

MEMO

TO: Chris Buchanan, Chairman
Bicycle Pedestrian Advisory Committee
FROM: George Bower
DATE: October 27, 2020
SUBJECT: Old Manchester Road Advisory Shoulder Technical Assessment
CC: Eric Hahn, Director of Public Works, Town of Amherst, NH

As a member of the Town of Amherst Bicycle Pedestrian Advisory Committee, I have prepared, per your request, a technical assessment of the feasibility of installing Advisory Shoulders on the newly resurfaced Old Manchester Road. Based on my review of technical documents and the roadway environment, I believe that the project can be implemented in substantial compliance with the national design guidance provided by the USDOT Federal Highway Administration in ‘**Small Town and Rural Multimodal Networks**’.

Proposal

The Bicycle & Pedestrian Advisory Committee is proposing that the Town of Amherst install Advisory Shoulders on the newly resurfaced Old Manchester Road to support multimodal uses from the intersection of Walnut Hill Road to the eastern intersection with NH Route 101. This proposal is consistent with the Multimodal Master Plan adopted by the Town in 2019.

The Advisory Shoulders on both sides of the roadway would provide for a minimum 12 foot wide bi-directional center travel lane for vehicle use and minimum five (5) foot wide Advisory Shoulders for bicycle and pedestrian use. See attachments for typical layout.

After implementation of the proposed Advisory Shoulders, Old Manchester Road would cease functioning as a standard low volume, two-lane rural road. It would become the functional equivalent of Austin Road, with the advantages of the paved surface with delineated travel lanes for vehicles and multimodal users.

There is no construction cost to this proposed improvement to Old Manchester Road beyond the planned striping other than information signs/markings.

Rationale

1. The Town of Amherst Bicycle & Pedestrian Advisory Committee has received input from numerous residents about the need to develop facilities for safe multimodal travel.
2. The recent resurfacing of Old Manchester Road creates a unique opportunity to implement and test the use of Advisory Shoulders on a local Town road.

3. Old Manchester Road has a very low Average Daily Traffic (ADT) traffic volumes (estimated at < 700 vehicles per day), which consists of local residents and delivery/service vehicles.
4. The road does not serve through traffic.
5. The road has generally good sight distance that is sufficient to support the multimodal user given the predominance of local vehicle trips.
6. The paved surface provides adequate road width to allow a single vehicle to pass pedestrians and bicyclists without leaving the center lane.
7. There are no recorded accidents on Old Manchester Road between vehicles and other roadway users (multimodal traffic).
8. As a local road serving only residential development there is significant pedestrian demand and Old Manchester Road is used as a bypass of RT-101 for east-west bicycle traffic.
9. The posted Speed Limit is 35MPH and generally well observed.
10. There are no areas for on-street parking.
11. The implementation of Advisory Shoulders at this time will serve as a demonstration on a low volume town road, which can be easily reversed when the road is reconstructed in 3-4 years if needed.

Advisory Shoulder-Benefits

1. Provide for the delineation of discrete, but non-exclusive travel paths for multimodal users and a controlled, shared lane for two-way vehicle traffic.
2. The layout of the Advisory Shoulders tend to reduce motor vehicle travel speeds.
3. Increases predictability of multimodal users by clarifying the desired lateral positioning of all users.
4. Functions well within a rural and small town traffic and land use plan by establishing a priority for non-motor vehicle uses.
5. Provides a delineated space on a roadway where the right of way is otherwise too narrow for dedicated side paths.
6. Minimizes potential roadway impacts to visual or natural resources.
7. Provides a dedicated surface for multimodal uses without increasing stormwater discharge, changes to drainage structures or impediments to snow removal.
8. May function as an interim measure where future plans include shoulder widening or the construction of traffic calming features.

Feasibility Assessment

A site locus showing the Old Manchester Road locations and elevation profile can be found in the attachments. The proposed Advisory Shoulders on Old Manchester Road can be constructed in conformance with the national design guidance provided by the USDOT Federal Highway Administration in 'Small Town and Rural Multimodal Networks, FHWA-HEP 17-024, December 2016.

Roadway Environment

1. Horizontal and vertical alignment varies along the 1.55 mile road but these elements do not pose any significant risks to multimodal users due to the low vehicular volumes.
2. Sight distance along Old Manchester Road is typical of a rural local road and at points of constraint, exceeds 250 feet for vehicle drivers. Two segments with restricted sight distance should be mitigated using signage or pavement markings.
3. Surface conditions are excellent as a result of the recent paving.
4. Shoulders vary in width outside of the paved surface but they are suitable for use as a 'refuge' for pedestrians, and in limited areas, bicyclists.
5. A limited number of obstructions consisting of utility poles and mailboxes, situated within 3 feet of the edge of pavement, currently exist and pose a risk of collision for bicyclists if forced off of the pavement.
6. Old Manchester Road serves local traffic and is not a route for bypass or through traffic. The roadway has very low daily and peak hour volume that is distributed across two primary and one minor intersection providing access to RT-101.

Recommendations

Implementation of safe and functional Advisory Shoulders on Old Manchester Road requires the application of a series of design elements that are specific to this roadway environment. My recommendations to the BPAC are as follows.

1. Establish the dimensions of the vehicle lane by using the center point of the pavement as the reference for the minimum 12 ft bi-directional travel lane. The outside of 12 foot vehicle bi-directional lane should be delineated using a white dashed line placed 6 feet to the left of the center point and 6 feet to the right of the center point to establish a consistent width for the length of Old Manchester Road.
2. The Advisory Shoulders on the outside of the center vehicle travel lane should be a minimum of five feet wide. By maintaining the fixed width center travel lane, where the pavement exceeds the standard 22 foot dimension, the Advisory Shoulders will be wider.
3. Signage should be installed at the Walnut Hill Rd intersection and RT-101 intersection entrances to inform vehicle drivers of the presence of the Advisory Shoulders and the use of the sides of the roadway by pedestrians and cyclists.
4. Warning/Information signs should be installed at three points on Old Manchester Road where there are potential vehicle/pedestrian conflicts:
 - a. At the curve near 10 Old Manchester Rd
 - b. At the crest of the hill near 20 Old Manchester Rd
 - c. At the crest of the hill near 60 Old Manchester Rd
5. A preferred alternative to the use of signs is to paint a series of diagrammatic pedestrian symbols on the pavement at 150 foot intervals through the area of travel constraint.
6. The speed limit should be reduced from the posted 35mph to 25mph to minimize vehicle and multimodal user conflicts. The 10 mph reduction in speed increases the travel time across the 1.55 mile length of Old Manchester Road by approximately 63 seconds. The average increase in motor vehicle travel time would be 31.5 seconds.

7. The Town should maintain a program of selective brush trimming to optimize sight distance for all users.
8. Pavement/shoulder edge maintenance should be maintained to minimize bicycle hazards.
9. Shoulder maintenance should be performed to mow/remove growth that would inhibit pedestrians from moving off of the Advisory Shoulders.
10. The BPAC should prepare and distribute information to all residents about the design, function and use of the Advisory Shoulders and solicit feedback about performance.

ATTACHMENTS

- Attachment A: Typical Advisory Shoulder Layouts and Functional Use**
- Attachment B: Multimodal Signs and Pavement Markings**
- Attachment C: Old Manchester Road Site Locus and Elevation Profile**

ATTACHMENT A

TYPICAL ADVISORY SHOULDER LAYOUTS AND FUNCTIONAL USE

Advisory Shoulders, Hanover NH

Valley Street, Hanover, New Hampshire. Installed in 2014, reevaluation study completed in 2016 and in permanent use with additional streets in consideration.

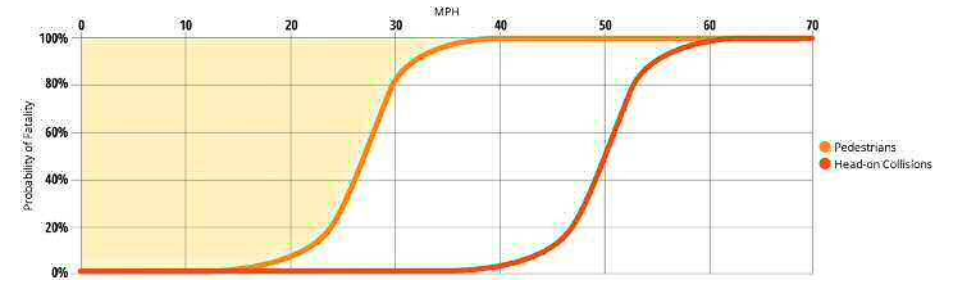
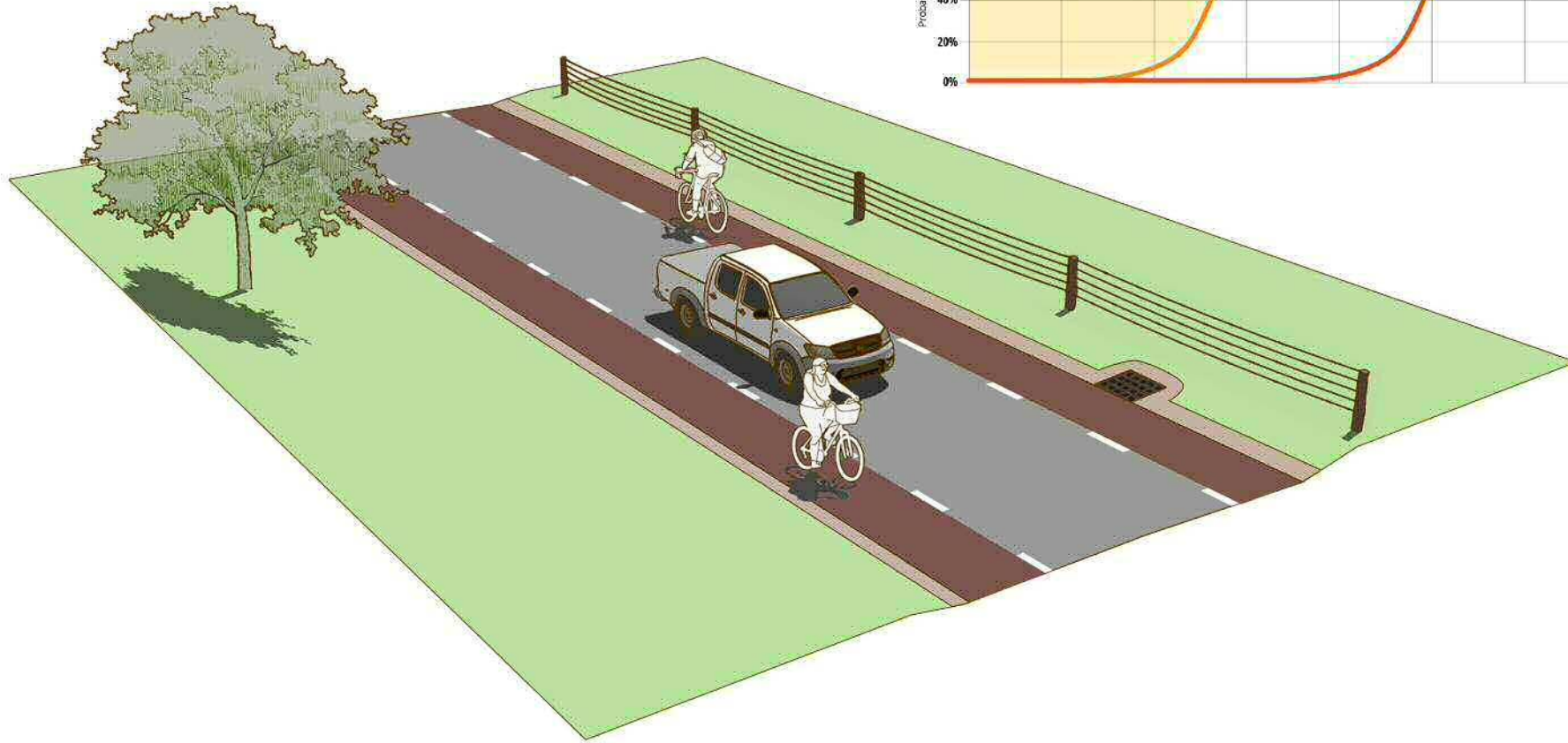


Advisory Shoulders, Hanover NH

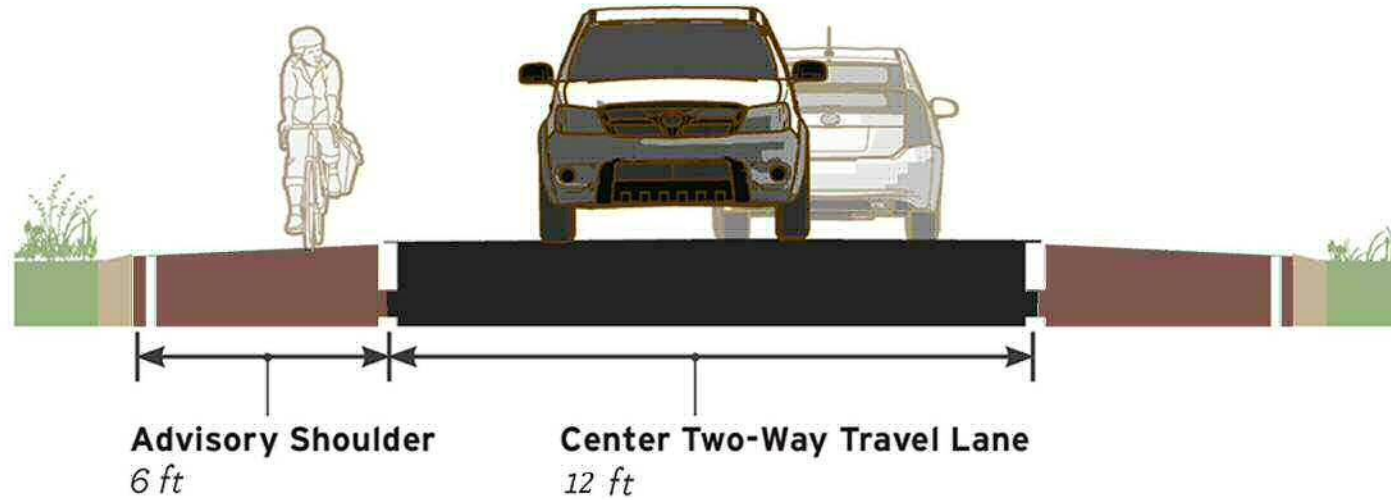
Valley Street, Hanover, New Hampshire. Installed in 2014, reevaluation study completed in 2016 and in permanent use with additional streets in consideration.



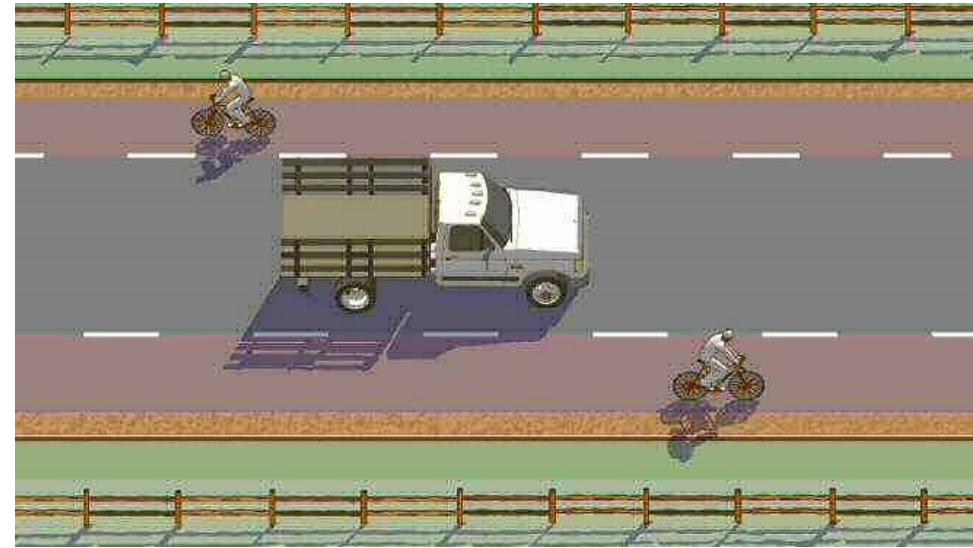
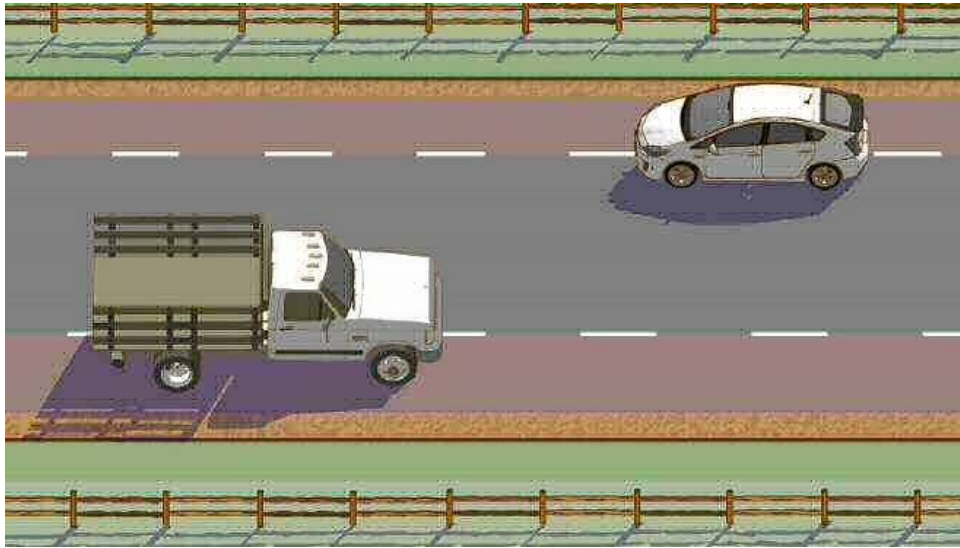
Advisory Shoulders



Advisory Shoulder Footprint Requirements



Advisory Shoulder Usage



ATTACHMENT B

MULTIMODAL SIGNS AND PAVEMENT MARKINGS

Advisory Shoulders Sign

MUTCD Signage currently in approval process

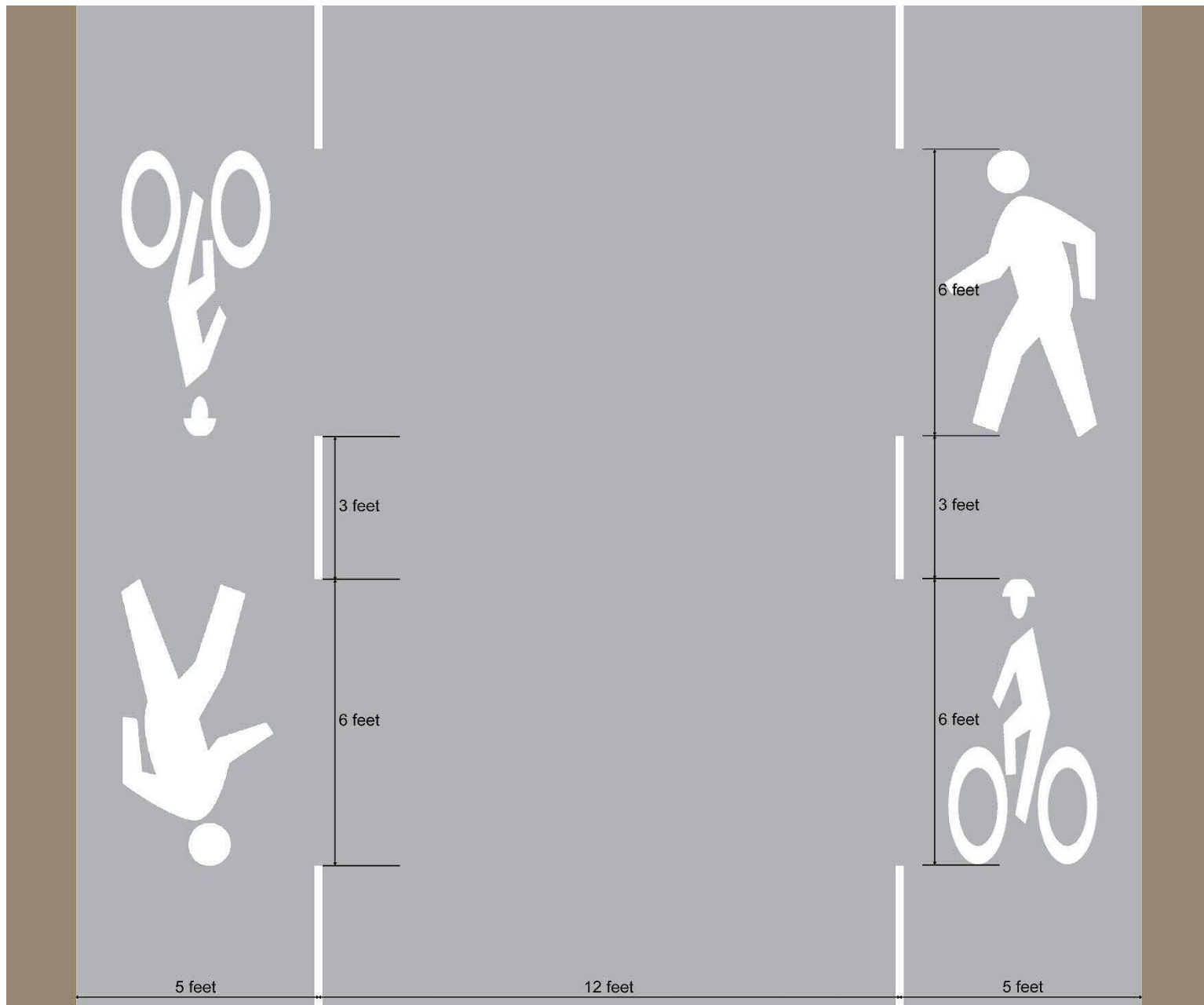


**YIELD TO
BICYCLES AND
PEDESTRIANS**

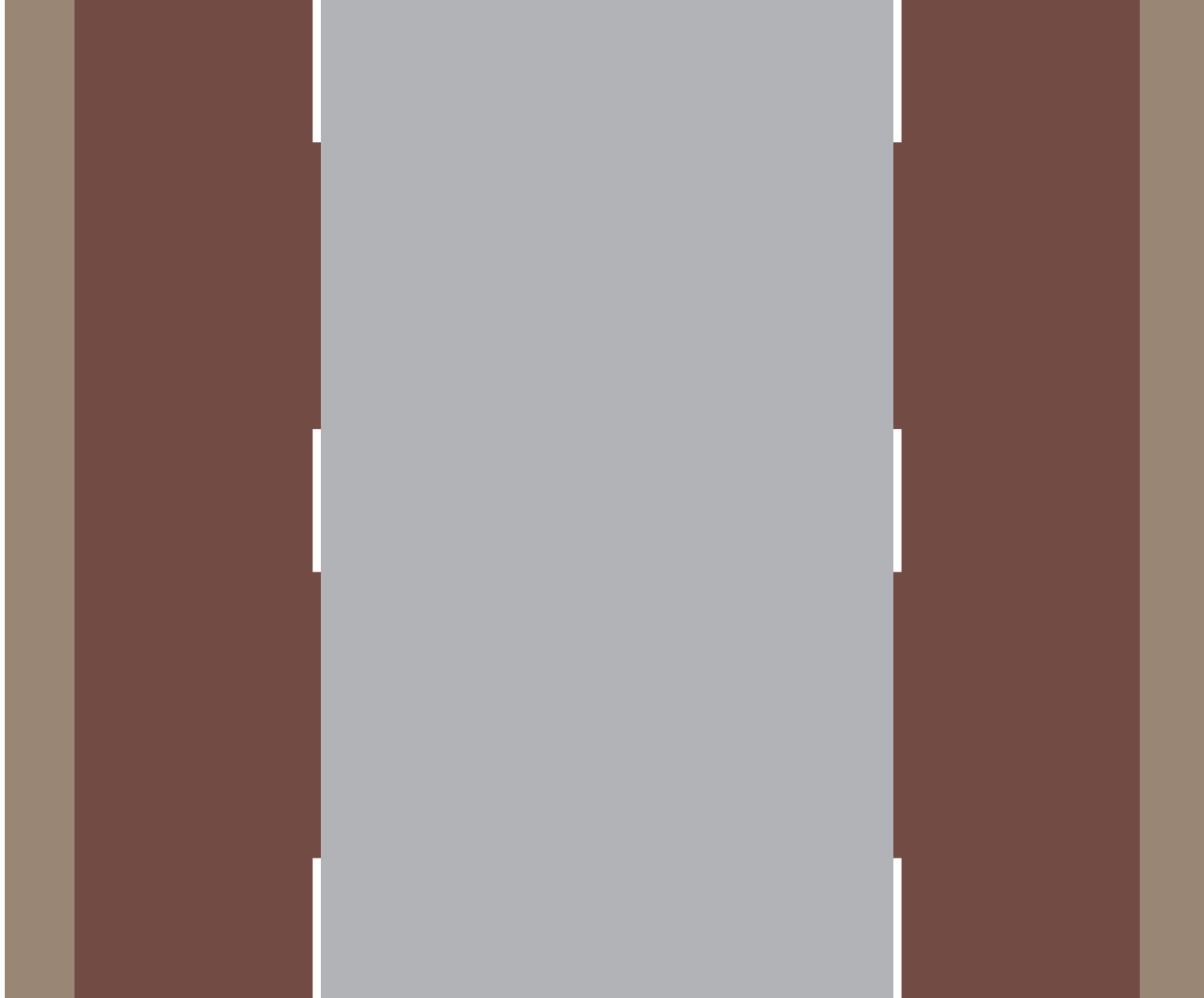


**YIELD TO
BICYCLES AND
PEDESTRIANS**

Advisory Shoulders in a 5'-12'-5' configuration with optional MUTCD "helmeted bicyclist symbol" and "pedestrian symbol"
Only necessary in select locations.

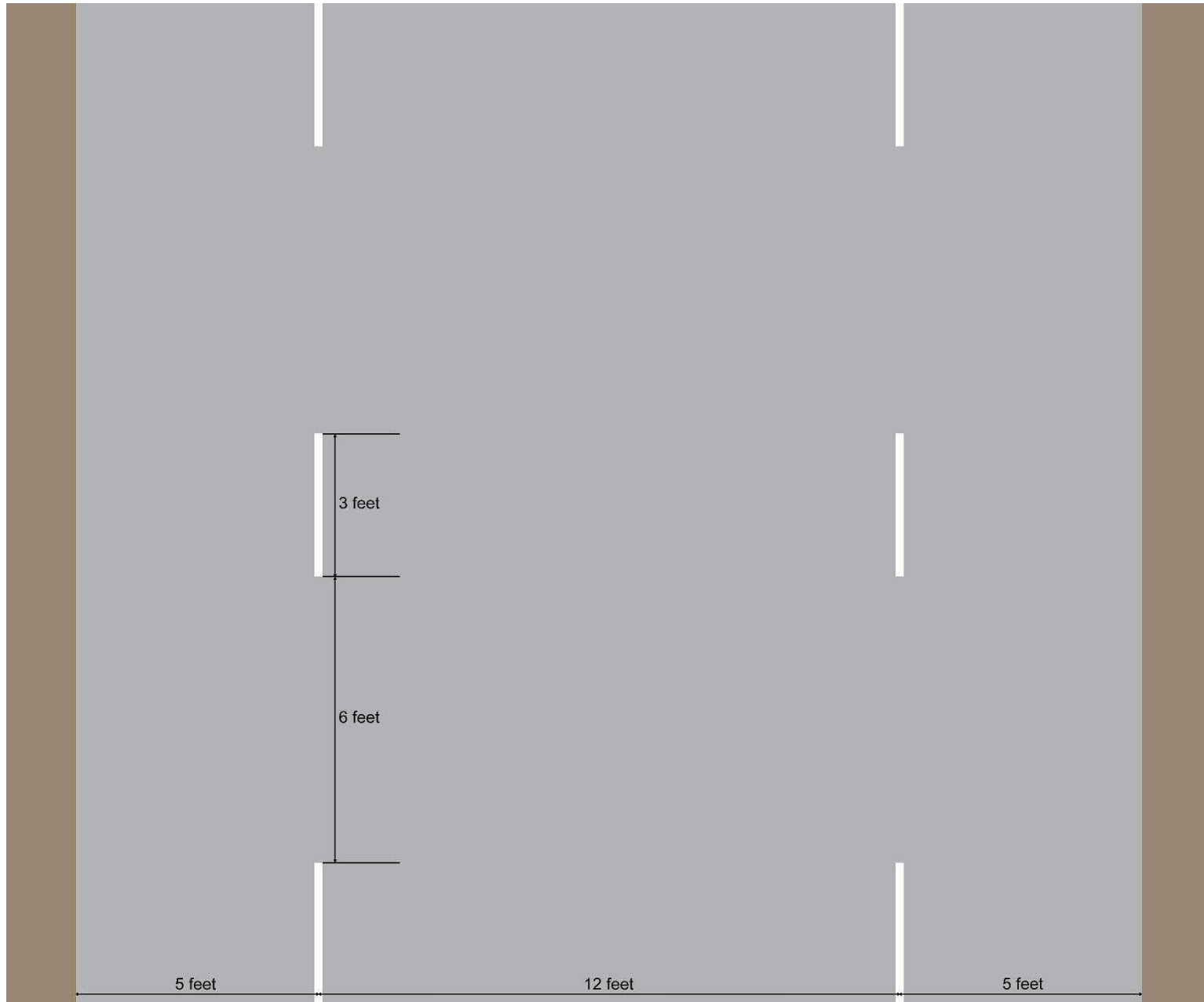


Advisory Shoulders in a 5'-12'-5' configuration with optimal Terra Cotta coloring of advisory lanes
Optimal configuration provided for reference, as coloring not requested for Old Manchester Road



Advisory Shoulders in a 5'-12'-5' configuration with measurements

FHWA MTUCD application of broken line markings is to indicate permissive conditions (MUTCD Sec. 3A.06)



ATTACHMENT C

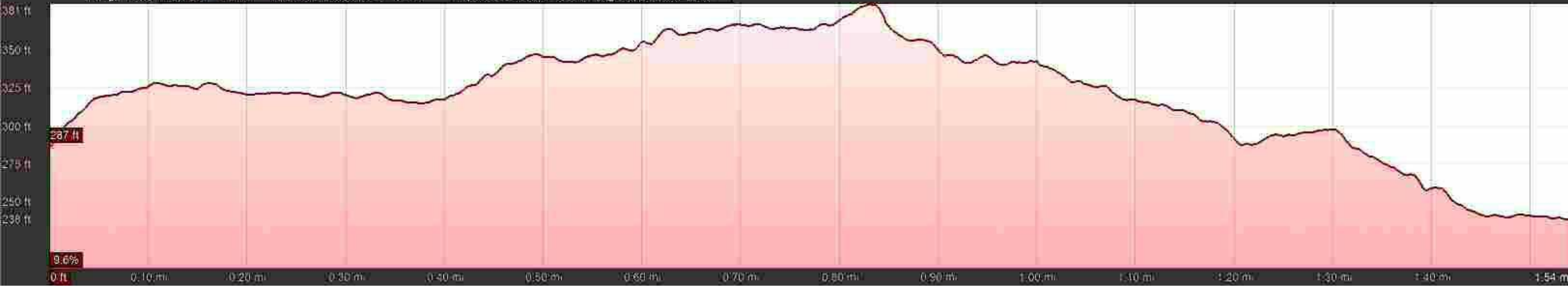
OLD MANCHESTER ROAD SITE LOCUS AND ELEVATION PROFILE

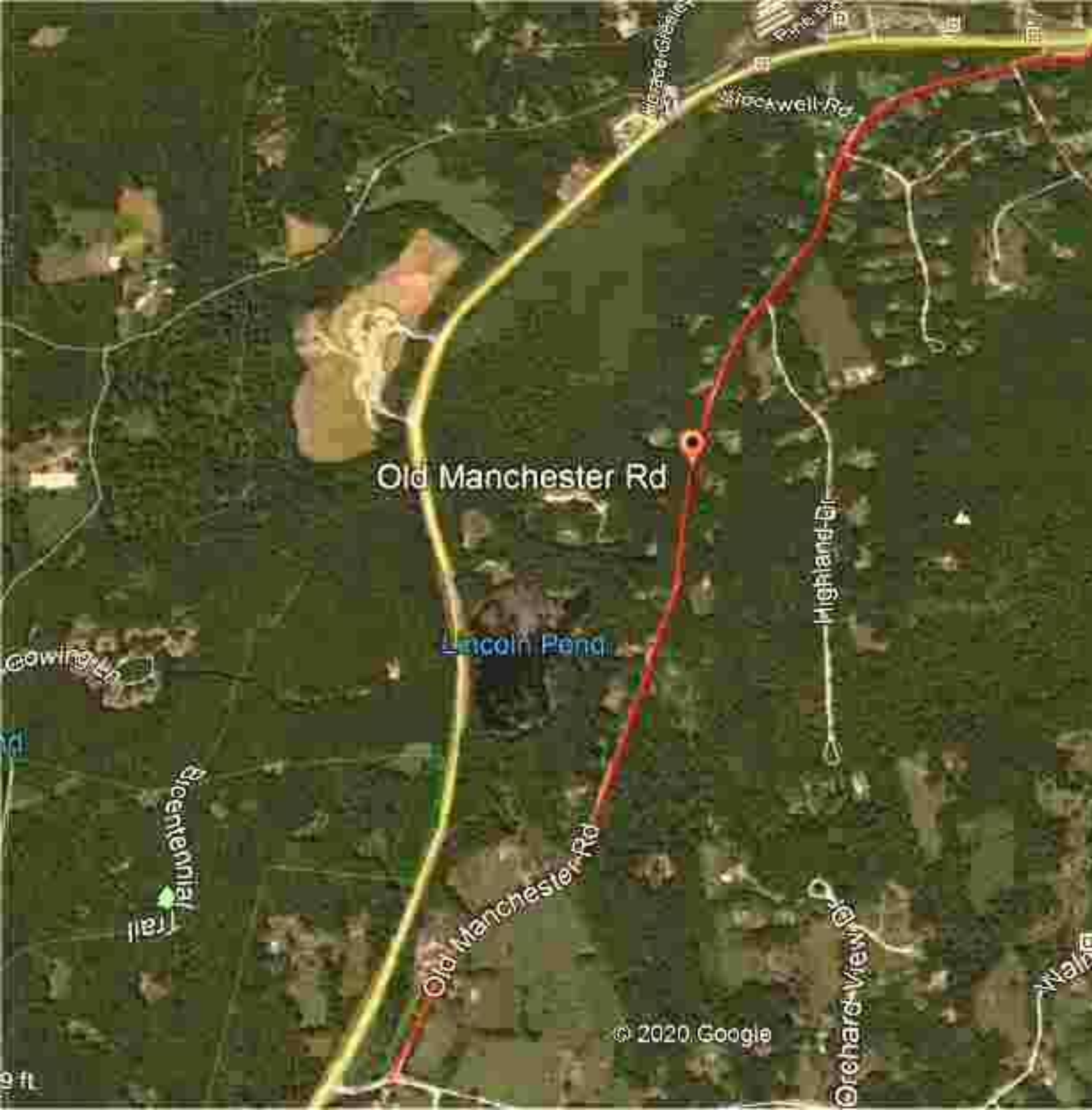
Graph Min Avg Max Elevation 235, 321, 381 ft

Range Totals Distance 1.54 mi

Elev Gain/Loss 106 ft -235 ft

Max Slope 20.6% -25.0% Avg Slope 4.3% -4.8%





Old Manchester Rd

Lincoln Pond

Old Manchester Rd

Highland Dr

Orchard View Dr

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Bicentennial Trail

Cowling Ln

Hickwell Rd

Pine Rd