



## BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

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Stephanie Pollack, MassDOT Secretary and CEO and MPO Chair  
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### *TECHNICAL MEMORANDUM*

**DATE:** September 19, 2016  
**TO:** Marcia Rasmussen, Director of Planning and Land Management,  
Town of Concord  
Elizabeth Hughes, Town Planner, Town of Concord  
**FROM:** Casey-Marie Claude, Boston Region Metropolitan Planning  
Organization Staff  
**RE:** Bicycle and Pedestrian Connections to West Concord Station

The lack of bicycle and pedestrian amenities between destinations in West Concord and the West Concord commuter rail station makes travel by either mode of transportation difficult in spite of the close proximity of many businesses to the station. This memorandum explores problems that inhibit bicycle and pedestrian access to these destinations and possible solutions to improve access.

## 1 ASSABET RIVER CROSSING

### 1.1 Overview

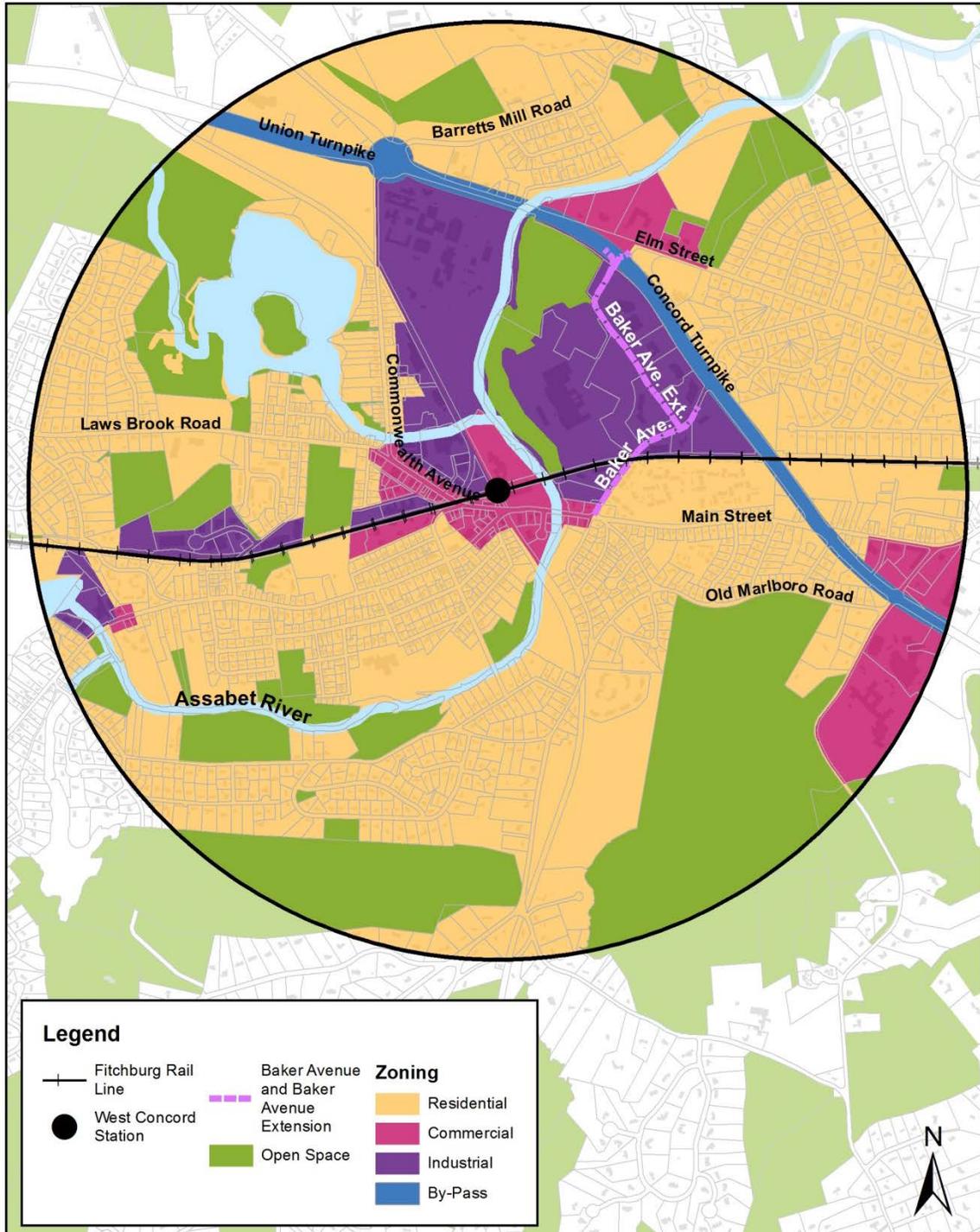
West Concord Station is located in West Concord Village, on the MBTA's Fitchburg commuter rail line. Survey data show that this station is used predominantly by residents of Concord and nearby towns who travel to work locations in the cities of Boston and Cambridge. The station also serves some people who make trips between their homes in other cities and towns along the Fitchburg Line and work locations in West Concord.

The largest concentrations of employment locations in West Concord are the industrial and office park developments along Baker Avenue and Baker Avenue Extension, east of the Assabet River (as illustrated in Figure 1). These developments include businesses in the fields of technology (including Avention, Kayak Software, Accurev, GSG, EveryNetwork, and Apriori), health care (Emerson Hospital Home Care, Lexington Eye Associates, and Harvard Vanguard Medical Associates), and food production (Welch Food Products).

As of February 2016, an estimated 1,477 people were traveling to work locations on Baker Avenue and Baker Avenue Extension daily. The following are the numbers of employees at specific addresses on these streets:

- *300-310 Baker Avenue*: 1,050 employees
- *330 Baker Avenue*: 162 Harvard Vanguard Medical Associates employees
- *54 Baker Avenue Extension*: 60 employees
- *86 Baker Avenue Extension*: 40 employees
- *130 Baker Avenue Extension*: 15 full-time employees and 150 students

Importantly, several medical companies will become tenants at 200 Baker Avenue soon, adding 350 employees at full capacity and thus increasing traffic. In addition, a new 118-room, extended-stay hotel is under construction near 300-310 Baker Avenue to accommodate families of patients at Emerson Hospital, tourists, and the demand generated by Concord's four private schools. Town planners expect that hotel guests will be interested in visiting the shops and restaurants in West Concord Village. This suggests that considerable additional travel volumes may be expected between West Concord Station and Baker Avenue and Baker Avenue Extension.



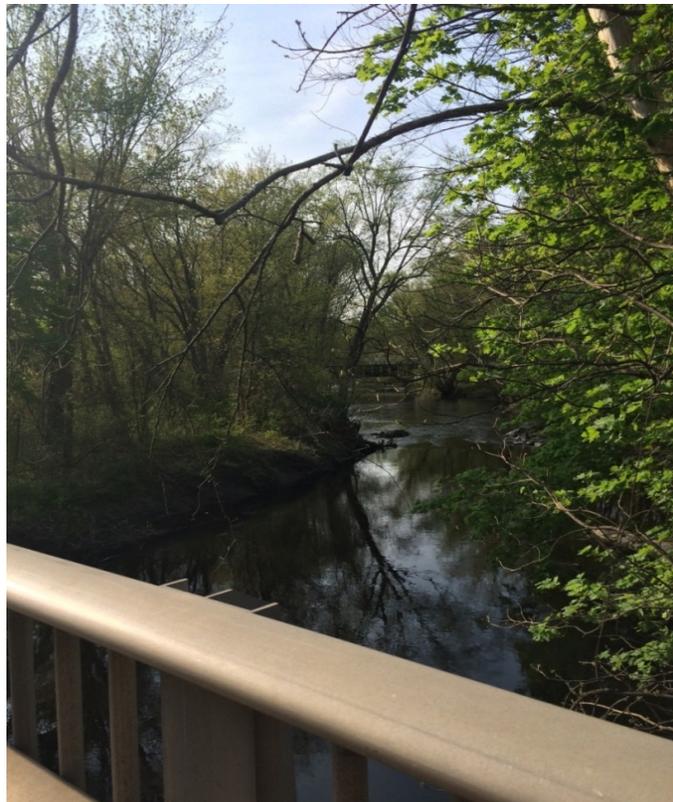
**CTPS** **Figure 1** **Baker Avenue Industrial Developments** **West Concord Station Area Zoning** *Town of Concord* *First-Mile, Last-Mile* *Connections to Transit*

## 1.2 Bicycle and Pedestrian Needs

The straight-line distance between West Concord Station and the nearest developments along Baker Avenue and Baker Avenue Extension is approximately one-quarter mile. However, the Assabet River separates the West Concord Station and West Concord Village area from the office and industrial areas. The only nearby road crossing of the river is the Main Street Bridge—a distance, via sidewalk, of more than one-half mile between the station and any of the employment locations along Baker Avenue or Baker Avenue Extension.

Some of these employment locations are almost directly across the river from West Concord Station. To shorten their walking distance to work, some employees cross the river on the Fitchburg Line railroad bridge. Since the bridge has no walkway, the practice is both dangerous and illegal.

**Figure 2**  
**View of Active Commuter Rail Bridge from the South**  
**on Main Street Bridge**



Source: Central Transportation Planning Staff

To improve access for bicyclists and pedestrians, the Town of Concord has considered the possibility of adding a pedestrian bridge over the Assabet River. The Town received \$10,000 as mitigation for the redevelopment of Baker Avenue, which it has set aside for a feasibility study for a pedestrian bridge. The safe, alternative route that the bridge would provide for those working or staying on the east side of the Assabet River could prove especially helpful to people who work along Baker Avenue Extension.

Bicycle or pedestrian improvements are also needed along Baker Avenue Extension. As Figure 3 illustrates, the two-lane roadway currently lacks accommodations for these users who are either forced to ride or walk in the roadway or off the street entirely.

**Figure 3**  
**Lack of Bicycle and Pedestrian Accommodations**  
**on Baker Avenue Extension**



Source: Central Transportation Planning Staff

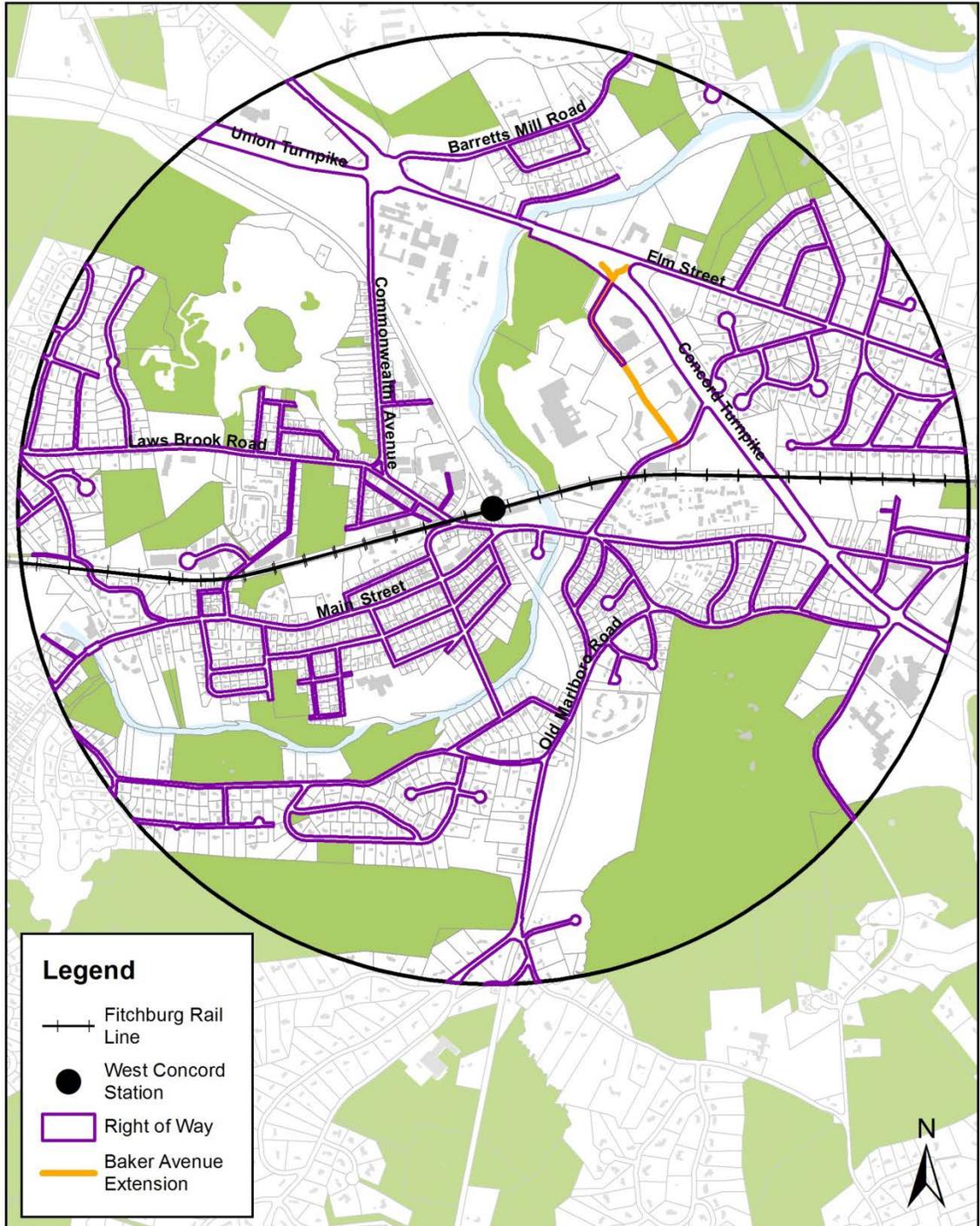
This situation is especially troublesome on the hill where, as shown in Figure 4, guardrails border both sides of the street to prevent vehicles from traveling down the slopes on either side of the pavement. Unfortunately, the guardrails and lack of roadway shoulder leave bicyclists and pedestrians no space to maneuver if they need to avoid vehicles.

**Figure 4**  
**Hill, Guardrails, and Lack of Accommodations on Baker Avenue Extension**



Source: Central Transportation Planning Staff

Tax-parcel data, illustrated in Figure 5, indicate that there is no public right-of-way along the segment of Baker Avenue Extension between Baker Avenue and 130 Baker Avenue Extension, meaning that it is not on town-owned land. In order to perform construction to change the bicycle and pedestrian environment there, the Town of Concord would need to acquire easements adjacent to the road. All of the several small businesses and medical offices along Baker Avenue Extension are within a mile of West Concord Station via existing roadways; but in spite of the close proximity of Baker Avenue Extension to West Concord Station, the lack of bicycle accommodations and sidewalks discourages bicycling or walking between workplaces and the commuter rail station.



**Legend**

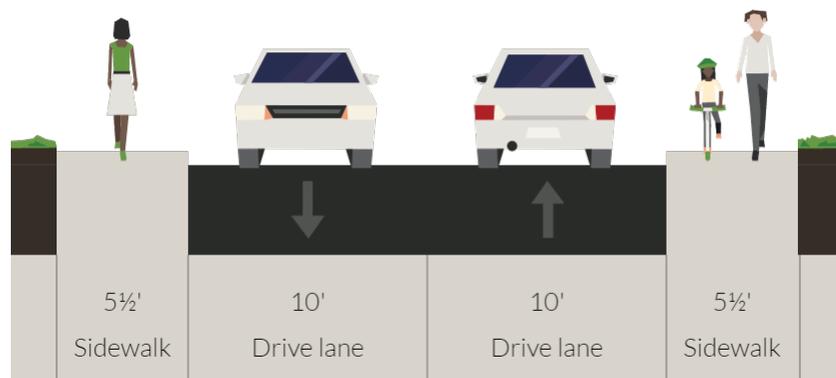
- +— Fitchburg Rail Line
- West Concord Station
- Right of Way
- Baker Avenue Extension

**CTPS** **Figure 5** *Town of Concord*  
**Lack of Baker Avenue Extension Right-of-Way** *First-Mile, Last-Mile*  
**West Concord Station Area** *Connections to Transit*

### 1.3 Recommendations

As a result of this study, the MPO staff recommend adding bicycle and pedestrian accommodations to Baker Avenue Extension wherever possible. At the very least, improvements should be made at locations where the roadway is at least 31 feet wide. Also, sidewalks with a minimum width of five feet and an additional six-inch-wide curb zone should be provided on either side of the roadway, as illustrated in Figure 6.

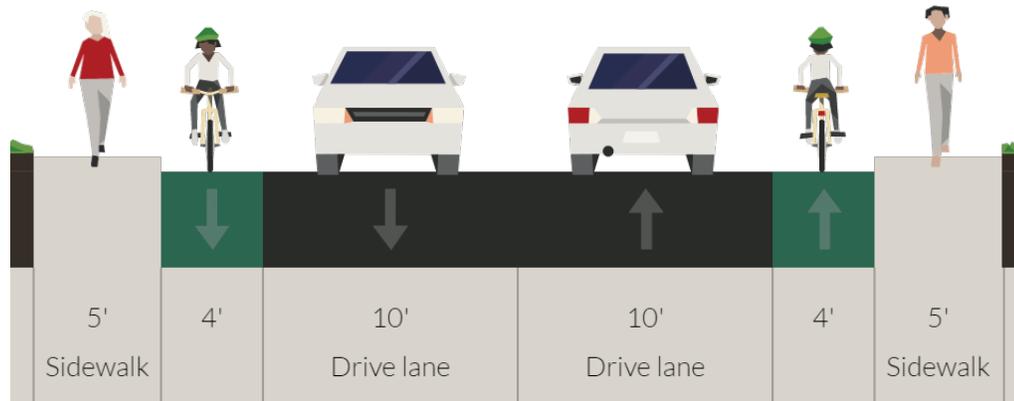
**Figure 6**  
**Minimum Accommodations**



Source: Central Transportation Planning Staff, using StreetMix.net.

Although currently there are no sidewalks along Baker Avenue Extension, the northwest side of Baker Avenue does include a paved path approximately four feet wide. In addition, on the southeast side of Baker Avenue near Main Street there is a small stretch of concrete sidewalk, which is approximately five feet wide. In spite of the limited bicycle and pedestrian infrastructure on Baker Avenue, tax-parcel data indicate that the street's most narrow right-of-way measures nearly 39 feet wide. This amount of space would allow for two 10-foot-wide traffic lanes, each bordered by a five-foot-wide sidewalk and a four-foot-wide bicycle lane. This allocation of Baker Avenue's right-of-way is illustrated in Figure 7 below.

**Figure 7**  
**Proposed Baker Avenue Improvements at Narrowest Width (38')**



Source: Central Transportation Planning Staff, using StreetMix.net.

The bicycle lane and sidewalk measurements, shown in Figure 7, are narrower than minimum state and federal width requirements for those facilities, reflecting the cross section of the narrowest point on Baker Avenue, which is 38 feet wide. The Town of Concord should expand the width of bicycle lanes and sidewalks along the remainder of the street, where the right-of-way is wider.

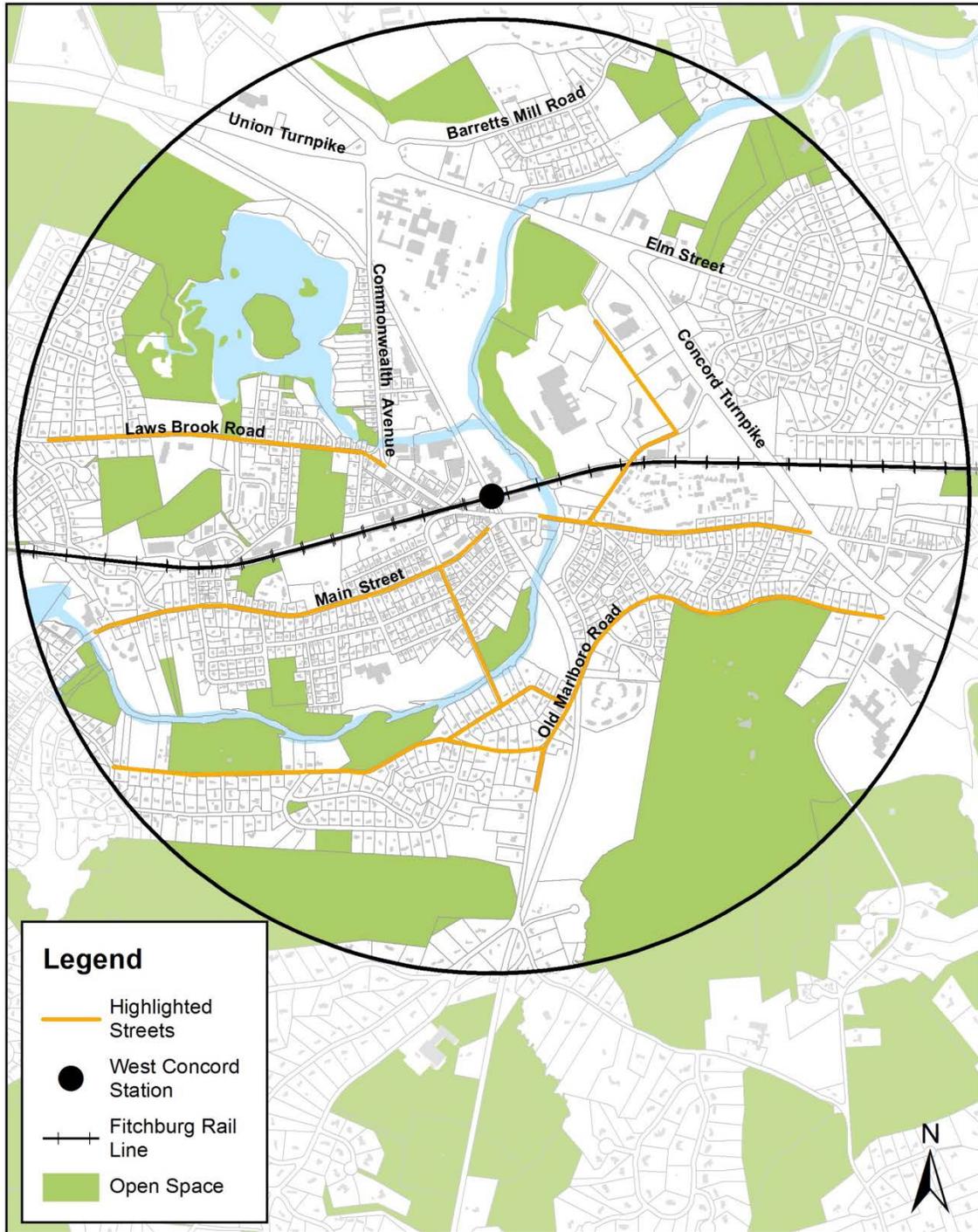
Federal design guidelines recommend that sidewalks include a five-foot-wide pedestrian zone and a six-inch-wide curb zone, plus a two-foot-wide zone for light poles and signs, so that they do not obstruct the paths of pedestrians. If trees are planted along a roadway, the two-foot-wide zone should be expanded to four feet wide. In addition, if the sidewalk is bordered by a building, storefront, wall, or fence, then two-and-a-half feet should be added to the sidewalk corridor as a frontage zone.

In Massachusetts, the minimum allowable width for a bicycle lane is five feet, and a design exception is required for narrower bicycle lanes. However, because the right-of-way is wider than 39 feet along most of Baker Avenue, the bicycle lane design exception would apply only to a small segment of the roadway. As an alternative to constructing separate bicycle lanes and sidewalks, the Town of Concord could consider paving shared-use paths along either side of Baker Avenue. Shared-use paths, often designed for two-way travel, should measure a minimum of 10 feet wide, but eight-foot-wide paths may be acceptable in cases where there are structural, environmental, or historical constraints. A shared-use path would provide grade separation between bicyclists and vehicles, although it could lead to conflicts between pedestrians and bicyclists. Further, a shared-use path on one side of the road would continue to limit access to businesses, as the other side of the roadway would remain without bicycle or pedestrian accommodations.

## 2 WEST CONCORD STATION AREA

### 2.1 Overview

Town of Concord planners highlighted streets around West Concord Station where bicycle and pedestrian comfort and safety are considered especially important because several employment locations and residential developments are located along the identified streets or within their vicinity. These streets, shown in Figure 8, are Main Street, Laws Brook Road, Baker Avenue, Baker Avenue Extension, Old Marlboro Road, Pine Street, Upland Road, and Harrington Avenue. Each of the streets, except for the portion of Main Street west of West Concord Station, lacks walking amenities on at least one side of the roadway. While there is often adequate right-of-way to accommodate additional bicycle and pedestrian amenities on roadways around the station, geographic constraints may make it difficult to add safe spaces for people to bicycle or walk.



**CTPS** **Figure 8** **Important Streets for Walking and Bicycling** *Town of Concord*  
**West Concord Station Area** *First-Mile, Last-Mile*  
*Connections to Transit*

**Figure 9**  
**Constrained Geography on Laws Brook Road**



Source: Central Transportation Planning Staff.

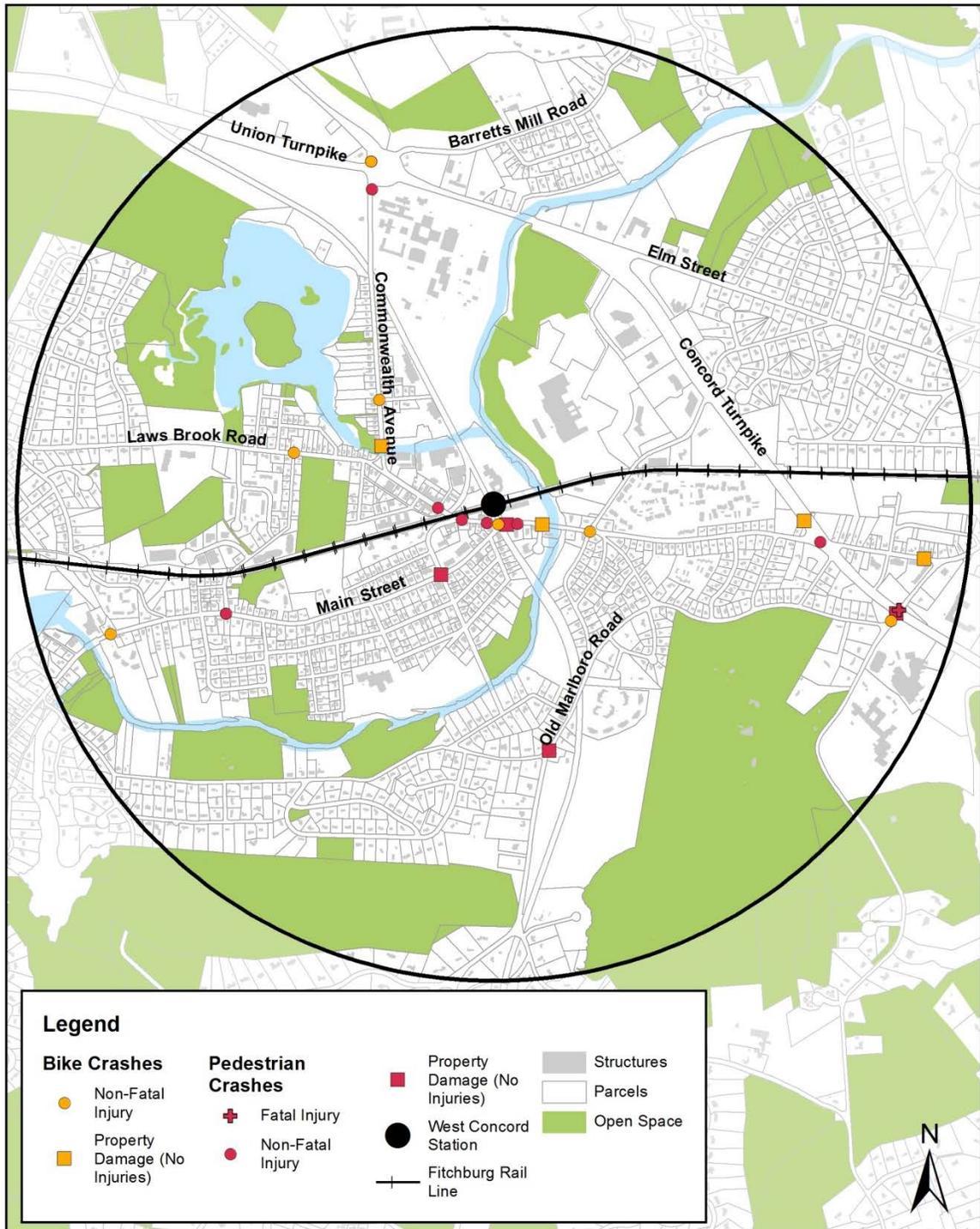
**Figure 10**  
**Constrained Geography on Harrington Avenue**



Source: Central Transportation Planning Staff.

In order to assess bicyclist and pedestrian safety in the area around West Concord Station, MPO staff mapped the locations where motor-vehicle crashes involving bicyclists or pedestrians occurred between 2004 and 2013. Within one mile of West Concord Station, there were 11 documented crashes involving bicyclists and 15 involving pedestrians during that time period.

Four of the bicycle crashes resulted in property damage only, and the other seven resulted in non-fatal injuries. Four of the pedestrian crashes resulted in property damage only, ten resulted in non-fatal injuries, and one resulted in a fatality. The greatest concentration of bicycle and pedestrian crash locations is near West Concord Station, although the fatal crash involving a pedestrian occurred along the Concord Turnpike. This information is represented in Figure 11 below.



**CTPS**

**Figure 11**  
**2004-2013 Bicycle & Pedestrian Crashes**  
**West Concord Station Area**

*Town of Concord*  
*First-Mile, Last-Mile*  
*Connections to Transit*

## 2.2 Recommendations

Bicycle and pedestrian accommodations should be provided wherever possible along Main Street, Laws Brook Road, Baker Avenue, Baker Avenue Extension, Old Marlboro Road, Pine Street, Upland Road, and Harrington Avenue, highlighted in Figure 8. In locations where a path or sidewalk is present on one side of the roadway, efforts should be made to add bicycle and pedestrian amenities on the opposite side of the roadway. If this is not possible, it is particularly important that safe, visible crosswalks facilitate the travel of pedestrians to the bicycle or pedestrian paths on the other side of the roadway. In locations where crossing distances are wider than 10 feet per travel lane, curb extensions—also known as bulb-outs or chokers—should be added to slow vehicular traffic speeds, increase the visibility of the crossing, and shorten the pedestrian crossings.

## 3 FINAL CONSIDERATIONS

In many locations, the opportunity to create bicycle and pedestrian accommodations may arise only when a roadway reconstruction project occurs. Any roadway reconstruction project should apply best-practices guidelines for serving bicycle, pedestrian, and ADA-accessible travel in general. More specifically, projects in West Concord should improve bicycle and walk access to West Concord Station and other transit stops as much as possible. Essentially, the MBTA, MassDOT, local governments, and land developers should coordinate and cooperate on all transportation improvement projects to ensure that the needs of bicyclists and pedestrians are integrated into final designs. In so doing, improved bicycle and pedestrian connections to transit in Concord will become a reality, thereby encouraging West Concord residents to adopt commutes that start and end by bicycle or foot.

CMC/cmc