left	Thru	Right	Peds	App. Total	U-Turn	Left	Thru	Right	Peds	App. Total	U-Turn	Left	Thru	Right	Peds	App. Total	U-Turn	Left	Thru	Right	Peds	App. Total	
7:00 AM	0	0	15	22	0	37	0	8	9	4	0	21	0	6	8	7	0	21	0	1	11	0	0	12	91
7:15 AM	0	1	13	27	0	41	0	7	8	0	0	15	0	6	4	13	0	23	0	2	16	2	0	20	99
7:30 AM	0	2	27	25	0	54	0	8	4	5	0	17	0	9	9	48	0	66	0	1	9	1	0	11	148
7:45 AM	0	1	20	13	0	34	0	11	19	3	0	33	0	10	8	21	0	39	0	9	7	1	0	17	123
Hourly Total	0	4	75	87	0	166	0	34	40	12	0	86	0	31	29	89	0	149	0	13	43	4	0	60	461
8:00 AM	0	1	12	7	0	20	0	12	17	2	0	31	0	5	3	9	0	17	0	2	3	3	0	8	76
8:15 AM	0	0	6	12	0	18	0	7	5	2	0	14	0	9	4	5	0	18	0	5	11	0	0	16	66
8:30 AM	0	1	6	10	0	17	0	7	5	0	0	12	0	7	5	3	0	15	0	2	7	1	0	10	54
8:45 AM	0	1	6	8	0	15	0	13	6	1	0	20	0	8	1	10	0	19	0	2	11	0	0	13	67
Hourly Total	0	3	30	37	0	70	0	39	33	5	0	77	0	29	13	27	0	69	0	11	32	4	0	47	263
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	0	1	10	15	0	26	0	17	11	0	0	28	0	23	11	18	0	52	0	5	5	0	0	10	116
4:15 PM	0	3	20	8	0	31	0	10	16	2	0	28	0	16	7	21	0	44	0	5	14	1	0	20	123
4:30 PM	0	1	9	16	0	26	0	17	18	1	0	36	0	10	8	11	0	29	0	1	9	1	0	11	102
4:45 PM	0	1	16	12	0	29	0	7	14	5	0	26	0	17	8	16	0	41	0	0	11	5	0	16	112
Hourly Total	0	6	55	51	0	112	0	51	59	8	0	118	0	66	34	66	0	166	0	11	39	7	0	57	453
5:00 PM	0	1	11	15	0	27	0	12	15	5	0	32	0	19	8	8	0	35	0	5	10	1	0	16	110
5:15 PM	0	1	9	14	0	24	0	13	23	3	0	39	0	27	9	4	0	40	0	3	12	1	0	16	119
5:30 PM	0	2	5	20	0	27	0	14	18	3	0	35	0	20	10	2	0	32	0	1	7	2	0	10	104
5:45 PM	0	0	16	14	0	30	0	12	10	3	0	25	0	11	7	5	0	23	0	1	8	0	0	9	87
Hourly Total	0	4	41	63	0	108	0	51	66	14	0	131	0	77	34	19	0	130	0	10	37	4	0	51	420
Grand Total	0	17	201	238	0	456	0	175	198	39	0	412	0	203	110	201	0	514	0	45	151	19	0	215	1597
Approach %	0.0	3.7	44.1	52.2	-	-	0.0	42.5	48.1	9.5	-	-	0.0	39.5	21.4	39.1	-	-	0.0	20.9	70.2	8.8	-	-	-
Total %	0.0	1.1	12.6	14.9	-	28.6	0.0	11.0	12.4	2.4	-	25.8	0.0	12.7	6.9	12.6	-	32.2	0.0	2.8	9.5	1.2	-	13.5	-
Lights	0	15	181	227	-	423	0	163	181	27	-	371	0	198	106	194	-	498	0	42	148	15	-	205	1497
% Lights	-	88.2	90.0	95.4	-	92.8	-	93.1	91.4	69.2	-	90.0	-	97.5	96.4	96.5	-	96.9	-	93.3	98.0	78.9	-	95.3	93.7
Buses	0	1	4	3	-	8	0	5	6	1	-	12	0	1	3	5	-	9	0	1	0	2	-	3	32
% Buses	-	5.9	2.0	1.3	-	1.8	-	2.9	3.0	2.6	-	2.9	-	0.5	2.7	2.5	-	1.8	-	2.2	0.0	10.5	-	1.4	2.0
Single-Unit Trucks	0	1	12	8	-	21	0	7	2	7	-	16	0	4	0	2	-	6	0	0	3	2	-	5	48
% Single-Unit Trucks	-	5.9	6.0	3.4	-	4.6	-	4.0	1.0	17.9	-	3.9	-	2.0	0.0	1.0	-	1.2	-	0.0	2.0	10.5	-	2.3	3.0
Articulated Trucks	0	0	4	0	-	4	0	0	6	2	-	8	0	0	0	0	-	0	0	1	0	0	-	1	13
% Articulated Trucks	-	0.0	2.0	0.0	-	0.9	-	0.0	3.0	5.1	-	1.9	-	0.0	0.0	0.0	-	0.0	-	2.2	0.0	0.0	-	0.5	0.8
Bicycles on Road	0	0	0	0	-	0	0	0	3	2	-	5	0	0	1	0	-	1	0	1	0	0	-	1	7
% Bicycles on Road	-	0.0	0.0	0.0	-	0.0	-	0.0	1.5	5.1	-	1.2	-	0.0	0.9	0.0	-	0.2	-	2.2	0.0	0.0	-	0.5	0.4
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-

Morris, IL Cold and Dry 01/28/16
Lisbon Rd and Middle Rd 11:21:22
Wednesday January 27, 2016

TURNS/TEAPAC[Ver 3.61.12] - 60-Minute Volumes: by Movement

Intersection # 1 lisbon/middle

Begin	N-Approach			E-Approach			SE-Approach			NW-Approach			Int
Time	NW	TH	SE	RT	TH	LT	N	TH	LT	N	TH	LT	Total
700	1	0	10	0	0	0	10	28	0	2	28	0	79
715	0	0	14	0	0	0	7	18	0	1	38	0	78
730	0	0	12	0	0	0	6	20	0	0	44	0	82
745	0	0	15	0	0	0	6	20	0	1	53	0	95
800	0	0	14	0	0	0	4	19	0	2	56	0	95
815	0	0	7	0	0	0	2	17	0	2	44	0	72*
830	0	0	7	0	0	0	2	9	0	2	30	0	50*
845	0	0	2	0	0	0	0	2	0	1	15	0	20*
1600	0	0	6	0	0	0	18	51	0	1	52	0	128
1615	0	0	6	0	0	0	12	46	0	0	49	0	113
1630	0	0	7	0	0	0	11	49	0	0	47	0	114
1645	0	0	13	0	0	0	9	53	0	0	46	0	121
1700	0	0	14	0	0	0	10	46	0	0	34	0	104
1715	0	0	12	0	0	0	8	35	0	0	28	0	83*
1730	0	0	9	0	0	0	7	23	0	0	19	0	58*
1745	0	0	1	0	0	0	3	7	0	0	5	0	16*

TURNS/TEAPAC[Ver 3.61.12] - 60-Minute Volumes: Appr/Exit Totals

Intersection # 1 lisbon/middle

Begin	Approach Totals				Exit Totals				Int
Time	N	E	SE	NW	N	E	SE	NW	Total
700	11	0	38	30	28	48	2	1	79
715	14	0	25	39	18	59	1	0	78
730	12	0	26	44	20	62	0	0	82
745	15	0	26	54	20	74	1	0	95
800	14	0	23	58	19	74	2	0	95
815	7	0	19	46	17	53	2	0	72*
830	7	0	11	32	9	39	2	0	50*
845	2	0	2	16	2	17	1	0	20*
1600	6	0	69	53	51	76	1	0	128
1615	6	0	58	49	46	67	0	0	113
1630	7	0	60	47	49	65	0	0	114
1645	13	0	62	46	53	68	0	0	121
1700	14	0	56	34	46	58	0	0	104
1715	12	0	43	28	35	48	0	0	83*
1730	9	0	30	19	23	35	0	0	58*
1745	1	0	10	5	7	9	0	0	16*

Intersection	**Lisbon Road with Nelson Road**	AM Period	7:00 AM to 9:00 AM
North/South Road	Lisbon Road	**AM Peak**	**7:00 AM to 8:00 AM**
East/West Road	Nelson Road	PM Period	4:00 PM to 6:00 PM
Count Conducted	Tuesday, January 12, 2016	**PM Peak**	**4:00 PM to 5:00 PM**

	Nelson Road Eastbound			Nelson Road Westbound			Lisbon Road Northbound			Lisbon Road Southbound		
Start Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:00 AM	0	0	0	0	1	1	2	4	0	1	7	1
7:15 AM	3	3	2	0	1	0	0	5	0	0	14	1
7:30 AM	0	6	1	0	1	0	1	2	0	2	7	0
7:45 AM	0	4	1	0	2	2	2	4	0	0	6	0
PEAK TOTAL	**3**	**13**	**4**	**0**	**5**	**3**	**5**	**15**	**0**	**3**	**34**	**2**
4:00 PM	0	3	1	0	2	2	1	5	0	1	5	0
4:15 PM	1	2	1	0	2	2	2	10	0	0	10	0
4:30 PM	1	3	0	0	4	2	0	9	1	1	7	1
4:45 PM	2	2	4	0	1	0	2	9	0	1	11	1
PEAK TOTAL	**4**	**10**	**6**	**0**	**9**	**6**	**5**	**33**	**1**	**3**	**33**	**2**

Morris, IL Weather: Cold and Dry 01/14/16
Lisbon Rd and Airport Rd 07:35:48
Tuesday January 12, 2016

TURNS/TEAPAC[Ver 3.61.12] - 60-Minute Volumes: by Movement

Intersection # 1 lisbon/airport

Begin	N-Approach			E-Approach			S-Approach			W-Approach			Int
Time	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	Total
700	0	29	0	0	3	1	0	23	3	7	4	0	70
715	1	23	0	0	2	2	0	21	2	8	3	0	62
730	1	22	0	0	1	1	0	15	3	7	2	0	52
745	1	19	0	0	0	1	0	14	4	5	3	0	47
800	1	24	0	0	0	1	0	11	4	4	3	0	48
815	0	21	0	0	0	0	0	7	4	2	3	0	37*
830	0	15	0	0	0	0	0	5	3	1	2	0	26*
845	0	10	0	0	0	0	0	3	0	0	0	0	13*
1600	1	34	0	3	1	1	0	26	17	4	3	0	90
1615	0	34	0	1	2	0	0	27	16	6	3	0	89
1630	0	28	0	0	2	1	0	26	15	6	3	0	81
1645	0	23	0	1	1	2	0	28	12	6	2	0	75
1700	0	19	1	1	2	3	0	23	9	7	1	0	66
1715	0	14	1	1	1	3	0	17	8	5	1	0	51*
1730	0	9	1	1	1	2	0	9	5	3	0	0	31*
1745	0	5	1	0	1	1	0	1	2	3	0	0	14*

TURNS/TEAPAC[Ver 3.61.12] - 60-Minute Volumes: Appr/Exit Totals

Intersection # 1 lisbon/airport

Begin	Approach Totals				Exit Totals				Int
Time	N	E	S	W	N	E	S	W	Total
700	29	4	26	11	23	4	37	6	70
715	24	4	23	11	21	3	33	5	62
730	23	2	18	9	15	2	30	5	52
745	20	1	18	8	14	3	25	5	47
800	25	1	15	7	11	3	29	5	48
815	21	0	11	5	7	3	23	4	37*
830	15	0	8	3	5	2	16	3	26*
845	10	0	3	0	3	0	10	0	13*
1600	35	5	43	7	29	3	39	19	90
1615	34	3	43	9	28	3	40	18	89
1630	28	3	41	9	26	3	35	17	81
1645	23	4	40	8	29	2	31	13	75
1700	20	6	32	8	24	2	29	11	66
1715	15	5	25	6	18	2	22	9	51*
1730	10	4	14	3	10	1	14	6	31*
1745	6	2	3	3	1	1	9	3	14*

Study Name	Lisbon/Minooka
Start Date	Tuesday, January 12, 2016 7:00 AM
End Date	Tuesday, January 12, 2016 6:00 PM
Site Code	

Report Summary

		Eastbound							Westbound								Northbound								Southbound								Northwestbound									Crosswalk	
Time Period	**Class.**	**U**	**L**	**T**	**BR**	**R**	**I**	**O**	**U**	**HL**	**L**	**T**	**R**	**I**	**O**	**U**	**L**	**T**	**R**	**HR**	**I**	**O**	**U**	**L**	**BL**	**T**	**R**	**I**	**O**	**U**	**HL**	**BL**	**BR**	**HR**	**I**	**O**	**Total**		**Pedestrians**	**Total**
Peak 1	Lights	0	1	4	8	8	21	14	0	2	3	1	0	6	10	0	6	15	3	0	24	29	0	2	17	18	1	38	27	0	0	6	11	1	18	27	107	W	0	0
Specified Period	%	0%	100%	100%	100%	89%	95%	93%	0%	67%	75%	100%	0%	67%	77%	0%	100%	94%	75%	0%	92%	85%	0%	100%	85%	86%	50%	84%	93%	0%	0%	100%	92%	50%	90%	87%	88%		0%	
7:00 AM - 8:00 AM	Buses	0	0	0	0	1	1	0	0	0	0	0	0	0	2	0	0	0	1	0	1	2	0	0	1	1	0	2	0	0	0	0	0	1	1	1	5	E	0	0
One Hour Peak	%	0%	0%	0%	0%	11%	5%	0%	0%	0%	0%	0%	0%	0%	15%	0%	0%	0%	25%	0%	4%	6%	0%	0%	5%	5%	0%	4%	0%	0%	0%	0%	0%	50%	5%	3%	4%		0%	
7:00 AM - 8:00 AM	Single-Unit Trucks	0	0	0	0	0	0	1	1	1	1	0	0	3	1	0	0	1	0	0	1	3	0	0	2	2	1	5	2	0	0	0	1	0	1	3	10	S	0	0
	%	0%	0%	0%	0%	0%	0%	7%	100%	33%	25%	0%	0%	33%	8%	0%	0%	6%	0%	0%	4%	9%	0%	0%	10%	10%	50%	11%	7%	0%	0%	0%	8%	0%	5%	10%	8%		0%	
	Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	
	Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	SE	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	
	Total	**0**	**1**	**4**	**8**	**9**	**22**	**15**	**1**	**3**	**4**	**1**	**0**	**9**	**13**	**0**	**6**	**16**	**4**	**0**	**26**	**34**	**0**	**2**	**20**	**21**	**2**	**45**	**29**	**0**	**0**	**6**	**12**	**2**	**20**	**31**	**122**		**0**	**0**
	PHF	0	0.25	0.25	0.5	0.56	0.61	0.62	0.25	0.38	0.5	0.25	0	0.56	0.54	0	0.75	0.5	0.5	0	0.59	0.57	0	0.25	0.62	0.58	0.25	0.66	0.52	0	0	0.75	0.6	0.5	0.71	0.55	0.64			
	Approach %						18%	12%						7%	11%						21%	28%						37%	24%						16%	25%					
Peak 2	Lights	0	0	0	8	2	10	14	0	0	1	2	2	5	2	0	0	3	0	0	3	9	0	1	26	6	2	35	25	0	0	10	20	1	31	34	84	W	0	0
Specified Period	%	0%	0%	0%	100%	100%	100%	100%	0%	0%	100%	100%	100%	100%	100%	0%	0%	100%	0%	0%	100%	100%	0%	100%	100%	100%	100%	100%	100%	0%	0%	100%	100%	100%	100%	100%	100%		0%	
4:00 PM - 5:00 PM	Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	E	0	0
One Hour Peak	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	
4:00 PM - 5:00 PM	Single-Unit Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	S	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	
	Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	N	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	
	Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	SE	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	
	Total	**0**	**0**	**0**	**8**	**2**	**10**	**14**	**0**	**0**	**1**	**2**	**2**	**5**	**2**	**0**	**0**	**3**	**0**	**0**	**3**	**9**	**0**	**1**	**26**	**6**	**2**	**35**	**25**	**0**	**0**	**10**	**20**	**1**	**31**	**34**	**84**		**0**	**0**
	PHF	0	0	0	0.5	0.25	0.42	0.88	0	0	0.25	0.5	0.5	0.62	0.5	0	0	0.75	0	0	0.75	0.75	0	0.25	0.93	0.5	0.25	0.88	0.78	0	0	0.62	0.83	0.25	0.7	0.77	0.81			
	Approach %						12%	17%						6%	2%						4%	11%						42%	30%						37%	40%					

Kenig Lindgren O'Hara Aboona, Inc.
9575 W. Higgins Rd., Suite 400

Rosemont, Illinois, United States 60018
(847)518-9990

Count Name: Lisbon/Sherrill
Site Code:
Start Date: 01/12/2016

Turning Movement Data

Start Time	Sherrill Road Westbound					Lisbon Road Northbound					Lisbon Road Southbound					
	U-Turn	Left	Right	Peds	App. Total	U-Turn	Thru	Right	Peds	App. Total	U-Turn	Left	Thru	Peds	App. Total	Int. Total
7:00 AM	0	0	0	0	0	0	2	0	0	2	0	0	1	0	1	3
7:15 AM	0	1	1	0	2	0	9	0	0	9	0	0	8	0	8	19
7:30 AM	0	2	1	0	3	0	1	0	0	1	0	1	6	0	7	11
7:45 AM	0	0	0	0	0	0	3	1	0	4	0	1	6	0	7	11
Hourly Total	0	3	2	0	5	0	15	1	0	16	0	2	21	0	23	44
8:00 AM	0	0	2	0	2	0	8	0	0	8	0	1	5	0	6	16
8:15 AM	0	1	0	0	1	0	3	0	0	3	0	0	6	0	6	10
8:30 AM	0	0	0	0	0	0	2	0	0	2	0	0	6	0	6	8
8:45 AM	0	0	0	0	0	0	4	0	0	4	0	0	7	0	7	11
Hourly Total	0	1	2	0	3	0	17	0	0	17	0	1	24	0	25	45
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	0	1	0	0	1	0	4	1	0	5	0	0	6	0	6	12
4:15 PM	0	0	0	0	0	0	6	0	0	6	0	1	7	0	8	14
4:30 PM	0	0	1	0	1	0	6	0	0	6	0	0	10	0	10	17
4:45 PM	0	2	0	0	2	0	6	0	0	6	0	0	8	0	8	16
Hourly Total	0	3	1	0	4	0	22	1	0	23	0	1	31	0	32	59
5:00 PM	0	0	0	0	0	0	4	0	0	4	0	0	4	0	4	8
5:15 PM	0	1	0	0	1	0	6	0	0	6	0	0	4	0	4	11
5:30 PM	0	0	0	0	0	0	6	0	0	6	0	0	5	0	5	11
5:45 PM	0	1	2	0	3	0	4	0	0	4	0	0	4	0	4	11
Hourly Total	0	2	2	0	4	0	20	0	0	20	0	0	17	0	17	41
Grand Total	0	9	7	0	16	0	74	2	0	76	0	4	93	0	97	189
Approach %	0.0	56.3	43.8	-	-	0.0	97.4	2.6	-	-	0.0	4.1	95.9	-	-	-
Total %	0.0	4.8	3.7	-	8.5	0.0	39.2	1.1	-	40.2	0.0	2.1	49.2	-	51.3	-
Lights	0	7	5	-	12	0	72	1	-	73	0	3	89	-	92	177
% Lights	-	77.8	71.4	-	75.0	-	97.3	50.0	-	96.1	-	75.0	95.7	-	94.8	93.7
Buses	0	1	2	-	3	0	1	0	-	1	0	1	0	-	1	5
% Buses	-	11.1	28.6	-	18.8	-	1.4	0.0	-	1.3	-	25.0	0.0	-	1.0	2.6
Single-Unit Trucks	0	1	0	-	1	0	1	1	-	2	0	0	4	-	4	7
% Single-Unit Trucks	-	11.1	0.0	-	6.3	-	1.4	50.0	-	2.6	-	0.0	4.3	-	4.1	3.7
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	-	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	-	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	-	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Capacity Analysis Worksheets
Existing Traffic Conditions

LEVEL OF SERVICE CRITERIA

Signalized Intersections

Level of Service	Interpretation	Average Control Delay (seconds per vehicle)
A	Very short delay, with extremely favorable progression. Most vehicles arrive during the green phase and do not stop at all.	≤10
B	Good progression, with more vehicles stopping than for Level of Service A, causing higher levels of average delay.	>10-20
C	Light congestion, with individual cycle failures beginning to appear. Number of vehicles stopping is significant at this level.	>20-35
D	Congestion is more noticeable, with longer delays resulting from combinations of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop, and the proportion of vehicles not stopping declines.	>35-55
E	Limit of acceptable delay. High delays result from poor progression, high cycle lengths, and high V/C ratios.	>55-80
F	Unacceptable delays occurring, with oversaturation.	>80.0

Unsignalized Intersections

Level of Service	Average Control Delay (seconds per vehicle)
A	0-10
B	>10-15
C	>15-25
D	>25-35
E	>35-50
F	>50

Source: Highway Capacity Manual, 2010.

ICU PEAK HOUR ADJUSTMENT FACTOR

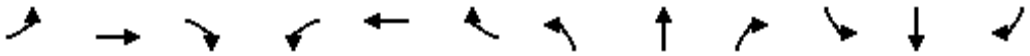
Level of Service	ICU Percentage
A	≤ 55.0%
B	> 55.1% to 64.0%
C	> 64.1% to 73.0%
D	> 73.1% to 82.0%
E	> 82.1% to 91.0%
F	> 91.1% to 100.0%
G	> 100.1% to 109.0%
H	> 109.1%

Source: *Intersection Capacity Utilization: Evaluation Procedures for Intersections and Interchanges,* 2003.

ICU vs. HCM LEVEL OF SERVICE COMPATIBILITY

Given ICU LOS	Resulting HCM LOS
F or worse	F normally D or E possible with special timings
E or better	E or better
D or better	D or better (depends on cycle length) v/c rations < 0.80

Source: *Intersection Capacity Utilization: Evaluation Procedures for Intersections and Interchanges,* 2003.

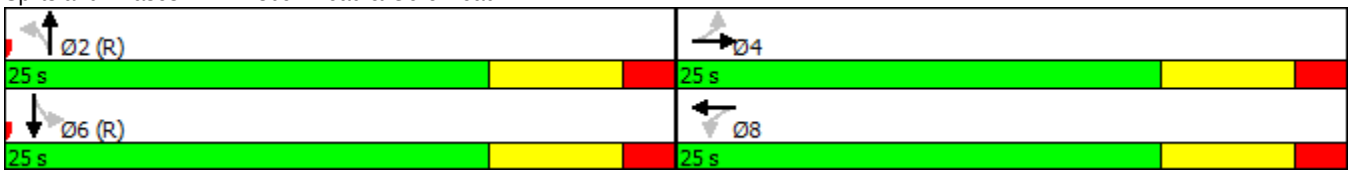


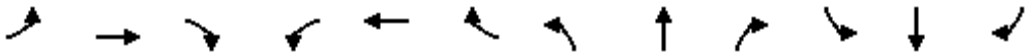
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	75	87	34	40	12	31	29	89	13	43	4
Future Volume (vph)	4	75	87	34	40	12	31	29	89	13	43	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Storage Length (ft)	75		0	150		0	100		0	115		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	50			95			115			80		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.919			0.966			0.887			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1163	1558	0	1407	1363	0	1745	1512	0	1517	1699	0
Flt Permitted	0.714			0.628			0.718			0.661		
Satd. Flow (perm)	874	1558	0	930	1363	0	1319	1512	0	1056	1699	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		112			15			114			5	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		1749			1964			2392			3824	
Travel Time (s)		47.7			53.6			46.6			74.5	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Heavy Vehicles (%)	50%	11%	6%	24%	22%	58%	0%	10%	7%	15%	5%	25%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	208	0	44	66	0	40	151	0	17	60	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)	18.0	18.0		18.0	18.0		18.0	18.0		18.0	18.0	
Actuated g/C Ratio	0.36	0.36		0.36	0.36		0.36	0.36		0.36	0.36	
v/c Ratio	0.02	0.33		0.13	0.13		0.08	0.24		0.04	0.10	
Control Delay	10.5	7.5		12.1	9.7		11.2	5.4		10.9	10.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.5	7.5		12.1	9.7		11.2	5.4		10.9	10.5	
LOS	B	A		B	A		B	A		B	B	
Approach Delay		7.6			10.7			6.6			10.6	
Approach LOS		A			B			A			B	
Queue Length 50th (ft)	1	19		8	10		8	7		3	10	
Queue Length 95th (ft)	5	43		22	25		20	27		11	25	
Internal Link Dist (ft)		1669			1884			2312			3744	
Turn Bay Length (ft)	75			150			100			115		
Base Capacity (vph)	314	632		334	500		474	617		380	614	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.02	0.33		0.13	0.13		0.08	0.24		0.04	0.10	

Intersection Summary			
Area Type:	Other		
Cycle Length: 50			
Actuated Cycle Length: 50			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.33			
Intersection Signal Delay: 8.2		Intersection LOS: A	
Intersection Capacity Utilization 41.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Lisbon Road & Gore Road



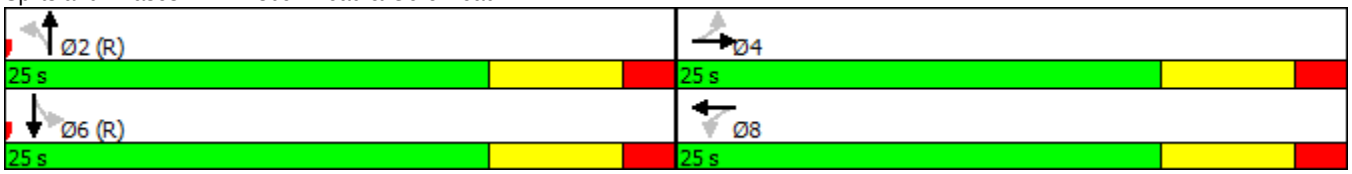


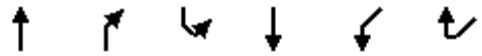
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	55	51	51	59	8	66	34	66	11	39	7
Future Volume (vph)	6	55	51	51	59	8	66	34	66	11	39	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Storage Length (ft)	75		0	150		0	100		0	115		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	50			95			115			80		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.928			0.982			0.901			0.976	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1745	1615	0	1745	1773	0	1694	1633	0	1745	1716	0
Flt Permitted	0.709			0.683			0.724			0.687		
Satd. Flow (perm)	1302	1615	0	1254	1773	0	1291	1633	0	1262	1716	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		55			9			72			8	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		1749			1964			2392			3824	
Travel Time (s)		47.7			53.6			46.6			74.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	7%	4%	0%	2%	0%	3%	0%	2%	0%	0%	28%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	115	0	55	73	0	72	109	0	12	50	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Yellow Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)	18.0	18.0		18.0	18.0		18.0	18.0		18.0	18.0	
Actuated g/C Ratio	0.36	0.36		0.36	0.36		0.36	0.36		0.36	0.36	
v/c Ratio	0.01	0.19		0.12	0.11		0.16	0.17		0.03	0.08	
Control Delay	10.5	7.6		11.7	10.3		12.0	6.1		10.6	9.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.5	7.6		11.7	10.3		12.0	6.1		10.6	9.8	
LOS	B	A		B	B		B	A		B	A	
Approach Delay		7.7			10.9			8.4			9.9	
Approach LOS		A			B			A			A	
Queue Length 50th (ft)	1	11		10	12		14	7		2	8	
Queue Length 95th (ft)	8	38		29	33		36	32		10	25	
Internal Link Dist (ft)		1669			1884			2312			3744	
Turn Bay Length (ft)	75			150			100			115		
Base Capacity (vph)	468	616		451	644		464	633		454	622	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.01	0.19		0.12	0.11		0.16	0.17		0.03	0.08	

Intersection Summary			
Area Type:	Other		
Cycle Length: 50			
Actuated Cycle Length: 50			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.19			
Intersection Signal Delay: 9.1		Intersection LOS: A	
Intersection Capacity Utilization 31.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Lisbon Road & Gore Road

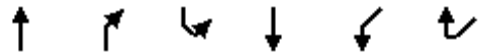




Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (veh/h)	28	10	2	36	10	1
Future Volume (Veh/h)	28	10	2	36	10	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	34	12	2	44	12	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			46		88	40
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			46		88	40
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1562		912	1031

Direction, Lane #	NB 1	SB 1	SW 1
Volume Total	46	46	13
Volume Left	0	2	12
Volume Right	12	0	1
cSH	1700	1562	920
Volume to Capacity	0.03	0.00	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	0.3	9.0
Lane LOS		A	A
Approach Delay (s)	0.0	0.3	9.0
Approach LOS			A

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	13.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations						
Traffic Volume (veh/h)	39	18	1	52	6	0
Future Volume (Veh/h)	39	18	1	52	6	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	44	20	1	58	7	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			64		114	54
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			64		114	54
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1551		887	1019

Direction, Lane #	NB 1	SB 1	SW 1
Volume Total	64	59	7
Volume Left	0	1	7
Volume Right	20	0	0
cSH	1700	1551	887
Volume to Capacity	0.04	0.00	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	0.1	9.1
Lane LOS		A	A
Approach Delay (s)	0.0	0.1	9.1
Approach LOS			A

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		13.5%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations											
Sign Control		Stop			Stop			Stop		Stop	
Traffic Volume (vph)	3	13	4	0	5	3	3	34	2	5	20
Future Volume (vph)	3	13	4	0	5	3	3	34	2	5	20
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	4	16	5	0	6	4	4	41	2	6	24

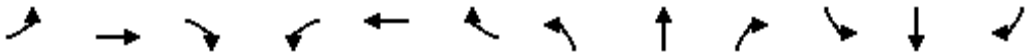
Direction, Lane #	EB 1	WB 1	SB 1	NW 1
Volume Total (vph)	25	10	47	30
Volume Left (vph)	4	0	4	6
Volume Right (vph)	5	4	2	0
Hadj (s)	-0.05	-0.21	0.07	0.18
Departure Headway (s)	4.0	3.9	4.1	4.2
Degree Utilization, x	0.03	0.01	0.05	0.04
Capacity (veh/h)	872	902	871	836
Control Delay (s)	7.1	6.9	7.3	7.4
Approach Delay (s)	7.1	6.9	7.3	7.4
Approach LOS	A	A	A	A

Intersection Summary				
Delay	7.2			
Level of Service	A			
Intersection Capacity Utilization	20.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR	NWR2
Lane Configurations												
Sign Control		Stop			Stop			Stop		Stop		
Traffic Volume (vph)	4	10	6	0	9	6	5	33	1	3	33	2
Future Volume (vph)	4	10	6	0	9	6	5	33	1	3	33	2
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	4	11	7	0	10	7	6	37	1	3	37	2

Direction, Lane #	EB 1	WB 1	SB 1	NW 1
Volume Total (vph)	22	17	44	42
Volume Left (vph)	4	0	6	3
Volume Right (vph)	7	7	1	2
Hadj (s)	-0.15	-0.25	0.01	-0.01
Departure Headway (s)	3.9	3.9	4.0	4.0
Degree Utilization, x	0.02	0.02	0.05	0.05
Capacity (veh/h)	887	907	878	876
Control Delay (s)	7.0	6.9	7.2	7.2
Approach Delay (s)	7.0	6.9	7.2	7.2
Approach LOS	A	A	A	A

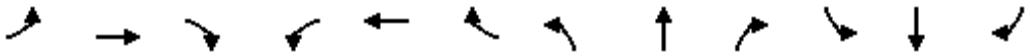
Intersection Summary				
Delay	7.2			
Level of Service	A			
Intersection Capacity Utilization	21.2%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	4	7	1	3	0	3	23	0	0	29	0
Future Volume (Veh/h)	0	4	7	1	3	0	3	23	0	0	29	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	0	5	8	1	4	0	4	28	0	0	35	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	73	71	35	82	71	28	35			28		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	73	71	35	82	71	28	35			28		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	99	100	100	100	100			100		
cM capacity (veh/h)	913	817	1038	893	817	1047	1576			1585		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	5	32	35
Volume Left	0	1	4	0
Volume Right	8	0	0	0
cSH	940	832	1576	1585
Volume to Capacity	0.01	0.01	0.00	0.00
Queue Length 95th (ft)	1	0	0	0
Control Delay (s)	8.9	9.4	0.9	0.0
Lane LOS	A	A	A	
Approach Delay (s)	8.9	9.4	0.9	0.0
Approach LOS	A	A		

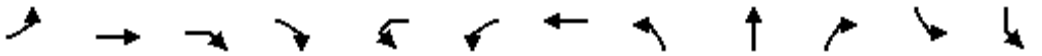
Intersection Summary				
Average Delay	2.3			
Intersection Capacity Utilization	13.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	3	4	1	1	3	17	26	0	0	34	1
Future Volume (Veh/h)	0	3	4	1	1	3	17	26	0	0	34	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	0	4	5	1	1	4	21	33	0	0	43	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	123	118	44	126	119	33	44			33		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	123	118	44	126	119	33	44			33		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	100	100	100	100	99			100		
cM capacity (veh/h)	843	765	1032	837	765	1046	1577			1592		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	9	6	54	44
Volume Left	0	1	21	0
Volume Right	5	4	0	1
cSH	894	949	1577	1592
Volume to Capacity	0.01	0.01	0.01	0.00
Queue Length 95th (ft)	1	0	1	0
Control Delay (s)	9.1	8.8	2.9	0.0
Lane LOS	A	A	A	
Approach Delay (s)	9.1	8.8	2.9	0.0
Approach LOS	A	A		

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	19.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	NBL	NBT	NBR	SBL2	SBL
Lane Configurations												
Volume (vph)	1	4	8	9	3	4	1	6	16	4	2	20
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right			No	No						No		
Ideal Flow	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	0	22	0	0	0	0	8	0	26	0	0	0
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	0.88	0.85	0.85	0.95	0.95	0.96	0.95	0.97	0.85	0.95	0.95
Saturated Flow (vph)	0	1676	0	0	0	0	1817	0	1835	0	0	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00					0.00		0.00			
Protected Option Allowed		No					No		No			
Reference Time (s)			0.0	0.0						0.0		
Adj Reference Time (s)			0.0	0.0						0.0		
Permitted Option												
Adj Saturation A (vph)	0	1708			0	0	227	0	1730		0	0
Reference Time A (s)	0.0	1.5			0.0	0.0	4.2	0.0	1.8		0.0	0.0
Adj Saturation B (vph	0	0			0	0	0	0	0		0	0
Reference Time B (s)	8.1	9.6			8.2	8.3	8.5	8.4	9.7		8.1	9.3
Reference Time (s)		1.5					4.2		1.8			
Adj Reference Time (s)		8.0					8.2		8.0			
Split Option												
Ref Time Combined (s)	0.0	1.6			0.0	0.0	0.5	0.0	1.7		0.0	0.0
Ref Time Seperate (s)	0.1	0.3			0.2	0.3	0.1	0.4	1.0		0.1	1.3
Reference Time (s)	1.6	1.6			0.5	0.5	0.5	1.7	1.7		2.9	2.9
Adj Reference Time (s)	8.0	8.0			8.0	8.0	8.0	8.0	8.0		8.0	8.0

Summary	EB WB	NB SB	NW	Combined
Protected Option (s)	NA	NA	NA	
Permitted Option (s)	8.2	9.7	Err	
Split Option (s)	16.0	16.0	8.0	
Minimum (s)	8.2	9.7	8.0	25.9

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	21.6%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	EBT	EBR	EBR2	WBL	WBT	WBR	NBT	SBL2	SBL	SBT	SBR	NWL
Lane Configurations												
Volume (vph)	0	8	2	1	2	2	3	1	26	6	2	10
Pedestrians												
Ped Button												
Pedestrian Timing (s)												
Free Right		No	No			No					No	
Ideal Flow	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	10	0	0	0	5	0	3	0	0	35	0	31
Lane Utilization Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.85	0.85	0.85	0.95	0.93	0.85	1.00	0.95	0.95	0.95	0.85	0.88
Saturated Flow (vph)	1615	0	0	0	1768	0	1900	0	0	1811	0	1679
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00				0.00		0.00			0.00		0.00
Protected Option Allowed	No				No		No			No		No
Reference Time (s)		0.0	0.0			0.0					0.0	
Adj Reference Time (s)		0.0	0.0			0.0					0.0	
Permitted Option												
Adj Saturation A (vph)	1615			0	438		1900	0	0	145		112
Reference Time A (s)	0.7			0.0	1.4		0.2	0.0	0.0	29.0		33.2
Adj Saturation B (vph	1615			0	0		1900	0	0	0		NA
Reference Time B (s)	0.7			8.1	8.3		0.2	8.1	9.7	10.3		NA
Reference Time (s)	0.7				1.4		0.2			10.3		
Adj Reference Time (s)	8.0				8.0		8.0			14.3		
Split Option												
Ref Time Combined (s)	0.7			0.0	0.3		0.2	0.0	0.0	2.3		2.2
Ref Time Seperate (s)	0.0			0.1	0.1		0.2	0.1	1.7	0.4		0.7
Reference Time (s)	0.7			0.3	0.3		0.2	2.3	2.3	2.3		2.2
Adj Reference Time (s)	8.0			8.0	8.0		8.0	8.0	8.0	8.0		8.0

Summary	EB WB	NB SB	NW	Combined
Protected Option (s)	NA	NA	NA	
Permitted Option (s)	8.0	14.3	Err	
Split Option (s)	16.0	16.0	8.0	
Minimum (s)	8.0	14.3	8.0	30.3

Right Turns
Adj Reference Time (s)
Cross Thru Ref Time (s)
Oncoming Left Ref Time (s)
Combined (s)

Intersection Summary			
Intersection Capacity Utilization	25.3%	ICU Level of Service	A

Reference Times and Phasing Options do not represent an optimized timing plan.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	2	28	1	2	42
Future Volume (Veh/h)	3	2	28	1	2	42
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.58	0.58	0.58	0.58	0.58	0.58
Hourly flow rate (vph)	5	3	48	2	3	72
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	127	49			50	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	127	49			50	
tC, single (s)	7.1	6.7			4.1	
tC, 2 stage (s)						
tF (s)	4.1	3.8			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	735	899			1570	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	8	50	75
Volume Left	5	0	3
Volume Right	3	2	0
cSH	789	1700	1570
Volume to Capacity	0.01	0.03	0.00
Queue Length 95th (ft)	1	0	0
Control Delay (s)	9.6	0.0	0.3
Lane LOS	A		A
Approach Delay (s)	9.6	0.0	0.3
Approach LOS	A		

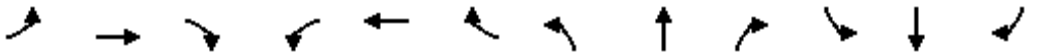
Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	13.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	3	1	22	1	1	31
Future Volume (Veh/h)	3	1	22	1	1	31
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	3	1	25	1	1	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	64	26			26	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	64	26			26	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	947	1056			1601	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	4	26	37
Volume Left	3	0	1
Volume Right	1	1	0
cSH	972	1700	1601
Volume to Capacity	0.00	0.02	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	8.7	0.0	0.2
Lane LOS	A		A
Approach Delay (s)	8.7	0.0	0.2
Approach LOS	A		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Capacity Analysis Worksheets
Projected 2040 Traffic Conditions

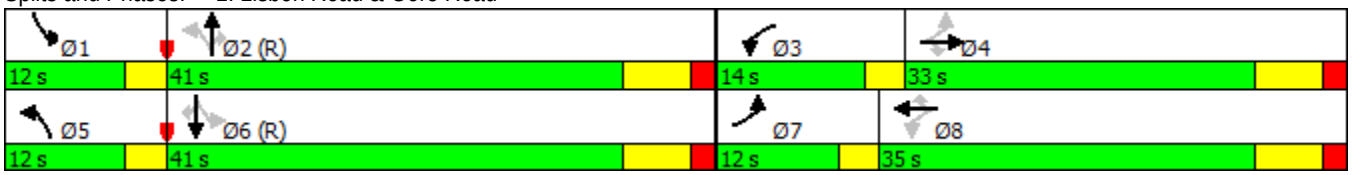


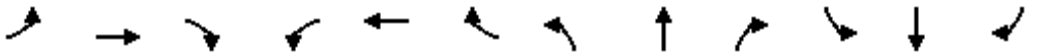
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	165	220	135	45	140	50	50	800	145	80	330	30
Future Volume (vph)	165	220	135	45	140	50	50	800	145	80	330	30
Ideal Flow (vphpl)	1900	2000	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	150		150	150		150	215		215	215		215
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	100			100			220			220		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1641	1818	1468	1641	1818	1468	1641	3455	1468	1641	3455	1468
Flt Permitted	0.587			0.614			0.544			0.233		
Satd. Flow (perm)	1014	1818	1468	1061	1818	1468	940	3455	1468	402	3455	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			142			109			153			109
Link Speed (mph)		25			25			25			45	
Link Distance (ft)		1749			1964			2392			1323	
Travel Time (s)		47.7			53.6			65.2			20.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	174	232	142	47	147	53	53	842	153	84	347	32
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	3.0	15.0	15.0	3.0	15.0	15.0	3.0	15.0	15.0	3.0	15.0	15.0
Minimum Split (s)	12.0	25.0	25.0	12.0	25.0	25.0	12.0	25.0	25.0	12.0	25.0	25.0
Total Split (s)	12.0	33.0	33.0	14.0	35.0	35.0	12.0	41.0	41.0	12.0	41.0	41.0
Total Split (%)	12.0%	33.0%	33.0%	14.0%	35.0%	35.0%	12.0%	41.0%	41.0%	12.0%	41.0%	41.0%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0	7.0	3.0	7.0	7.0	3.0	7.0	7.0	3.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	36.6	27.2	27.2	33.0	21.8	21.8	53.2	43.2	43.2	54.3	43.8	43.8
Actuated g/C Ratio	0.37	0.27	0.27	0.33	0.22	0.22	0.53	0.43	0.43	0.54	0.44	0.44
v/c Ratio	0.41	0.47	0.28	0.12	0.37	0.13	0.10	0.56	0.21	0.27	0.23	0.05
Control Delay	23.7	34.1	6.5	18.7	34.6	0.7	12.3	25.2	4.7	15.1	9.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	34.1	6.5	18.7	34.6	0.7	12.3	25.2	4.7	15.1	9.9	0.1
LOS	C	C	A	B	C	A	B	C	A	B	A	A
Approach Delay		23.7			24.3			21.6			10.2	
Approach LOS		C			C			C			B	
Queue Length 50th (ft)	74	128	0	18	79	0	15	220	0	15	36	0
Queue Length 95th (ft)	114	195	45	39	127	2	37	315	42	46	43	1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1669			1884			2312			1243	
Turn Bay Length (ft)	150		150	150		150	215		215	215		215
Base Capacity (vph)	427	498	505	454	509	489	574	1493	721	332	1512	704
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.47	0.28	0.10	0.29	0.11	0.09	0.56	0.21	0.25	0.23	0.05

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.56			
Intersection Signal Delay: 20.1		Intersection LOS: C	
Intersection Capacity Utilization 65.4%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Lisbon Road & Gore Road



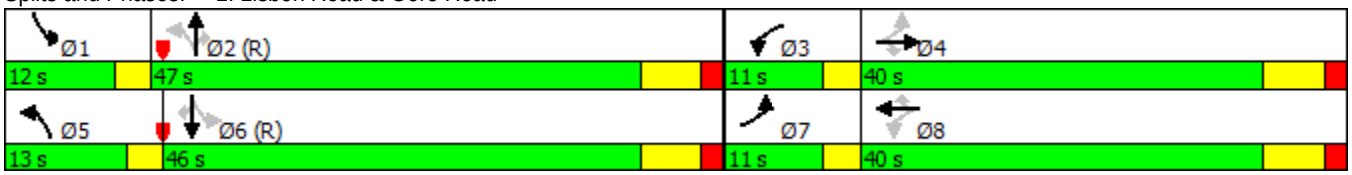


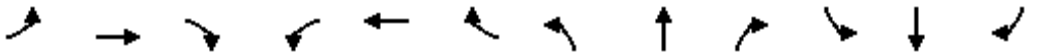
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	185	90	120	225	80	120	390	95	70	895	175
Future Volume (vph)	45	185	90	120	225	80	120	390	95	70	895	175
Ideal Flow (vphpl)	1900	2000	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	150		150	150		150	215		215	215		215
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	100			100			220			220		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1641	1818	1468	1641	1818	1468	1641	3455	1468	1641	3455	1468
Flt Permitted	0.568			0.560			0.142			0.511		
Satd. Flow (perm)	981	1818	1468	967	1818	1468	245	3455	1468	883	3455	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			99			99			100			181
Link Speed (mph)		25			25			25			45	
Link Distance (ft)		1749			1964			2392			1323	
Travel Time (s)		47.7			53.6			65.2			20.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	195	95	126	237	84	126	411	100	74	942	184
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	3.0	33.0	33.0	3.0	33.0	33.0	3.0	15.0	15.0	3.0	15.0	15.0
Minimum Split (s)	11.0	40.0	40.0	11.0	40.0	40.0	12.0	25.0	25.0	12.0	25.0	25.0
Total Split (s)	11.0	40.0	40.0	11.0	40.0	40.0	13.0	47.0	47.0	12.0	46.0	46.0
Total Split (%)	10.0%	36.4%	36.4%	10.0%	36.4%	36.4%	11.8%	42.7%	42.7%	10.9%	41.8%	41.8%
Yellow Time (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0	7.0	3.0	7.0	7.0	3.0	7.0	7.0	3.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	44.0	33.0	33.0	45.9	35.5	35.5	54.9	43.1	43.1	51.8	40.1	40.1
Actuated g/C Ratio	0.40	0.30	0.30	0.42	0.32	0.32	0.50	0.39	0.39	0.47	0.36	0.36
v/c Ratio	0.11	0.36	0.19	0.28	0.40	0.16	0.53	0.30	0.16	0.16	0.75	0.28
Control Delay	18.8	32.5	6.2	20.9	32.5	4.9	22.9	24.7	5.3	7.0	21.2	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.8	32.5	6.2	20.9	32.5	4.9	22.9	24.7	5.3	7.0	21.2	1.6
LOS	B	C	A	C	C	A	C	C	A	A	C	A
Approach Delay		23.2			24.1			21.3			17.3	
Approach LOS		C			C			C			B	
Queue Length 50th (ft)	19	108	0	53	133	0	45	107	0	13	321	1
Queue Length 95th (ft)	42	172	36	93	209	28	80	150	35	18	97	2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1669			1884			2312			1243	
Turn Bay Length (ft)	150		150	150		150	215		215	215		215
Base Capacity (vph)	449	545	509	452	586	540	249	1355	636	487	1258	649
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.36	0.19	0.28	0.40	0.16	0.51	0.30	0.16	0.15	0.75	0.28

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green, Master Intersection			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 20.2		Intersection LOS: C	
Intersection Capacity Utilization 82.6%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Lisbon Road & Gore Road



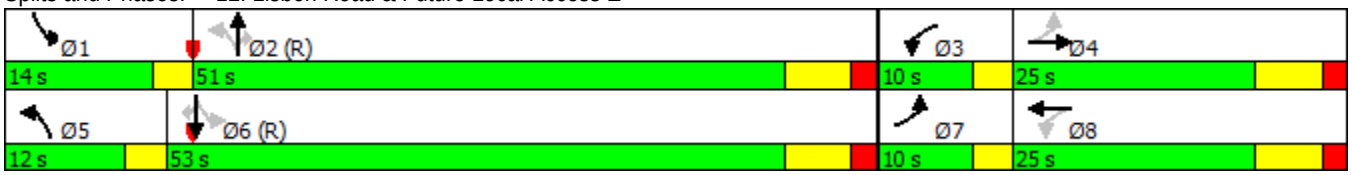


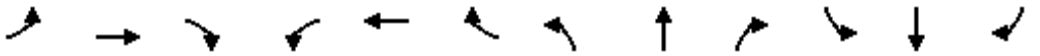
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	1	50	20	1	25	40	870	95	160	365	25
Future Volume (vph)	15	1	50	20	1	25	40	870	95	160	365	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	2000	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	150		0	150		0	215		215	215		215
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	100			100			220			220		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.853			0.856				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1641	1473	0	1641	1479	0	1641	3455	1468	1641	3455	1468
Flt Permitted	0.740			0.722			0.524			0.264		
Satd. Flow (perm)	1278	1473	0	1247	1479	0	905	3455	1468	456	3455	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		53			26				109			109
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		1653			2316			1323			1326	
Travel Time (s)		45.1			63.2			20.0			20.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	54	0	21	27	0	42	916	100	168	384	26
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		3.0	15.0	15.0	3.0	15.0	15.0
Minimum Split (s)	10.0	25.0		10.0	25.0		12.0	25.0	25.0	12.0	25.0	25.0
Total Split (s)	10.0	25.0		10.0	25.0		12.0	51.0	51.0	14.0	53.0	53.0
Total Split (%)	10.0%	25.0%		10.0%	25.0%		12.0%	51.0%	51.0%	14.0%	53.0%	53.0%
Yellow Time (s)	3.0	5.0		3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0	7.0	3.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	14.0	8.5		14.0	8.5		75.5	65.3	65.3	80.2	72.1	72.1
Actuated g/C Ratio	0.14	0.08		0.14	0.08		0.76	0.65	0.65	0.80	0.72	0.72
v/c Ratio	0.08	0.31		0.10	0.18		0.06	0.41	0.10	0.36	0.15	0.02
Control Delay	32.6	17.5		33.3	19.3		2.5	4.9	0.5	6.2	4.1	0.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.6	17.5		33.3	19.3		2.5	4.9	0.5	6.2	4.1	0.7
LOS	C	B		C	B		A	A	A	A	A	A
Approach Delay		20.9			25.4			4.4			4.5	
Approach LOS		C			C			A			A	
Queue Length 50th (ft)	9	1		12	1		2	64	0	25	6	0
Queue Length 95th (ft)	25	37		30	26		m8	73	m2	44	40	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1573			2236			1243			1246	
Turn Bay Length (ft)	150			150			215		215	215		215
Base Capacity (vph)	207	308		206	287		774	2255	996	498	2492	1089
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.18		0.10	0.09		0.05	0.41	0.10	0.34	0.15	0.02

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 10 (10%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.41			
Intersection Signal Delay: 5.7		Intersection LOS: A	
Intersection Capacity Utilization 54.5%		ICU Level of Service A	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 12: Lisbon Road & Future Local Access E



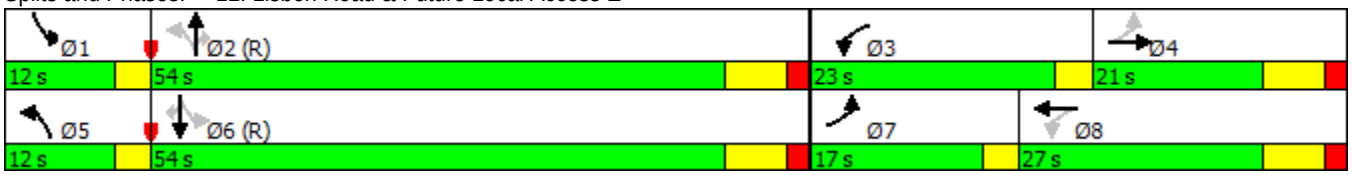


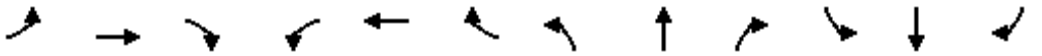
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	1	55	120	1	175	60	410	45	50	955	25
Future Volume (vph)	30	1	55	120	1	175	60	410	45	50	955	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	2000	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	150		0	150		0	215		215	215		215
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	100			100			220			220		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.853			0.851				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1641	1473	0	1641	1470	0	1641	3455	1468	1641	3455	1468
Flt Permitted	0.641			0.503			0.224			0.501		
Satd. Flow (perm)	1107	1473	0	869	1470	0	387	3455	1468	865	3455	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		58			184				129			129
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		1653			2316			1323			1326	
Travel Time (s)		45.1			63.2			20.0			20.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	32	59	0	126	185	0	63	432	47	53	1005	26
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		3.0	15.0	15.0	3.0	15.0	15.0
Minimum Split (s)	12.0	22.0		20.0	25.0		12.0	25.0	25.0	12.0	25.0	25.0
Total Split (s)	17.0	21.0		23.0	27.0		12.0	54.0	54.0	12.0	54.0	54.0
Total Split (%)	15.5%	19.1%		20.9%	24.5%		10.9%	49.1%	49.1%	10.9%	49.1%	49.1%
Yellow Time (s)	3.0	5.0		3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0	7.0	3.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	19.3	8.6		27.9	16.1		74.0	64.0	64.0	73.5	63.8	63.8
Actuated g/C Ratio	0.18	0.08		0.25	0.15		0.67	0.58	0.58	0.67	0.58	0.58
v/c Ratio	0.13	0.35		0.39	0.50		0.19	0.21	0.05	0.08	0.50	0.03
Control Delay	29.2	18.8		34.4	11.1		9.4	10.0	0.1	2.6	7.5	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.2	18.8		34.4	11.1		9.4	10.0	0.1	2.6	7.5	0.1
LOS	C	B		C	B		A	B	A	A	A	A
Approach Delay		22.4			20.5			9.1			7.1	
Approach LOS		C			C			A			A	
Queue Length 50th (ft)	17	1		70	1		12	52	0	1	79	0
Queue Length 95th (ft)	38	41		112	62		33	77	1	8	167	m0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		1573			2236			1243			1246	
Turn Bay Length (ft)	150			150			215		215	215		215
Base Capacity (vph)	311	238		373	426		367	2010	908	652	2003	905
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.25		0.34	0.43		0.17	0.21	0.05	0.08	0.50	0.03

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 97 (88%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.50			
Intersection Signal Delay: 10.4		Intersection LOS: B	
Intersection Capacity Utilization 61.8%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 12: Lisbon Road & Future Local Access E



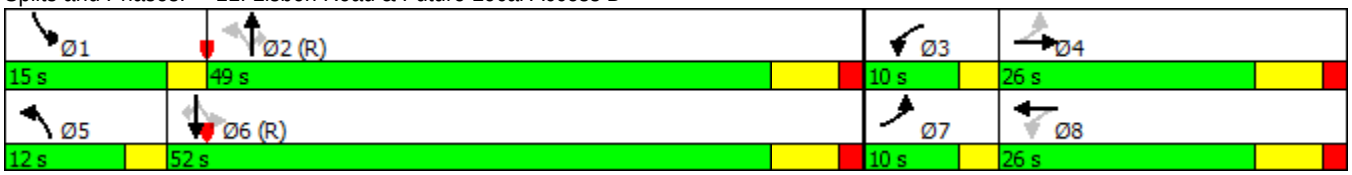


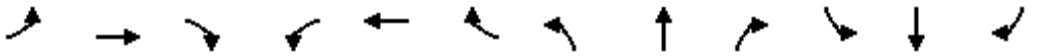
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	1	65	20	1	15	10	760	145	120	455	5
Future Volume (vph)	10	1	65	20	1	15	10	760	145	120	455	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	2000	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	150		0	150		0	215		215	215		215
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	100			100			220			220		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.852			0.859				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1641	1472	0	1641	1484	0	1641	3455	1468	1641	3455	1468
Flt Permitted	0.746			0.601			0.478			0.309		
Satd. Flow (perm)	1289	1472	0	1038	1484	0	826	3455	1468	534	3455	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		68			16				153			109
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		3370			2373			1326			1575	
Travel Time (s)		91.9			64.7			20.1			23.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	69	0	21	17	0	11	800	153	126	479	5
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		3.0	15.0	15.0	3.0	15.0	15.0
Minimum Split (s)	10.0	25.0		10.0	25.0		12.0	25.0	25.0	12.0	25.0	25.0
Total Split (s)	10.0	26.0		10.0	26.0		12.0	49.0	49.0	15.0	52.0	52.0
Total Split (%)	10.0%	26.0%		10.0%	26.0%		12.0%	49.0%	49.0%	15.0%	52.0%	52.0%
Yellow Time (s)	3.0	5.0		3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0	7.0	3.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	14.0	8.6		14.7	10.6		75.6	65.9	65.9	80.4	75.9	75.9
Actuated g/C Ratio	0.14	0.09		0.15	0.11		0.76	0.66	0.66	0.80	0.76	0.76
v/c Ratio	0.05	0.37		0.11	0.10		0.02	0.35	0.15	0.25	0.18	0.00
Control Delay	31.6	16.7		33.1	19.7		0.9	4.8	1.9	8.2	1.5	0.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.6	16.7		33.1	19.7		0.9	4.8	1.9	8.2	1.5	0.0
LOS	C	B		C	B		A	A	A	A	A	A
Approach Delay		18.7			27.1			4.3			2.8	
Approach LOS		B			C			A			A	
Queue Length 50th (ft)	6	1		12	1		0	66	0	10	5	0
Queue Length 95th (ft)	20	41		29	21		m1	110	2	54	21	m0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		3290			2293			1246			1495	
Turn Bay Length (ft)	150			150			215		215	215		215
Base Capacity (vph)	210	334		198	294		724	2276	1019	561	2623	1141
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.21		0.11	0.06		0.02	0.35	0.15	0.22	0.18	0.00

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 52 (52%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.37			
Intersection Signal Delay: 5.0		Intersection LOS: A	
Intersection Capacity Utilization 49.4%		ICU Level of Service A	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 11: Lisbon Road & Future Local Access D



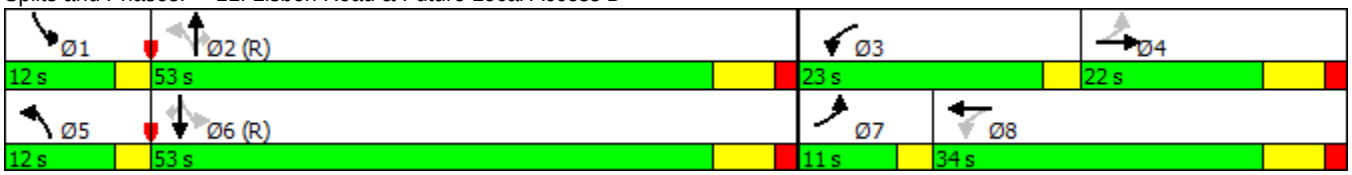


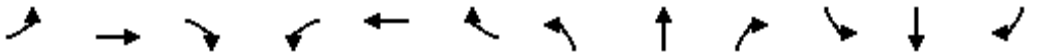
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1	35	140	1	120	30	565	25	20	860	10
Future Volume (vph)	5	1	35	140	1	120	30	565	25	20	860	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	2000	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	150		0	150		0	215		215	215		215
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	100			100			220			220		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.854			0.851				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1641	1475	0	1641	1470	0	1641	3455	1468	1641	3455	1468
Flt Permitted	0.769			0.488			0.255			0.417		
Satd. Flow (perm)	1328	1475	0	843	1470	0	440	3455	1468	720	3455	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		37			126				129			129
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		3370			2373			1326			1575	
Travel Time (s)		91.9			64.7			20.1			23.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	38	0	147	127	0	32	595	26	21	905	11
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	8.0		19.0	8.0		3.0	15.0	15.0	3.0	15.0	15.0
Minimum Split (s)	10.0	20.0		22.0	20.0		12.0	25.0	25.0	12.0	25.0	25.0
Total Split (s)	11.0	22.0		23.0	34.0		12.0	53.0	53.0	12.0	53.0	53.0
Total Split (%)	10.0%	20.0%		20.9%	30.9%		10.9%	48.2%	48.2%	10.9%	48.2%	48.2%
Yellow Time (s)	3.0	5.0		3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0	7.0	3.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	16.5	8.4		28.6	22.4		74.4	67.6	67.6	73.4	65.6	65.6
Actuated g/C Ratio	0.15	0.08		0.26	0.20		0.68	0.61	0.61	0.67	0.60	0.60
v/c Ratio	0.02	0.26		0.41	0.32		0.09	0.28	0.03	0.04	0.44	0.01
Control Delay	26.6	20.4		34.9	8.8		5.8	13.3	1.4	2.2	5.1	0.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.6	20.4		34.9	8.8		5.8	13.3	1.4	2.2	5.1	0.0
LOS	C	C		C	A		A	B	A	A	A	A
Approach Delay		21.1			22.8			12.5			4.9	
Approach LOS		C			C			B			A	
Queue Length 50th (ft)	3	1		78	1		3	98	0	2	57	0
Queue Length 95th (ft)	11	33		128	51		m21	238	m5	m4	84	m0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		3290			2293			1246			1495	
Turn Bay Length (ft)	150			150			215		215	215		215
Base Capacity (vph)	224	233		367	470		399	2123	951	566	2060	927
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.16		0.40	0.27		0.08	0.28	0.03	0.04	0.44	0.01

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 67 (61%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.44			
Intersection Signal Delay: 10.5		Intersection LOS: B	
Intersection Capacity Utilization 51.0%		ICU Level of Service A	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 11: Lisbon Road & Future Local Access D



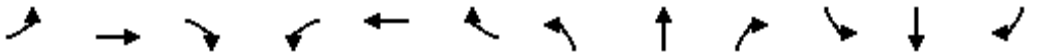


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	135	5	20	30	40	10	635	140	195	555	10
Future Volume (vph)	65	135	5	20	30	40	10	635	140	195	555	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	2000	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	145		0	145		0	215		215	215		215
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	175			175			220			220		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.995			0.915				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1641	1719	0	1641	1580	0	1641	3455	1468	1641	3455	1468
Flt Permitted	0.624			0.663			0.432			0.302		
Satd. Flow (perm)	1078	1719	0	1145	1580	0	746	3455	1468	522	3455	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			42				147			109
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		3143			2543			1575			1320	
Travel Time (s)		61.2			49.5			23.9			20.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	68	147	0	21	74	0	11	668	147	205	584	11
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	3.0	21.0		3.0	21.0		3.0	13.0	13.0	3.0	13.0	13.0
Minimum Split (s)	12.0	29.0		12.0	29.0		12.0	25.0	25.0	12.0	25.0	25.0
Total Split (s)	14.0	29.0		14.0	29.0		12.0	45.0	45.0	12.0	45.0	45.0
Total Split (%)	14.0%	29.0%		14.0%	29.0%		12.0%	45.0%	45.0%	12.0%	45.0%	45.0%
Yellow Time (s)	3.0	5.0		3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0	7.0	3.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	34.6	26.6		30.3	21.0		52.1	42.2	42.2	59.3	53.4	53.4
Actuated g/C Ratio	0.35	0.27		0.30	0.21		0.52	0.42	0.42	0.59	0.53	0.53
v/c Ratio	0.16	0.32		0.06	0.20		0.03	0.46	0.21	0.49	0.32	0.01
Control Delay	21.6	31.5		20.2	18.4		2.4	7.4	1.3	11.7	10.9	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	31.5		20.2	18.4		2.4	7.4	1.3	11.7	10.9	0.1
LOS	C	C		C	B		A	A	A	B	B	A
Approach Delay		28.4			18.8			6.3			11.0	
Approach LOS		C			B			A			B	
Queue Length 50th (ft)	28	67		9	17		1	71	1	69	153	0
Queue Length 95th (ft)	56	134		23	55		m1	51	7	53	231	m0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		3063			2463			1495			1240	
Turn Bay Length (ft)	145			145			215		215	215		215
Base Capacity (vph)	435	462		439	380		492	1458	704	426	1845	835
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.32		0.05	0.19		0.02	0.46	0.21	0.48	0.32	0.01

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 53 (53%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 11.3	Intersection LOS: B
Intersection Capacity Utilization 60.0%	ICU Level of Service B
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 7: Lisbon Road & Future Grandville Road Extension

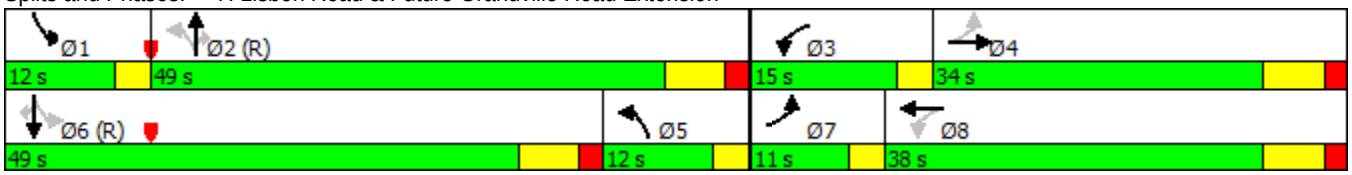


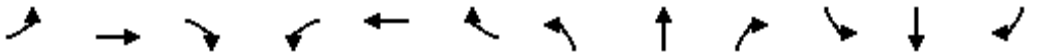
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	60	15	140	135	200	45	625	25	65	740	65
Future Volume (vph)	20	60	15	140	135	200	45	625	25	65	740	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	2000	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	145		0	145		0	215		215	215		215
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	175			175			220			220		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.970			0.910				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1641	1675	0	1641	1572	0	1641	3455	1468	1641	3455	1468
Flt Permitted	0.550			0.621			0.340			0.284		
Satd. Flow (perm)	950	1675	0	1073	1572	0	587	3455	1468	491	3455	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			68				129			169
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		3143			2543			1575			1320	
Travel Time (s)		61.2			49.5			23.9			20.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	21	79	0	147	353	0	47	658	26	68	779	68
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	27.0		11.0	31.0		3.0	15.0	15.0	3.0	15.0	15.0
Minimum Split (s)	10.0	34.0		14.0	38.0		12.0	25.0	25.0	12.0	25.0	25.0
Total Split (s)	11.0	34.0		15.0	38.0		12.0	49.0	49.0	12.0	49.0	49.0
Total Split (%)	10.0%	30.9%		13.6%	34.5%		10.9%	44.5%	44.5%	10.9%	44.5%	44.5%
Yellow Time (s)	3.0	5.0		3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0	7.0	3.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?							Yes				Yes	Yes
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	31.9	27.0		43.8	35.7		51.2	47.1	47.1	52.7	48.7	48.7
Actuated g/C Ratio	0.29	0.25		0.40	0.32		0.47	0.43	0.43	0.48	0.44	0.44
v/c Ratio	0.07	0.19		0.29	0.64		0.14	0.44	0.04	0.22	0.51	0.09
Control Delay	19.6	29.6		22.7	31.7		11.8	13.5	0.2	13.4	19.5	1.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.6	29.6		22.7	31.7		11.8	13.5	0.2	13.4	19.5	1.4
LOS	B	C		C	C		B	B	A	B	B	A
Approach Delay		27.5			29.0			13.0			17.7	
Approach LOS		C			C			B			B	
Queue Length 50th (ft)	9	38		65	155		12	93	0	17	266	0
Queue Length 95th (ft)	24	79		110	292		14	68	0	35	316	8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		3063			2463			1495			1240	
Turn Bay Length (ft)	145			145			215		215	215		215
Base Capacity (vph)	333	419		514	555		374	1489	706	329	1529	743
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.19		0.29	0.64		0.13	0.44	0.04	0.21	0.51	0.09

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 66 (60%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 19.1		Intersection LOS: B	
Intersection Capacity Utilization 63.6%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 7: Lisbon Road & Future Grandville Road Extension



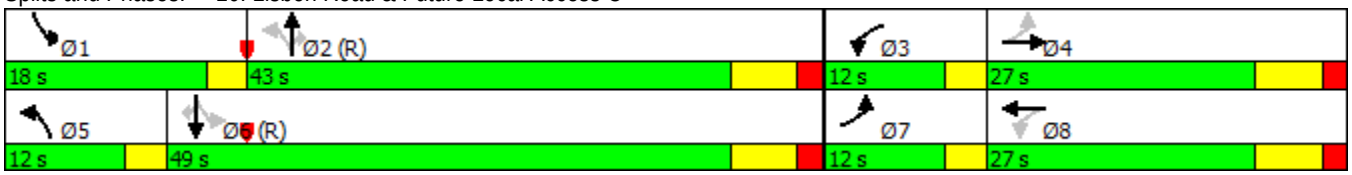


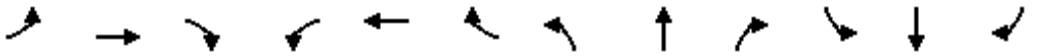
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	1	70	15	1	25	20	570	145	170	680	15
Future Volume (vph)	45	1	70	15	1	25	20	570	145	170	680	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	2000	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	150		0	150		0	215		215	215		215
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	100			100			220			220		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.852			0.856				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1641	1472	0	1641	1479	0	1641	3455	1468	1641	3455	1468
Flt Permitted	0.562			0.708			0.379			0.392		
Satd. Flow (perm)	971	1472	0	1223	1479	0	655	3455	1468	677	3455	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		74			26				153			109
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		4032			2466			1320			1323	
Travel Time (s)		110.0			67.3			20.0			20.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	75	0	16	27	0	21	600	153	179	716	16
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		3.0	15.0	15.0	3.0	15.0	15.0
Minimum Split (s)	12.0	25.0		12.0	25.0		12.0	25.0	25.0	12.0	25.0	25.0
Total Split (s)	12.0	27.0		12.0	27.0		12.0	43.0	43.0	18.0	49.0	49.0
Total Split (%)	12.0%	27.0%		12.0%	27.0%		12.0%	43.0%	43.0%	18.0%	49.0%	49.0%
Yellow Time (s)	3.0	5.0		3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0	7.0	3.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	17.5	11.2		15.2	8.4		71.8	61.9	61.9	77.7	71.3	71.3
Actuated g/C Ratio	0.18	0.11		0.15	0.08		0.72	0.62	0.62	0.78	0.71	0.71
v/c Ratio	0.21	0.32		0.08	0.18		0.04	0.28	0.16	0.29	0.29	0.01
Control Delay	33.0	14.4		30.1	19.5		2.1	5.8	2.6	4.7	4.1	0.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.0	14.4		30.1	19.5		2.1	5.8	2.6	4.7	4.1	0.0
LOS	C	B		C	B		A	A	A	A	A	A
Approach Delay		21.6			23.4			5.1			4.1	
Approach LOS		C			C			A			A	
Queue Length 50th (ft)	24	1		8	1		0	71	0	11	38	0
Queue Length 95th (ft)	53	42		24	27		m4	226	48	36	75	m0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		3952			2386			1240			1243	
Turn Bay Length (ft)	150			150			215		215	215		215
Base Capacity (vph)	237	353		247	316		579	2138	966	670	2464	1078
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.21		0.06	0.09		0.04	0.28	0.16	0.27	0.29	0.01

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 10 (10%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.32			
Intersection Signal Delay: 6.1		Intersection LOS: A	
Intersection Capacity Utilization 48.5%		ICU Level of Service A	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 10: Lisbon Road & Future Local Access C



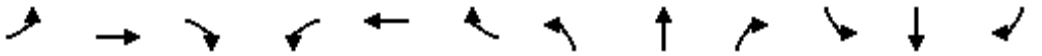


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	1	45	125	1	170	75	745	25	25	705	50
Future Volume (vph)	30	1	45	125	1	170	75	745	25	25	705	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	2000	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	150		0	150		0	215		215	215		215
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	100			100			220			220		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.853			0.851				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1641	1473	0	1641	1470	0	1641	3455	1468	1641	3455	1468
Flt Permitted	0.644			0.506			0.318			0.329		
Satd. Flow (perm)	1112	1473	0	874	1470	0	549	3455	1468	568	3455	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		47			179				129			129
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		4032			2466			1320			1323	
Travel Time (s)		110.0			67.3			20.0			20.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	32	48	0	132	180	0	79	784	26	26	742	53
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		3.0	15.0	15.0	3.0	15.0	15.0
Minimum Split (s)	12.0	24.0		12.0	25.0		12.0	25.0	25.0	12.0	25.0	25.0
Total Split (s)	13.0	24.0		22.0	33.0		12.0	52.0	52.0	12.0	52.0	52.0
Total Split (%)	11.8%	21.8%		20.0%	30.0%		10.9%	47.3%	47.3%	10.9%	47.3%	47.3%
Yellow Time (s)	3.0	5.0		3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0	7.0	3.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	20.6	8.5		28.3	15.9		75.0	66.0	66.0	72.0	63.0	63.0
Actuated g/C Ratio	0.19	0.08		0.26	0.14		0.68	0.60	0.60	0.65	0.57	0.57
v/c Ratio	0.12	0.31		0.39	0.49		0.18	0.38	0.03	0.06	0.38	0.06
Control Delay	28.8	19.6		34.4	11.1		4.0	11.9	0.3	4.0	8.1	0.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.8	19.6		34.4	11.1		4.0	11.9	0.3	4.0	8.1	0.1
LOS	C	B		C	B		A	B	A	A	A	A
Approach Delay		23.3			21.0			10.9			7.5	
Approach LOS		C			C			B			A	
Queue Length 50th (ft)	17	1		73	1		7	238	0	1	75	0
Queue Length 95th (ft)	38	37		117	60		m24	316	m1	11	117	1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		3952			2386			1240			1243	
Turn Bay Length (ft)	150			150			215		215	215		215
Base Capacity (vph)	260	267		368	484		467	2072	932	471	1978	895
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.18		0.36	0.37		0.17	0.38	0.03	0.06	0.38	0.06

Intersection Summary		
Area Type:	Other	
Cycle Length: 110		
Actuated Cycle Length: 110		
Offset: 11 (10%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Natural Cycle: 75		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.49		
Intersection Signal Delay: 11.5	Intersection LOS: B	
Intersection Capacity Utilization 56.0%	ICU Level of Service B	
Analysis Period (min) 15		
m Volume for 95th percentile queue is metered by upstream signal.		

Splits and Phases: 10: Lisbon Road & Future Local Access C

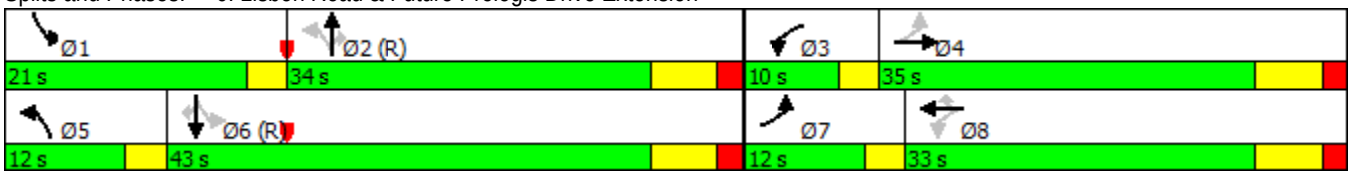


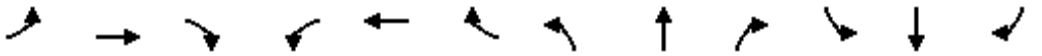
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	160	70	40	30	45	20	475	140	245	760	5
Future Volume (vph)	40	160	70	40	30	45	20	475	140	245	760	5
Ideal Flow (vphpl)	1900	1900	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	145		0	145		0	215		215	215		215
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (ft)	175			175			220			220		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.954				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1641	1648	0	1641	1818	1468	1641	3455	1468	1641	3455	1468
Flt Permitted	0.720			0.519			0.349			0.384		
Satd. Flow (perm)	1244	1648	0	896	1818	1468	603	3455	1468	663	3455	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22				142			147			109
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		3511			3232			1323			1986	
Travel Time (s)		68.4			63.0			20.0			30.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	242	0	42	32	47	21	500	147	258	800	5
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	3.0	26.0		3.0	26.0	26.0	3.0	15.0	15.0	3.0	15.0	15.0
Minimum Split (s)	12.0	33.0		12.0	33.0	33.0	12.0	25.0	25.0	12.0	25.0	25.0
Total Split (s)	12.0	35.0		10.0	33.0	33.0	12.0	34.0	34.0	21.0	43.0	43.0
Total Split (%)	12.0%	35.0%		10.0%	33.0%	33.0%	12.0%	34.0%	34.0%	21.0%	43.0%	43.0%
Yellow Time (s)	3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.0	2.0		0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0		3.0	7.0	7.0	3.0	7.0	7.0	3.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	35.3	26.6		34.2	26.0	26.0	47.1	36.9	36.9	57.4	49.5	49.5
Actuated g/C Ratio	0.35	0.27		0.34	0.26	0.26	0.47	0.37	0.37	0.57	0.50	0.50
v/c Ratio	0.09	0.53		0.12	0.07	0.10	0.06	0.39	0.23	0.50	0.47	0.01
Control Delay	19.1	33.3		19.5	28.5	0.4	4.0	10.9	1.3	9.7	10.4	0.0
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.1	33.3		19.5	28.5	0.4	4.0	10.9	1.3	9.7	10.4	0.0
LOS	B	C		B	C	A	A	B	A	A	B	A
Approach Delay		31.2			14.5			8.6			10.1	
Approach LOS		C			B			A			B	
Queue Length 50th (ft)	16	121		16	15	0	2	40	0	68	153	0
Queue Length 95th (ft)	36	194		36	39	0	6	50	0	63	122	m0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		3431			3152			1243			1906	
Turn Bay Length (ft)	145			145			215		215	215		215
Base Capacity (vph)	482	477		358	472	486	394	1275	634	556	1711	782
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.51		0.12	0.07	0.10	0.05	0.39	0.23	0.46	0.47	0.01

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 10 (10%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 85			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.53			
Intersection Signal Delay: 12.7		Intersection LOS: B	
Intersection Capacity Utilization 69.4%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 6: Lisbon Road & Future Prologis Drive Extension



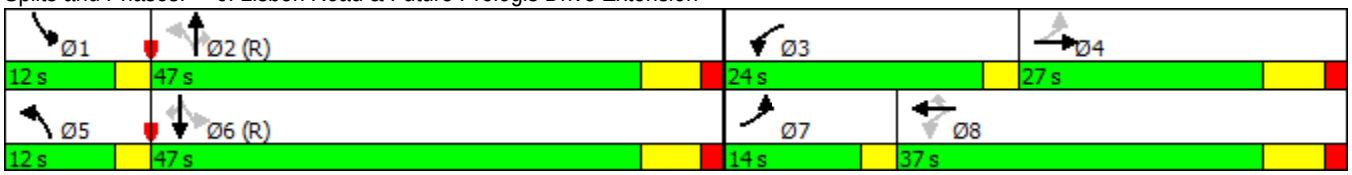


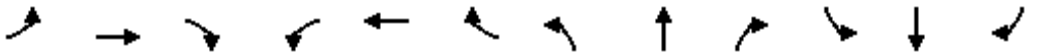
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	40	45	165	165	255	75	815	60	80	570	40
Future Volume (vph)	10	40	45	165	165	255	75	815	60	80	570	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	2000	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	145		0	145		0	215		215	215		215
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (ft)	175			175			220			220		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.921				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1641	1591	0	1641	1727	1468	1641	3455	1468	1641	3455	1468
Flt Permitted	0.647			0.564			0.383			0.252		
Satd. Flow (perm)	1118	1591	0	974	1727	1468	662	3455	1468	435	3455	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		45				268			129			129
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		3511			3232			1323			1986	
Travel Time (s)		68.4			63.0			20.0			30.1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	89	0	174	174	268	79	858	63	84	600	42
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	3.0	8.0		3.0	8.0	8.0	3.0	15.0	15.0	3.0	15.0	15.0
Minimum Split (s)	12.0	25.0		12.0	25.0	25.0	12.0	25.0	25.0	12.0	25.0	25.0
Total Split (s)	14.0	27.0		24.0	37.0	37.0	12.0	47.0	47.0	12.0	47.0	47.0
Total Split (%)	12.7%	24.5%		21.8%	33.6%	33.6%	10.9%	42.7%	42.7%	10.9%	42.7%	42.7%
Yellow Time (s)	3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.0	2.0		0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0		3.0	7.0	7.0	3.0	7.0	7.0	3.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None	None	None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	24.7	13.3		35.7	28.9	28.9	65.8	55.4	55.4	66.0	55.5	55.5
Actuated g/C Ratio	0.22	0.12		0.32	0.26	0.26	0.60	0.50	0.50	0.60	0.50	0.50
v/c Ratio	0.04	0.38		0.41	0.38	0.46	0.17	0.49	0.08	0.24	0.34	0.05
Control Delay	21.1	27.9		28.8	34.6	6.4	6.5	9.9	0.2	17.2	24.1	5.0
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.1	27.9		28.8	34.6	6.4	6.5	9.9	0.2	17.2	24.1	5.0
LOS	C	C		C	C	A	A	A	A	B	C	A
Approach Delay		27.2			20.7			9.0			22.2	
Approach LOS		C			C			A			C	
Queue Length 50th (ft)	5	29		90	95	0	6	53	0	39	157	3
Queue Length 95th (ft)	15	73		125	163	63	28	119	0	70	256	m17

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		3431			3152			1243			1906	
Turn Bay Length (ft)	145			145			215		215	215		215
Base Capacity (vph)	313	326		448	505	619	481	1740	803	362	1743	804
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.27		0.39	0.34	0.43	0.16	0.49	0.08	0.23	0.34	0.05

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 13 (12%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.49			
Intersection Signal Delay: 16.6		Intersection LOS: B	
Intersection Capacity Utilization 56.6%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 6: Lisbon Road & Future Prologis Drive Extension



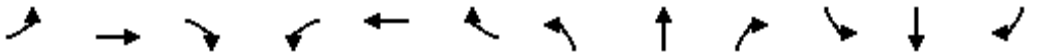


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	1	140	30	1	25	45	315	200	185	840	15
Future Volume (vph)	50	1	140	30	1	25	45	315	200	185	840	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	2000	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	150		0	150		0	215		215	215		215
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	100			100			220			220		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.851			0.856				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1641	1470	0	1641	1479	0	1641	3455	1468	1641	3455	1468
Flt Permitted	0.539			0.663			0.313			0.523		
Satd. Flow (perm)	931	1470	0	1145	1479	0	541	3455	1468	903	3455	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		147			26				211			109
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		2520			2276			1986			1093	
Travel Time (s)		68.7			62.1			30.1			16.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	148	0	32	27	0	47	332	211	195	884	16
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		3.0	15.0	15.0	3.0	15.0	15.0
Minimum Split (s)	12.0	25.0		12.0	25.0		12.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	12.0	25.0		12.0	25.0		12.0	38.0	38.0	25.0	51.0	51.0
Total Split (%)	12.0%	25.0%		12.0%	25.0%		12.0%	38.0%	38.0%	25.0%	51.0%	51.0%
Yellow Time (s)	3.0	5.0		3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0	7.0	3.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	Min	Min
Act Effct Green (s)	18.7	9.5		16.7	9.1		67.9	57.5	57.5	73.9	64.0	64.0
Actuated g/C Ratio	0.19	0.10		0.17	0.09		0.68	0.58	0.58	0.74	0.64	0.64
v/c Ratio	0.23	0.54		0.14	0.17		0.11	0.17	0.23	0.26	0.40	0.02
Control Delay	32.1	15.1		30.8	18.3		3.5	7.8	6.7	2.3	4.3	0.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.1	15.1		30.8	18.3		3.5	7.8	6.7	2.3	4.3	0.0
LOS	C	B		C	B		A	A	A	A	A	A
Approach Delay		19.6			25.1			7.1			3.8	
Approach LOS		B			C			A			A	
Queue Length 50th (ft)	27	1		16	1		1	38	40	20	65	0
Queue Length 95th (ft)	55	56		37	25		8	131	166	17	57	m0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		2440			2196			1906			1013	
Turn Bay Length (ft)	150			150			215		215	215		215
Base Capacity (vph)	243	385		249	287		480	1985	933	829	2209	978
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.38		0.13	0.09		0.10	0.17	0.23	0.24	0.40	0.02

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 72 (72%), Referenced to phase 2:NBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.54			
Intersection Signal Delay: 7.1		Intersection LOS: A	
Intersection Capacity Utilization 56.6%		ICU Level of Service B	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 9: Lisbon Road & Future Local Access B

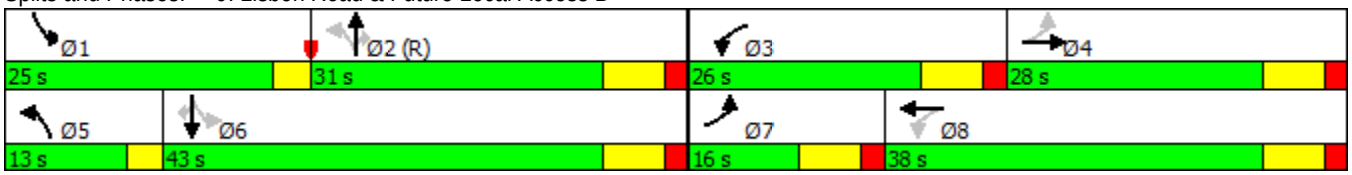


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	1	100	200	1	185	160	890	30	30	390	55
Future Volume (vph)	35	1	100	200	1	185	160	890	30	30	390	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	2000	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	150		0	150		0	215		215	215		215
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	100			100			220			220		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.851			0.851				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1641	1470	0	1641	1470	0	1641	3455	1468	1641	3455	1468
Flt Permitted	0.634			0.458			0.454			0.242		
Satd. Flow (perm)	1095	1470	0	791	1470	0	784	3455	1468	418	3455	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		105			195				238			208
Link Speed (mph)		25			25			45			45	
Link Distance (ft)		2520			2276			1986			1093	
Travel Time (s)		68.7			62.1			30.1			16.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	37	106	0	211	196	0	168	937	32	32	411	58
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	7	4		3	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	8.0		5.0	8.0		3.0	15.0	15.0	3.0	15.0	15.0
Minimum Split (s)	12.0	25.0		26.0	25.0		12.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	16.0	28.0		26.0	38.0		13.0	31.0	31.0	25.0	43.0	43.0
Total Split (%)	14.5%	25.5%		23.6%	34.5%		11.8%	28.2%	28.2%	22.7%	39.1%	39.1%
Yellow Time (s)	5.0	5.0		5.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	2.0	2.0		2.0	2.0		0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0		7.0	7.0		3.0	7.0	7.0	3.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	Min	Min
Act Effct Green (s)	20.1	11.1		36.1	26.5		63.9	53.8	53.8	56.4	45.9	45.9
Actuated g/C Ratio	0.18	0.10		0.33	0.24		0.58	0.49	0.49	0.51	0.42	0.42
v/c Ratio	0.15	0.44		0.53	0.39		0.31	0.55	0.04	0.11	0.29	0.08
Control Delay	26.7	14.7		33.0	7.7		5.6	9.8	0.1	18.6	34.7	4.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.7	14.7		33.0	7.7		5.6	9.8	0.1	18.6	34.7	4.8
LOS	C	B		C	A		A	A	A	B	C	A
Approach Delay		17.8			20.8			8.9			30.2	
Approach LOS		B			C			A			C	
Queue Length 50th (ft)	18	1		115	1		12	47	0	17	145	2
Queue Length 95th (ft)	39	51		168	59		30	78	m0	44	202	14

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		2440			2196			1906			1013	
Turn Bay Length (ft)	150			150			215		215	215		215
Base Capacity (vph)	244	365		406	563		545	1691	839	487	1441	733
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.29		0.52	0.35		0.31	0.55	0.04	0.07	0.29	0.08

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 60 (55%), Referenced to phase 2:NBTL, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 16.6		Intersection LOS: B	
Intersection Capacity Utilization 65.3%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 9: Lisbon Road & Future Local Access B

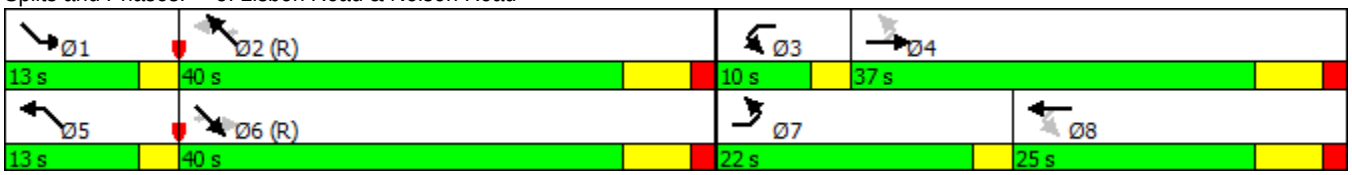


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	55	145	110	20	30	25	175	915	15	20	300	70
Future Volume (vph)	55	145	110	20	30	25	175	915	15	20	300	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	2000	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	145		0	145		0	215		215	215		215
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	175			175			220			220		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.935			0.933				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1641	1615	0	1641	1612	0	1641	3455	1468	1641	3455	1468
Flt Permitted	0.631			0.536			0.522			0.257		
Satd. Flow (perm)	1090	1615	0	926	1612	0	902	3455	1468	444	3455	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		39			26				142			142
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		1843			2977			1571			844	
Travel Time (s)		35.9			58.0			23.8			12.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	58	269	0	21	58	0	184	963	16	21	316	74
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4			8			6		6	2		2
Detector Phase	7	4		3	8		1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	3.0	18.0		3.0	18.0		3.0	15.0	15.0	3.0	15.0	15.0
Minimum Split (s)	12.0	25.0		10.0	25.0		12.0	25.0	25.0	13.0	25.0	25.0
Total Split (s)	22.0	37.0		10.0	25.0		13.0	40.0	40.0	13.0	40.0	40.0
Total Split (%)	22.0%	37.0%		10.0%	25.0%		13.0%	40.0%	40.0%	13.0%	40.0%	40.0%
Yellow Time (s)	3.0	5.0		3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0	7.0	3.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	33.2	25.5		29.4	20.3		60.5	52.6	52.6	53.6	43.4	43.4
Actuated g/C Ratio	0.33	0.26		0.29	0.20		0.60	0.53	0.53	0.54	0.43	0.43
v/c Ratio	0.14	0.61		0.07	0.17		0.30	0.53	0.02	0.07	0.21	0.10
Control Delay	21.0	34.0		19.8	21.0		8.9	14.0	0.1	23.4	28.9	14.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.0	34.0		19.8	21.0		8.9	14.0	0.1	23.4	28.9	14.5
LOS	C	C		B	C		A	B	A	C	C	B
Approach Delay		31.7			20.7			13.0			26.0	
Approach LOS		C			C			B			C	
Queue Length 50th (ft)	25	122		9	17		18	63	0	2	31	0
Queue Length 95th (ft)	46	207		22	48		60	199	m0	34	150	61

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Internal Link Dist (ft)		1763			2897			1491			764	
Turn Bay Length (ft)	145			145			215		215	215		215
Base Capacity (vph)	469	511		326	347		626	1817	839	374	1500	717
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.53		0.06	0.17		0.29	0.53	0.02	0.06	0.21	0.10

Intersection Summary		
Area Type:	Other	
Cycle Length: 100		
Actuated Cycle Length: 100		
Offset: 44 (44%), Referenced to phase 2:NWTL and 6:SETL, Start of Green		
Natural Cycle: 80		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.61		
Intersection Signal Delay: 19.1	Intersection LOS: B	
Intersection Capacity Utilization 59.0%	ICU Level of Service B	
Analysis Period (min) 15		
m Volume for 95th percentile queue is metered by upstream signal.		

Splits and Phases: 5: Lisbon Road & Nelson Road

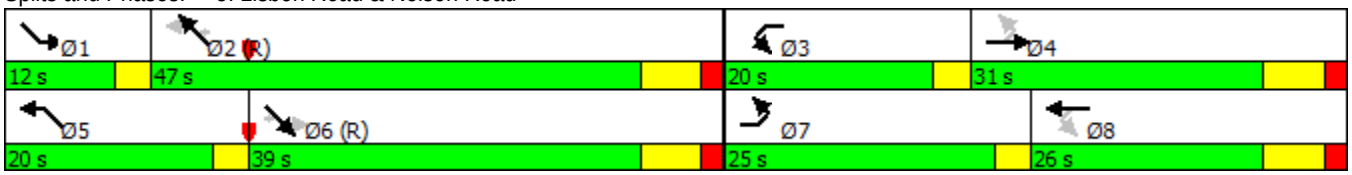


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (vph)	25	55	25	80	150	175	30	355	60	110	960	40
Future Volume (vph)	25	55	25	80	150	175	30	355	60	110	960	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	2000	1900	1900	2000	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Storage Length (ft)	145		0	145		0	215		215	215		215
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	175			175			220			220		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.954			0.919				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1641	1648	0	1641	1587	0	1641	3455	1468	1641	3455	1468
Flt Permitted	0.428			0.642			0.183			0.476		
Satd. Flow (perm)	739	1648	0	1109	1587	0	316	3455	1468	822	3455	1468
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		19			46				159			129
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		1843			2977			1570			844	
Travel Time (s)		35.9			58.0			23.8			12.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	26	84	0	84	342	0	32	374	63	116	1011	42
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases	4			8			6		6	2		2
Detector Phase	7	4		3	8		1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	3.0	23.0		3.0	19.0		3.0	15.0	15.0	3.0	15.0	15.0
Minimum Split (s)	12.0	30.0		12.0	26.0		12.0	25.0	25.0	25.0	25.0	25.0
Total Split (s)	25.0	31.0		20.0	26.0		12.0	39.0	39.0	20.0	47.0	47.0
Total Split (%)	22.7%	28.2%		18.2%	23.6%		10.9%	35.5%	35.5%	18.2%	42.7%	42.7%
Yellow Time (s)	3.0	5.0		3.0	5.0		3.0	5.0	5.0	3.0	5.0	5.0
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0	2.0	0.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	7.0		3.0	7.0		3.0	7.0	7.0	3.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		None	C-Min	C-Min	None	C-Min	C-Min
Act Effct Green (s)	40.7	31.1		45.0	35.0		52.9	42.3	42.3	58.8	48.7	48.7
Actuated g/C Ratio	0.37	0.28		0.41	0.32		0.48	0.38	0.38	0.53	0.44	0.44
v/c Ratio	0.08	0.18		0.17	0.64		0.14	0.28	0.10	0.23	0.66	0.06
Control Delay	19.0	25.0		20.3	34.4		10.6	18.9	1.0	4.7	11.8	0.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.0	25.0		20.3	34.4		10.6	18.9	1.0	4.7	11.8	0.2
LOS	B	C		C	C		B	B	A	A	B	A
Approach Delay		23.6			31.6			16.0			10.7	
Approach LOS		C			C			B			B	
Queue Length 50th (ft)	10	34		34	180		7	86	1	9	337	0
Queue Length 95th (ft)	27	76		66	289		16	118	6	21	185	m1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Internal Link Dist (ft)		1763			2897			1490			764	
Turn Bay Length (ft)	145			145			215		215	215		215
Base Capacity (vph)	483	479		538	536		267	1327	661	566	1528	721
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.18		0.16	0.64		0.12	0.28	0.10	0.20	0.66	0.06

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 80 (73%), Referenced to phase 2:NWTL and 6:SETL, Start of Green			
Natural Cycle: 95			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 16.6		Intersection LOS: B	
Intersection Capacity Utilization 64.3%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 5: Lisbon Road & Nelson Road

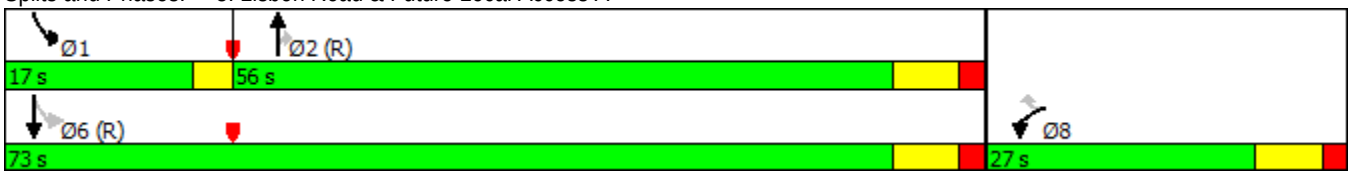


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	25	25	250	130	170	1080
Future Volume (vph)	25	25	250	130	170	1080
Ideal Flow (vphpl)	1900	1900	2000	1900	1900	2000
Lane Width (ft)	12	12	12	12	12	12
Storage Length (ft)	150	0		215	215	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100				220	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1641	1468	3455	1468	1641	3455
Flt Permitted	0.950				0.562	
Satd. Flow (perm)	1641	1468	3455	1468	971	3455
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		26		137		
Link Speed (mph)	25		45			45
Link Distance (ft)	4006		1571			4181
Travel Time (s)	109.3		23.8			63.3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Lane Group Flow (vph)	26	26	263	137	179	1137
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	20.0	20.0	15.0	15.0	3.0	15.0
Minimum Split (s)	27.0	27.0	25.0	25.0	12.0	25.0
Total Split (s)	27.0	27.0	56.0	56.0	17.0	73.0
Total Split (%)	27.0%	27.0%	56.0%	56.0%	17.0%	73.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	3.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	0.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	3.0	7.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?						
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	20.0	20.0	65.4	65.4	80.8	79.6
Actuated g/C Ratio	0.20	0.20	0.65	0.65	0.81	0.80
v/c Ratio	0.08	0.08	0.12	0.14	0.21	0.41
Control Delay	33.4	13.1	4.8	2.5	4.6	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.4	13.1	4.8	2.5	4.6	6.5
LOS	C	B	A	A	A	A
Approach Delay	23.2		4.0			6.3
Approach LOS	C		A			A
Queue Length 50th (ft)	14	0	57	10	34	173
Queue Length 95th (ft)	36	22	24	0	56	219

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Internal Link Dist (ft)	3926		1491			4101
Turn Bay Length (ft)	150			215	215	
Base Capacity (vph)	328	314	2258	1007	878	2750
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.08	0.12	0.14	0.20	0.41

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 37 (37%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.41			
Intersection Signal Delay: 6.3		Intersection LOS: A	
Intersection Capacity Utilization 56.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 8: Lisbon Road & Future Local Access A

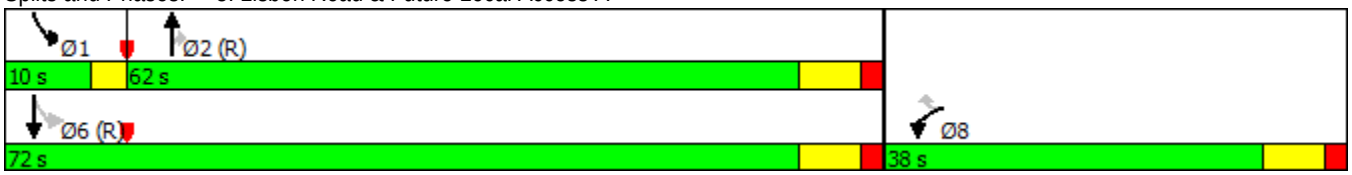


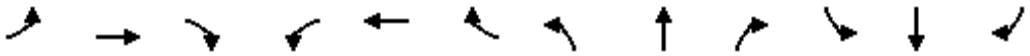
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	140	175	1120	40	40	305
Future Volume (vph)	140	175	1120	40	40	305
Ideal Flow (vphpl)	1900	1900	2000	1900	1900	2000
Lane Width (ft)	12	12	12	12	12	12
Storage Length (ft)	150	0		215	215	
Storage Lanes	1	1		1	1	
Taper Length (ft)	100				220	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1641	1468	3455	1468	1641	3455
Flt Permitted	0.950				0.148	
Satd. Flow (perm)	1641	1468	3455	1468	256	3455
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		164		42		
Link Speed (mph)	25		45			45
Link Distance (ft)	4006		1570			4181
Travel Time (s)	109.3		23.8			63.3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)						
Lane Group Flow (vph)	147	184	1179	42	42	321
Turn Type	Prot	Perm	NA	Perm	pm+pt	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2	6	
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	31.0	31.0	15.0	15.0	3.0	15.0
Minimum Split (s)	38.0	38.0	25.0	25.0	10.0	25.0
Total Split (s)	38.0	38.0	62.0	62.0	10.0	72.0
Total Split (%)	34.5%	34.5%	56.4%	56.4%	9.1%	65.5%
Yellow Time (s)	5.0	5.0	5.0	5.0	3.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	0.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	3.0	7.0
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?						
Recall Mode	None	None	C-Min	C-Min	None	C-Min
Act Effct Green (s)	31.0	31.0	59.1	59.1	69.0	65.0
Actuated g/C Ratio	0.28	0.28	0.54	0.54	0.63	0.59
v/c Ratio	0.32	0.35	0.64	0.05	0.17	0.16
Control Delay	33.5	8.4	6.0	0.2	9.5	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.5	8.4	6.0	0.2	9.5	10.4
LOS	C	A	A	A	A	B
Approach Delay	19.6		5.8			10.3
Approach LOS	B		A			B
Queue Length 50th (ft)	82	10	76	0	11	50
Queue Length 95th (ft)	139	65	90	m0	24	72

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Internal Link Dist (ft)	3926		1490			4101
Turn Bay Length (ft)	150			215	215	
Base Capacity (vph)	462	531	1856	808	248	2041
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.35	0.64	0.05	0.17	0.16

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 81 (74%), Referenced to phase 2:NBT and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 9.0		Intersection LOS: A	
Intersection Capacity Utilization 70.7%		ICU Level of Service C	
Analysis Period (min) 15			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 8: Lisbon Road & Future Local Access A

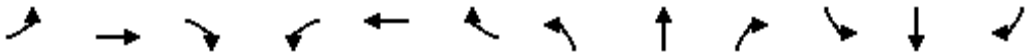




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	5	50	5	5	5	10	265	1	5	1200	1
Future Volume (Veh/h)	1	5	50	5	5	5	10	265	1	5	1200	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	5	53	5	5	5	11	279	1	5	1263	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1442	1576	632	998	1576	140	1264			280		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1442	1576	632	998	1576	140	1264			280		
tC, single (s)	7.7	6.7	7.1	7.7	6.7	7.1	4.3			4.3		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	99	95	87	97	95	99	98			100		
cM capacity (veh/h)	81	98	404	153	98	858	504			1223		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	59	15	11	186	94	5	842	422
Volume Left	1	5	11	0	0	5	0	0
Volume Right	53	5	0	0	1	0	0	1
cSH	303	168	504	1700	1700	1223	1700	1700
Volume to Capacity	0.19	0.09	0.02	0.11	0.06	0.00	0.50	0.25
Queue Length 95th (ft)	18	7	2	0	0	0	0	0
Control Delay (s)	19.7	28.6	12.3	0.0	0.0	8.0	0.0	0.0
Lane LOS	C	D	B			A		
Approach Delay (s)	19.7	28.6	0.5			0.0		
Approach LOS	C	D						

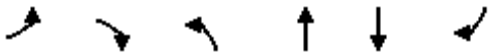
Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	43.7%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	5	15	5	5	5	60	1235	1	5	330	1
Future Volume (Veh/h)	1	5	15	5	5	5	60	1235	1	5	330	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	5	16	5	5	5	63	1300	1	5	347	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1141	1784	174	1628	1784	650	348			1301		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1141	1784	174	1628	1784	650	348			1301		
tC, single (s)	7.7	6.7	7.1	7.7	6.7	7.1	4.3			4.3		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	99	93	98	91	93	99	95			99		
cM capacity (veh/h)	130	69	815	55	69	393	1152			487		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	22	15	63	867	434	5	231	117
Volume Left	1	5	63	0	0	5	0	0
Volume Right	16	5	0	0	1	0	0	1
cSH	221	85	1152	1700	1700	487	1700	1700
Volume to Capacity	0.10	0.18	0.05	0.51	0.26	0.01	0.14	0.07
Queue Length 95th (ft)	8	15	4	0	0	1	0	0
Control Delay (s)	23.1	56.0	8.3	0.0	0.0	12.5	0.0	0.0
Lane LOS	C	F	A			B		
Approach Delay (s)	23.1	56.0	0.4			0.2		
Approach LOS	C	F						

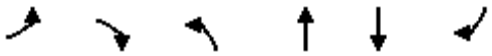
Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	50.8%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	55	1	1	265	1205	45
Future Volume (Veh/h)	55	1	1	265	1205	45
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	58	1	1	279	1268	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1433	658	1315			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1433	658	1315			
tC, single (s)	7.0	7.1	4.3			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.3			
p0 queue free %	50	100	100			
cM capacity (veh/h)	116	389	481			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	59	1	140	140	845	470
Volume Left	58	1	0	0	0	0
Volume Right	1	0	0	0	0	47
cSH	117	481	1700	1700	1700	1700
Volume to Capacity	0.50	0.00	0.08	0.08	0.50	0.28
Queue Length 95th (ft)	58	0	0	0	0	0
Control Delay (s)	63.4	12.5	0.0	0.0	0.0	0.0
Lane LOS	F	B				
Approach Delay (s)	63.4	0.0			0.0	
Approach LOS	F					

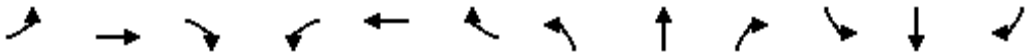
Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	30	1	1	1245	340	50
Future Volume (Veh/h)	30	1	1	1245	340	50
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	32	1	1	1311	358	53
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1042	206	411			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1042	206	411			
tC, single (s)	7.0	7.1	4.3			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.3			
p0 queue free %	85	100	100			
cM capacity (veh/h)	212	777	1089			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	33	1	656	656	239	172
Volume Left	32	1	0	0	0	0
Volume Right	1	0	0	0	0	53
cSH	217	1089	1700	1700	1700	1700
Volume to Capacity	0.15	0.00	0.39	0.39	0.14	0.10
Queue Length 95th (ft)	13	0	0	0	0	0
Control Delay (s)	24.6	8.3	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	24.6	0.0			0.0	
Approach LOS	C					

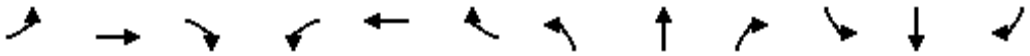
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	5	20	10	5	5	10	300	10	5	1220	5
Future Volume (Veh/h)	5	5	20	10	5	5	10	300	10	5	1220	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	5	21	11	5	5	11	316	11	5	1284	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1484	1646	644	1019	1642	164	1289			327		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1484	1646	644	1019	1642	164	1289			327		
tC, single (s)	7.7	6.7	7.1	7.7	6.7	7.1	4.3			4.3		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	93	94	95	93	94	99	98			100		
cM capacity (veh/h)	75	89	397	160	89	828	493			1174		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	31	21	11	211	116	5	856	433
Volume Left	5	11	11	0	0	5	0	0
Volume Right	21	5	0	0	11	0	0	5
cSH	176	160	493	1700	1700	1174	1700	1700
Volume to Capacity	0.18	0.13	0.02	0.12	0.07	0.00	0.50	0.25
Queue Length 95th (ft)	16	11	2	0	0	0	0	0
Control Delay (s)	29.8	30.8	12.5	0.0	0.0	8.1	0.0	0.0
Lane LOS	D	D	B			A		
Approach Delay (s)	29.8	30.8	0.4			0.0		
Approach LOS	D	D						

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	43.9%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	5	15	10	5	5	15	1250	10	5	365	5
Future Volume (Veh/h)	5	5	15	10	5	5	15	1250	10	5	365	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	5	16	11	5	5	16	1316	11	5	384	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1094	1756	194	1574	1752	664	389			1327		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1094	1756	194	1574	1752	664	389			1327		
tC, single (s)	7.7	6.7	7.1	7.7	6.7	7.1	4.3			4.3		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	97	93	98	82	93	99	99			99		
cM capacity (veh/h)	146	75	790	63	76	385	1111			476		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	26	21	16	877	450	5	256	133
Volume Left	5	11	16	0	0	5	0	0
Volume Right	16	5	0	0	11	0	0	5
cSH	215	82	1111	1700	1700	476	1700	1700
Volume to Capacity	0.12	0.25	0.01	0.52	0.26	0.01	0.15	0.08
Queue Length 95th (ft)	10	23	1	0	0	1	0	0
Control Delay (s)	24.0	63.0	8.3	0.0	0.0	12.6	0.0	0.0
Lane LOS	C	F	A			B		
Approach Delay (s)	24.0	63.0	0.1			0.2		
Approach LOS	C	F						

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	44.9%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	5	300	5	5	1220
Future Volume (Veh/h)	5	5	300	5	5	1220
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	5	316	5	5	1284
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	970	160			321	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	970	160			321	
tC, single (s)	7.0	7.1			4.3	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.3	
p0 queue free %	98	99			100	
cM capacity (veh/h)	236	831			1180	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	10	211	110	5	642	642
Volume Left	5	0	0	5	0	0
Volume Right	5	0	5	0	0	0
cSH	367	1700	1700	1180	1700	1700
Volume to Capacity	0.03	0.12	0.06	0.00	0.38	0.38
Queue Length 95th (ft)	2	0	0	0	0	0
Control Delay (s)	15.1	0.0	0.0	8.1	0.0	0.0
Lane LOS	C			A		
Approach Delay (s)	15.1	0.0		0.0		
Approach LOS	C					

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	43.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	5	1250	5	5	360
Future Volume (Veh/h)	5	5	1250	5	5	360
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	5	1316	5	5	379
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1518	660			1321	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1518	660			1321	
tC, single (s)	7.0	7.1			4.3	
tC, 2 stage (s)						
tF (s)	3.6	3.4			2.3	
p0 queue free %	95	99			99	
cM capacity (veh/h)	101	387			478	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	10	877	444	5	190	190
Volume Left	5	0	0	5	0	0
Volume Right	5	0	5	0	0	0
cSH	160	1700	1700	478	1700	1700
Volume to Capacity	0.06	0.52	0.26	0.01	0.11	0.11
Queue Length 95th (ft)	5	0	0	1	0	0
Control Delay (s)	29.1	0.0	0.0	12.6	0.0	0.0
Lane LOS	D			B		
Approach Delay (s)	29.1	0.0		0.2		
Approach LOS	D					

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		