Town of Belmont
Town Wide Traffic Study

Board of Selectmen Meeting

April 1, 2019

TOWN OF BELMONT

BSC GROUP

Purpose of Study

- Analyze current travel patterns,
- Determine the extent of cut-through traffic,
- Identify strategies to eliminate, reduce, or mitigate cut-through traffic volumes.

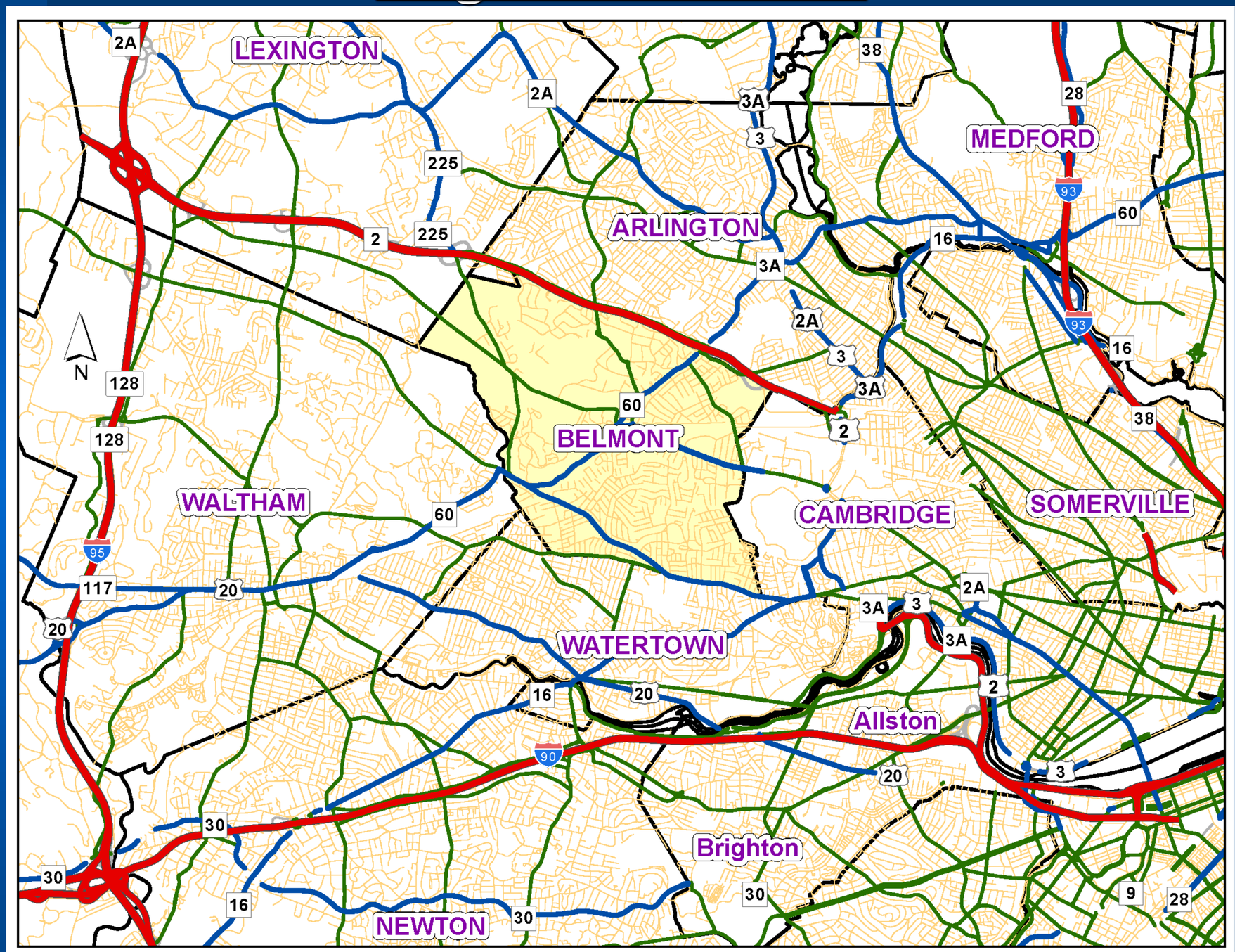
Study Objectives

- Improve safety for all users
- Eliminate, reduce, or mitigate cut-through traffic
- Reduce congestion/improve or maintain access

Key Findings

- Regional congestion contributes to cut-through traffic in Belmont
- High percentage of cut-through traffic is from immediate adjacent towns
- Peak traffic flow is generally directional based on time of day
- Neighborhoods near congested main roads experience high cut-through traffic volumes

Regional Context



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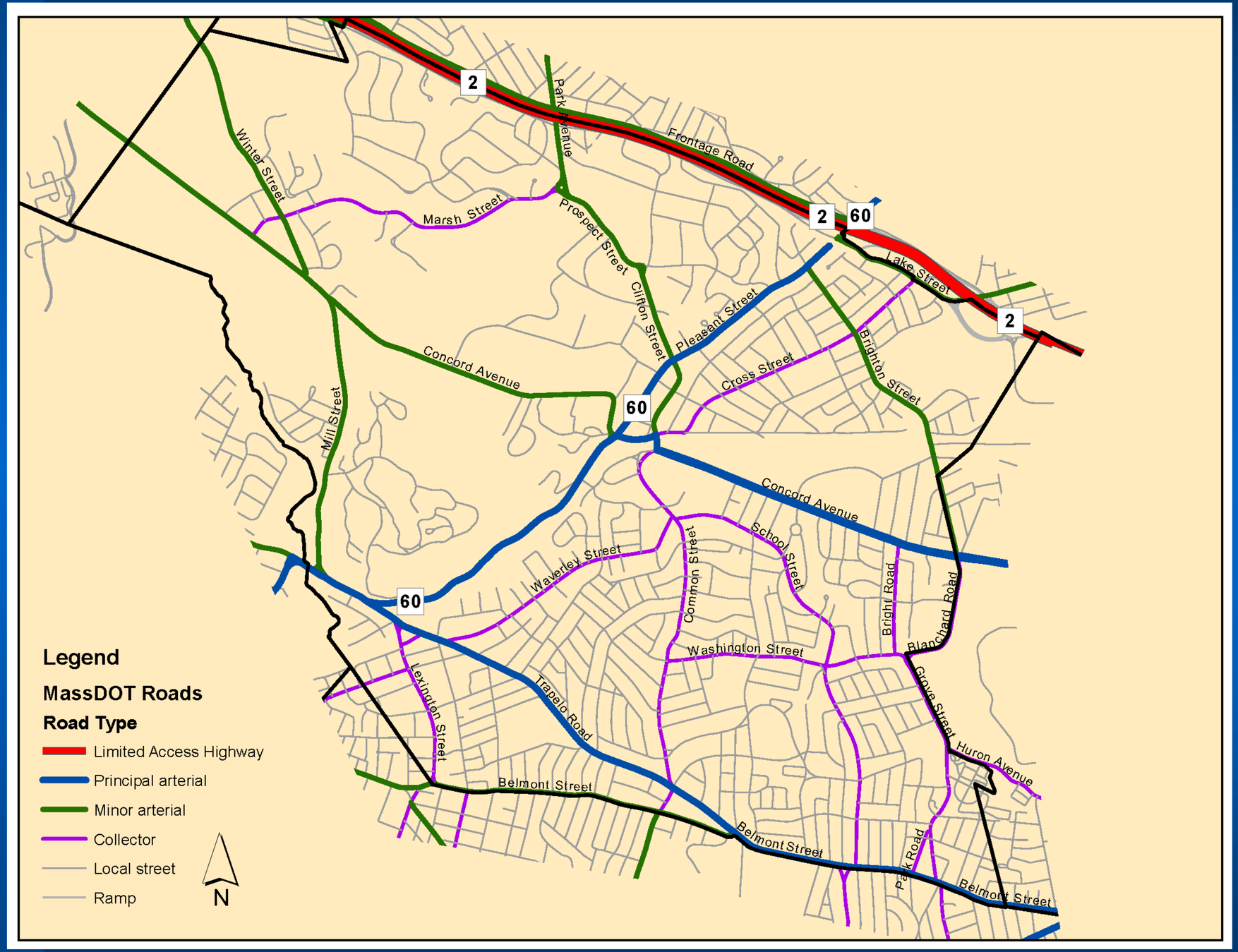
Roadway Functional Classification



Summary of TAC and Community Concerns

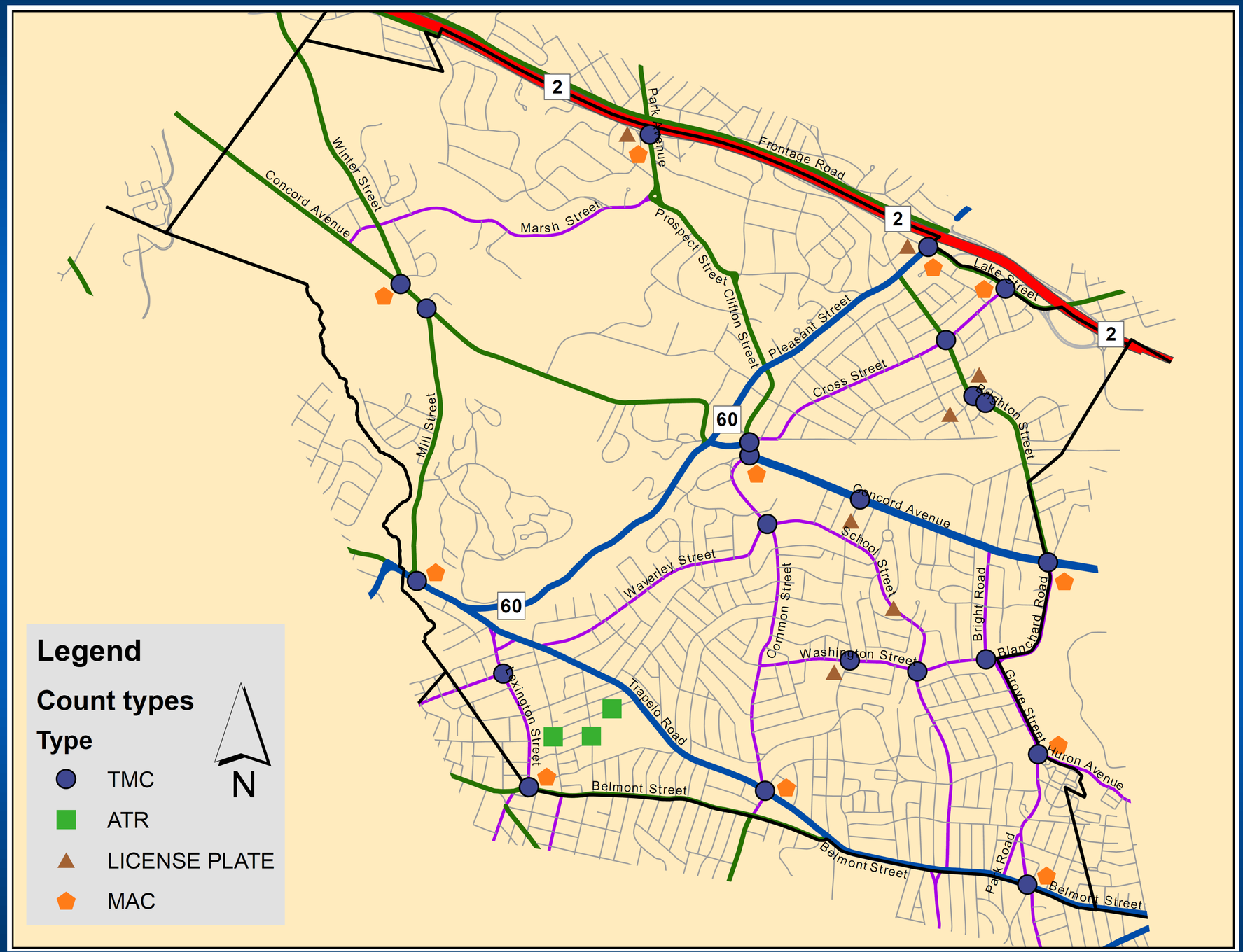
- Heavy congestion on Belmont streets
- Cut-through traffic worsened by navigational apps
- Speeding through neighborhood streets
- Pedestrian and bicycle safety
- School traffic contributing to AM congestion
- Lack of enforcement of existing traffic regulations

Data Collection Effort

- 12-Hour Turning Movement counts at 22 locations:
  - **Pedestrians; Bicycles; Vehicles**
- Recording of media access control (MAC) address of Wi-Fi enabled devices at 11 locations to determine:
  - **Travel times; Cut-through traffic**
- 48-hour automated traffic recording (ATR) counts at 3 locations
- License Plate surveys by Belmont Police at 7 locations

Study Area

LOCATION	TMC	ATR	LICENSE	MAC
Winter/Concord	X			X
Concord/Mill	X			
Trapelo/Mill	X			X
Lexington/Belmont	X			X
Park/Rt 2	X		X	X
Common/Concord	X			X
Common/School	X			
Common/Trapelo	X			X
Concord/Goden	X		X	
Goden/Washington	X		X	
Pleasant/Lake	X		X	X
Brighton/Cross	X			
Washington/School	X			
Lake/Cross	X			X
Blanchard/Concord	X			X
Washington/Bright	X			
Grove/Huron	X			X
Belmont/Grove	X			X
Brighton/Statler	X		X	
Brighton/Eliot	X			
Lexington/Sycamore	X			
White/Walnut		X		
Walnut/Trapelo		X		
Maple/Chestnut		X		
Waterhouse/Eliot			X	
School/Stone			X	
Concord/Leonard	X			



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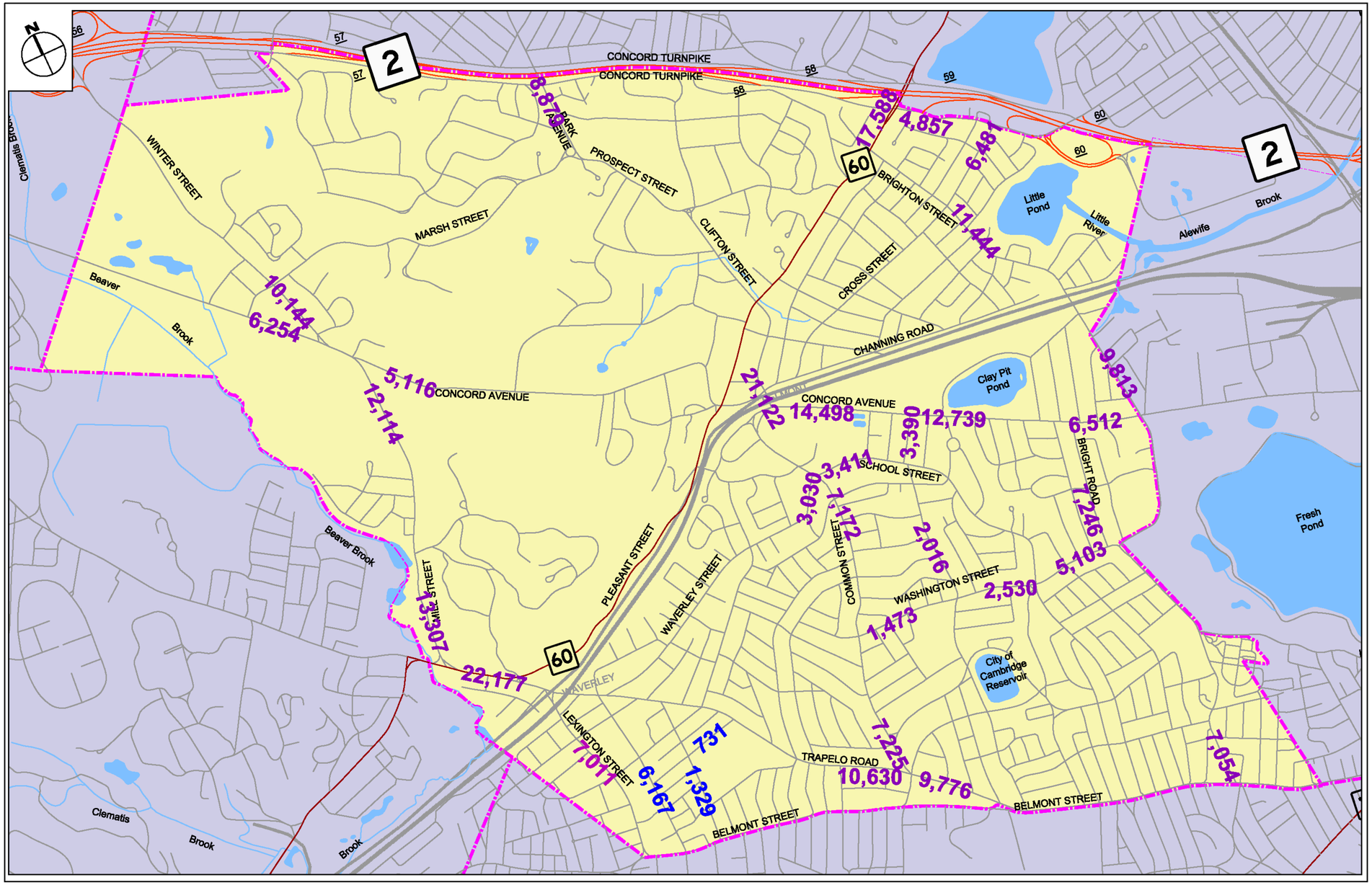
Existing 12-Hour Traffic Volumes



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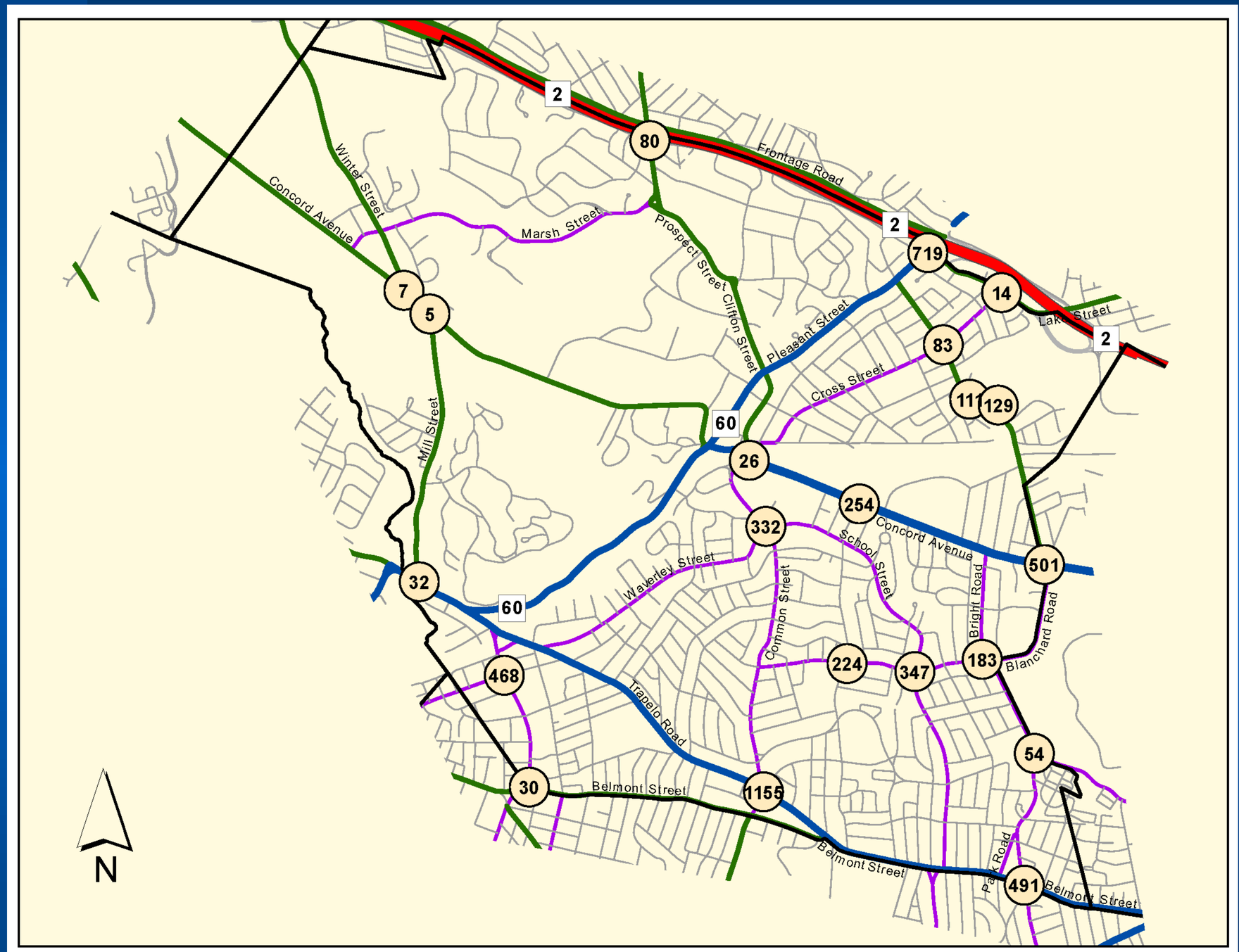
Existing 12-Hour Pedestrian Crossing Volumes



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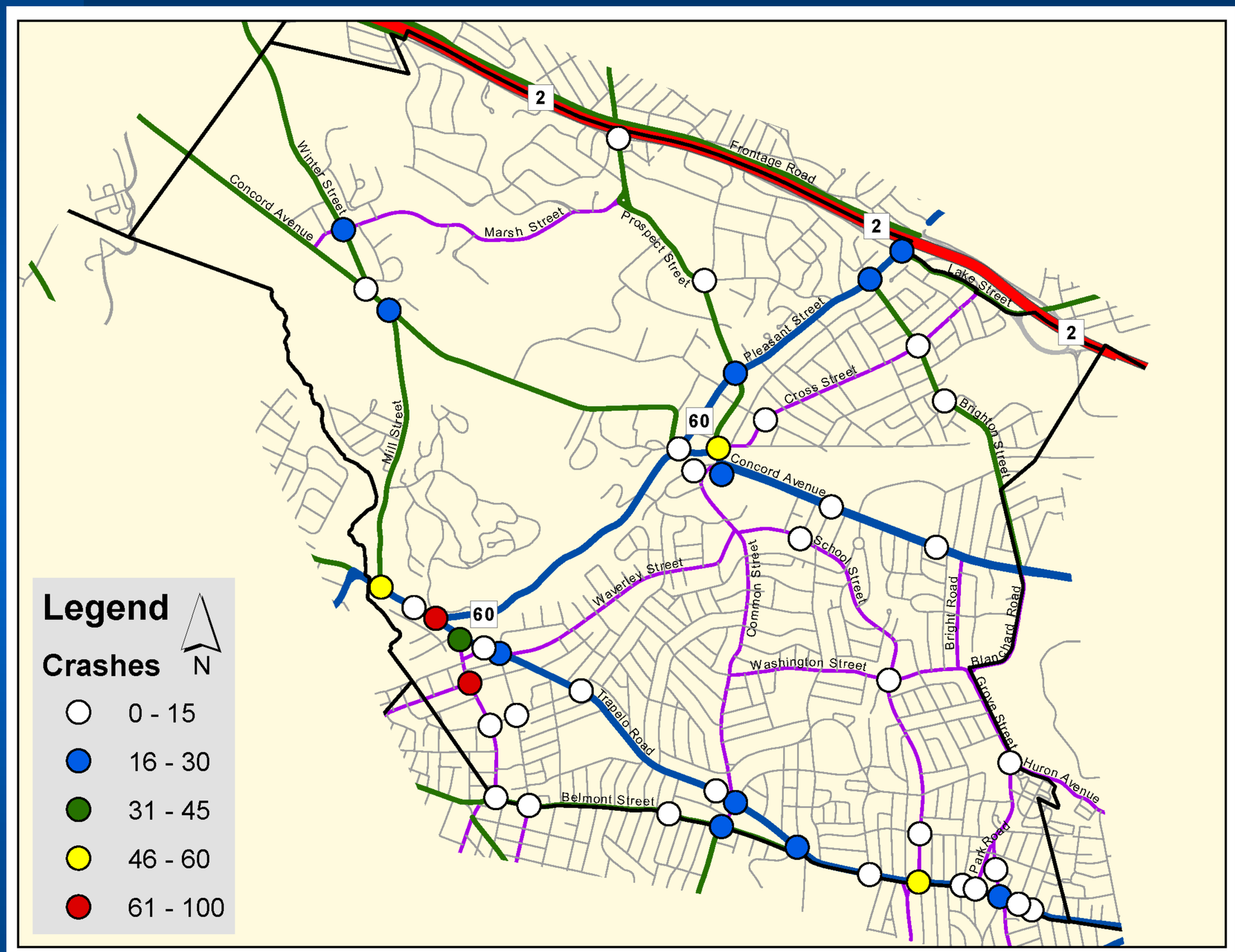
Crash Data 2008-2017



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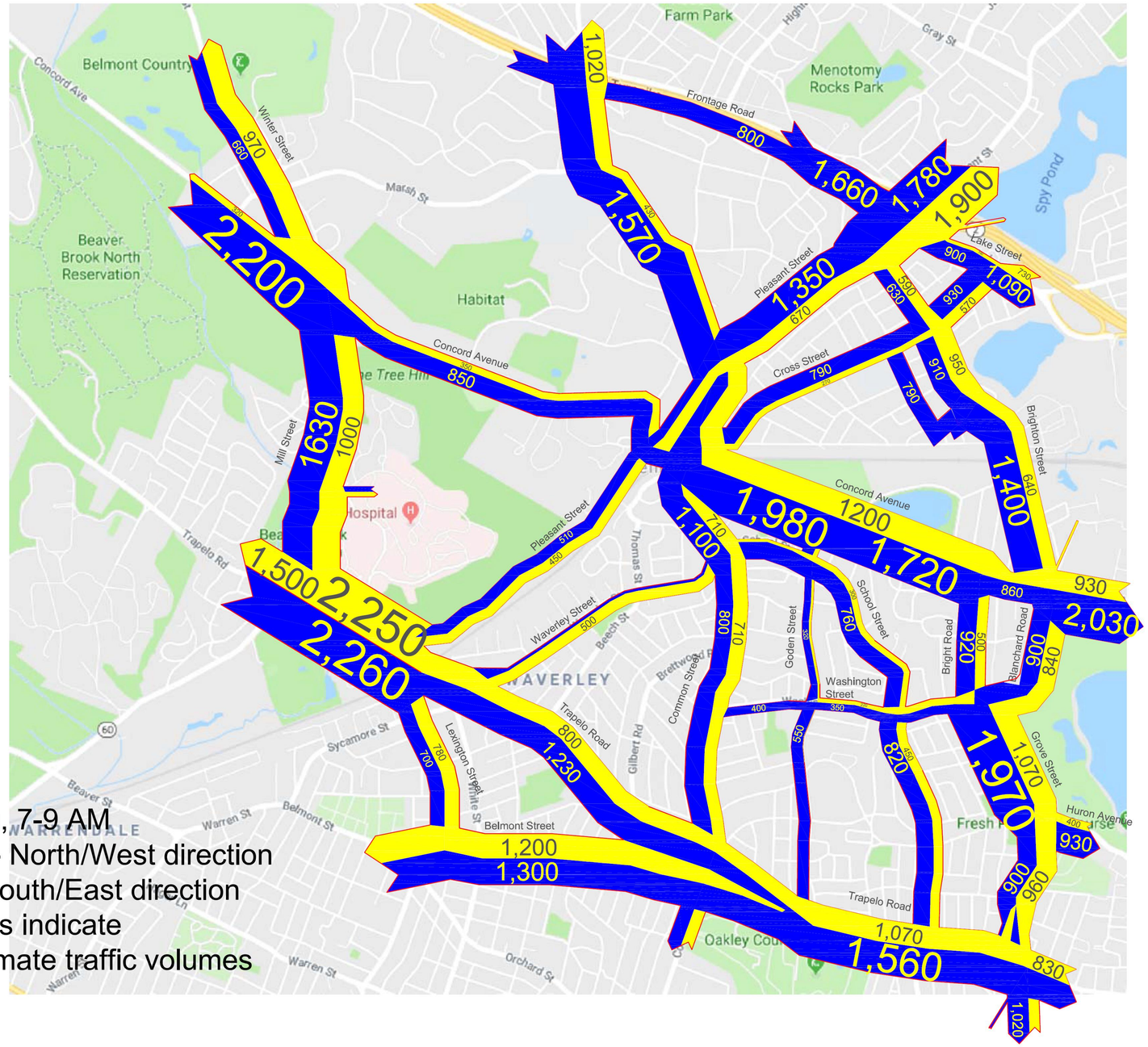
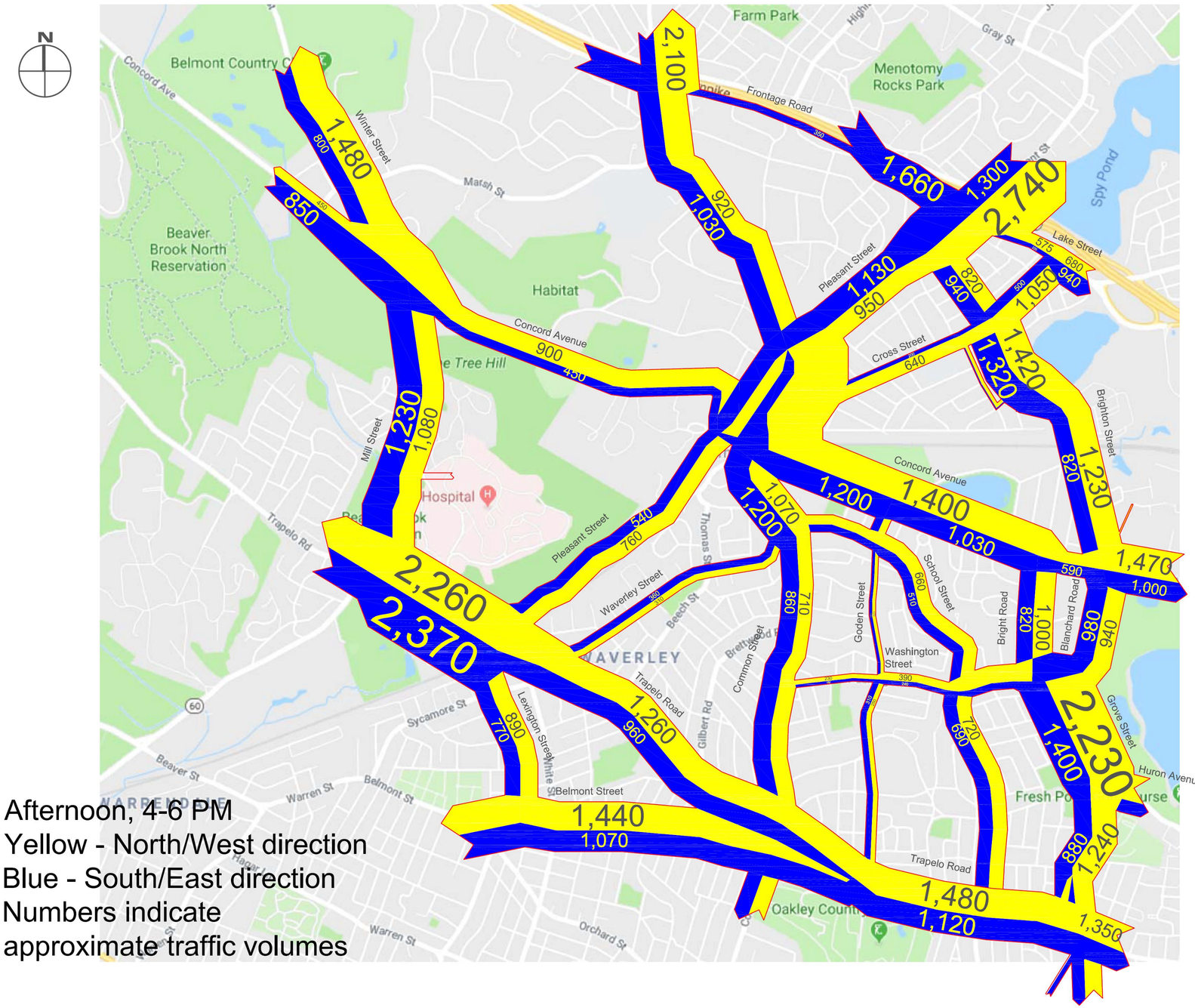
Travel Patterns AM



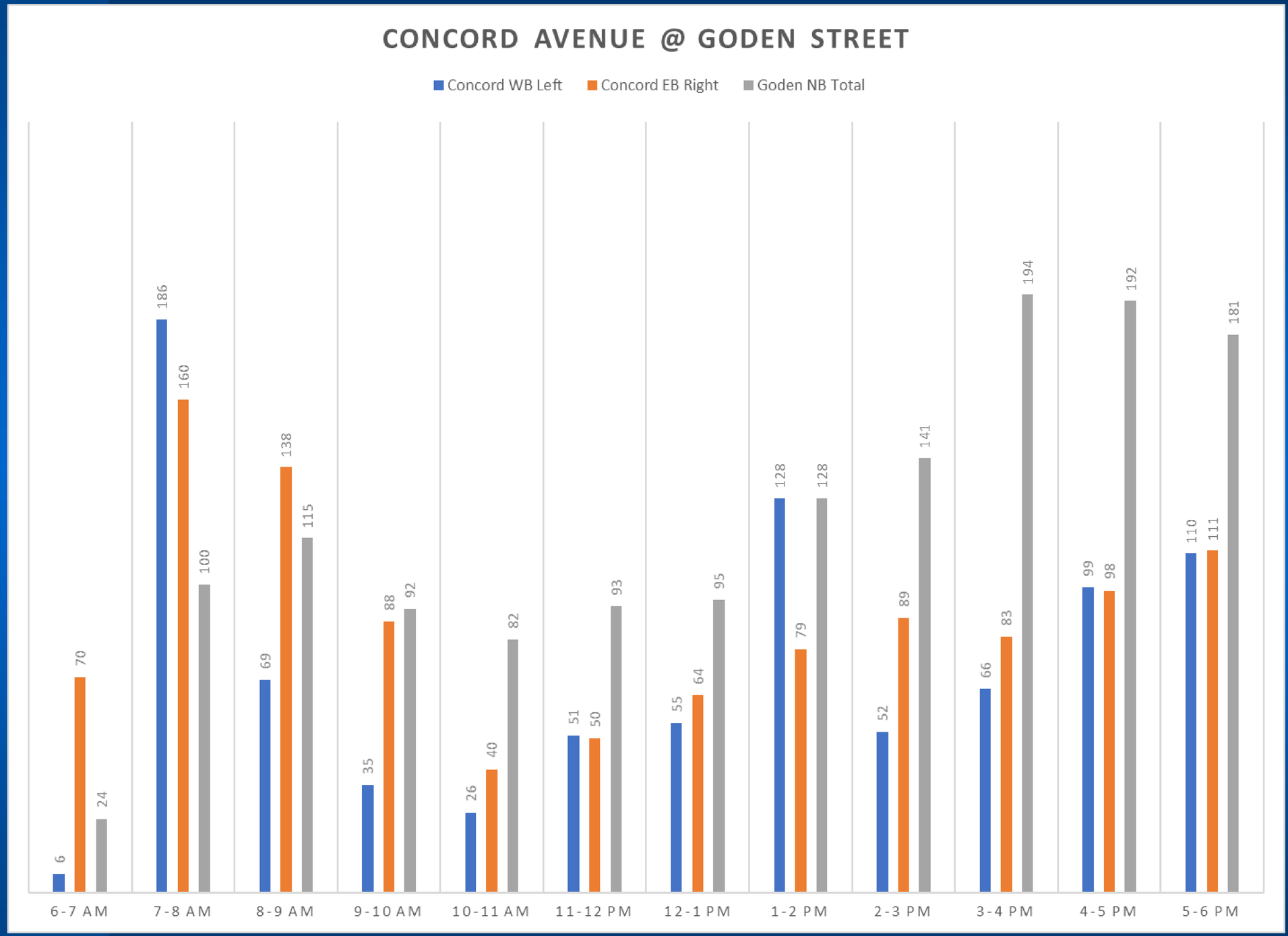
Morning, 7-9 AM
Yellow - North/West direction
Blue - South/East direction
Numbers indicate
approximate traffic volumes

Travel Patterns PM



Afternoon, 4-6 PM
Yellow - North/West direction
Blue - South/East direction
Numbers indicate approximate traffic volumes

Hourly Traffic Volume Variation



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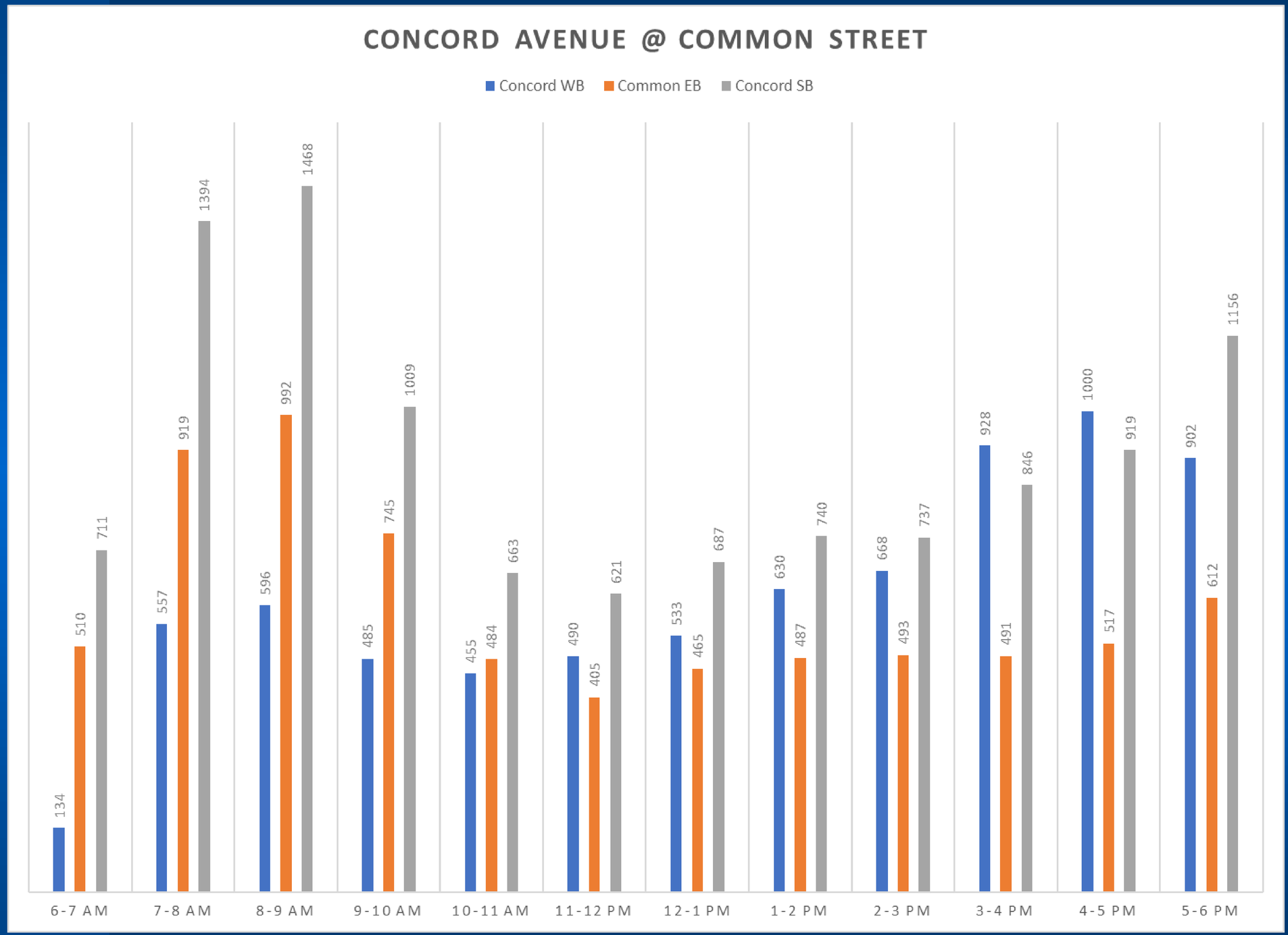

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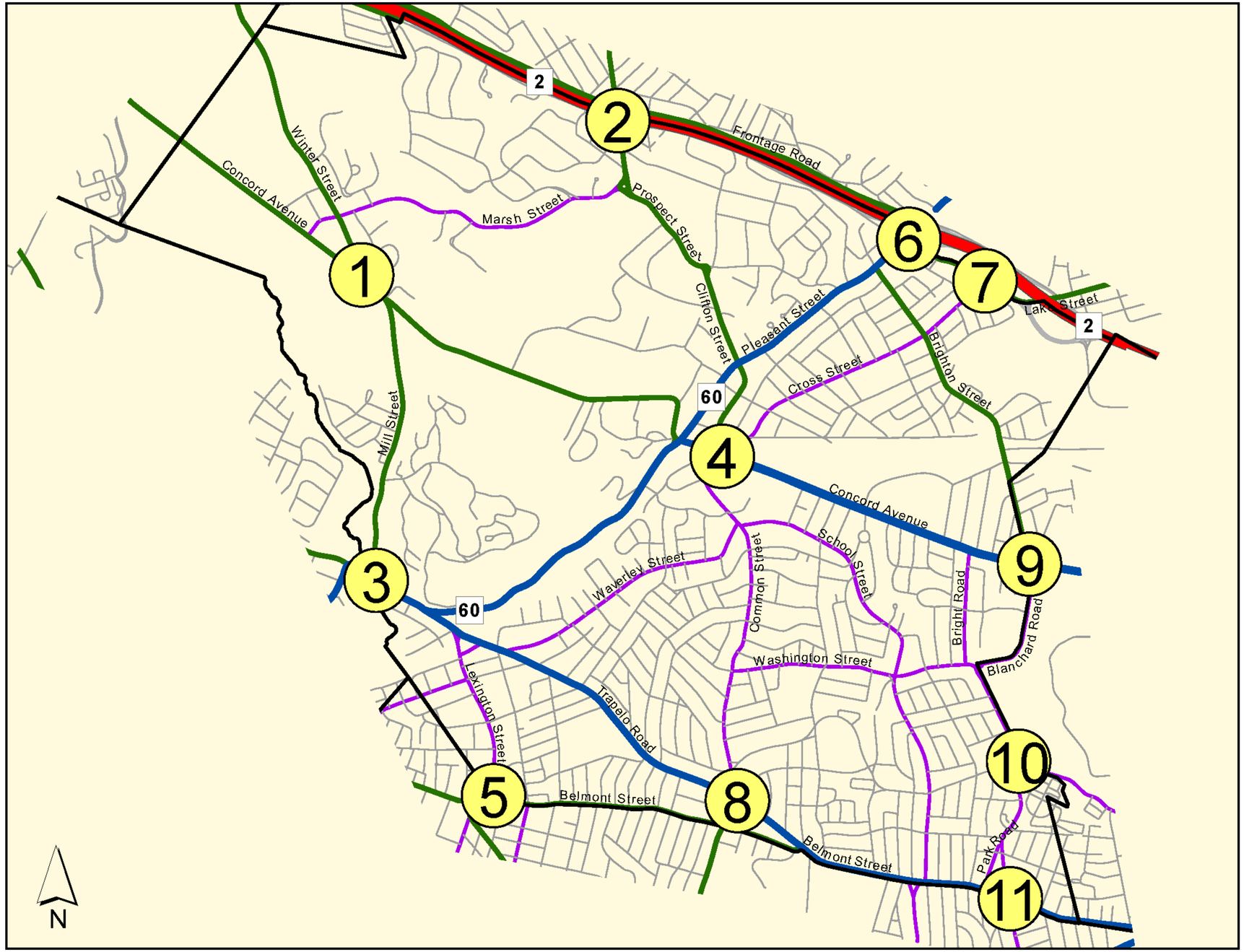
Trip Pattern – Node Map

NODE	LOCATION
1	Concord Avenue/Marsh Street
2	Park Avenue/Route 2
3	Mill Street/Trapelo Road
4	Concord Avenue/Common Street
5	Lexington Street/Belmont Street
6	Pleasant Street/Lake Street
7	Cross Street/Lake Street
8	Cushing Square
9	Concord Avenue/Blanchard Road
10	Huron Avenue/Grove Street
11	Belmont Street/Grove Street



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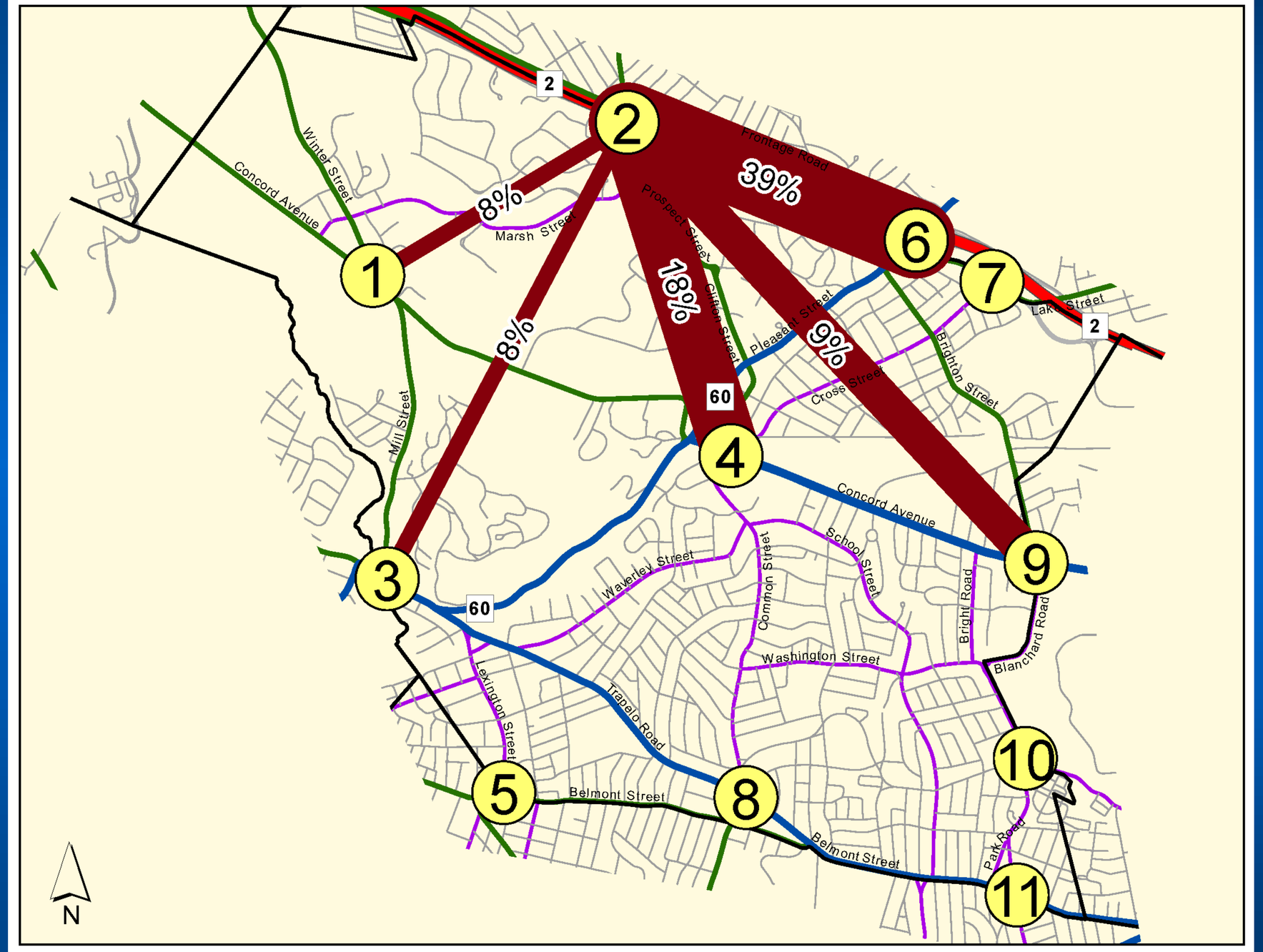
AM Trip Pattern – From Park Ave



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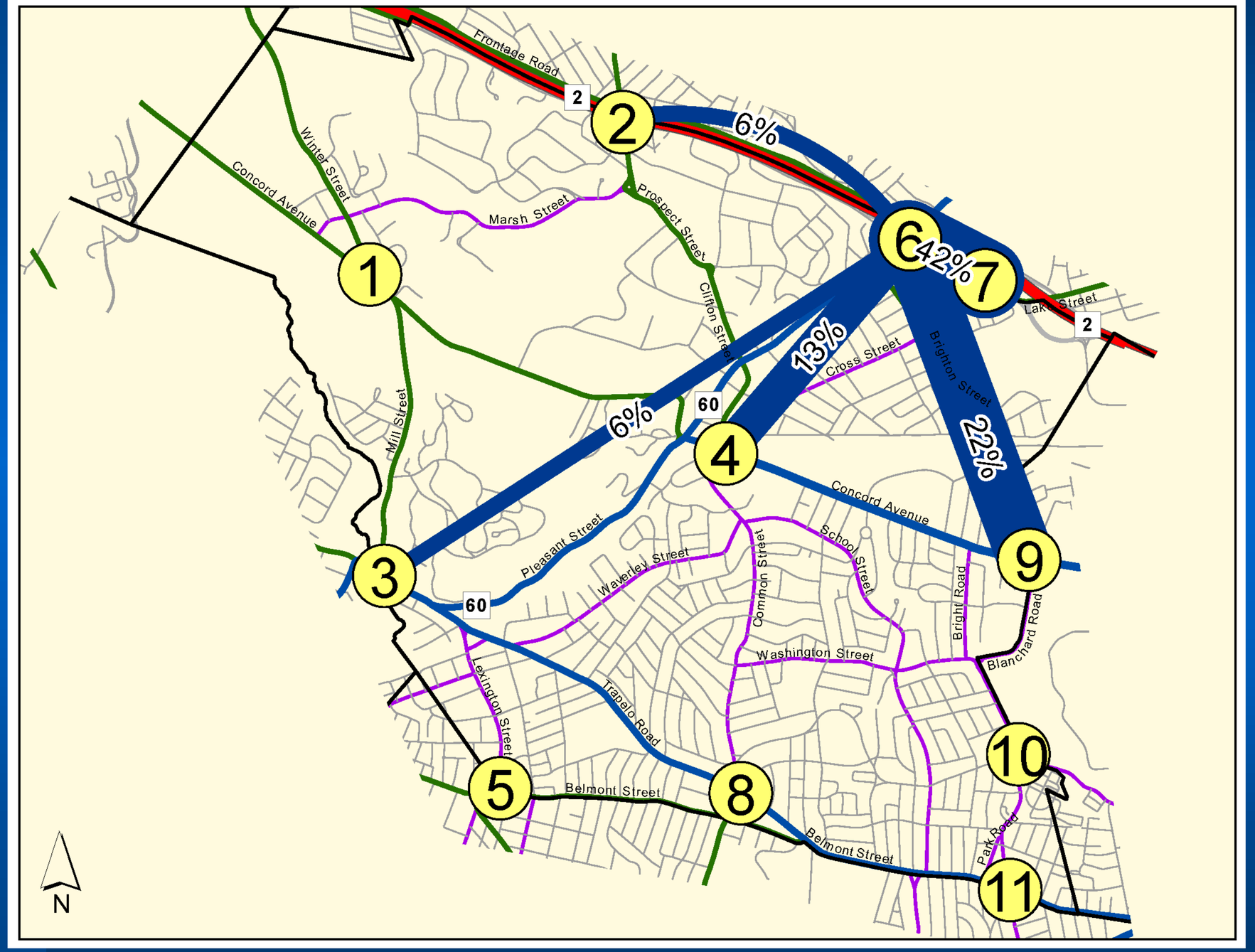
AM Trip Pattern – From Pleasant St



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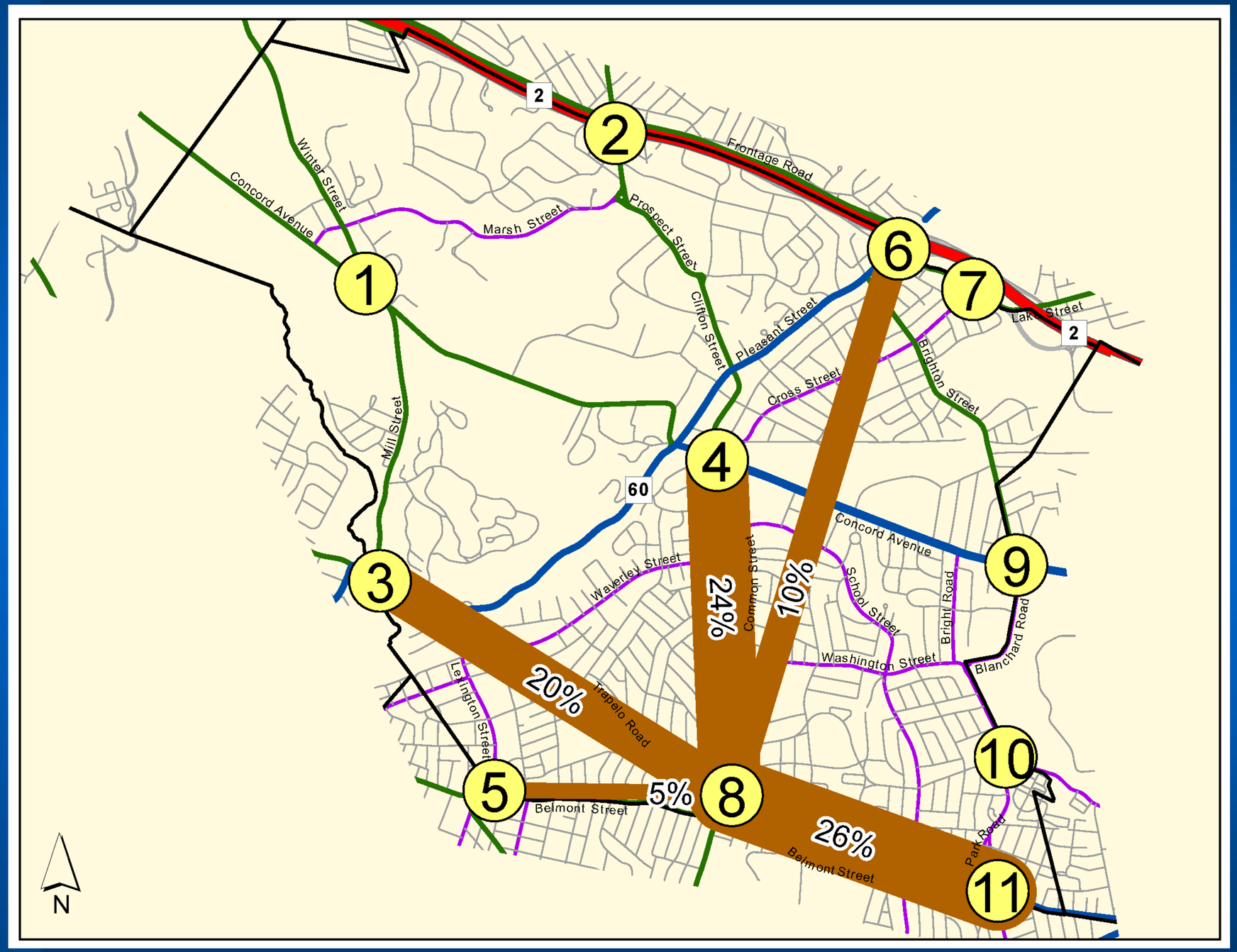
PM Trip Pattern – From Cushing Sq



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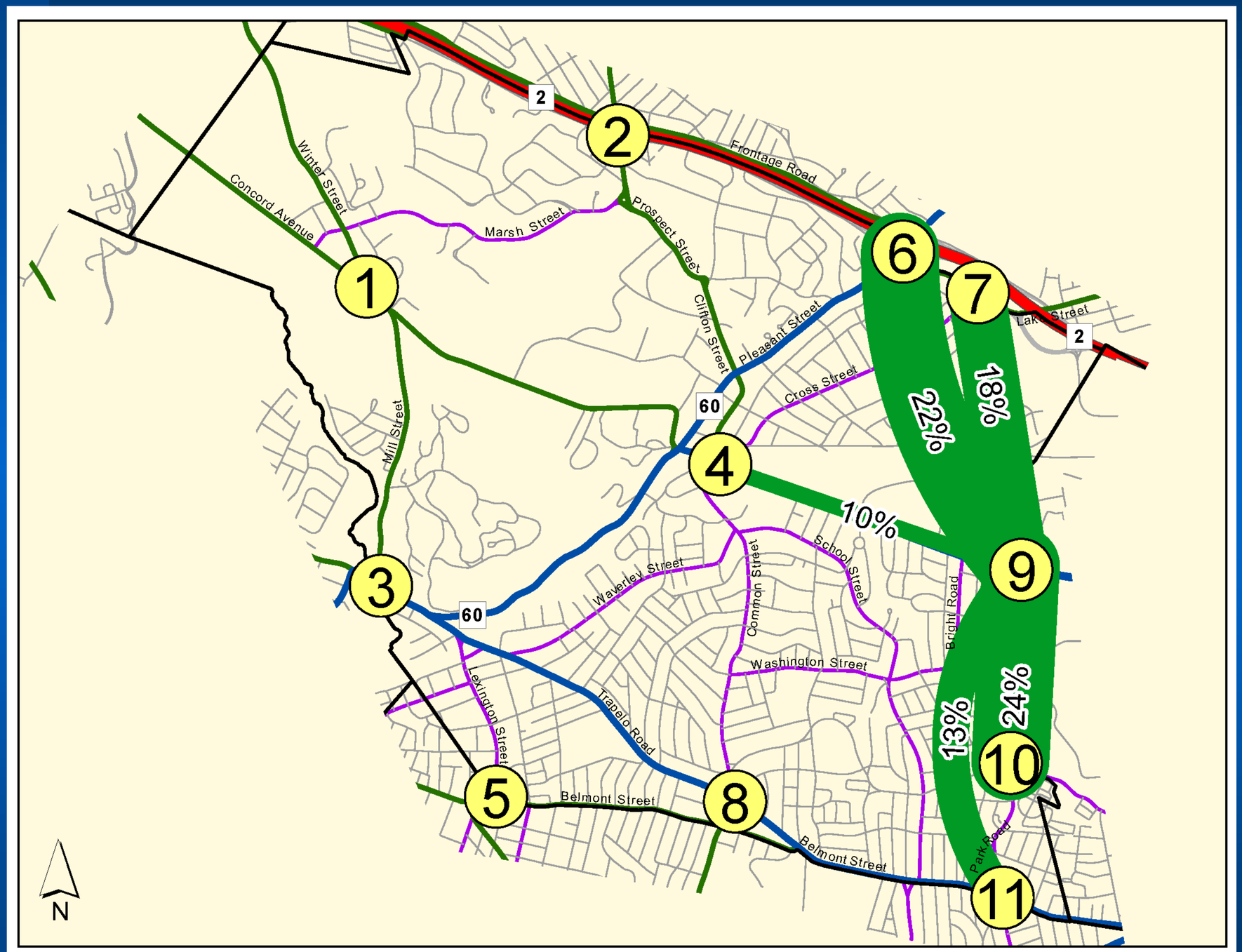
PM Trip Pattern – From Concord/Blanchard



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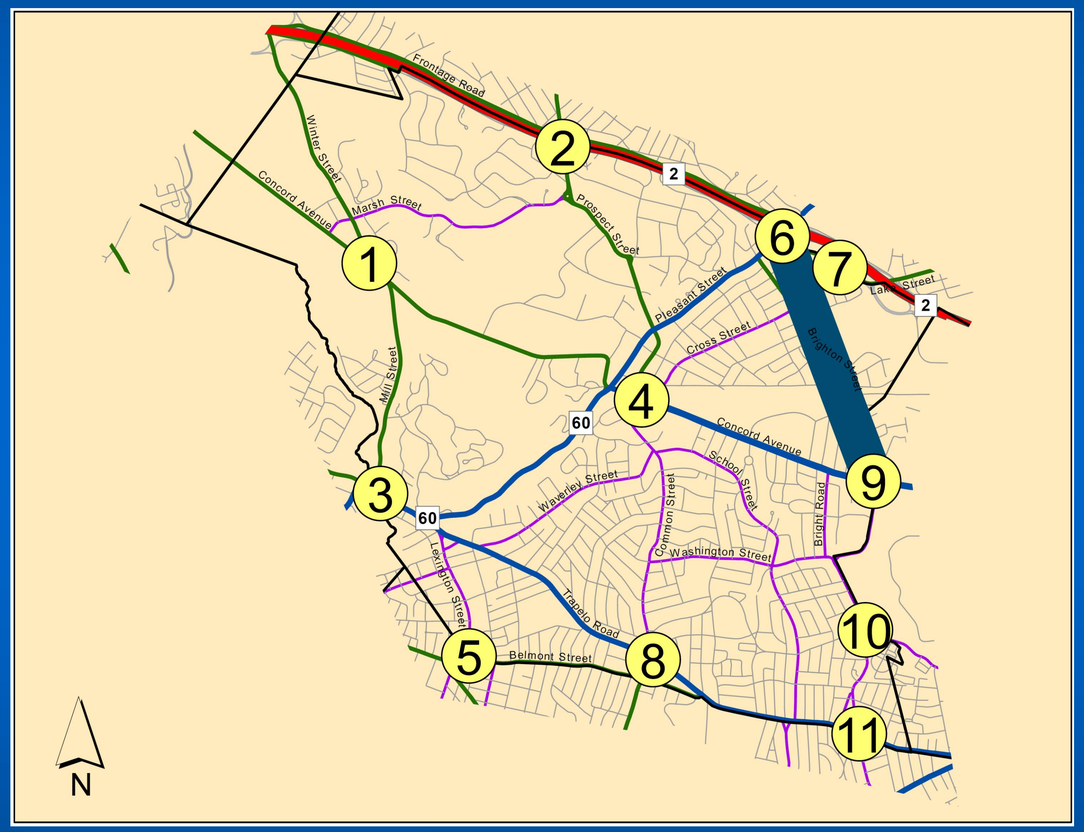
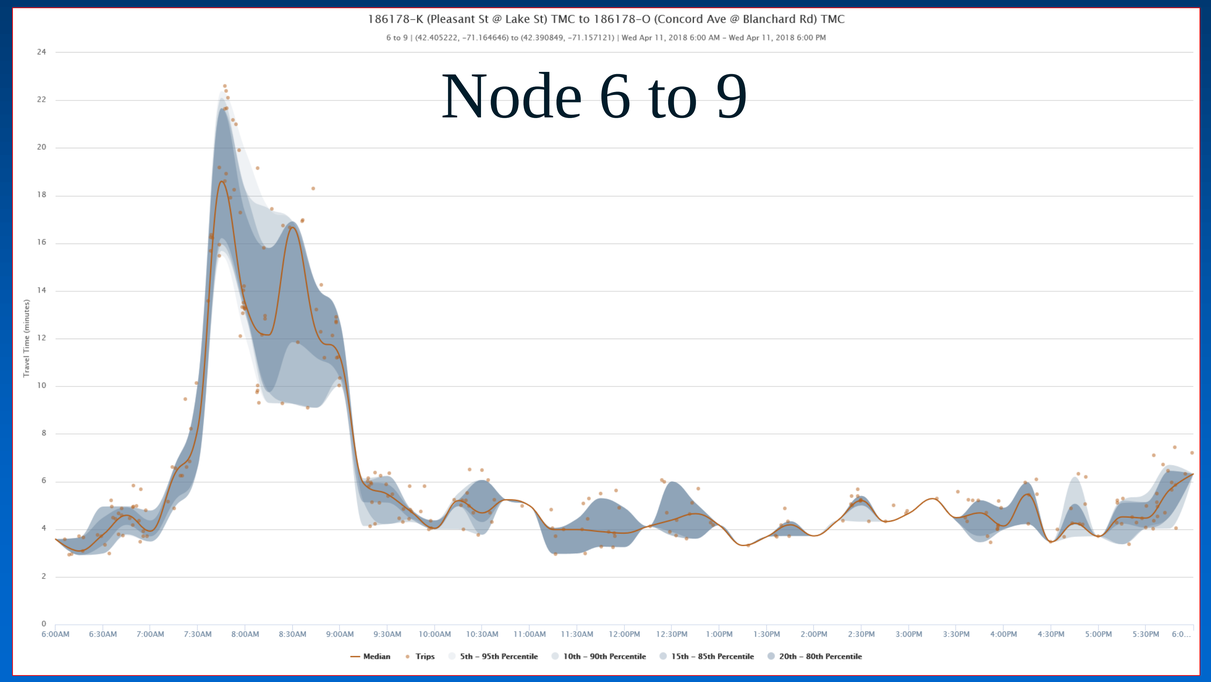
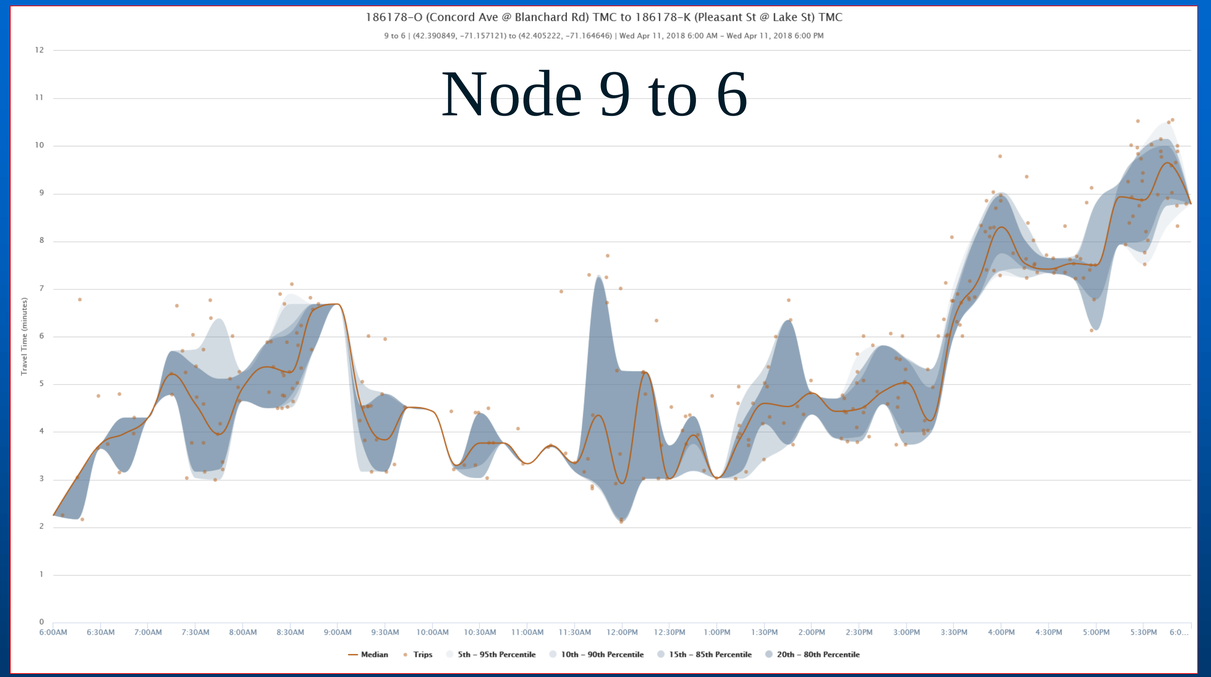
Travel Time Patterns Between

Pleasant/Lake (node 6) to Concord/Blanchard (node 9)







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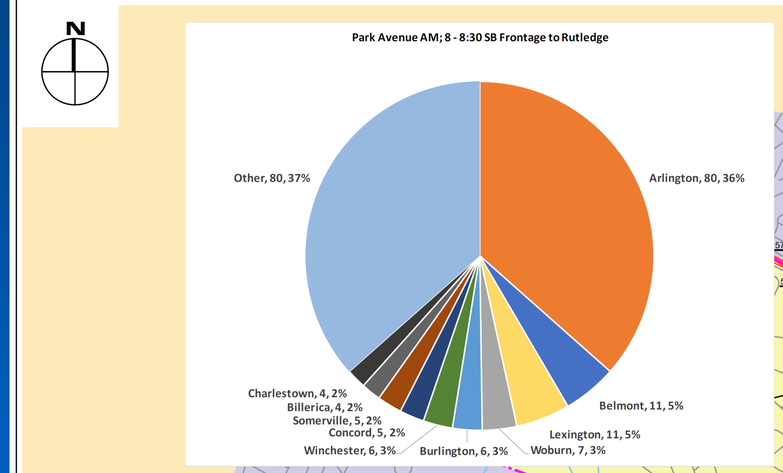
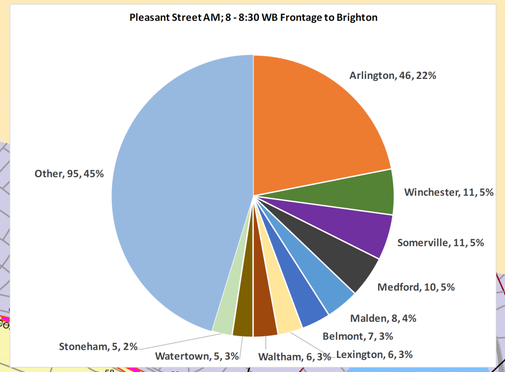
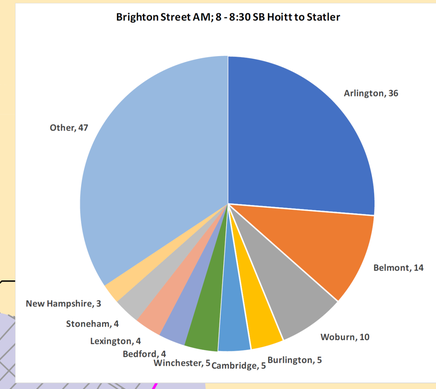
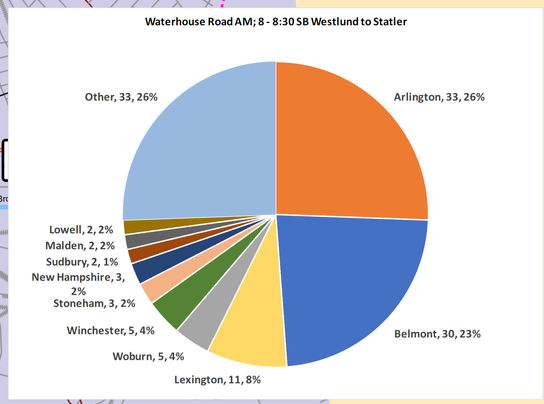
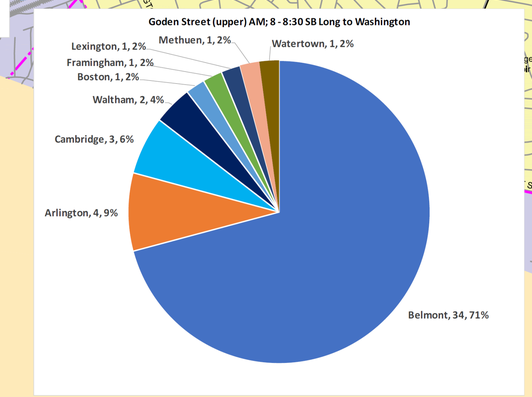
License Plate Survey - AM

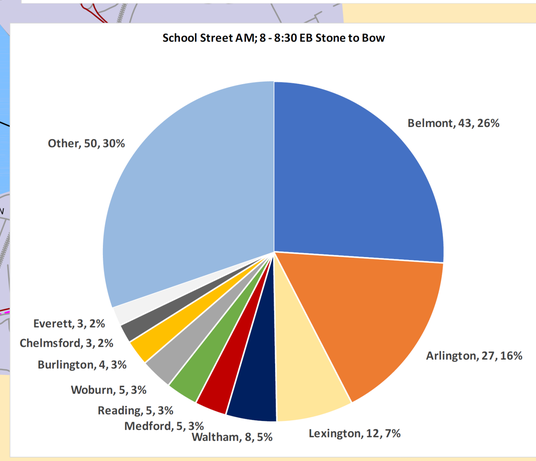


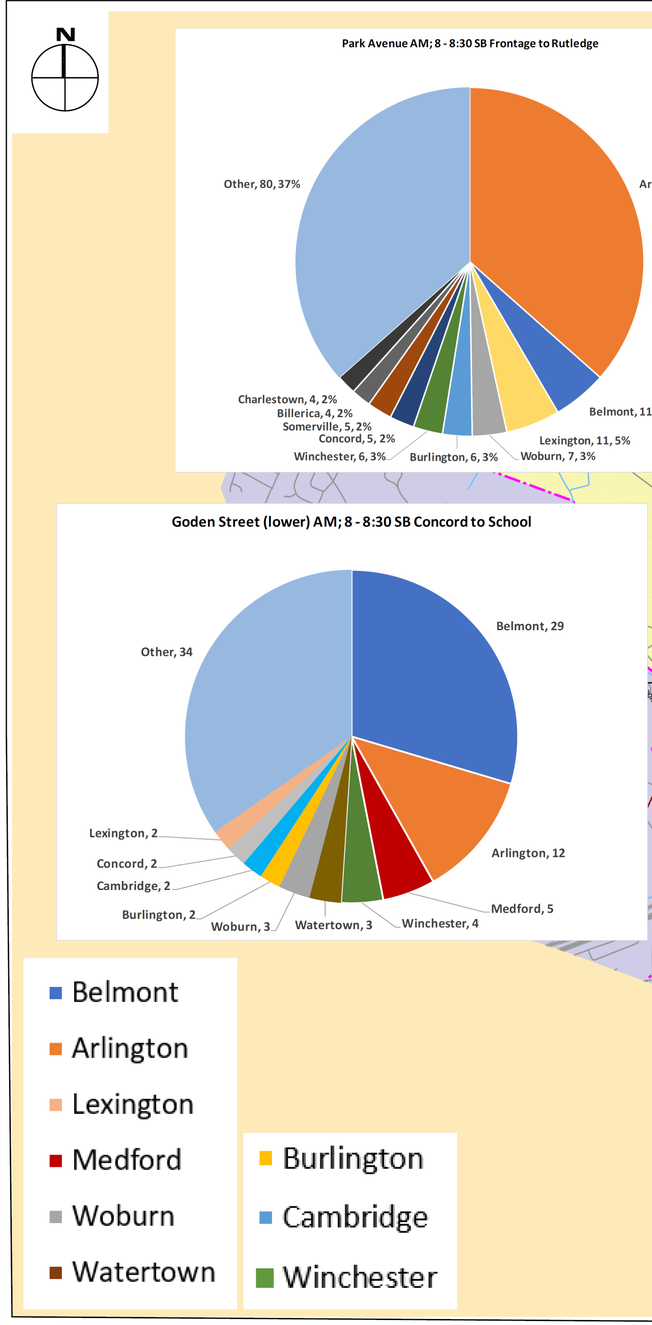












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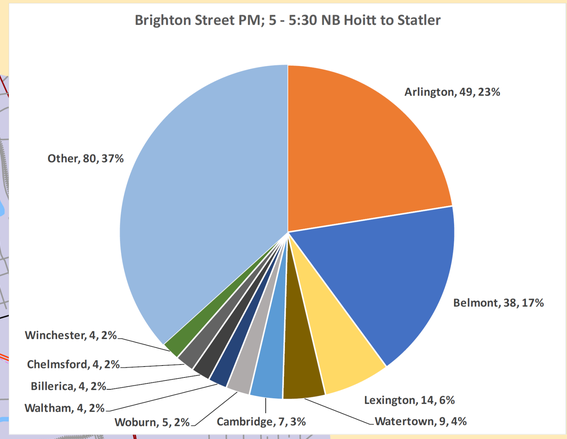
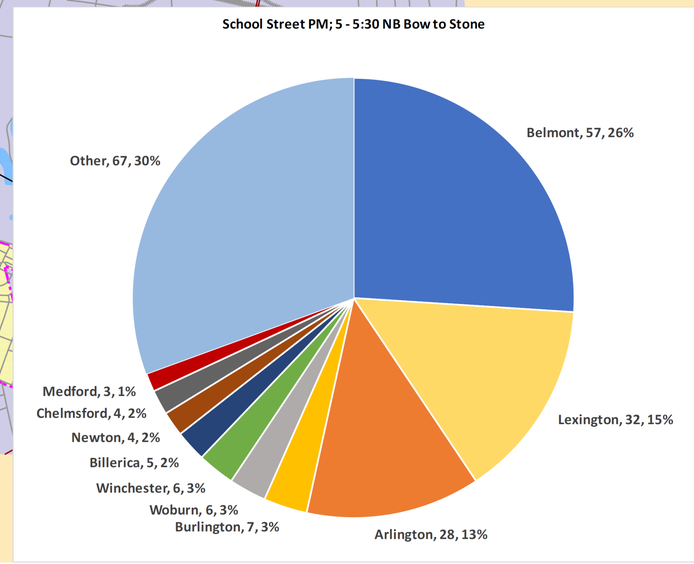
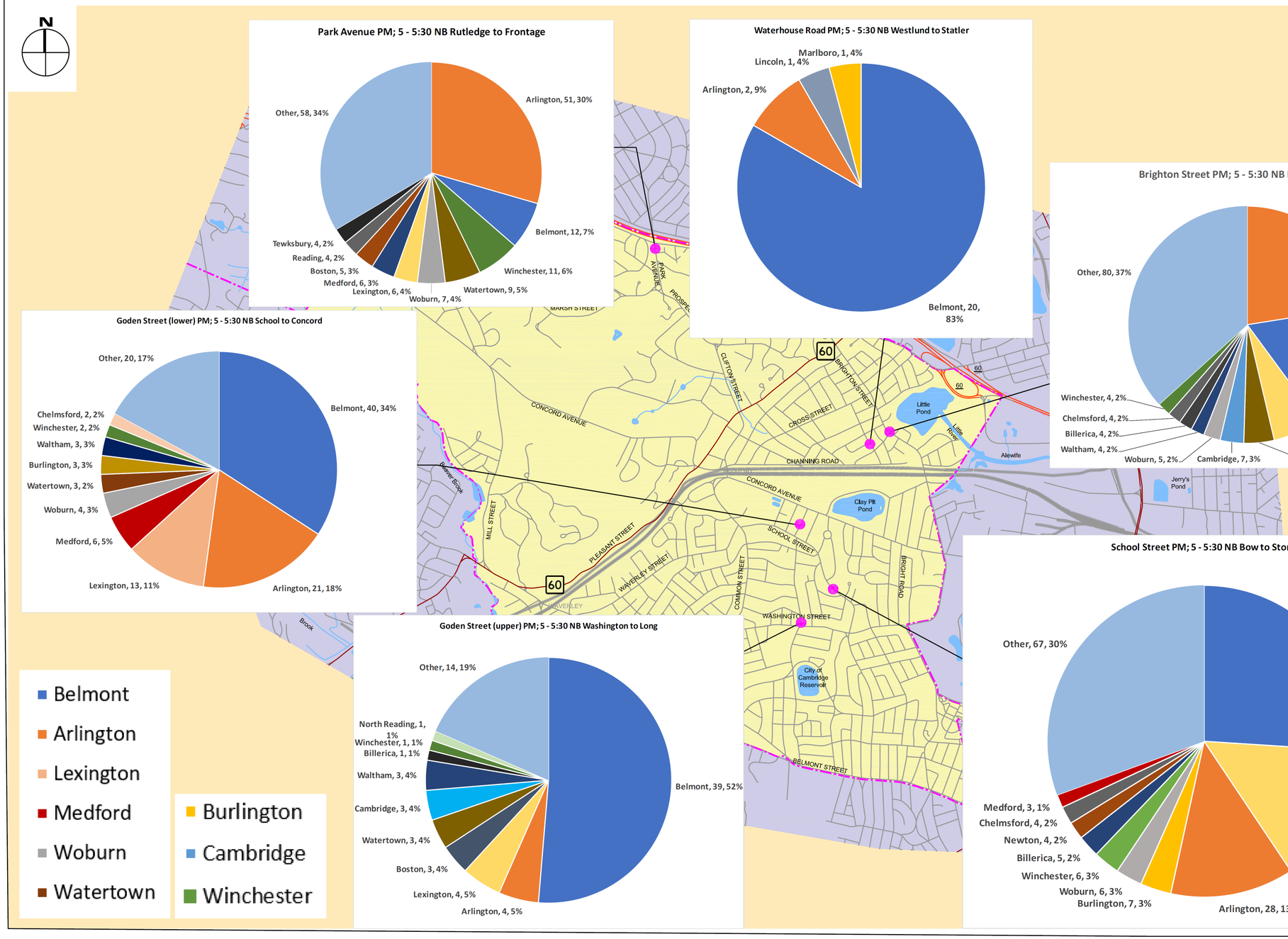
License Plate Survey - PM







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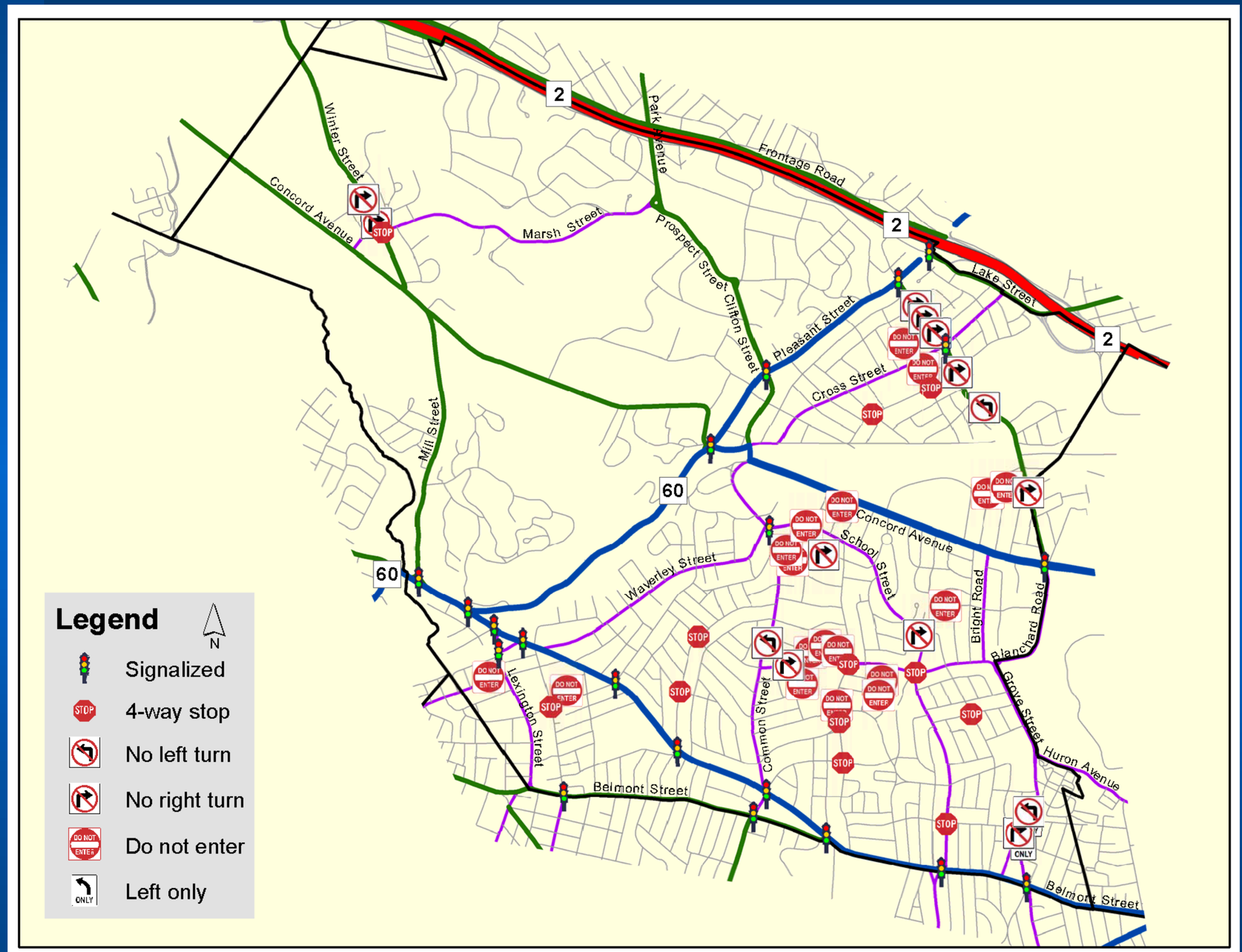
Approximate Cut-Through Traffic Percentages

	Trips ending outside Belmont		
ENTRY POINT	12 hr (6-6)	AM (7-9)	PM (4-6)
Concord @ Winter	25%-41%	29%-41%	19%-37%
Park @ Rt 2	38%-58%	54%-80%	20%-26%
Trapelo @ Mill	79%-89%	85%-94%	83%-93%
Belmont @ Lexington	37%-46%	25%-29%	42%-56%
Pleasant @ Rt 2	66%-82%	57%-83%	71%-81%
Lake @ Cross	44%-52%	35%-39%	51%-74%
Trapelo @ Common	48%-53%	42%-48%	64%-70%
Concord @ Blanchard	64%-71%	66%-72%	74%-83%
Grove @ Huron	30%-50%	25%-46%	35%-50%
Belmont @ Grove	64%-71%	67%-72%	69%-79%

Existing Traffic Restrictions



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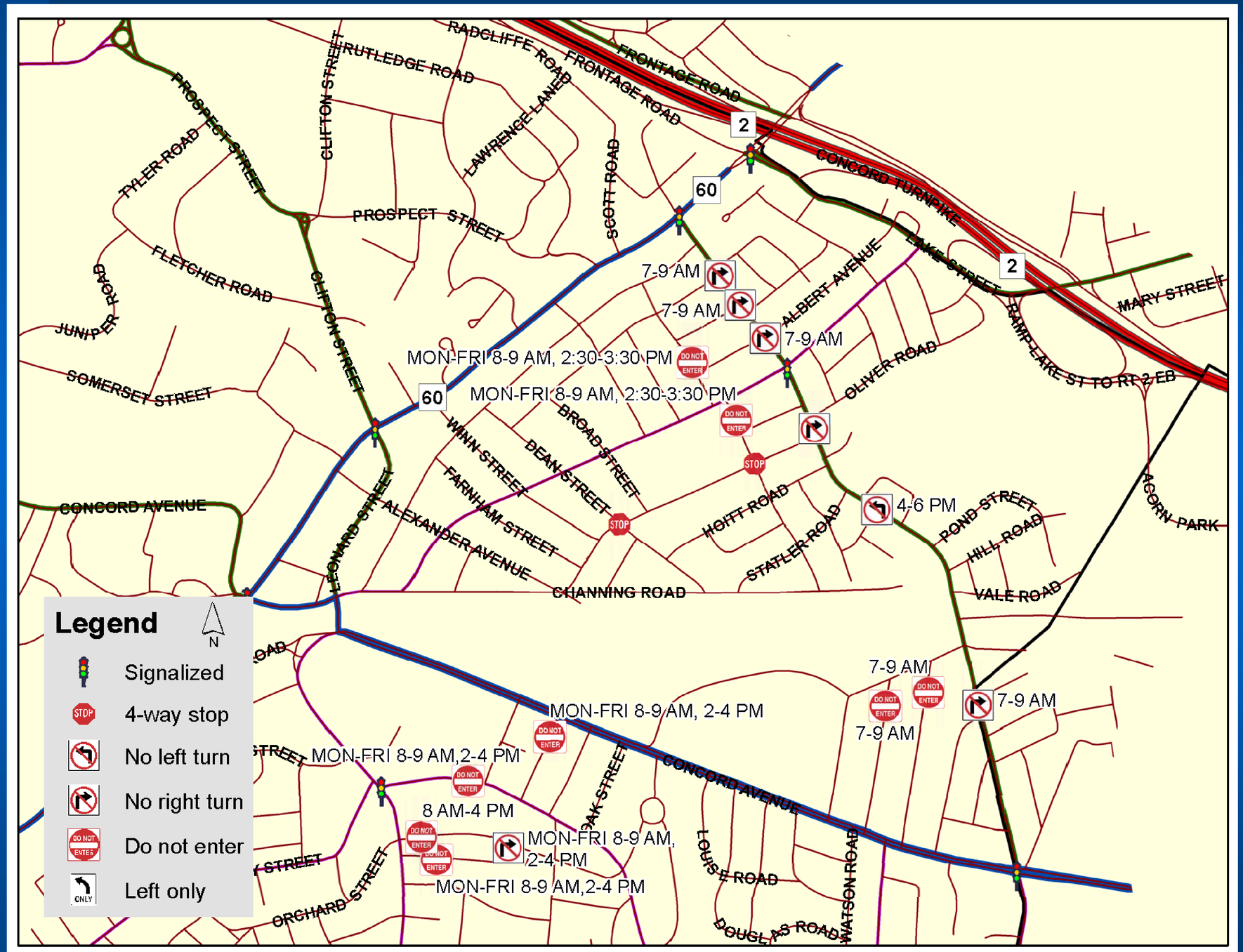

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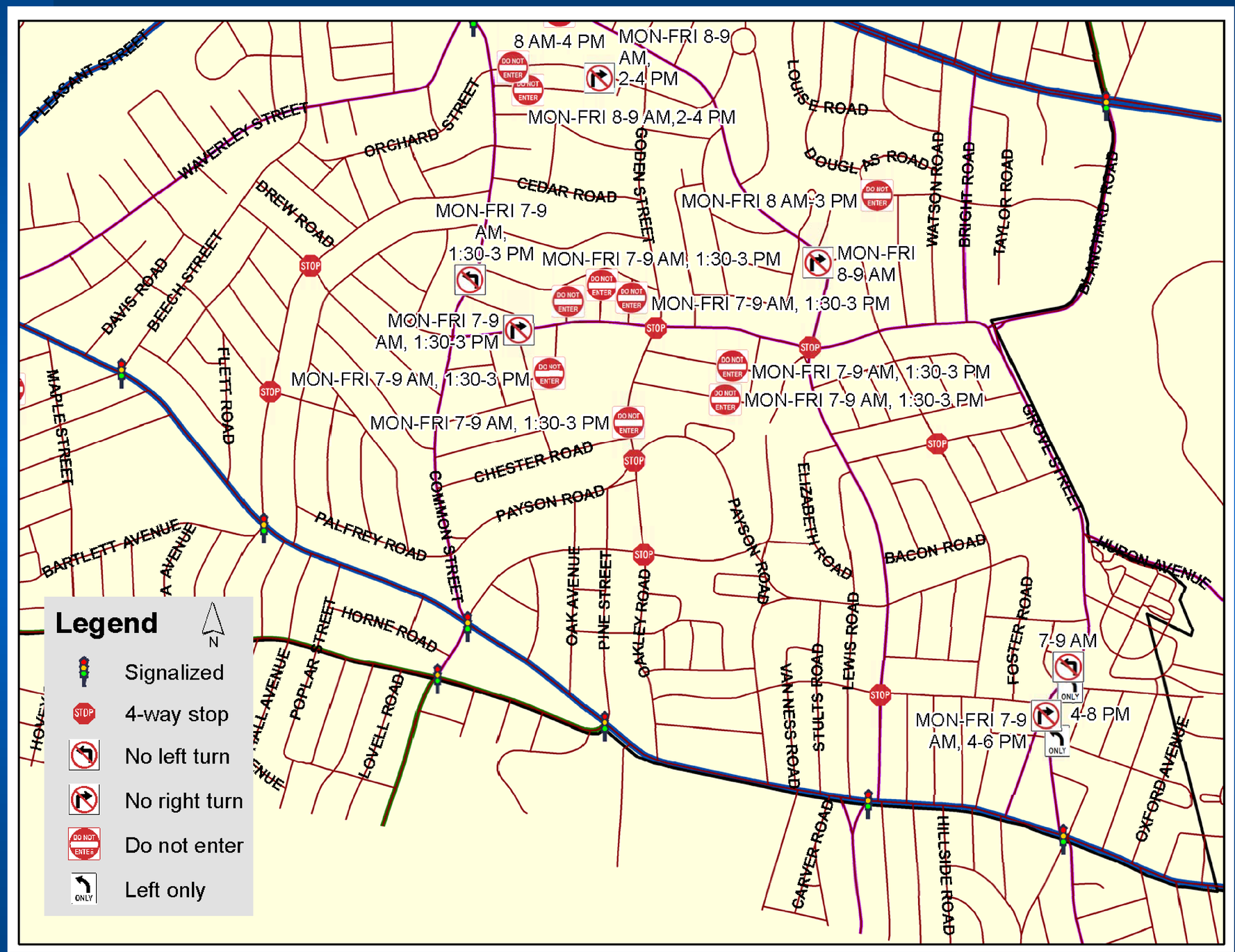
Existing Traffic Restrictions



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Mitigation Strategies

- Safety is the Goal
- Cut-through traffic: Keep vehicles on main roads
- Speeding: Employ self regulating roadway design
- Congestion: Increase capacity at key intersections

Traffic Calming: Volume vs Speed

- *Traffic calming* will mitigate traffic impacts on pedestrians and bicyclists
- *Volume control measures* use barriers to preclude one or more movements along a street or at an intersection (e.g. roadway closures, turn restrictions, circulation changes).
- *Speed control measures* use deflection of vehicle paths to moderate speeds (e.g. speed tables, raised crosswalks, roundabouts, parking treatments).

Examples of Volume Control Measures

Diverters

Median Barriers

One-Way/Circulation Changes

Traffic Circle

Turn Restrictions

Road Closure

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Examples of Speed Control Measures

Speed Hump

Choker

On-Street Parking

Speed Feedback

Chicane

Lateral Shift

Corner Extension

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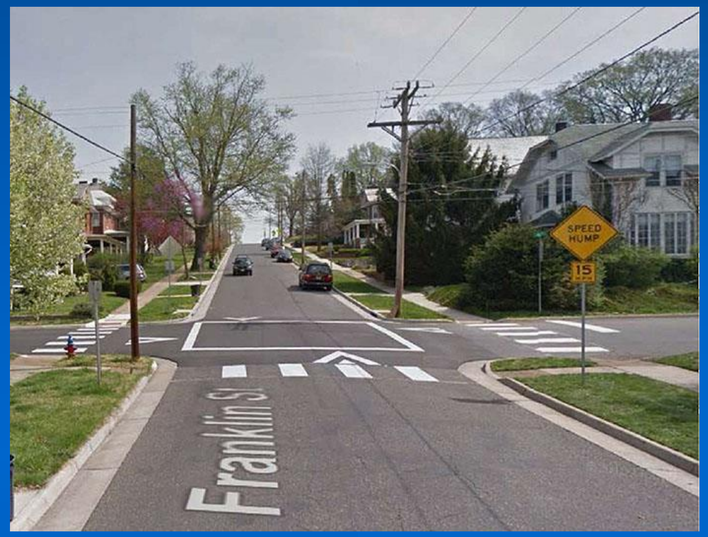
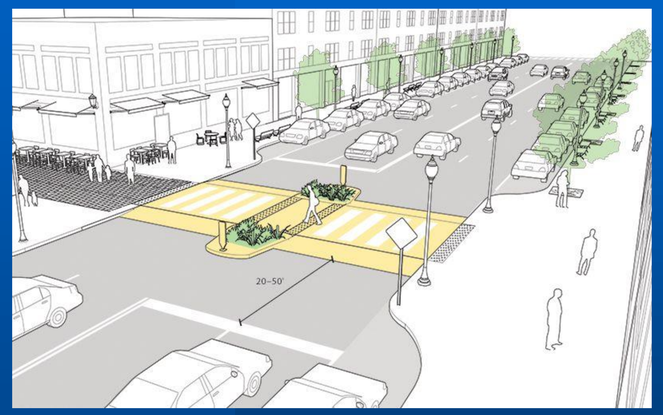
Examples of Pedestrian Safety Measures



Raised Intersection

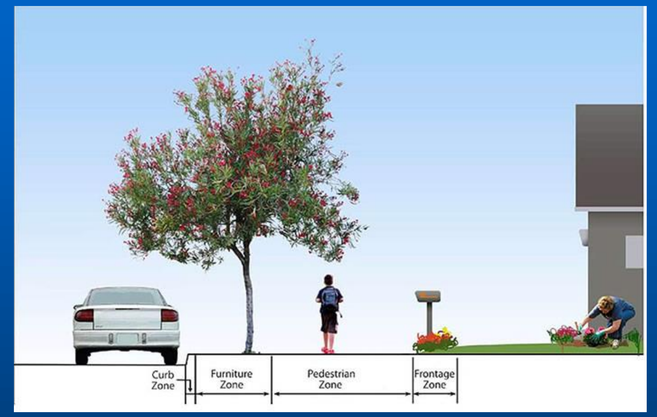
Crossing Island

Rectangular Rapid Flashing Beacon (RRFB)



Raised Crossing

Colored Crosswalks



Curbing and Street Furniture

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Measures Under State Jurisdiction

- Tolling of Non-Resident traffic
  - **Needs state approval**
- Automatic Speed Enforcement
  - **Needs legislation**
- Restricting Access from Neighboring Towns
  - **Restricting access from/to roadways under state jurisdiction or built with Federal funds requires MassDOT permission.**
  - **Neighboring town's approval also required.**

Next Steps

Selectmen appointed Transportation Advisory Committee will be tasked with the following:

- Reviewing the written Draft Report
- Identify acceptable commuter traffic routes through Belmont
- Recommend techniques to keep commuter traffic on the main routes
- Recommend techniques to improve safety for pedestrians and bicycles along main routes
- Evaluate existing traffic controls and recommend upgrades and improvements as required
- Evaluate the feasibility of separating Belmont traffic from commuter traffic

- Questions????

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