MEMORANDUM

September 12, 2022

To: Bryan Davis
Organization: Chittenden County Regional Planning Commission (CCRPC)
From: Jacob Stein and Michael Blau
Project: Chittenden County Regional Planning Commission Active Transportation Plan Update

Re: Milton and South Burlington Pedestrian Network Recommendations – FINAL

Pedestrian Network Recommendations

Background

The purpose of this task is to leverage the pedestrian trip potential results for Milton and South Burlington to guide pedestrian network improvements and provide guidance on how to replicate this process for other communities in the county. CCRPC staff selected Milton and South Burlington for additional analysis to understand pedestrian trip potential in those communities. These two communities were selected because they are two of the fastest growing communities in the state (according to US Census data 2010 and 2020), both are home to populations historically excluded from the planning process, and neither has an adopted comprehensive walk/bike plan. Note, however, that South Burlington has an active Bicycle & Pedestrian Committee which successfully advances active transportation projects in the City, and Milton has an adopted Recreation Master Plan that includes active transportation facilities and calls for the development of an active transportation plan that comprehensively considers walking, biking and trail connectivity in Milton.

Methodology

The pedestrian network recommendations for Milton and South Burlington include about 17 miles of pedestrian facilities and seven miles of traffic calming recommendations. These improvements would allow users of all ages and abilities to enjoy safer and more connected walking environments in the two communities. The pedestrian recommendations also include 21 spot improvements such as high visibility crosswalks, median islands, and rectangular rapid flashing beacons (RRFBs). The project team developed the network based on information gathered from previous tasks, including the Trip Potential Analysis, Level of Traffic Stress (LTS) Analysis, Strava activity data, public input, CCRPC's Transportation Improvement Program (TIP) and Metropolitan Transportation Plan (MTP) project locations, and important destination locations.

The project team overlaid the Trip Potential Analysis, Strava data, and LTS results to manually develop local pedestrian networks for the Milton and South Burlington areas. Figure 1 and Figure 2 show the networks. Table 1 and Table 2 include the project ID, facility type, project extents and rationale for each of the projects shown on the maps. The Town of Milton and City of South Burlington both cover fairly large areas and it is beyond the scope of this project to provide detailed recommendations for the entire network in each community. Recommendations for the Town of Milton focus on the Village of Milton. South Burlington recommendations include several focus areas selected based on trip potential, density of priority populations, and level of traffic stress with a focus on identifying spot improvements to improve the existing pedestrian network.

The project team relied primarily on aerial imagery and Google Street View to identify the gaps and barriers in the pedestrian networks in Milton and South Burlington. Overlaid with the pedestrian and bicycle usage data from

Strava and the LTS data, these sources provided a relatively accurate picture of the existing network. The project team created linear recommendations by looking for opportunities to make connections between existing sidewalk segments and to proposed new facilities where there is strong usage but also high levels of traffic stress.

The spot improvements focus on high-stress, high usage intersections where new pedestrian safety countermeasures could improve safety for vulnerable users (i.e., children, older adults, mobility impaired individuals) and/or where the existing facilities are not working optimally. Examples include crossings near schools or parks that are not stop controlled or have a standard crosswalk. Recommendations also address long crossings across busy roads.

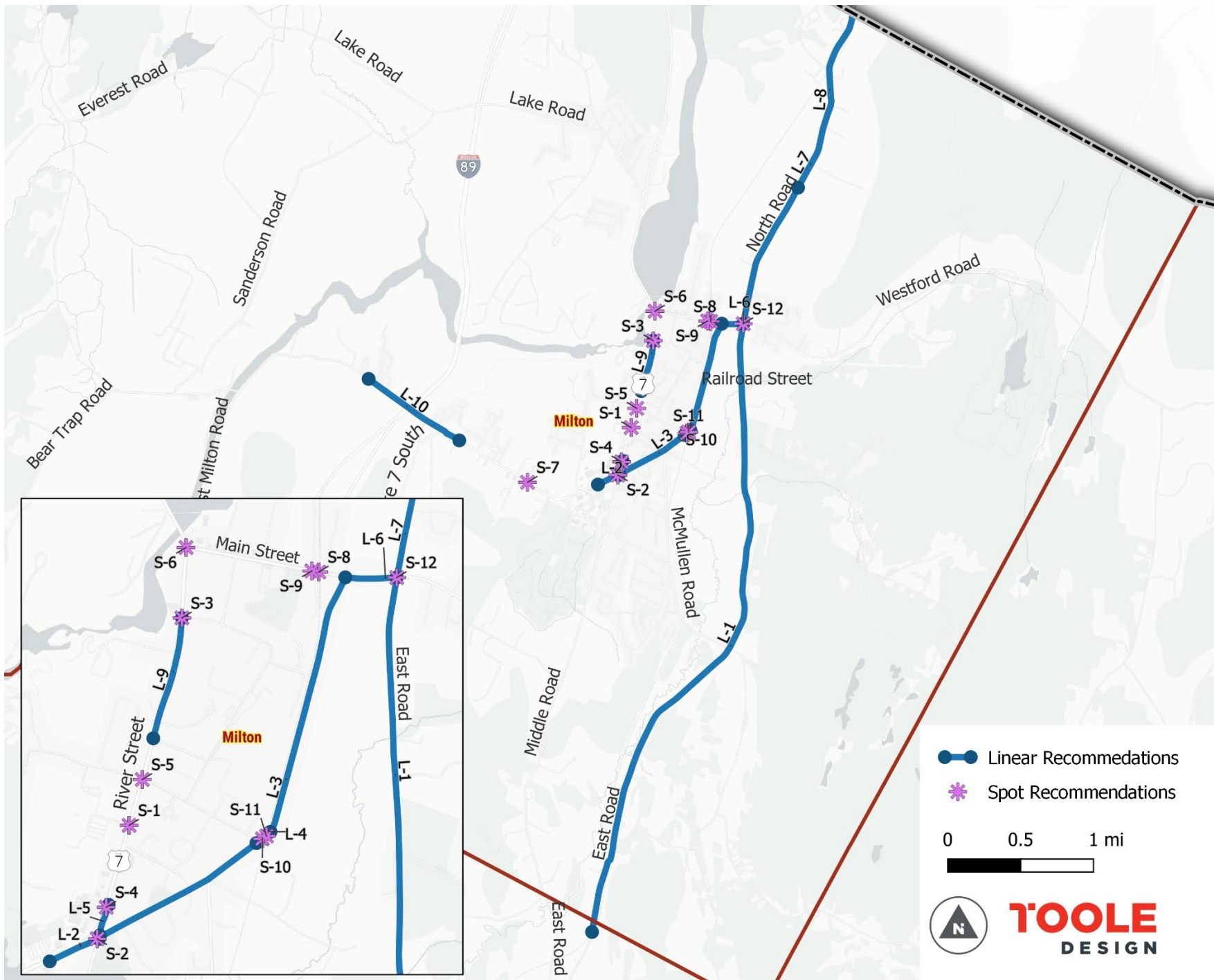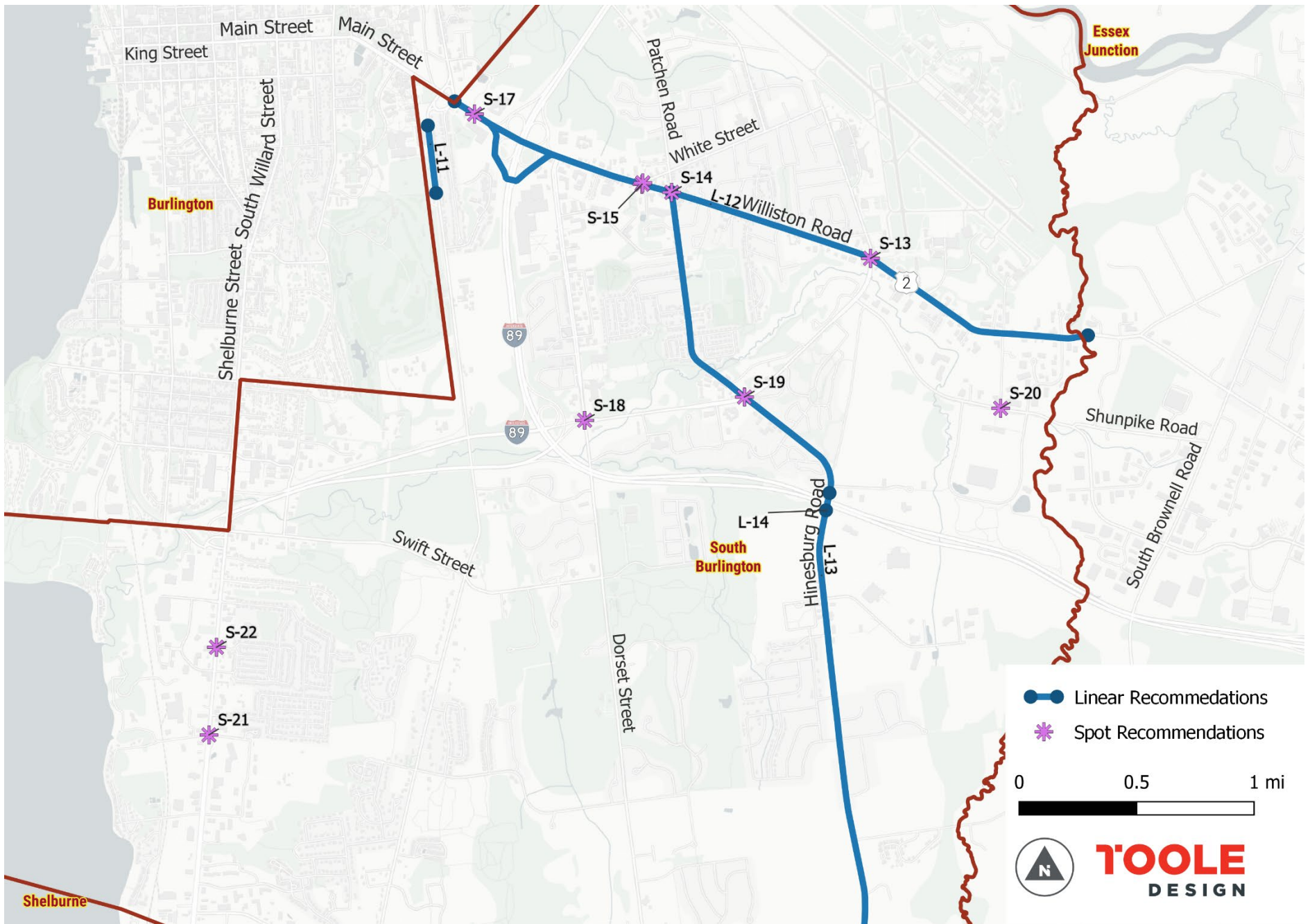# Figure 1: Milton Pedestrian Network Recommendations

Everest Road

Lake Road

Lake Road

Sanderson Road

Westford Road

North Road L-7

L-8

Bear Trap Road

West Milton Road

Route 7 South

L-10

Railroad Street

Milton

S-6
S-3
L-9
S-5
S-1
S-4
L-2
S-7
S-2
S-8
S-9
L-6 S-12
S-11
L-3 S-10

McMullen Road

L-1

Middle Road

East Road

East Road

Inset (Milton detail):

Main Street
S-6
S-8
S-9
L-6 L-7
S-12
East Road
L-1
S-3
L-9
River Street
Milton
S-5
S-1
S-11 L-3
L-4
S-10
S-4
L-5
L-2
S-2

Legend

● Linear Recommedations

✳ Spot Recommendations

0   0.5   1 mi

N

TOOLE DESIGN

Figure 2: South Burlington Pedestrian Network Recommendations

King Street

Main Street   Main Street

Essex Junction

Patchen Road

White Street

Shelburne Street   South Willard Street

Burlington

S-17

L-11

S-14

L-12 Williston Road

S-15

S-13

2

89

S-19

S-20

89

S-18

Shunpike Road

Swift Street

L-14

South Burlington

Hinesburg Road

L-13

South Brownell Road

Dorset Street

S-22

Linear Recommedations

Spot Recommendations

S-21

0   0.5   1 mi

Shelburne

TOOLE DESIGN

Table 1: Milton and South Burlington Linear Projects

PROJECT ID	COMMUNITY	TYPE	STREET NAME	TERMINI 1	TERMINI 2	RATIONALE
L-1	Milton	Sidepath	East Road	Main Street	Town Limits	High usage, high-stress (based on the LTS analysis) road requires a separate facility. This recommendation coupled with L-7 creates a safe pedestrian route through the Town.
L-2	Milton	Sidewalk	Railroad Street/US 7	Centre Drive	Middle Road	Fills gap between two sidewalk segments along a high-stress street. This recommendation is important because a user of the Railroad Street sidewalk would have to travel a relatively long distance out of the way (extra .4 miles) to reach commercial locations at Centre Drive if this sidewalk is not constructed. This helps connect the residential and park land uses to the east to the heart of the Village of Milton.
L-3	Milton	Traffic calming	Railroad Street	Middle Road	Main Street	Increases safety along a high-stress, medium use (according to Strava activity data) corridor with residential land use.
L-4	Milton	Sidewalk	Railroad Street	Barnum Street	North of Railroad crossing	High-stress, medium use corridor that lacks pedestrian path. Fills small gap in pedestrian network between two sections of sidewalk.
L-5	Milton	Sidewalk	River Street	Milton Square Shopping Center	Railroad Street	Currently, a poor-quality asphalt path exists. Upgrading the path would greatly improve pedestrian connectivity.
L-6	Milton	Sidewalk	Main Street	Railroad Street	East Road/North Road	Fills gap in pedestrian network along a high use, high stress corridor by connecting two existing sidewalk sections.
L-7	Milton	Traffic calming	North Road	Main Street	County Line	High-stress corridor with residential land use along a substantial portion of corridor. Sidewalk exists along southern portion of corridor, so reducing speeds along the corridor could support more pedestrian activity.
L-8	Milton	Sidewalk	North Road	Rowe Road	County Line	Fills pedestrian network gap between county line and existing sidewalk, which will connect residential land use to the town center and open space (Quarry Lane Open Space).
L-9	Milton	Sidewalk	River Street	Mackey Street	Cherry Street	Fills sidewalk gap on west side along high-stress major arterial and will connect Milton High School to River Street

PROJECT ID	COMMUNITY	TYPE	STREET NAME	TERMINI 1	TERMINI 2	RATIONALE
						Park. Closing this gap has the possible impact of increasing pedestrian activity between these two trip attractors.
L-10	Milton	Sidewalk	US 7 and Milton Road	Clark Falls Road	Nancy Drive	Fills pedestrian network gap and connects large multifamily housing complex to the Village of Milton via existing sidewalk. Would improve access along a medium- to high-stress road which has moderate usage.
L-11	South Burlington	Sidepath	Spears Street near UVM	South Burlington Recreation Path	PFG Road	Informal footpath exists and public input requests formalizing it. Creates a safe path connecting South Burlington Recreation Path to center of UVM campus. Corridor is moderately stressful
L-12	South Burlington	Traffic calming	Williston Road	City Limits/East Terrace	City Limits/Palmer Court	High- stress, High usage corridor that passes through areas with concentrations of priority populations. Corridor has high trip potential and thus is also has a recommendation for a bike facility. The project team understands that a proposed pedestrian/bicycle bridge that would take users around the I-89 junction but traffic calming along the rest of the corridor and especially at the junction would increase safety now as the bridge goes through the feasibility/scoping phase.
L-13	South Burlington	Sidepath/traffic calming	Hinesburg Road	Williston Road	City Limits at Cheesefactory Road	High -stress corridor with high usage in certain sections. Selected for bike facility due to large concentration of priority populations and trip potential.
L-14	South Burlington	Pedestrian bridge	Hinesburg Road	Bridge over I-89	N/A	Identified as barrier by public. Existing bridge does not offer an opportunity to improve pedestrian safety so the alternatives are building a parallel bridge or wait for bridge replacement in the long term.

Table 2: Spot Recommendations

PROJECT ID	COMMUNITY	TYPE	LOCATION	RATIONALE
S-1	Milton	RRFB or overhead pedestrian signal	River Street at Milton High School	School crosswalk currently has no stop control.
S-2	Milton	High visibility crosswalks and add Pedestrian Hybrid Beacon (PHB)	Middle Road/Railroad Street/River Street intersection	Creating safer crossings across high-stress (based on the LTS analysis) roads with moderate usage. Skewed intersections reduce sight distances for all users and increase crossing distances for pedestrians. Wide angles create large curb radii, which encourage high-speed turning movements. These conditions reduce the likelihood that drivers will yield to crossing pedestrians. The new crosswalk will go across River Street and will require a PHB as the oncoming traffic is not stop controlled.
S-3	Milton	PHB and high visibility crosswalk	River Street at Cherry Street/River Street Park	Connects River Street Park to residential land uses and the transit stop at this intersection. This combination of trip attractors makes this location potentially high use if safety was increased.
S-4	Milton	High visibility crosswalk	River Street at Milton Square Shopping Center	Adding a high visibility crosswalk across parking lot entrance would increase pedestrian safety at a major commercial hub and along a high-stress corridor.
S-5	Milton	High visibility crosswalk	River Street at Barnum St	Returns high visibility crosswalk removed since 2018. This intersection has a transit stop as well as a school crossing so this project will improve safety for priority populations.
S-6	Milton	High visibility crosswalk	US 7 at Main Street	It appears that a crosswalk was installed across Main Street but it has completely worn away. Reinstalling the crosswalk with high visibility markings rather than stamped brick pavers would improve safety for residents along Main Street.
S-7	Milton	Move crosswalk and add PHB	US 7 at Boysenberry Drive	Crosswalk currently is placed inside turn lane which is a conflict point. Moving the crosswalk forward to be in line with Boysenberry Drive and moving the turn lane back removes this conflict. Corridor is high-stress and high pedestrian usage, with the location also having a transit stop.

PROJECT ID	COMMUNITY	TYPE	LOCATION	RATIONALE
S-8	Milton	Pedestrian safety devices	Railroad crossing on Main Street	Currently, no passive or active safety devices exist to prevent pedestrian-train interactions. Study of best device/strategy for this location will need to be done.[1] MTP is currently improving the rail crossing on Cherry Street and the same improvements being added there could be utilized here.
S-9	Milton	High visibility crossing	Main Street at Sawmill Road	Crosswalk has been completely worn away, creating an unmarked crosswalk.
S-10	Milton	High visibility crosswalk	Railroad Street at Barnum Street and railroad crossing	Sidewalk exists south and north of this intersection (with a gap that L-4 will fill in) but on alternate sides of the road. This results in the need for a high visibility crossing to allow for safe travel between the sidewalk segments.
S-11	Milton	Pedestrian safety devices	Railroad crossing on Railroad Street near Barnum Street	Currently, no passive or active safety devices exist to prevent pedestrian-train interactions. Study of best device/strategy for this location will need to be done.[2] MTP is currently improving the rail crossing on Cherry Street and the same improvements being added there could be utilized here.
S-12	Milton	High visibility crosswalks	Main Street at North Road/East Road	Crossings with curb ramps were installed without marked crosswalks. Major high-stress, high usage intersection.
S-13	South Burlington	High visibility crosswalk and median islands	Kennedy Drive/Airport Drive and Williston Road	Both roads are wide and high-stress but see high pedestrian usage as well. Improving safety would improve the lives of a large concentration of priority populations as well as accommodate high walk trip potential.
S-14	South Burlington	Median islands	Hinesburg Road/Patchen Road and Williston Road	Adding median islands to both crossings across Williston Road and the Patchen crossing would lower the stress of these crossing for all users.

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[1] For further resources on noteworthy practices for pedestrian/bicycle crossings see: https://www.transportation.ohio.gov/working/engineering/roadway/manuals-standards/multimodal/11

[2] Ibid

PROJECT ID	COMMUNITY	TYPE	LOCATION	RATIONALE
				Both roads are wide and high stress but see high usage as well. Improving safety would improve the lives of a large concentration of priority populations as well as support the high trip potential.
S-15	South Burlington	Pedestrian signals and high visibility crosswalk	Williston Road at White Street and Midas Drive	Intersection is offset and skewed which creates a complicated traffic pattern. Crosswalk across Williston would provide the greatest benefit but adding signals on Midas and White would also improve safety greatly.
S-16	South Burlington	Median island or reduced turn radii/curb extension	Williston Road at White Street	In addition to the new crosswalk and pedestrian signals, reducing the crossing distance across White would make the pedestrian network much safer for the large concentration of priority populations along this corridor.
S-17	South Burlington	High visibility crosswalks and median islands, study and adjust signal timing	Williston Road at Doubletree Hilton and Staples Plaza	Very wide crossing distances and high-volume turning movements. Crossings have pedestrian signals, but the crossing distances may prove difficult to navigate for mobility impaired users. High-stress corridor with high-stress crossing.
S-18	South Burlington	Median island and adjustment of curb ramps	Kennedy Drive at Dorset Street	Median island across Dorset on southern leg would improve safety at this high-stress/high usage intersection. Several curb ramps appear to require a wheelchair user to maneuver in roadway to make crossing.
S-19	South Burlington	Widen median islands and improve crossing angles for curb ramps, study and adjust signal timing	Kennedy Drive at Hinesburg Road/ Route 10	Median Islands across Kennedy are too narrow for mobility impaired users and given the crosswalks are angled on both legs, this makes the crossings very difficult.
S-20	South Burlington	RRFB, reduce turn radii/curb extension	Kimball Avenue at Shunpike Road	High concentration of priority populations and existing crosswalk with no stop control. Would make accessing transit stop and job opportunities safer and easier.
S-21	South Burlington	High visibility crosswalk	US 7 at Holmes Road and Idx Drive	Crosswalks across Holmes and Idx have been worn down so replacing them should be a priority as this is a key corridor for accessing job opportunities and north/south travel for priority populations.

PROJECT ID	COMMUNITY	TYPE	LOCATION	RATIONALE
S-22	South Burlington	High visibility crosswalks and pedestrian signals	US 7 at Saturn Way and Baldwin	A crossing of US 7 at this location would improve access to jobs and services as well as two transit stops and shorten the block length between the crossings at Hannasfords Drive and at Fayette Drive.

Local Pedestrian Trip Potential

The pedestrian Trip Potential Analysis identifies areas where connections between land use factors, including commercial activity, employment, K-12 schools, parks, population, and transit, support pedestrian activity regardless of current infrastructure. It is useful both for identifying where the existing pedestrian network is likely to support high activity or where improvements in infrastructure would be expected to increase activity. Figure 3 and Figure 4 show the results for Milton and South Burlington. The project team used trip potential results as a starting point for developing pedestrian network recommendations.

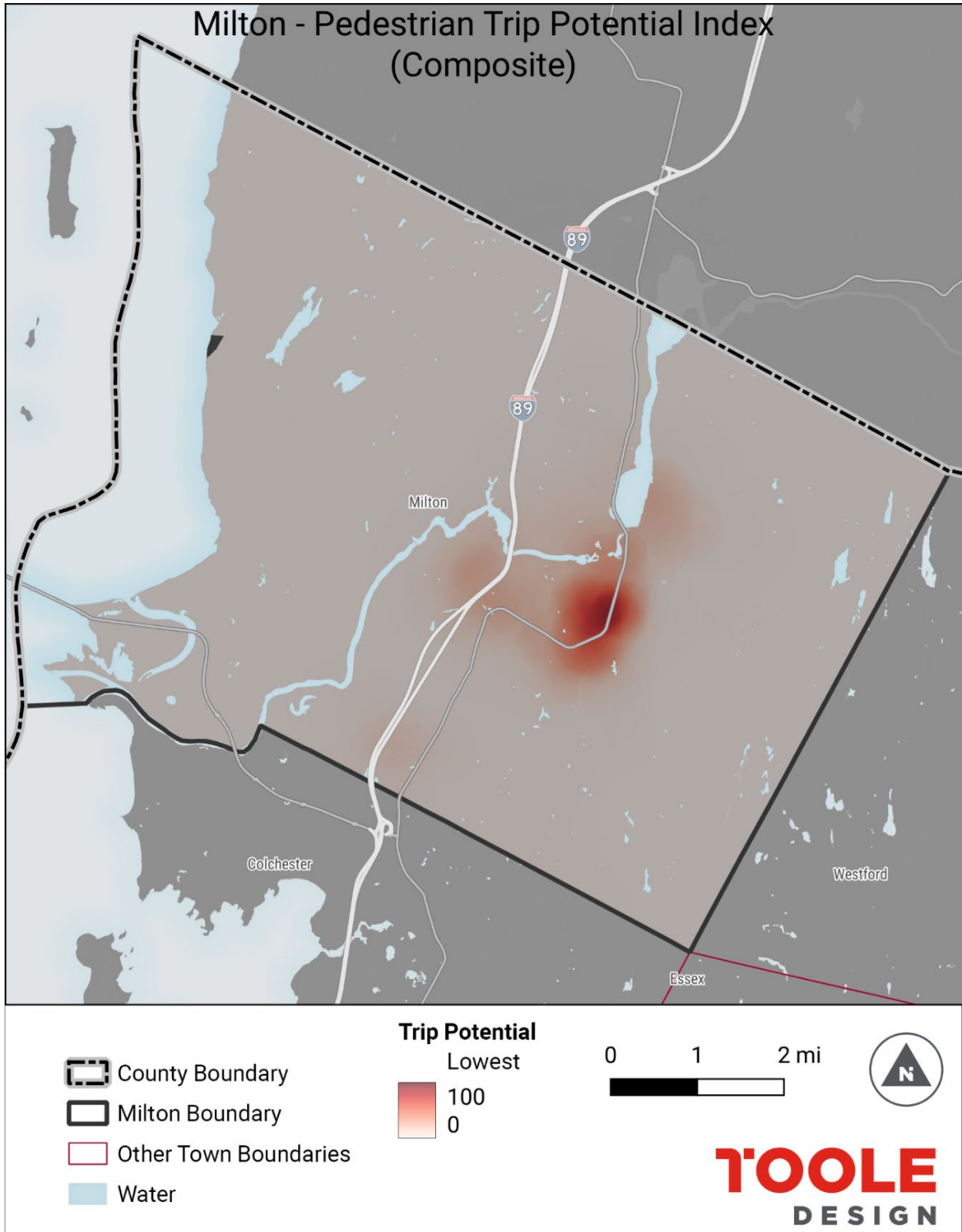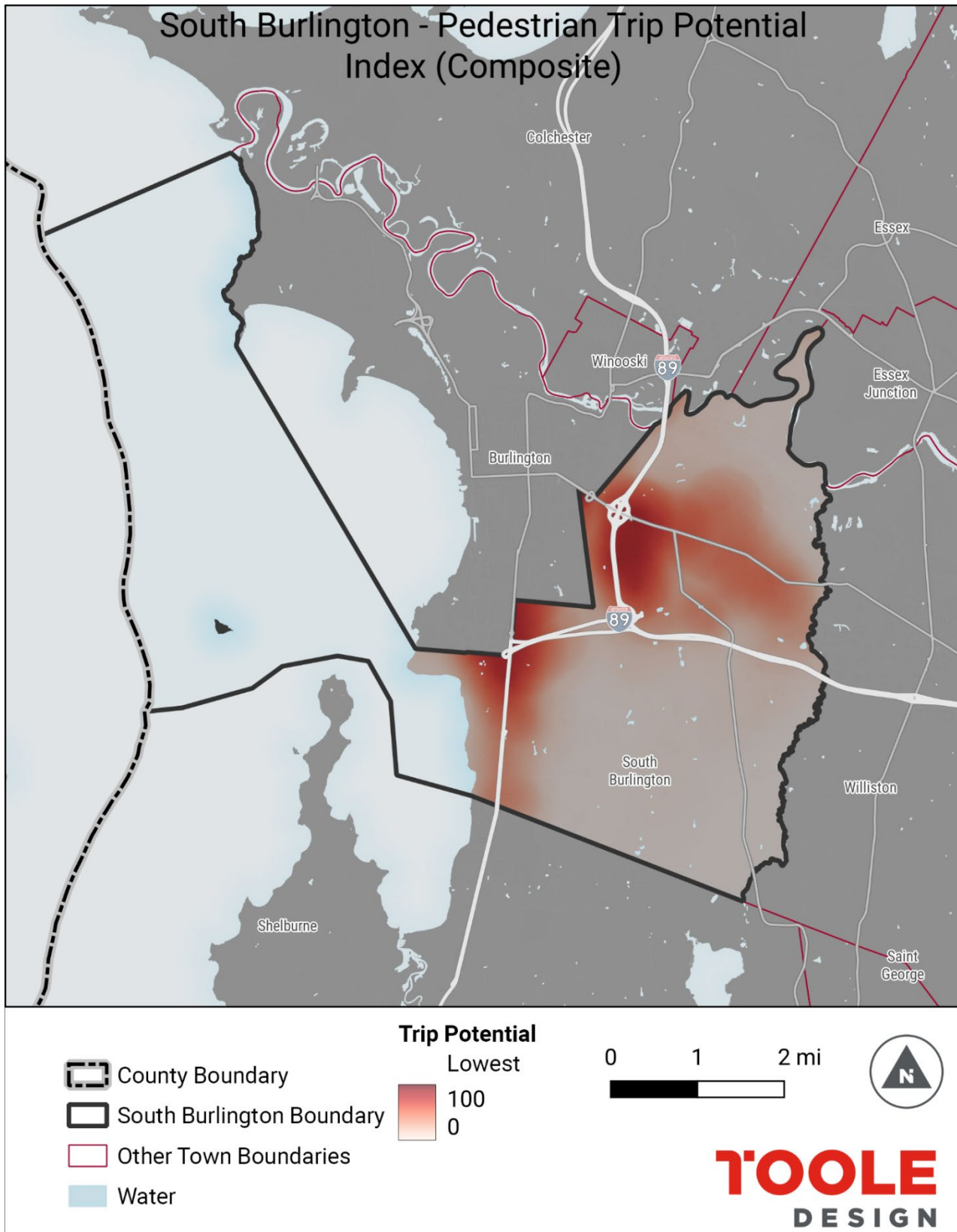**Figure 3: Milton Composite Pedestrian Trip Potential**

Milton - Pedestrian Trip Potential Index
(Composite)

Trip Potential
Lowest
100
0

County Boundary
Milton Boundary
Other Town Boundaries
Water

0   1   2 mi

N

TOOLE
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Figure 4: South Burlington Composite Pedestrian Trip Potential

Public Input, Existing Sidewalk network, MTP, and Other Destinations

After taking trip potential into account, the project team refined the pedestrian network routes by examining desired and actual connections to existing sidewalks, which ensures that the recommendations lead to a connected network of safe and comfortable pedestrian facilities across both communities.

Two recommended locations in Milton were at train crossings on Main Street and Railroad Street where it appears that no safety measures are in place to prevent pedestrian and train interactions. Potential for conflict here may prove insignificant based on the volume of train traffic, but further study could be warranted, especially as the MTP has a project on Cherry Street to improve the railroad crossing which is in between the two recommendations along the rail line.

Next Steps

The project team brought significant expertise to bear on the development of pedestrian network recommendations, along with a thorough and data-driven approach. However, CCRPC staff and/or the project team should conduct ground truthing to ensure assumed conditions of current infrastructure and proposed improvements are accurate and appropriate. This memo should also be shared with local agency staff, who hold a more nuanced understanding of infrastructure conditions and needs on the ground.

Beyond the specific recommendations for the Town of Milton and City of South Burlington, the hope was that this project identification process could serve as a model for other local communities. A few policy measures that could help with this effort are:

- A sidewalk and crosswalk inventory to identify where existing facilities exist and their state of repair.
- The project team used the data provided by CCRPC on key commercial and employment locations, schools, parks, and transit stops to identify key corridors for pedestrian activity. These data should be kept current as conditions evolve.
- Doing periodic pedestrian and bicycle counts would give staff the data to determine which corridors are seeing the most use currently; when coupled with traffic and speed counts these data would help identify locations where traffic calming would have the most impact.

Additional policy and program recommendations are being developed under Task 4.2.