

those in other time periods and are mainly due to delays at the Bridge Street intersection (for the northbound traffic) and at the Norman Street intersection (for the southbound traffic).

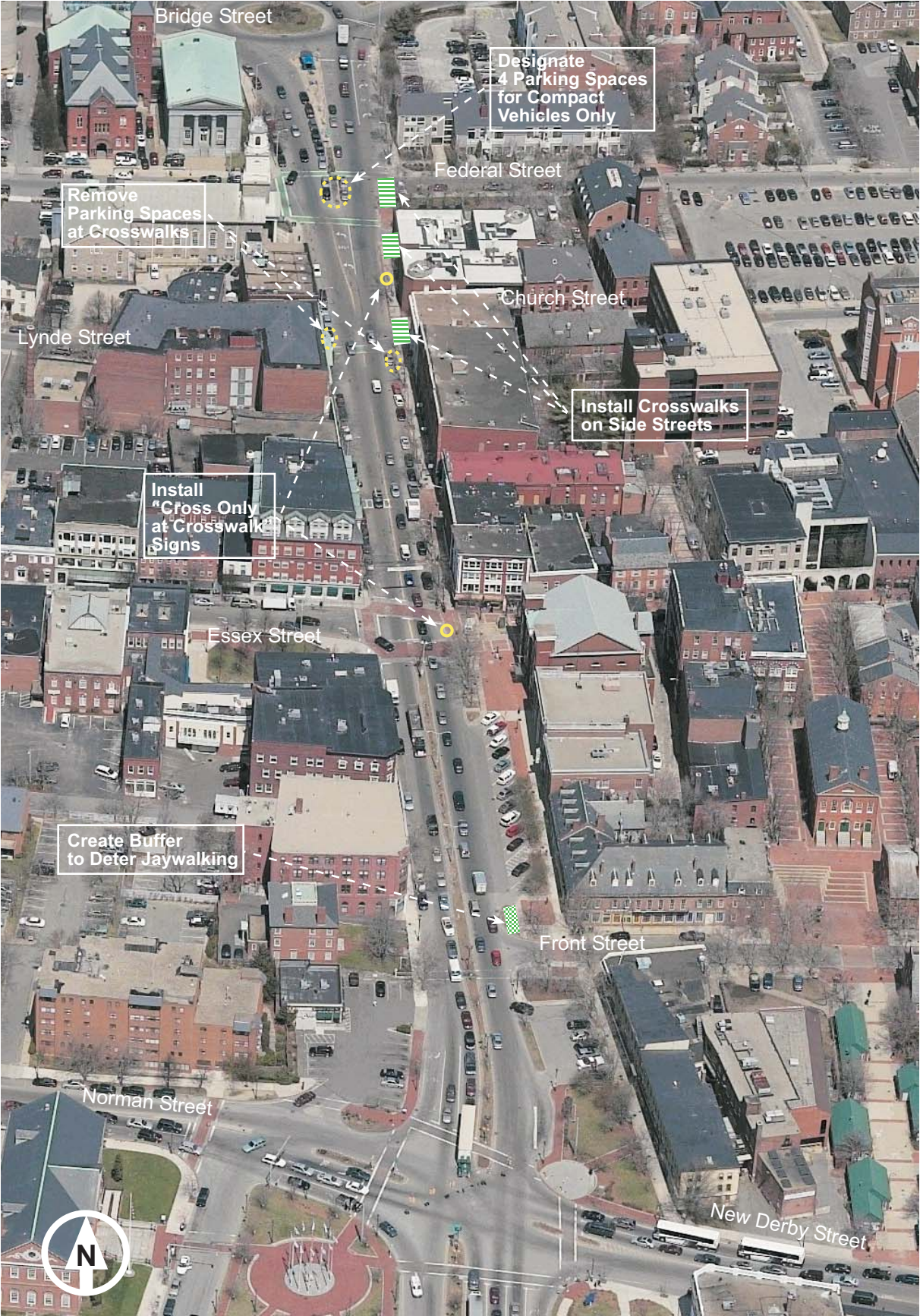
In addition to traffic delays at those intersections, the probe vehicle encountered on-street parking maneuvers or lane blockages by turning vehicles on some of the travel time runs. Therefore, pedestrian crossings should not be regarded as the only factor that causes traffic delay. It also should be noted that pedestrians and drivers were observed generally to interact with each other well, probably because the traffic speed in this section of Washington Street is low.

Proposed Improvements

The above data analyses show that all the crosswalks are used frequently by pedestrians. The crosswalk at the city hall was least used but did not cause major delays for traffic. In general, pedestrians and traffic interact with each other well under normal conditions. During peak tourist season when pedestrian crossings are heavy, police details usually are present to direct pedestrian and vehicular traffic. Therefore, this study does not recommend any crosswalk removal or any major long-term improvements in the study section of Washington Street. By 2010, the northbound traffic conditions will be improved to some extent as a result of construction of the Bridge Street bypass road. The project includes signaling the intersection of Washington Street at Bridge Street to regulate both pedestrian and vehicular traffic. In the meantime, this study proposes a series of short-term improvements in order to enhance pedestrian safety and circulation and to provide a better environment for the interaction between pedestrians and drivers. The proposed improvements are listed below, and the locations of some (not all) of the improvements are illustrated in Figure 4-16.

- Install crosswalks and appropriate curb cuts at Church Street, at the driveway of the district court, and at Federal Street on the east side of Washington Street. The location of curb cuts should be at the corner, if they serve more than one crosswalk, and they should be wide enough and have a sufficiently gentle slope to accommodate wheelchair users.
- Install “Cross Only at Crosswalks” regulatory signs (R9-2, MUTCD) on the sidewalk curbs at Essex Street near the pedestrian mall and also in front of the district courthouse.
- Designate the four parking spaces in the middle of the intersection of Washington Street at Federal Street for compact vehicles only. The designation will prevent vans, sport utility vehicles, and other large vehicles from obstructing pedestrians’ and drivers’ view of each other at the crosswalk just north of the intersection.
- Remove one on-street metered parking space on Washington Street (southbound) at Lynde Street. That parking spot is too close to the intersection. A parked car on the spot may easily obstruct the view between pedestrians and drivers. A similar treatment should be applied to the northbound approach on Washington Street at Church Street, where one on-street metered parking space should be removed and the two 15-minute parking spaces at the bank should be shifted southward (away from the intersection).
- Install low-height vegetation or decorative bollards/bricks at the curb extension on the northeast corner of the Front Street intersection. This would deter pedestrians from crossing Washington Street at this location and guide them to the crosswalk on the south side of Front Street. The height should be low so that drivers’ view will not be obstructed.

Figure 4-16 Locations of Some Proposed Improvements on Washington Street



- Improve lighting conditions at major pedestrian crossing locations. In addition to streetlights, low-height lights shining on crossing locations can be installed at the curbs near the crosswalks of Essex Street, Church Street, and Front Street, where pedestrian crossings at night are frequent.
- Give parking signs a uniform format and remove redundant parking limit signs.
- Consider installing a warning sign such as “Slow, Heavy Pedestrian Crossings” or “Expect Delays, Heavy Pedestrian Crossings” at each end of the study section.

4.4 Pedestrian Access to the Commuter Rail Station

This section presents recommendations for improving pedestrian access to the Salem station. CTPS consulted existing studies and design plans for the area, conducted field reconnaissance, performed pedestrian counts, and used best-practices guidelines to generate the recommended improvements. Figure 4-17 is an aerial view of the station and its vicinity.

Pedestrian Counts

On the morning of Tuesday, May 3, 2005, CTPS observed pedestrian activity around the station area. The day was sunny, breezy, and cool. Observers counted pedestrians approaching the station at the Washington Street entrance and at the Bridge Street driveway entrance, and recorded the use of crosswalks along North Street in the vicinity of Federal Street.

Observations began at 6:15 AM and ended at 8:30 AM, in order to capture activity associated with the inbound train departures beginning at 6:27 AM and ending with the 8:27 AM train. Pedestrian activity seems to pick up after 7:15 AM at most of the locations. The heaviest one-hour period of pedestrian activity at the two station entrances is 7:15–8:15 AM. The heaviest 15-minute period was observed to be 8:00–8:15 AM. Figure 4-18 summarizes the pedestrian counts at various locations for the morning peak period and peak hour.

The most heavily used entrance to the station by pedestrians was at the Bridge Street staircase at Washington Street. In total, 370 pedestrians used this entrance to enter the station: 216 who crossed Bridge Street at the crosswalk, and 164 who approached from the east along the Bridge Street sidewalk. Two other major pedestrian groups approached from the west and the northwest. At the station’s driveway off of Bridge Street at the North Street overpass, 121 pedestrians walked toward the station by crossing under the overpass. From the northwest, 87 pedestrians approached the station by using the North River crossing pathway.

The discussion of pedestrian access to the station is presented in three sections, according to geographic area:

- Access to the southeast station entrance, approaching from points along Bridge Street (north and east), including the intersection of Bridge Street and Washington Street
- Access to the southwest station entrance, approaching from points along North Street (south) and Bridge Street (west)
- Access to the station from points to the northwest

Figure 4-17 Salem Commuter Rail Station Study Area and Pedestrian Access



Photo: View facing south, taken in 2003.

Figure 4-18 Pedestrian Counts at Various Locations Near the Station



- A** Sidewalk: Bridge Street from (to) north/east
- B** NB (SB) Jaywalkers across Bridge St. at Washington St.
- C** Main Crosswalk (at ped signal)
- D** Minor Crosswalk (at North St. ramp)
- E** WB (EB) Jaywalkers across Washington St. at Bridge St.
- F** Driveway Sidewalk
- G** Path Under North St. Overpass
- H** Use of Staircase to Path Under North St. Bridge

- I** Riverbank Path Across North River Canal
- J** Lynde Street Crosswalk
- K** Times Ped. Crosswalk Signal Was Actuated
- L** Jaywalkers Between Lynde and Federal Streets
- M** Federal Street Crosswalk
- N** Jaywalkers North of Federal Street
- O** Westbound Ramps Crosswalk Near North St.
- P** Westbound Ramps Crosswalk Away from North St.

Each of the three discussions provides an inventory of existing conditions, describes planned construction activities, and presents improvements proposed by this study. The proposed improvements are mostly low-cost and can be implemented short-term.

4.4.1 Access to the Southeast Station Entrance, Approaching from Points along Bridge Street (North and East)

It is assumed that pedestrians using this entrance are mainly from the areas east and south of the station. The locations under review include the intersection of Bridge Street at Washington Street, Bridge Street west of the intersection, and the area east of the station (see Figure 4-19).

Existing Conditions

- Bridge Street features sidewalks on both sides of the street, and these are not buffered from the roadway.
- A pedestrian crossing signal is located midblock just east of St. Peter Street.
- West of Ash Street, the north-side sidewalk is grade-separated from the road and has a handrail. It leads to the staircase to the station.
- No connection to the station exists from the residential development (Jefferson at Salem) immediately to the east of the station. A fence and railroad tracks separate the two properties. The residential property features a paved bikeway/sidewalk along the property line, parallel to the railroad tracks.
- As shown in the pedestrian counts (see Figure 4-18), this entrance is the more heavily used of the two entrances to the station. During the peak morning period, nearly 400 pedestrians approached this entrance. Over half of this activity occurred at the intersection of Washington Street and Bridge Street; most of the pedestrians used the signalized pedestrian crosswalk, although a few jaywalkers were observed. Very few pedestrians crossed Bridge Street at the unsignalized crosswalk at the eastbound ramp to North Street (Route 114) northbound.

Planned Construction Activities

Transportation projects proposed in the area include the new station parking garage and the Bridge Street bypass road. The garage is still at the initial stage of concept design, with three alternatives that all retain the southwest entrance as the main pedestrian entrance.³ The Bridge Street bypass road⁴ is fully designed, with the following improvements planned in the vicinity of the southeast entrance:

- Bridge Street will be widened and realigned beginning east of Ash Street in order to align with the new bypass road.
- The intersection of the bypass road and Bridge Street, at the Jefferson at Salem entrance, will be signalized. Crosswalks will be provided at the four crossings, and the signal timing

³ *MBTA Salem Commuter Rail Station and Parking Improvements – 15% Concept Design Report*, TAMS Architecture, August 2004.

⁴ *Construction of Bridge Street Bypass in the City of Salem: 100% Design Plan*, prepared by Edwards & Kelcey, Inc., for the Massachusetts Highway Department, October 2003.