



Public Works
5520 Lacy Road
Fitchburg, WI 53711-5318
Phone: (608)270-4260
Fax: (608)270-4275
www.fitchburgwi.gov

To: Board of Public Works, Transportation and Transit Commission,
Common Council
CC: Bill Balke, Public Works Director/City Engineer
From: Andrew McFadden, Transportation Engineer
Date: April 26, 2021
Subject: W. Lacy Reconstruction Cross-section Design

This memo documents the background of the W. Lacy Rd Reconstruction project and evolution of its design. It is intended to provide context for Resolution R-61-21 approving a typical cross-section on W. Lacy Rd from Fitchrona Rd to Seminole Hwy.

Background

The Fitchburg Business Park has continued to grow with new business and employment in that region of the City. With the additions of Promega and Sub-Zero in the industrial park along with adjacent residential development, the City introduced several transportation and stormwater projects in 2018 to accommodate the expanding growth in traffic and travel in the region.

Commerce Park Drive was extended to Lacy Road to provide enhanced access to the industrial park. Lacy Road from the Badger State Trail to west of the Commerce Park Drive (Promega Plat area was to be upgraded to modern roadway design standards including curb and gutter, adequate driving lanes and bike lanes, along with terraces, trees, path, and sidewalk.

During the preliminary design related to the new intersection of Commerce Park Drive and Lacy Road, it became clear that the minimum sight distances were not adequate to the east and west. Horizontal and vertical alignment changes were included in the design to reduce these issues. The design speed limit was lowered to 40 mph (posted at 35) to reduce the adjacent grading impacts and provide for the minimum sight distances required for the design speed.

In order to minimize the construction footprint of the roadway, curb and gutter is proposed to reduce the runoff and clear zone requirements needed for the construction of a modern rural cross section. The area needed for modern ditches is reduced from 20 feet to a tree terrace of 7-feet on each side of the road.

In preliminary design, the typical cross section for the road between Seminole Highway and Fitchrona Road was intended to be similar to that of recently reconstructed portion of E. Lacy Road from City Hall to Syene Road.

I:\Public Works\Engineering\Trans\PROJ\2021 Lacy Road Sem_Fitch\Outreach\W. Lacy Staff Report 4-26-21.Docx

- 24-inch curb and gutter
- 10-foot driving lanes
- 2-foot bike buffer
- 4-foot bike lane
- 7-10 foot terraces
- 10-foot shared use path
- Raised and surface level median on a portion of the corridor
- 5-foot sidewalk on one side (additional)

High-level estimates for construction were prepared based on these assumptions to determine TID project plan costs related to the proposed development. The current roadway section does not meet minimum construction standards for a collector road with the current and projected traffic volumes and regional development. Because of the development in this region, roadways are required to be modernized to meet capacity and safety standards. Those costs were inserted into the 2019 CIP and programmed for construction in 2021. Staff began working with the Department of Transportation to obtain a Transportation Economic Assistance (TEA) grant given the amount of new employment being generated by the new development. The grant provides funding for necessary transportation infrastructure to support the new industrial development. The grant was submitted indicating that the preliminary cross section above would be constructed and needed for the new development. One Million dollars in matching funds was awarded to the City of Fitchburg to support the transportation construction related to the new development.

Design Process

The preliminary design, shown in **Figure 1**, was presented to the public on February 17. Staff received considerable feedback at and following the meeting. The majority of concerns from residents have been related to impacts to trees, right-of-way impacts, lack of support for sidewalk or seemingly redundant on-street bike lanes, and project costs. Staff received 20 comments from emails and survey responses and responded to more than 40 follow-up questions after the meeting. Staff asked six residents/business owners to join an ad-hoc advisory group. These members either live/work on the corridor or expressed interest in assisting the design. The group also included Michael Zimmerman and Mayor Aaron Richardson to provide context on the project. This group has met three times (3/31, 4/7, and 4/21).

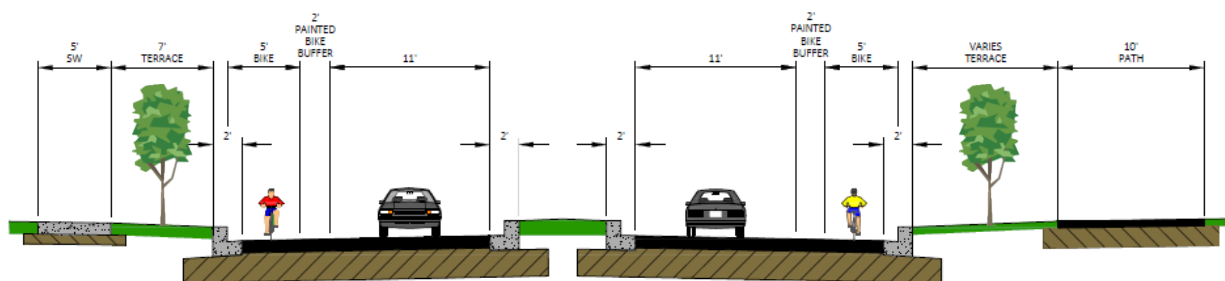


Figure 1: February 17 Cross-Section

At the first advisory group meeting on March 31st, group members indicated they would like to see a revised cross-section alternative without sidewalk, buffered bike lanes, and raised medians (except for short pedestrian refuges islands) and with an expanded path along the hill to accommodate high variability in path users' speed.

This information was relayed to the design consultant as the following:

- Grading for S. Side Sidewalk

- Grading the terrace and future sidewalk area will provide a clear zone for errant vehicles and reduce future regrading if development occurs. This area could be planted with native seed.
- 28' roadway – 26' asphalt surface, 24" Curb and gutter
 - 11' travel lanes and 3' unstriped shoulder area adjacent to both curbs was assumed to provide space for emergency stopped or mail delivery vehicles.
- Spot 75' medians at Rock Ridge Rd., the quarry entrance, and Commerce Park Dr.
- 7' terrace on north side of street
- North side 10' wide shared use path generally, expanding to 12' for approximately 1,900' along the hill centered on Commerce Park Dr.

This alternative was presented and discussed with the advisory group on 4/7. It represents the minimum street width practical for this roadway and reduces the preliminary design cross-section of 67' down to 59'. Two members of the group asked whether a rural cross-section (i.e. ditches instead of curb and gutter) could be considered. With the requirements of 100% runoff infiltration set by the North Stoner Prairie Neighborhood Plan and design standards setting a minimum 16' clear zone for errant vehicles, the rural cross-section is not anticipated to reduce cost or cross-section width. The group asked why the large areas of regrading especially along the hill adjacent to the quarry were necessary. Slopes located below the grade of the roadway require grading to reduce the chance of an errant vehicle rolling over. 4-to-1 slopes are preferred to allow vehicles to recover, but 3-to-1 slopes (called a critical slope) can be used. Slopes above the road grade can be graded up to a 2.5-to-1 slope, as steeper slopes would have erosion issues. The design team is exploring the type and cost of a retaining wall along this stretch to reduce the regrading limits, but have not included that detail in the resolution as its use would be constrained to only 7% of the entire corridor. The group requested the alternatives be compared according to three metrics:

- Cost
- Stormwater runoff generated
- High value trees removed

The City Forester identified high value trees in this corridor as Oak, Shagbark Hickory, and Hackberry. Trees of these species rated above poor to fair condition were included in the high-value tree count. A tree survey was conducted in late March 2021 and recorded 112 trees including 41 high value trees. Unfortunately, the initial tree survey only extended 30' from the existing roadway and missed trees further north of the roadway near the quarry that would be impacted by the proposed construction grading. The design team have requested an amendment to the original tree survey to determine the number of high value trees in this roughly 500' section of the corridor.

Table 1 provides the results of the comparison. Note that the high value tree impact is currently marked unknown until the revised tree survey work is performed. To date, no differential high value tree impacts have been found between the alternatives and the extents of grading along the quarry between the Feb 17 and April 7th alternatives are generally less than 10'.

Table 1: Design Alternative Comparison

	Cost	Runoff (CF)	High Value Trees Removed*	New Trees Planted
February 17 Alternative	\$6.35M	777,100	Unknown	270
April 7 Alternative	\$5.71M	642,400	Unknown	270
Difference	\$640K	135,400	Unknown	0
Percent Difference	9%	17.4%	Unknown	0%

A 9% difference in cost and 17.4% difference in runoff between the alternatives are noted in the table.

Based on comments received and information collected to date, staff recommends that a modified version of the April 7 Alternative be approved for this reconstruction project. The modified version would increase the street width from 28' to 30' in order to accommodate on-street bike facilities (overall typical cross-section width is 61'). The 28' roadway width included in the April 7 design is the narrowest possible while still allowing three vehicles to fit side-by-side in the event of an emergency stopped vehicle. A 30' wide street would provide 5' of painted shoulder for on-street bike lanes and provide greater flexibility for delivery vehicles. For reference, Fitchburg's local streets are typically constructed at 32' widths and WisDOT's [Field Design Manual](#) recommends 32-34' widths for Urban Design Class 2b roads without parking and with 24" curb and gutter.

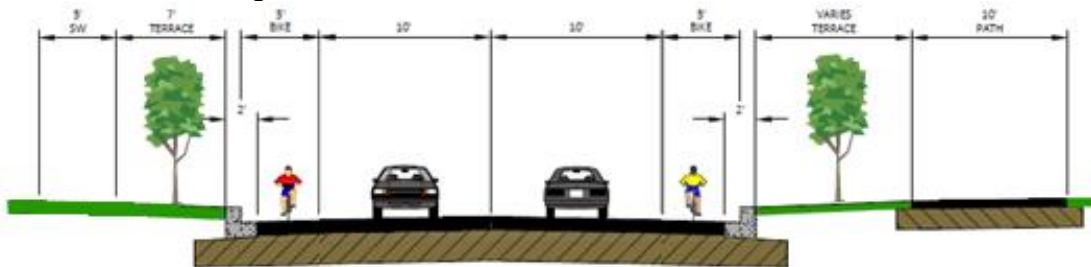


Figure 2: Staff Recommended Cross-Section

Figure 2 provides the revised April 7 alternative that staff is recommending. The 12' path is recommended along the hill centered on Commerce Park Dr. to provide separation between faster and slower path users. Some deviations from the typical cross-section such as short raised medians for pedestrian refuge and turn lanes at major intersections and driveways are planned.

Conclusion

Resolution R-61-21 provides the high-level description that is typical of cross-section resolutions. This corridor, like others, varies considerably in terrain and usage across its length. The staff recommendation is a compromise between the minimum street width option provided to the advisory group on 4/7 and the full cross-section more consistent with E. Lacy shown to the public on February 17. Staff has heard the great questions and feedback from residents and has answered their questions and made changes to the design. Compared to the February 17 design, the staff recommended design:

- removes 2' painted on-street buffers adjacent to the bike lanes
- removes the installation of concrete sidewalk on the south side
- narrows vehicle travel lanes from 11' to 10'
- significantly reduces the length of medians along the corridor
- adds 2' of width to the shared use path along the hill.

The intention of this resolution is to request feedback from the Council on what basic elements should be included in this corridor project. The design then will be further refined for specific areas of the corridor with public assistance and Council approval in the 60% plans and related Transportation Project Plat (TPP). Further details about, cost, runoff generated, retaining wall feasibility, and tree loss will be provided as information is collected and the design is further developed.

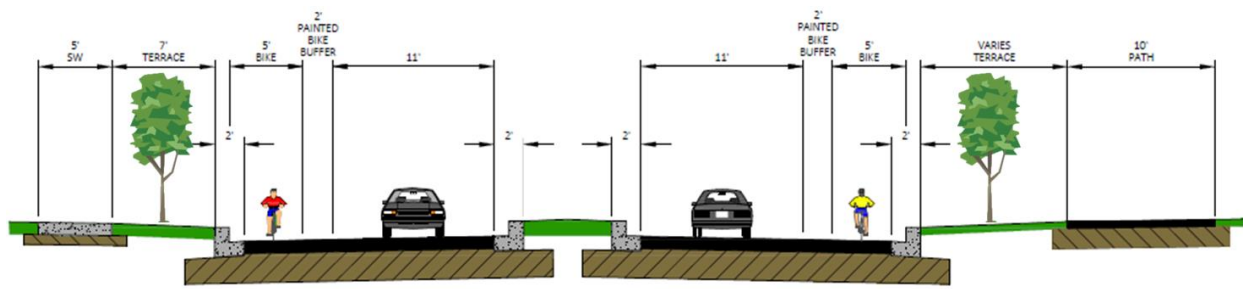
This project is scheduled to be constructed in Summer 2022 after already being delayed one year. After a TPP is approved, a 5-month property negotiation period is needed before

construction bidding can commence. Further delays in the project schedule could increase construction bid pricing and increase the likelihood of construction impacts to adjacent schools during the academic year.

The diagram and text below shows the pros and cons of each cross-sectional element. An exhibit showing the April 7 design and including the April 7 and February 17 grading limits is attached to this memo. **Presentations and summaries of the public meeting and advisory group meetings can be found on the project website -**

<https://www.fitchburgwi.gov/2678/Lacy-Road-Fitchrona-to-Seminole-Hwy>.

Pro and Cons of Cross-section elements



Pros of Terrace

- Buffer between users
- Space for street trees and lighting
- Provides storage for snow
- Can account for grade changes

Cons of Terrace

- Cost of construction
- Cost of maintenance
- Increased cross-section width

Pros of Median

- Channelizes traffic
- Slows some drivers
- Provides pedestrian refuge
- Can account for grade changes

Cons of Median

- Cost – Up to \$575,000
- Increased maintenance
- Some increased runoff
- Requires 20' clear zone
- Increased roadway width

Pros of bike lane

- Separates different users
- On-street bike facilities are consistent with the rest of Lacy
- Flexible space for delivery and road work
- Additional pavement markings may reinforce speed limit

Cons of bike lane

- Cost – Up to \$500,000
- Increased pavement and runoff
- Loss of additional trees

Pros of shared use path

- Provides high comfort facility
- Simple trail connections

Cons of shared use path

- Cost
- Increased pavement and runoff
- Loss of additional trees

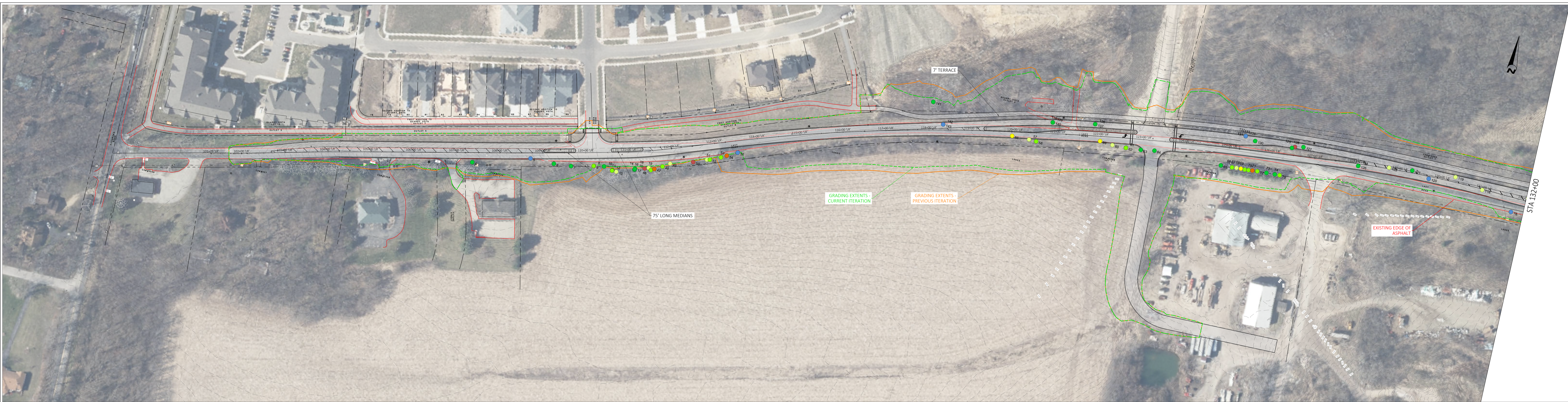
Pros of sidewalk

- Separates different users
- Provides continuity and access to future development south of Lacy

Cons of sidewalk

- Cost – Up to \$150,000
- Unclear snow removal responsibility
- Unclear near-term usage

NOT FOR CONSTRUCTION



TREE SURVEY	
CONDITION	
DEAD	●
POOR	●
FAIR TO POOR	●
FAIR	●
FAIR TO GOOD	●
GOOD TO FAIR	●
GOOD	●
OTHER	●

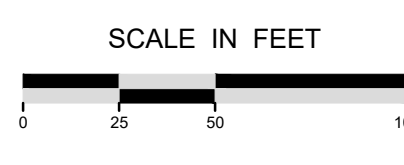


DATE: 4/20/2021

NO.	DATE	BY	REVISION

ISSUE DATE: 4/20/2021
 DESIGN BY: RLM
 DRAWN BY: RLM
 EOR PROJECT NO: 1361

Emmons & Olivier Resources, Inc.
 119 SOUTH MAIN ST
 COTTAGE GROVE, WI 53027
 P 608.833.4222
 F 608.833.4222
 WWW.EORINC.COM



LACY ROAD WEST RECONSTRUCTION
 CITY OF FITCHBURG
 DANE CO, WISCONSIN

OVERALL PLAN