Route 114 Long-Term Safety Improvements Planning Study,
From Sylvan Street to Avalon Bay Drive
Danvers and Peabody, Massachusetts

Executive Summary

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1. Introduction

The Route 114 Long-Term Safety Improvements Planning Study addresses safety and operational issues along a 1.60 miles segment of Route 114 from Sylvan Street in the City of Peabody to Avalon Bay Drive in the Town of Danvers shown in Figure 1. This study is in response to two fatal crashes between 2019 and 2021 and aims to develop and analyze alternatives for corridor reconfiguration to enhance safety, mobility, and accessibility for all transportation users.

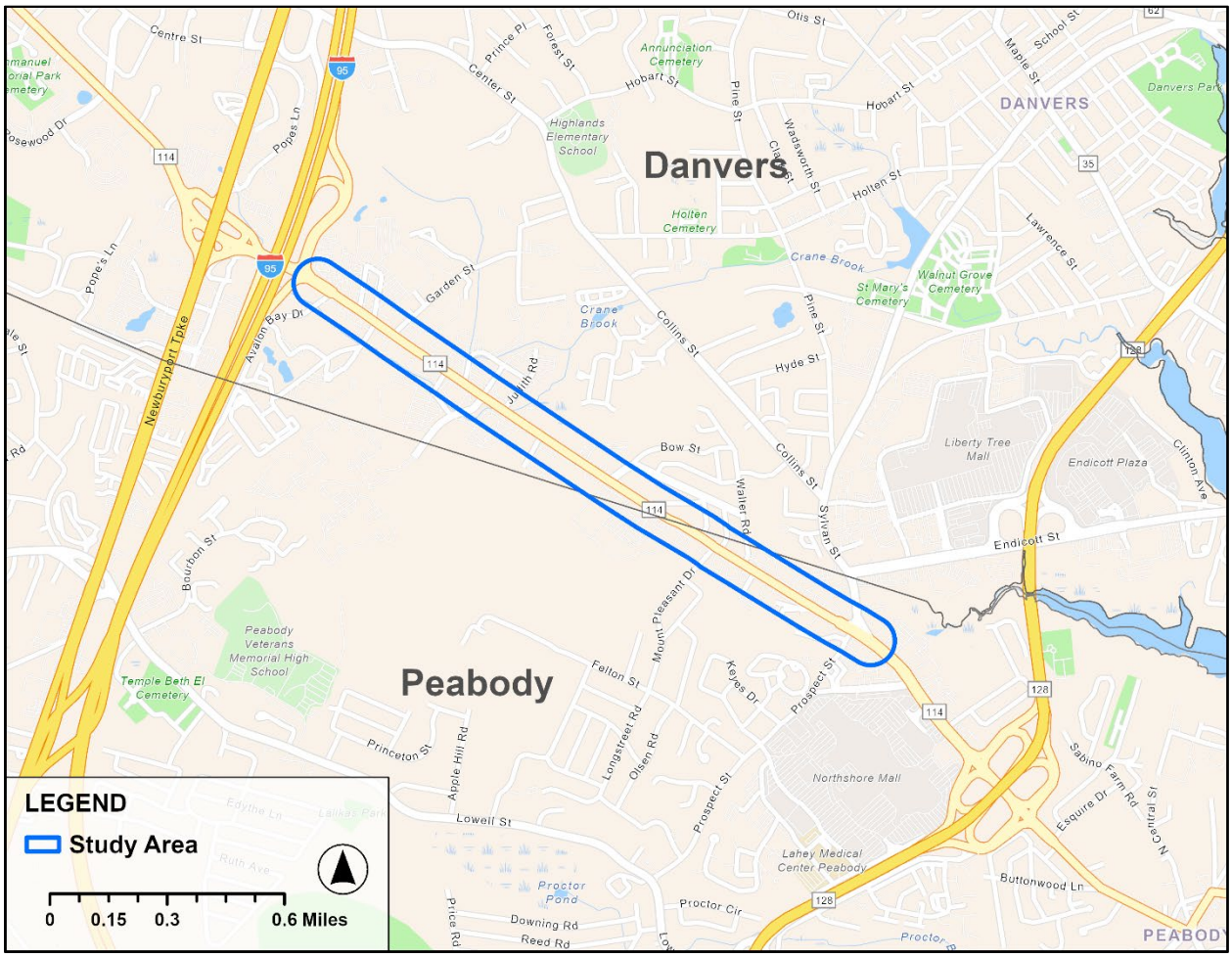

Figure 1. Route 114 Study Area Map

Prior to this study, two Road Safety Audits (RSAs) were completed, which led to short-term improvements implemented by the Massachusetts Department of Transportation (MassDOT). While the RSAs informed early actions, this study specifically focuses on the broader corridor, which includes seven signalized intersections and numerous curb cuts serving local streets, driveways, and a mix of commercial and residential uses.

Improving transportation safety conditions in the study area served as the foundational goal of the study and is supported by several others listed below:

- Improve safety and comfort for all transportation users in the corridor.
- Provide mobility and accessibility for all transportation users.
- Promote economic development and improved quality of life.
- Provide cost effective improvements.
- Avoid or minimize impacts on environmental and other natural resources.
- Support local, regional, and statewide policies.

A series of four key stakeholder and public meetings were held to ensure comprehensive input and build support for long-term safety improvements. Several government officials were critical to the development of the study, including representatives from the City of Peabody and the Town of Danvers, Representatives Tom Walsh and Sally Kerans' Offices, and Senator Joan Lovely. Feedback from residents and local business owners and operators was also integral to shaping the study.

2. Existing Conditions and Challenges

The study area is characterized by mixed-use, residential, and regional business zoning, with at least four proposed developments that could impact traffic and land use. The presence of wetlands, rivers (especially Crane Brook), and floodways and floodplains will require careful consideration of best management practices as well as environmental regulations and their associated permitting processes. Narrow sidewalks, frequent curb cuts, and few crossing opportunities limit pedestrian and bicyclist access and safety. The existing roadway cross section is shown in Figure 2.

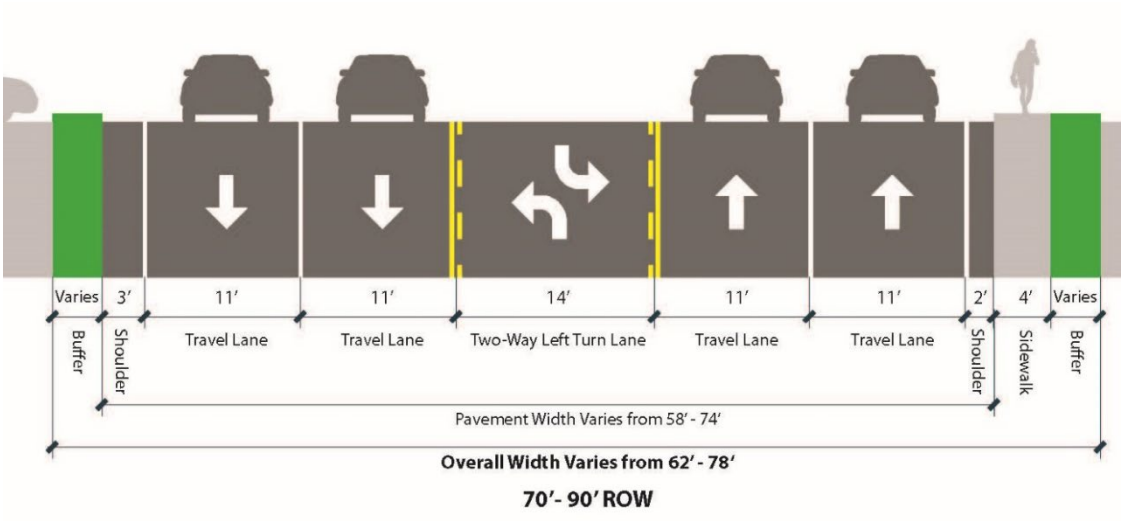

Figure 2. Existing Conditions Typical Section

Figure 3. Narrow sidewalks without buffer from travel lanes on the north side of Route 114

Figure 4. Sidewalk obstruction

3. Alternatives Development

Two primary alternatives were developed to meet the study goals based on the issues and opportunities identified from public meeting and business outreach meeting feedback. This feedback included, but was not limited to, an emphasis on speed enforcement and safety, continued support for signalized breaks, and the proposed introduction of roundabouts, medians, and crosswalks to reduce speed and improve safety. Alternative 1 ($22.38 million) is estimated to cost approximately 7.3% more than Alternative 2 ($20.8 million). The higher estimated cost of Alternative 1 is due to the need for additional excavation, roadway widening, and roundabout construction.

Alternative 1 proposes the replacement of the center left-turn lane with a 6-foot-wide mulch median with roundabouts at key intersections (Avalon Bay Drive, Garden Street, and Palmer Avenue), enhancing pedestrian and bicycle infrastructure with a 10-foot-wide shared-use path with five-foot-wide landscape buffer and 6-foot-wide sidewalks. The proposed Alternative 1 roadway cross section is shown in Figure 5.

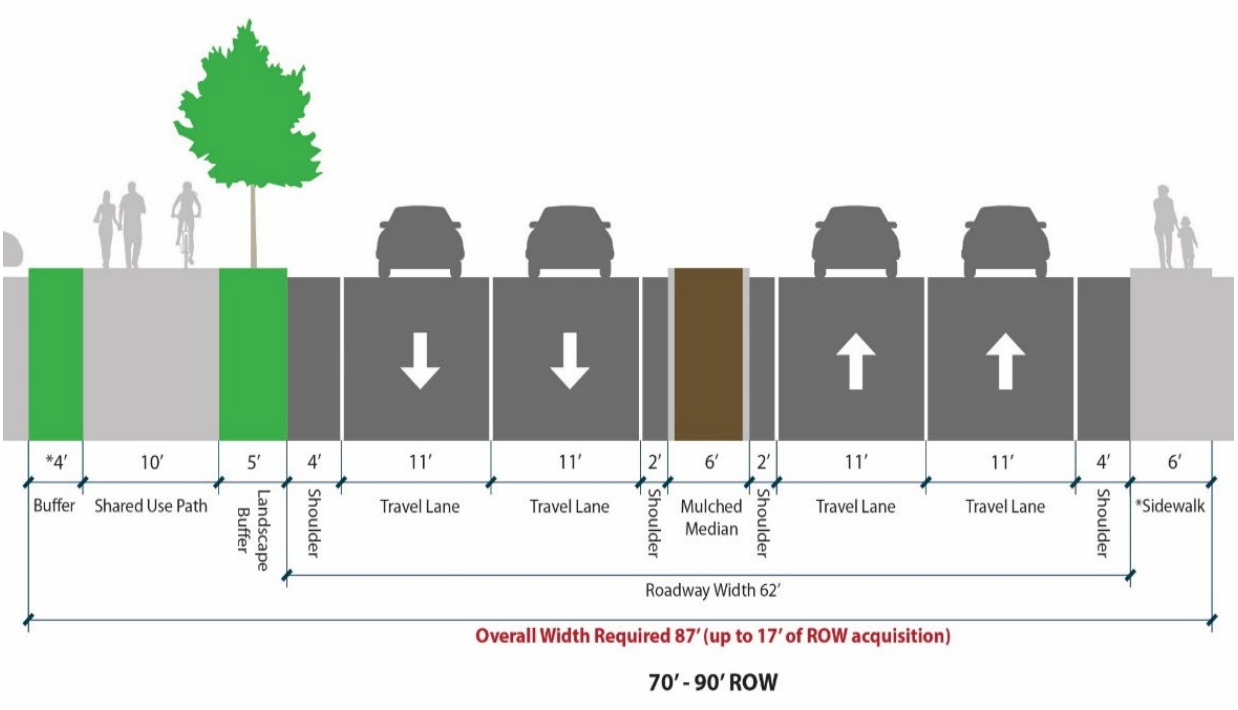

Figure 5. Proposed Alternative 1 Cross Section

Alternative 2 proposes the replacement of the center left-turn lane with a 2-foot-wide concrete barrier with two-foot-wide shoulders on each side. It includes the continued use of signalized intersections with the installation of strategically located loons for U-turns, and an eight-foot-wide shared-use path with a two-foot-wide buffer and a six-foot-wide sidewalk. The proposed Alternative 2 roadway cross section is shown in Figure 6.

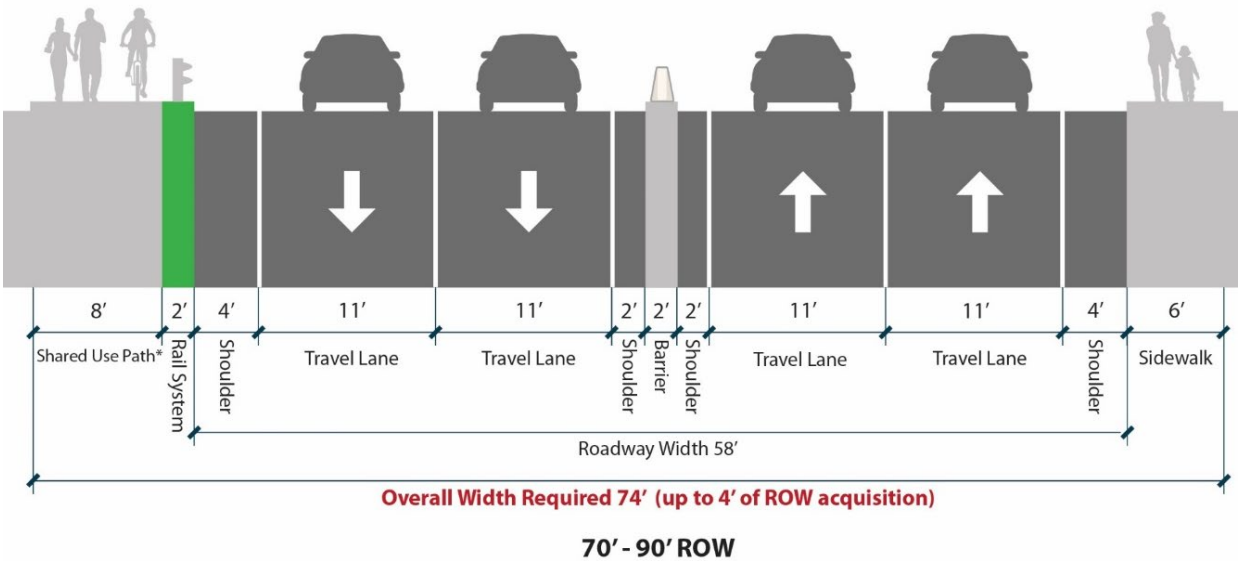

Figure 6. Proposed Alternative 2 Cross Section

3.1 Changes in Circulation Patterns

Both Alternatives maintain the existing horizontal and vertical alignment and replace the two-way left-turn lane in the center of the roadway. The two-way turn-lane would be replaced with either a median (Alternative 1) or a barrier (Alternative 2) to control left-turn movements along the corridor, while also enhancing pedestrian and bicyclist infrastructure.

To accommodate traffic that can no longer make direct left turns due to the proposed median and intersections, alternative routes will be required. Vehicles would instead use the proposed roundabouts, signalized intersections, or designated U-turn locations to complete their movements safely and efficiently. . Both alternatives also include enhancements to pedestrian and bicyclist infrastructure, such as shared-use paths, sidewalks, safe pedestrian and bicyclist crossing treatments, and improved multimodal accommodations. Figure 7 and Figure 8 demonstrate the comparison of access changes proposed under each alternative in the segment of Route 114 between Avalon Bay Drive and Garden Street.

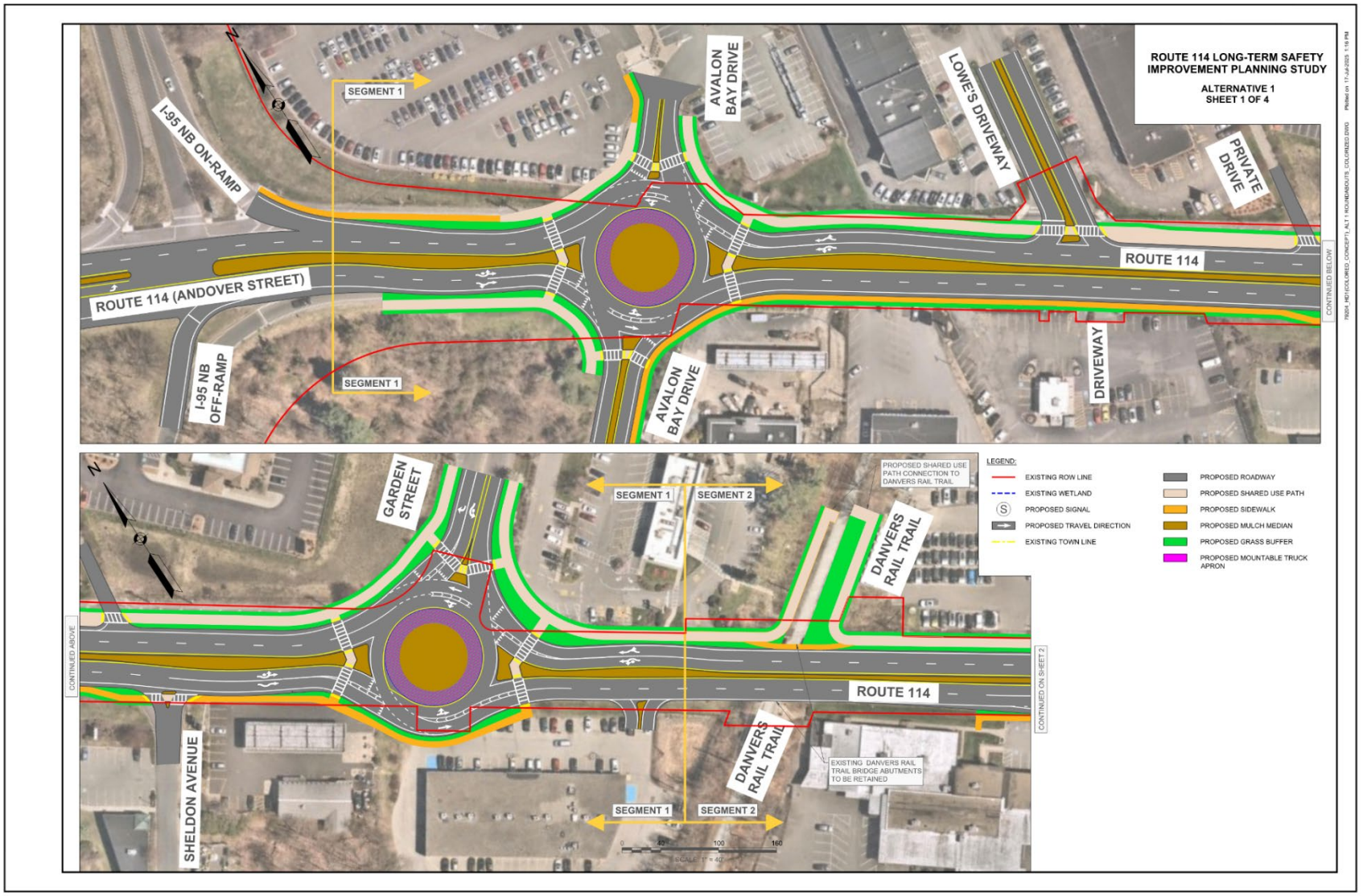

Figure 7. Avalon Bay Drive to Garden Street with Roundabouts provided to facilitate U-Turns in Alternative 1

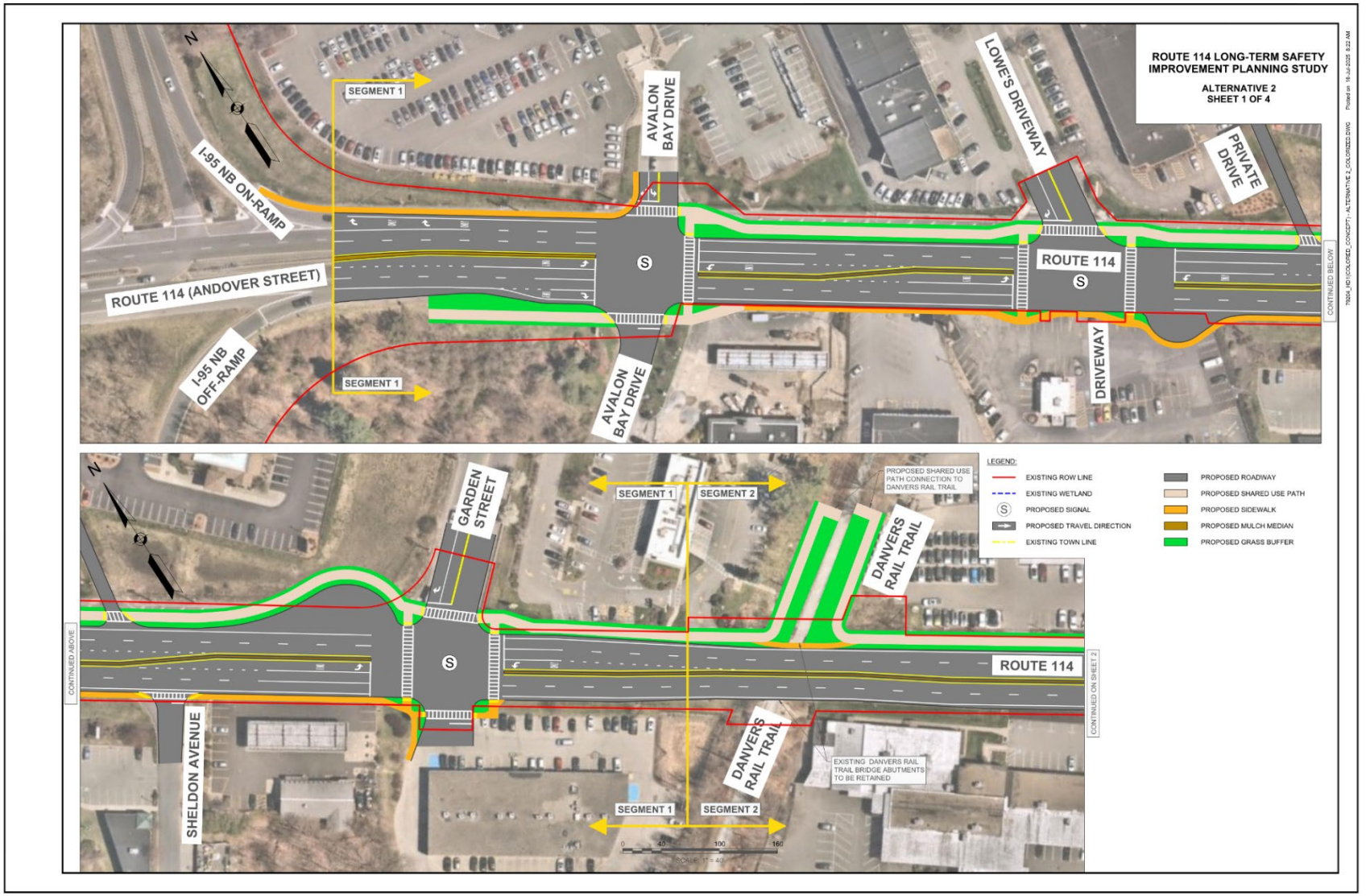

Figure 8. Avalon Bay Drive to Garden Street with designated U-Turn aprons for large vehicles in Alternative 2

4. Findings

The alternative analysis findings as they related to the overall study goals and objectives are described below.

Goal #1: Improve safety and comfort for all transportation users

- The removal of the two-way left-turn lane and addition of the median or barrier within the study area would prevent dangerous, mid-block crossings and U-turns, improving safety conditions for all road users.
- Persons over the age of 65, populations with disabilities, and mobility device users would experience more comfortable pedestrian conditions because of the wider sidewalk and shared-use path, greater separation from vehicles, and additional crossing opportunities at new high-visibility crosswalks, resulting in shorter, safer travel distances.
- For persons over the age of 65 and persons with disabilities, the addition of high-visibility crosswalks and/or roundabouts accompanied by pedestrian crossing refuges provide a safer and more comfortable crossing experience. These improvements enable residents to safely cross busy intersections to access various businesses and recreational destinations along the corridor.
- The addition of roundabouts in Alternative 1 would greatly increase vehicle safety at those intersections, while providing acceptable traffic operations.

Goal #2: Provide mobility and accessibility for all transportation users

- Both Alternatives would provide new ADA accessible pedestrian facilities and improved multimodal access to key neighborhood destinations along Route 114 for residents of the community.

Goal #3: Promote economic development and improved quality of life

- The wider sidewalks and new shared-use path with a protective buffer would enable bicyclist and pedestrian connectivity on both sides of the corridor for the entirety of the three segments. This would increase mobility opportunities and foster community cohesion through increased bicycle and pedestrian navigability of the area. EJ populations and populations without vehicles would experience enhanced multimodal connectivity along the corridor resulting from the safe and protected connections to employment opportunities, housing developments, businesses, and recreational destinations.
- Mid-block crossings with a PHB would facilitate additional connectivity for residents of proximate neighborhoods to access community services and businesses on the opposite side of the corridor without needing to walk or bicycle extensive distances. The

minimization of travel distance and time, and improvement of safety and connectivity at this crossing, would benefit residents without vehicles as well as residents with mobility disabilities.

Goal #4: Provide cost-effective improvements

- Both Alternatives would offer improved safety for drivers and pedestrians alike while minimizing roadway widening and land taking. Certain measures were taken to further minimize the estimated construction costs for each Alternative. These measures include roadway milling and paving in lieu of full depth reconstruction, mulched medians and precast concrete barriers in lieu of raised concrete islands with granite curb edging and limiting the shared-use path to one side of the roadway rather than both.

Goal #5: Avoid or minimize impacts on environmental and other natural resources

- The study area is located within and adjacent to sensitive environmental resource areas, including wetlands, waterways, floodways, and floodplain. It is anticipated that both Alternatives would result in impacts to regulated resource areas requiring permitting under the Massachusetts Water Protection Act and the US Clean Water Act. During design development, impacts to these resource areas would be avoided and or minimized to the maximum extent practicable.

Goal #6: Support local, regional, and statewide policies

- Both Alternatives were designed to meet and exceed the goals, policies, and standards that MassDOT has adopted.

5. Recommendations

Despite the higher cost, the study recommends implementing Alternative 1 due to its better long-term safety and operations benefits for the community. Stakeholder and public participation should continue throughout the implementation process to build community support and address concerns. The full roadway layout for the preferred alternative is shown in Figure 9, Figure 10, Figure 11, and Figure 12.

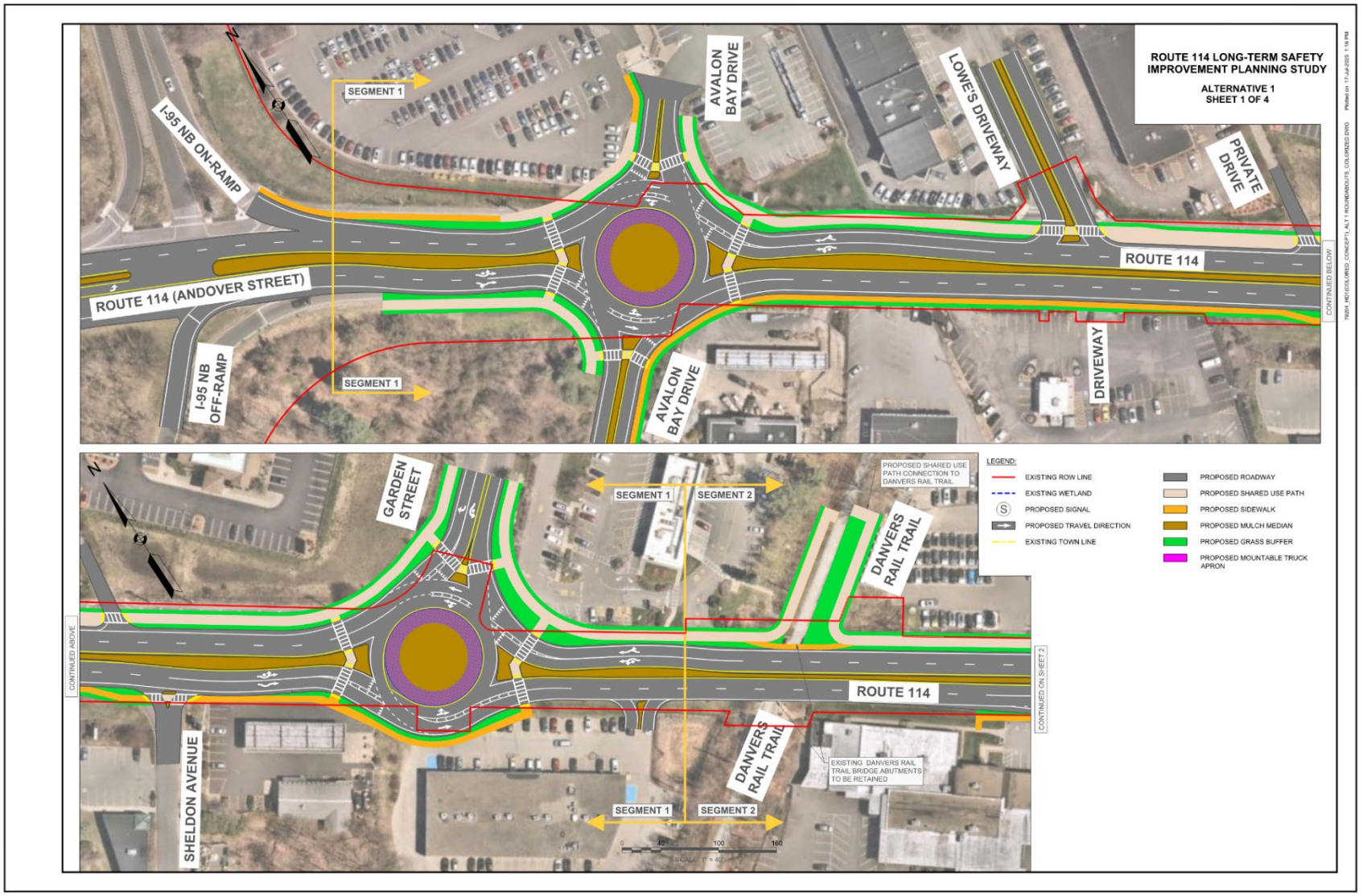

Figure 9. Preferred Long-Term Alternative, from Avalon Bay Drive to Danvers Rail Trail

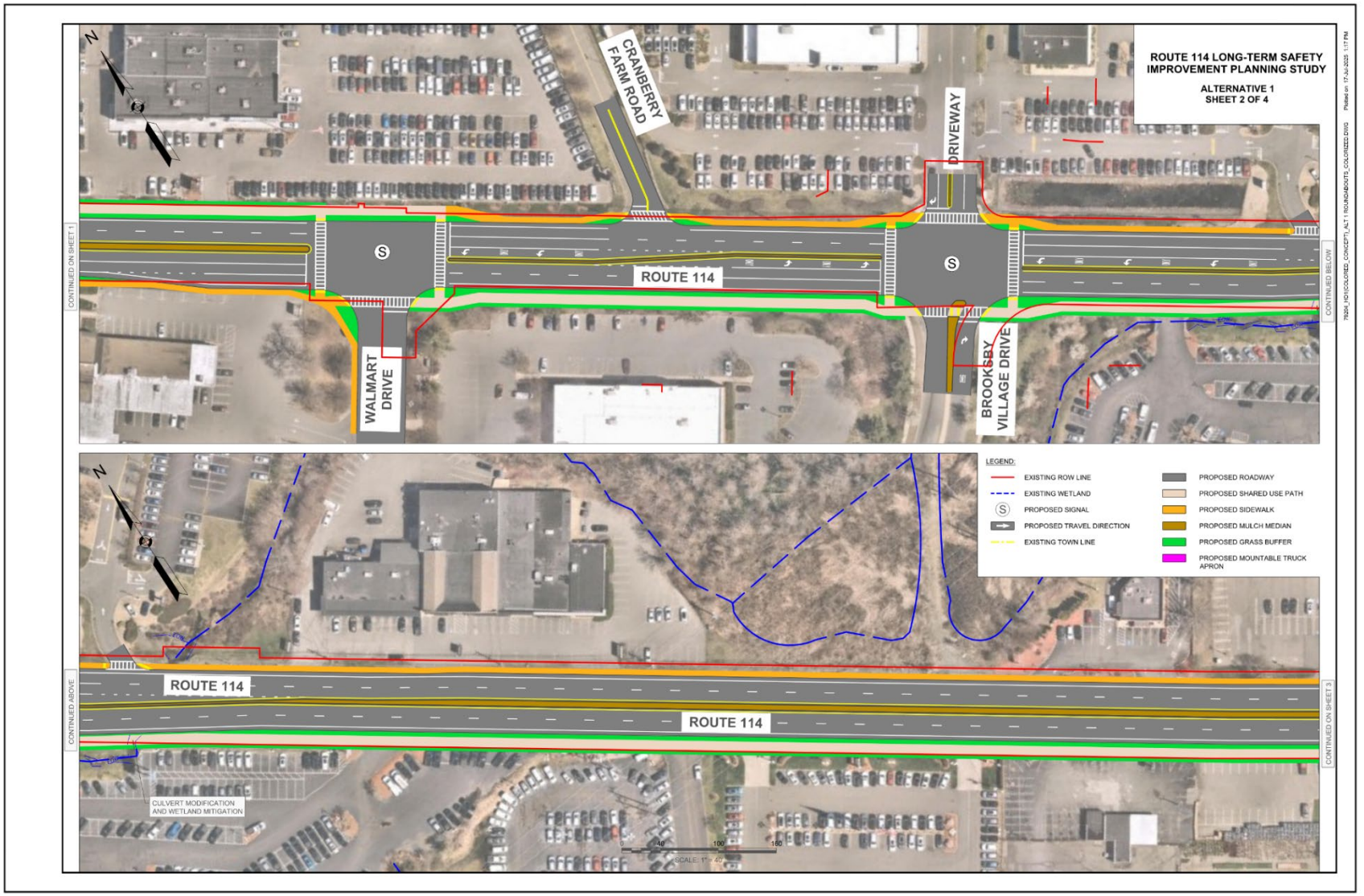

Figure 10. Preferred Long-Term Alternative, from Walmart Drive to MacArthur Boulevard

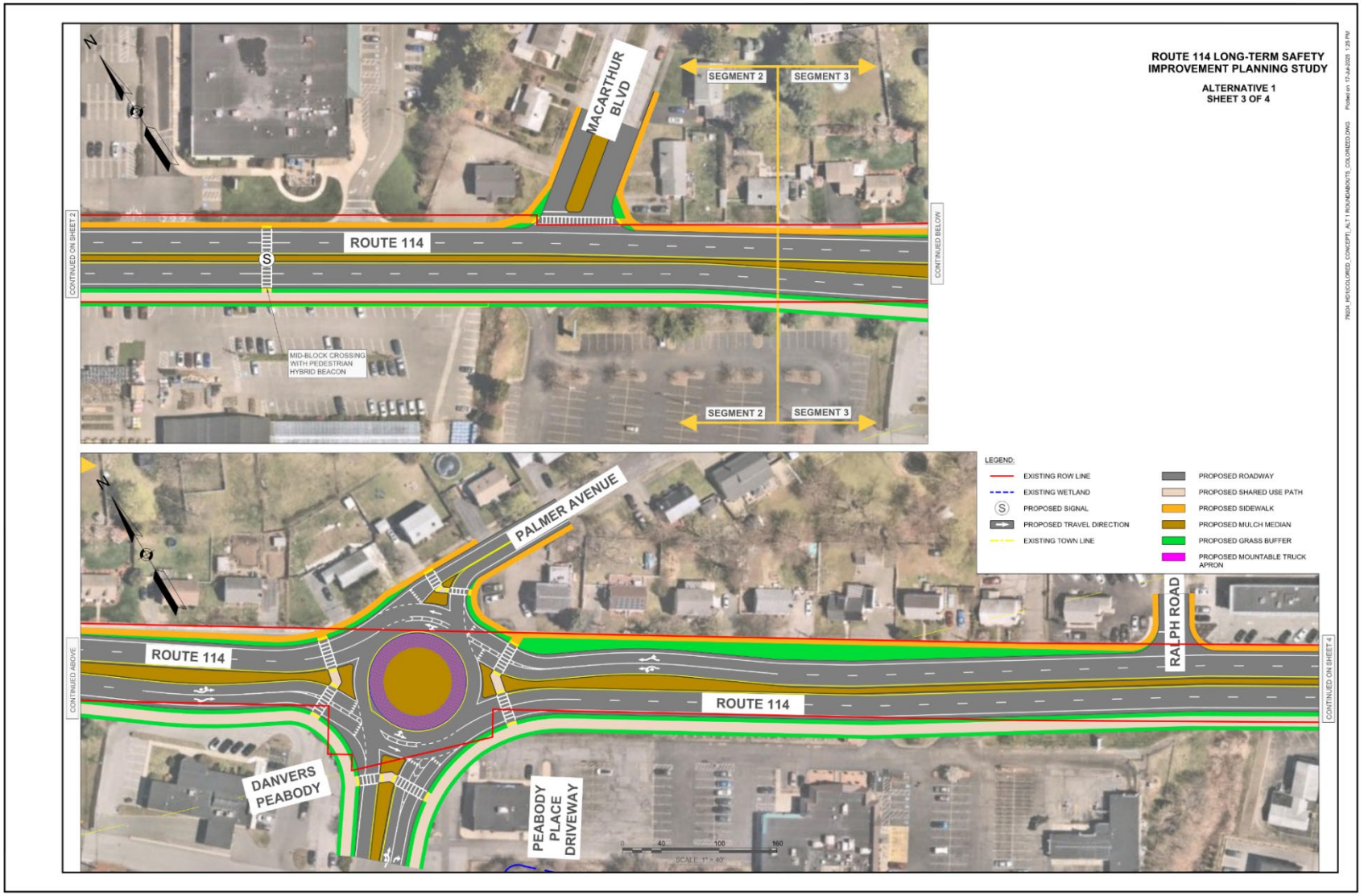

Figure 11. Preferred Long-Term Alternative, from MacArthur Boulevard to Ralph Road

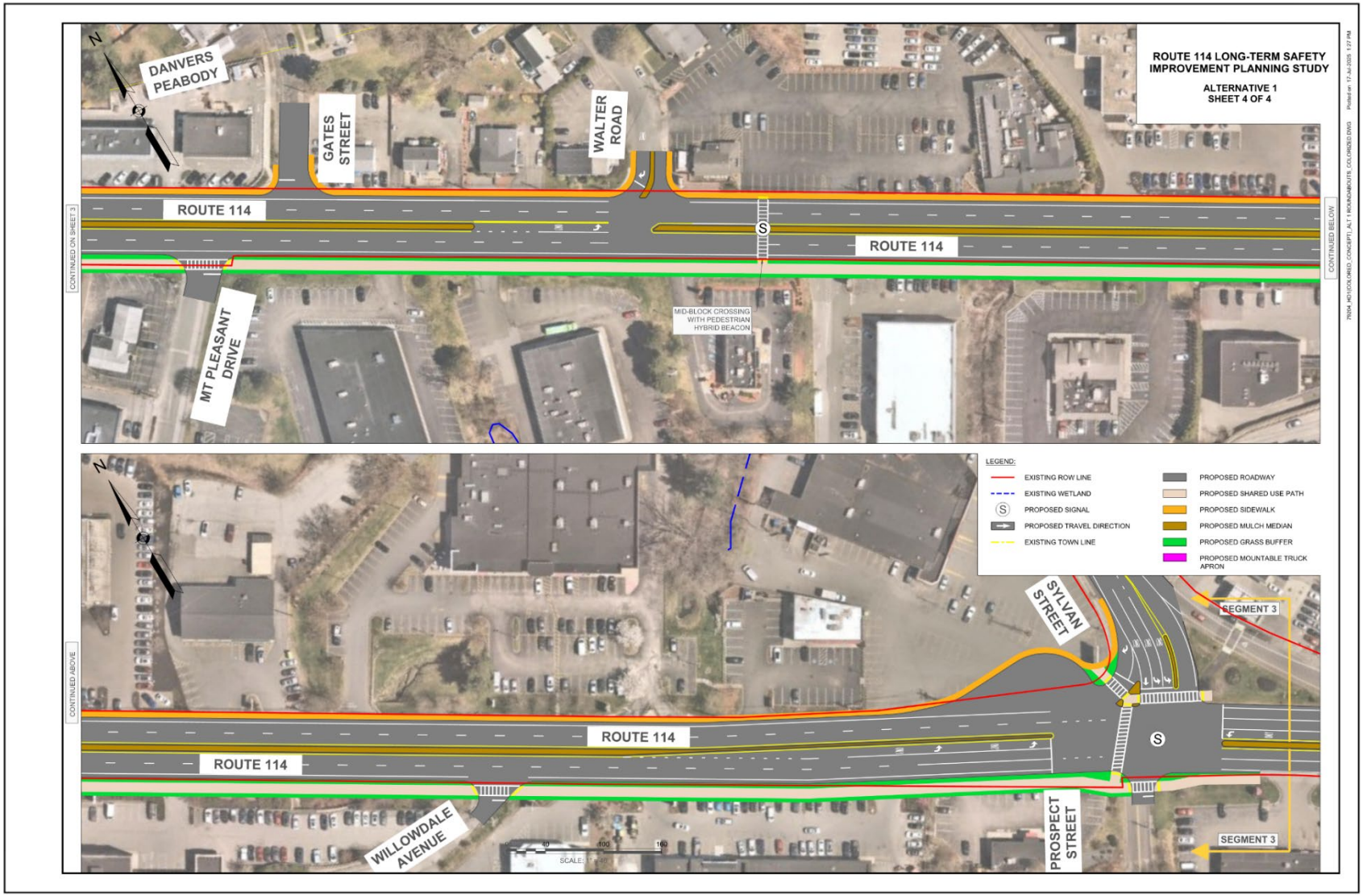

Figure 12. Preferred Long-Term Alternative, from Mount Pleasant Drive to Sylvan Street