

# Route 38 Transportation Study



Northern Middlesex Council of Governments  
April 8, 2014

# Purpose and Goals

- Evaluate transportation conditions within the Route 38 corridor
  - Traffic Operations
  - Bicycle and Pedestrian Accommodations
  - Safety
  - Access
- Study Goals:
  - Assess existing and future operating conditions
  - Identify deficiencies and needs
  - Outline recommendations for addressing existing and anticipated transportation needs

# Zoning and Land Use

- 6.3 mile corridor containing 431 parcels (968.63 acres of land)
- Base Zoning Characteristics
  - Commercial – 270 parcels (51.73% land area)
  - Industrial – 51 parcels (4.05%)
  - Residence 40 – 86 parcels (28.18%)
  - Multi-Family – 8 parcels (14.59%)
  - Transitional – 14 parcels (1.18%)
  - Municipal – 2 parcels (0.27%)

# Overlay Zoning Districts

- Wireless Communications Facilities
- Village Mixed-Use Overlay District
- Village Residential Overlay District
- Town Center Overlay District
- Community Village Overlay District
- South Village Overlay District

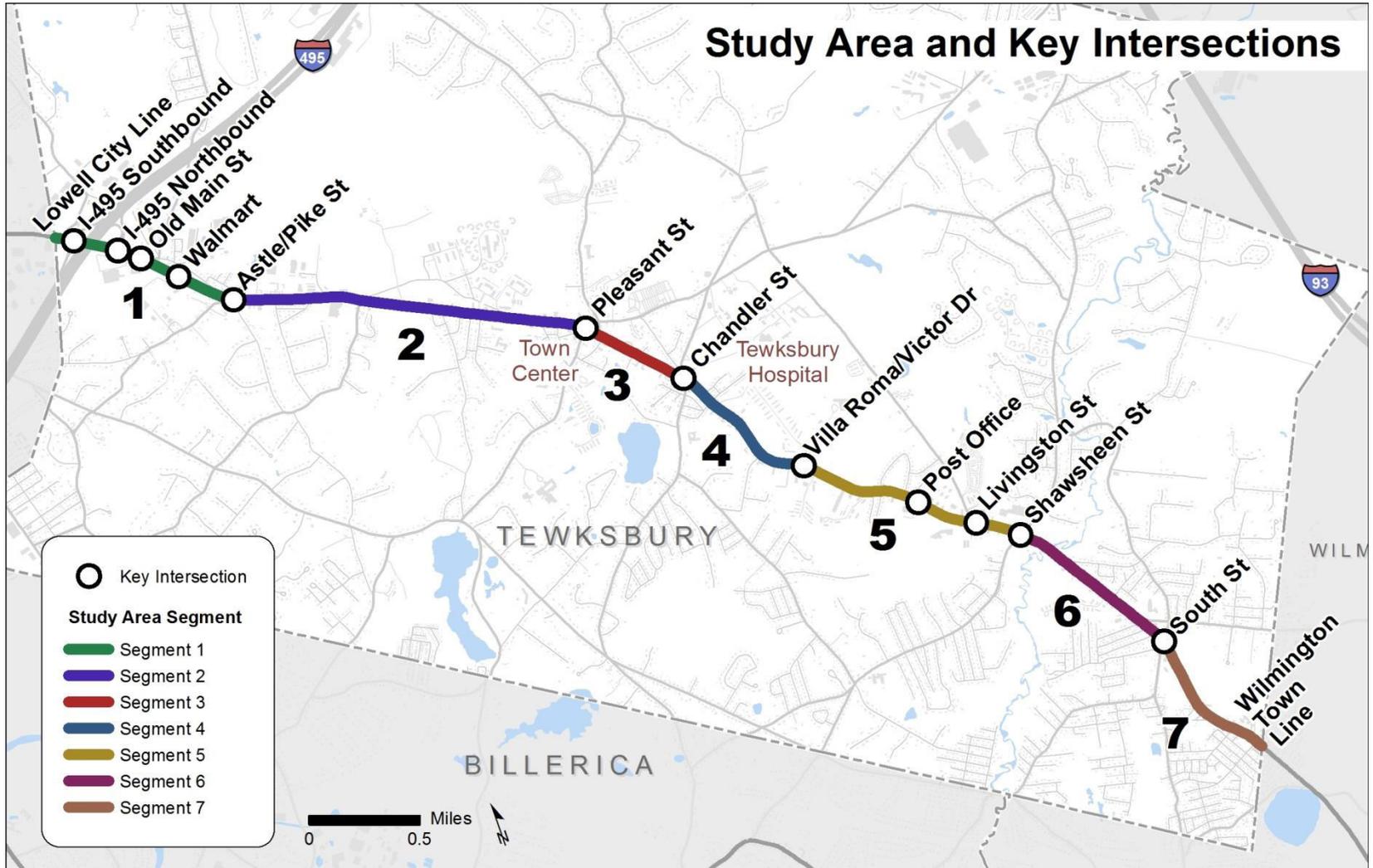
# Land Use Characteristics

Land Use	No. of Parcels	Acreage	% Acreage
Commercial	142	352.53	36.39
Residential	224	225.53	23.28
Exempt	19	245.23	25.32
Industrial	3	5.83	0.60
Vacant Industrial	8	18.31	1.90
Vacant Developable	16	76.45	7.90
Vacant Undevelopable	17	36.60	3.78
Potentially Developable	1	4.16	0.43
Residential Open Land	1	4.00	0.41
Totals	431	968.63	100.00

# Study Methodology -Transportation

- Evaluate Existing Traffic Operations
  - ATR and Turning Movement Counts
  - Traffic Safety Analysis
  - Inventory of Pedestrian and Bicycle Facilities
  - Level of Service (LOS) and Delay Analysis
- Evaluate Future Traffic Conditions
  - Forecasted Traffic Volumes based on background growth and known development proposals
  - Level of Service (LOS) and Delay Analysis
- Formulate Improvement Recommendations

# Study Area Segments



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- Lowell City Line to Astle/Pike Street
- Astle/Pike Street to Pleasant Street
- Pleasant Street to Chandler Street
- Chandler Street to Victor Drive
- Victor Drive to Shawsheen Street
- Shawsheen Street to South Street
- South Street to Wilmington Town Line

# Study Area Intersections

- Main Street at I-495 Intersections (2 ramp intersections)
- Main Street and Old Main Street
- Main Street and Walmart Plaza
- Main Street at Astle/Pike/Veranda
- Main Street at Pleasant/East Street
- Main Street at Chandler Street
- Main Street at Victor Drive
- Main Street at Post Office Drive
- Main Street at Livingston Street
- Main Street at Shawsheen Street
- Main Street at South Street

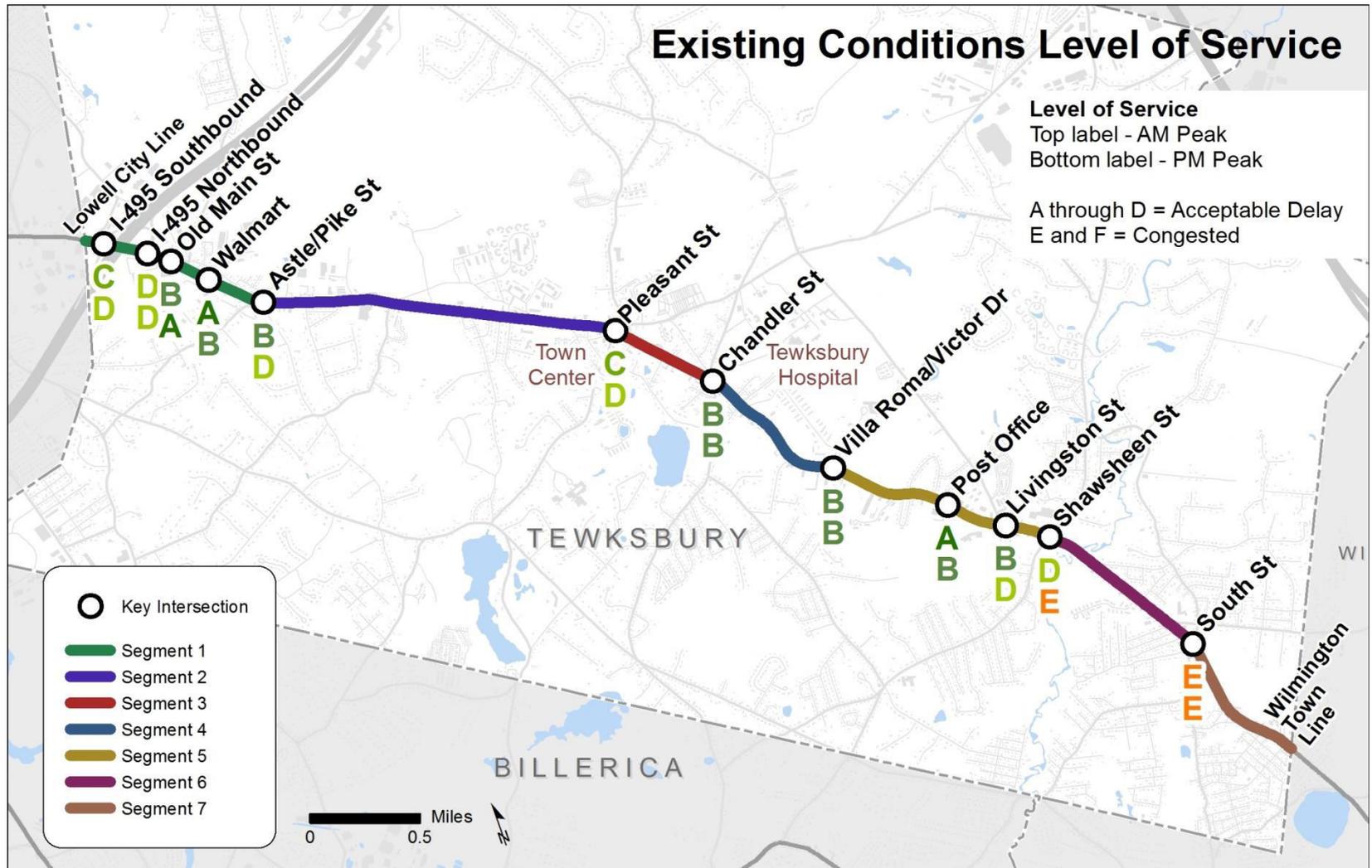
# Average Daily Traffic Volumes

Location	Average Daily Traffic (ADT) vehicles per day (vpd)	P.M. Peak Hour Volume	A.M. Peak Hour Volume
Route 38 at Lowell City Line	29,400	3,184	2,128
Route 38 south of I-495	27,300	2,583	1,862
Route 38 north of Capitol Avenue	23,200	2,171	1,621
Route 38 north of Dewey Street	22,100	1,984	1,889
Route 38 South of Pleasant Street	19,000	1,679	1,334
Route 38 south of Chandler Street	20,100	1,826	1,447
Route 38 north of Shawsheen Street	22,400	1,965	1,454
Route 38 south of DeCarolus Drive	19,700	1,567	1,564
Route 38 south of South Street	15,100	1,365	1,382

# Existing Operating Conditions at Study Area Intersections

INTERSECTION	Existing Conditions			
	AM Peak Hour		PM Peak Hour	
	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)	LOS
Route 38 and I-495 SB Ramps	29.8	C	47.7	D
Route 38 and I-495 NB Ramps	47	D	39.7	D
Route 38 and Old Main Street	13	B	7.1	A
Route 38 and Walmart Plaza	4.8	A	13	B
Route 38 and Astle/Pike Street	18.9	B	45.7	D
Route 38 and Pleasant Street	26.5	C	39.8	D
Route 38 and Chandler Street	11.4	B	15.3	B
Route 38 and Victor Drive	11.7	B	11.4	B
Route 38 and Post Office Drive	7.2	A	10.1	B
Route 38 and Livingston Street	16.8	B	40	D
Route 38 and Shawsheen Street	54.5	D	72.4	E
Route 38 and South Street	60.7	E	68.8	E

# Existing Traffic Operations

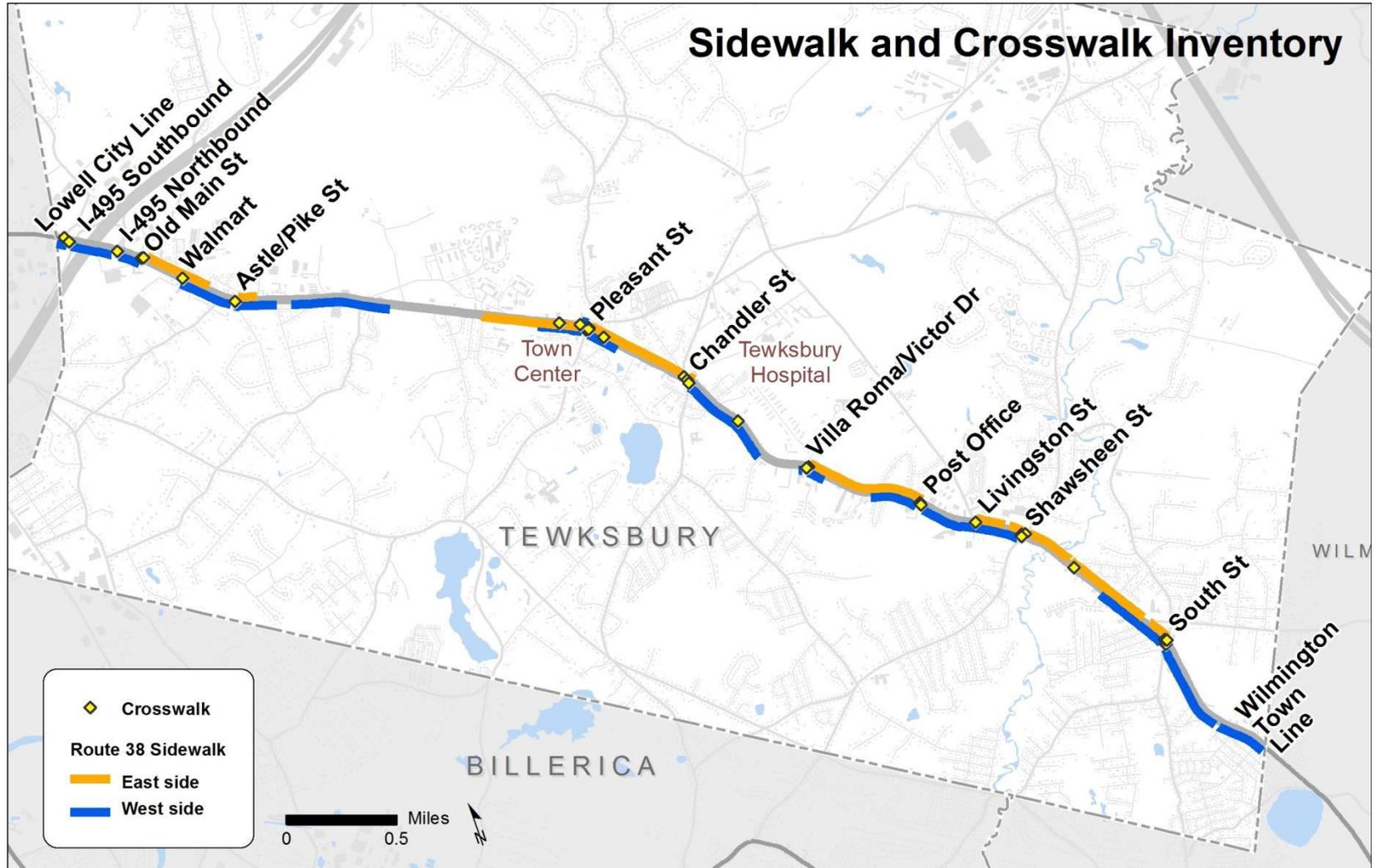


# Safety: Crash Data Analysis

(2008-2010 MassDOT data)

- Identification of High Crash Locations
  - Four Locations:
    - Main Street at Shawsheen Street - 69 crashes, 13 with injuries
    - Main Street at Astle/Pike/Veranda Street – 58 crashes, 6 with injuries
    - Main Street at Pleasant Street – 26 crashes, 7 with injuries
    - Main Street at Capitol Avenue – 32 crashes, 4 with injuries

# Pedestrian Facilities Inventory



# Future Conditions Analysis

- Traffic Volumes were projected to 2022
- Traffic growth calculations included the following development projects:
  - 553 Main Street – Ocean State Job Lots
  - 2230 Main Street – 2-story, 21,000 sf mixed use building
  - 0 Victor Drive – 80 townhouse units
  - 2087 Main Street – multi-purpose recreation facility
  - 2131 Main Street – zoned for commercial/restaurant use; most likely use identified as fast food with drive thru (approximately 9,000 sf)
  - 1777 Main Street – Redevelopment of former Heath Brook Plaza

# 2022 Traffic Operations with Anticipated Development Projects

Intersection	2022 Conditions with Anticipated Development			
	AM Peak Hour		PM Peak Hour	
	Control Delay (sec/veh)	LOS	Control Delay (sec/veh)	LOS
Route 38 and I-495 SB Ramps	29.5	C	53.0	D
Route 38 and I-495 NB Ramps	<b>59.0</b>	<b>E</b>	54.9	D
Route 38 and Old Main Street	13.4	B	8.0	A
Route 38 and Walmart Plaza	5.1	A	10.6	B
Route 38 and Astle/Pike Street	<b>56.1</b>	<b>E</b>	<b>90.2</b>	<b>F</b>
Route 38 and Pleasant Street	40.5	D	51.6	D
Route 38 and Chandler Street	12.9	B	33.1	C
Route 38 and Victor Drive	17.6	B	21.7	C
Route 38 and Post Office Drive	9.2	A	13.2	B
Route 38 and Livingston Street	27.4	C	<b>182.1</b>	<b>F</b>
Route 38 and Shawsheen Street	<b>88.2</b>	<b>F</b>	<b>113.8</b>	<b>F</b>
Route 38 and South Street	<b>125.9</b>	<b>F</b>	<b>60.2</b>	<b>E</b>

# 2022 Intersection Level of Service with Recommended Improvements

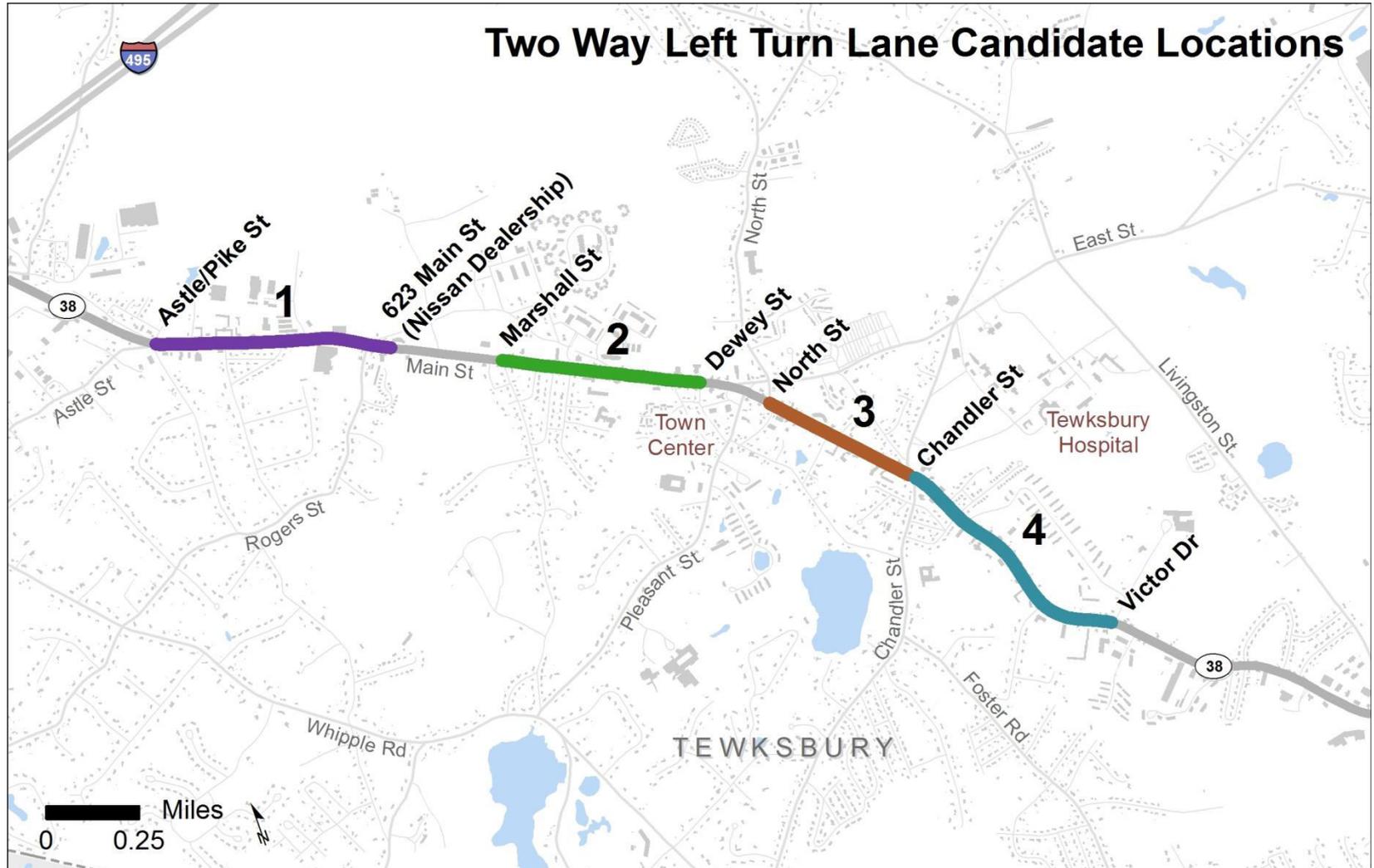
Intersection	2022 LOS with recommended Improvements				Recommended Operational Improvements
	AM Peak Hour		PM Peak Hour		
	Control delay (sec/veh)	LOS	Control delay (sec/veh)	LOS	
<b>Route 38 and I-495 SB Ramps</b>	29.5	C	53.0	D	None
<b>Route 38 and I-495 NB Ramps</b>	49.0	D	54.9	D	Signal timing only: add time to westbound left turn phase
<b>Route 38 and Old Main Street</b>	13.4	B	8.0	A	None
<b>Route 38 and Walmart Plaza</b>	5.1	A	10.6	B	None
<b>Route 38 and Astle/Pike Street</b>	54.5	D	38.9	D	Add a SB Main St right turn lane, a NB Main St exclusive through lane, and adjust signal timing
<b>Route 38 and Pleasant Street</b>	40.5	D	51.6	D	None
<b>Route 38 and Chandler Street</b>	12.9	B	33.1	C	None
<b>Route 38 and Victor Drive</b>	17.6	B	21.7	C	None
<b>Route 38 and Post Office Drive</b>	9.2	A	13.2	B	None
<b>Route 38 and Livingston Street</b>	18.3	B	24.6	C	Add a NB Main St exclusive through lane, add a WB Livingston St Right turn lane, adjust signal timing
<b>Route 38 and Shawsheen Street</b>	34.4	C	44.3	D	NB and SB Main St Exclusive Through lanes, signal timing changes
<b>Route 38 and South Street</b>	46.3	D	47.7	D	Combine EB and WB South Street signal phases, adjust signal timing

# Two-Way Left Turn Lanes

- Reduction of delays at mid-block access areas caused by left turning vehicles blocking mainline
- Safety benefits (can reduce crashes)
- Emergency Vehicle benefits
- Four Candidate Locations:



# Two-Way Left Turn Lane Locations



# Other Recommendations

- **Access Management**

- Establish a partnership between the Town and MassDOT to address future access issues along corridor:
  - Limit the number of conflict points at Driveway Locations
  - Separate Conflict Points
  - Reduce the interference of Through Traffic (two-way left turn lanes)
  - Provide Adequate On-Site Circulation and Storage in Parking Areas
  - Provide adequate vehicle stacking for drive through lanes

# Other Recommendations (continued)

- Transportation Demand Management
  - Encouraging a shift from single occupancy vehicle trips to non-single occupant modes; shifting trips out of peak periods
  - Adopt a TDM Policy
    - Encourage use of transit, ridesharing, bicycling, walking or travel outside of peak periods
    - Participation in a Transportation Management Association (TMA)
    - Alternative Work Programs – Encourage Telecommuting/ Flextime
    - Work toward providing:
      - ADA Compliant Sidewalks
      - Bicycle Facilities
      - Land Use policies that encourage mixed-use development
      - Enhances streetscaping and pedestrian amenities

# Recommendations for Improving Traffic Operations

- Corridor-Wide Traffic Signal Optimization;
  - Coordination of Traffic Signals
    - Post Office Drive to Shawsheen Street
    - I-495 Interchange Area from Clark Road to Old Main Street
  - Signal Phasing Modifications
    - Main Street at South Street
- Need for Increased Capacity at some locations:
  - Main Street at Livingston Street – add a WB Livingston St. right turn lane and NB Main St through lane
  - Main Street at Astle/Pike Streets – add a SB Main St. right turn lane and NB exclusive through lane
  - Main Street at Shawsheen Street – additional NB and SB Main St through lanes
  - Widen Main Street to four lanes between Livingston St. and Shawsheen St.

# Recommendations for Bicycle and Pedestrian Facilities

- Bicycle and Pedestrian Accommodations
  - Where possible, include 5-foot shoulders to accommodate bicycles
  - Where 5-foot shoulders are not possible, “Share the Road” markings (Sharrows) may be substituted
  - Encourage the inclusion of bicycle storage facilities
  - Develop a continuous, ADA compliant sidewalk network
- Develop performance criteria relative to transportation for inclusion in the Town’s Zoning Bylaws

# Thank You!

- Questions?
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