MAY 2024

SAFE STREETS DUNEDIN

BELTREES SAFER STREET PLAN

Alternatives Report

PREPARED FOR:

City of DUNEDIN Florida

FORWARD PINELLAS

PREPARED BY:

FEHR & PEERS

FINAL

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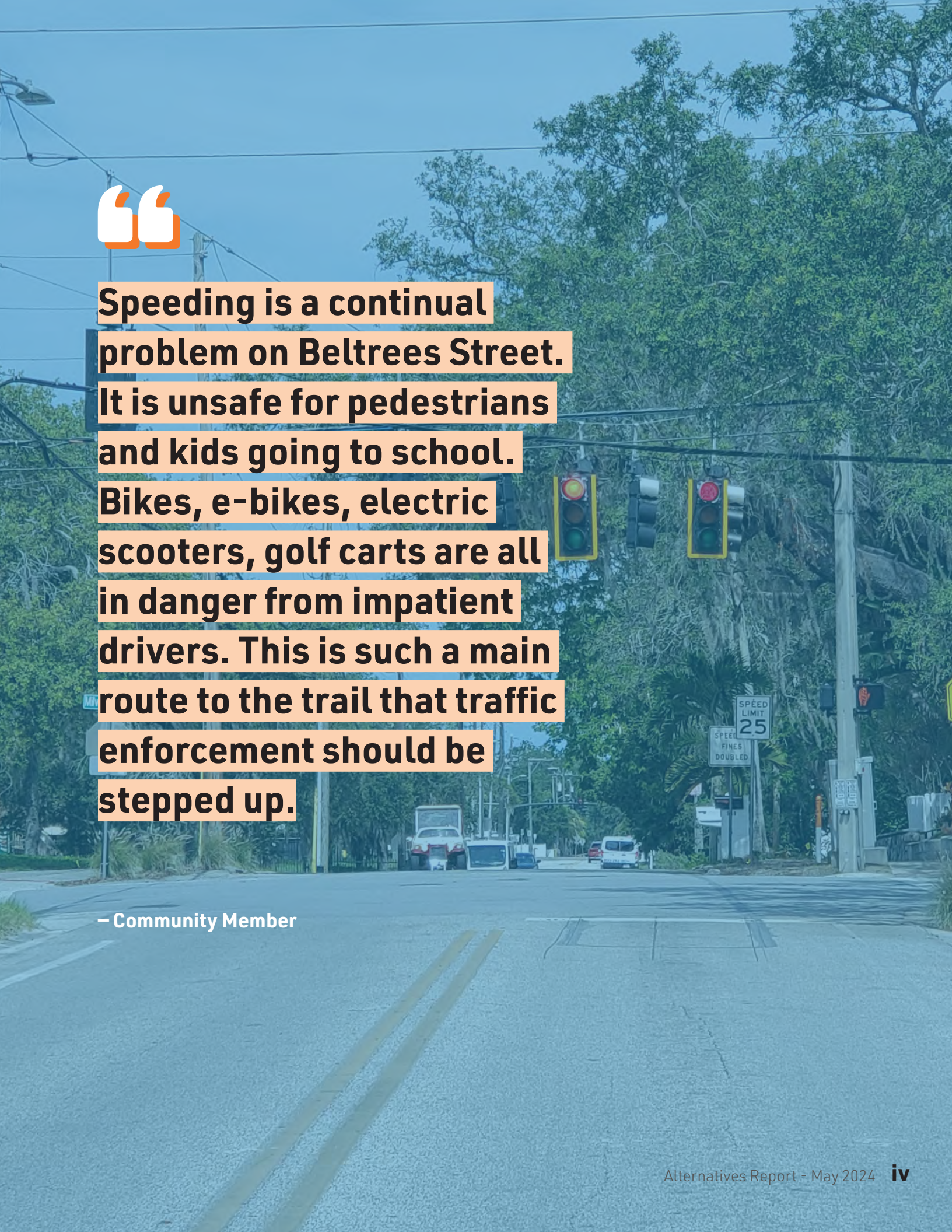


Speeding is a continual problem on Beltrees Street. It is unsafe for pedestrians and kids going to school. Bikes, e-bikes, electric scooters, golf carts are all in danger from impatient drivers. This is such a main route to the trail that traffic enforcement should be stepped up.

– Community Member

How to Use this Document

This report and associated technical appendices represent the Alternatives Report for the Beltrees Safer Street Plan in Dunedin, Florida. This chapter discusses the study purpose and project background. This Alternatives Report provides an overview of the process that was employed to develop and evaluate a range of alternatives that meet the purpose and need of the project and provide alternatives based on feedback from elected officials and the community.

> The purpose of this report is **to document the framework and process** utilized to develop corridor concepts and **provide guidance** for the project as it moves into the design and implementation phase.

This document is organized in four chapters, with detailed information provided in technical appendices. Concept plans and typical cross sections of the alternatives are provided in Appendix A with detailed cost estimates provided in Appendix C.

CHAPTER 1

PROJECT BACKGROUND

Describes the various goals and objectives that informed the development of this plan.

CHAPTER 2

EXISTING CONDITIONS

Provides a summary of the existing transportation conditions along and connecting to the corridor, as well as a summary of opportunities and constraints. The full existing conditions report is provided in Appendix B.

CHAPTER 3

COMMUNITY ENGAGEMENT

Summarizes the various community engagement activities, and a high-level overview of how Community and Stakeholder Engagement influenced the alternatives from this plan.

CHAPTER 4

CONCEPT PLAN DEVELOPMENT

Presents the various intersection and corridor treatment alternatives. Since this is a concept plan and detailed engineering designs would need to be prepared, considerations for the future design stage are provided to better describe the design approach and parameters. A cost estimate and other engineering considerations are also provided.

Executive Summary

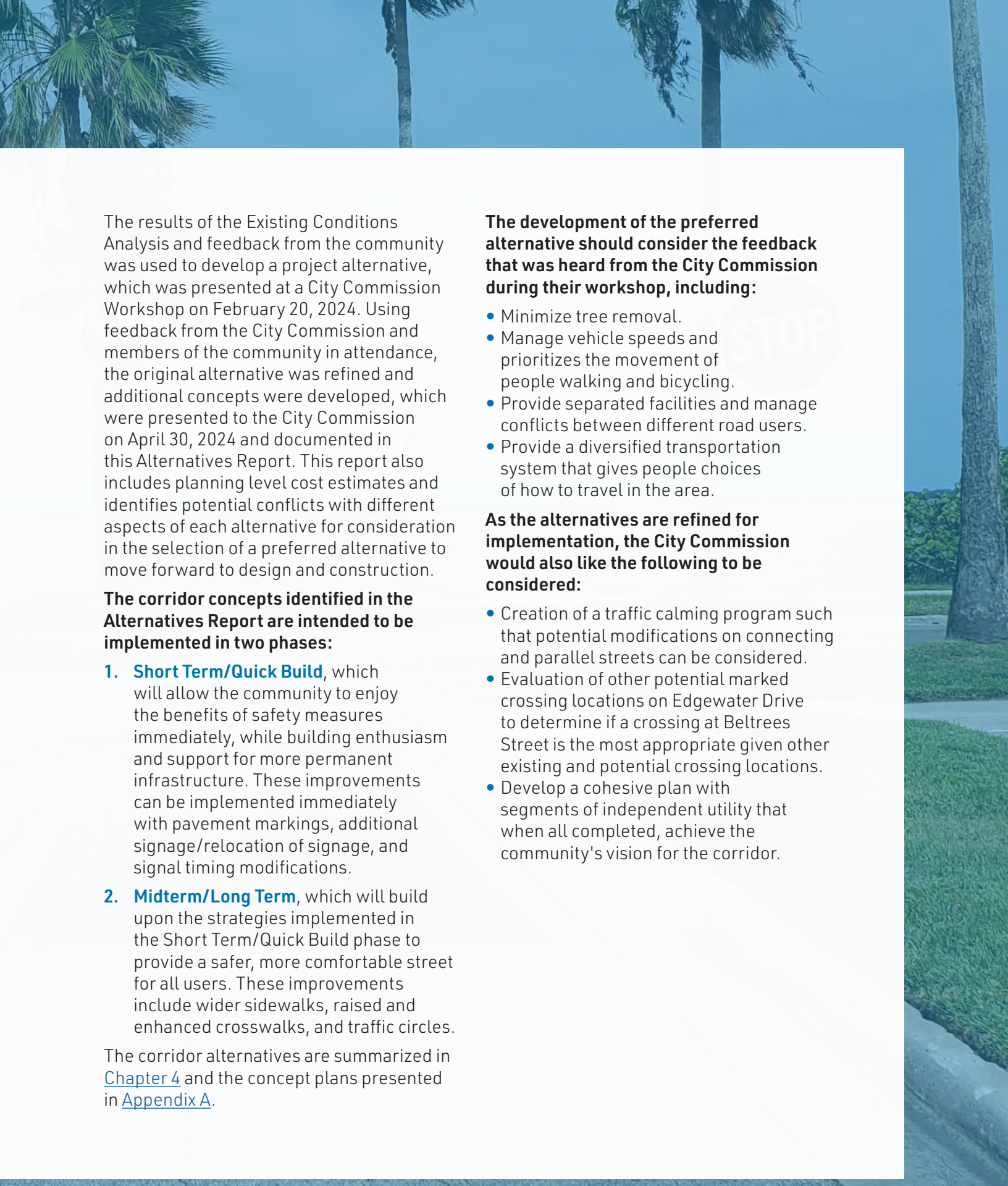
This project, referred to as the Beltrees Safer Street Plan, extends along Beltrees Street between Edgewater Drive (Alt US-19) and Patricia Avenue.

To better understand the transportation challenges and opportunities along the corridor, an assessment of the existing conditions was completed that considered transportation safety, and the experience for people traveling along and across the corridor. The assessment, which is provided in Chapter 2 and Appendix B, was coupled with feedback from the public from online and in-person engagement with the **key findings below**.

The goal of the Beltrees Safer Street Plan is to identify transportation safety issues and develop alternatives for further consideration that **improve transportation safety outcomes for all roadway users and increase transportation choices for the community** by improving bicycle and pedestrian connectivity along the corridor.

Key Findings

1. **People drive too fast along the corridor.**
2. **There is a lack of consistent and comfortable pedestrian infrastructure along the corridor.**
3. **There is no consistent and clearly delineated bicycle infrastructure along the corridor.**
4. **While there is not a history of fatal or severe injury crashes along the corridor, the crash patters could lead to more severe crashes in the future and people reported being involved in frequent near-misses.**



The results of the Existing Conditions Analysis and feedback from the community was used to develop a project alternative, which was presented at a City Commission Workshop on February 20, 2024. Using feedback from the City Commission and members of the community in attendance, the original alternative was refined and additional concepts were developed, which were presented to the City Commission on April 30, 2024 and documented in this Alternatives Report. This report also includes planning level cost estimates and identifies potential conflicts with different aspects of each alternative for consideration in the selection of a preferred alternative to move forward to design and construction.

The corridor concepts identified in the Alternatives Report are intended to be implemented in two phases:

1. **Short Term/Quick Build**, which will allow the community to enjoy the benefits of safety measures immediately, while building enthusiasm and support for more permanent infrastructure. These improvements can be implemented immediately with pavement markings, additional signage/relocation of signage, and signal timing modifications.
2. **Midterm/Long Term**, which will build upon the strategies implemented in the Short Term/Quick Build phase to provide a safer, more comfortable street for all users. These improvements include wider sidewalks, raised and enhanced crosswalks, and traffic circles.

The corridor alternatives are summarized in Chapter 4 and the concept plans presented in Appendix A.

The development of the preferred alternative should consider the feedback that was heard from the City Commission during their workshop, including:

- Minimize tree removal.
- Manage vehicle speeds and prioritizes the movement of people walking and bicycling.
- Provide separated facilities and manage conflicts between different road users.
- Provide a diversified transportation system that gives people choices of how to travel in the area.

As the alternatives are refined for implementation, the City Commission would also like the following to be considered:

- Creation of a traffic calming program such that potential modifications on connecting and parallel streets can be considered.
- Evaluation of other potential marked crossing locations on Edgewater Drive to determine if a crossing at Beltrees Street is the most appropriate given other existing and potential crossing locations.
- Develop a cohesive plan with segments of independent utility that when all completed, achieve the community's vision for the corridor.

Next-Steps

To maintain project momentum, the following outlines next steps for project development:

Task 1: Work with the City of Dunedin Engineering Department to prepare design documents for the low-cost/quick build elements as those improvements can be implemented within the existing right-of-way with readily available materials (paint and signage) based on the concept plans and implement as feasible through maintenance. A plan to measure the performance of these improvements should be developed and implemented.

Task 2: Conduct additional outreach with key businesses along the corridor and residents that would be directly affected by some elements to obtain additional feedback to incorporate into a refined project alternative.

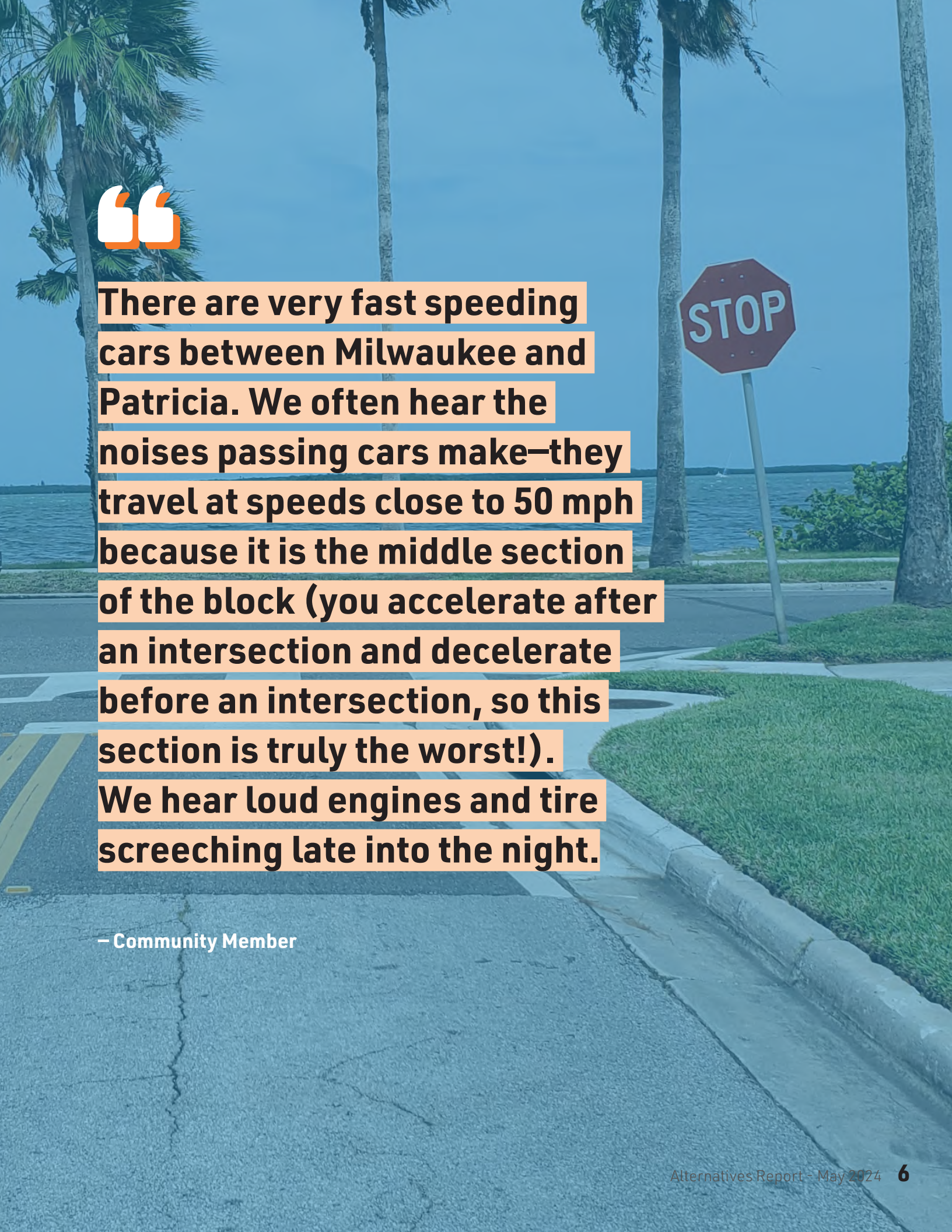
Task 3: Identify potential funding sources to move the longer-term alternatives into design, including Forward Pinellas, Safe Streets and Roads for All grant program, and Safe Routes to School grant program. Conduct detailed survey and right-of-way analysis along the corridor and using feedback obtained in Task 2, complete 30% design plans[1] including detailed cost estimates to evaluate and compare the costs, impacts and constraints of different concept elements to develop a consensus plan for implementation. Final design should consider the phasing of project elements.

Task 4: Identify construction funds, should those funds not have been identified in Task 3.

Based on the feedback received during the Commission Meeting, the following next steps are proposed to help move this plan forward:

- Complete a road construction survey and right-of-way analysis along the corridor
- Using the survey as a base line, complete 30% design plans[1] including detailed cost estimates to evaluate and compare the costs, impacts and constraints of each alternative
- Complete additional community and stakeholder outreach to reach a consensus on a preferred alternative
- Develop a funding and phasing plan to identify potential grant opportunities and implementation timelines for different sections of the corridor and elements of the preferred alternative.

1 30% Design Plans are typically conceptual plans with sufficient detail to include limits of R/W acquisition (if any), identification of potential utility conflicts, Basis of Design documentation, a detailed summary of construction quantities and a cost estimate.



There are very fast speeding cars between Milwaukee and Patricia. We often hear the noises passing cars make–they travel at speeds close to 50 mph because it is the middle section of the block (you accelerate after an intersection and decelerate before an intersection, so this section is truly the worst!). We hear loud engines and tire screeching late into the night.

– Community Member

1

Project Background

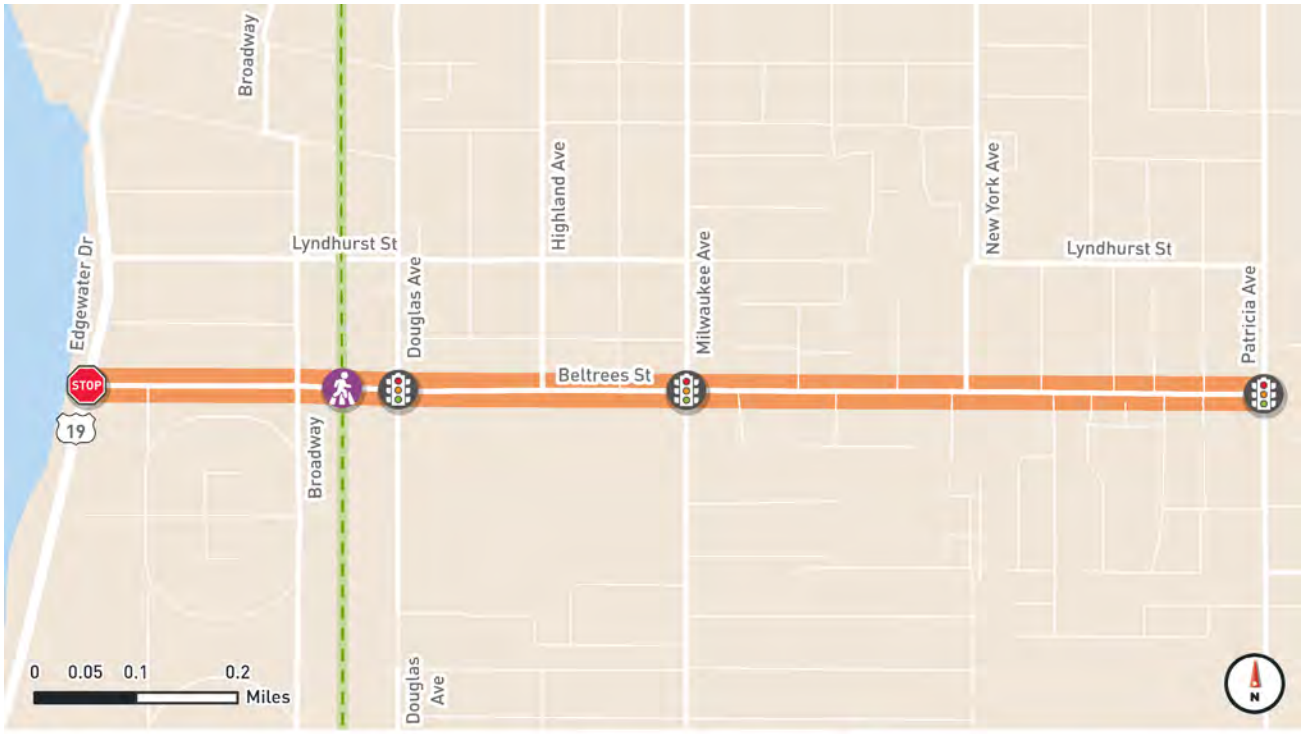
Forward Pinellas prepared a Vision Zero Action Plan known as Safe Streets Pinellas, which was adopted in March 2021 and updated in February 2023. That plan contains policies and action items aimed at eliminating fatal and severe injury collisions on roads in Pinellas County by 2045.

The Beltrees Safer Street Plan builds upon the direction from the Safe Streets Pinellas action plan to address crash histories as well as reported concerns from residents related to speeding and school children's safety along Beltrees Street.

This project, referred to as the Beltrees Safer Street Plan, extends along Beltrees Street between Edgewater Drive (Alt US-19) and Patricia Avenue. **Figure 1** displays the limits of the study corridor, which is approximately 1 mile long.

The goal of the Beltrees Safer Street Plan is to **identify transportation safety issues** and **develop concepts for consideration** that improve transportation safety outcomes for all roadway users and **increase transportation choices** for the community by improving bicycle and pedestrian connectivity along the Beltrees Street corridor.

Figure 1. Project Extents



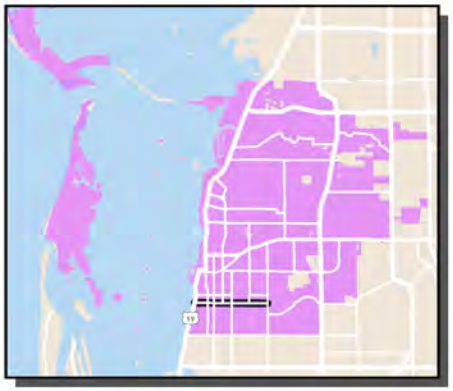
Signalized Intersection

Major Street Stop-controlled Intersection

Pedestrian Crosswalk on Uncontrolled Segment

Trails and Paths

Study Corridor



Study Corridor

City of Dunedin

2

Existing Conditions

A detailed existing conditions assessment was prepared to identify opportunities and constraints along the corridor to consider in the development of project alternatives. A summary of the existing conditions assessment is provided in this chapter with the full analysis provided as Appendix B.

Overview

The existing conditions assessment provides a detailed description of the study area roadways, transit service, bicycle and pedestrian network, roadway operations for people driving, and a collision assessment. Key findings are presented in **Table 1** based on the following parameters:

- Roadway operations for people driving were evaluated based on peak hour intersection level of service calculations and corridor travel time.
- The experience for people walking and bicycling was evaluated using a level of traffic stress assessment.
- Transportation safety was evaluated based on reported collisions from 2018 to 2022.

Table 1. Existing Conditions Summary

TOPIC	KEY FINDINGS
Transportation Safety	• During the analysis period, 23 collisions were reported along the corridor, including 13 that resulted in injuries • There were no reported incapacitating injuries or fatalities during the five-year analysis period. • The majority of collisions along the corridor occurred at an intersection or were intersection-related, amounting to 56% of all collisions (13 collisions), with most collisions occurring at the intersections of Douglas Avenue, Milwaukee Avenue, and Patricia Avenue. • Although there were no reported collisions where someone was killed or severely injured (KSI collisions) in the past five years along the corridor, there is a history of collision types that are more likely to result in a KSI collision, including angle, left turn, off road, pedestrian, and bicycle collisions, along the corridor: › *About 69% of the crashes on the roadway (16 crashes) fall into one of these five crash types, and 56% of those (9 crashes) resulted in a non-incapacitating injury*
Driving	• Traffic volumes range between 1,330 and 4,600 vehicles per day. • Most vehicles that use the Beltrees Street corridor are passenger vehicles (82%). Light duty trucks like pick-up trucks and sport utility vehicles represent approximately 13% of the vehicle mix. • The major intersections along Beltrees Street operate within their established level of service standards for people driving.
Walking and Biking	• Beltrees Street is generally uncomfortable for people walking and bicycling, especially on portions of the road where the sidewalk is adjacent to the travel lane. • In general, sidewalks are in good condition but there are locations where the sidewalks are narrow or where there are encroachments by utilities and/or overgrown vegetation. • Crosswalks are only provided at signalized intersections with an average spacing of approximately 1/4-mile. • No dedicated bicycle facilities are provided along the corridor (there is a striped shoulder that is used as a bike lane, but it is not designed to bike lane standards).

(Continued on next page)

TOPIC	KEY FINDINGS
Travel Speeds	• Average travel speeds along the corridor ranged from 11 miles per hour (mph) west of Douglas Avenue to 28 mph between Milwaukee Avenue and Patricia Avenue. • On average, 25% of people driving traveled below the speed limit of 25 mph (5 to 24 mph), 16% of people driving traveled about the speed limit (25-29 mph) and 58% of people driving were traveling in excess of 30 mph, with more than 22% over 35 mph.
Other	• The roadway cross section varies throughout the segment; west of Douglas Avenue, the roadway is approximately 20 feet wide with 10-foot travel lanes, but east of Douglas Avenue, the roadway varies in width between 24 and 32 feet, with travel lanes varying between 12 and 16 feet wide. • Improvements to the intersection of Edgewater Drive (Alt US-19) will require coordination with FDOT. • Existing Americans with Disability Act (ADA) deficiencies along the corridor will require upgrades as part of improvement implementation. • There are no fixed transit routes along Beltrees Street; there are bus stops at the intersection of Beltrees Street with Douglas Avenue and with Patricia Avenue. • Transit service in the study area is provided by the Pinellas Suncoast Transit Authority (PSTA). PSTA offers fixed route and Demand Response Transit (DRT) service within Pinellas County, connecting to other transit systems, including the Hillsborough Area Regional Transit Authority (HART), Pasco County Public Transportation (GOPASCO), and Manatee County Area Transit (MCAT).

Source: Fehr & Peers, 2024.

Opportunities

The following summarizes potential opportunities along the corridor that were considered in the refinement of corridor alternatives:

- There is a wide landscape buffer on the north side of the roadway between the Fred Marquis Pinellas Trail and Milwaukee Avenue that could allow for the widening of the sidewalk.
- Intersections along the corridor operate at acceptable levels of service (LOS) for people driving, with the three signalized intersections operating at LOS A or B, allowing for flexibility in changes to the intersection, including removing turn lanes.
- The grid network provides opportunities to increase the density of crossings of Beltrees Street to at least every 600 to 800 feet. Some crossings, for example the trail crossing, are candidates for crossing enhancements, such as raised crosswalks and RRFBs.
- Travel speeds along the corridor can be better managed through roadway design elements aimed at a target speed of 25 mph.
- There are opportunities to reduce the crossing distance at crossings along the corridor, thus reducing the potential exposure of people crossing the roadway to people driving.
- The apparent right-of-way from Douglas Avenue to Patricia Avenue (approximately 60 feet) allows for several alternatives to be considered.
- Requirement to upgrade traffic signal equipment at Milwaukee Avenue to include mast arms presents an opportunity to reconstruct intersection as a mini roundabout.
- Long-term potential to underground utilities along the corridor presents opportunity to narrow street sections and widen/improve sidewalks.
- Opportunities to make intersections and pedestrian access routes compliant with ADA requirements.

Constraints

The following summarizes potential constraints along the corridor to consider in the refinement of corridor alternatives:

- West of the Fred Marquis Pinellas Trail, right of way constraints and steep grades on the south side of the roadway may restrict the ability to install a sidewalk.
- High density of driveways along some portions of the corridor limit potential bicycle facility design options.
- Existing ADA deficiencies along the corridor could limit low-cost quick-build alternatives that could be implemented while funding is sought for the long-term project.
- Opportunities to modify the intersection with Edgewater Drive will be more involved. Since this intersection is owned and maintained by FDOT, additional agency coordination would be required.

3

Community Engagement

This section describes the various activities that were employed to obtain feedback from the community and stakeholders which informed the development of the alternatives. Feedback from the community is a vital component of the project, and was solicited in numerous ways, including:

- Meetings and discussion with City Staff and Forward Pinellas staff
- A project website and web based online feedback tool
- A walking audit with stakeholders, including staff from the City, Forward Pinellas, Pinellas County and Law Enforcement
- A walking audit with community members which also included members of the Edgewater Drive Advisory Committee
- A workshop with the City Commission

General Feedback Summary

In reviewing the feedback received from the various engagement efforts, the following key themes emerged:

1. **People drive too fast on the corridor.**

2. **There is a lack of consistent and comfortable pedestrian infrastructure along the corridor.**

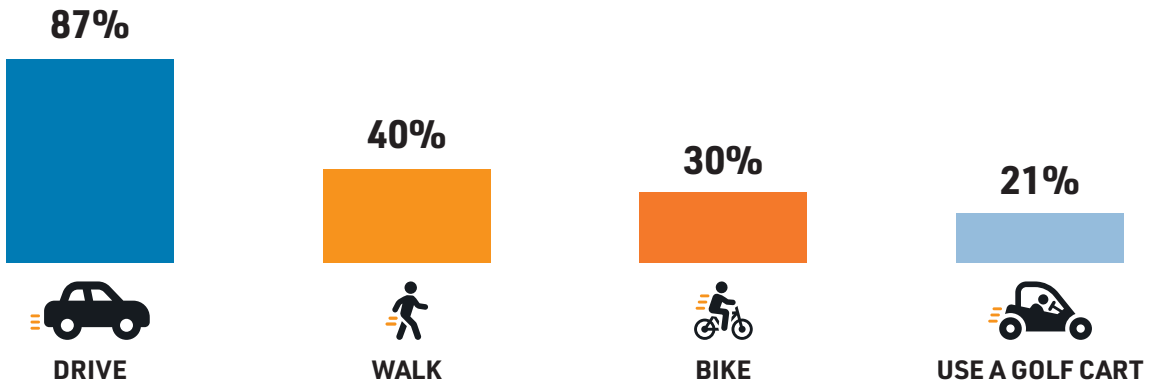
3. **There is no consistent and clearly delineated bicycle infrastructure along the corridor.**

Figure 2. Feedback Statistics

Comments were generally dispersed along the corridor, with a higher density of comments provided for the segment east of Douglas Avenue. It should be noted that most of the people that took the survey (**69%**) do not have a destination on Beltrees Street but travel along it to access another destination.

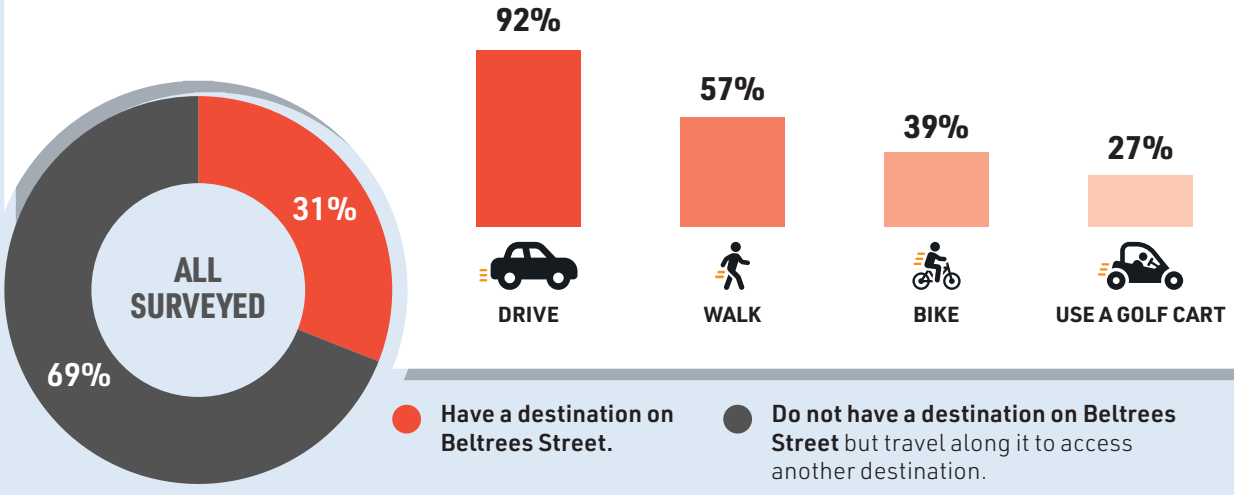
Travel Modes of All Survey Respondents

A vast majority of all respondents (**87%**) included driving as one of their modes of transportation along Beltrees Street; while **40%** included walking, **30%** included biking and **21%** included the use of golf carts.



Travel Modes of Survey Respondents Who Have a Destination on Beltrees Street

Of the participants who indicated that they have a destination on Beltrees Street, **92%** included driving while **57%** included walking, **39%** included biking and **27%** included the use of golf carts.



Have a destination on Beltrees Street.

Do not have a destination on Beltrees Street but travel along it to access another destination.

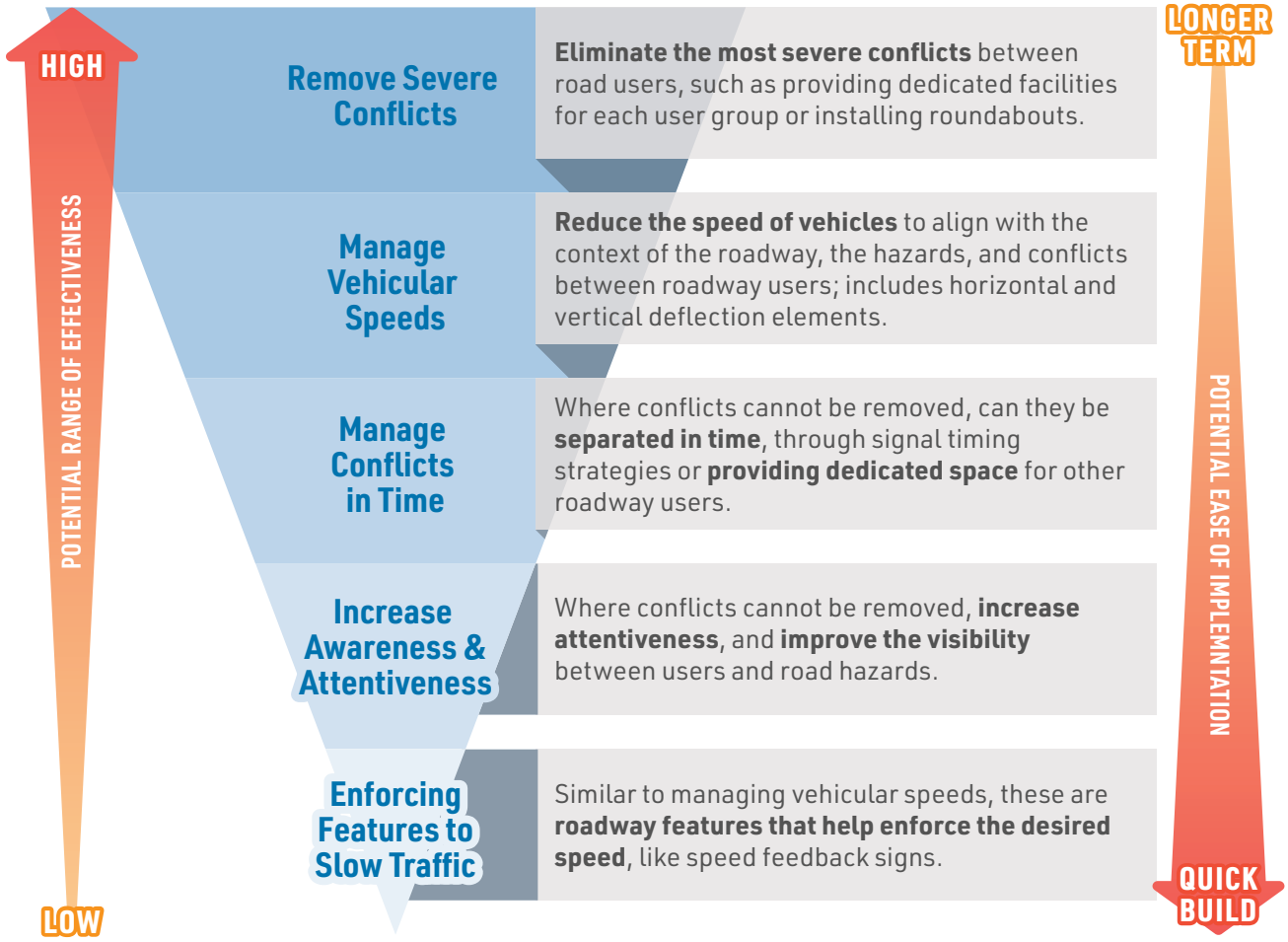
4

Concept Plan Development

Design Approach

The following section describes the objectives and general design approach for developing the concept alternatives. Within that framework, the most effective strategies include removing conflicts and minimizing hazards, and where that is not feasible, better management of the conflict through speed reductions and managing conflicts in time.

Figure 3. Design Approach



Design Parameters

The concept plan alternatives were developed based on 10 key design principles that should be carried through to the final design. These design features are based on Complete Street best practices as of the development of the concept plan alternatives (2024). Depending on the timing of final design and construction, more recent best practice documents should be consulted to determine if modifications from the concept plan should be considered in consultation with City staff.

THE 10 DESIGN PRINCIPLES ARE AS FOLLOWS:

1. The target speed, the posted speed and the operating speed should be the same with a target speed no greater than 25 mph.
2. PROWAG (Public Rights-of-Way Accessibility Guidelines) should be used in the design of all public streets, including shared use paths and curb ramps.
3. 10-foot travel lane as the default standard.
4. Constrain geometric features whenever feasible (i.e., reduce curb radii and shorten crossing distances).
5. New sidewalks should be at least 6-feet wide, with 8-feet preferred especially if people bicycling are expected to share the sidewalk with people walking (as there would be a 10-12-foot shared use path on one side of the street, where existing sidewalks would remain, they will not be widened to 8-feet as a part of this project).[2]
6. Crosswalks should be provided frequently with consideration for the convenience of people walking as the primary factor in determining where to place crosswalks.
7. Lighting should be evaluated, and pedestrian-scale lighting considered with the idea that streetlights should also serve people walking not just people driving. All marked pedestrian crossings shall have the appropriate lighting.
8. Bicycle facilities should be provided in order to promote more people biking, connectivity, and safety, in order of preference based on right-of-way availability:
    a. *Shared use path – at least 10 feet, with 12 preferred*
    b. *Protected bike lanes/cycle tracks*
    c. *7-foot buffered bike lane*
    d. *6-foot buffered bike lane*
    e. *5-foot bike lane*
    f. *4-foot bike lane*
    g. *Sharrows (shared lane markings)*
9. Intersections – where a change to intersection traffic control is being contemplated, roundabout control must be considered first.
10. Trees and shade should be incorporated where feasible.

2 There are several locations along the corridor where an existing 5-foot sidewalk is provided. Due to right-of-way constraints along the segment, it may not be feasible to widen to the minimum of 6-feet, but that will be explored in the final design once a full survey and understanding of utilities is available.

POSTED SPEED:

The maximum lawful speed for a particular location as displayed on a regulatory sign.

OPERATING SPEED:

The speeds at which vehicles are observed operating during free flow conditions. Free flow conditions mean that vehicles are unimpeded by other vehicles or by traffic control devices such as traffic signals.

TARGET SPEED:

The highest operating speed at which vehicles should ideally operate on a roadway in a specific context.

Source: ITE

Corridor Concept Alternative Development

The alternatives developed as part of the Beltrees Safer Street Plan are intended to be implemented in two phases:

1. **Short Term/Quick Build Phase** which will allow the community to enjoy the benefits of safety measures immediately, while building enthusiasm and support for more permanent infrastructure; and
2. **Midterm/Long Term Phase** which will build upon the alternatives implemented in the Short Term/Quick Build phase to provide a safer, more comfortable street for all users.

Table 2 and **Table 3** provide the alternatives that were presented to the City Commission during a Commission Workshop on February 20, 2024 and refined for inclusion in this plan. While there was mixed feedback about the conversion of the segment between Edgewater Drive and Douglas Avenue to one-way westbound, many people expressed support for the traffic calming elements along the corridor to slow people driving and provide a safer environment for people walking and biking.

Based on feedback from the City Commission and members of the community in attendance, the Midterm/Long Term alternatives in **Table 3** were refined, and a variation of these corridor concepts was developed. The proposed alternatives, including the suggested revisions are presented in **Table 4**. The alternatives listed in **Table 3** will be referred to as Alternative #1 and the alternatives in **Table 4** will be referred to as Alternative #2. The concept plans for all the alternatives are shown in Appendix A with this chapter providing additional context and details to help inform the design stage of the project. Typical cross sections along the corridor that form the basis of the concept plans are also provided in Appendix A.

Table 2. Short Term/Quick Build Corridor Concepts

ALTERNATIVES	INTENDED BENEFIT
Corridorwide	
Evaluate pedestrian crossing times (and revise as necessary) using a 3.5 ft/sec pedestrian walking speed.	To ensure the traffic signals can accommodate people with slower walking speeds.
Evaluate Yellow and All-Red intervals at all signalized intersections.	Provided as a margin of safety to reduce the risk of angle crashes at the signalized intersections.
Evaluate overall cycle lengths, recall times and detection.	To encourage pedestrian compliance with "WALK" and "DON'T WALK" indications. Shorter cycle lengths and longer "WALK" intervals generally provide better service for pedestrians and encourage better compliance.
Beltrees Street between Edgewater Drive and Douglas Avenue	
Double up bicycle warning signs (W-11-1 and W16-7p) on both approaches to the Fred Marquis Pinellas Trail and trim landscaping on eastbound approach to 4 feet.	**Increase Attentiveness and Awareness.** To alert drivers to expect people crossing the street on bicycles and to improve overall visibility of trail users crossing Beltrees Street.
Install Speed Feedback signs along Beltrees Street approximately 500 feet east of Edgewater Drive for eastbound traffic and approximately 400 feet west of Broadway for westbound traffic.	**Manage vehicular speeds.**

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ALTERNATIVES	INTENDED BENEFIT
Beltrees Street and Douglas Avenue	
Install flexible retro-reflective backplates on all approaches (no structural analysis needed for flexible backplates).	**Increase Attentiveness and Awareness.** To improve visibility of the signal and reduce red-light running incidences and the risk of angle crashes.
Beltrees Street between Douglas Avenue and Milwaukee Avenue	
Install Speed Feedback signs along Beltrees Street approximately 800 feet east of Douglas Avenue for eastbound traffic and approximately 550 feet west of Milwaukee Avenue for westbound traffic.	**Manage vehicular speeds.**
Install Automated Speed Cameras along Beltrees Street approximately 600 feet east of Douglas Avenue for eastbound traffic.	**Implement Enforcing Features to Slow Traffic.**
Relocate School zone flasher to be in line with "SCHOOL" pavement markings on the eastbound approach of Beltrees Street and Milwaukee Avenue.	**Implement Enforcing Features to Slow Traffic.** Establish a consistent area for the School Zone. Florida Statute 312.1895 allows Law Enforcement to ticket violations based on the location of the sign (not the pavement markings).
Beltrees Street between Milwaukee Avenue and Patricia Avenue	
Install Speed Feedback signs and Automated Speed Cameras along Beltrees Street approximately 800 feet east of Milwaukee Avenue for eastbound traffic and approximately 850 feet west of Patricia Avenue for westbound traffic.	**Manage vehicular speeds.** **Implement Enforcing Features to Slow Traffic.**

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ALTERNATIVES	INTENDED BENEFIT
Beltrees Street between Milwaukee Avenue and Patricia Avenue	
Install Automated Speed Cameras along Beltrees Street approximately 150 feet east of Milwaukee Avenue for westbound traffic.	**Implement Enforcing Features to Slow Traffic.**
Relocate School zone flasher to be in line with "SCHOOL" pavement markings on the westbound approach of Beltrees Street and Milwaukee Avenue.	**Implement Enforcing Features to Slow Traffic**. Establish a consistent area for the School Zone. Florida Statute 312.1895 allows Law Enforcement to ticket violations based on the location of the sign (not the pavement markings).

Table 3. Midterm/Long Term Alternatives (Alternative #1)

ALTERNATIVES	INTENDED BENEFIT
Corridorwide	
Review and provide ADA compliant curb ramps at all intersections.	Improve access for people with mobility impairments i.e., wheelchairs and mobility scooters.
Beltrees Street and Edgewater Drive	
Provide curb extensions on the westbound approach	**Reduce crossing distance for pedestrians.**
Provide crosswalks including Rectangular Rapid Flashing Beacons (RRFBs) on the north and south legs of the intersection.	**Increase Attentiveness and Awareness.** To alert drivers to expect people crossing the street and to improve overall visibility of pedestrians crossing Edgewater Drive.
Install "DO NOT ENTER" signs (on both sides of the road) and pavement markings on eastbound approach to Beltrees Street and Edgewater Drive.	**See alternative for segment between Edgewater Drive and Douglas Avenue.** To discourage wrong-way driving. This alternative is associated with the alternative of converting this segment to one-way westbound.
Beltrees Street between Edgewater Drive and Douglas Avenue	
Convert the segment between Douglas Avenue and Edgewater Drive to one-way westbound or eastbound (direction to be decided and coordinated between the City and FDOT). The proposed cross-section would consist of a 10-foot vehicular travel lane, a 5-foot westbound bicycle lane and a 5-foot eastbound bicycle lane.	**Remove Severe Conflicts.** To provide dedicated bicycle facilities for people on bicycles. To reduce conflicts between pedestrians and vehicles at the intersection of Beltrees Street and Edgewater Drive. To manage vehicular speeds by reducing the usable pavement for vehicular traffic.

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ALTERNATIVES	INTENDED BENEFIT
Beltrees Street between Edgewater Drive and Douglas Avenue	
Convert the crossing at the Fred Marquis Pinellas Trail to a raised crossing.	**Increase Attentiveness and Awareness.** To improve visibility of trail users crossing Beltrees Street to drivers to increase yielding compliance.
Provide a raised intersection including textured pavement at the intersection of Beltrees Street and Broadway.	**Manage vehicular speeds.**
Beltrees Street and Douglas Avenue	
Provide high emphasis crosswalks with Elephant feet markings on west leg and north leg.	**Increase Attentiveness and Awareness**. To designate shared pedestrian and bicycle crossings.
Beltrees Street between Douglas Avenue and Milwaukee Avenue	
Provide a 10-foot to 12-foot shared-use path on the north side. Width of the trail will vary depending on available right-of-way and utility conflicts.	**Remove Severe Conflicts.** To provide dedicated bicycle facilities for people on bicycles and provide facilities that appeal to a wider range of bicycle riders.
Provide a marked crosswalk including RRFBs and a 6-foot refuge island approximately 600 feet east of Douglas Avenue.	**Remove Severe Conflicts and Increase Attentiveness and Awareness.** To provide more opportunities to cross Beltrees Street. Currently, the average spacing between marked crosswalks is approximately 1/4-mile with marked crosswalks only being provided at the signalized intersections.

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ALTERNATIVES	INTENDED BENEFIT
Beltrees Street and Milwaukee Avenue	
Convert traffic control to a mini roundabout and provide raised crosswalks on all approaches. A planning level analysis is provided below based on AM and PM peak hour volumes.	**Remove Severe Conflicts.** To manage vehicular speeds. To mitigate the risk of right-angle crashes by reducing the potential crash angles. To provide consistent traffic control during hurricanes.
Beltrees Street between Milwaukee Avenue and Patricia Avenue	
Provide a two-way cycle track separated by modular traffic segregators (e.g., Zicla Zippers) on the north side.	**Remove Severe Conflicts.** To provide dedicated bicycle facilities for people on bicycles.
Provide a marked crosswalk including RRFBs and a 6-foot refuge island approximately 600 feet east of Milwaukee Avenue and approximately 700 feet west of Patricia Avenue.	**Remove Severe Conflicts and Increase Attentiveness and Awareness.** To provide more opportunities to cross Beltrees Street. Currently, the average spacing between marked crosswalks is approximately 1/4-mile with marked crosswalks only being provided at the signalized intersections.

Table 4. Midterm/Long Term Corridor Concept (Alternative #2)

CORRIDOR CONCEPT	INTENDED BENEFIT
Corridorwide	
Review and provide ADA compliant curb ramps at all intersections.	Improve access for people with mobility impairments i.e., wheelchairs and mobility scooters.
Beltrees Street and Edgewater Drive	
Provide curb extensions on the westbound approach	**Reduce crossing distance for pedestrians**
Provide crosswalks including Rectangular Rapid Flashing Beacons (RRFBs) on the north and south legs of the intersection.	**Increase Attentiveness and Awareness.** To alert drivers to expect people crossing the street and to improve overall visibility of pedestrians crossing Edgewater Drive.
Beltrees Street between Edgewater Drive and Douglas Avenue	
Widen the sidewalk on the north side to provide a 10-foot to 12-foot shared-use path on the north side. Width of the trail will vary depending on available right-of-way and utility conflicts. This may require the removal or relocation of up to 27 trees.	**Remove Severe Conflicts.** To provide dedicated bicycle facilities for people on bicycles and provide facilities that appeal to a wider range of bicycle riders.
Convert the crossing at the Fred Marquis Pinellas Trail to a raised crossing.	**Increase Attentiveness and Awareness.** To improve visibility of trail users crossing Beltrees Street to drivers to increase yielding compliance.
Provide a raised intersection including textured pavement at the intersection of Beltrees Street and Broadway.	**Manage vehicular speeds.**

CORRIDOR CONCEPT	INTENDED BENEFIT
Beltrees Street and Douglas Avenue	
Provide high emphasis crosswalks with Elephant feet markings on west leg and south leg.	**Increase Attentiveness and Awareness**. To designate shared pedestrian and bicycle crossings.
Beltrees Street between Douglas Avenue and Milwaukee Avenue	
Provide a 10-foot to 12-foot shared-use path on the south side. Width of the trail will vary depending on available right-of-way and utility conflicts. Because of the limited space between the sidewalk and the curb, this would require curb reconstruction to provide the 10' minimum width of the Shared Use Path. It is recommended that the City coordinate with the School Board to obtain an easement to accommodate the proposed trail.	**Remove Severe Conflicts.** To provide dedicated bicycle facilities for people on bicycles and provide facilities that appeal to a wider range of bicycle riders.
Provide a marked crosswalk including RRFBs and a 6-foot refuge island approximately 600 feet east of Douglas Avenue.	**Remove Severe Conflicts and Increase Attentiveness and Awareness.** To provide more opportunities to cross Beltrees Street. Currently, the average spacing between marked crosswalks is approximately 1/4-mile with marked crosswalks only being provided at the signalized intersections.

(Continued on next page)

CORRIDOR CONCEPT	INTENDED BENEFIT
Beltrees Street and Milwaukee Avenue	
Convert traffic control to a mini roundabout and provide raised crosswalks on all approaches. A planning level analysis is provided below based on AM and PM peak hour volumes.	**Remove Severe Conflicts.** To manage vehicular speeds. To mitigate the risk of right-angle crashes by reducing the potential crash angles. To provide consistent traffic control during hurricanes.
Beltrees Street between Milwaukee Avenue and Patricia Avenue	
Provide a two-way cycle track separated by modular traffic segregators (e.g., Zicla Zippers) on the south side.	**Remove Severe Conflicts.** To provide dedicated bicycle facilities for people on bicycles.
Provide a marked crosswalk including RRFBs and a 6-foot refuge island approximately 600 feet east of Milwaukee Avenue and approximately 700 feet west of Patricia Avenue.	**Remove Severe Conflicts and Increase Attentiveness and Awareness.** To provide more opportunities to cross Beltrees Street. Currently, the average spacing between marked crosswalks is approximately 1/4-mile with marked crosswalks only being provided at the signalized intersections.

Intersection Treatments

The corridor concepts included changes to the intersection of Beltrees Street and Edgewater Drive and the intersection of Beltrees Steet and Milwaukee Avenue which would affect the operation of those intersections and the surrounding network. The following sections provide an assessment of the proposed changes to the individual intersections and the surrounding network.

BELTREES STREET AND MILWAUKEE AVENUE

A long-term concept is to convert the traffic control at the intersection from a traffic signal to a mini roundabout. A geometric and operational feasibility assessment was completed to determine if the proposed mini roundabout would be a viable alternative.

The geometric assessment was completed using Auto Turn software with a WB-62 as a design vehicle. The AutoTurn analysis shows that the proposed mini roundabout is a viable alternative from a geometric standpoint; the results of the AutoTurn Analysis are provided on **Figures 4 to 6**.

DESIGN VEHICLE

The design vehicle is the least maneuverable vehicle that routinely uses a street or a facility. Where emergency vehicles are much larger than the design vehicle, they can be permitted to make turns by using all areas of the right-of-way, including mountable corner islands or median tips, and portions of the sidewalk, where necessary.

CONTROL VEHICLE

The control vehicle is the least maneuverable vehicle that is ever planned to use a street, but potentially at very low speeds or with multipoint turns.

Source: NACTO

Figure 4. AutoTurn Analysis (Right Turn Movements)

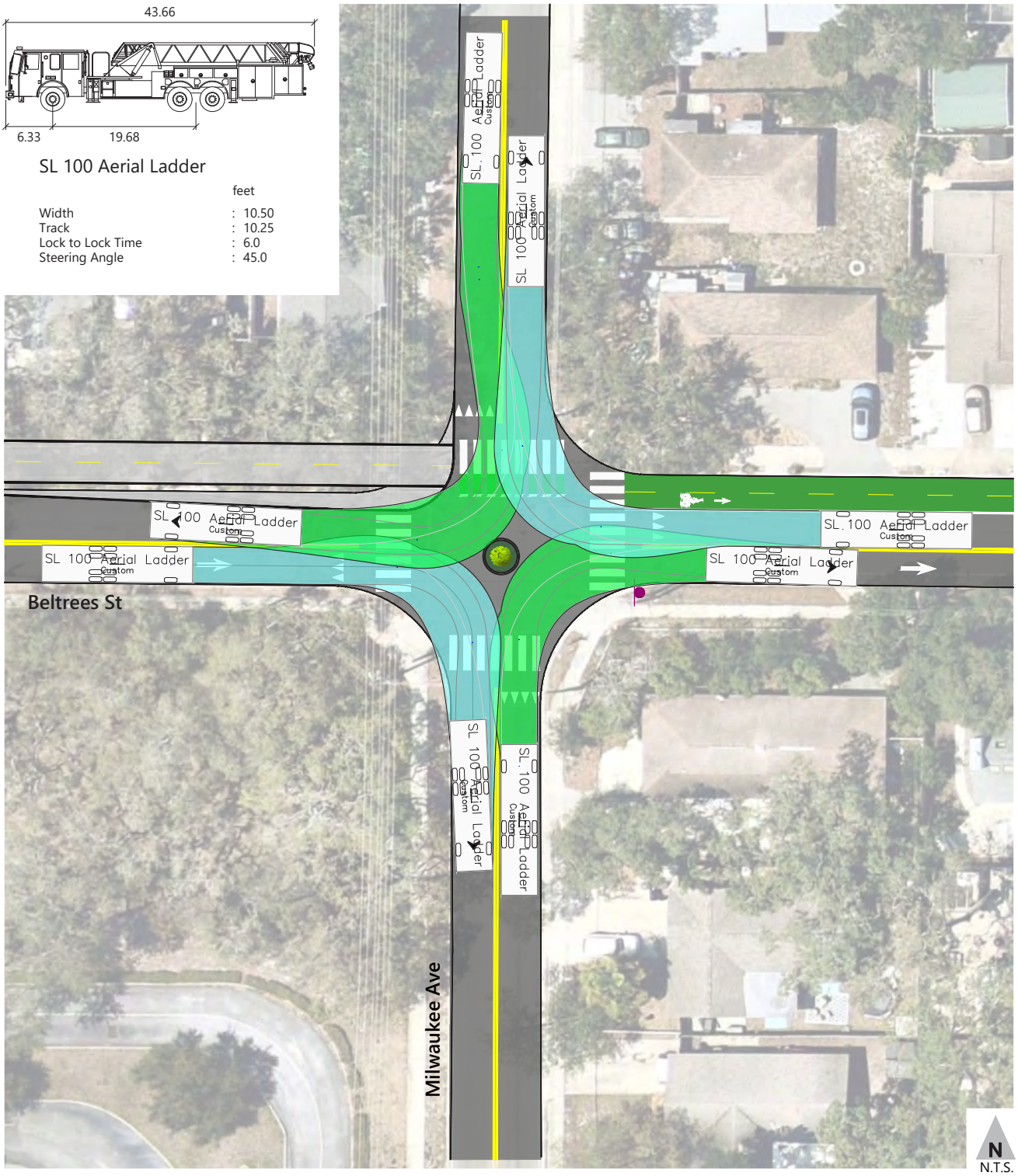


Figure 5. AutoTurn Analysis (Through Movements)

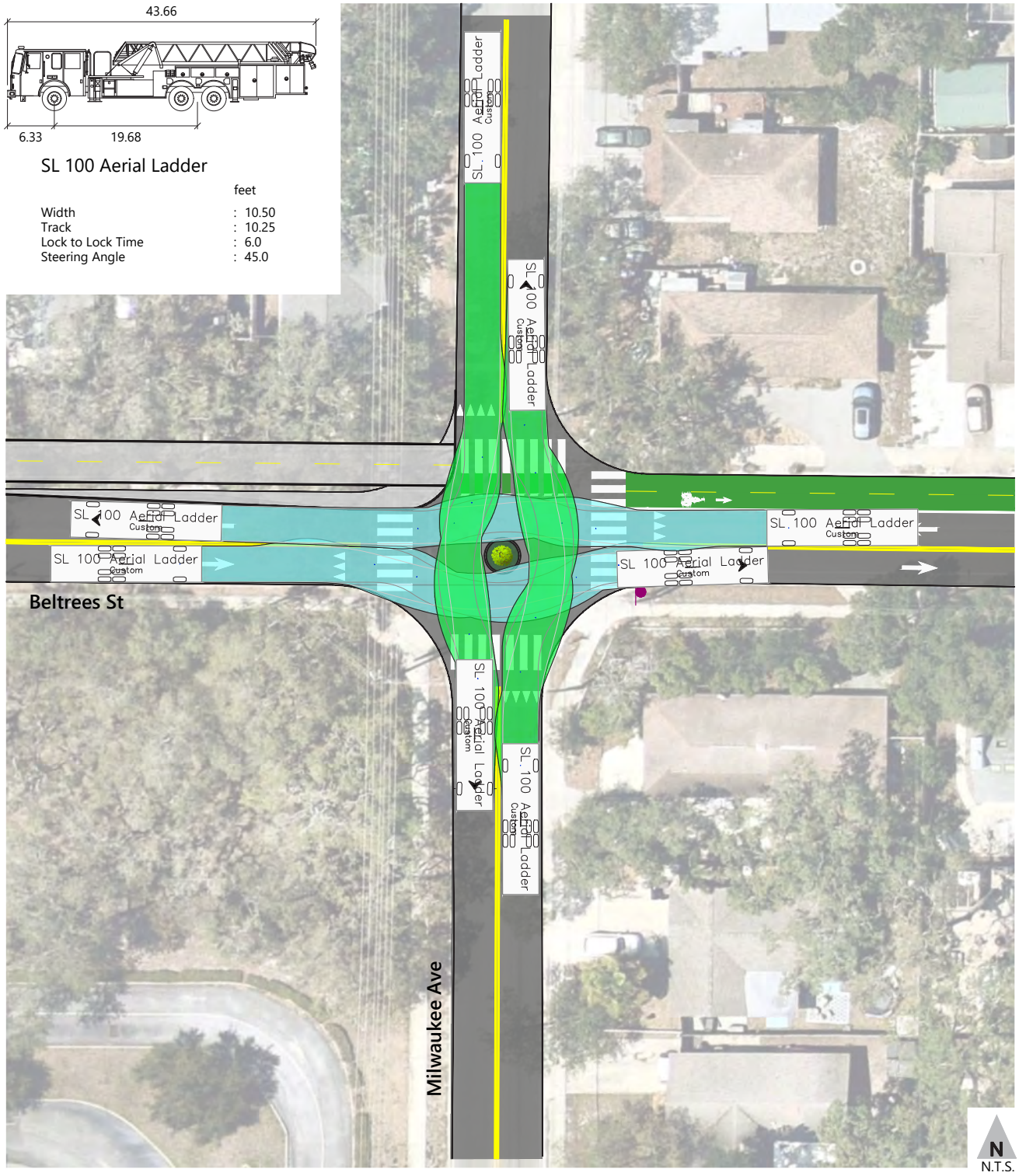
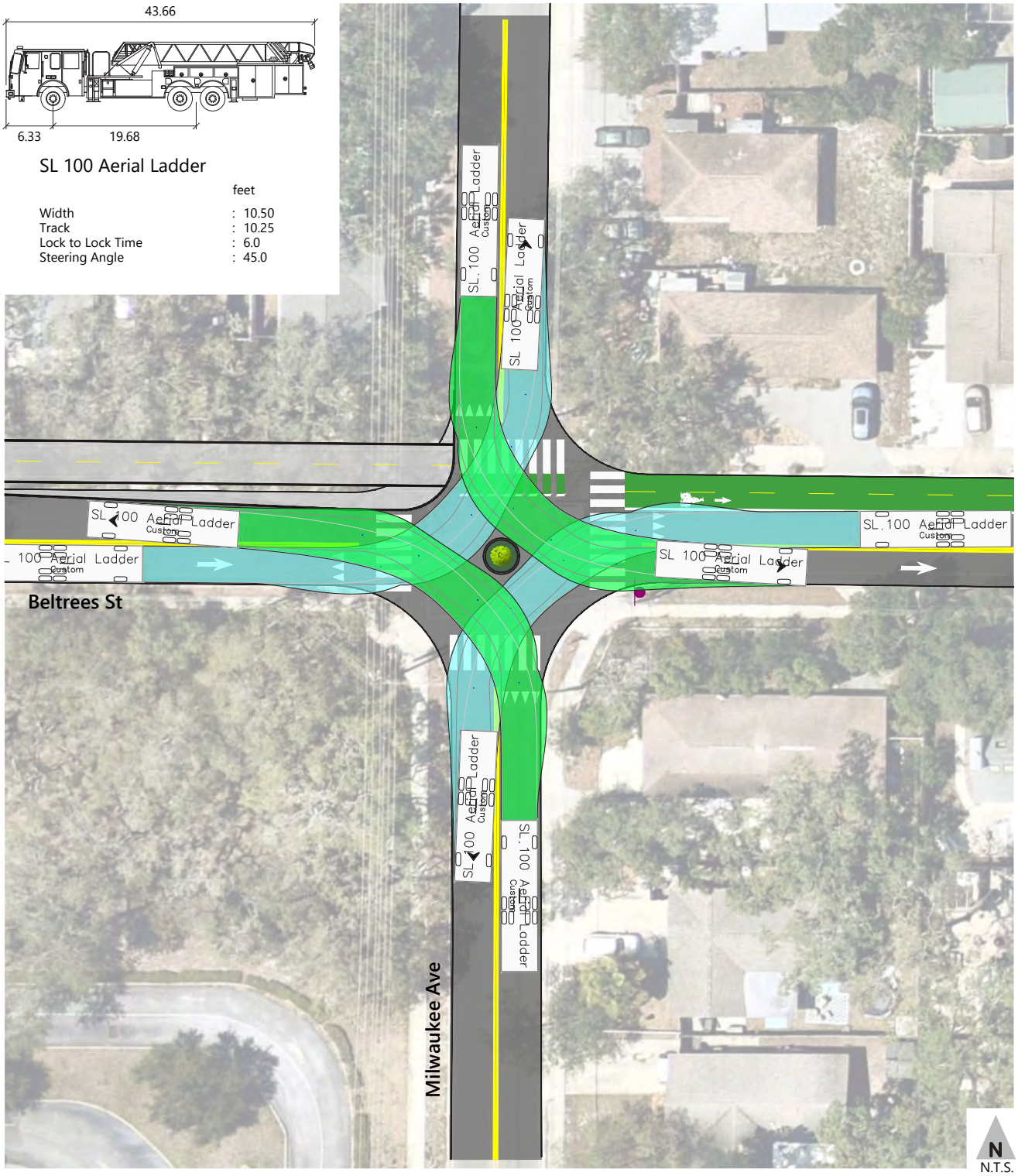


Figure 6. AutoTurn Analysis (Left Turn Movements)

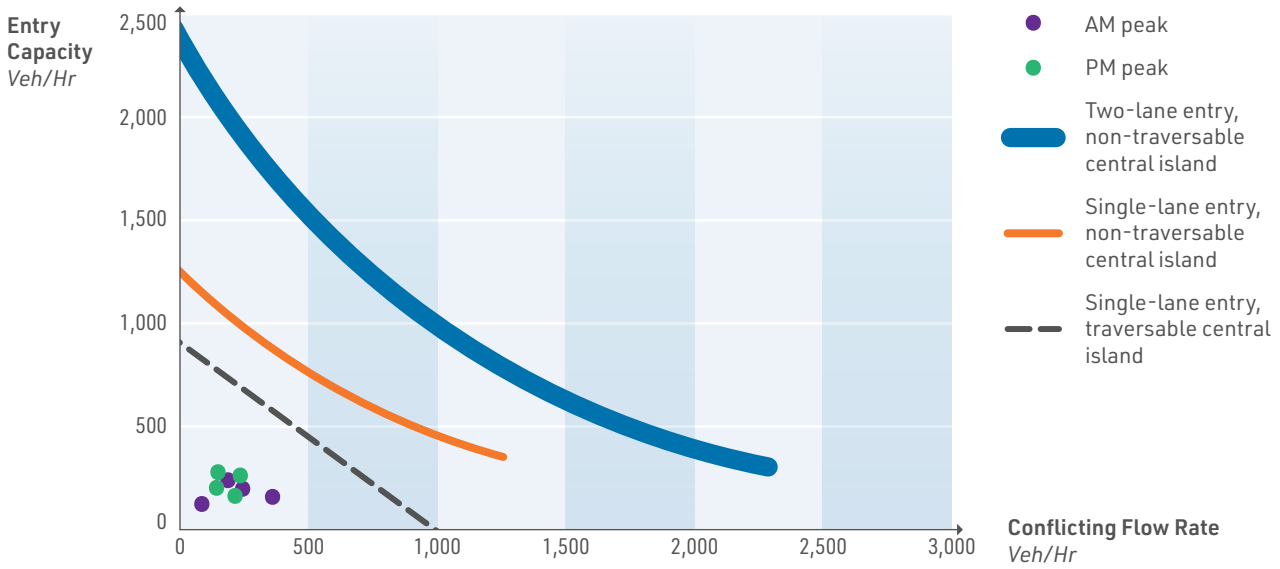


The operational assessment was completed using the Planning-level capacity estimate chart (Exhibit 8.5) from NCHRP 1043 (Guide for Roundabouts). The entry flows and conflicting flows are presented in **Table 5** and were developed based on the AM and PM peak hour traffic volumes at the intersection (see Existing Conditions in Appendix B). Dots representing the respective volumes are pinned to the chart presented in **Figure 6** for illustration purposes. As shown in **Figure 6**, the approach and circulatory peak hour volumes are substantially below the capacity thresholds for a single lane roundabout; the proposed mini roundabout is a viable alternative. It is acknowledged that mini roundabouts and traditional single-lane roundabouts have some slight operational differences; however, considering how far the volumes are below the threshold for a single lane roundabout, it is anticipated that the mini roundabout would operate adequately. A more detailed operational analysis is recommended during the design phase of this project that considers conductions before and after a game at the TD Ballpark.

Table 5. Roundabout Entry and Conflicting Volumes

APPROACH	VOLUME	AM PEAK	PM PEAK
Eastbound	Entry	132	159
	Conflicting	323	195
Westbound	Entry	191	157
	Conflicting	152	179
Northbound	Entry	189	200
	Conflicting	68	163
Southbound	Entry	234	163
	Conflicting	179	135

Figure 7. Planning Level Capacity Estimate



BELTREES STREET AND EDGEWATER DRIVE

A long-term alternative between Douglas Avenue and Edgewater Drive is to convert Beltrees Street to a one-way street westbound. That reconfiguration would restrict northbound right-turns and southbound left turns at the intersection of Beltrees Street and Edgewater Drive. The turning volumes for the northbound right-turn and the southbound left-turn at the intersection of Beltrees Street and Edgewater Drive are presented in **Table 6**.

As shown in **Table 6**, these vehicular volumes are relatively low and could be absorbed by the surrounding network with minimal disruptions to the operation of other intersections. Approximately ten houses take direct access from Beltrees Street and would be most affected by the proposed access change. Additional outreach to the residents most directly affected should occur as part of the design process should that element remain. In an emergency, sufficient right-of-way would be maintained such that emergency vehicles could travel on the street in either direction to minimize any potential disruptions in emergency response time.

Table 6. Traffic Volumes to be Redirected with Proposed Configuration

MOVEMENT	AM PEAK	PM PEAK
Northbound Right Turn	29	65
Southbound Left-Turn	1	8

OPINION OF PROBABLE COST FOR ALTERNATIVES

Planning level cost estimates were prepared for the two alternative based on FDOT's Basis of Estimates and the Cost Per Mile Models Report. A per-mile cost for each project element was calculated based on the current unit prices of the compiled FDOT standard pay items required to construct the respective element. In addition to the construction costs, percentage-based costs were included for contractor mobilization and maintenance of traffic, set at 10% each. A project contingency factor of 30% was also applied to account for unknowns and additional cost escalations. The cost estimates include reconstruction of curb ramps along the corridor to meet current ADA standards as well as addressing other ADA deficiencies along the corridor. The cost for some roadway elements shown in **Table 7** and **Table 8** are also reliant on other portions of the construction process. For example, the estimate for the roundabouts does not include costs for site preparation, grading, and other elements, which are estimated elsewhere. Street lighting is also not included since the cost would largely depend on the type of fixture selected as well as the lighting levels provided that would dictate spacing. Other community amenities are also not included, such as benches and bike racks.

High-level summary by major category are provided in **Table 7** and **Table 8** with the full cost estimates provided in Appendix C. The cost estimates included in **Table 7** and **Table 8** are for evaluation purposes only; as the project moves into subsequent phases, detailed cost estimates will need to be prepared.

Table 7. Planning Level Cost Estimate Summary for Alternative #1

DESCRIPTION		ESTIMATED COST
Roadway Construction	$	1,244,300
Signalization	$	64,000
Signing and Pavement Markings	$	83,592
SUBTOTAL	**$**	**1,391,892**
Mobilization (10%)	$	139,189
Maintenance of Traffic (MOT) (10%)	$	139,189
SUB-TOTAL WITH MOBILIZATION AND MOT	**$**	**1,670,270**
Project Unknowns/Contingency (30%)	$	501,081
GRAND TOTAL	**$**	**2,171,352**

Table 8. Planning Level Cost Estimate Summary for Alternative #2

DESCRIPTION		ESTIMATED COST
Roadway Construction	$	$1,656,940
Signalization	$	$64,000
Signing and Pavement Markings	$	$67,352
SUBTOTAL	**$**	**$1,788,292**
Mobilization (10%)	$	$178,829
Maintenance of Traffic (MOT) (10%)	$	$178,829
SUB-TOTAL WITH MOBILIZATION AND MOT	**$**	**$2,145,950**
Project Unknowns/Contingency (30%)	$	$643,785
GRAND TOTAL	**$**	**$2,789,736**

Technical Appendices

APPENDIX A – CORRIDOR CONCEPT PLANS

APPENDIX B – EXISTING CONDITIONS REPORT

APPENDIX C - COST ESTIMATES

Appendix A:

Corridor Concept Plans

Short Term/ Quick Build Alternatives

ST-1

CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL
DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Beltrees Street - Edgewater Drive to Patricia Avenue
Short Term Concept

MATCHLINE - SEE SHEET LT-1

MATCHLINE - SEE SHEET LT-3

INSTALL W11-1 AND W16-7P ON BOTH APPROACHES TO PINELLAS TRAIL

Broadway

Fred Marquis Pinellas Trail

N

1:40

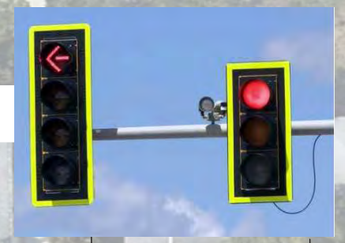
ST-2

CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Beltrees Street - Edgewater Drive to Patricia Avenue
Short Term Concept

MATCHLINE - SEE SHEET LT-2

INSTALL FLEXIBLE RETRO-REFLECTIVE BACKPLATES ON ALL APPROACHES



Douglas Ave

MATCHLINE - SEE SHEET LT-4

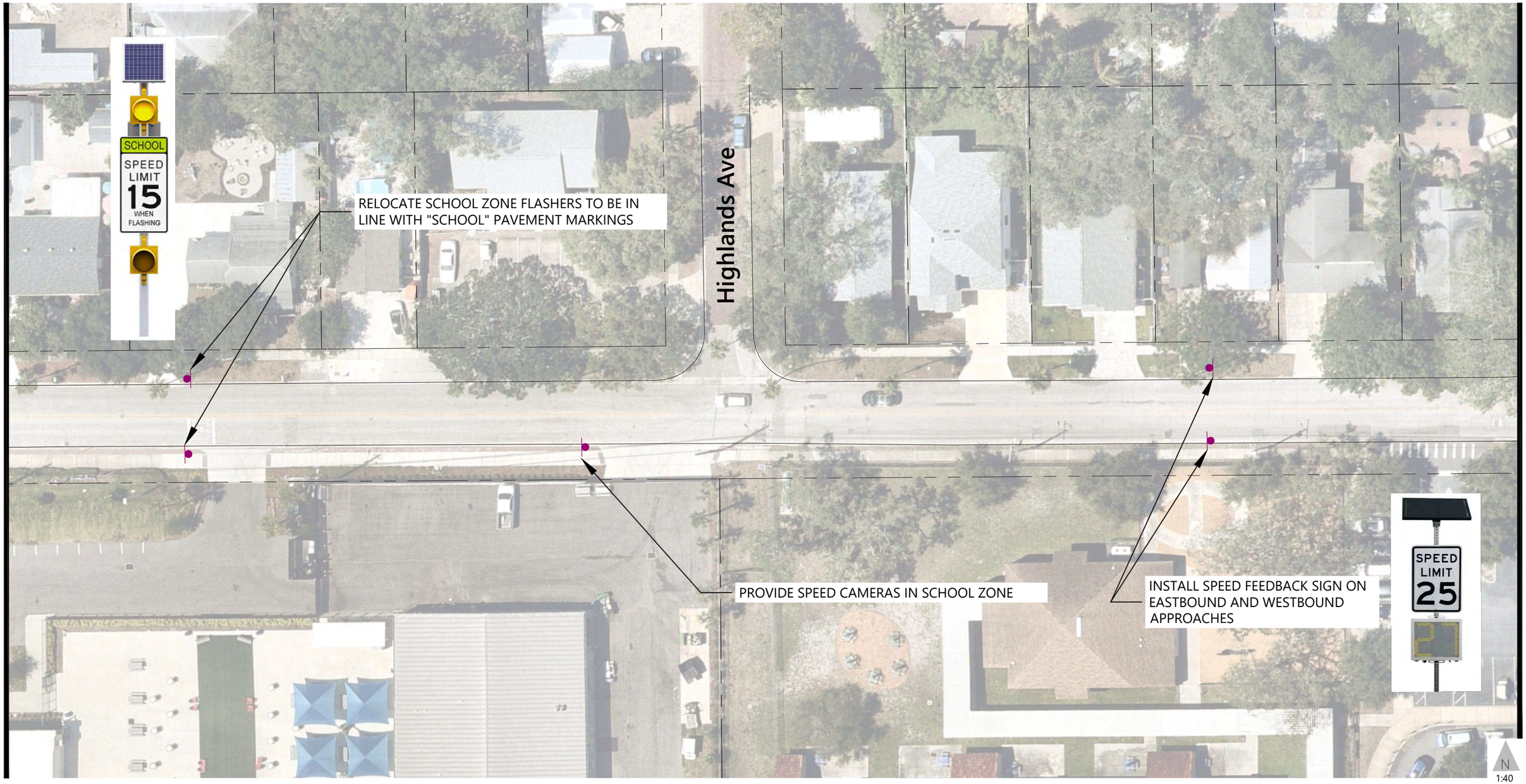
N

1:40

ST-3

CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Beltrees Street - Edgewater Drive to Patricia Avenue
Short Term Concept

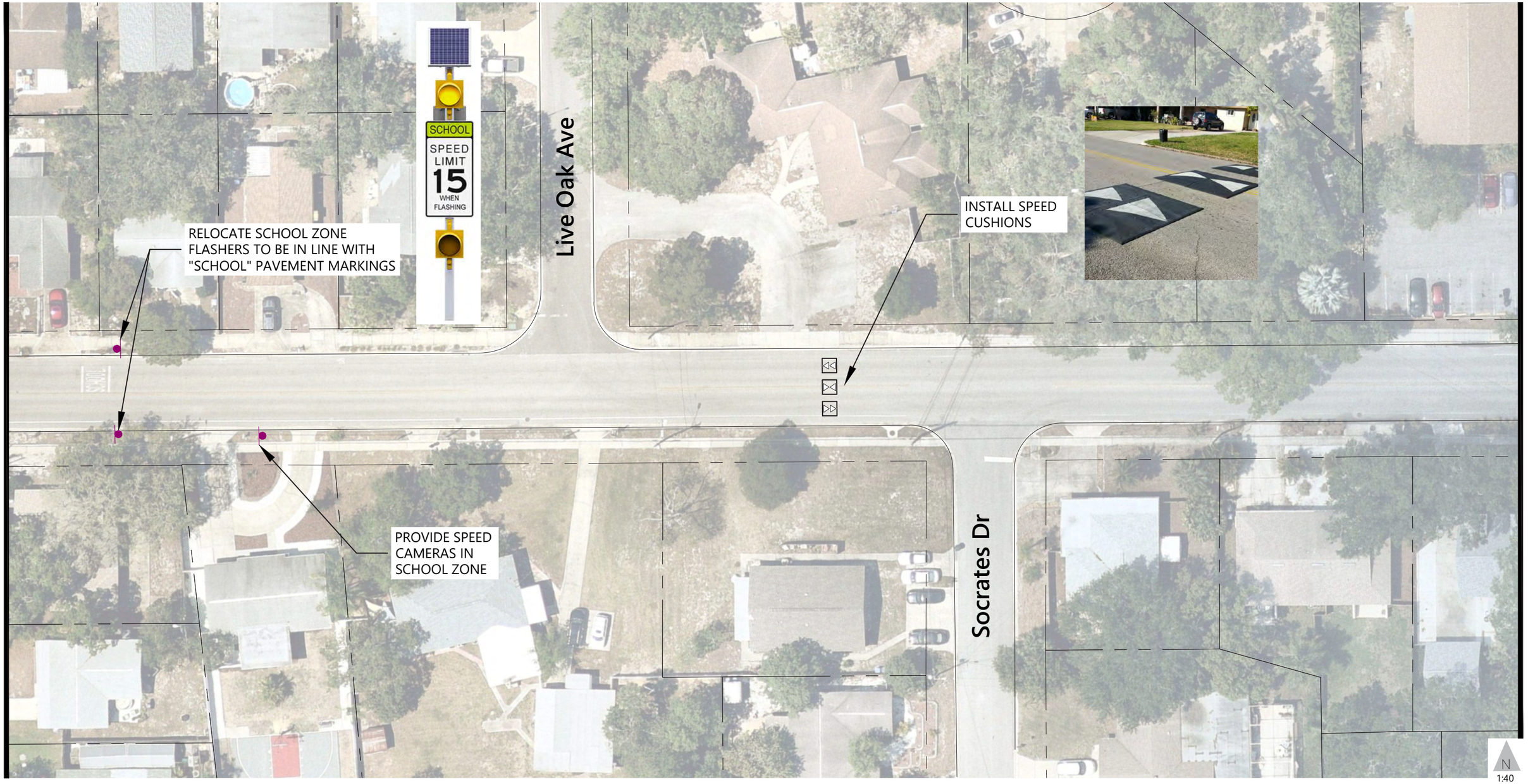


Beltrees Street - Edgewater Drive to Patricia Avenue
Short Term Concept

CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL
DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Beltrees Street - Edgewater Drive to Patricia Avenue
Short Term Concept

CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL
DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.



CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL
DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Beltrees Street - Edgewater Drive to Patricia Avenue
Short Term Concept

MATCHLINE - SEE SHEET LT-6

New York Ave

Acropolis Dr

INSTALL SPEED FEEDBACK SIGN ON EASTBOUND APPROACH

MATCHLINE - SEE SHEET LT-8

N

1:40

CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Beltrees Street - Edgewater Drive to Patricia Avenue
Short Term Concept

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CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Beltrees Street - Edgewater Drive to Patricia Avenue
Short Term Concept

MATCHLINE - SEE SHEET LT-8

ST-9

CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL
DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Beltrees Street - Edgewater Drive to Patricia Avenue
Short Term Concept

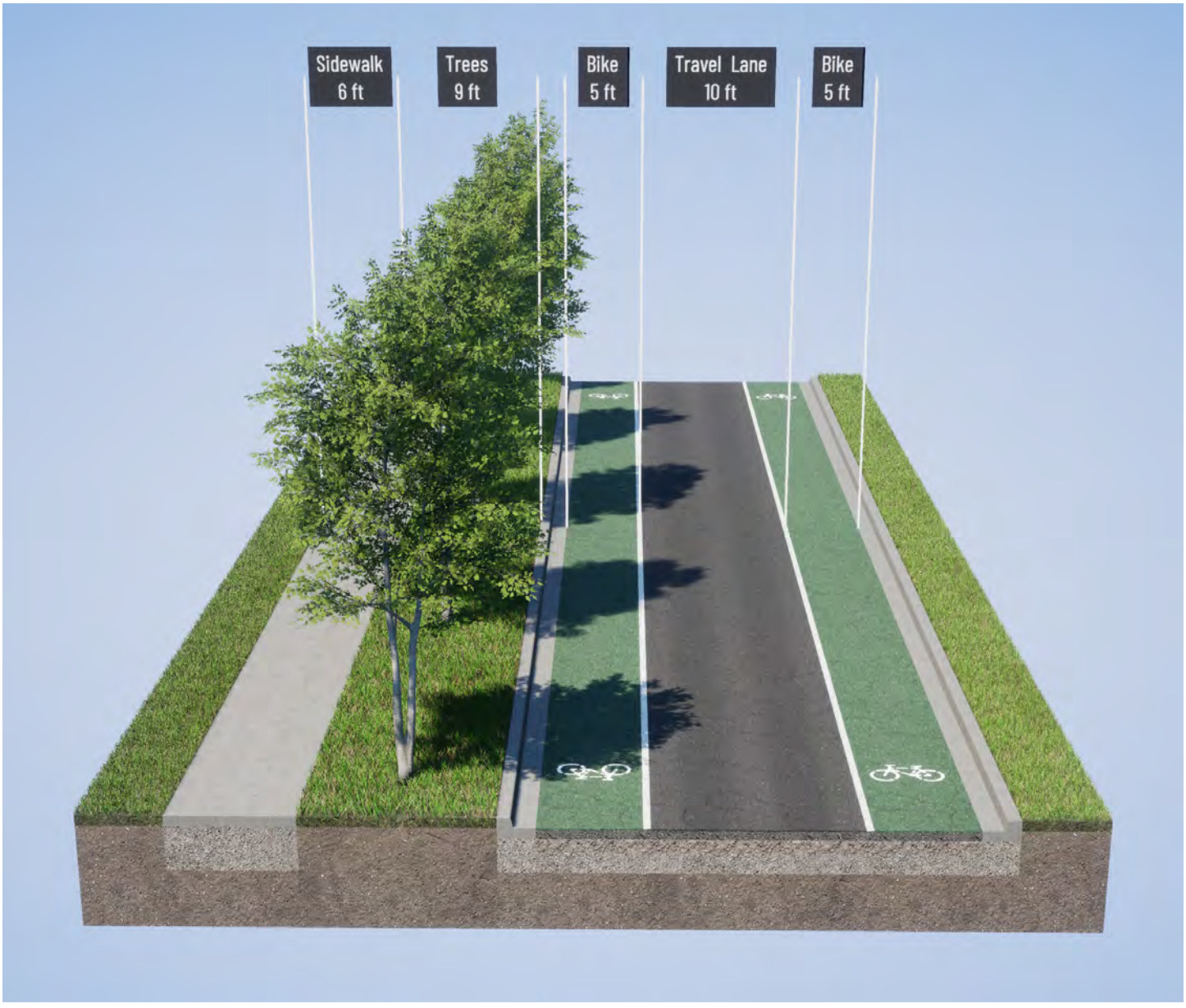
Midterm/ Long Term Alternatives:

Alternative 1

MIDTERM/LONG TERM ALTERNATIVES

Alternative 1

Cross Section between Edgewater Drive and Douglas Avenue (Looking East)

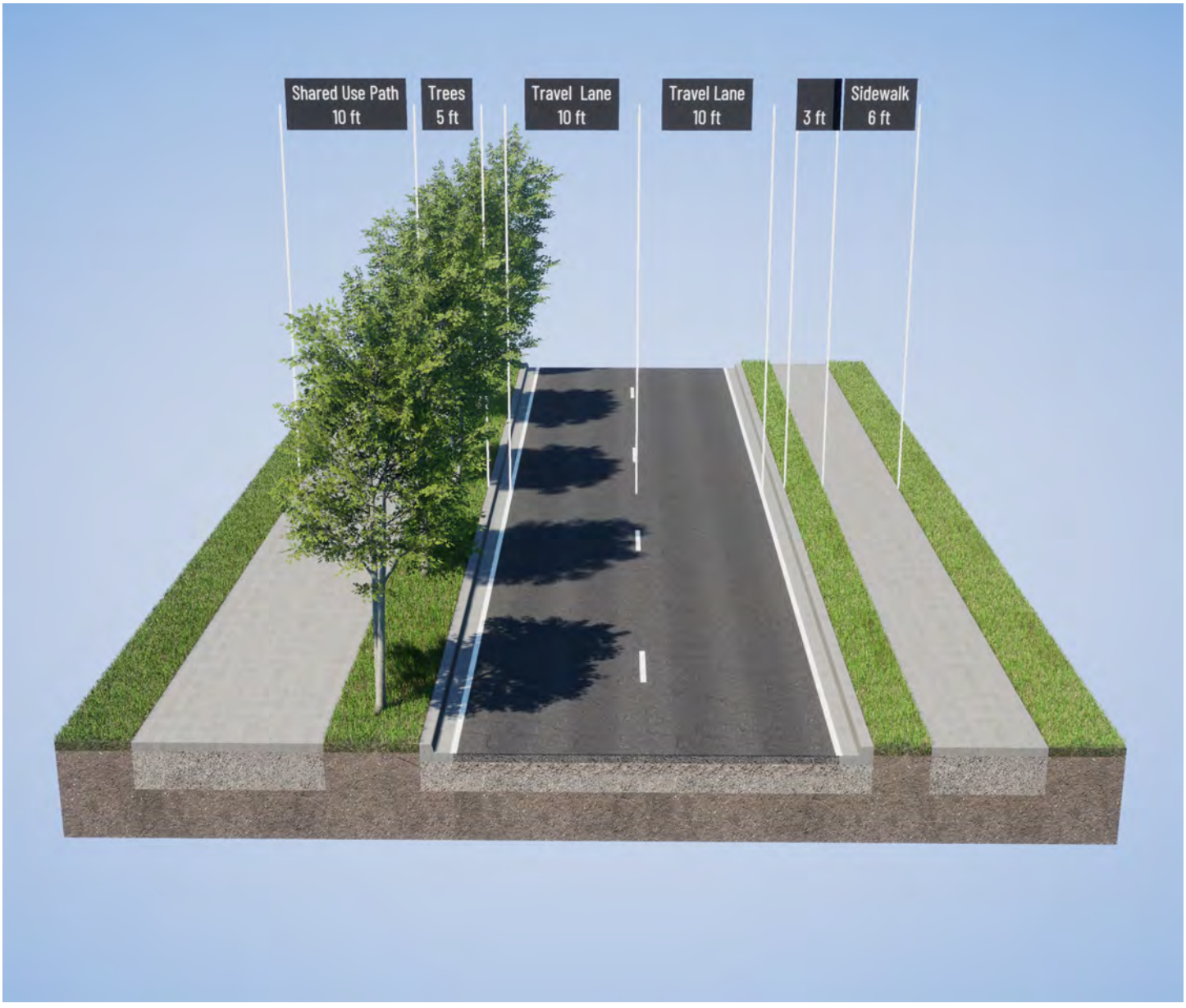


Note: For this cross section, the 5-foot bike lane includes a 6" edge line, resulting in an effective lane width of 4.5 feet.

MIDTERM/LONG TERM ALTERNATIVES

Alternative 1

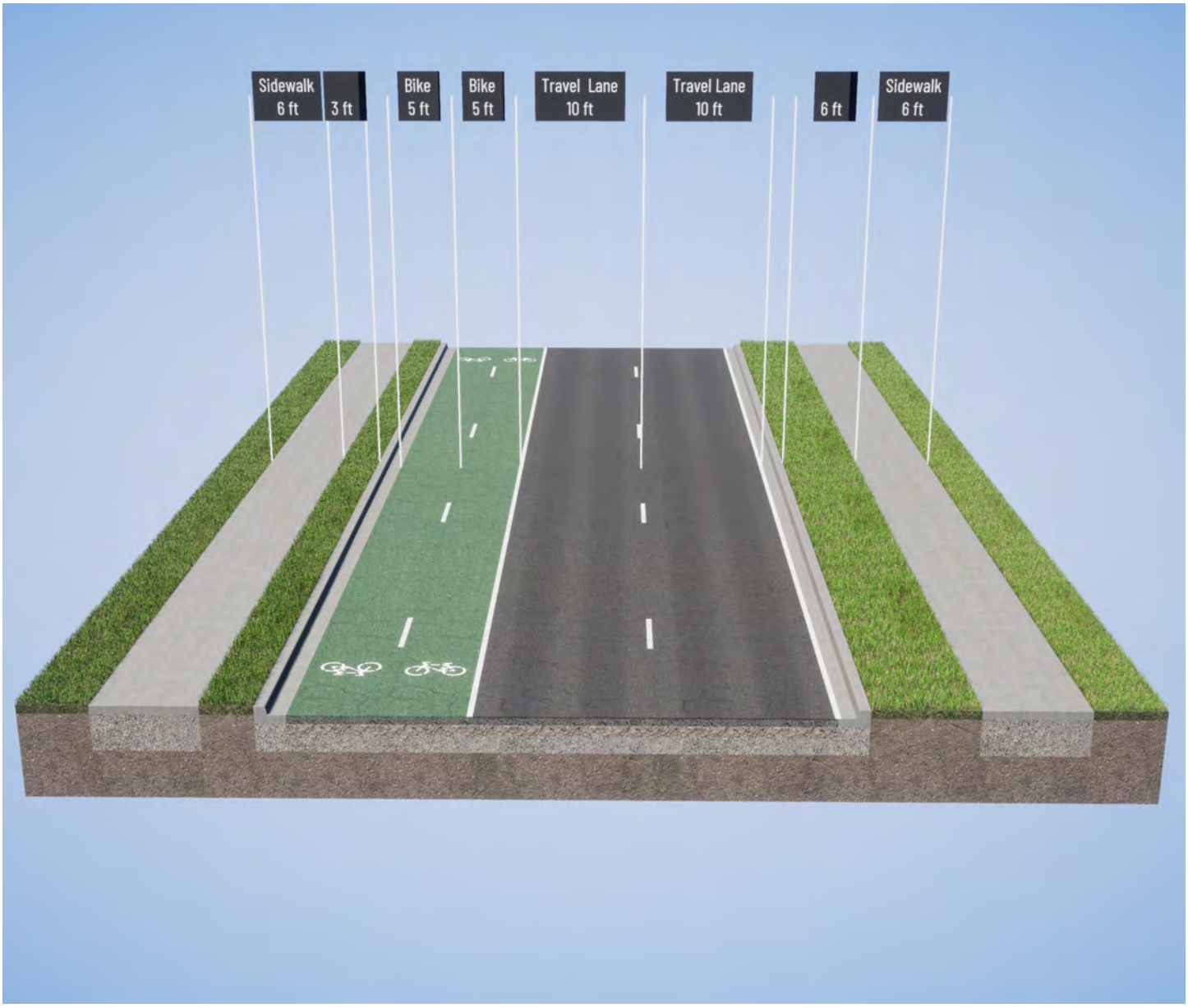
Cross Section between Douglas Avenue and Milwaukee Avenue (Looking East)



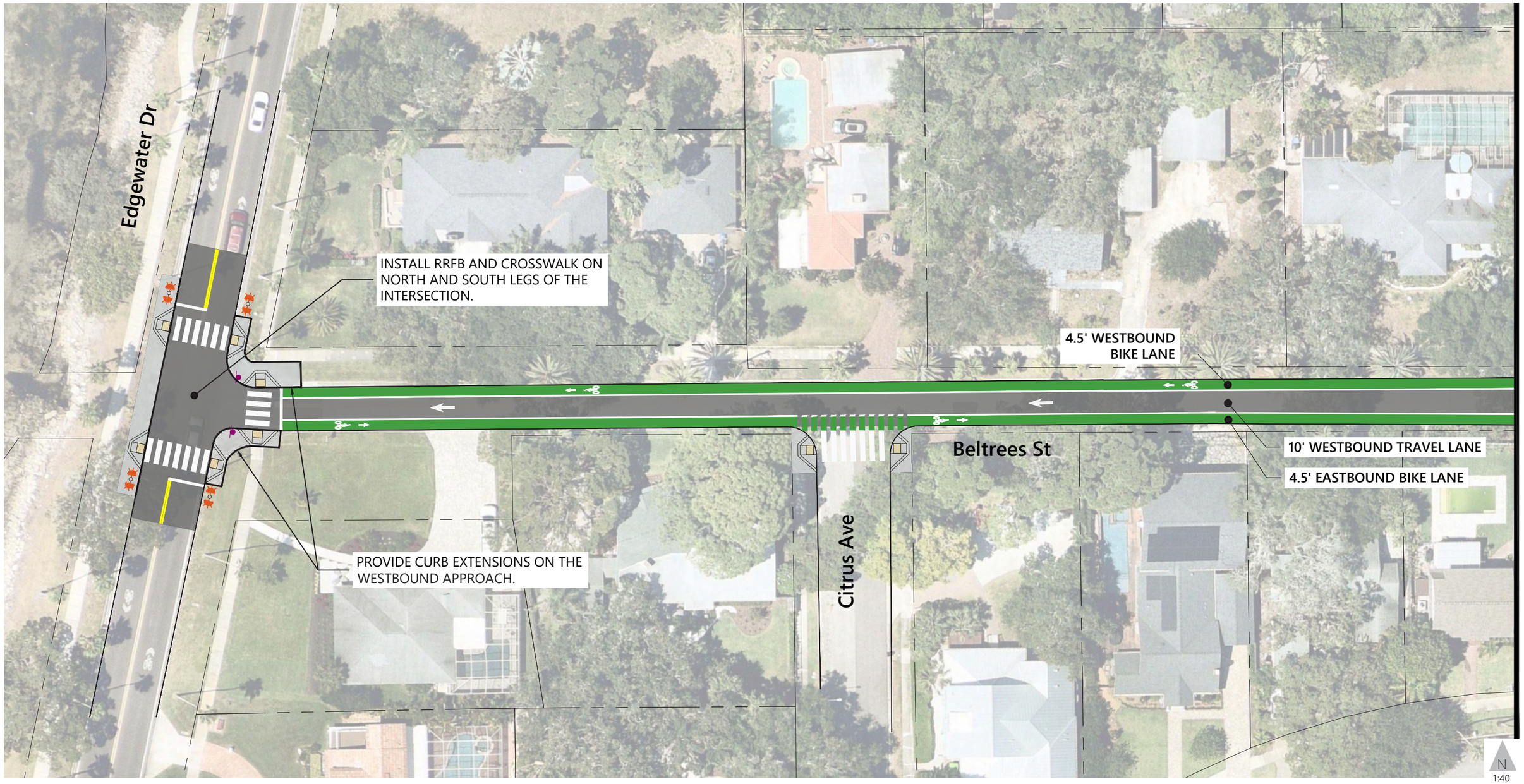
MIDTERM/LONG TERM ALTERNATIVES

Alternative 1

Cross Section between Milwaukee Avenue and Patricia Avenue (Looking East)



Note: Vertical separation between the travel lane and the bike lane could be accomplished with low profile lane dividers such as Zicla Zipper ® or Armadillos ® (lane dividers not shown in cross-section). Height of vertical separation is intended to accommodate trash pickup).



MATCHLINE - SEE SHEET LTA1-2

NOTE:

DIRECTION OF TRAVEL LANE TO BE DETERMINED.
10' WESTBOUND TRAVEL LANE SHOWN FOR ILLUSTRATION PURPOSE.

LTA1-1

CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Beltrees Street - Edgewater Drive to Patricia Avenue
Long Term Concept - Alternative 1

MATCHLINE - SEE SHEET LTA1-1

MATCHLINE - SEE SHEET LTA1-3

INSTALL RAISED INTERSECTION

INSTALL RAISED CROSSWALK AT FRED MARQUIS PINELLAS TRAIL.

Broadway

Fred Marquis Pinellas Trail

N

1:40

NOTE:

DIRECTION OF TRAVEL LANE TO BE DETERMINED.
10' WESTBOUND TRAVEL LANE SHOWN FOR ILLUSTRATION PURPOSE.

LTA1-2

CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Beltrees Street - Edgewater Drive to Patricia Avenue
Long Term Concept - Alternative 1

MATCHLINE - SEE SHEET LTA1-2

MATCHLINE - SEE SHEET LTA1-4

INSTALL HIGH EMPHASIS CROSSWALK
COMBINED WITH GREEN BIKE MARKINGS.

INSTALL SHARED USE PATH.

5' 5'

INSTALL R3-17B

BIKE LANE ENDS

Douglas Ave

N

1:40

NOTE:

DIRECTION OF TRAVEL LANE TO BE DETERMINED.
10' WESTBOUND TRAVEL LANE SHOWN FOR
ILLUSTRATION PURPOSE.

LTA1-3

CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL
DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Beltrees Street - Edgewater Drive to Patricia Avenue
Long Term Concept - Alternative 1

MATCHLINE - SEE SHEET LTA1-3

Highlands Ave

10' 10'

13' 13'

6' 6'

11' 15'

6' 6'

INSTALL PINCHPOINT.

INSTALL HIGH-EMPHASIS MARKED CROSSWALK, RRFB AND A 6' REFUGE ISLAND.

MATCHLINE - SEE SHEET LTA1-5

N

1:40

LTA1-4

CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Beltrees Street - Edgewater Drive to Patricia Avenue
Long Term Concept - Alternative 1

MATCHLINE - SEE SHEET LTA1-4

MATCHLINE - SEE SHEET LTA1-6

Louden Ave

Milwaukee Ave

Colonial Ct

INSTALL HIGH EMPHASIS CROSSWALK
COMBINED WITH GREEN BIKE MARKINGS.
INSTALL PERMANENT TRAFFIC CIRCLE.

INSTALL CHICANE.

9'

9'

21'

10'

19'

26'

23'

N

1:40

LTA1-5

Beltrees Street - Edgewater Drive to Patricia Avenue
Long Term Concept - Alternative 1

CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL
DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

MATCHLINE - SEE SHEET LTA1-5

Live Oak Ave

INSTALL HIGH EMPHASIS CROSSWALK WITH RRFB.

Socrates Dr

MATCHLINE - SEE SHEET LTA1-7

N

1:40

CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL
DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Beltrees Street - Edgewater Drive to Patricia Avenue
Long Term Concept - Alternative 1

MATCHLINE - SEE SHEET LTA1-6

MATCHLINE - SEE SHEET LTA1-8

New York Ave

Acropolis Dr

5' WESTBOUND BIKE LANE

5' EASTBOUND BIKE LANE

10' WESTBOUND TRAVEL LANE

10' EASTBOUND TRAVEL LANE

N

1:40

NOTE:

DIRECTION OF TRAVEL LANE TO BE DETERMINED.
10' WESTBOUND TRAVEL LANE SHOWN FOR
ILLUSTRATION PURPOSE.

CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL
DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Beltrees Street - Edgewater Drive to Patricia Avenue
Long Term Concept - Alternative 1

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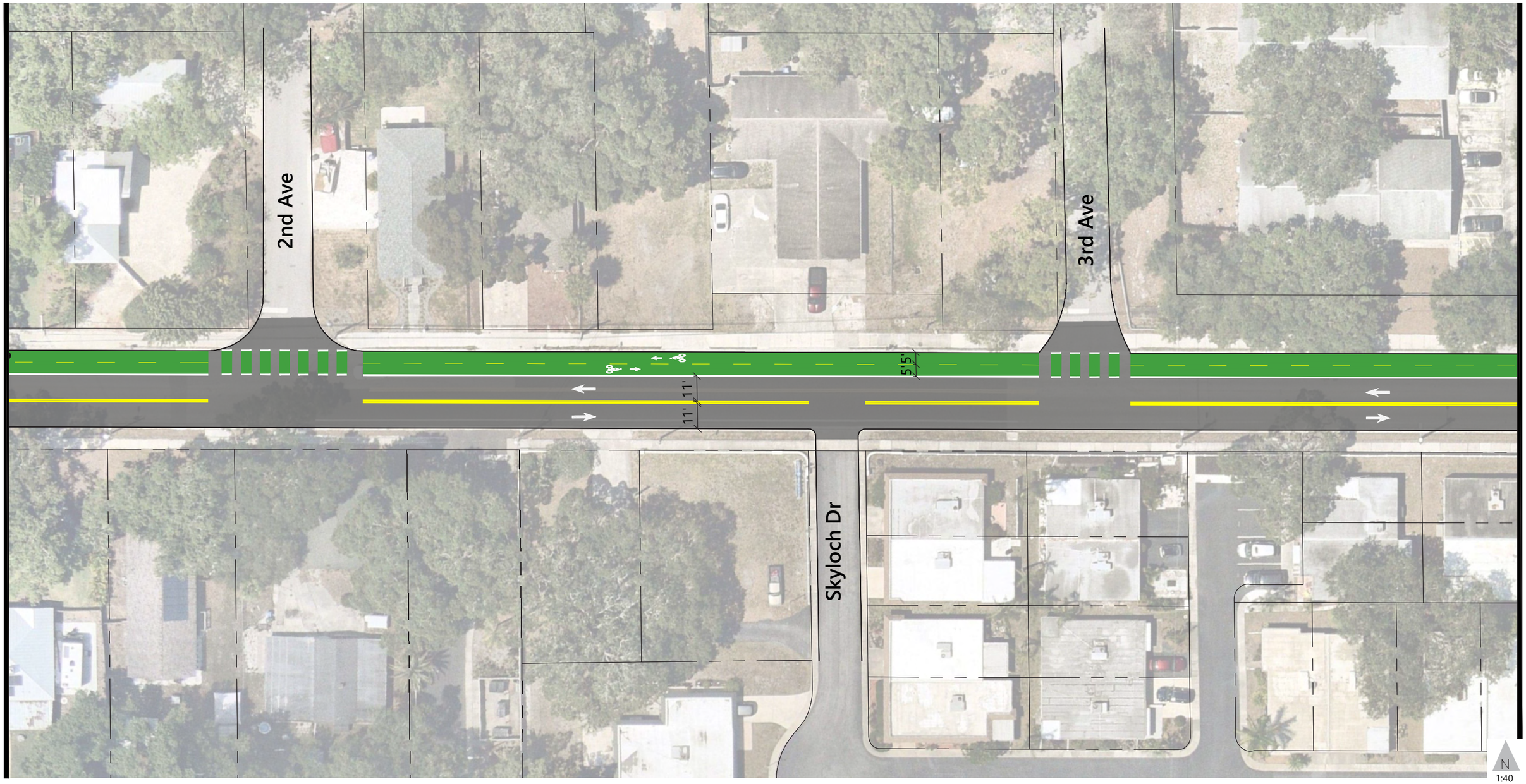
MATCHLINE - SEE SHEET LTA1-7



MATCHLINE - SEE SHEET LTA1-9

NOTE:
DIRECTION OF TRAVEL LANE TO BE DETERMINED.
10' WESTBOUND TRAVEL LANE SHOWN FOR
ILLUSTRATION PURPOSE.

CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL
DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Beltrees Street - Edgewater Drive to Patricia Avenue
Long Term Concept - Alternative 1

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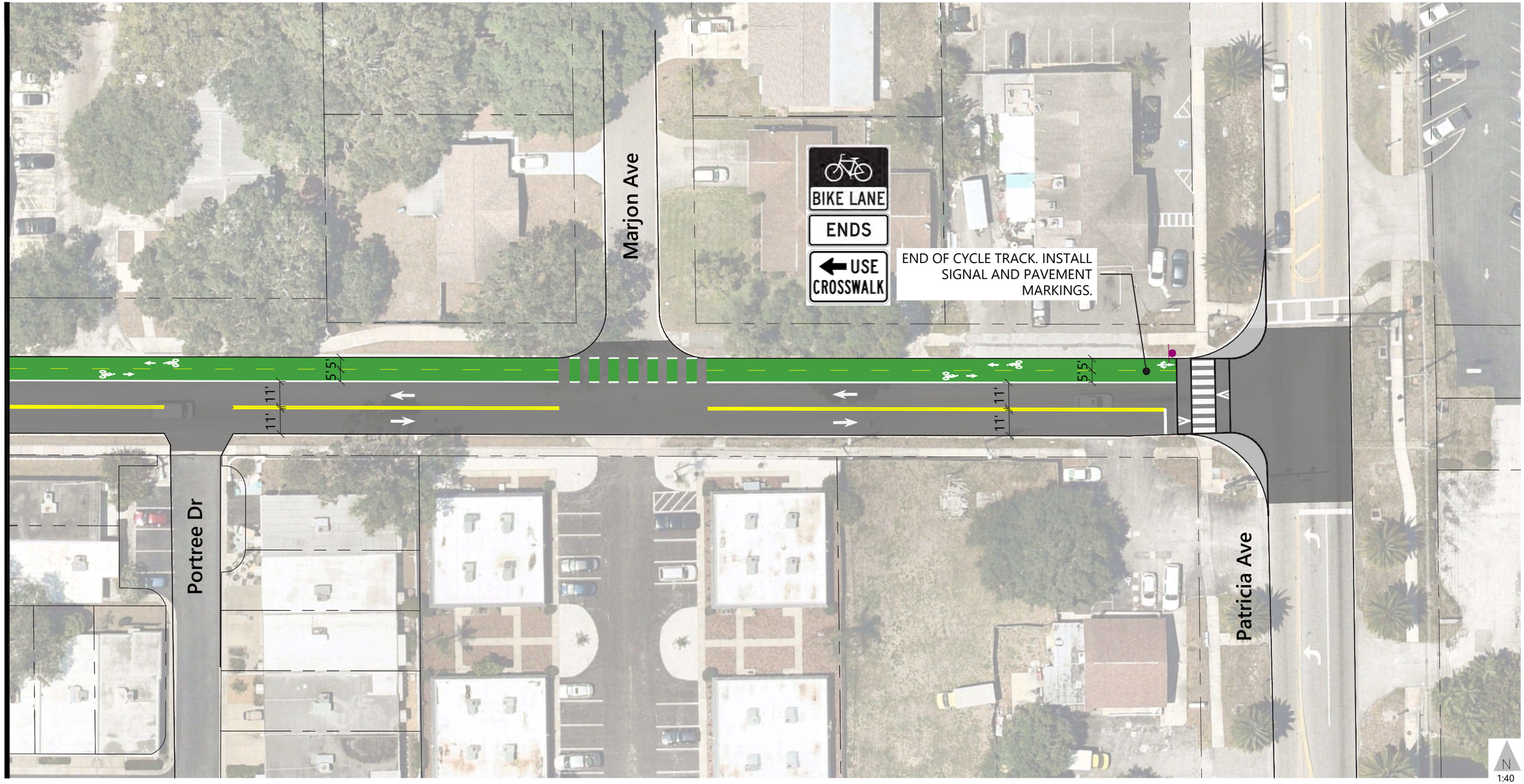
Apr 11, 2024

MATCHLINE - SEE SHEET LTA1-8



NOTE:
DIRECTION OF TRAVEL LANE TO BE DETERMINED.
10' WESTBOUND TRAVEL LANE SHOWN FOR ILLUSTRATION PURPOSE.

CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Beltrees Street - Edgewater Drive to Patricia Avenue
Long Term Concept - Alternative 1

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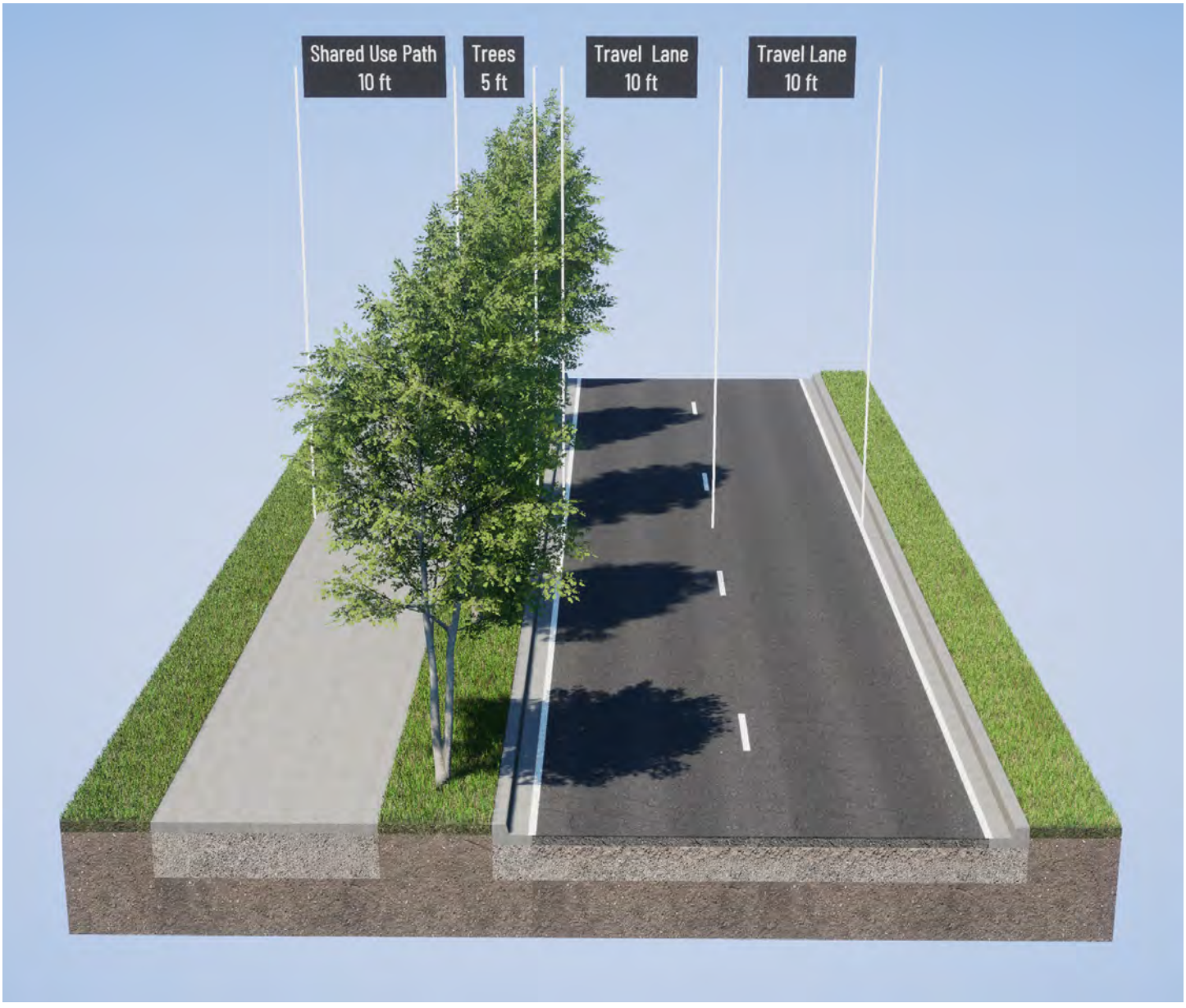
Midterm/ Long Term Alternatives:

Alternative 2

Alternative 2

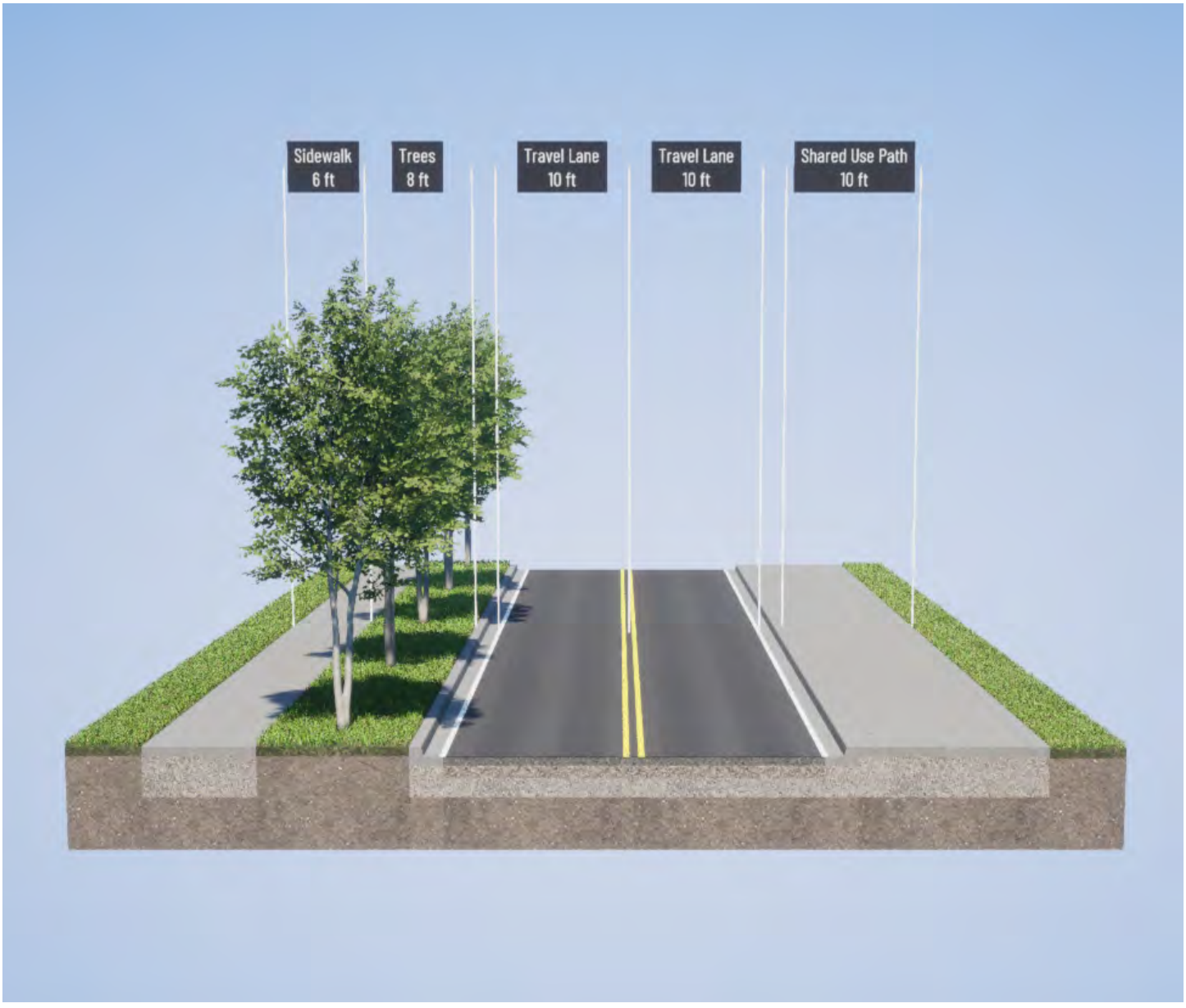
Cross Section between Edgewater Drive and Douglas Avenue (Looking East)



MIDTERM/LONG TERM ALTERNATIVES

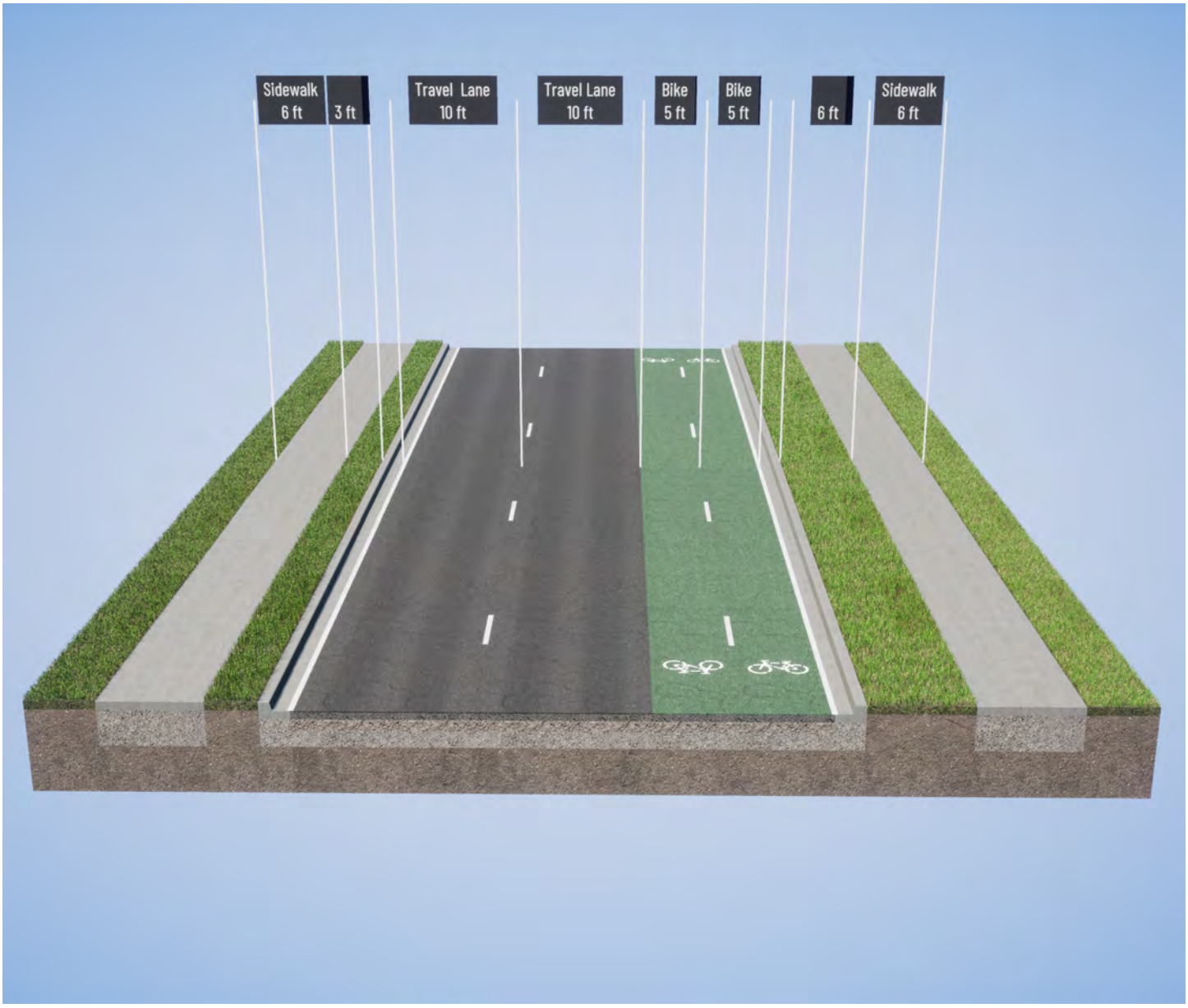
Alternative 2

Cross Section between Douglas Avenue and Milwaukee Avenue (Looking East)

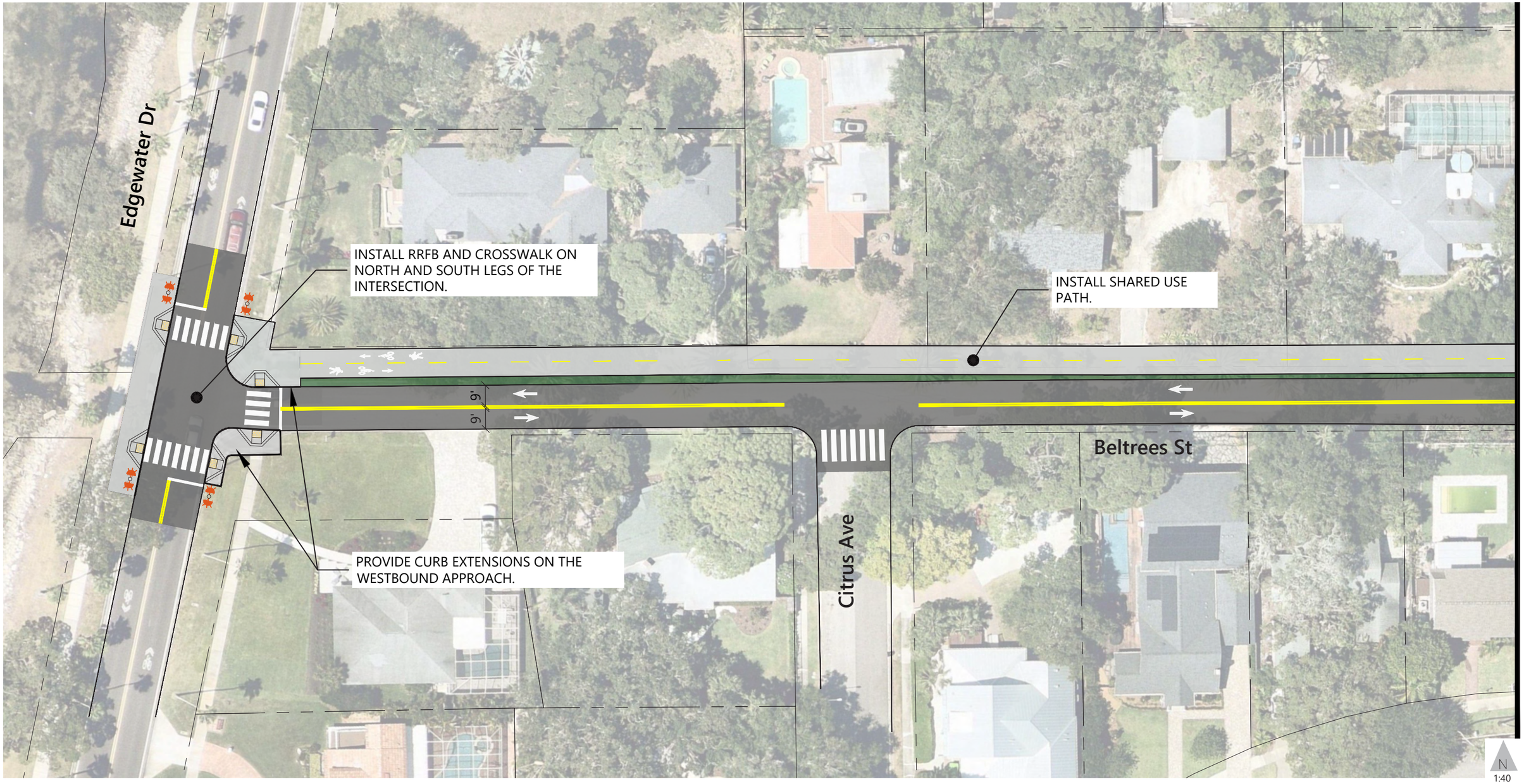


Alternative 2

Cross Section between Milwaukee Avenue and Patricia Avenue (Looking East)



Note: Vertical separation between the travel lane and the bike lane could be accomplished with low profile lane dividers such as Zicla Zipper ® or Armadillos ® (lane dividers not shown in cross-section). Height of vertical separation is intended to accommodate trash pickup).



MATCHLINE - SEE SHEET LTA2-2

LTA2-1

CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL
DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Beltrees Street - Edgewater Drive to Patricia Avenue
Long Term Concept - Alternative 2

MATCHLINE - SEE SHEET LTA2-1

MATCHLINE - SEE SHEET LTA2-3

INSTALL RAISED INTERSECTION

INSTALL SHARED USE PATH.

INSTALL RAISED CROSSWALK AT FRED MARQUIS PINELLAS TRAIL.

Broadway

Fred Marquis Pinellas Trail

N

1:40

CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL
DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Beltrees Street - Edgewater Drive to Patricia Avenue
Long Term Concept - Alternative 2

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MATCHLINE - SEE SHEET LTA2-2

MATCHLINE - SEE SHEET LTA2-4

INSTALL SHARED USE PATH.

INSTALL HIGH EMPHASIS CROSSWALK COMBINED WITH GREEN BIKE MARKINGS.

INSTALL SHARED USE PATH.

Douglas Ave

N

1:40

LTA2-3

CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Beltrees Street - Edgewater Drive to Patricia Avenue
Long Term Concept - Alternative 2

MATCHLINE - SEE SHEET LTA2-3

10'
10'
13'
13'
11'
15'
Highlands Ave
INSTALL PINCHPOINT.
INSTALL HIGH-EMPHASIS MARKED CROSSWALK, RRFB AND A 6' REFUGE ISLAND.
N
1:40

MATCHLINE - SEE SHEET LTA2-5

CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL
DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Beltrees Street - Edgewater Drive to Patricia Avenue
Long Term Concept - Alternative 2

MATCHLINE - SEE SHEET LTA2-4

MATCHLINE - SEE SHEET LTA2-6

Louden Ave

INSTALL HIGH EMPHASIS CROSSWALK
COMBINED WITH GREEN BIKE MARKINGS.
INSTALL PERMANENT TRAFFIC CIRCLE.

23'
10'
19'
23'

INSTALL BIKE LANE

INSTALL CHICANE.

INSTALL SHARED USE PATH.

Milwaukee Ave

Colonial Ct

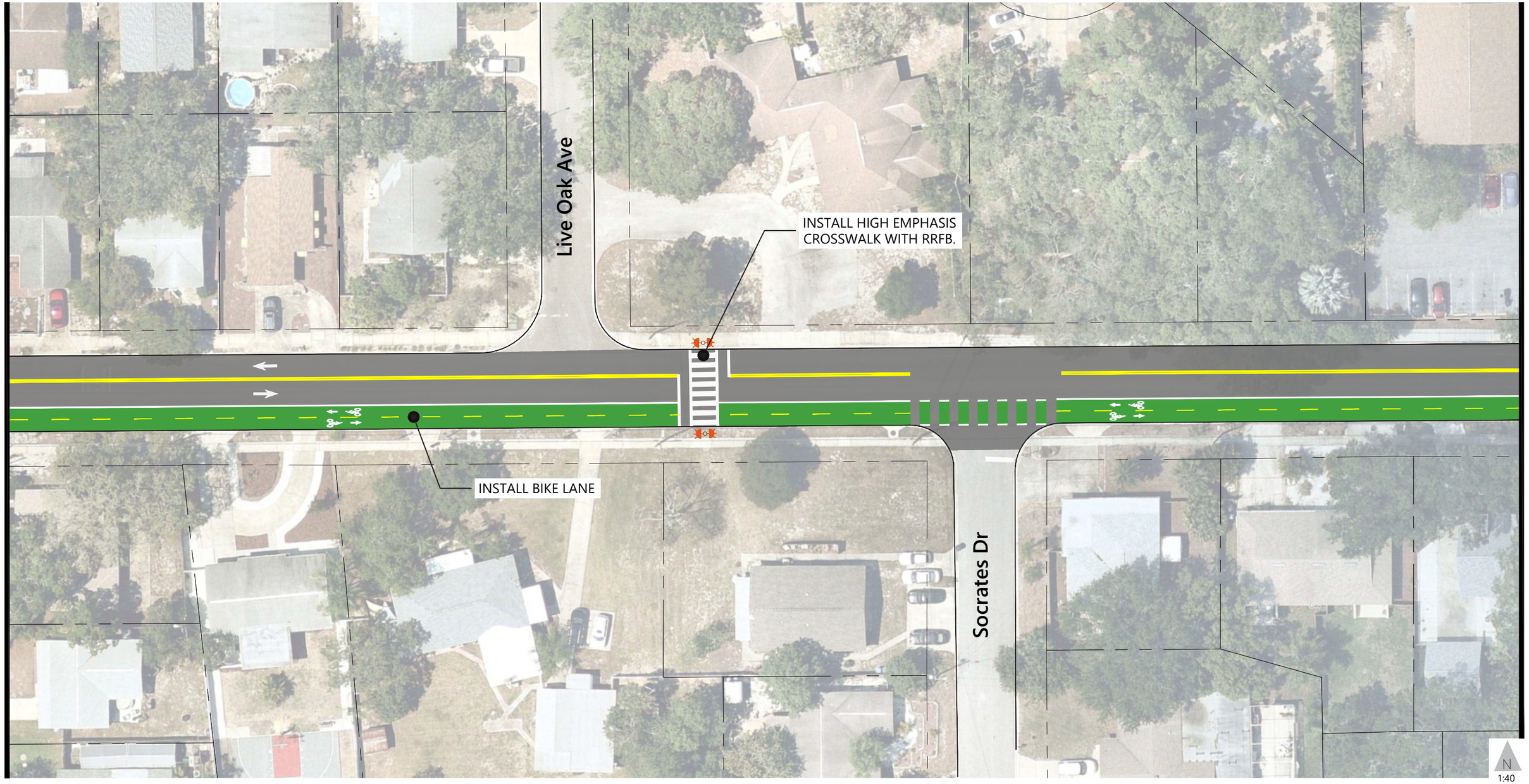
N

1:40

LTA2-5

CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL
DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Beltrees Street - Edgewater Drive to Patricia Avenue
Long Term Concept - Alternative 2



LTA2-6

CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL
DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Beltrees Street - Edgewater Drive to Patricia Avenue
Long Term Concept - Alternative 2

MATCHLINE - SEE SHEET LTA2-6

INSTALL BIKE LANE

New York Ave

Acropolis Dr

MATCHLINE - SEE SHEET LTA2-8

N

1:40

Beltrees Street - Edgewater Drive to Patricia Avenue
Long Term Concept - Alternative 2

CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL
DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Apr 11, 2024 CADD FILE: C:\Users\egeyer\Fehr & Peers\Orlando Office - South Region Design\Projects\OR23-0043.00_Beltrees Street SS4A\Concept Plan\CAD\0043-Concept_LongTerm_11X17_A2.dwg

MATCHLINE - SEE SHEET LTA2-7

2nd Ave

3rd Ave

Skyloch Dr

10'

11'

11'

11'

5'

5'

INSTALL BIKE LANE

INSTALL BIKE LANE

MATCHLINE - SEE SHEET LTA2-9

N

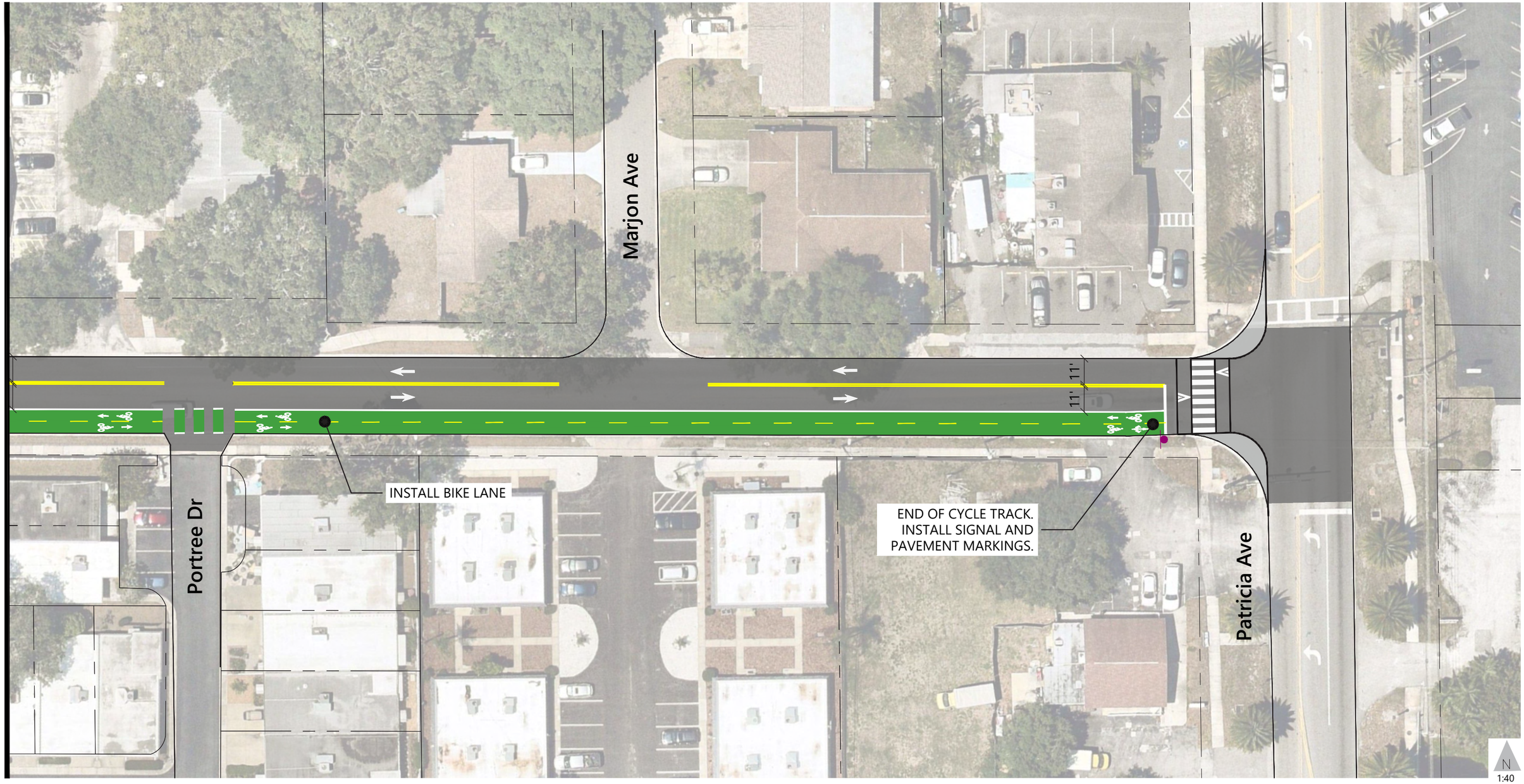
1:40

LTA2-8

CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL
DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Beltrees Street - Edgewater Drive to Patricia Avenue
Long Term Concept - Alternative 2

Apr 11, 2024 CADD FILE: C:\Users\vgeyer\Fehr & Peers\Orlando Office - South Region Design\Projects\DR23-0043.00_Beltrees Street SS4A\Concept Plan\CAD\0043-Concept_LongTerm_11X17_A2.dwg



CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL
DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Beltrees Street - Edgewater Drive to Patricia Avenue
Long Term Concept - Alternative 2

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Appendix B

Existing Conditions Report

Draft Memorandum

Date: January 29, 2024

To: Kathy Gademer, City of Dunedin
Valerie Brookens, Forward Pinellas

From: Kristof Devastey, Fehr & Peers

Subject: Beltrees Safer Street Plan – Existing Conditions Assessment

Overview

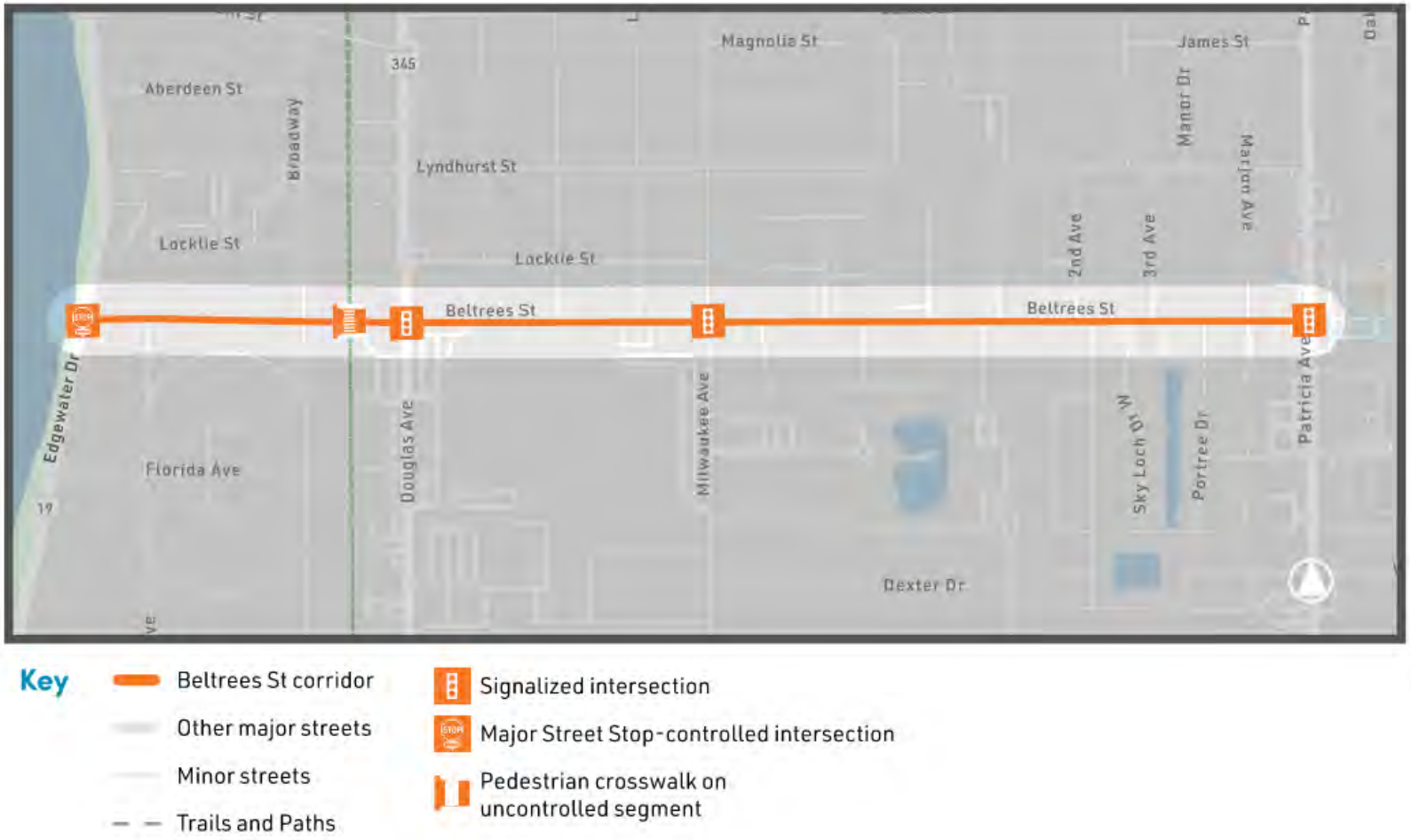
Fehr & Peers is working with the City of Dunedin and Forward Pinellas to complete a corridor safety study for Beltrees Street between Edgewater Drive (Alt US-19) and Patricia Avenue, referred to as the Beltrees Safer Street Plan. **Figure 1** displays the limits of the study corridor, which is approximately 1 mile long. The goal of the Beltrees Safer Street Plan is to identify transportation safety concerns and develop recommendations that improve transportation safety outcomes for all roadway users and increase transportation choices for the community by improving bicycle and pedestrian connectivity along the Beltrees Street corridor.

Forward Pinellas prepared a Vision Zero Plan known as Safe Streets Pinellas, which was adopted in March 2021 and updated in February 2023. The plan contains policies and action items aimed to reduce the number of fatal and severe injury collisions on roadways in Pinellas County to zero by 2045. The Beltrees Safer Street Plan builds upon the direction from the *Safe Streets Pinellas* action plan to address reported concerns from residents related to speeding and school children's safety along Beltrees Street.

This memorandum is organized to provide project background, describe the local roadway network, and provide an assessment of existing safety conditions and corridor operations, including conditions for people driving, walking, and bicycling. As part of this memorandum, the existing roadway cross sections are documented, and opportunities and constraints along the

corridor are identified. A separate memorandum will be prepared to document the development of the potential recommendations, which may identify interim and long-term roadway modifications. The various interim documents, including this memorandum, will be consolidated into a report that will ultimately inform the preparation of detailed engineering plans when funding is available.

Figure 1: Study Area



Roadway Network

This section describes the existing roadway network in the vicinity of Beltrees Street.

Beltrees Street is an east-west roadway that extends between Edgewater Drive to the west and Patricia Avenue to the east. Based on the City of Dunedin's Comprehensive Plan, Beltrees Street is classified as a local street. Beltrees Street is a two-lane undivided street, with one lane in each direction. Based on the data collected along Beltrees Street, the corridor carries approximately 1,330 vehicles/day between Edgewater Drive and Douglas Avenue, 2,780 vehicles/day between Douglas Avenue and Milwaukee Avenue and 4,600 vehicles/day between Milwaukee Avenue and Patricia Avenue. Beltrees Street has a posted speed limit of 25 miles per hour (mph). West of Douglas Avenue, the road is approximately 20 feet wide with 10-foot travel lanes, but east of Douglas Avenue, the lanes vary between 14 and 16 feet wide. The only signalized intersections with dedicated turn lanes are Douglas Avenue, that has a dedicated left-turn lane on the westbound approach and Patricia Avenue, that has dedicated left-turn and right-turn lanes on the eastbound approach. There are no dedicated bicycle facilities along Beltrees Street; however, the Fred Marquis Pinellas Trail crosses Beltrees Street approximately 200 feet west of Douglas Avenue. East of the Pinellas Trail, there are continuous sidewalks on both sides of the street; west of the trail, there are only sidewalks on the north side of the road.

The land use along Beltrees Street is primarily residential but also includes a mix of commercial, civic, educational, and recreational land uses, notably the Spring Training headquarters for the Toronto Blue Jays (TD Ballpark) and Curtis Fundamental Elementary School.

Edgewater Drive is a two-lane roadway that runs along the coast and serves as the western terminus of Beltrees Street and the study segment. It is one of the main north-south corridors in the area and carries approximately 14,000 vehicles per day based on Florida Department of Transportation's (FDOT) *Florida Traffic Online* website. Edgewater Drive falls under the jurisdiction of the FDOT and is classified as an Urban Minor Arterial with a preliminary context classification of C4 (Urban General). Edgewater Drive has a posted speed limit of 35 mph in the area surrounding Beltrees Street. There are no dedicated bicycle facilities along Edgewater Drive; however, shared-use markings (sharrows) are provided. There is a five-foot sidewalk on the east side of the road and a linear park with a meandering six-foot wide sidewalk on the western side. There are limited marked crossings connecting the linear park on the west side to the neighborhoods on the east side of Edgewater Drive, with no marked crossing at Beltrees Street. The land uses along Edgewater Drive are primarily single-family residential with fronting driveways in the vicinity of Beltrees Street; however, there are some commercial uses along the corridor.

Douglas Avenue is a north-south roadway with a posted speed limit of 25 mph and an approximate average annual daily traffic (AADT) of 4,100 vehicles per day based on FDOT's *Florida Traffic*

Online website. Based on the City of Dunedin's Comprehensive Plan, Douglas Avenue is classified as a local street. North of Beltrees Street, the roadway is a two-lane undivided street, and south of Beltrees Street, Douglas Avenue is a 3-lane street with a two-way left-turn lane. The roadway provides access to the Dunedin Public Library and TD Ball Park. Route 78 provides transit access along the corridor. There are no bicycle facilities; sidewalks are provided on both sides of the roadway. The land use along Douglas Avenue is primarily commercial/civic with some residential as well.

Milwaukee Avenue is a two-lane, north-south roadway with a posted speed limit of 30 mph. It serves around 2,900 vehicles per day based on FDOT's *Florida Traffic Online* website. Based on the City of Dunedin's Comprehensive Plan, Milwaukee Avenue is classified as a local street. Curtis Fundamental Elementary School and a private Christian school have their primary access on Milwaukee Avenue. There are no bicycle facilities on Milwaukee Avenue; sidewalks are provided on both sides of the street. The surrounding land uses are primarily single-family residential with some institutional and commercial uses.

Patricia Avenue is primarily a three-lane roadway that serves as the eastern terminus of Beltrees Street. Patricia Avenue has one lane in each direction and a center two-way left-turn lane. It has a speed limit of 30 mph and an AADT of 9,300 vehicles per day based on FDOT's *Florida Traffic Online* website. Based on the City of Dunedin's Comprehensive Plan, Patricia Avenue is classified as a local street. It provides direct access to Dunedin Highland Middle School and Dunedin Elementary School. Transit service is provided by routes 61 and 66L. There are no bicycle facilities along Patricia Avenue; sidewalks with landscape buffers are provided on both sides of the roadway. The land use fronting the roadway are a mix of institutional, commercial, and residential uses.

Bicycle and Pedestrian Facilities

Pedestrian facilities include sidewalks, pathways, crosswalks, and pedestrian signals. Pedestrian facilities are generally provided on all the major public roadways, as described above. However, many of the facilities do not provide a comfortable walking experience as some pedestrian paths are adjacent to travel lanes, and some sidewalks are narrow and do not provide sufficient space for side-by-side pedestrian passing. At signalized intersections, some of the pedestrian push buttons do not meet Americans with Disability Act (ADA) requirements in terms of push button locations. The average spacing between marked crosswalks is approximately ¼ mile with marked crosswalks being provided at the signalized intersections and at the trail crossing, and the longest distance between marked crosswalks being about half a mile. Legal unmarked crosswalks are located at every intersection along the corridor. While pedestrians have the right-of-way at unmarked crosswalks, studies have shown very low rates of drivers yielding to people crossing the street when crosswalks are not marked. As a best practice, marked crossings provided at 400 to

800-foot intervals typically increase compliance by emphasizing to drivers to expect people crossing the roadway.

The sidewalk width along the majority of Beltrees Street is around 4 feet. Between Edgewater Drive and the Fred Marquis Pinellas Trail, the sidewalk is 5 feet wide, and the sidewalk on the north side of the roadway between Milwaukee Avenue and Patricia Avenue is 6 feet wide. While a 4-foot sidewalk may meet current ADA requirements, it does not adequately provide for two-way pedestrian travel or meet FDOT standards. Sidewalks that are adjacent to vehicle travel lanes can feel uncomfortable to many roadway users and their effective width can be reduced as people walk as far from the travel lane as possible. In some areas along the corridor, the effective travel width for people using the sidewalk can also be affected by overgrown landscaping and encroaching utility poles.

Bicycle facilities are not provided along Beltrees Street; however, a shared use path crosses Beltrees Street (the Fred Marquis Pinellas Trail) and shared lane markings are provided along Edgewater Drive. Shared use paths are paved trails that are physically separated from vehicular travel; these facilities are typically shared with pedestrians, and bicycles must yield to pedestrians.

The Federal Highway Administration *Bikeway Selection Guide,* February 2019, provides criteria to aid in the selection of the most appropriate bicycle facility given specific roadway characteristics, including the volume of vehicles and the posted or prevailing travel speed for vehicles. A shared lane or bicycle boulevard is generally appropriate for low volume (between 2,000 and 3,000 vehicles per day) and low speed (20 to 25 mile per hour vehicle travel speeds) roadways. A bike lane (with or without a painted buffer) is generally appropriate for medium volume (between 3,000 and 6,500 vehicles per day) and medium speed (25 to 35 mile per hour vehicle travel speeds) roadways. For roadways with higher than 6,500 vehicles per day and vehicle travel speeds of greater than 35 miles per hour, a separated bike lane or shared use path is recommended. Based on the guidance provided by FHWA, the shared lane marking along Edgewater Drive may not be the most appropriate type of bicycle facility for use by a wide proportion of the population.

Golf Carts

Golf Carts are permitted on the majority of the roadways within the City of Dunedin. Golf carts and other low speed vehicles are permitted to operate on streets where the posted speed limit is 30 miles per hour or less, unless within a restricted area. The City of Dunedin's Golf Cart program abides by Florida Statute 316.312 and also requires additional equipment and limits the service areas where golf carts and low-speed vehicles can operate. As of the completion of this memo, golf carts must be registered with the City of Dunedin and are not allowed on Edgewater Drive or sections of Patricia Avenue.

We recognize that e-bikes are part of the low-speed vehicle ecosystem; however, the policies and design guidance surrounding e-bikes are still not defined. Changes to policy and design guidance will continue to be monitored throughout the development of this plan.

Transit Service

Transit service in the study area is provided by the Pinellas Suncoast Transit Authority (PSTA). PSTA offers fixed route and Demand Response Transit (DRT) service within Pinellas County, connecting to other transit systems, including the Hillsborough Area Regional Transit Authority (HART), Pasco County Public Transportation (GOPASCO), and Manatee County Area Transit (MCAT). As of the date of this memo, there are no transit routes along Beltrees Street; there are bus stops at the intersection of Beltrees Street with Douglas Avenue and with Patricia Avenue. In the study area, Routes 61, 66L, and 78 provide service (**Table 1**). Although transit options are available, including on weekends and holidays, the routes operate on infrequent headways.

Table 1: Transit Service

Route	Frequency[1]	Operational Hours	Destinations
61	1 hour	M-S: 5:25 AM – 8:30 PM Su & Holidays: 7:20 AM – 6:35 PM	Along Patricia Ave in study area, between Indian Rocks Shopping Center and Main St & Summerdale Dr
66L	Varies	M – F: 4:55 AM – 6:30 PM[2]	Along Patricia Ave in study area, between Tarpon Springs and Park Street Terminal
78	30 Minutes	M – F: 6:10 AM – 9:53 PM S: 6:04 AM – 10:25 PM Su & Holidays: 7:50 AM – 7:57 PM	Along Douglas Ave in study area, between Downtown Clearwater and Westfield Countryside
Dunedin Loop	10-15 Minutes	Th: 11 AM – 10 PM Fri & S: 11 AM – 12 AM Su: 11 AM – 7 PM	Along Douglas Ave in study area between Skinner Blvd and Plaza Drive

Notes: M – Monday, F – Friday, S – Saturday, Su - Sunday
1. Frequency is approximate and may vary slightly throughout the day.
2. Route schedule changes depending on whether school is in session.

Source: Pinellas Suncoast Transit Authority; Fehr & Peers, 2023

Safety

Crash Analysis

Reported crash data along the study segment was downloaded from SIGNAL-4 Analytics for a 5-year period (2018-2022). For the purpose of this memo, FDOT's KABCO crash severity rating will be used:

K: Fatal Crash- a fatality resulting from the crash

A: Incapacitating Injury/Severe Injury - incapacitating injuries such as amputation, disabling, and/or more

B: Non-Incapacitating Injury/Moderate Injury: the victim has minor injuries such as cuts or scrapes but are not incapacitating

C: Possible Injury/Minor Injury - there is possible injury, but on a lesser scale

O: Property Damage Only -there were no apparent injuries at the scene

During that period, 23 collisions were reported along the corridor, including 13 that resulted in injuries (B and C injuries). There were no reported incapacitating injuries or fatalities during the five-year analysis period.

Most collisions involved only automobiles (18 collisions). Three collisions involved a bicyclist, and one involved a pedestrian. There were no collisions involving someone riding a motorcycle. Combined, collisions involving vulnerable users i.e., users who are not in an automobile accounted for 18 percent of all collisions. These collisions are mapped in **Figure 2.**

The crash analysis evaluated and summarized the data during the analysis period by:

- Location
- Time of Day
- Driving Under the Influence
- Hit-and-Run Collisions
- Crash Type

Since there were no noticeable trends identified related to Aggressive Driving, Speeding or Distracted Driving, no crash narrative is being provided for those factors.

Location

The majority of collisions along the corridor occurred at an intersection or were intersection-related, amounting to 56% of all collisions (13 collisions), with most collisions occurring at the intersections of Douglas Avenue, Milwaukee Avenue, and Patricia Avenue. Two of the three bicycle-involved collisions and the pedestrian-involved collision occurred at intersections.

Time of Day

Collisions occurring at night accounted for 32 percent of all collisions (7 collisions). All of the bicycle- or pedestrian-involved collisions occurred during the day. Of the 12 injury collisions, 31 percent occurred at night (4 collisions).

Driving Under the Influence and Hit and Run Collisions

There was one collision that involved someone driving under the influence. This was also the only hit-and-run crash. No one was injured in the collision. For the purposes of this analysis, driving under the influence refers to intoxication caused by alcohol use over the legal limit, or being under the influence of illegal drugs, prescription drugs, or other medication which can cause impairment.

Focus Crash Types

There were no reported collisions where someone was killed or severely injured (KSI collisions) in the past five years along the corridor; however, there were certain collision types that are more likely to result in a KSI collision, including angle, left turn, off road, pedestrian, and bicycle collisions. About 69 percent of the crashes on the roadway (16 crashes) fall into one of these five crash types, and 56 percent of those (9 crashes) resulted in a non-incapacitating injury (**Table 2**). Recommendations on the corridor will seek to reduce the risk of these types of collisions.

Table 2: Crash Types

Collision Type	Injury Collisions	No Injury Collisions	Total
Angle	3	1	4
Bicycle	1	2	3
Left Turn	2	2	4
Off Road	2	2	4
Pedestrian	1	0	1
Total	**9**	**7**	**16**

Source: Signal4 Analytics; Fehr & Peers, 2023

Figure 2: Crash Summary

Roadway Operations

Operations along the Beltrees Street corridor were evaluated to understand how people move along and across the corridor. For this assessment, data was collected to obtain the following information:

1. Vehicular segment volumes
2. Intersection volumes for vehicles, pedestrians, bicycles, and golf carts
3. Vehicular travel speeds

Data Collection

Continuous 72-hour classification and speed counts were collected between Tuesday November 7, 2023, and Thursday November 9, 2023, at the following locations:

1. Beltrees Street between Edgewater Drive and Douglas Avenue
2. Beltrees Street between Douglas Avenue and Milwaukee Avenue
3. Beltrees Street between Milwaukee Avenue and Patricia Avenue

Daily traffic volumes for each segment are summarized in **Table 3** and **Table 4**, which show that the segment between Milwaukee Avenue and Patricia Avenue experiences the highest level of daily traffic. The lowest levels of daily traffic are between Edgewater Drive and Douglas Avenue.

Table 3: Average Daily Traffic

	Between Edgewater Drive and Douglas Avenue	Between Douglas Avenue and Milwaukee Avenue	Between Milwaukee Avenue and Patricia Avenue	Roadway Average
Vehicular Volume[1]	1,330	2,780	4,600	2,900[2]

Notes:
1. Volume represents the bi-directional three-day average rounded to the nearest 10.
2. Volume difference due to rounding.

Source: Fehr & Peers, 2023

Most vehicles that use the Beltrees Street corridor are passenger vehicles (82 percent) and light duty trucks like pick-up trucks and sport utility vehicles represent approximately 13 percent of the vehicle mix. Motorcyclists, heavy trucks, and buses combined comprise about 6 percent of activity along the corridor combined, as summarized in **Table 4**.

Table 4: Volume by Vehicle Type

	Passenger Cars	Light Duty Trucks	Buses	Motorcycles	Trucks	Total
Average Volume[1]	2,370	370	10	90	80	2,920
% of Vehicles	82%	13%	0.3%	3%	3%	100%

Notes:
1. Volume represents the bi-directional three-day average rounded to the nearest 10.

Source: Fehr & Peers, 2023

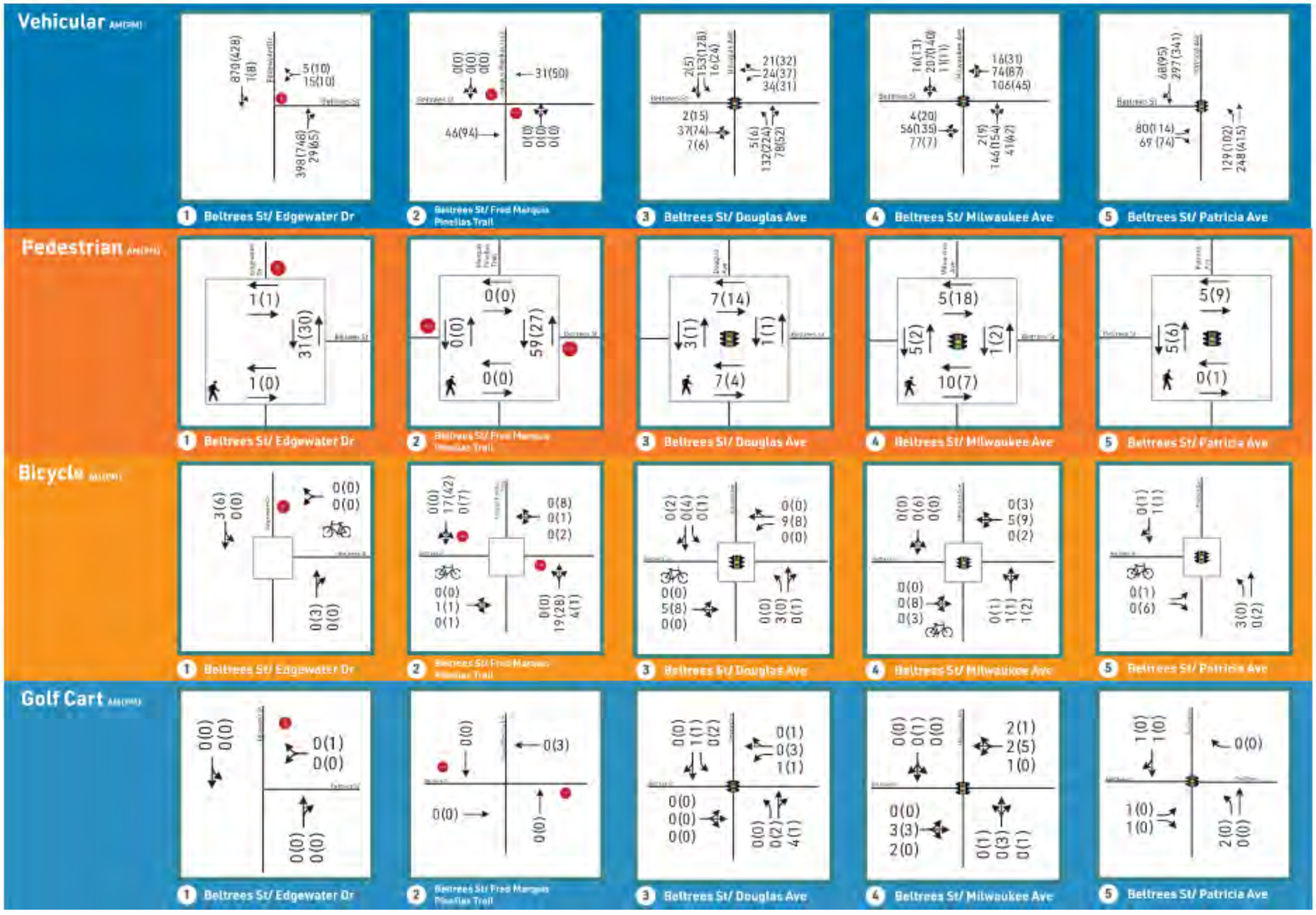
Based on the 72-hour counts, the peak two-hour window during each the morning and afternoon were identified, and multimodal Turning Movement Counts (TMCs) were collected on Tuesday, November 7, 2023, during the weekday morning (7:00 – 9:00 AM) and afternoon (4:00 – 6:00 PM) peak periods at the following locations:

1. Beltrees Street and Edgewater Drive
2. Beltrees Street and Fred Marquis Pinellas Trail
3. Beltrees Street and Douglas Avenue
4. Beltrees Street and Milwaukee Avenue
5. Beltrees Street and Patrcia Avenue

The TMCs included a separate count of vehicles, pedestrians, bicyclists, golf carts and heavy vehicles. It should be noted that schools were in session and weather conditions were dry during the counts and that the morning peak hour coincides with school drop-off activities. The volumes in the afternoon are the highest during the traditional PM peak period from 4:00 to 6:00 PM. Based on the TMCS, the morning and afternoon peak hours were determined to be 7:15 – 8:15 AM and 4:30 – 5:30 PM respectively.

Figure 3 displays the AM and PM peak hour turning movement volumes for the study intersections as well as golf cart, bicycle, and pedestrian volumes. The highest levels of pedestrian activity were observed at the Fred Marquis Pinellas Trail crossing during the AM peak hour. The highest levels of bicycle activity were observed at the trail crossing during the PM peak hour. Overall, people walking and people bicycling were a small percentage of overall travel volumes along the corridor.

Figure 3: AM and PM Peak Turning Movement Counts



Travel Speeds

The posted speed limit on Beltrees Street is 25 mph. As part of the data collection efforts, travel speeds were captured at three locations along the corridor over a 72-hour period. Average travel speeds along the corridor ranged from 11 miles per hour west of Douglas Avenue to 28 miles per hour between Milwaukee Avenue and Patricia Avenue. On average, 25 percent of people driving traveled below the speed limit (5 to 24 miles per hour), 16 percent of people driving traveled about the speed limit (25-29 miles per hour) and 58 percent of people driving were traveling in excess of 30 miles per hour, with more than 22 percent over 35 miles per hour, as shown in **Table 5** and **Table 6**. The speed percentiles represent the distribution of speed values showing their observed or theoretical frequency of occurrence. For example, the 15th percentile speed represents the speed at or below which 15 percent of vehicles travel. The speed at which people travel in a motor vehicle has a direct correlation with the outcome of a crash. A person walking or bicycling struck by a person driving a vehicle at 20 miles per hour has a 90 percent chance of surviving the collision, while a person walking or bicycling struck by a person driving a vehicle at 40 miles per hour has a 10 percent chance of surviving the crash.

Posted Speed - the maximum lawful speed for a particular location as displayed on a regulatory sign.

Operating Speed – the speeds at which vehicles are observed operating during free flow conditions. Free flow conditions mean that vehicles are unimpeded by other vehicles or by traffic control devices such as traffic signals.

Target Speed - the highest operating speed at which vehicles should ideally operate on a roadway in a specific context.

Source: ITE

As a current practice, speed limits on roadways are generally set by the 85th percentile travel speed, or the speed at which 85 percent of people are driving at or below; the 85th percentile speed by segment is also presented in **Figure 4**, which shows an 85th percentile speed of 14 to 33 miles per hour along the corridor. While some drivers base their travel speed on the speed limit, most people drive the speed that represents their assessment of the acceptable level of risk; this assessment is informed by the design of the street, the expected users, and the surrounding land uses. A large gap between the 85th percentile speed and the posted speed limit typically indicates a divergence between the roadway design elements, and the desired travel speed (i.e., Target Speed) along the corridor. Ideally, the posted speed, the target speed and the operating speed should all be the same.

Although there is not a large gap between the posted speed and the operating speeds for the majority collected data, there were a few egregious occurrences of speeding with some vehicles traveling between 60-65 mph. It should also be noted that the traffic volumes and operating speeds along Beltrees Street seem to increase as the width of the pavement and the travel lanes increase (west to east).

Figure 4: Speed and Volume Summary

Segment 1
Edgewater Dr to Douglas Ave

14 mph 85th percentile speeds

1,333 Average Daily Traffic Volumes

Segment 2
Douglas Ave to Milwaukee Ave

30 mph 85th percentile speeds

2,777 Average Daily Traffic Volumes

Segment 3
Milwaukee Ave to Patricia Ave

33 mph 85th percentile speeds

4,596 Average Daily Traffic Volumes

Table 5: Percent of Traffic by Speed Bin

	< 20	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-65
% of Eastbound	19%	8%	17%	35%	17%	3%	<1%	<1%	<1%	<1%
% of Westbound	17%	5%	16%	37%	20%	4%	<1%	<1%	<1%	<1%
% of Totals	18%	7%	16%	36%	19%	3%	<1%	<1%	<1%	<1%

Source: Fehr & Peers, 2023

Table 6: Percentile Speeds by Direction

Direction	Percentiles				
	15th	50th	Average	85th	95th
Between Edgewater Drive and Douglas Avenue					
Eastbound	7	10	11	14	17
Westbound	7	10	11	14	17
Average	7	10	11	14	17
Between Douglas Avenue and Milwaukee Avenue					
Eastbound	18	25	24	30	33
Westbound	19	26	25	30	34
Average	18	26	24	30	34
Between Milwaukee Avenue and Patricia Avenue					
Eastbound	22	28	28	33	36
Westbound	23	28	28	34	36
Average	23	28	28	33	36

Notes:
1. Volume represents the three-day average.

Source: Fehr & Peers, 2023

Intersection Operations

Vehicular traffic operations were evaluated based on level of service (LOS) calculations for the morning and evening peak hours, with the results summarized in **Table 7**. LOS measures traffic flow on a scale from A to F from the perspective of the motorist and indicates the comfort and convenience associated with driving. LOS A represents free-flow traffic conditions with little to no congestion. LOS F represents oversaturated conditions where traffic demand exceeds capacity resulting in long queues and delays. The LOS analysis uses procedures outlined in the Highway Capacity Manual (HCM) 6th Edition. The LOS at signalized intersections is based on the average delay experienced by all motorists. At unsignalized intersections, the LOS is based on the movement with the greatest average delay. The study intersections were evaluated using Synchro version 11 software. The City of Dunedin Comprehensive Plan considers an intersection operating at LOS E or F during peak periods to be deficient. All the study intersections operate within their established level of service standards for people driving under existing conditions. The Synchro worksheets are provided as **Attachment A**.

Table 7: Existing Conditions Intersection Operations

Intersection	Control	AM		PM	
		Delay[1]	LOS	Delay[1]	LOS
Beltrees Street at Edgewater Drive	SSSC	1 (32)	A (D)	1 (25)	A (C)
Beltrees Street at Douglas Avenue	Signal	8	A	10	A
Beltrees Street at Milwaukee Avenue	Signal	9	A	9	A
Beltrees Street at Patricia Avenue	Signal	13	B	13	B

Notes: SSSC = side street stop controlled. **Bold** indicates unacceptable operations.
1. Average delay/LOS for intersection. For signalized intersections, average delay is the weighted average for all movements. For side street stop-controlled intersections, the intersection average (worst movement average delay) is reported.
Source: Fehr & Peers, 2023

The 95th percentile queue is defined as the queue length that has only a 5-percent probability of being exceeded during the analysis period. While it is a useful parameter for determining the appropriate length of turn lanes (when available), it may not be typical of what an average driver would experience. The 95th percentile vehicle queues are summarized in **Table 8**, which shows vehicle queues at intersections along the corridor are typically contained within the available storage and do not extend beyond adjacent intersections. At the intersection of Beltrees Street and

Patricia Avenue, the southbound vehicle queue can periodically extend beyond the Cedarwood Avenue, but queue typically clear quickly and overall area circulation is not impeded.

Table 8: Existing 95th Percentile Vehicle Queues

Intersection	Movement	Storage Length (ft)	AM (ft)	PM (ft)
1. Beltrees Street at Edgewater Drive	WBLTR	225	25	25
3. Beltrees Street at Douglas Avenue	EBLTR	215	50	75
	WBL	105	50	50
	WBT	600	50	50
	NBL	75	25	25
	NBT	>1,000	100	125
	SBL	75	25	25
	SBT	225	75	75
4. Beltrees Street at Milwaukee Avenue	EBT	275	50	100
	WBT	200	100	100
	NBT	>1,000	100	100
	SBT	225	125	100
5. Beltrees Street at Patricia Avenue	EBL	40	100	100
	EBR	225	25	25
	NBL	90	75	50
	NBT	575	125	150
	SBT	200	300	275

Notes:
1. Results based on Synchro. Maximum queue lengths are rounded to nearest 25 feet. All queues are expressed on a 'per lane" basis. Movements that are highlighted represent queues that reach or exceed available storage.
2. Available storage lengths based on review of aerial imagery and measured to upstream adjacent intersection and does not include additional storage that can be provided in the taper
Source: Fehr & Peers, 2023

Walking and Bicycling Comfort

While level of service calculations measure mobility from the perspective of a person driving, level of service calculations are not the best way to measure the experience of a person walking or bicycling. People outside of a vehicle are typically more concerned about how close adjacent vehicle traffic is to their location in the right-of-way, the speed of adjacent vehicle traffic, the number of conflict points (i.e., points where their path of travel crosses that of a motor vehicle), as well as the type of facility provided for them to walk or bike along. Level of Traffic Stress (LTS) is a way to evaluate the stress a person walking or bicycling might experience while using the street. To establish a baseline for where new and enhanced walking and bicycling facilities could improve comfort along the corridor, a Level of Traffic Stress (LTS) analysis was conducted to assess the comfort for people bicycling and walking along the corridor under existing conditions.

High-level descriptions of the LTS Scores are presented in **Table 9**. The analysis, originally developed by the Mineta Transportation Institute, is based on the analysis methodology outlined in the 2023 FDOT Multimodal Quality/Level of Service (Q/LOS) Handbook. A more detailed description is provided on pages 97 through 99 of the Q/LOS Handbook.

Table 9: LTS Scores

LTS	Description	Typical Facilities
LTS 1	Facilities are suitable for all users, including children traveling alone, the elderly and people using a wheeled mobility device. People generally feel safe and comfortable using the facility and they are willing to use the facility.	Low vehicle volume, low speed roadways with sidewalks on both sides of the street. As traffic volumes and speeds increase, the addition of separation between the vehicle lanes and walking and bicycling facilities increases.
LTS 2	All users are able to use the facility, and most are willing to use the facility.	Moderate vehicle volume, moderate speed roadways with sidewalks on both sides of the street. As traffic volumes and speeds increase, the addition of separation between the vehicle lanes and walking and bicycling facilities increases. In some instances, there may only be sidewalks on one side of the roadway but typically not active uses on that side of the roadway.

LTS 3	Tolerable for trained and experienced bicyclists and some pedestrians. People may only use the facility when there are limited route and mode choices available.	Higher vehicle volume, higher speed roadways with sidewalks on both sides of the street. Limited separation exists between vehicle lanes and walking and bicycling facilities. In some instances, there may only be sidewalks on one side of the roadway.
LTS 4	Uncomfortable for most people and a barrier to walking and bicycling for many. For people using a wheeled mobility device, such as a wheelchair, the facility may be impassible. People may only use the facility when there are limited route and mode choices available.	Multilane roadways with high speed/high volume vehicle travel typically without facilities for bicycling. Sidewalks may be present, but typically with no separation between sidewalk and travel lane. Bicycle facilities may be present, but with no separation from the adjacent travel lane.

Notes: Adapted from the research conducted by the Mineta Transportation Institute

The Level of Traffic Stress (LTS) method offers two main advantages over other planning tools: 1) the data is generally available through publicly accessible mapping tools, such as Google Streetview and 2) it provides a consistent approach to evaluating traffic stress. While the LTS methodology used does provide a useful approach to understanding the challenges to walking and bicycling, it may not fully capture stress levels for all non-motorized users. Level of Traffic Stress ratings should not be construed as a predictor of facility use by people walking and bicycling. Area demographics and land uses along a corridor are better predictors of the level of walking and bicycling that does and could occur. For example, in a low-density area where land uses are spread apart and most people have access to a vehicle, people may walk or bicycle for recreational purposes in the area, but not as a primary mode of travel. Conversely, in an area where complementary uses are within close proximity and people have less access to vehicles, walking and bicycling activity is typically higher, even when low stress facilities are not available.

An LTS analysis for people biking and for people walking was conducted for the Beltrees Street corridor, as presented on **Figure 5**. Beltrees received an overall score of 2 for both biking and walking along the majority of the corridor, meaning that most people bicycling and walking are willing to use the facility. The segment between Edgewater Drive and the Fred Marquis Pinellas Trail received an LTS of 4 for people walking because there is no sidewalk on the south side of this segment.

Figure 5: Level of Traffic Stress Summary

Existing Roadway Cross Sections

The Beltrees Street study corridor was divided into four segments for the purposes of assessing the existing roadway cross-section to aid in the development of roadway cross section recommendations. As part of this process, recommendations will also be developed for key intersections along the corridor where travel conditions (vehicle operations, collision history, key north-south bicycle/pedestrian connection) require additional treatments. A roadway cross sections compatibility with various intersection treatments could be part of the evaluation criteria. The Beltrees Street corridor was divided into the following segments:

- Edgewater Drive to Fred Marquis Pinellas Trail
- Fred Marquis Pinellas Trail to Douglas Avenue
- Douglas Avenue to Milwaukee Avenue
- Milwaukee Avenue to Patricia Avenue

For each segment, the following information is summarized in **Table 10**:

- Length
- Vehicle speeds and volume
- Intersecting streets
- Number of driveway conflicts
- Preliminary right-of-way assessment

Utilities are generally provided above ground along the Beltrees Street corridor, with utility lines running along the south side of the roadway. Streetlights are primarily provided on the south side of the roadway. While not included as a part of this project, construction could also accommodate the undergrounding of aboveground utilities along the corridor. The probable cost to bury power lines as a standalone project range between $600,000 and $1,000,000 per mile. If incorporated into the overall project, this cost per mile is likely to be significantly reduced.

Senate Bill 796, the *Public Utility Storm Protection Plans*, requires that local utility provider provide a plan to underground all utilities in the State to improve resiliency and minimize electricity disruptions in the event of serve weather. Early coordination with the local utility provider is recommended to determine if undergrounding of utilities can be included in the overall project construction to reduce the overall cost of constructing each separately, as well as minimize the disruptions to residents and businesses along the corridor.

Beltrees Street has a closed drainage system. Some locations along the corridor are curbed (with and without gutter); however, the majority of the corridor has a gutter pan with no curb. Drainage inlets are provided along the corridor, primarily at intersections.

Table 10: Existing Cross Section Segment Summary

Segment (Length)	Direction/Location	Daily Traffic Volume	Average Speed	85th Speed	Number of Driveways	Intersecting Streets	Locations with Marked Crosswalks	Estimated Right-of-Way	Other/Notes
1.Edgewater Dr to Fred Marquis Pinellas Trail (1,135 ft) Data collected west of Broadway	Eastbound/Southside of Street	734	11	14	3	Citrus Avenue Broadway	Edgewater Drive	26 to 39-foot typical ROW	
	Westbound/Northside of Street	599	11	14	11				
2. to Douglas Ave (225 ft) Data collected west of Broadway	Eastbound/Southside of Street	734	11	14	1		Douglas Avenue	60-foot typical ROW	
	Westbound/Northside of Street	599	11	14	2				
3. Douglas Ave to Milwaukee Ave (1,265 feet) Data collected between Highland Ave and Louden Ave)	Eastbound/Southside of Street	1,462	24	30	4	Highland Avenue Louden Avenue	Douglas Avenue Milwaukee Avenue	55-foot typical ROW	
	Westbound/Northside of Street	1,321	25	30	16				
4. Milwaukee Ave to Patricia Ave (2,570 feet)	Eastbound/Southside of Street	2,243	28	33	23	Colonial Court Live Oak Lane	Milwaukee Avenue Patricia Avenue	50 to 57-foot typical ROW; some locations have	

Table 10: Existing Cross Section Segment Summary

Segment (Length)	Direction/Location	Daily Traffic Volume	Average Speed	85th Speed	Number of Driveways	Intersecting Streets	Locations with Marked Crosswalks	Estimated Right-of-Way	Other/Notes
Data collected west of Acropolis Drive	Westbound/Northside of Street	2,353	28	34	22	Socrates Drive Acropolis Drive New York Avenue 2nd Avenue Skyloch Drive 3rd Avenue Skyloch Court Portree Drive Marjon Avenue		slightly more ROW	

Source: Fehr & Peers

Community Engagement

Community outreach and engagement is a critical component of the Beltrees Street Safer Street Plan. There were three main components of the outreach:

- Online Engagement
- Two walking audits
- A community workshop

The following sections provide details about each component of the engagement.

Online Engagement

The online engagement materials were hosted on an online platform called Social Pinpoint, which people could access through the Beltrees Street project website (https://dunedin-fl.civilspace.io/en/projects/beltrees-street-corridor-study). The goal of the engagement was to understand how and why people travel along Beltrees Street, how they feel about transportation safety along the corridor, and what their priorities are for the roadway.

The online outreach comprised of a survey and an interactive comment map. Between the two elements, 318 people participated. The following sections provide summaries of the feedback received from the survey and comment map.

Survey Results

The survey consisted of eight key questions aimed at understanding people's relationship to Beltrees Street and their concerns related to safety and mobility. Each question is provided below with a summary of responses.

There were 304 people who took the survey but not every respondent answered all the questions.

The survey asked community members what their relationship is with Beltrees Street. They were asked to select as many of the following options that apply to them:

- I live on Beltrees Street.
- I work on Beltrees Street.
- My child or family member attends Curtis Fundamental Elementary School.
- I own or operate a business or commercial property on Beltrees Street.
- I travel on Beltrees Street to another destination.

Most respondents (69%) do not have a destination on Beltrees Street but travel along it to access another destination.

Participants were asked what travel mode they use when traveling along the corridor. Participants could select as many of the following options that applied to them:

- Biking
- Driving
- Walking
- Golf Cart
- E-bike or other low-speed vehicle
- Car-pooling

A vast majority of the respondents (87%) included driving as one of their modes of transportation along Beltrees Street; while 40% included walking, 30% included biking and 21% included the use of golf carts. From the participants who indicated that they have a destination on Beltrees Street, 92% included driving while 57% included walking, 39% included biking and 27% included the use of golf carts.

Then respondents were asked if they feel safe traveling on Beltrees Street. Most respondents (69%) indicated they feel safe traveling Beltrees Street. That number decreased to 60% when filtered to only include those participants who indicated having a destination on Beltrees Street. For people who said that they walk or bike on Beltrees Street, approximately 50% felt safe traveling along Beltrees Street.

To further understand participants' concerns for the corridor related to safety and mobility, participants were given a list of concerns and asked to rank them by order of importance. The following list presents those concerns ranked by respondents, ranked from most important to least important.

1. Speeding/operating speed of vehicles
2. Drivers failing to yield to pedestrians.
3. Lack of sidewalks/poor condition of sidewalks
4. Lack of bike lanes or paths/poor condition of bike lanes or paths
5. Distracted driving (e.g. cell phones, vehicle screens)
6. Lack of crosswalks
7. Poor lighting
8. Lack of safe routes for children to walk to school.
9. Parking along street
10. Impaired driving (e.g. alcohol, cannabis)
11. Poor accessibility for people with disabilities
12. Long distances/not enough time to cross the street.

Participants were then asked if there were any drainage issues along the corridor that impacted their travel along Beltrees Street. The vast majority of participants (91%) responded that drainage issues do not affect their travel along the corridor.

After gaining an understanding of people's perspective of the roadway, we then wanted to know what ideas or suggestions they had to enhance safety on the roadway. Below are some of the common themes from those that responded. A complete list of the suggestions can be found in **Attachment B**.

- Install bike lanes
- Provide traffic calming devices
- Construct roundabouts
- Resurface roadway
- Retime signal at Milwaukee Avenue
- Widen the sidewalks
- Install lighting
- Conduct more enforcement
- More visible, enhanced, crosswalks
- Beautification projects
- Maintain vegetation
- Improve sight distance at intersections
- Improve school pick-up/drop-off

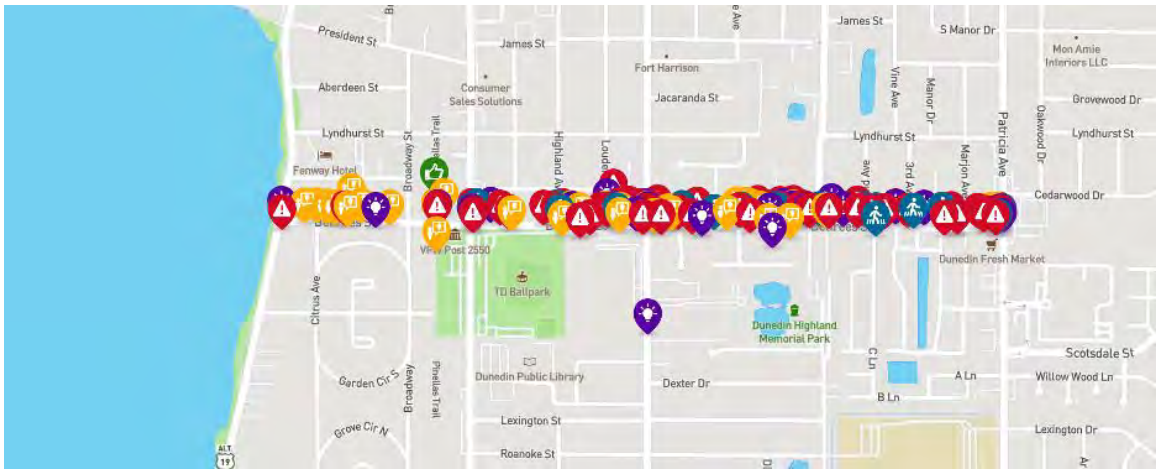
Comment Map

The comment map provided an online map of Beltrees Street that allowed users to leave comments at specific locations. There were five pre-set options for comment types, each of which gave the user the possibility to write in a comment. The five options were:

- I feel unsafe.
- I like this
- I want a crossing.
- I have an idea.
- I have more comments.

Comments were distributed fairly consistently along the corridor, with the fewest comments between Douglas Avenue and Edgewater Drive (See **Figure 6** below).

Figure 6: Comment Map



There were 161 contributions to the comment map, of which, about 44% of the comments related to a user not feeling safe. Most of the comments were related to additional topics. Below is a summary of the general concerns of respondents. A list of all the comments is provided in **Attachment B**.

- Speeding
- Flooding
- Sight distance issues
- Poor pavement condition
- Poor lighting
- Lack of crosswalks
- Lack of enhanced crosswalks
- Narrow lanes west of Dougals Avenue
- No landscape buffer
- Narrow sidewalks
- Lack of dedicated bicycle facilities
- Overgrown vegetation
- Lack of enforcement

Walk Audit

Walk Audits were completed along Beltrees Street on December 11, 2023, to document deficiencies that could impact safety and mobility along the corridor and to provide insight into the needs and preferences of those who live and work along Beltrees Street, especially those who are older, disabled, or have children. The first walk audit included the project team and technical staff from

stakeholder agencies; the second walk audit included members of the community that were invited by City of Dunedin staff. The second walk audit also served as an opportunity to further engage the community, build awareness of the importance of walkable design and identify specific pedestrian safety issues. These audits, through their collaborative and on-the-ground nature, frequently reveal issues and opportunities that may not be otherwise evident through traditional data collection methods.

Following a briefing on audit goals and safety protocols, participants walked the study segment, pausing at numerous locations to discuss observations and insights. Field materials were provided ahead of the audit and included a summary of crashes, prompt lists and questions, aerial maps, and note pages. The Audit field package is provided as **Attachment C**.

The remainder of this section provides a summary of observations made during the walk audits. The summary does not capture every possible observation made during the walk audits but will more so list common concerns reported on the audit forms and issues highlighted by the participants and discussed during the audit.

ADA

While many Americans with Disabilities Act (ADA) accessibility-related observations were made, this summary focuses primarily on other design elements. A formal ADA assessment was not conducted as part of this audit; however, a high-level review indicates that there are some locations along the corridor that do not meet current ADA requirements related to the design of curb ramps and pedestrian access routes. Additionally, the pedestrian push buttons at some signalized intersections along the corridor are not ADA compliant, including at Milwaukee Avenue. More specifically, push buttons are not installed parallel to the associated crosswalk, which could be confusing for people with a vision impairment who expect push buttons to be oriented parallel to their desired direction of travel. ADA requires that whenever streets are altered, new curb ramps must be constructed to the current ADA standards, including roadway resurfacing and restriping. It is recommended that a formal ADA review be completed for the corridor. ADA recommendations could include modifications to directional curb ramps, addressing changes in level between sidewalk panels, and correcting noncompliant cross slopes, driveway aprons and traffic signals.

Sidewalks

In general, sidewalks were in good condition but there were instances where the sidewalks were narrow or where there were encroachments by utilities and/or overgrown vegetation. There were also observations made regarding the cross slopes of the sidewalk not meeting ADA requirements, and cracks and buckling in the sidewalk. West of the Fred Marquis Pinellas Trailthere is no sidewalk on the southside.

Pavement and Markings

Pavement conditions throughout the corridor were noted as being deficient with cracking and rutting observed at several locations. It is anticipated that these deficiencies will be addressed as part of an upcoming resurfacing project (2024). The "School Zone" pavement markings along Beltrees Street and along Milwaukee Avenue do not align with the flashers as required by Chapter 15 of the *Manual on Speed Zoning for Highways, Roads, and Streets in Florida*.

School zone sign

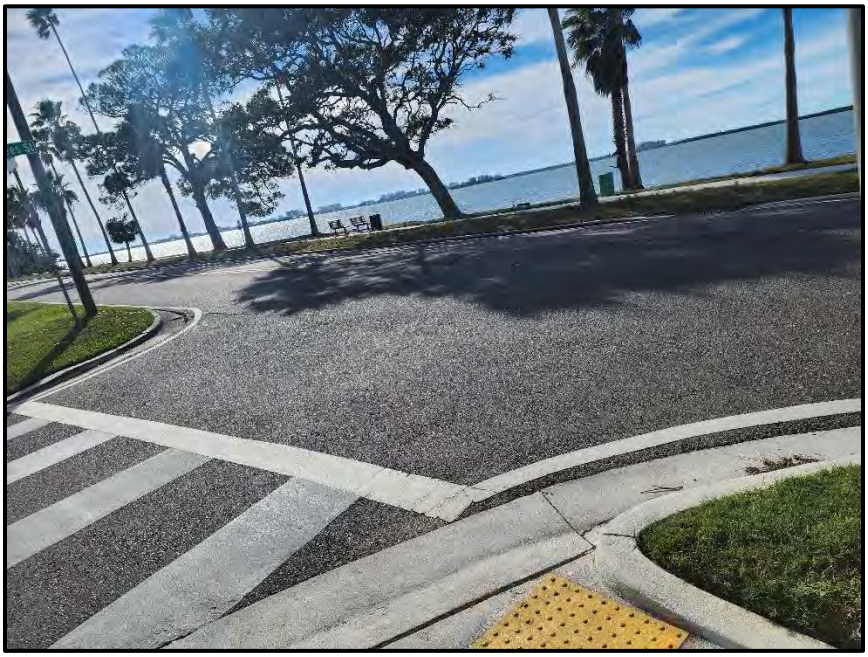
Bicycle Facilities

As previously mentioned, there are no dedicated bicycle facilities along Beltrees Street. During the walk audit several people were observed riding on the shoulder against traffic or riding on the sidewalk and weaving into the street to avoid pedestrians on the sidewalk. Based on conversations with the City staff, the shoulders were added as part of the most recent resurfacing to provide for a visual narrowing to manage vehicular speeds


Douglas
300 AVE 400

Crosswalks

As previously mentioned, crosswalks are only provided at signalized intersections with an average spacing of approximately ¼ mile. At the intersection of Milwaukee Avenue, no crosswalk is provided on the east leg of the intersection. At the intersection of Edgewater Drive, no crosswalks are provided to cross Edgewater Drive. Looking west, there are sight distance issues between westbound vehicles and users crossing the Fred Marquis Pinellas Trailfrom south to north; the sight distance issue is caused by the height of the vegetation (see picture immediately below).



Drainage

Drainage issues were observed at several locations along the corridor including puddling and drainage inlets blocked by debris. It is expected that some of the puddling issues will be addressed during the upcoming resurfacing project. Based on conversations with City staff during the audit, the debris blocking the inlets is a known and recurring issue that is typically mitigated by maintenance.

Utilities

The traffic signal at Milwaukee Avenue is mounted on span wire assembly despite being within 10 miles from the coastline. The Pinellas County Transportation Design Manual which references the FDOT Design Manual, requires traffic signals within a ten mile boundary of the coast line to be mounted on mast arms.

Opportunities and Constraints

Based on the analysis of existing conditions along the corridor, we have identified several opportunities and constraints to consider in the development of project alternatives.

Opportunities

The following summarizes potential opportunities along the corridor to consider in the refinement of project recommendations:

- There is a wide landscape buffer on the north side of the roadway between the Fred Marquis Pinellas Trail and Milwaukee Avenue that could allow for the widening of the sidewalk.
- The study intersections operate at an acceptable level of service, with three of the intersections operating at LOS A or B, allowing for flexibility in changes to the intersection, including removing turn lanes.
- The grid network provides opportunities to increase the density of crossings of Beltrees Street to at least every 600 to 800 feet. Some crossings, for example the trail crossing, may need enhancements, such as raised crosswalks and RRFBs.
- Travel speeds along the corridor can be better managed through roadway design elements aimed at a target speed of 25 miles per hour.
- Opportunities to reduce the crossing distance at crossings along the corridor, reducing the potential exposure of people crossing the roadway to people driving.
- The apparent right-of-way from Douglas Avenue to Patricia Avenue (approximately 60 feet) allows for a number of alternatives to be considered.
- Need to upgrade traffic signal equipment at Milwaukee Avenue to include mast arms presents an opportunity to reconstruct intersection as a mini roundabout.
- Long-term potential to underground utilities along the corridor presents opportunity to narrow street sections and widen/improve sidewalks.
- Opportunities to make intersections and pedestrian access routes compliant with ADA requirements

Constraints

The following summarizes potential constraints along the corridor to consider in the refinement of project recommendations:

- West of the Fred Marquis Pinellas Trail, right of way constraints and steep grades on the south side of the roadway may restrict the ability to install a sidewalk.
- High density of driveways along some portions of the corridor limit potential bicycle facility design options.
- Existing ADA deficiencies along the corridor could limit low-cost quick-build alternatives that could be implemented while funding is sought for the long-term project.

- Opportunities to modify the intersection with Edgewater Drive will be more involved; as this intersection is owned and maintained by FDOT, additional agency coordination would be required.

Next Steps

This completes our existing conditions assessment for the Beltrees Street Safer Street Plan. The information used in this memorandum will be used to help inform the development of project recommendations.

Attachments

- Attachment A: Synchro Worksheets
- Attachment B: Online Engagement Summary
- Attachment C: Walk Audit Field Package

ATTACHMENT A

SYNCHRO WORKSHEETS

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	5	398	29	1	870
Future Vol, veh/h	15	5	398	29	1	870
Conflicting Peds, #/hr	1	0	0	31	31	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	17	6	457	33	1	1000

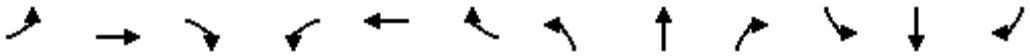
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1508	505	0	0	521	0
Stage 1	505	-	-	-	-	-
Stage 2	1003	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	132	565	-	-	1040	-
Stage 1	604	-	-	-	-	-
Stage 2	353	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	128	548	-	-	1009	-
Mov Cap-2 Maneuver	128	-	-	-	-	-
Stage 1	586	-	-	-	-	-
Stage 2	352	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	31.6	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	158	1009	-
HCM Lane V/C Ratio	-	-	0.145	0.001	-
HCM Control Delay (s)	-	-	31.6	8.6	0
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0	-

Beltrees Complete Streets Study
3: Douglas Ave & Beltrees St

Existing - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	37	7	34	24	21	5	132	78	16	153	2
Future Volume (veh/h)	2	37	7	34	24	21	5	132	78	16	153	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.97		0.94	0.97		0.93	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	2	43	7	39	28	18	6	152	68	18	176	2
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	80	174	28	309	117	76	833	741	331	791	1126	13
Arrive On Green	0.11	0.11	0.11	0.11	0.11	0.11	0.61	0.61	0.61	0.61	0.61	0.61
Sat Flow, veh/h	30	1513	240	1310	1024	658	1195	1205	539	1151	1831	21
Grp Volume(v), veh/h	52	0	0	39	0	46	6	0	220	18	0	178
Grp Sat Flow(s),veh/h/ln	1783	0	0	1310	0	1682	1195	0	1744	1151	0	1852
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	1.2	0.1	0.0	2.7	0.3	0.0	2.0
Cycle Q Clear(g_c), s	1.3	0.0	0.0	1.0	0.0	1.2	2.1	0.0	2.7	3.1	0.0	2.0
Prop In Lane	0.04		0.13	1.00		0.39	1.00		0.31	1.00		0.01
Lane Grp Cap(c), veh/h	281	0	0	309	0	193	833	0	1072	791	0	1138
V/C Ratio(X)	0.18	0.00	0.00	0.13	0.00	0.24	0.01	0.00	0.21	0.02	0.00	0.16
Avail Cap(c_a), veh/h	875	0	0	749	0	758	833	0	1072	791	0	1138
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.7	0.0	0.0	19.6	0.0	19.7	4.5	0.0	4.1	4.8	0.0	4.0
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.3	0.0	0.9	0.0	0.0	0.4	0.1	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	0.4	0.0	0.5	0.0	0.0	0.8	0.1	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.1	0.0	0.0	19.8	0.0	20.6	4.5	0.0	4.6	4.9	0.0	4.3
LnGrp LOS	C	A	A	B	A	C	A	A	A	A	A	A
Approach Vol, veh/h		52			85			226			196	
Approach Delay, s/veh		20.1			20.2			4.6			4.4	
Approach LOS		C			C			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		36.7		12.1		36.7		12.1				
Change Period (Y+Rc), s		* 6.7		6.5		* 6.7		6.5				
Max Green Setting (Gmax), s		* 30		22.0		* 30		22.0				
Max Q Clear Time (g_c+I1), s		5.1		3.2		4.7		3.3				
Green Ext Time (p_c), s		1.6		0.4		2.0		0.2				

Intersection Summary												
HCM 6th Ctrl Delay			8.3									
HCM 6th LOS			A									

Notes

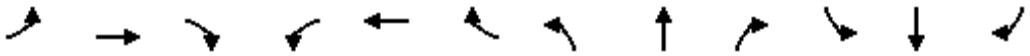
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	53	39	52	6	242	18	178
v/c Ratio	0.16	0.16	0.16	0.01	0.19	0.02	0.13
Control Delay	16.3	18.8	12.3	7.4	5.5	7.4	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.3	18.8	12.3	7.4	5.5	7.4	6.5
Queue Length 50th (ft)	12	11	8	1	21	2	20
Queue Length 95th (ft)	32	28	27	6	79	13	72
Internal Link Dist (ft)	173		203		226		197
Turn Bay Length (ft)		105		75		75	
Base Capacity (vph)	725	542	701	864	1270	815	1336
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.07	0.07	0.01	0.19	0.02	0.13

Intersection Summary

Beltrees Complete Streets Study
4: Milwaukee Ave & Beltrees St

Existing - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	56	77	106	74	16	2	146	41	11	207	16
Future Volume (veh/h)	4	56	77	106	74	16	2	146	41	11	207	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	0.99		0.96	0.99		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	5	64	67	122	85	13	2	168	36	13	238	18
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	141	227	226	385	209	25	133	351	75	146	393	29
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	23	829	827	669	765	90	6	1468	312	42	1645	121
Grp Volume(v), veh/h	136	0	0	220	0	0	206	0	0	269	0	0
Grp Sat Flow(s),veh/h/ln	1678	0	0	1524	0	0	1786	0	0	1808	0	0
Q Serve(g_s), s	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Cycle Q Clear(g_c), s	1.8	0.0	0.0	3.1	0.0	0.0	2.7	0.0	0.0	3.6	0.0	0.0
Prop In Lane	0.04		0.49	0.55		0.06	0.01		0.17	0.05		0.07
Lane Grp Cap(c), veh/h	594	0	0	619	0	0	558	0	0	569	0	0
V/C Ratio(X)	0.23	0.00	0.00	0.36	0.00	0.00	0.37	0.00	0.00	0.47	0.00	0.00
Avail Cap(c_a), veh/h	1939	0	0	1780	0	0	2060	0	0	2072	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	8.0	0.0	0.0	8.4	0.0	0.0	9.1	0.0	0.0	9.4	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.3	0.0	0.0	0.4	0.0	0.0	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.0	0.8	0.0	0.0	0.7	0.0	0.0	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.1	0.0	0.0	8.7	0.0	0.0	9.5	0.0	0.0	10.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	A	A	A	B	A	A
Approach Vol, veh/h		136			220			206			269	
Approach Delay, s/veh		8.1			8.7			9.5			10.0	
Approach LOS		A			A			A			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		14.5		13.2		14.5		13.2				
Change Period (Y+Rc), s		6.9		* 6.6		6.9		* 6.6				
Max Green Setting (Gmax), s		30.0		* 30		30.0		* 30				
Max Q Clear Time (g_c+I1), s		5.1		4.7		3.8		5.6				
Green Ext Time (p_c), s		1.4		1.2		0.8		1.6				

Intersection Summary												
HCM 6th Ctrl Delay			9.2									
HCM 6th LOS			A									

Notes

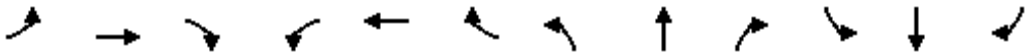
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	158	225	217	269
v/c Ratio	0.27	0.52	0.39	0.48
Control Delay	6.9	15.8	12.0	14.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	6.9	15.8	12.0	14.4
Queue Length 50th (ft)	9	33	28	40
Queue Length 95th (ft)	44	100	84	110
Internal Link Dist (ft)	227	189	208	178
Turn Bay Length (ft)				
Base Capacity (vph)	1355	1108	1449	1449
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.12	0.20	0.15	0.19

Intersection Summary

Beltrees Complete Streets Study
5: Patricia Ave & Beltrees St/Ped Phase

Existing - AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	0	69	0	0	5	129	248	0	0	297	68
Future Volume (veh/h)	80	0	69	0	0	5	129	248	0	0	297	68
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	0	1856	0	0	1856	1856	1856	0	0	1856	1856
Adj Flow Rate, veh/h	92	0	59	0	0	5	148	285	0	0	341	78
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	3	0	3	0	0	3	3	3	0	0	3	3
Cap, veh/h	257	0	0	0	0	0	474	1076	0	0	468	107
Arrive On Green	0.15	0.00	0.00	0.00	0.00	0.00	0.12	0.58	0.00	0.00	0.32	0.32
Sat Flow, veh/h	1767	92			0		1767	1856	0	0	1452	332
Grp Volume(v), veh/h	92	20.1			0.0		148	285	0	0	0	419
Grp Sat Flow(s),veh/h/ln	1767	C					1767	1856	0	0	0	1784
Q Serve(g_s), s	2.3						2.3	3.7	0.0	0.0	0.0	10.2
Cycle Q Clear(g_c), s	2.3						2.3	3.7	0.0	0.0	0.0	10.2
Prop In Lane	1.00						1.00		0.00	0.00		0.19
Lane Grp Cap(c), veh/h	257						474	1076	0	0	0	575
V/C Ratio(X)	0.36						0.31	0.26	0.00	0.00	0.00	0.73
Avail Cap(c_a), veh/h	1078						795	1132	0	0	0	1088
HCM Platoon Ratio	1.00						1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00						1.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	18.9						8.9	5.1	0.0	0.0	0.0	14.8
Incr Delay (d2), s/veh	1.2						0.4	0.2	0.0	0.0	0.0	2.5
Initial Q Delay(d3),s/veh	0.0						0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0						0.7	1.0	0.0	0.0	0.0	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.1						9.2	5.3	0.0	0.0	0.0	17.3
LnGrp LOS	C						A	A	A	A	A	B
Approach Vol, veh/h								433			419	
Approach Delay, s/veh								6.7			17.3	
Approach LOS								A			B	

Timer - Assigned Phs	1	2	3			6						
Phs Duration (G+Y+Rc), s	12.7	22.2	14.4			34.8						
Change Period (Y+Rc), s	6.6	* 6.3	* 7.2			* 6.3						
Max Green Setting (Gmax), s	15.0	* 30	* 30			* 30						
Max Q Clear Time (g_c+I1), s	4.3	12.2	4.3			5.7						
Green Ext Time (p_c), s	0.3	3.5	0.4			2.4						

Intersection Summary												
HCM 6th Ctrl Delay			12.7									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBR	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	92	79	6	148	285	419
v/c Ratio	0.34	0.22	0.01	0.30	0.25	0.57
Control Delay	31.9	2.3	0.0	8.0	7.2	20.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.9	2.3	0.0	8.0	7.2	20.7
Queue Length 50th (ft)	34	0	0	20	41	119
Queue Length 95th (ft)	86	5	0	62	113	276
Internal Link Dist (ft)					282	160
Turn Bay Length (ft)	40			90		
Base Capacity (vph)	752	753	979	606	1362	771
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.10	0.01	0.24	0.21	0.54

Intersection Summary

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	10	748	65	8	428
Future Vol, veh/h	10	10	748	65	8	428
Conflicting Peds, #/hr	0	1	0	30	30	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	11	11	831	72	9	476

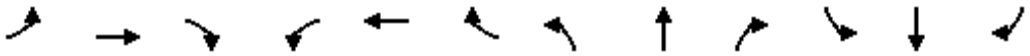
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1391	898	0	0	933	0
Stage 1	897	-	-	-	-	-
Stage 2	494	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	157	339	-	-	738	-
Stage 1	400	-	-	-	-	-
Stage 2	615	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	150	329	-	-	717	-
Mov Cap-2 Maneuver	150	-	-	-	-	-
Stage 1	388	-	-	-	-	-
Stage 2	605	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	24.6	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	206	717	-
HCM Lane V/C Ratio	-	-	0.108	0.012	-
HCM Control Delay (s)	-	-	24.6	10.1	0
HCM Lane LOS	-	-	C	B	A
HCM 95th %tile Q(veh)	-	-	0.4	0	-

Beltrees Complete Streets Study
3: Douglas Ave & Beltrees St

Existing - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	74	6	31	37	32	6	224	52	24	128	5
Future Volume (veh/h)	15	74	6	31	37	32	6	224	52	24	128	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.96		0.95	0.99		0.91	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	17	82	6	34	41	27	7	249	47	27	142	6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	106	209	14	348	140	92	849	923	174	713	1074	45
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.60	0.60	0.60	0.60	0.60	0.60
Sat Flow, veh/h	164	1519	102	1306	1017	670	1249	1542	291	1091	1794	76
Grp Volume(v), veh/h	105	0	0	34	0	68	7	0	296	27	0	148
Grp Sat Flow(s),veh/h/ln	1784	0	0	1306	0	1687	1249	0	1833	1091	0	1869
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	1.8	0.1	0.0	3.9	0.6	0.0	1.7
Cycle Q Clear(g_c), s	2.6	0.0	0.0	0.8	0.0	1.8	1.8	0.0	3.9	4.5	0.0	1.7
Prop In Lane	0.16		0.06	1.00		0.40	1.00		0.16	1.00		0.04
Lane Grp Cap(c), veh/h	329	0	0	348	0	232	849	0	1098	713	0	1120
V/C Ratio(X)	0.32	0.00	0.00	0.10	0.00	0.29	0.01	0.00	0.27	0.04	0.00	0.13
Avail Cap(c_a), veh/h	851	0	0	742	0	741	849	0	1098	713	0	1120
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.7	0.0	0.0	19.0	0.0	19.4	4.8	0.0	4.8	5.9	0.0	4.4
Incr Delay (d2), s/veh	0.8	0.0	0.0	0.2	0.0	1.0	0.0	0.0	0.6	0.1	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.0	0.3	0.0	0.7	0.0	0.0	1.2	0.1	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.5	0.0	0.0	19.2	0.0	20.4	4.8	0.0	5.4	6.0	0.0	4.6
LnGrp LOS	C	A	A	B	A	C	A	A	A	A	A	A
Approach Vol, veh/h		105			102			303			175	
Approach Delay, s/veh		20.5			20.0			5.4			4.8	
Approach LOS		C			B			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		36.7		13.4		36.7		13.4				
Change Period (Y+Rc), s		* 6.7		6.5		* 6.7		6.5				
Max Green Setting (Gmax), s		* 30		22.0		* 30		22.0				
Max Q Clear Time (g_c+I1), s		6.5		3.8		5.9		4.6				
Green Ext Time (p_c), s		1.3		0.5		2.7		0.6				

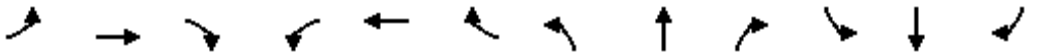
Intersection Summary		
HCM 6th Ctrl Delay	9.7	
HCM 6th LOS	A	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	106	34	77	7	307	27	148
v/c Ratio	0.31	0.13	0.21	0.01	0.26	0.04	0.12
Control Delay	19.5	18.1	12.0	7.8	7.5	7.7	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.5	18.1	12.0	7.8	7.5	7.7	7.3
Queue Length 50th (ft)	27	9	11	1	38	3	18
Queue Length 95th (ft)	59	27	36	7	120	18	62
Internal Link Dist (ft)	173		203		226		197
Turn Bay Length (ft)		105		75		75	
Base Capacity (vph)	691	516	702	799	1175	691	1199
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.07	0.11	0.01	0.26	0.04	0.12

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	135	7	45	87	31	9	154	42	11	140	13
Future Volume (veh/h)	20	135	7	45	87	31	9	154	42	11	140	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.96	0.99		0.94	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	22	150	7	50	97	26	10	171	36	12	156	14
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	179	480	21	254	333	74	147	309	63	154	344	30
Arrive On Green	0.29	0.29	0.29	0.29	0.29	0.29	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	107	1637	71	285	1134	251	41	1460	299	61	1623	140
Grp Volume(v), veh/h	179	0	0	173	0	0	217	0	0	182	0	0
Grp Sat Flow(s),veh/h/ln	1815	0	0	1669	0	0	1800	0	0	1825	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	2.0	0.0	0.0	2.0	0.0	0.0	2.9	0.0	0.0	2.3	0.0	0.0
Prop In Lane	0.12		0.04	0.29		0.15	0.05		0.17	0.07		0.08
Lane Grp Cap(c), veh/h	681	0	0	660	0	0	519	0	0	527	0	0
V/C Ratio(X)	0.26	0.00	0.00	0.26	0.00	0.00	0.42	0.00	0.00	0.35	0.00	0.00
Avail Cap(c_a), veh/h	2099	0	0	1934	0	0	2098	0	0	2116	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	7.5	0.0	0.0	7.5	0.0	0.0	9.6	0.0	0.0	9.4	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.2	0.0	0.0	0.5	0.0	0.0	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	0.6	0.0	0.0	0.8	0.0	0.0	0.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.7	0.0	0.0	7.7	0.0	0.0	10.2	0.0	0.0	9.8	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	B	A	A	A	A	A
Approach Vol, veh/h		179			173			217			182	
Approach Delay, s/veh		7.7			7.7			10.2			9.8	
Approach LOS		A			A			B			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		14.9		12.4		14.9		12.4				
Change Period (Y+Rc), s		6.9		* 6.6		6.9		* 6.6				
Max Green Setting (Gmax), s		30.0		* 30		30.0		* 30				
Max Q Clear Time (g_c+I1), s		4.0		4.9		4.0		4.3				
Green Ext Time (p_c), s		1.1		1.3		1.1		1.0				

Intersection Summary												
HCM 6th Ctrl Delay			8.9									
HCM 6th LOS			A									

Notes

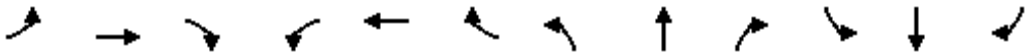
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	WBT	NBT	SBT
Lane Group Flow (vph)	180	181	228	182
v/c Ratio	0.23	0.26	0.40	0.32
Control Delay	11.0	10.7	11.7	11.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.0	10.7	11.7	11.5
Queue Length 50th (ft)	22	21	26	22
Queue Length 95th (ft)	79	77	94	78
Internal Link Dist (ft)	227	189	208	178
Turn Bay Length (ft)				
Base Capacity (vph)	1533	1354	1550	1552
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.12	0.13	0.15	0.12

Intersection Summary

Beltrees Complete Streets Study
5: Patricia Ave & Beltrees St/Ped Phase

Existing - PM Peak Hour



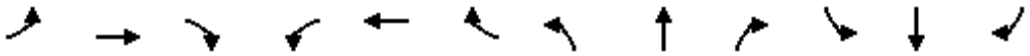
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	114	0	74	0	0	0	102	415	0	0	341	95
Future Volume (veh/h)	114	0	74	0	0	0	102	415	0	0	341	95
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	0	1885	0	0	1885	1885	1885	0	0	1885	1885
Adj Flow Rate, veh/h	127	0	82	0	0	0	113	461	0	0	379	106
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	0	1	0	0	1	1	1	0	0	1	1
Cap, veh/h	288	0	0	0	0	0	432	1100	0	0	494	138
Arrive On Green	0.16	0.00	0.00	0.00	0.00	0.00	0.11	0.58	0.00	0.00	0.35	0.35
Sat Flow, veh/h	1795	127			0		1795	1885	0	0	1409	394
Grp Volume(v), veh/h	127	21.5			0.0		113	461	0	0	0	485
Grp Sat Flow(s),veh/h/ln	1795	C					1795	1885	0	0	0	1804
Q Serve(g_s), s	3.4						1.8	7.1	0.0	0.0	0.0	12.6
Cycle Q Clear(g_c), s	3.4						1.8	7.1	0.0	0.0	0.0	12.6
Prop In Lane	1.00						1.00		0.00	0.00		0.22
Lane Grp Cap(c), veh/h	288						432	1100	0	0	0	632
V/C Ratio(X)	0.44						0.26	0.42	0.00	0.00	0.00	0.77
Avail Cap(c_a), veh/h	1023						751	1100	0	0	0	1028
HCM Platoon Ratio	1.00						1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00						1.00	1.00	0.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	20.0						9.4	6.1	0.0	0.0	0.0	15.2
Incr Delay (d2), s/veh	1.5						0.3	0.4	0.0	0.0	0.0	2.8
Initial Q Delay(d3),s/veh	0.0						0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4						0.6	2.1	0.0	0.0	0.0	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.5						9.8	6.4	0.0	0.0	0.0	18.0
LnGrp LOS	C						A	A	A	A	A	B
Approach Vol, veh/h								574			485	
Approach Delay, s/veh								7.1			18.0	
Approach LOS								A			B	

Timer - Assigned Phs	1	2	3			6						
Phs Duration (G+Y+Rc), s	12.3	24.8	15.6			37.0						
Change Period (Y+Rc), s	6.6	* 6.3	* 7.2			* 6.3						
Max Green Setting (Gmax), s	15.0	* 30	* 30			* 30						
Max Q Clear Time (g_c+I1), s	3.8	14.6	5.4			9.1						
Green Ext Time (p_c), s	0.2	3.9	0.5			4.1						

Intersection Summary	
HCM 6th Ctrl Delay	13.1
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	0	69	0	0	5	129	248	0	0	297	68
Future Volume (vph)	80	0	69	0	0	5	129	248	0	0	297	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.2		7.2			7.2	6.6	6.3			6.3	
Lane Util. Factor	1.00		1.00			1.00	1.00	1.00			1.00	
Frpb, ped/bikes	1.00		1.00			1.00	1.00	1.00			0.99	
Flpb, ped/bikes	1.00		1.00			1.00	1.00	1.00			1.00	
Frt	1.00		0.85			0.86	1.00	1.00			0.97	
Flt Protected	0.95		1.00			1.00	0.95	1.00			1.00	
Satd. Flow (prot)	1752		1568			1596	1752	1845			1788	
Flt Permitted	0.95		1.00			1.00	0.31	1.00			1.00	
Satd. Flow (perm)	1752		1568			1596	564	1845			1788	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	92	0	79	0	0	6	148	285	0	0	341	78
RTOR Reduction (vph)	0	0	68	0	0	6	0	0	0	0	5	0
Lane Group Flow (vph)	92	0	11	0	0	0	148	285	0	0	414	0
Confl. Peds. (#/hr)												5
Confl. Bikes (#/hr)												1
Turn Type	Prot		Perm			Prot	pm+pt	NA			NA	
Protected Phases	3					4	1	6			2	
Permitted Phases			3				6					
Actuated Green, G (s)	11.1		11.1			0.4	44.3	44.3			29.2	
Effective Green, g (s)	11.1		11.1			0.4	44.3	44.3			29.2	
Actuated g/C Ratio	0.15		0.15			0.01	0.58	0.58			0.38	
Clearance Time (s)	7.2		7.2			7.2	6.6	6.3			6.3	
Vehicle Extension (s)	4.0		4.0			0.2	3.0	4.0			4.0	
Lane Grp Cap (vph)	254		227			8	458	1068			682	
v/s Ratio Prot	c0.05					c0.00	0.04	c0.15			c0.23	
v/s Ratio Perm			0.01				0.15					
v/c Ratio	0.36		0.05			0.00	0.32	0.27			0.61	
Uniform Delay, d1	29.5		28.2			37.9	9.1	8.0			19.0	
Progression Factor	1.00		1.00			1.00	1.00	1.00			1.00	
Incremental Delay, d2	1.2		0.1			0.1	0.4	0.2			1.8	
Delay (s)	30.7		28.3			37.9	9.5	8.2			20.8	
Level of Service	C		C			D	A	A			C	
Approach Delay (s)		29.6			37.9			8.6			20.8	
Approach LOS		C			D			A			C	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	76.5	Sum of lost time (s)	27.3
Intersection Capacity Utilization	45.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	127	82	113	461	485
v/c Ratio	0.42	0.21	0.23	0.38	0.62
Control Delay	30.6	2.6	6.6	7.5	19.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	30.6	2.6	6.6	7.5	19.8
Queue Length 50th (ft)	49	0	16	80	147
Queue Length 95th (ft)	98	10	38	150	274
Internal Link Dist (ft)				282	160
Turn Bay Length (ft)	40		90		
Base Capacity (vph)	770	769	612	1395	788
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.16	0.11	0.18	0.33	0.62

Intersection Summary

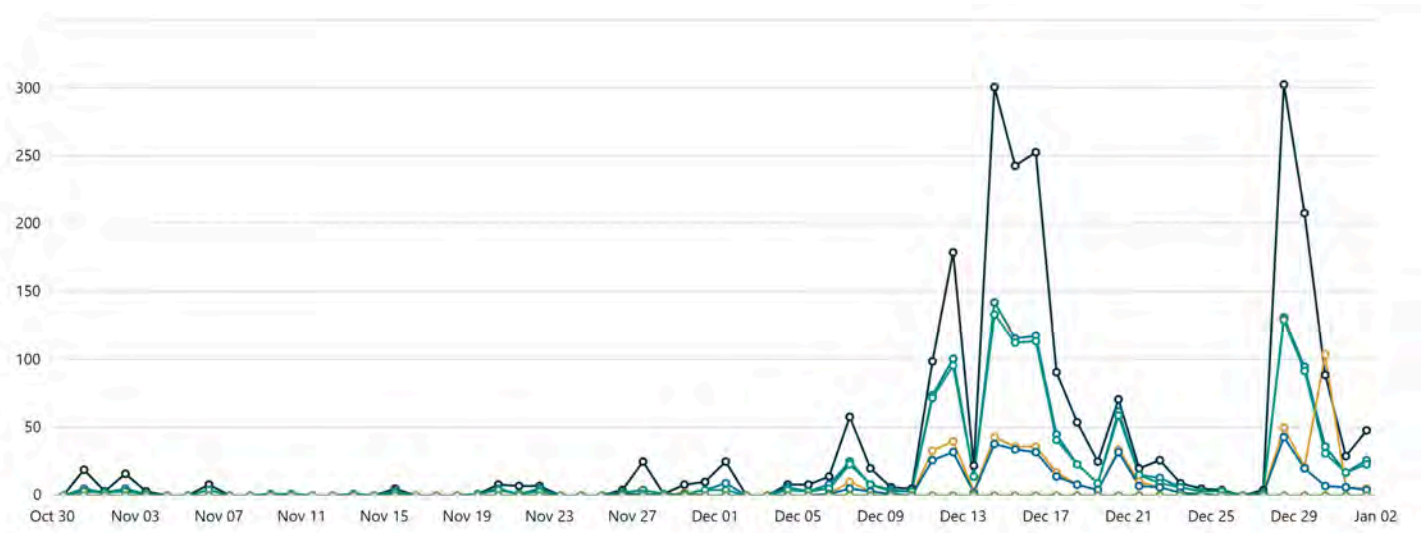
ATTACHMENT B

ONLINE ENGAGEMENT SUMMARY

F&P Social Pinpoint

Report Type: Project
Project Name: Help us create a safer Beltrees Street.
Date Range: 30-10-2023 - 01-01-2024
Exported: 10-01-2024 01:38:02

Performance Summary
Information regarding key visitation and utilisation metrics for your Site or projects.



2,355 Views	1,164 Visits	1,026 Visitors	479 Contributions	318 Contributors	0 Followers

Views - The number of times a Visitor views any page on a Site.
Visits - The number of end-user sessions associated with a single Visitor.
Visitors - The number of unique public or end-users to a Site. A Visitor is only counted once, even if they visit a Site several times in one day.
Contributions - The total number of responses or feedback collected through the participation tools.
Contributors - The unique number of Visitors who have left feedback or Contributions on a Site through the participation tools.
Followers - The number of Visitors who have 'subscribed' to a project using the 'Follow' button.

Conversions

Information regarding how well your engagement websites converted Visitors to perform defined key actions.

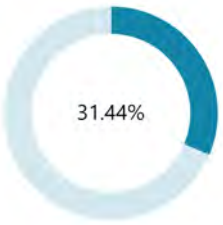
Feedback

Percentage of visits where at least **1 contribution** was made.

Attention

Percentage of visits that lasted at least **1 active minute**.

Actions



Percentage of visits where at least **2 actions** were performed.

Participation

Information regarding how people have participated in your projects and activities.

Contributions by Activity
Contributions by Activity is a breakdown of contributions across each tool

	Activity	Contributions		%
	Form	318		66.39%
	Social Map	161		33.61%

Top Activities
Top Activities is the top 5 tools that received the highest contributions

	Activity	Page Name	Contributions	Contributors
	Form	Beltrees Complete Streets Survey	318	304
	Social Map	Beltrees Street Comment Map	161	38
	Social Map	Beltrees Street Safety Study	0	0

Projects

The current number and status of your Site's projects (e.g. engagement websites)

Engagement Time

1	21	47
Days	Hours	Minutes

Dec 14th 2023	Thursday
Peak Visitation Date	Peak Visitation Day

Top Visited Pages
Summary information for the top five most visited Pages.

Page Name	Visitation %	Visits	Visitors
Help us create a safer Beltrees Street.	78.09%	909	818
Beltrees Complete Streets Survey	65.64%	764	709
Beltrees Street Comment Map	27.66%	322	301

People

Information regarding who has participated in your projects and activities.

Follower Activity
Information regarding the activity of registered Members who have 'followed' or subscribed to one or more projects.

0 Total Followers	0 New Followers	0 Total Follows	0 New Follows

Total Followers - The number of unique Members who have 'followed' at least one project.
New Followers - The number of new unique Members who have 'followed' at least one project within the specified reporting date range.
Total Follows - The number of total 'follows' performed by all Followers across all projects. Each Follower may record multiple Follows.
New Follows - The number of new total 'follows' performed by all Members across all projects within the specified reporting date range.

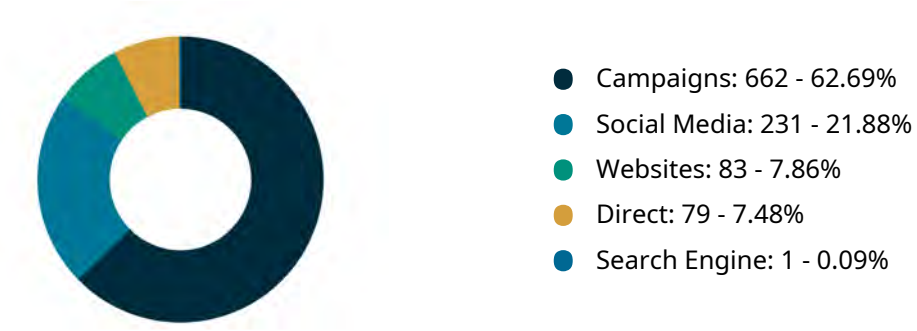
Visitor Profile
Visitor Profile is a comparison between new visitor and returning over the selected period

First Time - The number of Visitors that are visiting a Site for the first time within the reporting date range.
Returning - The number of Visitors that have made more than one Visit to a Site within the reporting date range.

Acquisition

Information regarding the method by which Visitors arrived to your Site or projects.

Referral Types
Referral traffic is the segment of traffic that arrives on your website through another source, like through a link on another domain.



Direct - Visitors who have arrived at a Site by entering the exact web address or URL of the page.
Search Engine - Visitors who have arrived at a Site via a search engine. Such as Google, Yahoo, etc.
Websites - Visitors who have arrived at the Site after clicking a link located on an external website.
Social Media - Visitors who have arrived at a Site by clicking a link from a known social media site such as Facebook, X, LinkedIn, etc.
Campaigns - Visitors who have arrived through a campaign (using a UTM). See your email campaign report for more details on campaigns sent from this platform.

Downloads

Information regarding your downloads, the total set of unique documents downloaded, total downloads of all files, and your top downloads.

4
Total Documents

0
Total Downloads

Top Downloads
Top file downloads in your selection, ordered by the number of downloads.

File Title	File Type	Downloads
20230620_111658.jpg	JPG	0
CommentMap.png	PNG	0
20230620_111658.jpg	JPG	0
SafeStreetsDunedin_Logo.png	PNG	0

Email Campaigns

Information regarding your email campaigns, your total campaigns, the total number of recipients, and your top campaigns by click-through rate (clicks as a percentage of total recipients).

0
Email Campaigns Sent

0
Total Recipients

0%
Click-through Rate

No Data Available

F&P Social Pinpoint

Report Type: Form Results Summary
Date Range: 30-10-2023 - 01-01-2024
Exported: 09-01-2024 06:42:53

Open

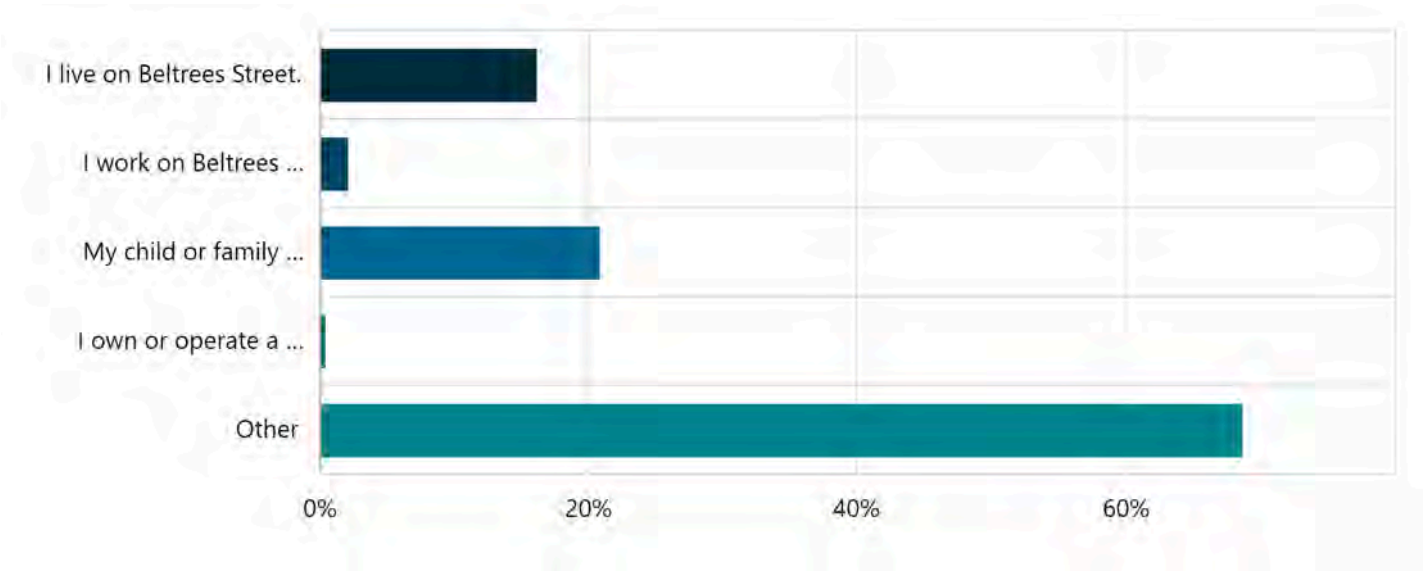
Thank you for your interest in the Beltrees Safer Street Plan.
Help us create a safer Beltrees Street.

304	318
Contributors	Contributions

Contribution Summary

1. What is your connection to Beltrees Street? (Select all that apply)

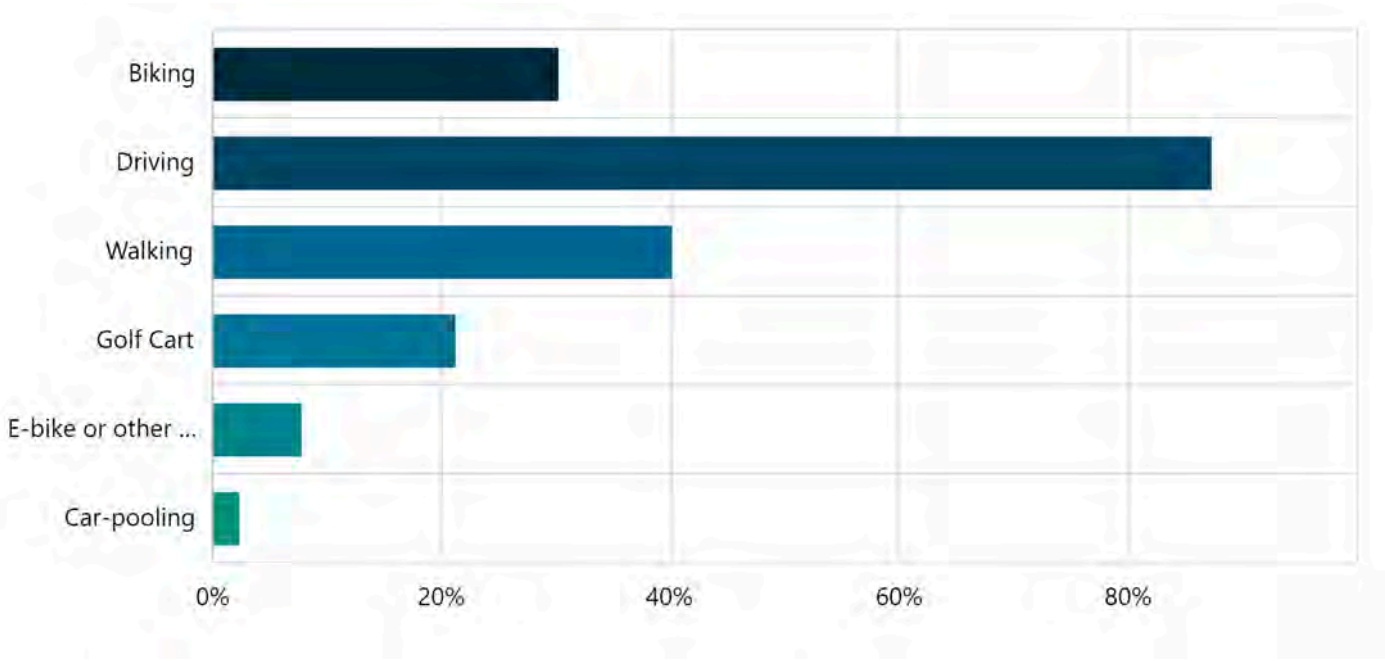
Multi Choice | Skipped: 19 | Answered: 299 (94%)



Answer choices	Percent	Count
I live on Beltrees Street.	16.05%	48
I work on Beltrees Street.	2.01%	6
My child or family member attends Curtis Fundamental Elementary School.	20.74%	62
I own or operate a business or commercial property on Beltrees Street.	0.33%	1
Other	68.56%	205

2. When traveling along Beltrees Street, what are your primary modes of transportation? (Select all that apply)

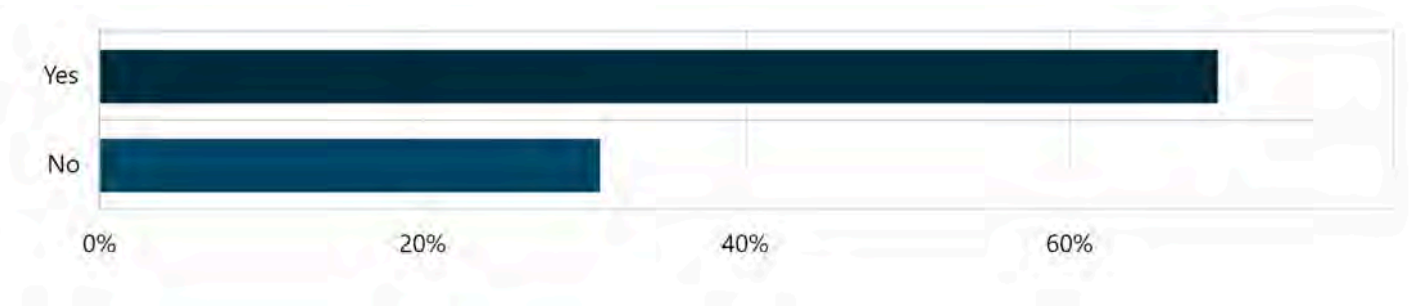
Multi Choice | Skipped: 6 | Answered: 312 (98.1%)



Answer choices	Percent	Count
Biking	30.13%	94
Driving	87.18%	272
Walking	40.06%	125
Golf Cart	21.15%	66
E-bike or other low-speed vehicle	7.69%	24
Car-pooling	2.24%	7

3. Do you feel safe traveling on Beltrees Street?

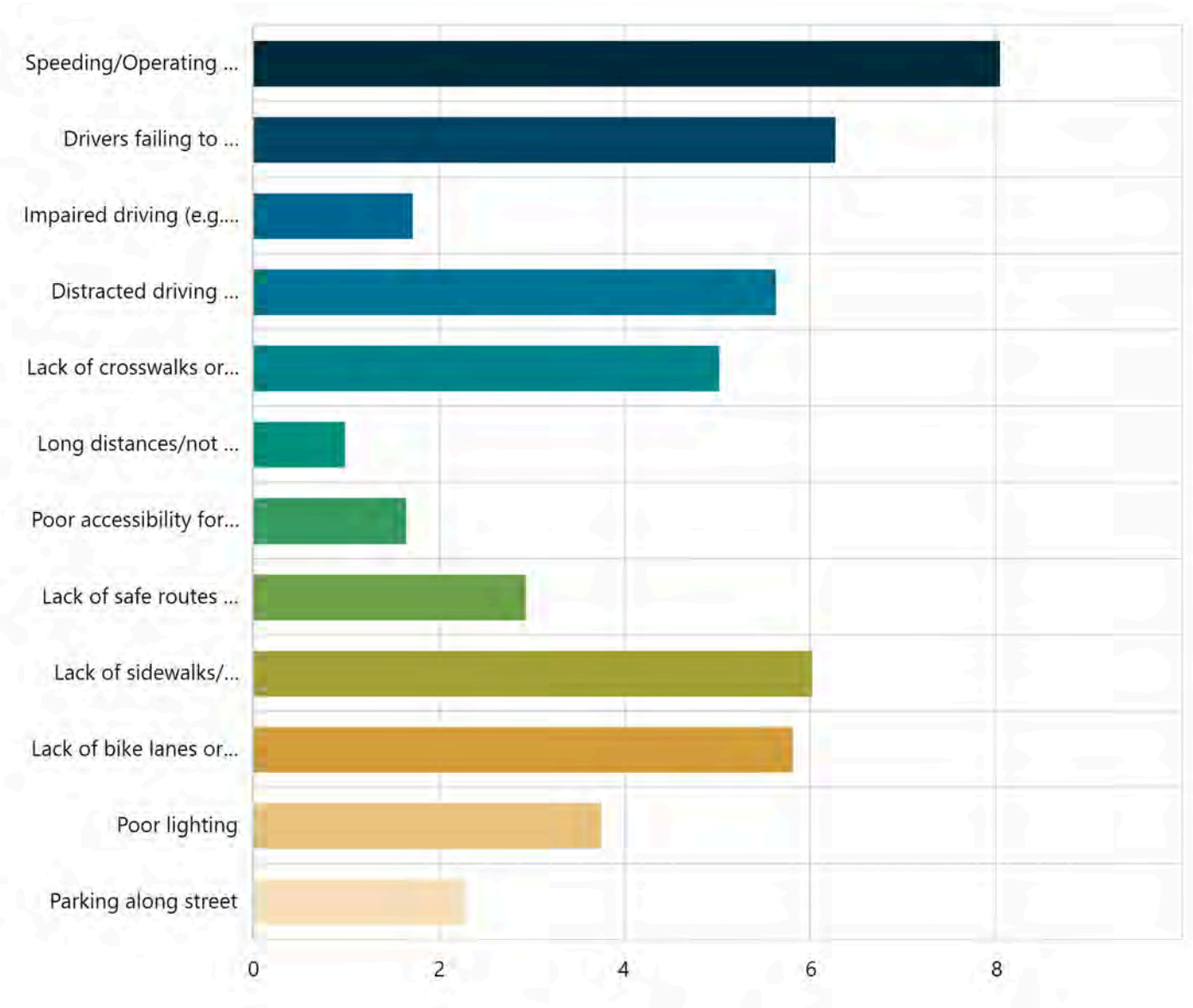
Multi Choice | Skipped: 17 | Answered: 301 (94.7%)



Answer choices	Percent	Count
Yes	69.10%	208
No	30.90%	93
Total	**100.00%**	**301**

4. What are your top 5 transportation safety concerns on Beltrees Street. Drag and drop your safety concerns from most important to least important.

Ranking | Skipped: 48 | Answered: 270 (84.9%)



	1	2	3	4	5	6	7	8	9	10	11	12	Count	Score	Avg Rank
Speeding/Operating speed of vehicles	46.77% 94	17.91% 36	15.42% 31	7.46% 15	12.44% 25	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	201	8.03	2.21
Drivers failing	23.64% 39	25.45% 42	18.79% 31	15.76% 26	16.36% 27	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	165	6.26	2.76

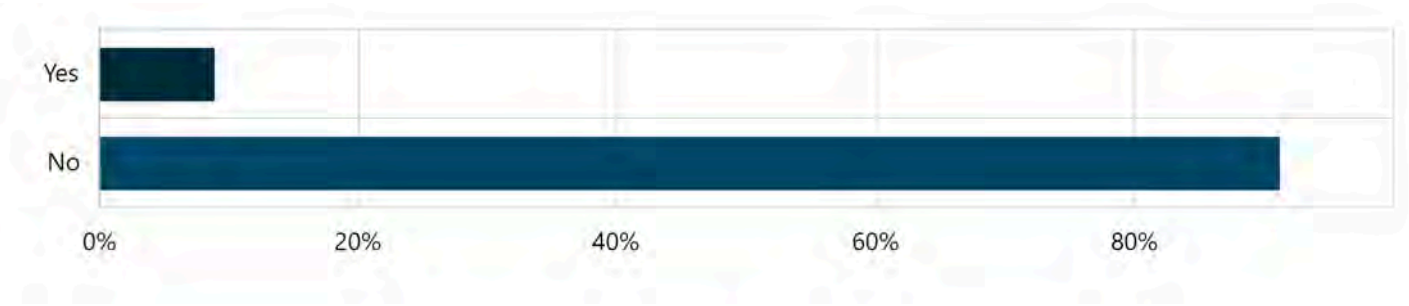
to yield to pedestrians.															
Impaired driving (e.g., alcohol, cannabis)	8.33% 4	20.83% 10	14.58% 7	39.58% 19	16.67% 8	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	48	1.71	3.35
Distracted driving (e.g., cell phones, vehicle screens)	18.54% 28	25.17% 38	18.54% 28	17.88% 27	19.87% 30	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	151	5.62	2.95
Lack of crosswalks or crosswalk not visible	15.44% 21	24.26% 33	17.65% 24	24.26% 33	18.38% 25	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	136	5.01	3.06
Long distances/ not enough time to cross the street	3.45% 1	13.79% 4	13.79% 4	27.59% 8	41.38% 12	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	29	0.98	3.90
Poor accessibility for peo	4.35% 2	26.09% 12	26.09% 12	15.22% 7	28.26% 13	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	46	1.64	3.37

ple with disabilities															
Lack of safe routes for children to walk to school	11.11% 9	19.75% 16	23.46% 19	25.93% 21	19.75% 16	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	81	2.93	3.23
Lack of sidewalks/poor condition of sidewalks	14.20% 23	23.46% 38	27.78% 45	18.52% 30	16.05% 26	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	162	6.01	2.99
Lack of bike lanes or paths/poor condition of bike lanes or paths	17.61% 28	13.21% 21	24.53% 39	25.79% 41	18.87% 30	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	159	5.80	3.15
Poor lighting	10.28% 11	14.02% 15	20.56% 22	19.63% 21	35.51% 38	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	107	3.74	3.56
Parking along street	15.38% 10	7.69% 5	12.31% 8	33.85% 22	30.77% 20	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	0% 0	65	2.27	3.57

Score - Sum of the weight of each ranked position, multiplied by the response count for the position choice, divided by the total contributions. Weights are inverse to ranked positions.
Avg Rank - Sum of the ranked position of the choice, multiplied by the response count for the position choice, divided by the total 'Count' of the choice.

5. Are there drainage issues that affect your travel along Beltrees Street during and after periods of rain? If yes, where?

Multi Choice | Skipped: 24 | Answered: 294 (92.5%)



Answer choices	Percent	Count
Yes	8.84%	26
No	91.16%	268
Total	**100.00%**	**294**

6. What ideas, suggestions, or additional considerations do you have to enhance transportation safety on Beltrees Street?

Long Text | Skipped: 146 | Answered: 172 (54.1%)

Sentiment

No sentiment data

Tags

No tag data

Featured Contributions

No featured contributions

7. What is your zip code?

Short Text | Skipped: 28 | Answered: 290 (91.2%)

Sentiment

No sentiment data

Tags

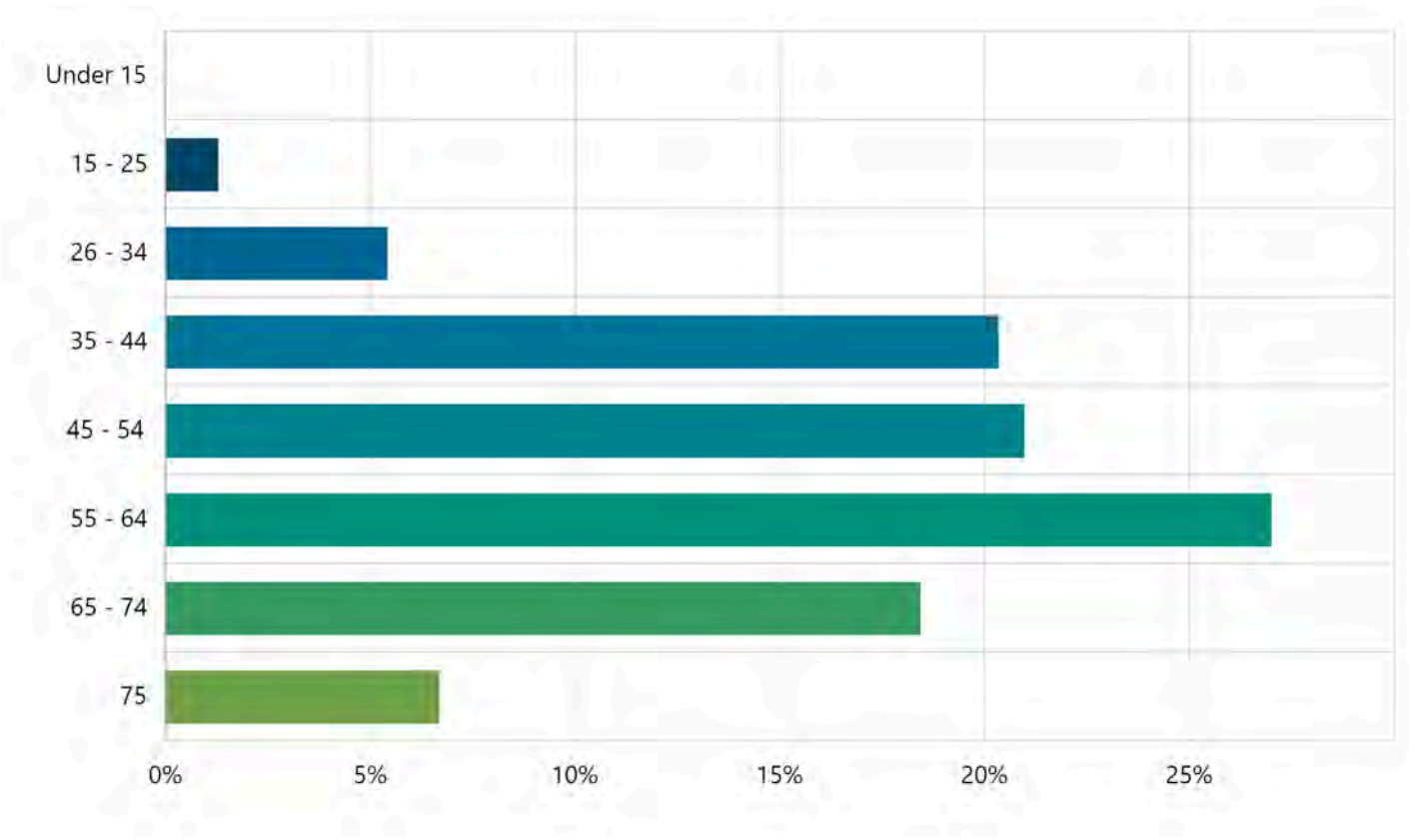
No tag data

Featured Contributions

No featured contributions

8. What is your age range?

Multi Choice | Skipped: 3 | Answered: 315 (99.1%)



Answer choices	Percent	Count
Under 15	0%	0
15 - 25	1.27%	4
26 - 34	5.40%	17
35 - 44	20.32%	64
45 - 54	20.95%	66
55 - 64	26.98%	85
65 - 74	18.41%	58
75	6.67%	21
Total	**100.00%**	**315**

ATTACHMENT C

WALK AUDIT PACKAGE

SAFE STREETS DUNEDIN

Walk Audit Field Guide

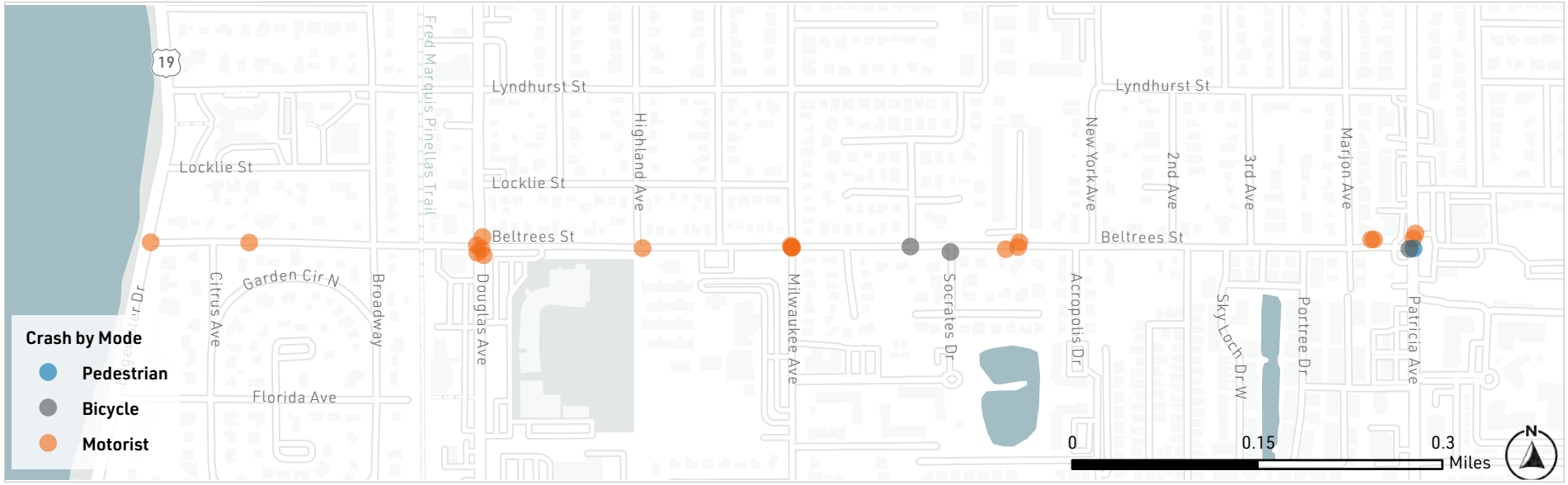
Beltrees Safer Street Plan

December 11, 2023

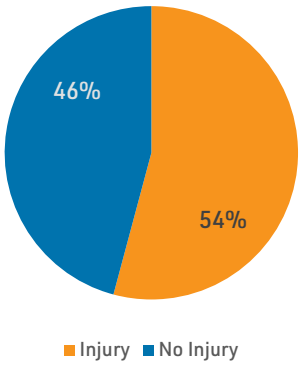
Prepared by: Fehr & Peers
Prepared for: City of Dunedin and Forward Pinellas

FEHR & PEERS

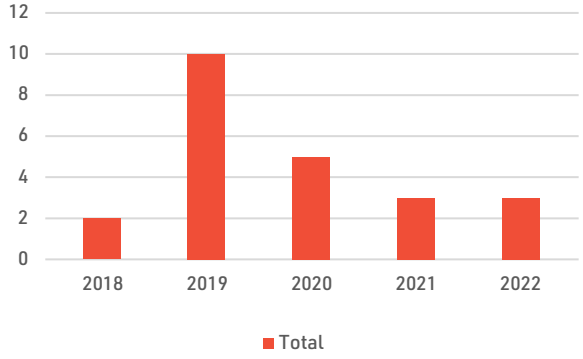
COLLISION PROFILE



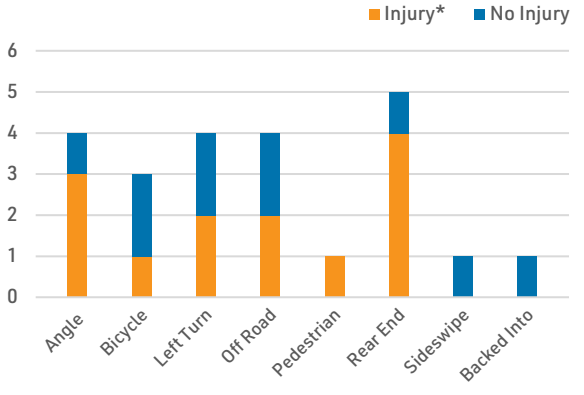
Crash by Severity



Crash by Year



Crash Severity



*Injury: These injuries do not prevent the injured person from walking, driving, or normally continuing the activities that he/she was capable of performing before the injury occurred. This includes momentary unconsciousness, bruises, lumps, and minor lacerations.

ALONG THE STREET

Between Edgewater Drive and Douglas Avenue

Prompt List	Yes	No	N/A	Notes
Are pedestrian and bicycle facilities appropriate for the adjacent land use?	☐	☐	☐	
Does the street address pedestrian and bicycle needs, including those with disabilities?	☐	☐	☐	
Are safe, continuous, and convenient pedestrian and bicycle routes provided?	☐	☐	☐	
Are pedestrian and bicycle facilities shared or separate?	☐	☐	☐	
Are bicycle facilities adequate and comfortable?	☐	☐	☐	
Are there conflicts between pedestrians and bicyclists riding on the sidewalk?	☐	☐	☐	
Are pedestrian and bicycle facilities in good condition without cracks or raised sections?	☐	☐	☐	
Are sidewalks free of obstacles (hydrants, utility poles, overgrown landscaping, trash receptacles)	☐	☐	☐	
Are sidewalks wide enough (at least 5 feet) for two people to walk side by side or pass one another ?	☐	☐	☐	
Does the sidewalk include curb cut ramps (for use by wheelchairs, baby strollers, etc.) wherever it is interrupted by a street?	☐	☐	☐	
Do drivers yield to pedestrians at driveways?	☐	☐	☐	
Is the sidewalk separated from the street by a barrier or buffer (a curb, grass, landscaping)?	☐	☐	☐	
What are the distances between marked crosswalks (mid-block crossing and intersections) ?	☐	☐	☐	
Are crosswalks well marked and clearly visible to drivers and pedestrians?	☐	☐	☐	
Are marked crosswalks provided on stop-controlled approaches of unsignalized intersections?	☐	☐	☐	
Do midblock crosswalks include signage alerting drivers to the presence of pedestrians?	☐	☐	☐	
Do midblock crossings include crossing enhancements i.e., pedestrian signal, flashing beacons or other type of beacon?	☐	☐	☐	
Can pedestrians and bicycles be seen by motorists during dark conditions i.e., is lighting adequate?	☐	☐	☐	
Are there obstructions blocking the driver's view of pedestrians and bicycles?	☐	☐	☐	
Are marked crosswalks provided on stop-controlled approaches of unsignalized intersections?	☐	☐	☐	
Can pedestrians, bicyclists and drivers see each other on all legs of an intersection?	☐	☐	☐	

AT THE INTERSECTION

Beltrees Street & Douglas Avenue

Prompt List	Yes	No	N/A	Notes
Are marked crosswalks provided on all approaches of signalized intersections?	☐	☐	☐	
Are pedestrian push-buttons and countdown pedestrian signal heads provided on all approaches of signalized intersections?	☐	☐	☐	
Do pedestrians and bicyclists use the push buttons before crossing?	☐	☐	☐	
Are pedestrians waiting for a "WALK" indication to cross or are they crossing against the signal?	☐	☐	☐	
Do crossing signals provide enough time for pedestrians to cross? *(Please note the amount of time provided)*	☐	☐	☐	
How long do pedestrians have to wait for a "WALK" indication in between signal cycles? *(Please note the time)*	☐	☐	☐	
Are there restrictions on turning-movements, like no right-turn-on-red?	☐	☐	☐	
Do vehicles have protected (green arrow) or permitted (green ball) left-turn control?	☐	☐	☐	
Do drivers yield to pedestrians and bicycles in the crosswalk (especially during right-turns)?	☐	☐	☐	
Are marked crosswalks provided on stop-controlled approaches of unsignalized intersections?	☐	☐	☐	
Can pedestrians, bicyclists and drivers see each other on all legs of an intersection?	☐	☐	☐	

ALONG THE STREET

Between Highland Avenue and Socrates Drive

Prompt List	Yes	No	N/A	Notes
Are pedestrian and bicycle facilities appropriate for the adjacent land use?	☐	☐	☐	
Does the street address pedestrian and bicycle needs, including those with disabilities?	☐	☐	☐	
Are safe, continuous, and convenient pedestrian and bicycle routes provided?	☐	☐	☐	
Are pedestrian and bicycle facilities shared or separate?	☐	☐	☐	
Are bicycle facilities adequate and comfortable?	☐	☐	☐	
Are there conflicts between pedestrians and bicyclists riding on the sidewalk?	☐	☐	☐	
Are pedestrian and bicycle facilities in good condition without cracks or raised sections?	☐	☐	☐	
Are sidewalks free of obstacles (hydrants, utility poles, overgrown landscaping, trash receptacles)	☐	☐	☐	
Are sidewalks wide enough (at least 5 feet) for two people to walk side by side or pass one another ?	☐	☐	☐	
Does the sidewalk include curb cut ramps (for use by wheelchairs, baby strollers, etc.) wherever it is interrupted by a street?	☐	☐	☐	
Do drivers yield to pedestrians at driveways?	☐	☐	☐	
Is the sidewalk separated from the street by a barrier or buffer (a curb, grass, landscaping)?	☐	☐	☐	
What are the distances between marked crosswalks (mid-block crossing and intersections) ?	☐	☐	☐	
Are crosswalks well marked and clearly visible to drivers and pedestrians?	☐	☐	☐	
Are marked crosswalks provided on stop-controlled approaches of unsignalized intersections?	☐	☐	☐	
Do midblock crosswalks include signage alerting drivers to the presence of pedestrians?	☐	☐	☐	
Do midblock crossings include crossing enhancements i.e., pedestrian signal, flashing beacons or other type of beacon?	☐	☐	☐	
Can pedestrians and bicycles be seen by motorists during dark conditions i.e., is lighting adequate?	☐	☐	☐	
Are there obstructions blocking the driver's view of pedestrians and bicycles?	☐	☐	☐	
Are marked crosswalks provided on stop-controlled approaches of unsignalized intersections?	☐	☐	☐	
Can pedestrians, bicyclists and drivers see each other on all legs of an intersection?	☐	☐	☐	

AT THE INTERSECTION

Beltrees Street & Milwaukee Avenue

Prompt List	Yes	No	N/A	Notes
Are marked crosswalks provided on all approaches of signalized intersections?	☐	☐	☐	
Are pedestrian push-buttons and countdown pedestrian signal heads provided on all approaches of signalized intersections?	☐	☐	☐	
Do pedestrians and bicyclists use the push buttons before crossing?	☐	☐	☐	
Are pedestrians waiting for a "WALK" indication to cross or are they crossing against the signal?	☐	☐	☐	
Do crossing signals provide enough time for pedestrians to cross? *(Please note the amount of time provided)*	☐	☐	☐	
How long do pedestrians have to wait for a "WALK" indication in between signal cycles? *(Please note the time)*	☐	☐	☐	
Are there restrictions on turning-movements, like no right-turn-on-red?	☐	☐	☐	
Do vehicles have protected (green arrow) or permitted (green ball) left-turn control?	☐	☐	☐	
Do drivers yield to pedestrians and bicycles in the crosswalk (especially during right-turns)?	☐	☐	☐	
Are marked crosswalks provided on stop-controlled approaches of unsignalized intersections?	☐	☐	☐	
Can pedestrians, bicyclists and drivers see each other on all legs of an intersection?	☐	☐	☐	

ALONG THE STREET

Between Socrates Drive and Patrica Avenue

Prompt List	Yes	No	N/A	Notes
Are pedestrian and bicycle facilities appropriate for the adjacent land use?	☐	☐	☐	
Does the street address pedestrian and bicycle needs, including those with disabilities?	☐	☐	☐	
Are safe, continuous, and convenient pedestrian and bicycle routes provided?	☐	☐	☐	
Are pedestrian and bicycle facilities shared or separate?	☐	☐	☐	
Are bicycle facilities adequate and comfortable?	☐	☐	☐	
Are there conflicts between pedestrians and bicyclists riding on the sidewalk?	☐	☐	☐	
Are pedestrian and bicycle facilities in good condition without cracks or raised sections?	☐	☐	☐	
Are sidewalks free of obstacles (hydrants, utility poles, overgrown landscaping, trash receptacles)	☐	☐	☐	
Are sidewalks wide enough (at least 5 feet) for two people to walk side by side or pass one another ?	☐	☐	☐	
Does the sidewalk include curb cut ramps (for use by wheelchairs, baby strollers, etc.) wherever it is interrupted by a street?	☐	☐	☐	
Do drivers yield to pedestrians at driveways?	☐	☐	☐	
Is the sidewalk separated from the street by a barrier or buffer (a curb, grass, landscaping)?	☐	☐	☐	
What are the distances between marked crosswalks (mid-block crossing and intersections) ?	☐	☐	☐	
Are crosswalks well marked and clearly visible to drivers and pedestrians?	☐	☐	☐	
Are marked crosswalks provided on stop-controlled approaches of unsignalized intersections?	☐	☐	☐	
Do midblock crosswalks include signage alerting drivers to the presence of pedestrians?	☐	☐	☐	
Do midblock crossings include crossing enhancements i.e., pedestrian signal, flashing beacons or other type of beacon?	☐	☐	☐	
Can pedestrians and bicycles be seen by motorists during dark conditions i.e., is lighting adequate?	☐	☐	☐	
Are there obstructions blocking the driver's view of pedestrians and bicycles?	☐	☐	☐	
Are marked crosswalks provided on stop-controlled approaches of unsignalized intersections?	☐	☐	☐	
Can pedestrians, bicyclists and drivers see each other on all legs of an intersection?	☐	☐	☐	

AT THE INTERSECTION

Beltrees Street & Patricia Avenue

Prompt List	Yes	No	N/A	Notes
Are marked crosswalks provided on all approaches of signalized intersections?	☐	☐	☐	
Are pedestrian push-buttons and countdown pedestrian signal heads provided on all approaches of signalized intersections?	☐	☐	☐	
Do pedestrians and bicyclists use the push buttons before crossing?	☐	☐	☐	
Are pedestrians waiting for a "WALK" indication to cross or are they crossing against the signal?	☐	☐	☐	
Do crossing signals provide enough time for pedestrians to cross? *(Please note the amount of time provided)*	☐	☐	☐	
How long do pedestrians have to wait for a "WALK" indication in between signal cycles? *(Please note the time)*	☐	☐	☐	
Are there restrictions on turning-movements, like no right-turn-on-red?	☐	☐	☐	
Do vehicles have protected (green arrow) or permitted (green ball) left-turn control?	☐	☐	☐	
Do drivers yield to pedestrians and bicycles in the crosswalk (especially during right-turns)?	☐	☐	☐	
Are marked crosswalks provided on stop-controlled approaches of unsignalized intersections?	☐	☐	☐	
Can pedestrians, bicyclists and drivers see each other on all legs of an intersection?	☐	☐	☐	

ADDITIONAL NOTES

ADDITIONAL NOTES

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Appendix C

Cost Estimates

Alternative 1

ITEM	UNIT	ESTIMATED COST	QTY	TOTAL
Two Directional 12' Shared Path	Per Mile	$ 564,000.00	0.25	$ 141,000
Mill & Resurface 2 Lane Urban Road with 4'	Per Mile	$ 853,000.00	1.1	$ 938,300
Edgewater / Beltrees Improvement				
Flashing Beacons	Each	$ 8,000.00	4	$ 32,000
Pedestrian Ramps	Each	$ 2,500.00	6	$ 15,000
Concrete Work	SY	$ 100.00	166	$ 16,600
Pavement Markings / Striping	LF	$ 5.00	230	$ 1,150
Traffic Calming Components				
Raised Intersection	Each	$ 75,000.00	1	$ 75,000
Traffic Circle	Each	$ 10,000.00	2	$ 20,000
Pinch Point	Each	$ 2,500.00	2	$ 5,000
Chicane	Each	$ 3,000.00	1	$ 3,000
High Emphasis Crosswalk	Each	$ 5,000.00	4	$ 20,000
Misc Items				
Pedestrian Ramps	Each	$ 2,500.00	6	$ 15,000
Flashing Beacons	Each	$ 8,000.00	4	$ 32,000
Raised Crosswalk	Each	$ 12,000.00	1	$ 12,000
Green Bike Lane Paint	Sq Ft	$ 1.60	33000	$ 52,800
Bike Lane Striping	LF	$ 1.50	4500	$ 6,750
Bike Lane Markings (Raised Thermo)	Each	$ 12.00	41	$ 492
Bike Lane Crossing Markings (Green Raised Thermo)	Sq Ft	$ 1.60	1500	$ 2,400
New Sign & Post	Each	$ 1,700.00	2	$ 3,400
Sub Total				**$ 1,391,892**
Maintenance of Traffic (10%)				$ 139,189.20
Mobilization (10%)				$ 139,189.20
Sub-total with Mobilization and MOT				$ 1,670,270.40
Contingency (30%)				$ 501,081.12
Total Cost Estimate				**$ 2,171,351.52**

Alternative 2

ITEM	UNIT	ESTIMATED COST	QTY	TOTAL
Two Directional 12' Shared Path (Mill & Pave)	Per Mile	$ 564,000.00	0.51	$ 287,640
New 2 Lane Urban Road with 4' Bike Lane	Per Mile	$ 760,000.00	0.35	$ 266,000
Mill & Resurface 2 Lane Urban Road with 4' Bike Lane	Per Mile	$ 853,000.00	1.1	$ 938,300
Edgewater / Beltrees Improvement				
Flashing Beacons	Each	$ 8,000.00	4	$ 32,000
Pedestrian Ramps	Each	$ 2,500.00	6	$ 15,000
Concrete Work	SY	$ 100.00	166	$ 16,600
Pavement Markings / Striping	LF	$ 5.00	230	$ 1,150
Traffic Calming Components				
Raised Intersection	Each	$ 75,000.00	1	$ 75,000
Traffic Circle	Each	$ 10,000.00	2	$ 20,000
Pinch Point	Each	$ 2,500.00	2	$ 5,000
Chicane	Each	$ 3,000.00	1	$ 3,000
High Emphasis Crosswalk	Each	$ 5,000.00	4	$ 20,000
Misc Items				
Pedestrian Ramps	Each	$ 2,500.00	6	$ 15,000
Flashing Beacons	Each	$ 8,000.00	4	$ 32,000
Raised Crosswalk	Each	$ 12,000.00	1	$ 12,000
Green Bike Lane Paint	Sq Ft	$ 1.60	23000	$ 36,800
Bike Lane Striping	LF	$ 1.50	4500	$ 6,750
Bike Lane Markings (Raised Thermo)	Each	$ 12.00	41	$ 492
Bike Lane Crossing Markings (Green Raised Thermo)	Sq Ft	$ 1.60	1350	$ 2,160
New Sign & Post	Each	$ 1,700.00	2	$ 3,400
Sub Total				**$ 1,788,292**
Maintenance of Traffic (10%)				$ 178,829.20
Mobilization (10%)				$ 178,829.20
Sub-total with Mobilization and MOT				$ 2,145,950.40
Contingency (30%)				$ 643,785.12
Total Cost Estimate				**$ 2,789,735.52**