Syene Road Reconstruction Project

ID 22-3368

Cross Section and Intersection Alternative Study Report

July 29, 2021

EXECUTIVE SUMMARY

This report summarizes the cross section and intersection alternatives developed for the Syene Road Reconstruction Project. The conclusions are based on several factors including planning recommendations, public input, technical analysis, constructability, and cost.

The 1.5-mile project (McCoy Road to Aurora Avenue) will convert the deteriorating rural roadway (shoulders with ditches) to a mostly urban roadway (curb and gutter) with storm sewer and drainage system upgrades. Improving corridor safety, addressing intersection efficiency, and select median installations will also be included. Upgrades to pedestrian and bicycle accommodations, as well as spot sanitary sewer and watermain improvements are planned. Streetscaping such as plantings, trees and other decorative elements will be considered. Improvements will provide better connectivity with surrounding neighborhoods and support new economic development along the corridor. Construction is anticipated to begin in 2022 and be complete by mid-2023.

STUDY SUMMARY AND RECOMMENDATIONS

Corridor Details:

- Syene Road is a locally and regionally significant roadway with a variety of land uses, and high potential for development and re-development near the corridor.
- The roadway conveys between 3,600 and 8,700 vehicles per day.
- Traffic volumes are anticipated to increase by approximately 2,000 vehicles per day by 2045.
- Pavement Condition is Fair to Poor.
- Mobility:
    - Bicyclists:
        - Bicyclist mobility is currently adequate for those who use paths, as there is a shared use path along most of the roadway corridor.
        - On-road bicyclist mobility is currently insufficient, as indicated by the High Stress rating and Bicycle Level of Service (BLOS) D.
    - Pedestrian mobility is currently adequate, as indicated by the shared use path along most of the roadway corridor, and the sidewalk along much of the residential areas. The project should include upgrades for ADA compliance at intersections and improvements to facilitate neighborhood and corridor connectivity.
    - Vehicle mobility is expected to degrade due to anticipated traffic growth.
        - Minor congestion is currently present at the E Cheryl Parkway and Ninebark Drive/Central Park Place intersections. Congestion is anticipated to worsen without intersection improvements.
        - Moderate levels of congestion are currently present during peak hours at the McCoy Road intersection. Congestion is anticipated to worsen without intersection improvements.

- Safety: A review of safety conditions along the corridor resulted in three locations of note, with the following recommendations:
    - Syene Road intersection with Lacy Road: A railroad crossing is located on Lacy Road, adjacent to the intersection. A traffic signal may mitigate the likelihood of traffic queuing onto the tracks and help clear queuing during train crossing events.
    - McCoy Road intersection with Syene Road: Angle type crashes were observed at this location that would likely be mitigated by installation of a traffic signal.
    - Capital City Trail Crossing of Syene Road (north of the Syene Road and McCoy Road intersection): One fatal crash occurred at this location involving a cyclist. Improvements at this location should enhance the visibility of the crossing for motorists and motor vehicle traffic for users of the path.

Study Recommendations:

- Cross sections A, B and C are recommended for implementation.

- Intersection controls are recommended for implementation or further evaluation as follows:
    - Syene Road and Lacy Road Intersection: Traffic Signal
    - Syene Road and East Cheryl Parkway Intersection: Traffic Signal or Roundabout
    - Syene Road and Central Park Place/Ninebark Drive: Mini Roundabout or Stop Sign
    - Syene Road and McCoy Road: Traffic Signal if warranted

INTRODUCTION AND BACKGROUND

Syene Road is a minor arterial and an important north/south corridor for the City of Fitchburg. Land uses immediately adjacent to the Syene Road corridor include commercial, single-family and multi-family residential, agricultural, freight rail, and recreational properties. Recreational land uses include two public City parks and undeveloped land open to the public. There is one area of ongoing development planning on the corridor, and other large areas with potential for development or re-development near the corridor. Fire Station #3 is located on the roadway at the north end of the project area.

The planning documents and previous studies that provide the foundation for this project design are summarized in **Attachment A: Project History**

EXISTING CONDITIONS

Functional Classification: Minor Arterial
Speed Limit: 35 MPH (reduced from 45 MPH in 2019)
ADT:

Syene Road Segment	2025	2045
Lacy to E Cheryl:	3,600	4,050
E Cheryl to McCoy:	7,850	9,950
McCoy to north/east:	8,700	10,150

Existing lanes: 2 – 11' travel lanes
Existing shoulders: Varies, but primarily 3' paved, 3' gravel
Existing shared use path on west side of Syene Road
Existing sidewalk on east side in the following locations:
East Cheryl Parkway to Rodeo Way
Approximately 200' north of Rodeo Way to West Clayton Road
Pavement Condition: Fair to Poor (PASER pavement rating ranges from 5 - 3[1])
Last year improved: 2012 overlay

TRAFFIC OPERATIONS AND ROADWAY SAFETY

Traffic operations and roadway safety characteristics of the Syene Road corridor have been evaluated as part of the design process for the project. An analysis of existing operating conditions has identified intersections with existing and projected traffic congestion during the anticipated design life (20 years) of the improvements and locations where improvements may mitigate crash rates and particular crash patterns. Analysis was completed estimating delays and queues for each intersection. Delays were used to assign letters representing levels of service (LOS), with LOS A representing little to no congestion and increasing to LOS F representing the highest level of congestion.

Traffic forecasting and modeling has been completed that provides a detailed contrast between future roadway operations under existing conditions and with improvements. Improvements to mitigate crash patterns, side street access changes, and improvements to lane configurations at intersections were also evaluated.

Traffic operations at the study intersections are anticipated to degrade over time, if no improvements are made, as traffic volumes increase. Intersection control changes presented as alternatives in this document would improve those future traffic operations and promote safety and mobility for all users. Intersection level analysis is presented under the **INTERSECTION ALTERNATIVES** section of this document.

Travel times along the corridor were calculated under existing conditions and with the recommended intersection control at each intersection under existing and future year traffic volumes. This was completed primarily to help understand impacts to response times for the fire station located towards

[1] PASER pavement ratings are from 10 to 1, with 10 being excellent and 1 poor.

the north end of the project corridor. Preliminary results of that analysis are available in **Attachment D: Preliminary Travel Times**

Crash Data

A crash inventory was compiled for the project corridor that included crashes reported during years 2016-2020. Crash rates were calculated for the intersections along the corridor and are summarized in **Table 1** below.

Table 1: Intersection Crash Rate Summary

Intersection[A]	Crashes	AADT[B] Entering				Number of Years	Crash Rate[C]
		Northbound	Southbound	Eastbound	Westbound		
Syene Rd & Lacy Rd	11	1550	1550	2525	1600	5	0.83
Syene Rd & E Cheryl Pkwy	3	1550	3200	2775	2050	5	0.17
Syene Rd & No Oaks Ridge	0	3200	3200	N/A	125	5	0.00
Syene Rd & Central Park Pl	1	3200	3200	500	250	5	0.08
Syene Rd & Argus Ln	1	3200	3200	N/A	175	5	0.08
Syene Rd & Clayton Rd	1	3200	3200	N/A	160	5	0.08
Syene Rd & McCoy Rd	21	3200	3400	1875	N/A	5	1.36

[A] Number reported between 2016 – 2020
[B] Given in vehicles per day (vpd)
[C] Given in per million entering vehicles

Crash rates are generally considered elevated or concerning at or above about 1 crash per million entering vehicles. A lower crash rate does not necessarily mean that no problematic crash pattern exists.

The intersections of Syene Road with Lacy Road and McCoy Road have the greatest crash rates.

Syene Road and Lacy Road Intersection

The intersection of Syene Road with Lacy Road had 11 crashes and a crash rate of 0.83 crashes per million entering vehicles.

The majority of crashes at the Lacy Road intersection were angle type crashes. Two of those crashes had a confirmed injury and one had a possible injury. No incapacitating or fatal injuries were reported. Future year crash rates are not anticipated to increase greatly with traffic volumes and the rate of injury crashes would not be anticipated to increase if intersection control remains the same. Therefore, no improvements were identified at this location for the purposes of mitigating this crash pattern.

Syene Road and McCoy Road

The intersection of Syene Road with McCoy Road had 21 crashes and a crash rate of 1.36 crashes per million entering vehicles.

About half of the crashes that occurred at the McCoy Road intersection were angle or head on type crashes involving vehicles travelling opposite directions. Nine injury crashes occurred at the intersection during the study period. Six of the nine injury crashes were related to the angle and head on crashes. Future increases in traffic volumes are anticipated to increase the average number of yearly crashes. Resulting congestion may increase crash rates as drivers experience increased delays and begin to accept additional risk to enter the intersection. Improvements that make the intersection

easier and more efficient for motorists to traverse such as geometric improvements and intersection control changes are anticipated to mitigate crash rates and severity.

One fatal crash involving a cyclist occurred at the Capital City Trail crossing[2] of Syene Road. Improvements at this location should enhance the visibility of the crossing for motorists and motor vehicle traffic for users of the path.

CROSS SECTION ALTERNATIVES

History

The existing roadway is rural (shoulders with ditches). Development over the last 20+ years has changed the character of the corridor from primarily agricultural as shown in **Figure 1** to mixed use, of which a large part is residential, as shown in **Figure 2**. The roadway was not upgraded with the adjacent developments.

Figure 1: 2000 Dane Co Aerial Imagery

Figure 2: 2020 Dane Co Aerial Imagery

Typically, as an area urbanizes, the roadway shoulders and ditches are replaced with curb and gutter and storm sewer. The additional impervious area associated with development is captured in the curb and gutter and storm sewer system and is treated in a stormwater detention basin or other similar facility. Although the developments have stormwater treatments, Syene Road itself was not upgraded and the runoff not routed to the stormwater treatment facilities.

The City of Fitchburg hired a consultant to evaluate a future project along Syene Road to better accommodate the continued mixed-use development in the area. The results of the evaluation are documented in the Syene Road Reconstruction Study dated August 2019 (2019 Study). The 2019 Study recommended a two-lane divided urban cross section with a sidewalk on one side and a path on the other side throughout the project limits. The 2019 Study recommended cross section is provided in **Figure 3** below.

[2] An additional crash involving a cyclist was reported in June 2020.

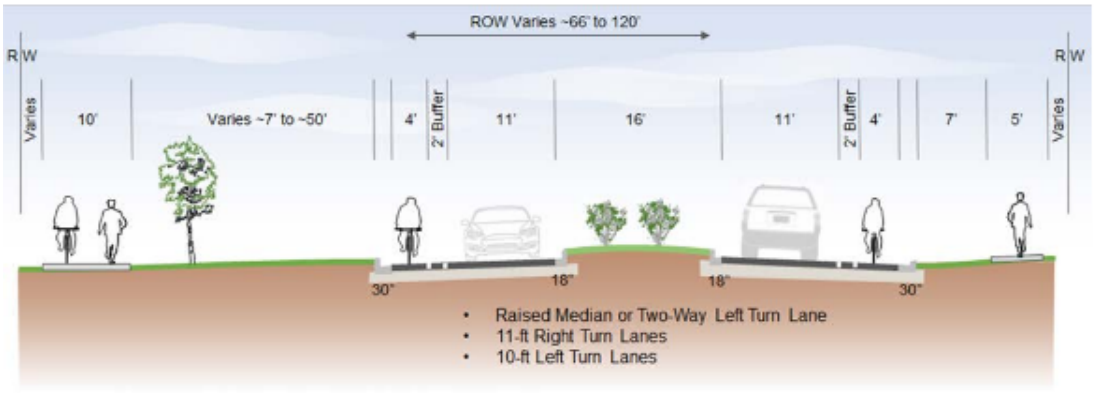


Figure 3: 2019 Study Recommended Cross Section

Current Evaluation

The 2019 Study recommended cross section was used as a starting point for the cross section alternative analysis completed with this evaluation.

Lane Width

The 11' lane width matches the existing lane width on Syene Road. It is also consistent with lane width design guidance for arterial roadways. See **Attachment A: Project History.**

Bicycle Facilities

There is shared use path along most of the roadway corridor. Bicyclist mobility is currently adequate for those that use paths.

The on-road bicycle facilities were evaluated using the Bicycle Level of Service (BLOS) Calculator and the Madison MPO Low Stress Bike Route Map.

- The existing BLOS[3] is D.
- The stress rating is LTS 4, which is the highest stress rating possible.
- These are included in **Attachment B: Bicycle Facilities Evaluation.**

The existing on-road bicycle facilities are insufficient and will worsen under future traffic projected. BLOS calculations for future conditions are included in Attachment B.

The 4' bicycle lane with 2' buffer is consistent with planning document recommendations summarized in **Attachment A: Project History.**

Pedestrians

There is shared use path along most of the roadway corridor, and sidewalk along much of the residential areas. Pedestrian mobility is currently adequate. Upgrades for ADA compliance will be included at intersections. Improvements to promote connectivity between neighborhoods and along the corridor will be included where feasible.

The project corridor was evaluated and was split into segments that have differing adjacent land use. The 2019 Study recommended cross section was then modified to fit the specific setting within that segment. Some segments with different adjacent land use have the same cross section for reasons further described in **Refined Cross Sections** below.

[3] BLOS values are A, B, C, D, E and F; where A is the highest level of service or most comfortable facility to use, and F is the lowest level of service or least comfortable facility to use. A/B are "comfortable enough" for a range of adults to use, while C is "comfortable enough" for more experienced cyclists.

Three distinct cross sections were developed for the yellow segments, orange segments, and green segment shown in **Figure 4.**

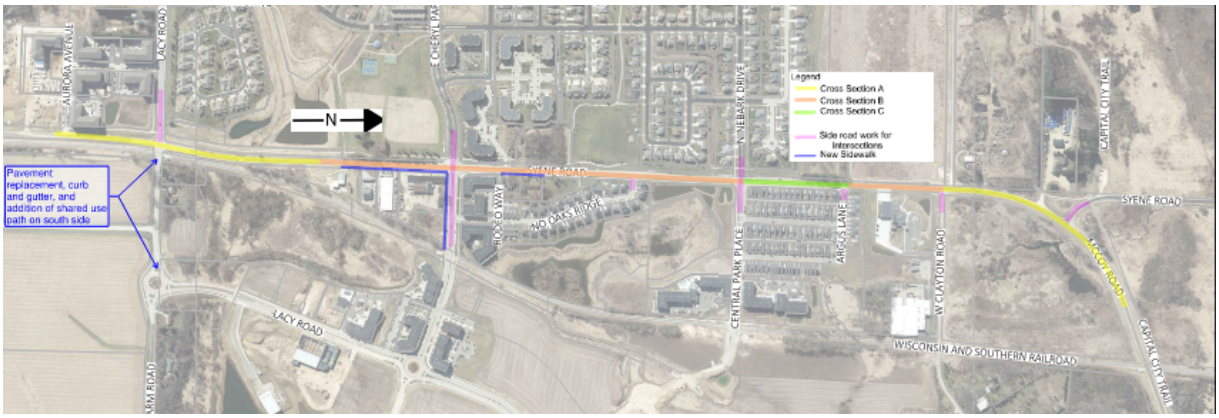


Figure 4: Project Corridor

Several minor variations for each cross section were developed, with varying real estate, environmental, and cost impacts. These options were reviewed by City staff and narrowed down.

Concept Cross Sections

These cross sections were presented at the first public meeting on February 25, 2021. Cross sections were concept level in order to obtain feedback before preliminary design progressed.

Concept Cross Section A

- Aurora Avenue to south of E Cheryl Parkway
- W Clayton Road to McCoy Road
- Adds buffered bicycle lanes in comparison to the existing roadway and may include curb and gutter

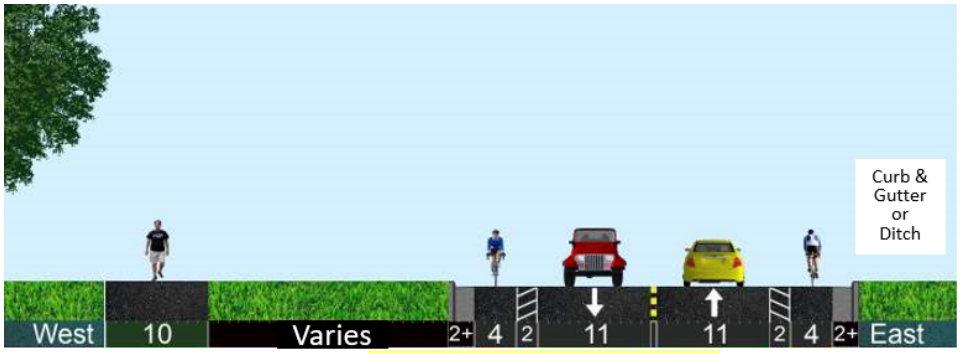


Figure 5: Concept Cross Section A

Concept Cross Section B

- South of E Cheryl Parkway to Ninebark Drive
- Argus Lane to W Clayton Road
- Adds a median, buffered bicycle lanes, and curb and gutter in comparison to the existing roadway
- Continuous median to encourage lower vehicular speed and provide turn lane space and median refuge for mid-block crossings

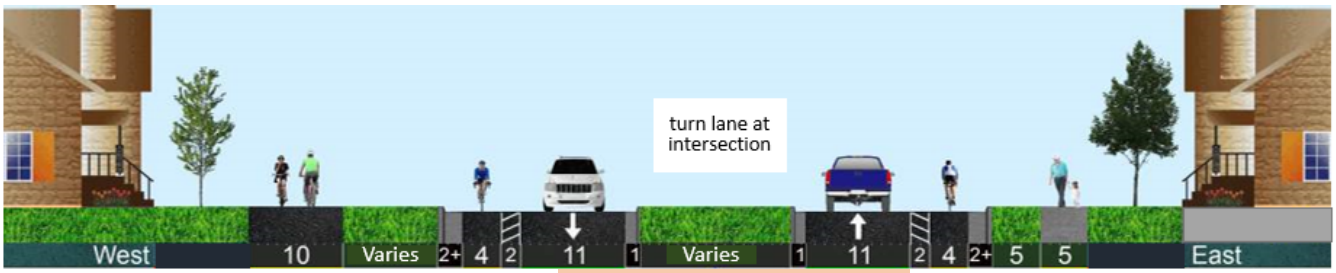


Figure 6: Concept Cross Section B

Concept Cross Section C

- Ninebark Drive to Argus Lane
- There are three sub-alternatives proposed based on impacts

- A property on the National Register of Historic Places is located on the northern end of the west side of this segment. The State Historic Preservation Office will review the project.
- Property owners on the east side requested on-street parking.
- Adds a median, buffered bicycle lanes, curb and gutter, and a parking lane on the east side in comparison to the existing roadway.

Concept Cross Section C1

- 5' terrace on east side for snow storage and utilities
- Widest alternate

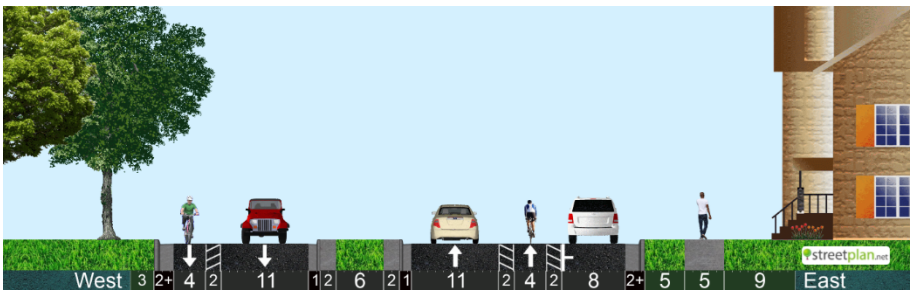


Figure 7: Concept Cross Section C1

Concept Cross Section C2

- No sidewalk terrace
- 7' sidewalk on east side to provide offset from sidewalk to curb head for parked car door opening

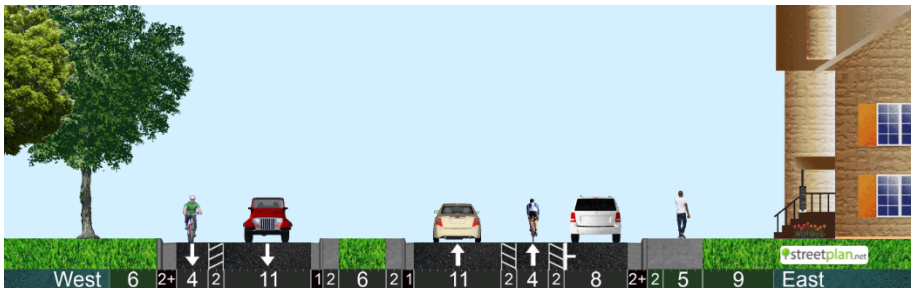


Figure 8: Concept Cross Section C2

Concept Cross Section C3

- No sidewalk terrace
- 7' sidewalk on east side to provide offset from sidewalk to curb head for parked car door opening
- Narrowest possible continuous median

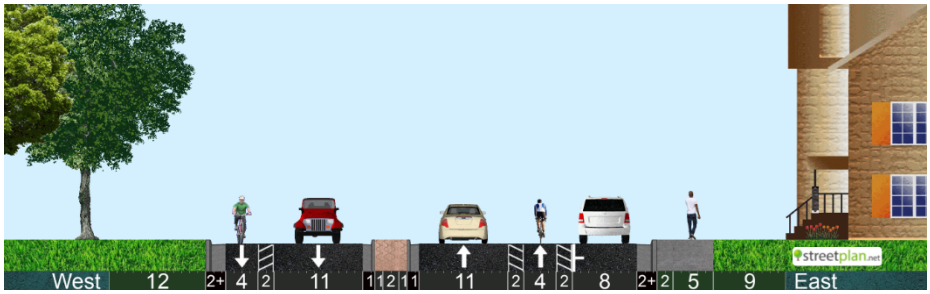


Figure 9: Concept Cross Section C3

Public Feedback

Feedback was generally focused on Cross Section C with concern expressed about the addition of parking.

Refined Cross Sections

In an effort to further understand resident and stakeholder views on the project, City staff held additional meetings with small groups. Additional Cross Section alternatives were developed based on feedback from the public meeting and these Resident Outreach Small Group Meetings.

Feedback is generally in favor changing the following cross section elements:

Lane Width

10' travel lanes

Considerations:

- Narrower than the existing 11' lanes
- Meets minimum width for arterial roadways
- Narrower lanes provide some traffic calming. A recurring comment from the public is that traffic is still travelling too fast on Syene Road, even after the speed limit reduction.
- Cost savings of approximately $100,000

Medians

No continuous median

Considerations:

- Medians provide some traffic calming. A recurring comment from the public is that traffic is still travelling too fast on Syene Road, even after the speed limit reduction.
- Cost savings of approximately $500,000

Cross Section A

This cross section is proposed:

- Aurora Avenue to south of E Cheryl Parkway
- W Clayton Road to McCoy Road

This cross section narrows the travel lane and adds buffered bicycle lanes in comparison to the existing roadway. Curb and gutter will be included in some locations.

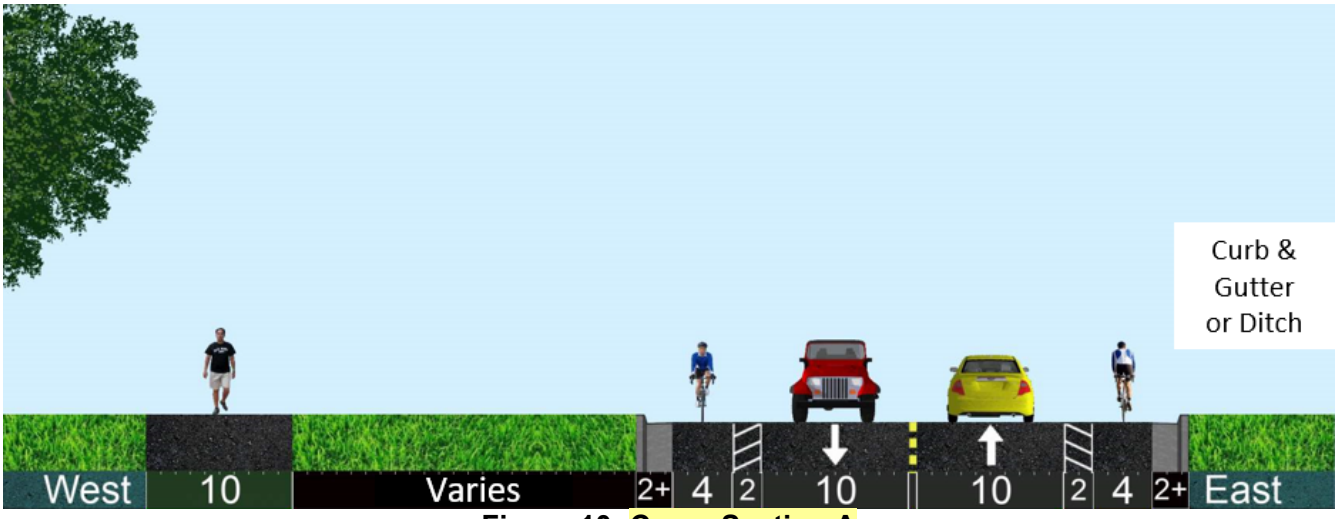


Figure 10: Cross Section A

Highlights (no change from concept level):

- Curb and gutter may be excluded due to the transition to adjacent rural roadway.
- Aurora Avenue to south of E Cheryl Parkway:
  - No sidewalk on east side next to railroad corridor.
  - No continuous median to minimize impacts to the railroad corridor on the east and park on the west.
- W Clayton Road to McCoy Road:
  - No sidewalk on east side next to Dane County owned natural land.

- No continuous median to minimize impacts to Dane County natural land.
- Median may be included as part of intersection improvements.

Cross Section B
This cross section is proposed:
- South of E Cheryl Parkway to Ninebark Drive
- Argus Lane to W Clayton Road

This cross section narrows the travel lane and adds buffered bicycle lanes and curb and gutter in comparison to the existing roadway.

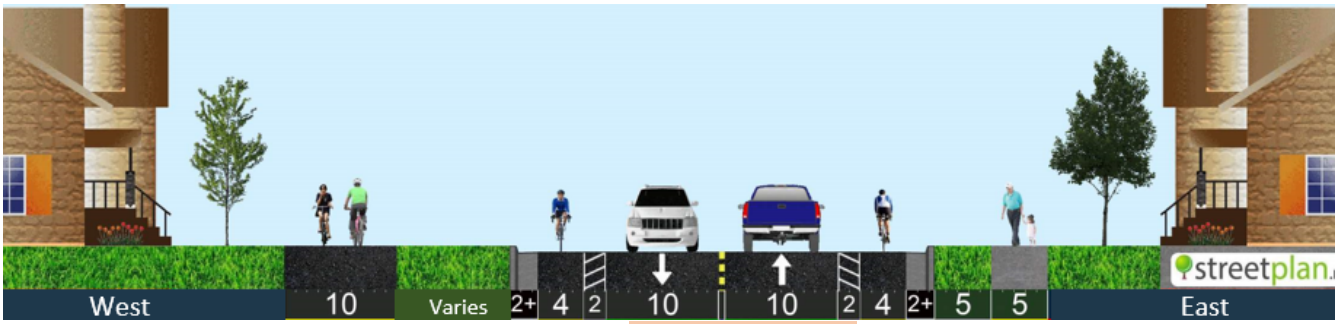


Figure 11: Cross Section B

Highlights:
- Median may be included as part of intersection improvements.

Cross Section C
This cross section is proposed from Ninebark Drive to Argus Lane. A property on the National Register of Historic Places is located on the northern end of the west side of this segment. In addition, the property owners on the east side requested on-street parking.

This cross section narrows the travel lane and adds buffered bicycle lanes, and curb and gutter, and a parking lane on the east side in the **southern part of this segment only** in comparison to the existing roadway.

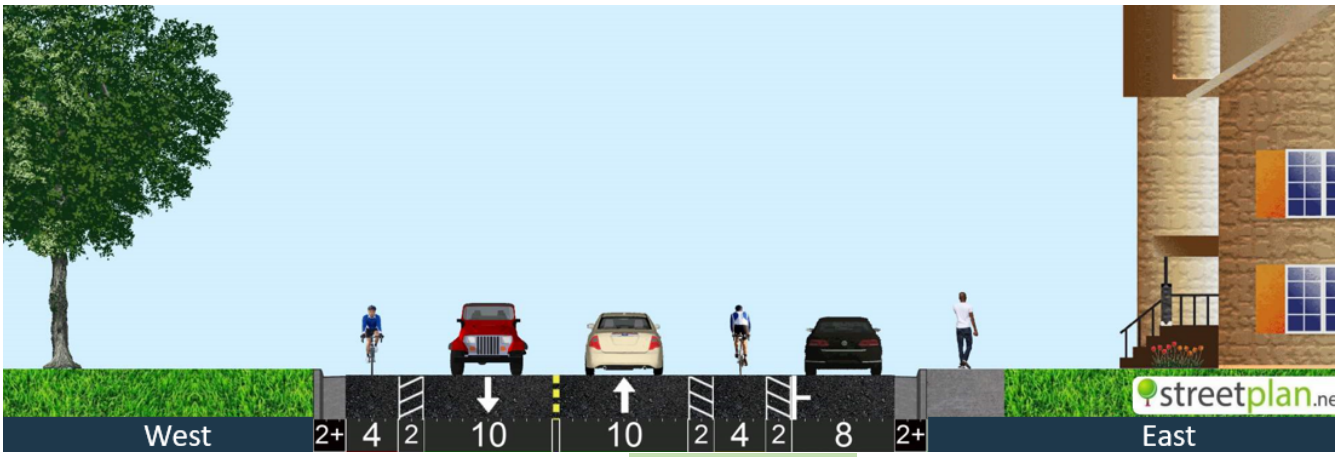


Figure 12: Cross Section C

Highlights:
- Median may be included as part of intersection improvements.
- The State Historic Preservation Office will need to review the project and be in agreement with proposed property impacts.

Public Meeting video, exhibits, and survey results and Resident Outreach Small Group Meeting notes are available on the project website: https://www.fitchburgwi.gov/2669/Syene-Road-McCoy-to-Aurora

Lacy Road and Side Street Improvements
Improvements are proposed on Lacy Road, from Syene Road to the Haight Farm Road roundabout, including a shared use path on the south side, pavement replacement and curb and gutter.

Improvements will also be completed on side streets to accomodate main line or intersection modifications. The work will tie back into the existing roadway as quickly as feasible.

Cross Section Cost Estimate
The concept level cost estimate for the cross sections described above, **excluding intersection costs**, is $7,800,000.

Cross Section Recommendations
Cross Section A, B and C are recommended as outlined in **Revised Cross Sections**.

INTERSECTION ALTERNATIVES

An alternative study was conducted for the intersections summarized in this section. Alternatives were identified based on previously completed studies, input from City staff, and engineering judgment. Analyses were based on traffic operations, safety, and costs. Intersection alternative exhibits are included in **Attachment C: Intersection Alternatives.**

Syene Road & Lacy Road

History

During a period of rail inactivity, the City of Fitchburg removed the track from Lacy Road and adjusted the roadway elevation after a multiple fatality accident occurred after a vehicle lost control while going over the crossing.

The Syene Road and Lacy Road intersection was converted from a 2-way stop control to a 4-way stop control in 2012.

To prepare for the rail line becoming active again, the elevation of Lacy Road was restored to (slightly higher than) its prior elevation, track was reinstalled, and flashing lights with gates were installed in 2014.

The rail line became active in 2014 / 2015.

In 2015, Fitchburg received WisDOT Local Program funding to reconstruct Lacy Road from Research Park Drive to Syene Road. The project included improvements at the Syene Road and Lacy Road intersection and at the track crossing of Lacy Road. WisDOT led the coordination with the railroad on these improvements and a layout including medians and signals was proposed. Due to several factors, including funding limitations, the time required for the railroad coordination process, and complexity and unknowns of future quiet zone plans, the intersection and track crossing were removed from the project and the Lacy Road 2017 construction limits ended west of Syene Road.

This project builds on the previous work completed with the Lacy Road project.

Alternatives
The following alternatives were carried forward for analysis:

- All Way Stop Control (AWSC) (existing)
- Traffic Signal

The traffic signal alternative includes medians at the track crossing to facilitate a future quiet zone application. Medians are necessary to prevent vehicles from going around the gates.

A roundabout was also considered initially, however, this alternative was dropped due to proximity to the Wisconsin & Southern Railroad tracks. Spillback of queues from the tracks would have a strong potential to grow through a roundabout and block all movements.

Traffic Operations and Analysis

Traffic operations were analyzed under the existing and design year traffic volumes and are summarized below in **Table 2** and **Table 3**, respectively.

Table 2 – Level of Service Comparison – Syene Road & Lacy Road – Base Year Volumes

Peak Period	Traffic Control	Meaure of Effectiveness	Intersection Movement												Intersection
			Eastbound			Westbound			Northbound			Southbound			
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM Peak	AWSC (Existing)	LOS	B			A			A			A		A	A
		DELAY (s)	11			10			10			9		9	10
		Queue (ft)	40			25			<25			<25		<25	-
	Traffic Signal	LOS	A	A		A	A		A	A		A	A	A	A
		DELAY (s)	9	7		7	7		8	8		8	7	8	8
		Queue (ft)	30	35		<25	40		<25	65		<25	25	<25	-
PM Peak	AWSC (Existing)	LOS	B			B			A			B		A	B
		DELAY (s)	13			11			10			11		10	12
		Queue (ft)	70			30			<25			30		25	-
	Traffic Signal	LOS	A	A		A	A		A	A		A	A	A	A
		DELAY (s)	8	8		9	7		8	8		8	8	9	8
		Queue (ft)	30	70		<25	45		<25	25		<25	50	25	-

Table 3 – Level of Service Comparison – Syene Road & Lacy Road – Design Year Volumes

Peak Period	Traffic Control	Meaure of Effectiveness	Intersection Movement												Intersection
			Eastbound			Westbound			Northbound			Southbound			
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM Peak	AWSC (Existing)	LOS	B			B			B			B		A	B
		DELAY (s)	13			11			11			10		10	11
		Queue (ft)	60			35			35			<25		<25	-
	Traffic Signal	LOS	A	A		A	A		A	A		A	A	A	A
		DELAY (s)	9	7		7	7		9	10		9	9	3	9
		Queue (ft)	45	45		<25	50		<25	50		<25	25	<25	-
PM Peak	AWSC (Existing)	LOS	C			B			B			B		B	B
		DELAY (s)	18			13			11			13		11	14
		Queue (ft)	115			40			<25			45		30	-
	Traffic Signal	LOS	A	A		A	A		A	A		A	A	A	A
		DELAY (s)	9	9		10	7		9	8		8	9	9	9
		Queue (ft)	40	95		<25	55		<25	30		<25	65	30	-

Delays and queues under all intersection control alternatives were found to be acceptable with lower delays and queues in the traffic signal scenario.

Traffic signal warrants are met due to the proximity of the intersection to the railroad crossing. Other signal warrants have not been evaluated to date.

Safety

A review of crashes that were recently reported at the intersection did not find any crash patterns that would impact intersection control alternative selection. The existing control is generally anticipated to result in fewer crashes than if a signal were to be installed. The predominant crash type with signal control is anticipated to be rear end followed by angle.

For westbound Lacy Road, the track is 24' from the stop bar for Syene Road. The stop bar is placed closer to Syene Road than is typical in order to maximize space between the track and stop. The passenger car length used for design is 19', so fits, but does not meet the clear storage distance requirements of the MUTCD. Any larger vehicle, including a school bus, would extend over the track crossing when stopped at the Syene Road stop sign.

Traffic signal control is more likely to result in queuing of westbound traffic if the stop bar is downstream (west) from the track. For this project, the layout proposed is the stop bar upstream (east) from the track. This will allow the roadway intersection and track crossing to function as one signalized intersection and the signal will only provide opportunity to cross the track on a green. In addition, railroad preemption of the signal will be utilized[4].

Queues at an AWSC intersection must clear without intervention when there are queues over the tracks.

Railroad Coordination
Preliminary coordination with the railroad has been completed. Changes at the track crossing are required to go to the Office of the Commissioner of Railroads and will require a hearing. The railroad supports the signal alternative.

In addition, the City of Fitchburg desires to apply for a quiet zone after improvements to the track crossing at Irish Lane are complete at some point in the future, separate from this project. This project will implement improvements at the track crossing at Lacy Road to facilitate the future quiet zone application. Based on current requirements, this intersection will require medians at the track crossing and additional measures may be required.

Costs[5]
A preliminary cost analysis was completed and is summarized below:

- AWSC (existing) – $400,000 (existing intersection footprint with pavement replacement only)
- Traffic Signal - $880,000

Recommendation
A signal is recommended at this location. Due to the adjacent railroad crossing, signalization will allow the roadway and crossing to be signaled as a whole intersection, with pre-emption for the railroad crossing.

Syene Road & E Cheryl Parkway
Alternatives
The following alternatives were carried forward for analysis:

- AWSC (existing)
- Traffic Signal
- Single Lane Roundabout

Traffic Operations and Analysis
Traffic operations were analyzed under the existing and design year traffic volumes and are summarized below in **Table 4** and **Table 5**, respectively.

[4] Traffic signal preemption involves a special timing sequence upon the arrival of a train when an at-grade crossing exists nearby on one or more legs of the signalized intersection. A traffic signal controller is preempted by warning from the railroad company.

[5] Intersection costs do not reflect other costs (mobilization, traffic control, erosion control, etc.)

Table 4 – Level of Service Comparison – Syene Road & E Cheryl Parkway – Base Year Volumes

Peak Period	Traffic Control	Meaure of Effectiveness	Intersection Movement												Intersection
			Eastbound			Westbound			Northbound			Southbound			
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM Peak	AWSC (Existing)	LOS	C	B	B	C		B	D			C		B	C
		DELAY (s)	16	14	11	19		13	28			21		15	20
		Queue (ft)	30	25	<25	70		30	130			85		50	-
	Traffic Signal	LOS	B	A	A	A	A		B	A		B	A	A	A
		DELAY (s)	13	8	8	8	10		11	10		11	9	10	10
		Queue (ft)	45	30	<25	<25	90		25	85		25	70	30	-
	Roundabout	LOS	A			A			A			A			A
		DELAY (s)	6			8			6			9			8
		Queue (ft)	<25			45			30			60			-
PM Peak	AWSC (Existing)	LOS	B	C	B	B		B	C			F		B	E
		DELAY (s)	14	20	10	10		14	18			72		13	35
		Queue (ft)	30	85	<25	40		<25	45			345		35	-
	Traffic Signal	LOS	B	B	A	B	A		B	A		A	A	A	A
		DELAY (s)	11	10	9	11	9		11	7		9	9	8	9
		Queue (ft)	55	115	<25	<25	45		<25	50		50	140	25	-
	Roundabout	LOS	B			A			A			B			A
		DELAY (s)	11			5			6			10			10
		Queue (ft)	75			<25			<25			100			-

*Pink highlighted LOS ratings indicate failing levels of service

Table 5 – Level of Service Comparison – Syene Road & E Cheryl Parkway – Design Year Volumes

Peak Period	Traffic Control	Meaure of Effectiveness	Intersection Movement												Intersection
			Eastbound			Westbound			Northbound			Southbound			
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM Peak	AWSC (Existing)	LOS	C	C	B	E		C	F			E		D	E
		DELAY (s)	23	18	14	42		19	106			48		27	49
		Queue (ft)	60	35	<25	160		50	355			190		110	-
	Traffic Signal	LOS	B	A	A	A	A		B	B		B	B	B	B
		DELAY (s)	13	8	8	9	9		13	11		13	10	11	10
		Queue (ft)	65	45	<25	<25	110		35	115		30	95	30	-
	Roundabout	LOS	A			B			A			B			B
		DELAY (s)	7			13			8			12			11
		Queue (ft)	35			90			50			110			-
PM Peak	AWSC (Existing)	LOS	C	E	B	C		B	D			F		C	F
		DELAY (s)	19	40	13	20		14	30			270		20	111
		Queue (ft)	45	165	<25	40		<25	105			850		85	-
	Traffic Signal	LOS	B	B	A	B	B		B	A		B	B	B	B
		DELAY (s)	13	12	10	14	11		14	8		11	11	9	11
		Queue (ft)	90	185	25	<25	80		25	85		80	225	35	-
	Roundabout	LOS	C			A			A			C			C
		DELAY (s)	22			6			9			17			17
		Queue (ft)	170			<25			40			210			-

*Pink highlighted LOS ratings indicate failing levels of service

Failing levels of service with extensive delays and queues are expected under the existing AWSC scenario. Delays and queues under the traffic signal and roundabout alternatives were found to be acceptable with lower delays and queues in the traffic signal scenario.

Traffic signal warrants are met under existing and design year traffic volumes.

Safety

A review of crashes that were recently reported at the intersection did not find any crash patterns that would impact intersection control alternative selection. The existing control is generally anticipated to result in fewer crashes than if a signal or roundabout were to be installed. The predominant crash type with signal control is anticipated to be rear end followed by angle.

Costs[5]

A preliminary cost analysis was completed and is summarized below:

- AWSC (existing) – $400,000 (existing intersection footprint with pavement replacement only)
- Traffic Signal – $1,035,000
- Roundabout – $1,085,000

Recommendation

Complete further evaluation including public input on the signal and roundabout alternatives. A signal or roundabout will provide similar levels of service in this location.

Syene Road & Central Park Place/Ninebark Drive

Alternatives

The following alternatives were carried forward for analysis:

- Two Way Stop Control (TWSC) (existing)
- Mini Roundabout

Both a mini roundabout and a compact roundabout are under consideration for this location. These would be smaller than a traditional roundabout.

Traffic Operations and Analysis

Traffic operations were analyzed under the existing and design year traffic volumes and are summarized below in **Table 6** and **Table 7**, respectively.

Table 6 – Level of Service Comparison – Syene Road & Central Park Place – Base Year Volumes

Peak Period	Traffic Control	Meaure of Effectiveness	Intersection Movement												Intersection
			Eastbound			Westbound			Northbound			Southbound			
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM Peak	TWSC (Existing)	LOS	D		B	C		B	A			A	-		-
		DELAY (s)	30		10	22		12	8			9	-		-
		Queue (ft)	40		<25	<25		<25	<25			<25	-		-
	Roundabout	LOS	A			A			A			A			A
		DELAY (s)	5			5			8			6			7
		Queue (ft)	<25			<25			65			35			-
PM Peak	TWSC (Existing)	LOS	C		B	C		A	A			A	-		-
		DELAY (s)	24		13	23		10	9			8	-		-
		Queue (ft)	<25		<25	<25		<25	<25			<25	-		-
	Roundabout	LOS	A			A			A			A			A
		DELAY (s)	5			4			5			10			8
		Queue (ft)	<25			<25			25			95			-

Table 7 – Level of Service Comparison – Syene Road & Central Park Place – Design Year Volumes

Peak Period	Traffic Control	Meaure of Effectiveness	Intersection Movement												Intersection
			Eastbound			Westbound			Northbound			Southbound			
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM Peak	TWSC (Existing)	LOS	F		B	E		B	A			A	-		-
		DELAY (s)	78		11	38		11	8			9	-		-
		Queue (ft)	100		<25	<25		<25	<25			<25	-		-
	Roundabout	LOS	A			A			B			A			A
		DELAY (s)	6			6			10			7			8
		Queue (ft)	<25			<25			100			50			-
PM Peak	TWSC (Existing)	LOS	E		C	E		B	A			A	-		-
		DELAY (s)	38		15	38		10	10			8	-		-
		Queue (ft)	<25		<25	<25		<25	<25			<25	-		-
	Roundabout	LOS	A			A			A			B			B
		DELAY (s)	7			4			6			13			10
		Queue (ft)	<25			<25			35			155			-

*Pink highlighted LOS ratings indicate failing levels of service

Failing levels of service are expected under the existing TWSC scenario under design year volumes for the eastbound left turn and through movements. Delays and queues for all other movements under all intersection control alternatives were found to be acceptable with lower delays and queues in the roundabout scenario.

Safety
A review of crashes that were recently reported at the intersection did not find any crash patterns that would impact intersection control alternative selection. The existing control is generally anticipated to result in higher severity crashes than if a roundabout were to be installed.

Costs[5]
A preliminary cost analysis was completed and is summarized below:

- TWSC (existing) – $350,000 (existing intersection footprint with pavement replacement only)
- Mini Roundabout – $630,000

Recommendation
Complete further evaluation including public input on the stop control and mini roundabout alternatives.

Syene Road & McCoy Road
Alternatives
The following alternatives were carried forward for analysis:

- TWSC (existing)
- Traffic Signal
  - Continuous T
  - Realigned Intersection
  - Signal on Existing Alignment
    Note: All signal options have the same level of service
- Single Lane Roundabout

Traffic Operations and Analysis
Traffic operations were analyzed under the existing and design year traffic volumes and are summarized below in **Table 8** and **Table 9**, respectively.

Table 8 – Level of Service Comparison – Syene Road & McCoy Road – Base Year Volumes

Peak Period	Traffic Control	Meaure of Effectiveness	Intersection Movement												Intersection
			Eastbound			Westbound			Northbound			Southbound			
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM Peak	TWSC (Existing)	LOS	D		D				A	-			-	-	-
		DELAY (s)	33		33				9	-			-	-	-
		Queue (ft)	50		50				25	-			-	-	-
	Traffic Signal - Continuous T	LOS	B		B				A	-			B	B	B
		DELAY (s)	18		12				9	-			14	15	11
		Queue (ft)	40		<25				65	-			160	40	-
	Roundabout	LOS	A		A				A				C		B
		DELAY (s)	5		5				9				16		12
		Queue (ft)	<25		<25				80				160		-
PM Peak	TWSC (Existing)	LOS	F		F				A	-			-	-	-
		DELAY (s)	112		112				9	-			-	-	-
		Queue (ft)	405		405				<25	-			-	-	-
	Traffic Signal - Continuous T	LOS	B		B				A	-			B	B	B
		DELAY (s)	20		14				9	-			16	12	14
		Queue (ft)	180		35				35	-			275	30	-
	Roundabout	LOS	B		B				A				A		A
		DELAY (s)	11		11				7				9		9
		Queue (ft)	80		80				30				75		-

*Pink highlighted LOS ratings indicate failing levels of service

Table 9 – Level of Service Comparison – Syene Road & McCoy Road – Design Year Volumes

Peak Period	Traffic Control	Meaure of Effectiveness	Intersection Movement												Intersection
			Eastbound			Westbound			Northbound			Southbound			
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM Peak	TWSC (Existing)	LOS	F		F				B	-			-	-	-
		DELAY (s)	167		167				10	-			-	-	-
		Queue (ft)	180		180				40	-			-	-	-
	Traffic Signal - Continuous T	LOS	C		B				A	-			B	B	B
		DELAY (s)	21		14				15	-			15	17	13
		Queue (ft)	60		<25				105	-			220	50	-
	Roundabout	LOS	A		A				B				E		D
		DELAY (s)	6		6				11				46		28
		Queue (ft)	<25		<25				120				440		-
PM Peak	TWSC (Existing)	LOS	F		F				A	-			-	-	-
		DELAY (s)	480		480				9	-			-	-	-
		Queue (ft)	1030		1030				<25	-			-	-	-
	Traffic Signal - Continuous T	LOS	C		B				B	-			B	B	B
		DELAY (s)	25		18				12	-			19	13	17
		Queue (ft)	260		70				40	-			395	50	-
	Roundabout	LOS	C		C				A				B		B
		DELAY (s)	22		22				8				11		14
		Queue (ft)	185		185				50				115		-

*Pink highlighted LOS ratings indicate failing levels of service

Failing levels of service are expected under the existing TWSC scenario under existing and design year volumes for the eastbound approach. Failing levels of service are expected under the roundabout control alternative under design year volume for the southbound approach. Delays and queues for other movements under the roundabout control alternative were found to be acceptable. Delays and queues for all movements under the traffic signal control alternatives were found to be acceptable.

Safety

This intersection has a crash rate of 1.36 crashes per million entering vehicles, which is elevated. A review of the crashes recently reported did not find any crash patterns that would impact intersection control alternative selection. The review showed crash types consistent with drivers experiencing increased delay and accepting additional risk to enter the intersection. As traffic volumes increase, these are anticipated to worsen under existing conditions. The existing control is generally anticipated to result in higher crashes than if a signal or roundabout were to be installed. The predominant crash type with signal is anticipated to be rear end followed by angle.

All signal alternatives would have queues that extend past the Capital City Trail Trailhead driveway.

A review of crashes associated with the Capital City Trail crossing of Syene Road suggest that improvements at this location should enhance the visibility of the crossing for motorists and motor vehicle traffic for users of the path.

Costs[5]

A preliminary cost analysis was completed and is summarized below:

- TWSC (existing) – $846,000
- Traffic Signal
  - Continuous T – $1,400,000
  - Realigned Intersection - $1,300,000
  - Signal on Existing Alignment - $1,100,000
- Roundabout – $1,100,000

Recommendation

Complete further evaluation including warrant analysis on the signal alternatives and apply for WisDOT HSIP funding.

Any of the signalized alternatives would address level of service and elevated crash rate concerns for the intersection.

COSTS[6]

The project construction cost based on the recommended cross sections and intersection improvements is estimated as follows:

Cross sections, Lacy Road and sideroad improvements = $7,800,000
Lacy Road Intersection = $880,000
East Cheryl Parkway Intersection[7] = $1,035,000
Central Park Place Intersection[8] = $630,000
McCoy Road Intersection[9] = $1,300,000
Total = $11,645,000

Geotechnical investigations discovered shallow marginal natural and cohesive fill soils. The recommendation discussed undercut and select crushed in addition to the typical pavement section. This equates approximately $1,800,000 of the project costs above, which was not anticipated nor budgeted for.

WisDOT HSIP funding is a possilbility for the Syene Road and McCoy Road intersection. The crash rate at that location makes it a good candidate for funding and City staff have started conversations with WisDOT.

STUDY SUMMARY AND RECOMMENDATIONS

Corridor Details:

- Syene Road is a locally and regionally significant roadway with a variety of land uses, and high potential for development and re-development near the corridor.
- The roadway conveys between 3,600 and 8,700 vehicles per day.
- Traffic volumes are anticipated to increase by approximately 2,000 vehicles per day by 2045.
- Pavement Condition is Fair to Poor.
- Mobility:
    - Bicyclists:
        - Bicyclist mobility is currently adequate for those who use paths, as there is a shared use path along most of the roadway corridor.
        - On-road bicyclist mobility is currently insufficient, as indicated by the High Stress rating and Bicycle Level of Service (BLOS) D.
    - Pedestrian mobility is currently adequate, as indicated by the shared use path along most of the roadway corridor, and the sidewalk along much of the residential areas. The project should include upgrades for ADA compliance at intersections and improvements to facilitate neighborhood and corridor connectivity.
    - Vehicle mobility is expected to degrade due to anticipated traffic growth.
        - Minor congestion is currently present at the E Cheryl Parkway and Ninebark Drive/Central Park Place intersections. Congestion is anticipated to worsen without intersection improvements.

[6] Construction cost estimates do not include design, real estate payments for easements or fee acquisition, compensable utility relocations, utility undergrounding, work to be completed by the railroad at the Lacy Road crossing, or wetland banking fees.

[7] Utilizing the signal estimate for the purposes of this calculation.

[8] Utilizing the mini roundabout estimate for the purposes of this calculation.

[9] Utilizing the signal with realigned intersection estimate for the purposes of this calculation.

        - Moderate levels of congestion are currently present during peak hours at the McCoy Road intersection. Congestion is anticipated to worsen without intersection improvements.
- Safety: A review of safety conditions along the corridor resulted in three locations of note, with the following recommendations:
    - Syene Road intersection with Lacy Road: A railroad crossing is located on Lacy Road, adjacent to the intersection. A traffic signal may mitigate the likelihood of traffic queuing onto the tracks and help clear queuing during train crossing events.
    - McCoy Road intersection with Syene Road: Angle type crashes were observed at this location that would likely be mitigated by installation of a traffic signal.
    - Capital City Trail Crossing of Syene Road (north of the Syene Road and McCoy Road intersection): One fatal crash occurred at this location involving a cyclist. Improvements at this location should enhance the visibility of the crossing for motorists and motor vehicle traffic for users of the path.

Study Recommendations:

- Cross sections A, B and C are recommended for implementation.

- Intersection controls are recommended for implementation or further evaluation as follows:
    - Syene Road and Lacy Road Intersection: Traffic Signal
    - Syene Road and East Cheryl Parkway Intersection: Traffic Signal or Roundabout
    - Syene Road and Central Park Place/Ninebark Drive: Mini Roundabout or Stop Sign
    - Syene Road and McCoy Road: Traffic Signal if warranted

ATTACHMENTS

Attachment A: Project History
Attachment B: Bicycle Facilities Evaluation
Attachment C: Intersection Alternatives
Attachment D: Preliminary Travel Times

Attachment A: Project History

Syene Road Reconstruction Project
ID 22-3368
Project History

June 9, 2021

ROADWAY DATA

Functional Classification: Minor Arterial
Speed Limit: 35 MPH (reduced from 45 MPH in 2019)
ADT:

Syene Road Segment	2025	2045
Lacy to E Cheryl:	3,600	4,050
E Cheryl to McCoy:	7,850	9,950
McCoy to north/east:	8,700	10,100

Existing lanes: 2 – 11' travel lanes
Existing shoulders: Varies, but primarily 3' paved, 3' gravel
Existing shared use path on west side of Syene Road
Existing sidewalk on east side in the following locations:
East Cheryl Parkway to Rodeo Way
Approximately 200' north of Rodeo Way to West Clayton Road
Pavement Condition: Fair to Poor (PASER pavement rating ranges from 5 - 3)
Last year improved: 2012 overlay

PLANNING DOCUMENTS

The following planning documents excerpts relate to the Syene Road Reconstruction project:

Nine Springs Neighborhood Plan 12/08/1998

- Preserve existing historic structures, particularly the McCoy House.
- Although recent regional studies do not show the rail corridor through the Nine Springs Neighborhood as a high priority transit corridor, the options for potential transit service should be reserved.

McGaw Park Neighborhood Plan (MPNP) 06/09/2009, amended 09/26/2014

- Consideration is being given to light rail transit (LRT) or bus rapid transit (BRT) on the existing dormant rail line* that runs parallel to and on the east side of Syene Road. The MPNP includes a station within the Transit Oriented Development (TOD) land use area east of Syene Road between Lacy Road and Nobel Drive**. If LRT is chosen over BRT, consideration should be given to providing a pedestrian bridge over the rail corridor and Syene Road to link the east and west TOD areas. If BRT is chosen over LRT, an at-grade crossing should be sufficient.
  * The rail line is no longer dormant.
  ** Nobel Drive does not currently intersect Syene Road. This potential future connection is south of Lacy Road and these project limits.
- The TIA prepared for the MPNP identifies traffic signals in the future at the Syene Road intersection with Lacy Road.
- City of Fitchburg staff has indicated that school buses currently stop between Syene Road and the rail corridor. The rail is also posted as being exempt. It is strongly recommended that bus stops be moved to the opposite side of Syene Road or the opposite side of the rail corridor.
- In addition, the plan includes information on stormwater facilities, water conditions of Swan Creek, sanitary sewer, and water supply.

City of Fitchburg Bicycle and Pedestrian Plan 03/28/2017

- Syene Road is a Primary Bicycle Route, and as such, a shared use path and buffered/protected bicycle lanes or cycle tracks are Strongly Recommended:

Table 3.1 – Bicycle and Pedestrian Facilities and Network Matrix

Pedestrian Network	Bicycle Network	Route Type	Shared Use Paths*	Neighbhd. Slow Street Traffic Calming	Bicycle Lanes	Buffered / Protected Bicycle Lanes / Cycletracks	Shared-Lane Markings	Paved Shoulders
	✓	Primary Bike Routes	S	C	R	S		R**
	✓	Neighbhood. Bike Routes	C	S	C		R	
✓	✓	Scenic Recreational Trails	S					

S = Strongly Recommended R = Recommended C = Considered

* Not applicable to existing neighborhoods as identified in Figure 3.5 herein

** Recommended only in rural areas of Fitchburg

- The Lacy Road, E Cheryl Parkway and McCoy Road intersections are Primary Intersections for both bicycle and pedestrian routes.
- There is a Pedestrian Activity Area surrounding Swan Creek Park extending from north of the E Cheryl Parkway intersection to north of the Lacy Road intersection along Syene Road.
- Corridors that raise the most safety concerns for bicyclists and pedestrians are also the same corridors that are used the most by bicyclists and pedestrians (such as McKee Road, Lacy Road, Fish Hatchery Road, Syene Road, CTH M, and Whalen Road).
- References the Comprehensive Parks, Open Space and Recreation Plan, Conceptual Park and Open Space Proposal, which
    - identifies and prioritizes new or improved parks and open spaces throughout the rural areas.
    - was originally developed in 2004 and shows a potential network of linked parks and open spaces.
        - The Heritage Circle Route, a 19-mile connected trail network encircling the City of Fitchburg, aligned with the Badger State Trail, CTH M, Syene Road and connecting to the Capital City Trail, is noted as a proposed trail for the future.
- The rural to urban reconstruction may result in:
    - A reduced speed of 35 mph
    - A sidewalk on the east side
    - On street bicycle lanes
    - A roundabout at E Cheryl Parkway
    - An improved traffic signal at Lacy Road
- Vegetation management needed at the Syene Road and McCoy Road intersection.

PREVIOUS STUDIES

The following study excerpts relate to the Syene Road Reconstruction project:

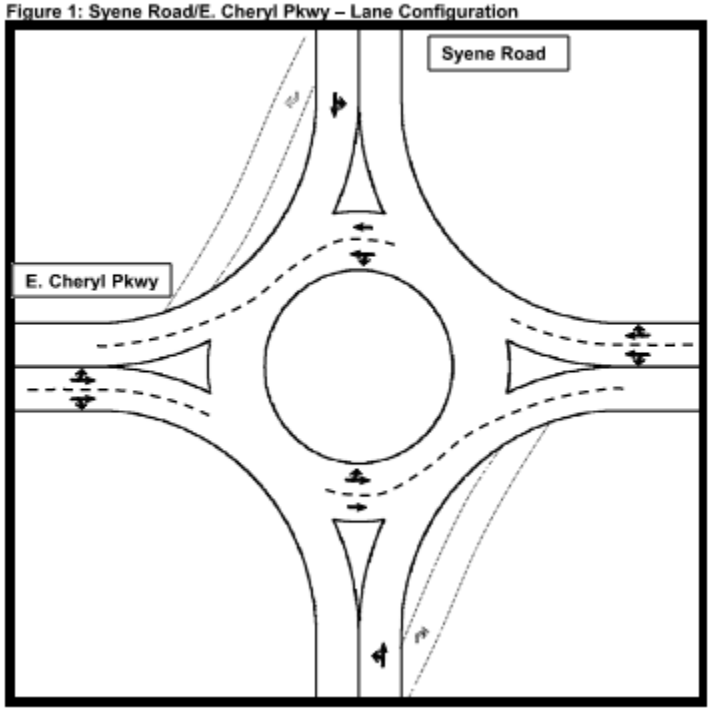
Northeast Fitchburg Transportation Study June 2002 with Supplement in December 2002

- Syene Road is described as a major roadway in the study area.
- The study examined the feasibility of a new USH 14 interchange. This has since been constructed.
- The study material is dated and does not have relevant recommendations for this project.

Roundabout Operational Analysis – Proposed Roundabout at Syene Road / E Cheryl Parkway January 2012

- Layout of the intersection would be a multi-lane roundabout
    - Two lane entries on E Cheryl Parkway
    - Syene Road could be single lane for 2035 background condition but would need right turn bypass lanes for 2035 build condition

Figure 1: Syene Road/E. Cheryl Pkwy – Lane Configuration



Nine Springs Technical Memo April 2012

- Nine Springs Neighborhood is bounded by Syene Road on the west side, from East Cheryl Parkway to West Clayton Road.
- This neighborhood development follows SmartCode zoning code that places a strong emphasis on walking and biking as integral modes of transportation.
- The long-term vision for this neighborhood includes transit-oriented design, with the future provision of bus transit throughout the development and commuter rail along the abandoned Union Pacific railroad corridor*.
    * The rail line is no longer abandoned.
- It is the goal that future residents will live and work in their neighborhood, and will choose to commute by walking, biking, or taking transit.

Syene Road Reconstruction Study August 2019

- Reduce the existing posted speed limit of 45 mph to 35 mph
- Construct a cross section with:
    - 11’ travel lane
    - 6’ on-street bicycle accommodations (2’ buffer, 4’ bicycle lane)
    - 16’ median

- 7’ terrace
- 5’ sidewalk
- 10’ shared use path

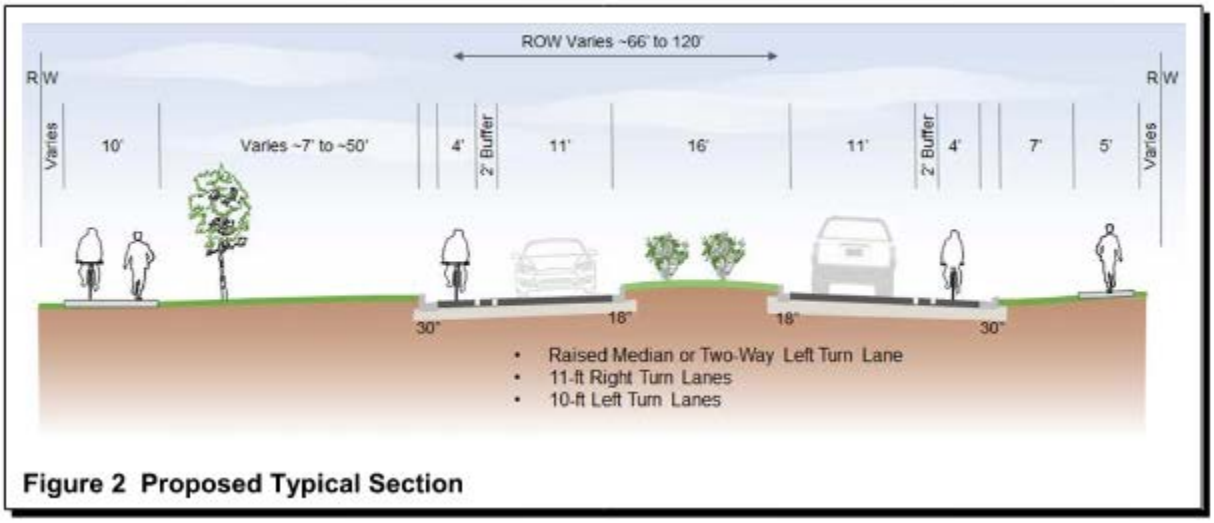


Figure 2 Proposed Typical Section

- Intersection control upgrades at Lacy Road, E Cheryl Parkway, Ninebark, and McCoy Road
- Standard lighting at intersections and along the corridor

DESIGN RESOURCES

WisDOT FDM:

FDM 11-20 Attachment 1.1 Urban Streets Modernization Roadway Design Criteria for Posted Speed Limits of 40 mph or less

Urban Streets Modernization Roadway Design Criteria for Posted Speed Limits of 40 mph or Less

Functional Class	Design Year ADT Thresholds at Levels of Service C, D & E [1]				Design Basis	Roadway Criteria [9]						
						Travel Lanes			Roadway (Face of Curb to Face of Curb) Width (feet)[4]			
									No Parking[6,7]		Parking [6,7]	
	Scenarios	C[2] LOS 4.0 ADTs (DHVs)	D LOS 5.0 ADTs (DHVs)	Middle E LOS 5.5 ADTs (DHVs)	Urban Design Class [Design Speed] (mph)[3]	No.	Lane Widths (feet)[5]	Median Widths (feet)	Range of Normal Widths[8]	Range of Widths including Bike Accommodations/ Lanes	Range of Normal Widths[8]	Range of Widths including Bike Accommodations/ Lanes
Locals	N/A	Low Volume Residential (0-250 ADT)			1a **[20-25]**	1	**12**	No	**N/A**	**N/A**	**28**	**N/A**
		Volume not a consideration			1b **[25-30**(20)**]**	2	**10-12** (9)	No	**24-28** (22)	**32-36** (30)	**36-40** (32)	**46-56** (44)
Arterials and Collectors	N/A	≤ 4,500 ADT (660 DHV)			2a **[30-45]**	2	**11-12** (10)	No	**34-36** (24)	**34-36** (32)	**46-48** (34)	**48-56** (46)
	Worst Best	6,500 (1086) 20,000 (2260)	7,500 (1170) 22,500 (2475)	8,000 (1216) 25,000 (2700)	2b **[30-45]**	2	**11-12** (10)	No	**34-36** (24)	**34-36** (32)	**46-48** (34)	**48-56** (46)
	Worst Best	16,000-(1888) 41,000 (4100)	17,500 (2048) 47,000 (4610)	18,000 (2088) 50,500 (4900)	3 **[30-45]**	4	**11-12** (10)	No	**48-60** (44)	**56-60** (52)	**68-72** (54)	**70-80** (66)
	Worst Best	22,000 (2440) 41,500 (4110)	22,750 (2500) 47,000 (4610)	23,000 (2530) 51,000 (4950)	4 **[30-45]**	4	**11-12** (10)	**14-30** (6)	**2 @ 26-28** (2 @ 24)	**2 @ 30-32** (2 @ 28)	**2 @ 36-38** (2 @ 29)	**2 @ 37-42** (2 @ 35)
Arterials	Worst Best	35,500 (3660) 68,000 (6390)	37,500 (3790) 76,000 (7070)	38,500 (3850) 81,500 (7580)	5 **[30-45]**	6	**11-12** (10)	**14-30** (6)	**2 @ 36-40** (2 @34)	**2 @ 41-44** (2 @ 38)	**2 @ 47-50** (2 @ 39)	**2 @ 48-54** (2 @ 45)

Upper values are shown in **bold** and Lower values are shown in parentheses. Use of values below existing roadway dimensions are to be justified by completing environmental process, predictive safety and benefit/cost analyses.

See page 2 of this attachment for superscript notes.

May 15, 2019 *Attachment 1.1* *Page 1*

Attachment B: Bicycle Facilities Evaluation

Existing Conditions

Bicycle Level of Service for this road segment

Lanes per direction:	1
Outside lane width:	11 ft
Paved shoulder/bikelane width:	3 ft
Bidirectional ADT traffic volume:	7850 (veh/day)
Posted speed limit:	35 mph
Heavy vehicle percentage:	3.8%
FHWA's pavement condition rating:	4
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	3.58	D (3.51-4.50)	Moderately Low

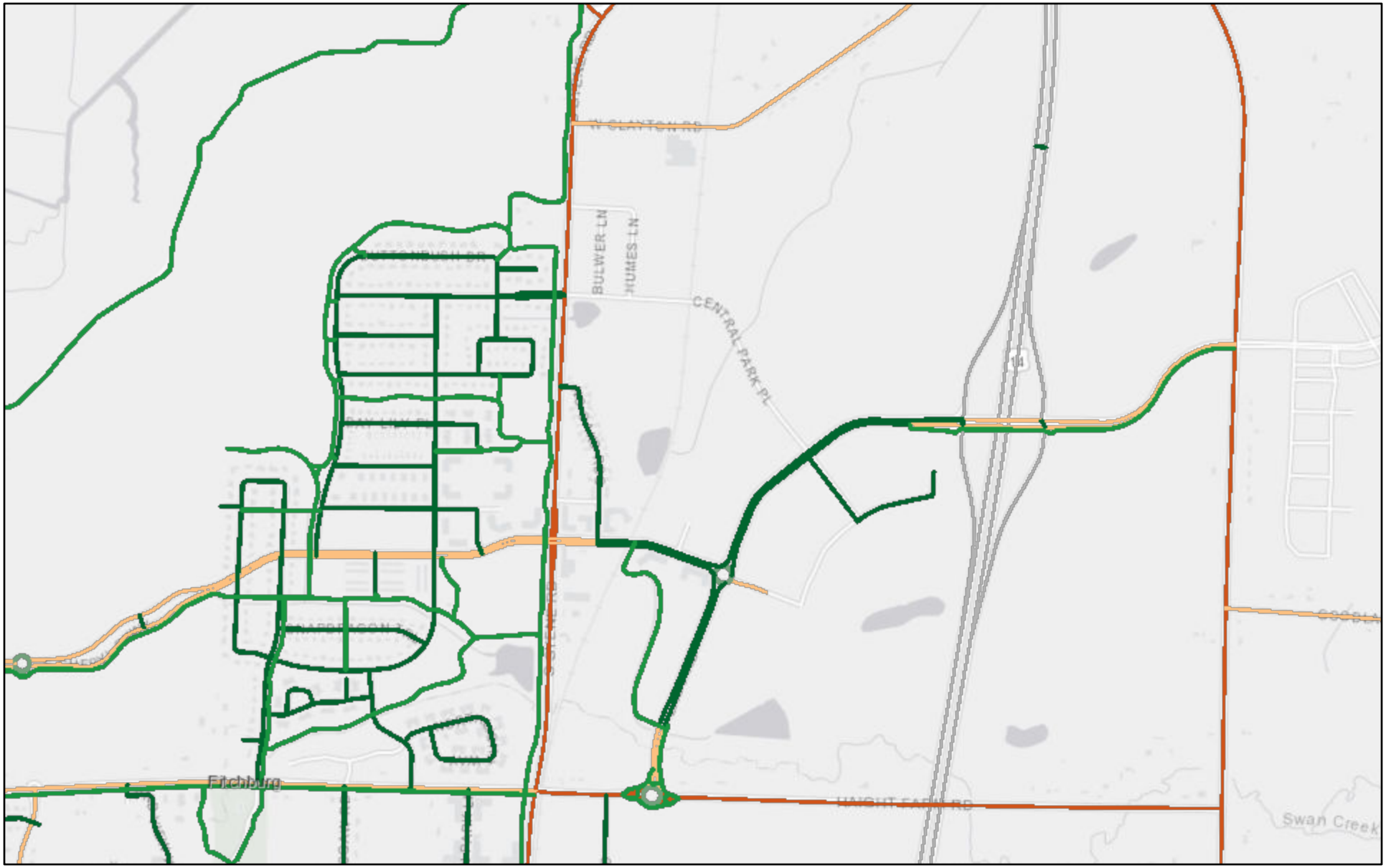
Proposed Conditions with Future Traffic Volume

Bicycle Level of Service for this road segment

Lanes per direction:	1
Outside lane width:	11 ft
Paved shoulder/bikelane width:	6 ft
Bidirectional ADT traffic volume:	9950 (veh/day)
Posted speed limit:	35 mph
Heavy vehicle percentage:	3.8%
FHWA's pavement condition rating:	5
% of segment with occupied on-street parking:	5%

	Score	Level-of-service	Compatibility Level
BLOS:	2.48	B (1.51-2.50)	Very High

Syene Road - Low Stress Bike Route Finder



7/7/2021, 11:02:30 AM

1:18,056

0 0.1 0.2 0.4 mi

0 0.17 0.35 0.7 km

On Street LTS

- LTS 1: Lowest stress
- LTS 2: Low stress
- LTS 3: Moderate stress
- LTS 4: Highest stress
- Bicycles prohibited
- Bike Path
- Ped/Bike Over/Underpass
- Bike Elevator

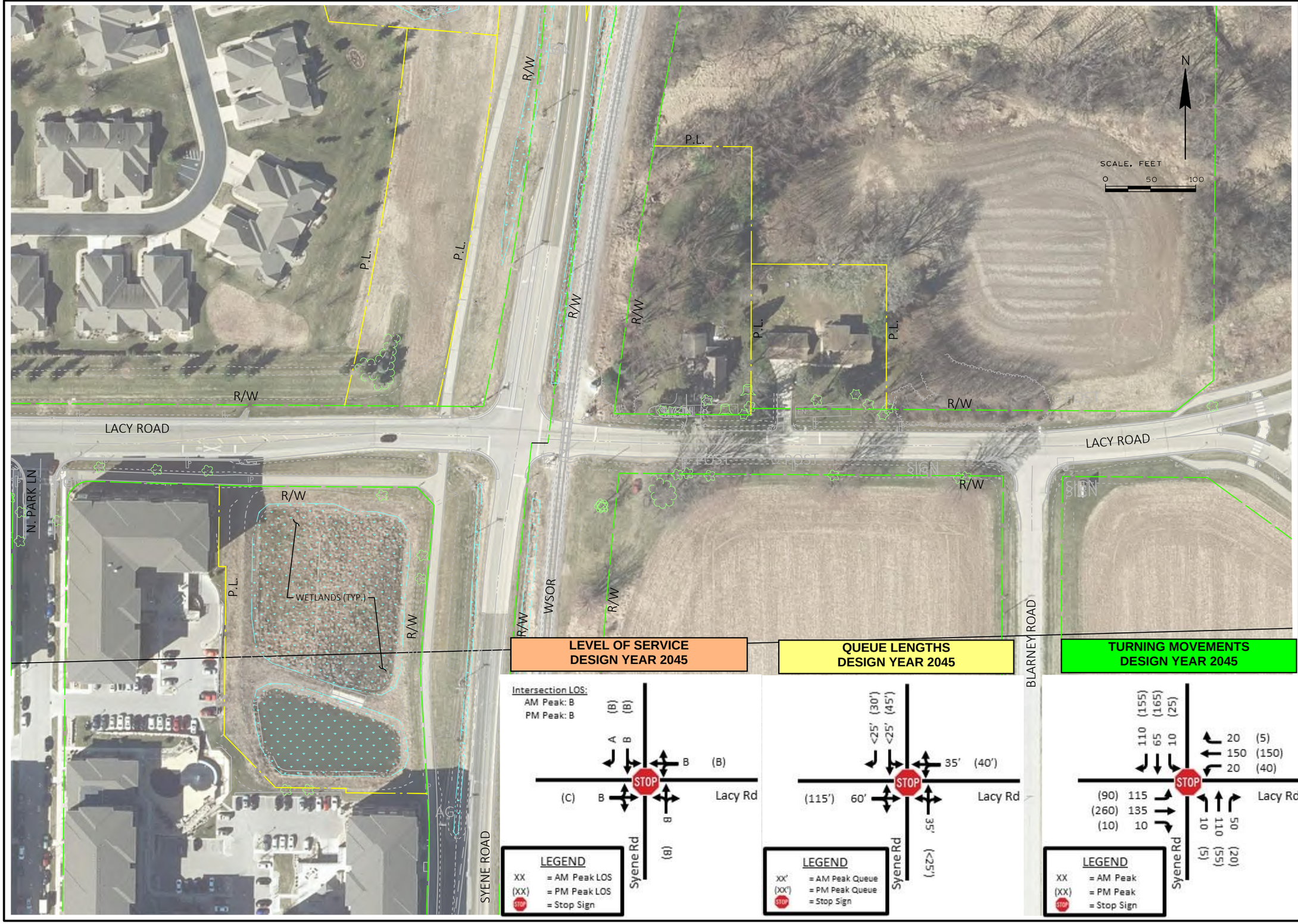
Greater Madison MPO

Attachment C: Intersection Alternatives

PLOT DATE : 6/18/2021 2:07 PM

PLOT BY : LANCE WILLISTON

FILE NAME : G:\FITCHBRG\20087-000 SYENE ROAD\CIVIL 3D\SHEETSOTHER\INTERSECTION ALTS\INTERSECTION ALTS.DWG



LEVEL OF SERVICE DESIGN YEAR 2045

Intersection LOS:
AM Peak: B
PM Peak: B

QUEUE LENGTHS DESIGN YEAR 2045

TURNING MOVEMENTS DESIGN YEAR 2045

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CONCEPT LEVEL ALTERNATIVE

CITY OF FITCHBURG

LACY ROAD INTERSECTION

NO BUILD--ALL WAY STOP

JUNE 2021

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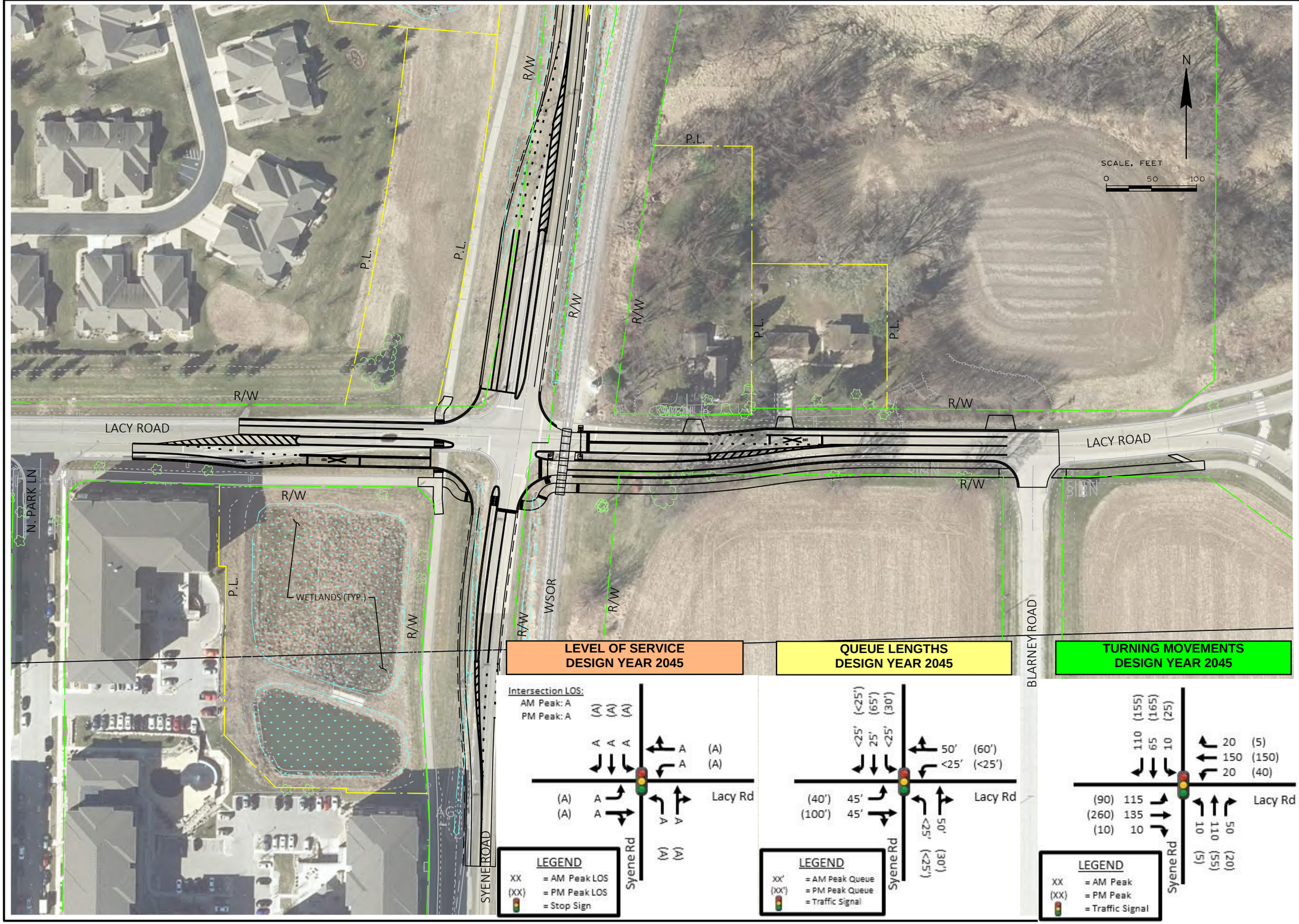
SHEET NO.

PLOT DATE : 6/18/2021 2:08 PM

PLOT BY : LANCE WILLISTON

FILE NAME : G:\FITCHBRG\20087-000 SYENE ROAD\CIVIL 3D\SHEETSOTHER\INTERSECTION ALTS\INTERSECTION ALTS.DWG



LEVEL OF SERVICE DESIGN YEAR 2045

QUEUE LENGTHS DESIGN YEAR 2045

TURNING MOVEMENTS DESIGN YEAR 2045

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CONCEPT LEVEL ALTERNATIVE

CITY OF FITCHBURG

LACY ROAD INTERSECTION

SIGNAL

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SHEET NO.

PLOT DATE : 6/18/2021 2:49 PM

PLOT BY : LANCE WILLISTON

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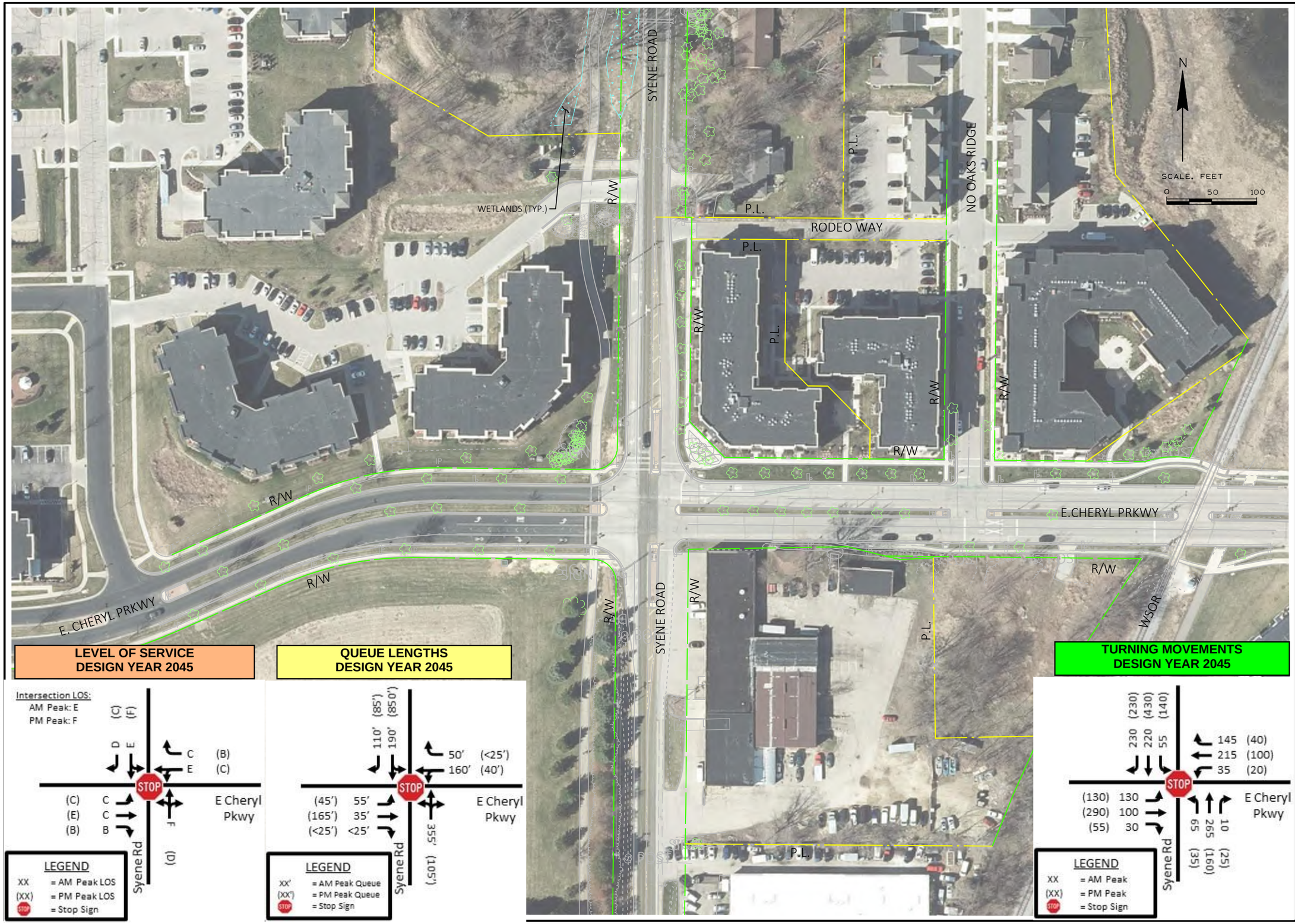

LEVEL OF SERVICE DESIGN YEAR 2045

QUEUE LENGTHS DESIGN YEAR 2045

TURNING MOVEMENTS DESIGN YEAR 2045

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CONCEPT LEVEL ALTERNATIVE

CITY OF FITCHBURG
E. CHERYL PRKWY INTERSECTION

NO BUILD--ALL WAY STOP

JUNE 2021

Revisions:

SHEET NO.

PLOT DATE : 6/18/2021 2:48 PM

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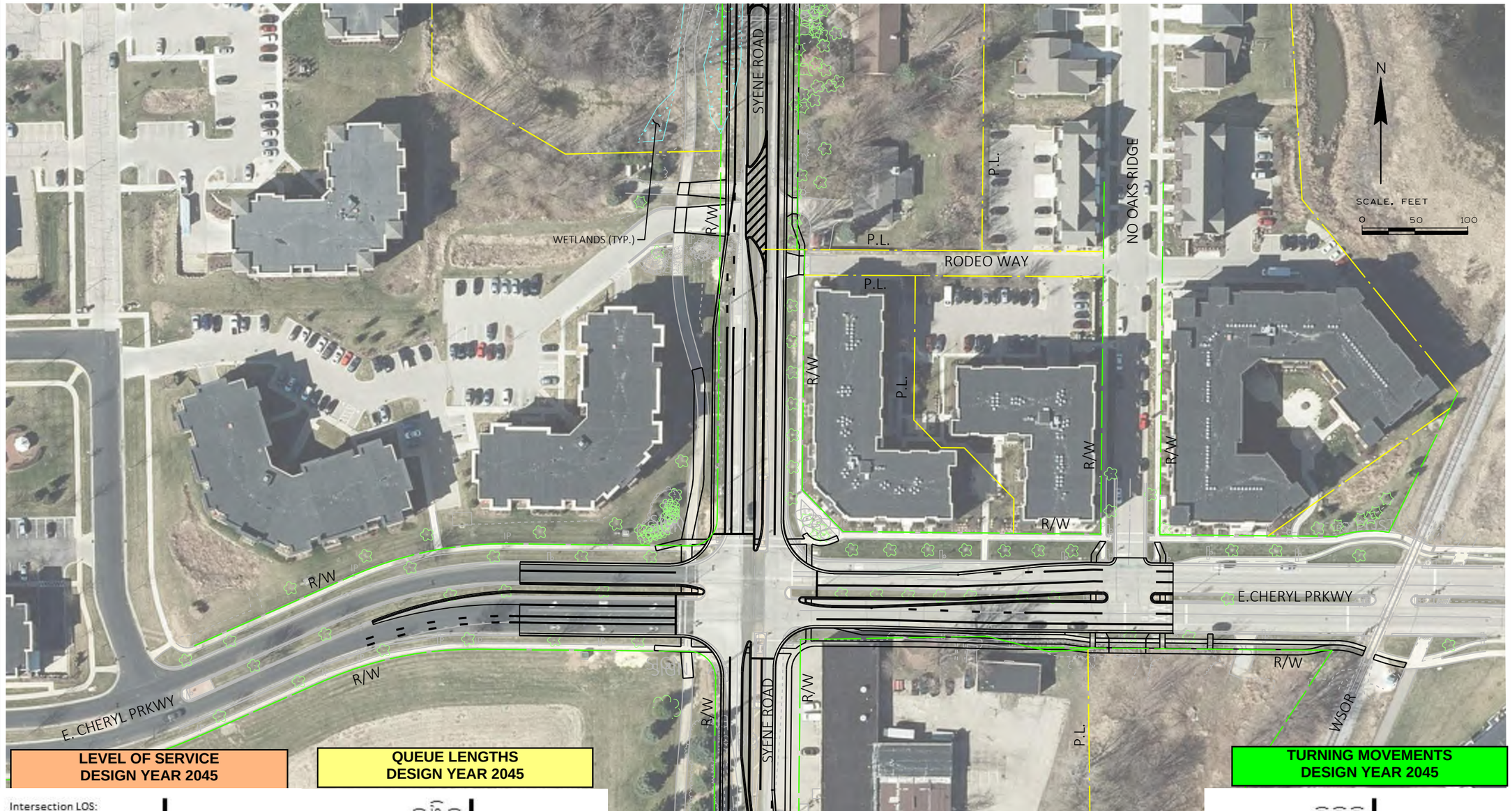
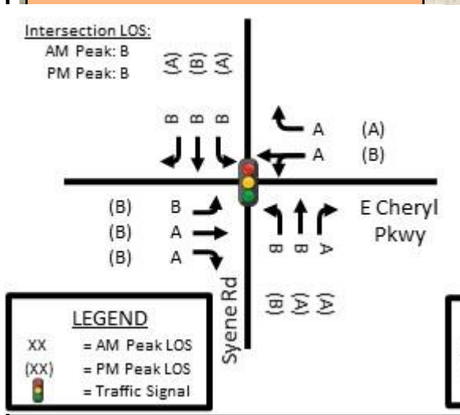
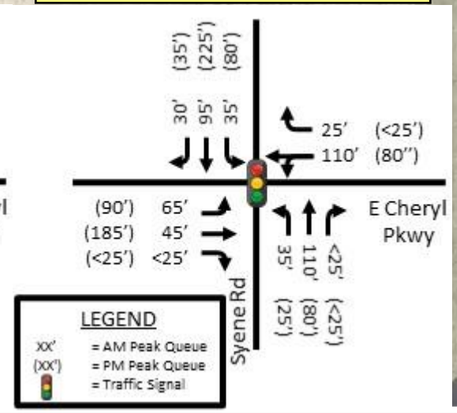


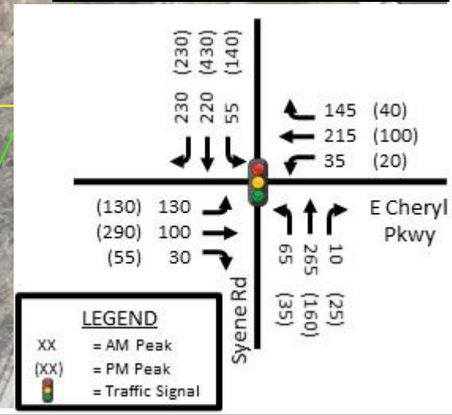
LEVEL OF SERVICE DESIGN YEAR 2045



QUEUE LENGTHS DESIGN YEAR 2045



TURNING MOVEMENTS DESIGN YEAR 2045



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CONCEPT LEVEL ALTERNATIVE

CITY OF FITCHBURG

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SIGNAL

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PLOT DATE : 6/18/2021 2:47 PM

PLOT BY : LANCE WILLISTON

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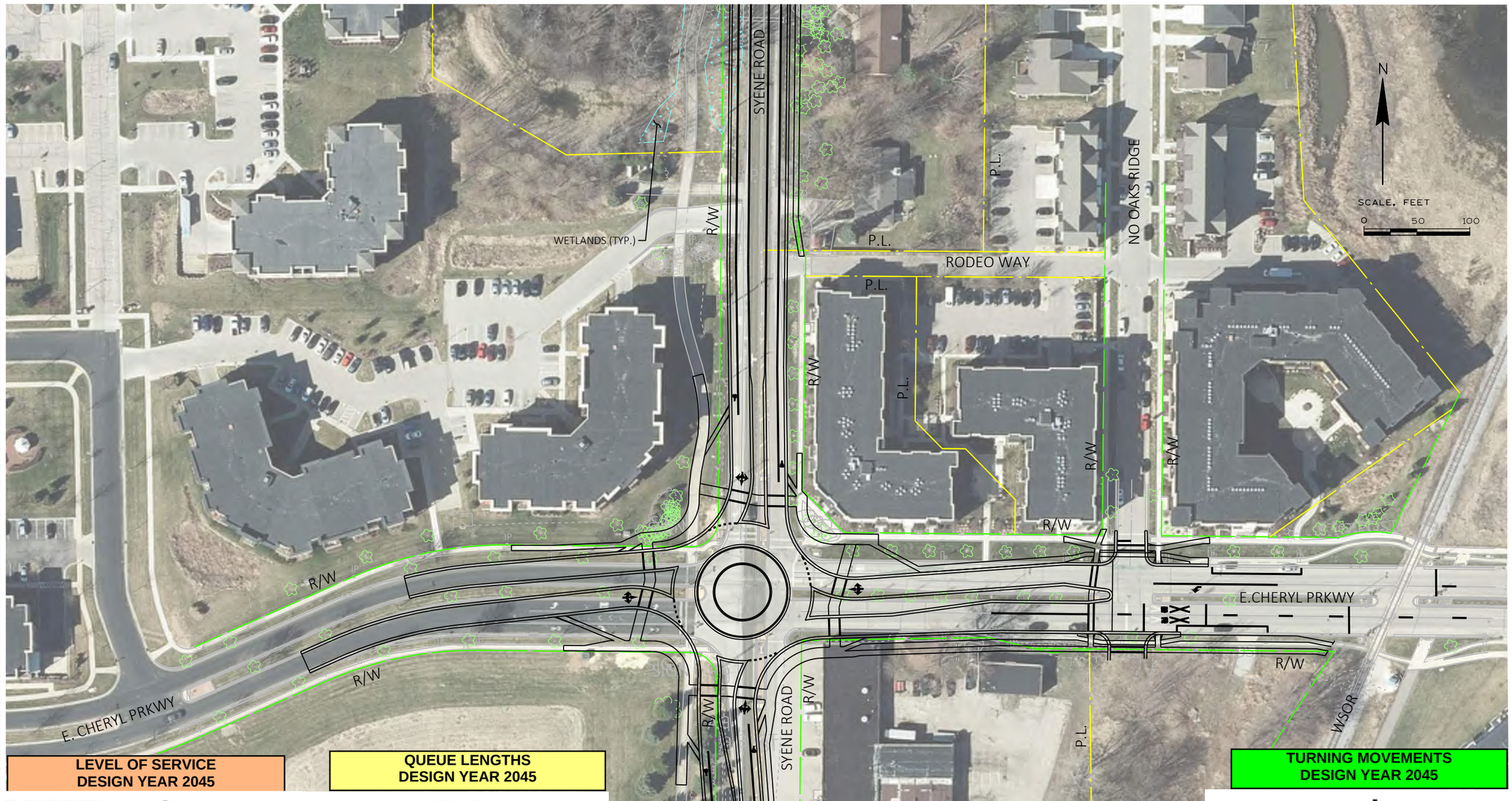
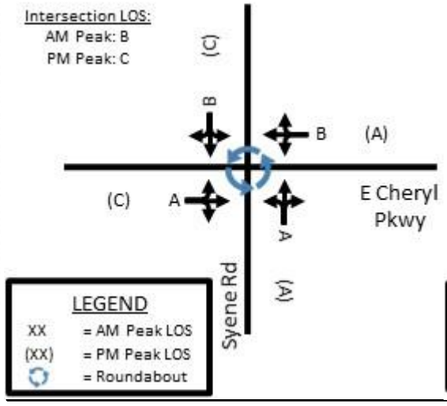
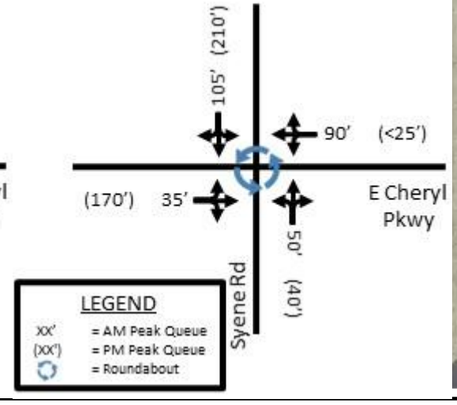


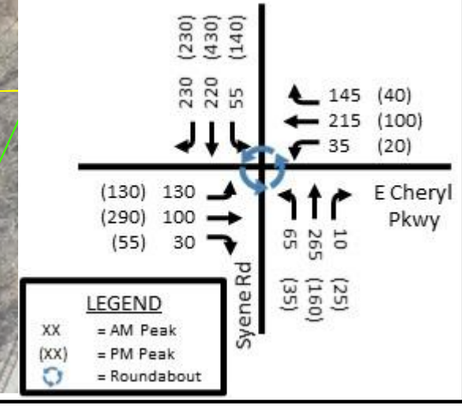
LEVEL OF SERVICE DESIGN YEAR 2045



QUEUE LENGTHS DESIGN YEAR 2045



TURNING MOVEMENTS DESIGN YEAR 2045



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CONCEPT LEVEL ALTERNATIVE

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JUNE 2021

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SHEET NO.

PLOT DATE : 6/18/2021 2:56 PM

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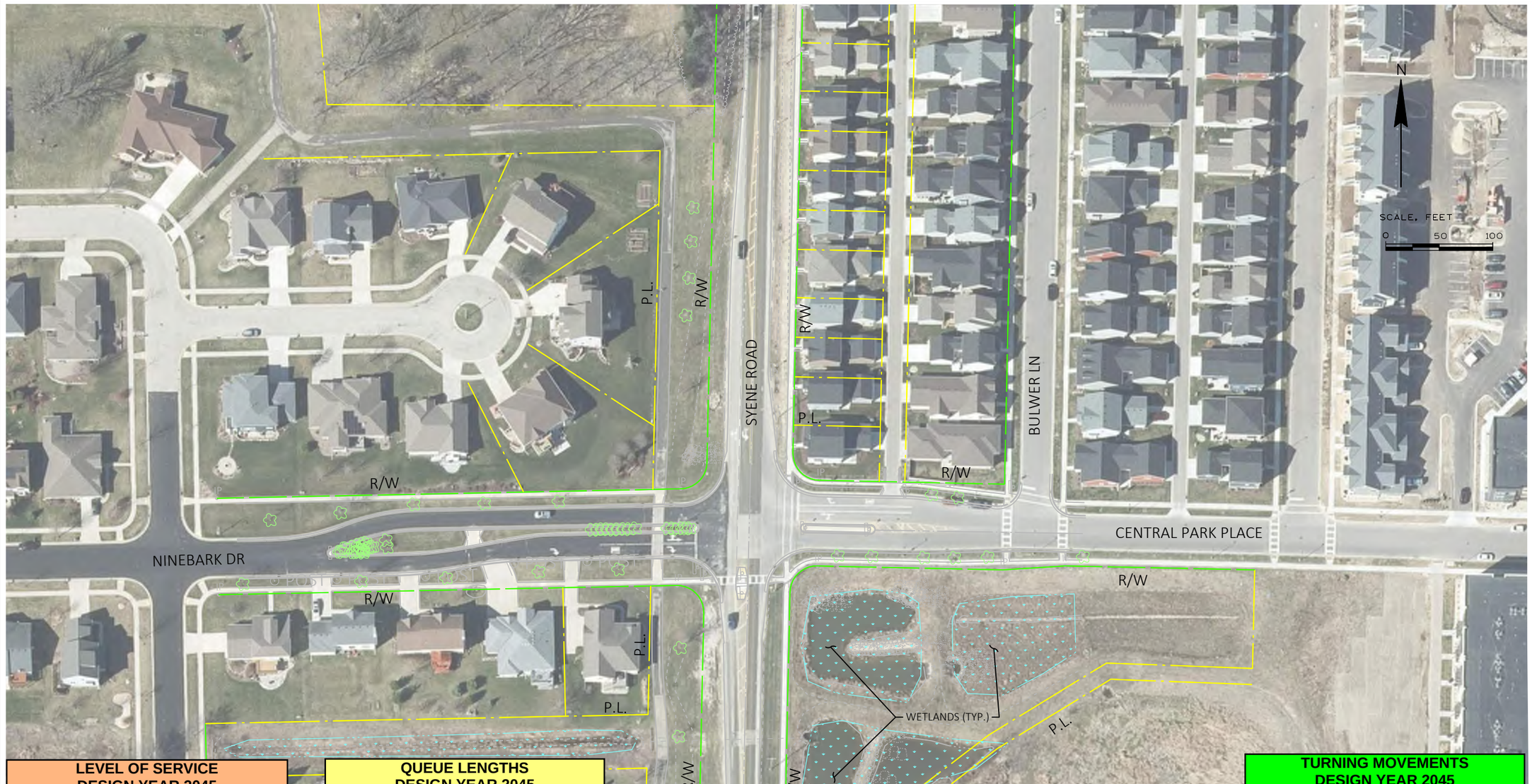
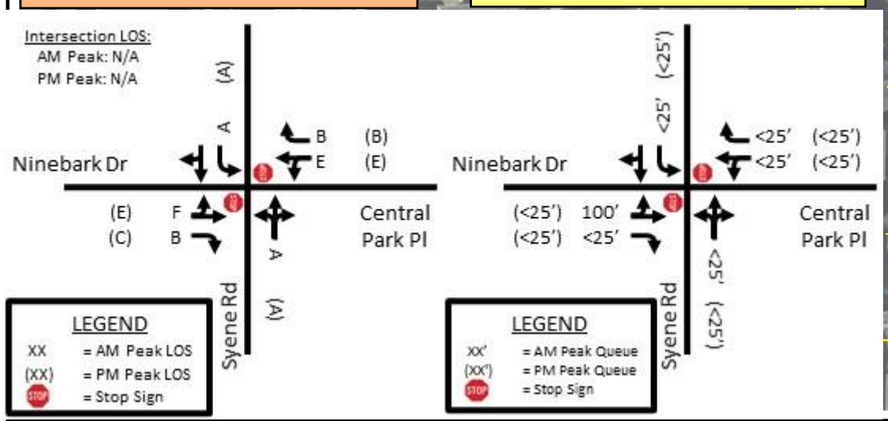
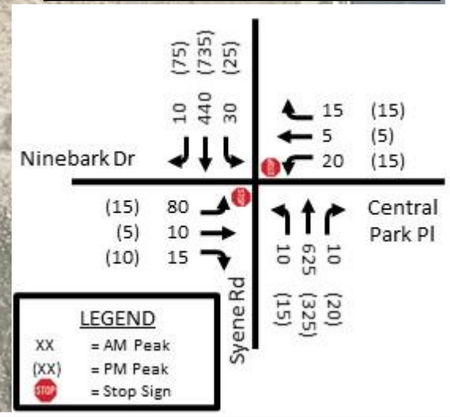


LEVEL OF SERVICE DESIGN YEAR 2045



QUEUE LENGTHS DESIGN YEAR 2045

TURNING MOVEMENTS DESIGN YEAR 2045



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CONCEPT LEVEL ALTERNATIVE

CITY OF FITCHBURG
NINEBARK DR/CENTRAL PARK PLACE INTERSECTION

NO BUILD--STOP ON SIDEROAD

JUNE 2021

Revisions:

SHEET NO.

PLOT DATE : 6/18/2021 2:58 PM

PLOT BY : LANCE WILLISTON

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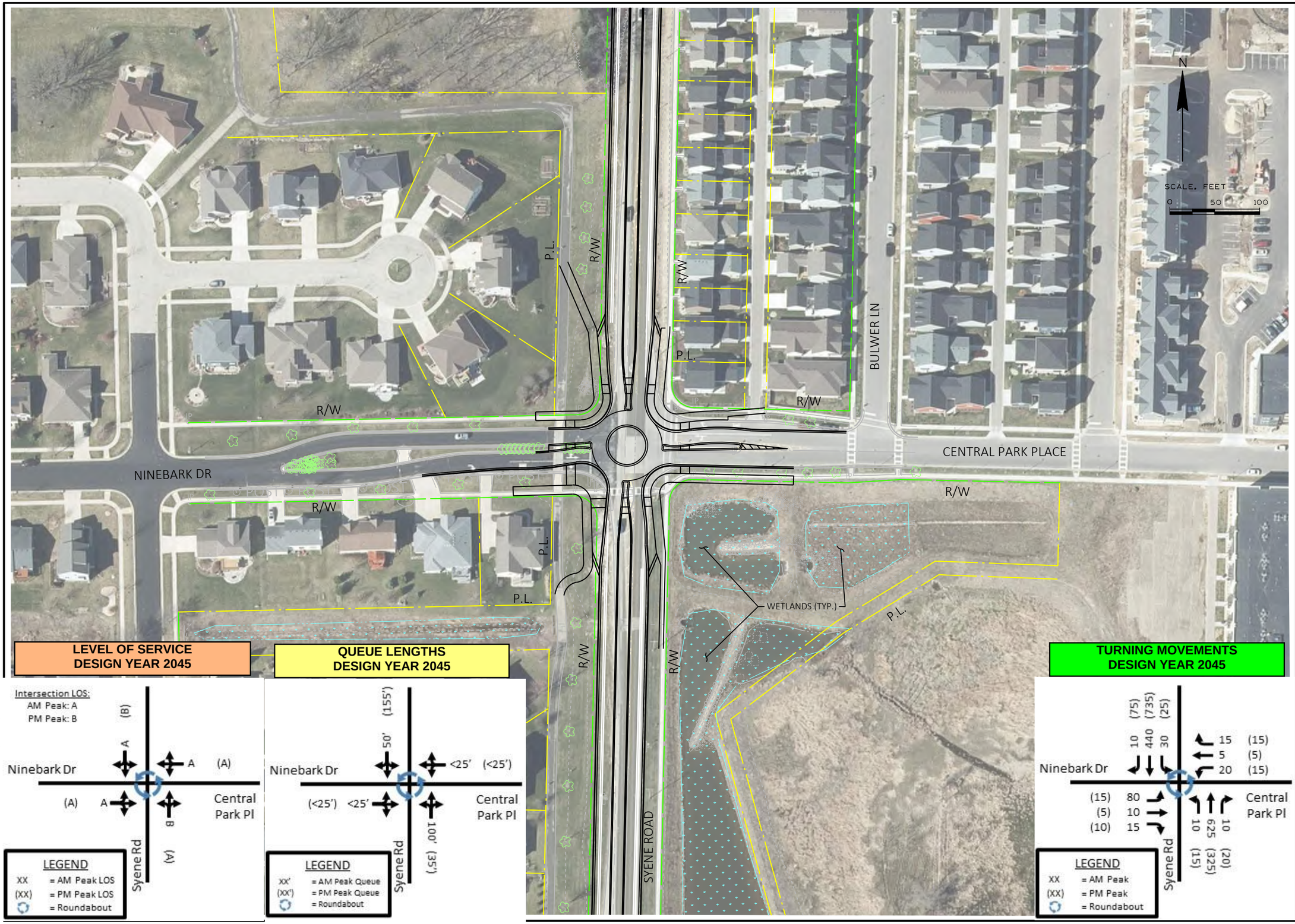

LEVEL OF SERVICE DESIGN YEAR 2045

QUEUE LENGTHS DESIGN YEAR 2045

TURNING MOVEMENTS DESIGN YEAR 2045

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CONCEPT LEVEL ALTERNATIVE

CITY OF FITCHBURG
NINEBARK DR/CENTRAL PARK PLACE INTERSECTION

RAB (MINI)

JUNE 2021

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SHEET NO.

PLOT DATE : 6/18/2021 3:00 PM

PLOT BY : LANCE WILLISTON

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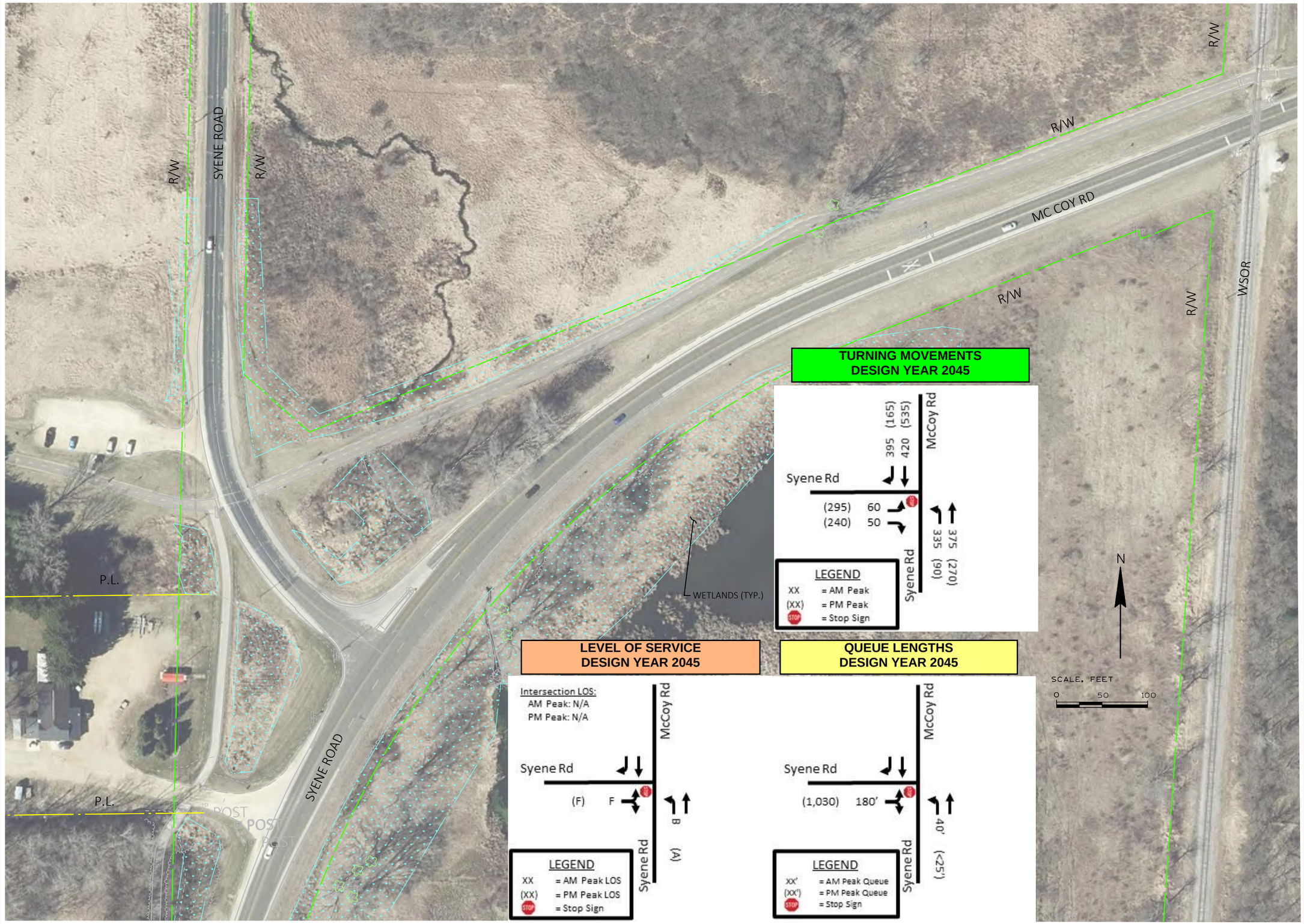

TURNING MOVEMENTS DESIGN YEAR 2045

LEVEL OF SERVICE DESIGN YEAR 2045

QUEUE LENGTHS DESIGN YEAR 2045

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CONCEPT LEVEL ALTERNATIVE

CITY OF FITCHBURG

MC COY RD INTERSECTION

NO BUILD--STOP ON SIDEROAD

JUNE 2021

Revisions:

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PLOT DATE : 6/18/2021 3:02 PM

PLOT BY : LANCE WILLISTON

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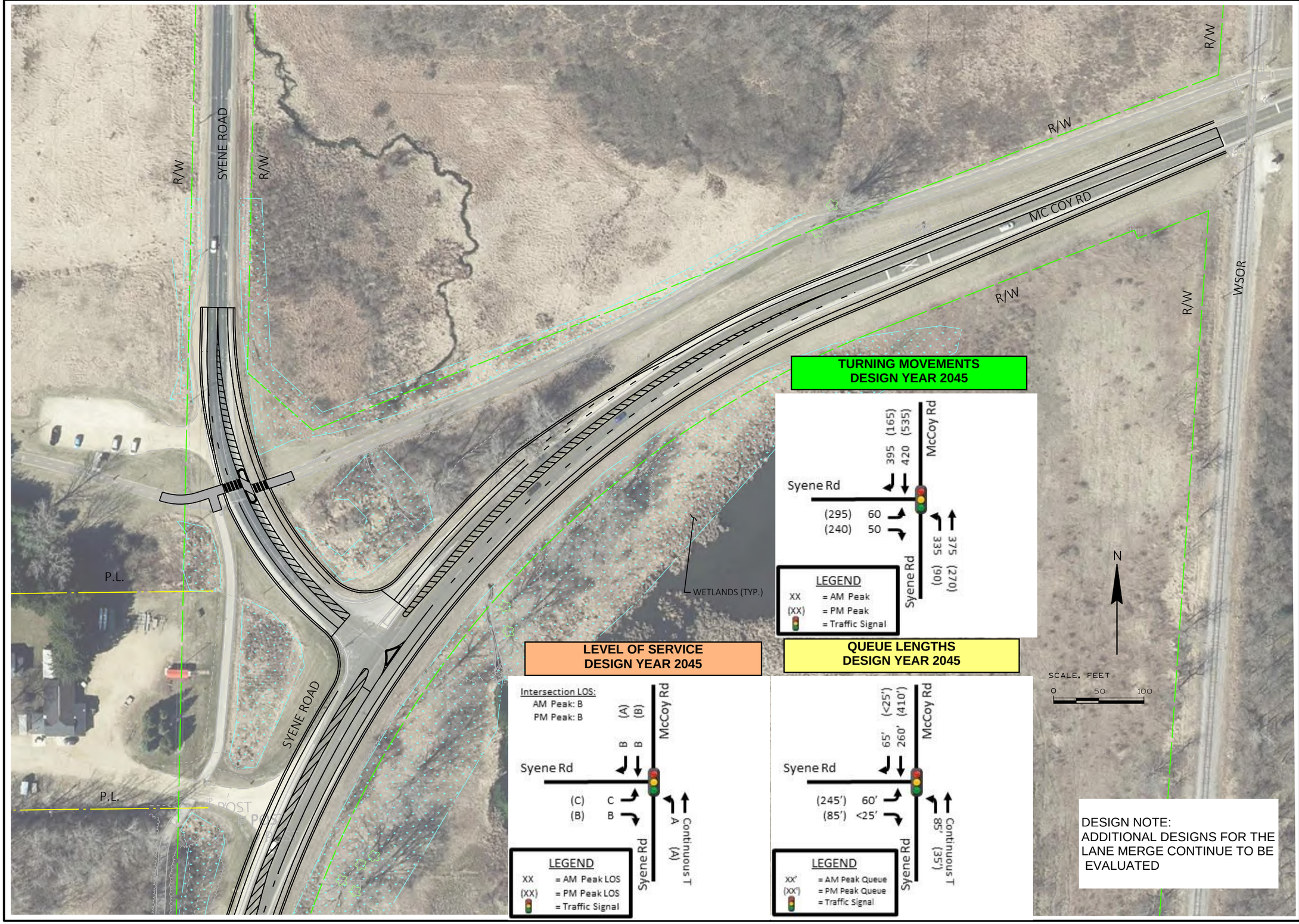

TURNING MOVEMENTS DESIGN YEAR 2045

LEVEL OF SERVICE DESIGN YEAR 2045

QUEUE LENGTHS DESIGN YEAR 2045

DESIGN NOTE:
ADDITIONAL DESIGNS FOR THE LANE MERGE CONTINUE TO BE EVALUATED

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CONCEPT LEVEL ALTERNATIVE

CITY OF FITCHBURG

MC COY RD INTERSECTION

SIGNAL W/BYPASS ("CONTINUOUS T")

JUNE 2021

Revisions:

SHEET NO.

PLOT DATE : 6/18/2021 3:04 PM

PLOT BY : LANCE WILLISTON

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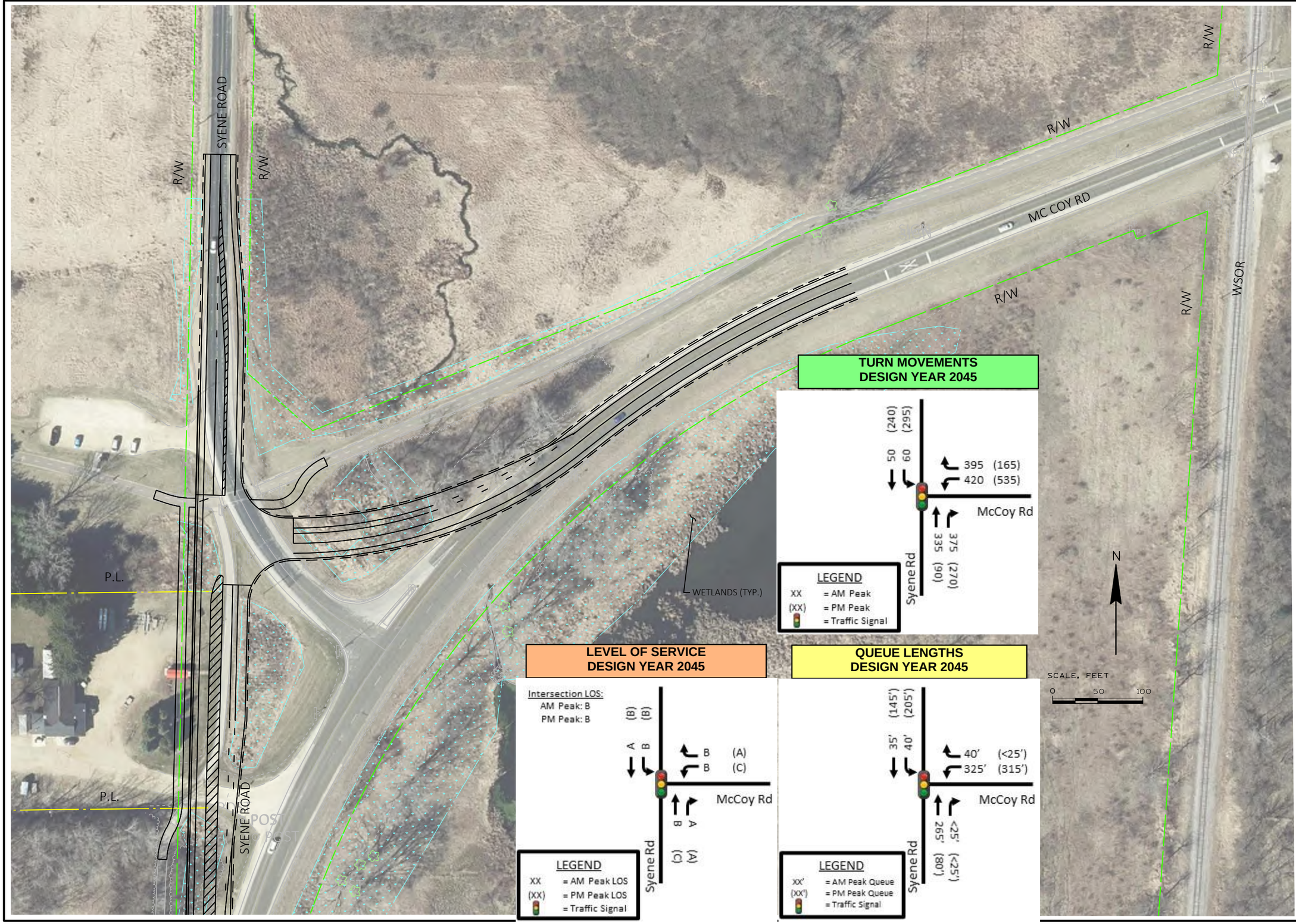

TURN MOVEMENTS DESIGN YEAR 2045

LEVEL OF SERVICE DESIGN YEAR 2045

QUEUE LENGTHS DESIGN YEAR 2045

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CONCEPT LEVEL ALTERNATIVE

CITY OF FITCHBURG

MC COY RD INTERSECTION

RE-ALIGNMENT W/SIGNAL (#1)

JUNE 2021

Revisions:

SHEET NO.

PLOT DATE : 6/18/2021 3:05 PM

PLOT BY : LANCE WILLISTON

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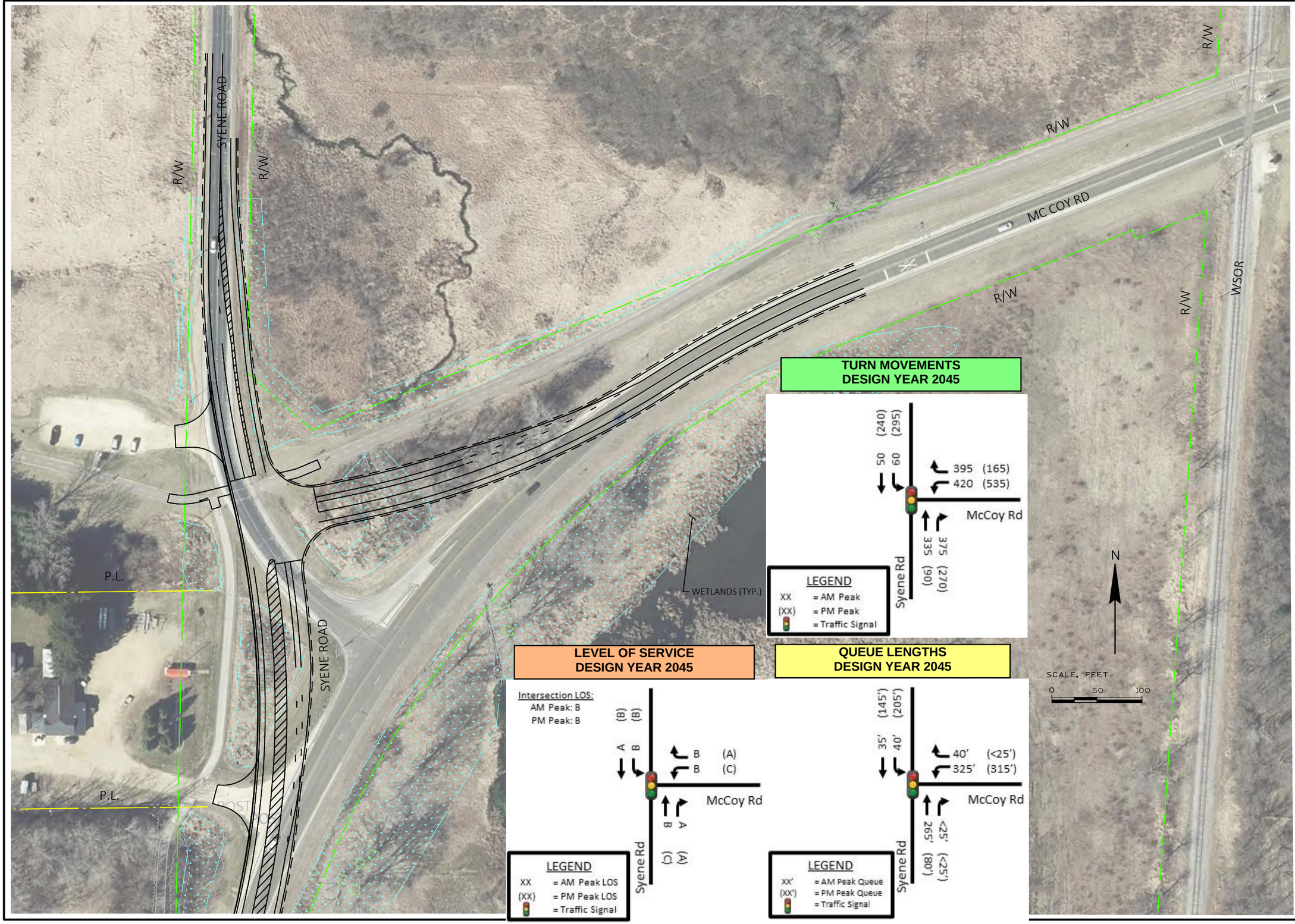

TURN MOVEMENTS DESIGN YEAR 2045

LEVEL OF SERVICE DESIGN YEAR 2045

QUEUE LENGTHS DESIGN YEAR 2045

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CONCEPT LEVEL ALTERNATIVE

CITY OF FITCHBURG

MC COY RD INTERSECTION

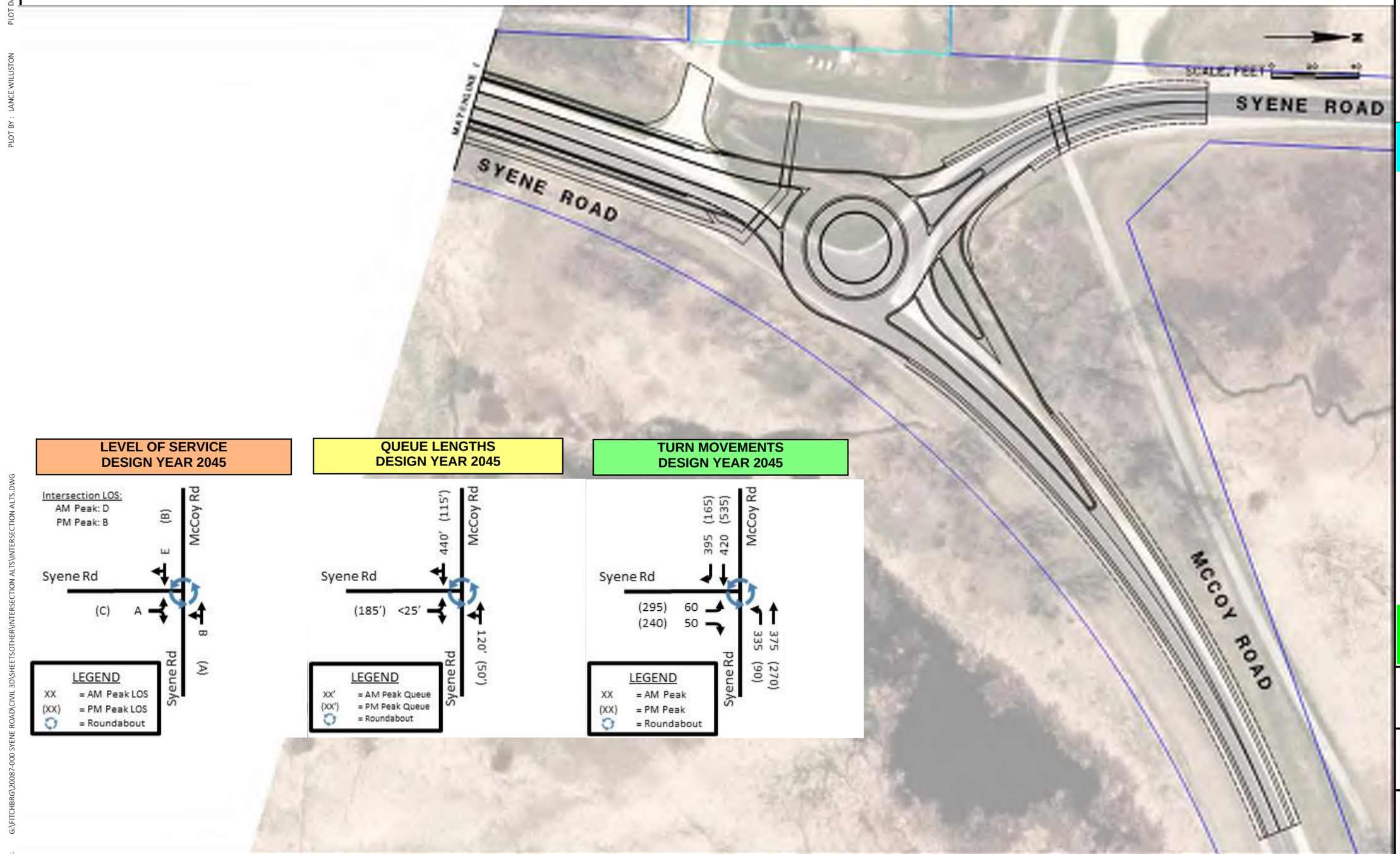
RE-ALIGNMENT W/SIGNAL (#2)

JUNE 2021

Revisions:

SHEET NO.

LAYOUT FROM:
SYENE RD RECONSTRUCTION STUDY
STRAND ASSOCIATES
AUGUST 2019



LEVEL OF SERVICE DESIGN YEAR 2045

Intersection LOS:
AM Peak: D
PM Peak: B

LEGEND
XX = AM Peak LOS
(XX) = PM Peak LOS
= Roundabout

QUEUE LENGTHS DESIGN YEAR 2045

LEGEND
XX' = AM Peak Queue
(XX') = PM Peak Queue
= Roundabout

TURN MOVEMENTS DESIGN YEAR 2045

LEGEND
XX = AM Peak
(XX) = PM Peak
= Roundabout

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CONCEPT LEVEL ALTERNATIVE

CITY OF FITCHBURG

MC COY RD INTERSECTION

RAB
(SINGLE LANE)

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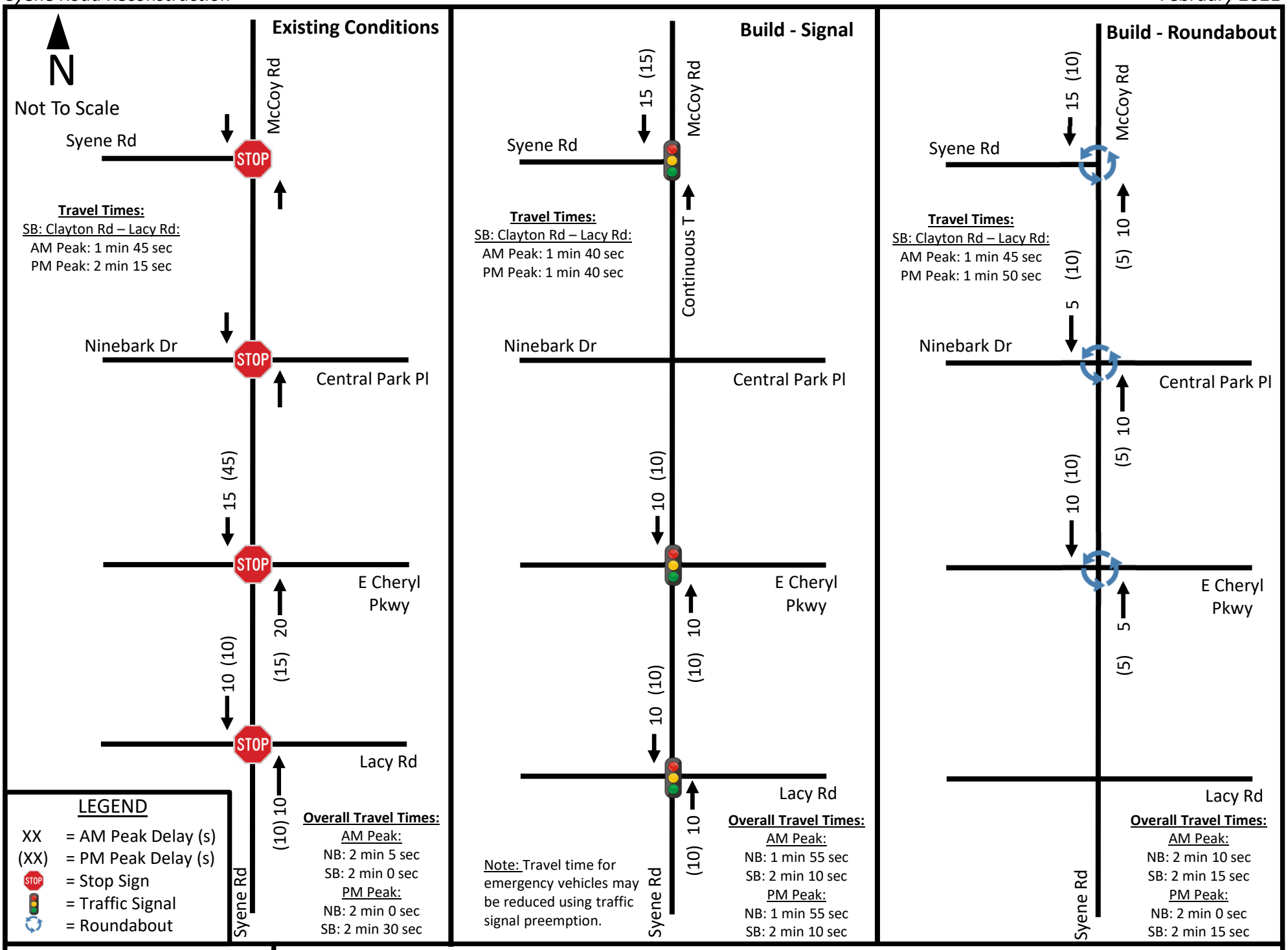
Attachment D: Preliminary Travel Times



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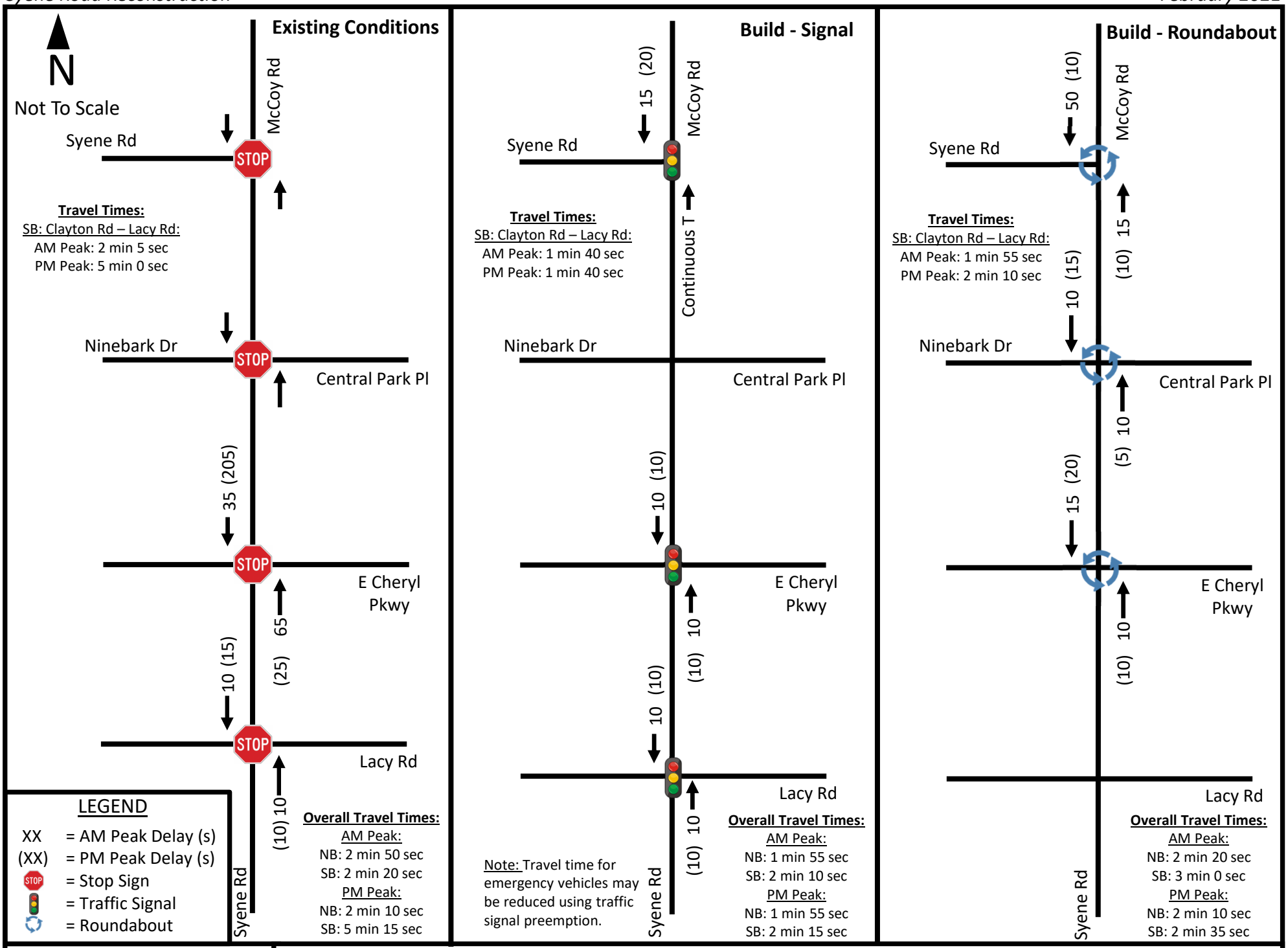
Travel Times - 2019 Build Traffic

PRELIMINARY RESULTS
SUBJECT TO REVIEW AND ADJUSTMENT
FEB 2021



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Travel Times - 2045 Build Traffic

PRELIMINARY RESULTS
SUBJECT TO REVIEW AND ADJUSTMENT
FEB 2021