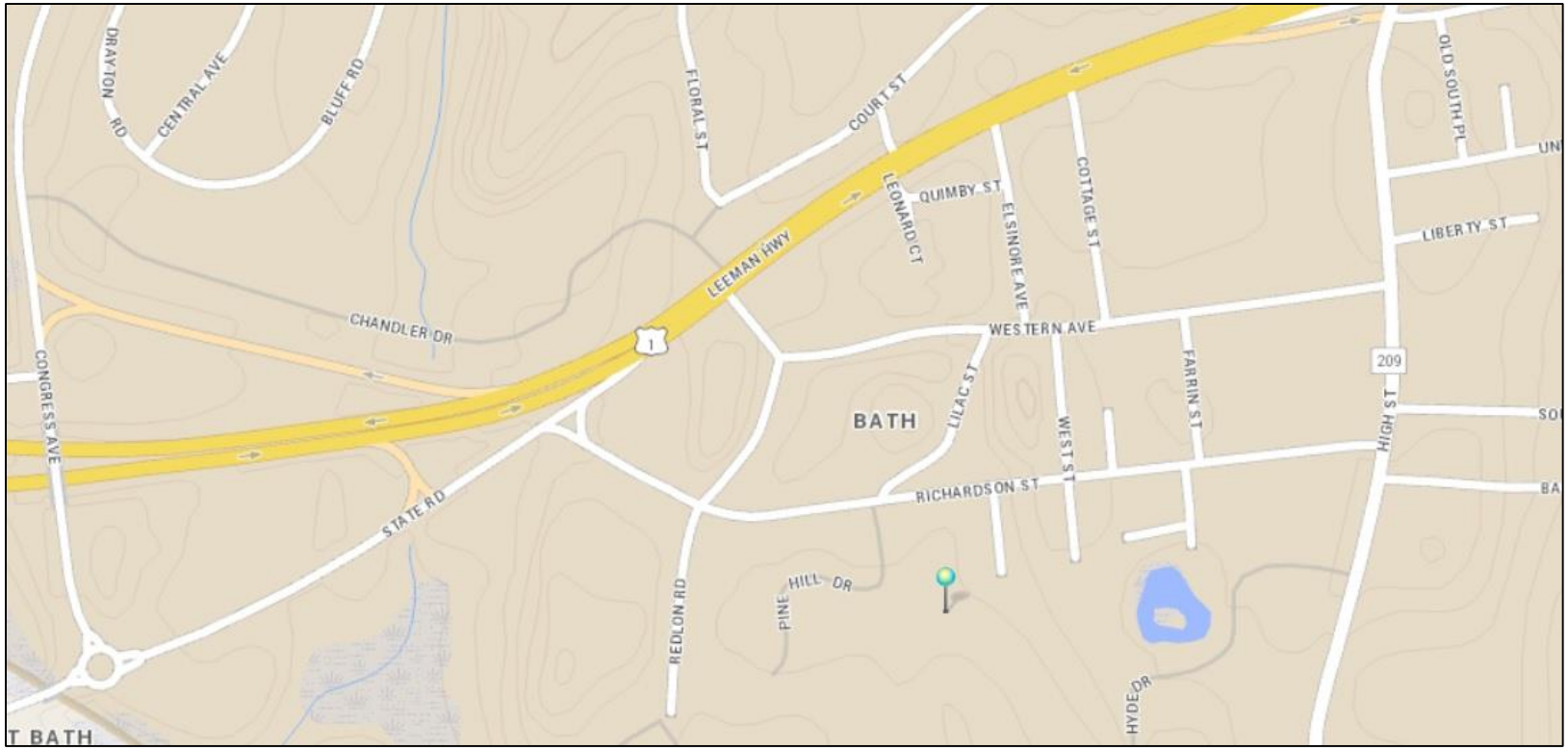
Richardson St & Western Ave
Bath Traffic Calming



Public Meeting #2
March 14, 2018

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Traffic Calming Study

Agenda

- Prior Work
- Research
- Findings and TC Options
- Review Concepts
- Ongoing Activities
- Next Steps
- Feedback and Input

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Traffic Calming – Prior Work

- Resident Complaints about Speeding on Richardson St and Western Ave
- Speed and Volume Studies – 2015 and 2016
- Two Axle Vehicle Limits
- Hiring of Consultant
  - ✓ Assess the Situation
  - ✓ Understand Goals and Outcomes
  - ✓ Make TC Recommendations
  - ✓ Develop Concept Plans

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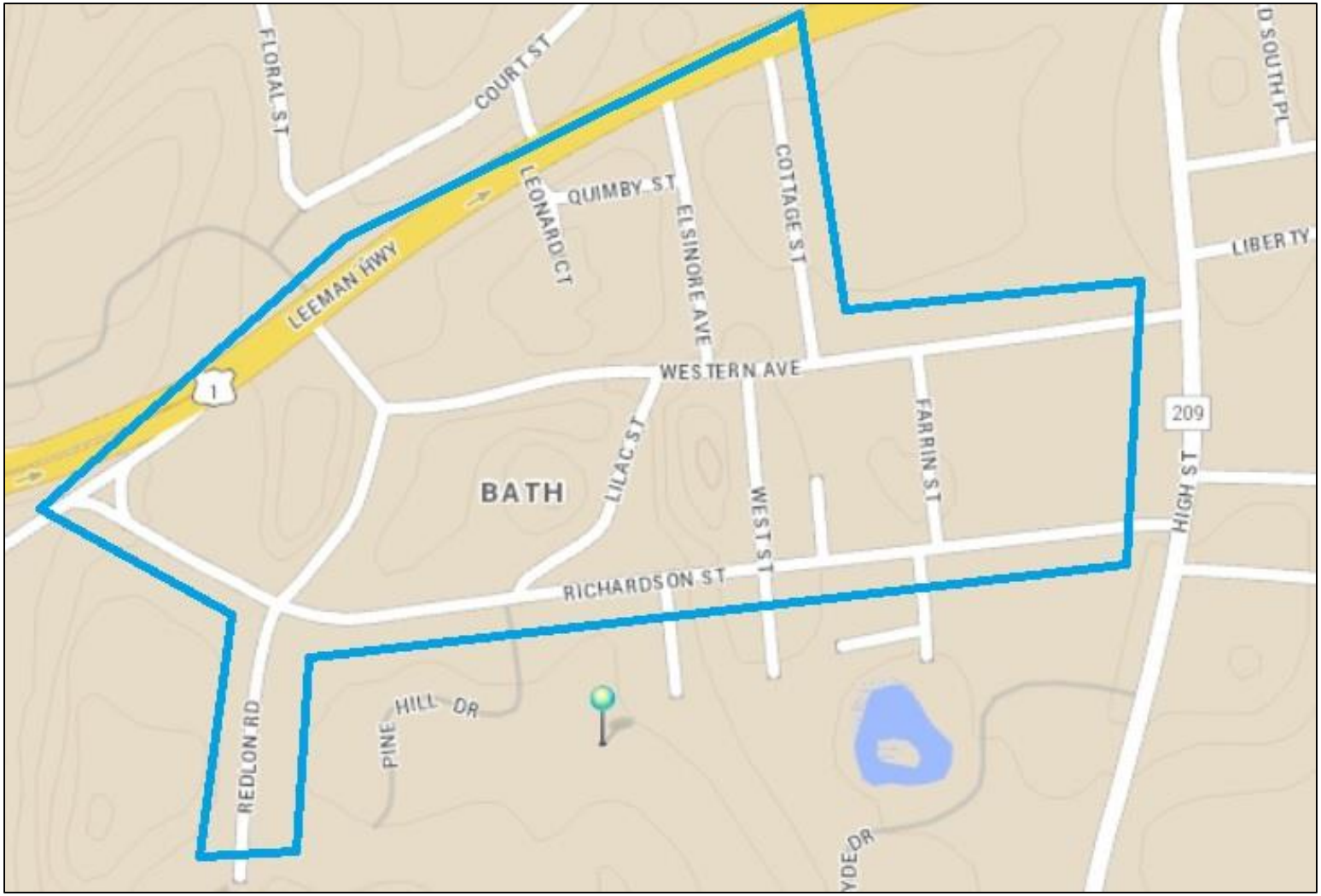
Traffic Calming – Study Limits



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Traffic Calming – Prior Work

- Initial Public Meeting – Dec 13, 2017
  - Why Route 1 signing for Richardson St
  - Both speed and volume a concern
  - Trucks are a concern
  - Consider one way streets & dead ends
  - Emergency responders input
  - BIW issue
  - Safety & pedestrian concern
  - Use Route 1 & 209

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Traffic Calming – Prior Work

- Review of Road Classifications

  Richardson St

  Priority 4 roadway, urban collector, state road

  20 mph, 4700 AADT

  Western Ave

  Priority 6 roadway, local, town road

  20 mph, 1000 AADT

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Traffic Calming – Prior Work

- DOT Coordination
  - ✓ Roadway classification (change from collector to town way)
    - Criteria – Land use, AADT, trip lengths, network configuration, route spacing
    - Functions as a collector
  - ✓ Two axle vehicle limits
  - ✓ Route 1 signs for Richardson

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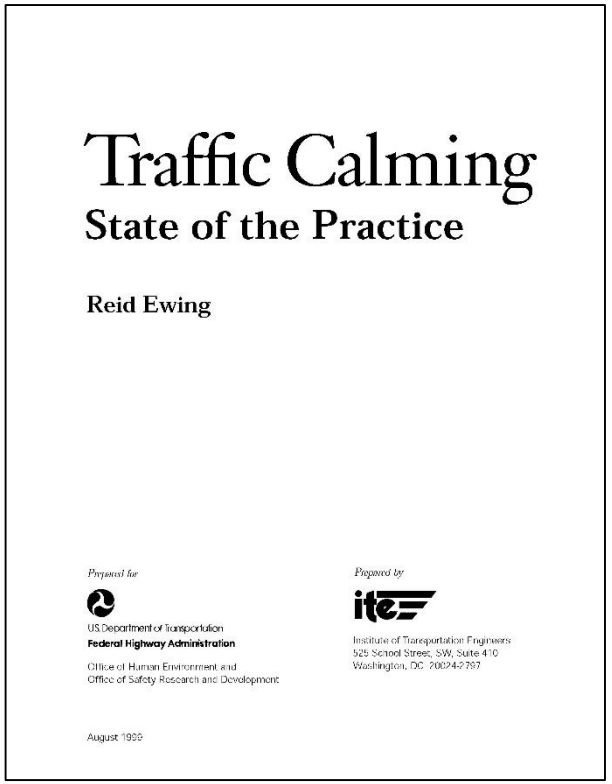
Traffic Calming – Research

- Review of Federal and State TC Documents
  - ✓ Institute of Transportation Engineers (ITE)
  - ✓ Federal Highway Administration (FHWA)


Traffic Calming
State of the Practice

Reid Ewing

Prepared for
U.S. Department of Transportation
Federal Highway Administration
Office of Human Environment and
Office of Safety Research and Development

Prepared by
Institute of Transportation Engineers
525 School Street, SW, Suite 410
Washington, DC 20024-2797

August 1999

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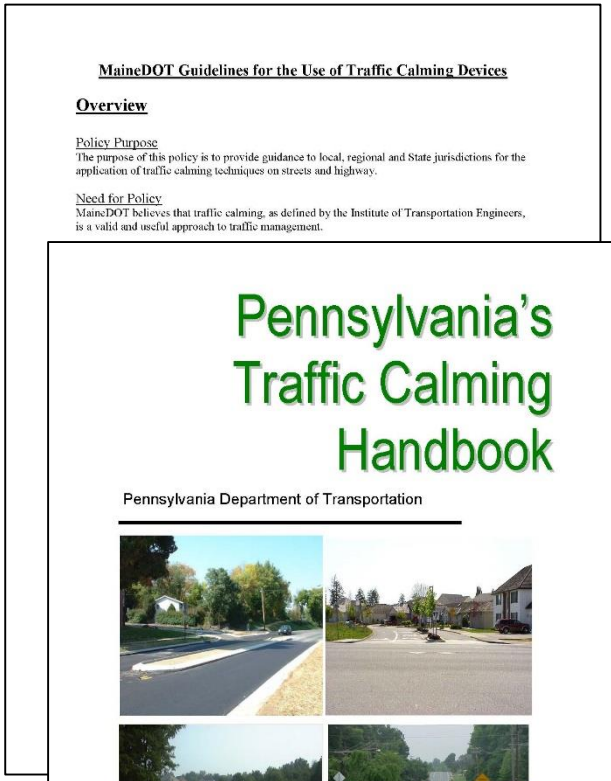
Traffic Calming – Research

- Review of Federal and State TC Documents
  - ✓ Maine Department of Transportation
  - ✓ Delaware Department of Transportation
  - ✓ Pennsylvania Department of Transportation



MaineDOT Guidelines for the Use of Traffic Calming Devices

Overview

Policy Purpose
The purpose of this policy is to provide guidance to local, regional and State jurisdictions for the application of traffic calming techniques on streets and highway.

Need for Policy
MaineDOT believes that traffic calming, as defined by the Institute of Transportation Engineers, is a valid and useful approach to traffic management.

Pennsylvania's Traffic Calming Handbook

Pennsylvania Department of Transportation

Pub 383 (7-12)

pennsylvania
DEPARTMENT OF TRANSPORTATION

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Traffic Calming – Findings/Options

- Traffic Calming Techniques
  - ✓ Lateral Deflection
  - ✓ Vertical Deflection
  - ✓ Physical Obstruction
  - ✓ Signs and Pavement Markings

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TRAFFIC CALMING OPTIONS – RICHARDSON ST & WESTERN AVE, BATH MAINE

Lateral Deflection Techniques

Treatment	MDOT Allowed	Speed Reduction	Volume Reduction	Noise and Pollution	Effect Service Operations	Approximate Cost (PennDOT 2012)	Advantages	Disadvantages	Consider for Bath TC
Curb Extensions/ Bulb-outs	Yes	Yes (Good) 1-2 MPH on Average (Opening Dependent)	No (Slight if any)	No Change	No – Service Vehicles should be able to operate around them, or over them in some cases	$7,000-$10,000 (Pair)	• Good for Ped • Reduce Speeds • Prevent parking near intersections	• Drainage Concerns • Snow Removal	**Yes – possible use as a gateway treatment into the neighborhood**
Chicanes	Yes	Yes (Good) 1-6 MPH in the vicinity of the Chicane 5-13 MPH inside the Chicane	Yes (Good) May reduce volume up to 20%	No Change	Maybe –The larger the intended speed reduction means the harder it will be to maneuver	$6,000 – $15,000	• Reduce Speeds • Reduce Volumes • Aesthetic appeal	• Requires a lot of curbside space • Snow Removal • Hinders Large Trucks	No – possible, however, the large number of driveways makes this a very unlikely option
Traffic Circles - Mini	Yes	Yes (better when used In series) 4-6 MPH inside the vicinity of the circle	Yes (up to 20%)	No Change	Yes –Difficult for trucks and emergency vehicles.	$8,000-$25,000 (Depends on difficulty)	• Reduce Speed • Significantly reduces collisions • Aesthetic appeal	• Potential issues with emergency vehicles and delays • Hinders Large Trucks	**Yes – should be considered, however, costs and space are issues. Viable on Western Ave.**
On-Street Parking	Yes	Yes (Better with narrow roads and full parking access)	No (Slight if any)	No Change	No – Service vehicles should be able to operate around them.	Low cost alternative	• May reduce Speeds • Provides buffer between traffic and pedestrians	• Increased risk of minor accidents • Large amounts of driveways can affect its use	Yes (possible but unlikely due to large numbers of driveways)– low cost alternative
Choker	Yes	Yes (Good) Depending on width opening	No (Slight if any)	No Change	No – Service vehicles should be able to operate around them.	$4,000 - $10,000 (Dependent on length)	• Reduce Speed • Minimal impact to emergency response times	• Drainage Concerns • Snow removal • Concern with driveways	**Yes – a definite candidate for this project**
Median Island	Yes	Yes (Good) Depending on width opening	No (Slight if any)	No Change	No – Service vehicles should be able to operate around them.	$5,000 - $15,000 (Dependent on length)	• Reduce Speed • Minimal impact to emergency response times • Ped refuge	• Concern with driveways • Removes parking	**Yes – a definite candidate for this project**
Angle Point	Not Specified	Yes (Good) Cars need take turns using the road	Yes (Moderate)	Increase (Slight)	No – Service vehicles should be able to operate around them.	$5,000-$15,000	• Effective for both speed and volume reduction • Enhance neighborhood feel	• Snow removal • Concern with driveways	Yes – a definite candidate for this project

Vertical Deflection Techniques

Treatment	MDOT Allowed	Speed Reduction	Volume Reduction	Noise and Pollution	Effect Service Operations	Approximate Cost (PennDOT 2012)	Advantages	Disadvantages	Consider for Bath TC
Speed Humps	Yes	Yes (Very Good) 15 mph to 20 mph over hump	Yes (Good) May reduce volume up to 18%	Increase (Moderate)	Yes – Emergency vehicles are delayed on average 10 sec per speed hump, varies depending on vehicle type	$1,500 to $3,500	• Effective for both speed and volume reduction • Relatively inexpensive	• Avoided on transit routes • Emergency vehicle coordination required	**Yes – a definite candidate for this project**
Speed Tables (Raised Crosswalk)	Yes	Yes (Very Good) Slightly less effective than speed humps	Yes (Good) May reduce volume up to 12%	Increase (Moderate)	Yes – Emergency vehicles are delayed on average 6 sec per speed hump, varies depending on vehicle type	$2,000 to $10,000	• Effective for both speed and volume reduction • Improves pedestrian visibility	• Emergency vehicle coordination required • Drainage concerns	Yes – this option should be considered in high pedestrian areas on the project
Speed Cushion (Speed Pillow)	Yes	Yes (Very Good) 15% Speed Reduction	Yes (Good) May reduce volume up to 30%	Increase (Moderate)	No – Speed cushions are designed to allow emergency and transit vehicles to straddle the "hump"	Slightly more than a speed hump	• Effective for both speed and volume reduction • Minimal impact to emergency response times • Relatively inexpensive	• Snow removal • Harder to construct then a speed hump	Yes – a definite candidate for this project
Raised Intersections	Yes	Yes (Minor) Gentle approach slopes do not create a speed hump effect	No (Slight if any)	Increase (Slight)	Yes – Minor delays are expected	$15,000 to $60,000	• Can create speed and volume reduction if used in unison with other treatments such as bulb-outs • Reduce Pedestrian vehicle conflicts	• Expensive to construct and maintain • Drainage concerns	No – the cost outweighs the benefits for this specific neighborhood

Physical Obstruction Techniques

Treatment	MDOT Allowed	Speed Reduction	Volume Reduction	Noise and Pollution	Effect Service Operations	Approximate Cost (PennDOT 2012)	Advantages	Disadvantages	Consider for Bath TC
Semi Diverters	Not Specified	Yes (Minor if at all)	Yes (Very Good) May reduce volume up to 60%, generally closer to 40%	Decrease (Moderate)	No – Semi Diverters can permit emergency vehicles to go around them in the wrong direction to avoid having to make additional movements	$3,000 to $20,000 $1,000 (Trail/Temporary measures)	• Reduce cut through Traffic • Requires longer route to destination	• Could be violated on low volume streets • Resident access will be reduced	**Yes – A definite candidate for this project**
Diagonal Diverter (Truncated Diagonal Diverter)	Not Specified	Yes (Minor) Could lower speeds in the vicinity of the diverter	Yes (Very Good) 35% reductions could be expected	Decrease (Moderate)	Yes – Diagonal diverters force vehicles to make turns that would normally not existing and may alter the emergency routes.	$7,500 to $20,000	• Reduce cut through Traffic • May reduce speeds • Less impact then street closure	• Drainage concerns • Resident access will be reduced • Potential issues with emergency vehicles	Yes – May be limited due to tight ROW and narrow roads. Viable on Western Ave.
Right in/Right out Islands	Not Specified	No reduction is anticipated	Yes (Moderate) May reduce volume between 20% - 30%	Decrease (Slight)	No – Island can be built using mountable curb to allow access vehicles to turn as needed	$3,500 to $7,500	• Reduce cut through Traffic • Increase pedestrian safety by reducing crossing length	• Resident access will be reduced • Requires additional roadway with at intersections	Yes – May be limited due to tight ROW and narrow roads. Viable on Western Ave.
Raised Median through Intersection	Not Specified	No reduction is anticipated	Yes (Very Good) May reduce traffic up to 70%	Decrease (Moderate)	Yes – Given access restrictions, this measure should not be used on primary response routes	$1,500 to $20,000 (Depending on length of island)	• Reduced traffic volumes • Improve intersection safety by removing conflicting movements	• Driveway/ resident impacts • Effect emergency vehicle response times • Requires a wider roadway footprint to implement	**Yes – A definite candidate for this project Viable on Western Ave.**
Street Closure	Not Specified	Yes (Good) Especially if dead end street segments are less than 400'	Yes (Very Good) May reduce Traffic up to 80%	Decrease (Large)	Yes – Given access restrictions, this measure should not be used on primary response routes	$1,500 to $20,000 (Depending on the extent of the closure)	• Eliminate cut through traffic • Enhance neighborhood feel • May reduce speeds	• Resident access will be reduced • Obstruct emergency vehicle access • May require cul-de-sac end treatment	Yes – A definite candidate for this project on side roads.

Signs and Pavement Marking Techniques

Treatment	MDOT Allowed	Speed Reduction*	Volume Reduction*	Noise and Pollution	Effect Service Operations	Approximate Cost (PennDOT 2012)	Advantages	Disadvantages	Consider for Bath TC
Striping Changes (See note 5 and 6)	Yes	Dependent on use	Dependent on use	No Change	No – Service vehicles should be able to operate around them.	Low cost alternative	• Low cost option • Quick installation	• Not a standalone solution • Problems in Winter seeing striping	Yes – used in sequence with other techniques
Signage (Traffic-Calmed Neighborhood)	Yes*	Dependent on use	Dependent on use	No Change – Possible Increase All way Stop (Moderate)	Yes – Dependent on the signs	Low cost alternative	• Low cost option • Quick installation	• Can increase noise if not done alongside other treatments	Yes – used in sequence with other techniques
Temporary Traffic Calming	Yes	Dependent on use	Dependent on use	Dependent on Use	Yes – Depending on the temporary measure that are used	Low cost option (Temporary)	• Allows the city to try out different methods	• Not a permanent solution • Not effective during winter months	Yes – a good option

*MUTCD states that using stop signs is not an accepted form of traffic calming

Notes

1. Information developed from traffic calming guidelines published by ITE, FHWA, MaineDOT, Delaware DOT and PennDOT.
2. FHWA acknowledges that there is a lack of proven design standards regarding traffic calming.
3. Placement of all traffic calming features need to be coordinated with utilities and driveways in the area.
4. Drainage will need to remain at the forefront of the design process.
5. There is currently a Transit Route running down Richardson Street. (Small Bus).
6. Richardson Street is roughly 24' wide.
7. Western Avenue is roughly 30' wide.

Traffic Calming – Concepts

- Traffic Calming Features
  - ✓ Speed Humps or Speed Tables
  - ✓ Gateway Chokers
  - ✓ Semi-Diverters (partial closures)
  - ✓ Mini Circles
  - ✓ Raised Medians

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ROUTE 1
LEEMAN HIGHWAY
FLORAL ST.
SHOPPING CENTER DR.
LEEMAN HIGHWAY
STATE RD.
RICHARDSON ST.
REDLON RD.
CONNECTOR RD.
WESTERN AVE EXD
LEONARD CT
QUIMBY ST.
ELSINORE AVE.
COTTAGE ST.
WESTERN AVE.
LILAC ST.
PINE HILL DR.
EVERGREEN ST.
WEST ST.
PLUM LN.
FARRIN STREET
RICHARDSON ST.
CATO AVE.
MATTY WAY
HIGH ST.
UNION ST
LIBERTY ST
SOUTH
BATH ST
LEGEND
- STOP SIGN
- SPEED HUMP OR TABLE
- GATEWAY CHOKER
- SEMI DIVERTER
- MINI CIRCLE
- MEDIAN
- ALL-WAY STOP
PLAN
100 0 100 200
Scale of Feet
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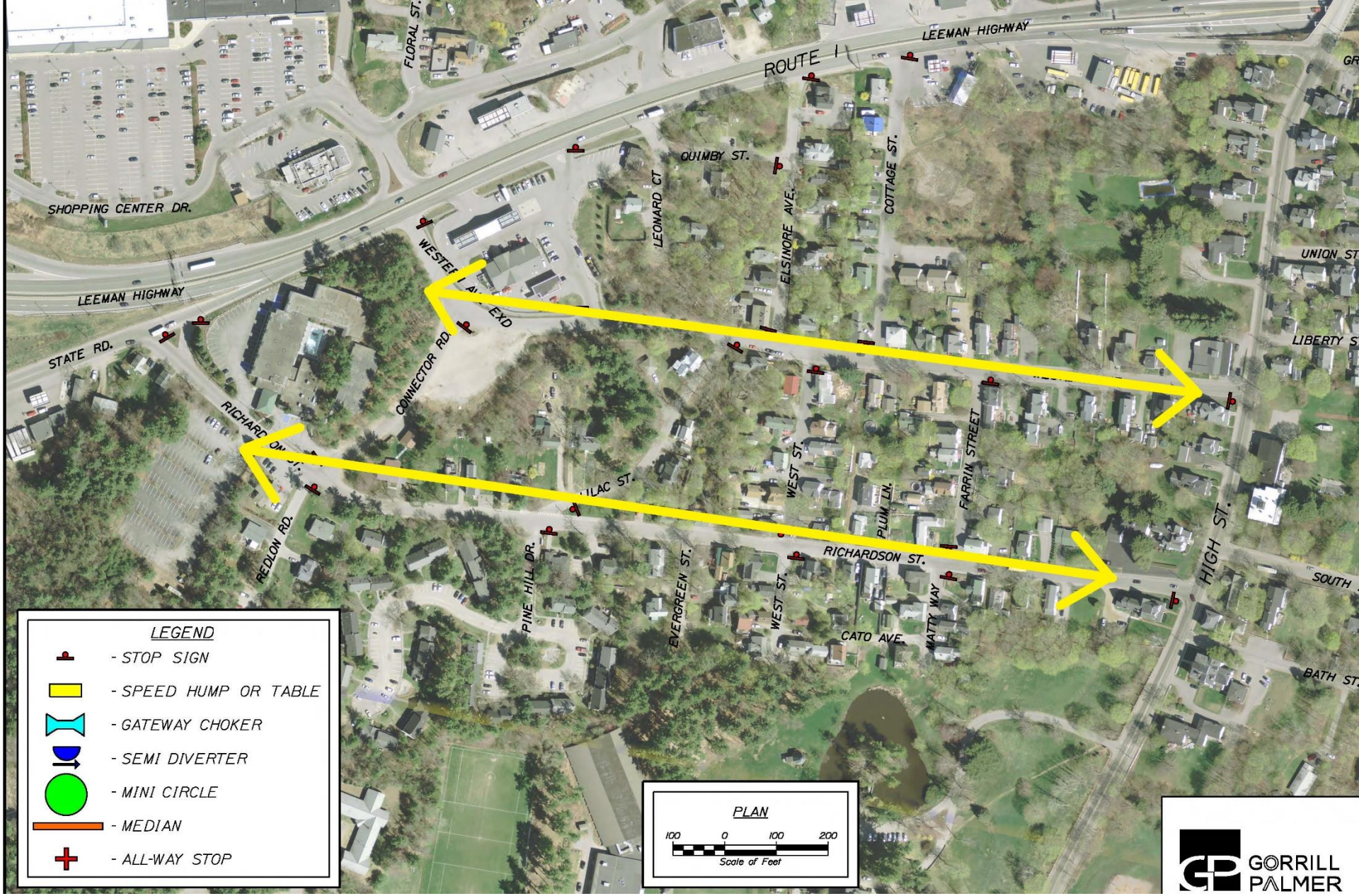
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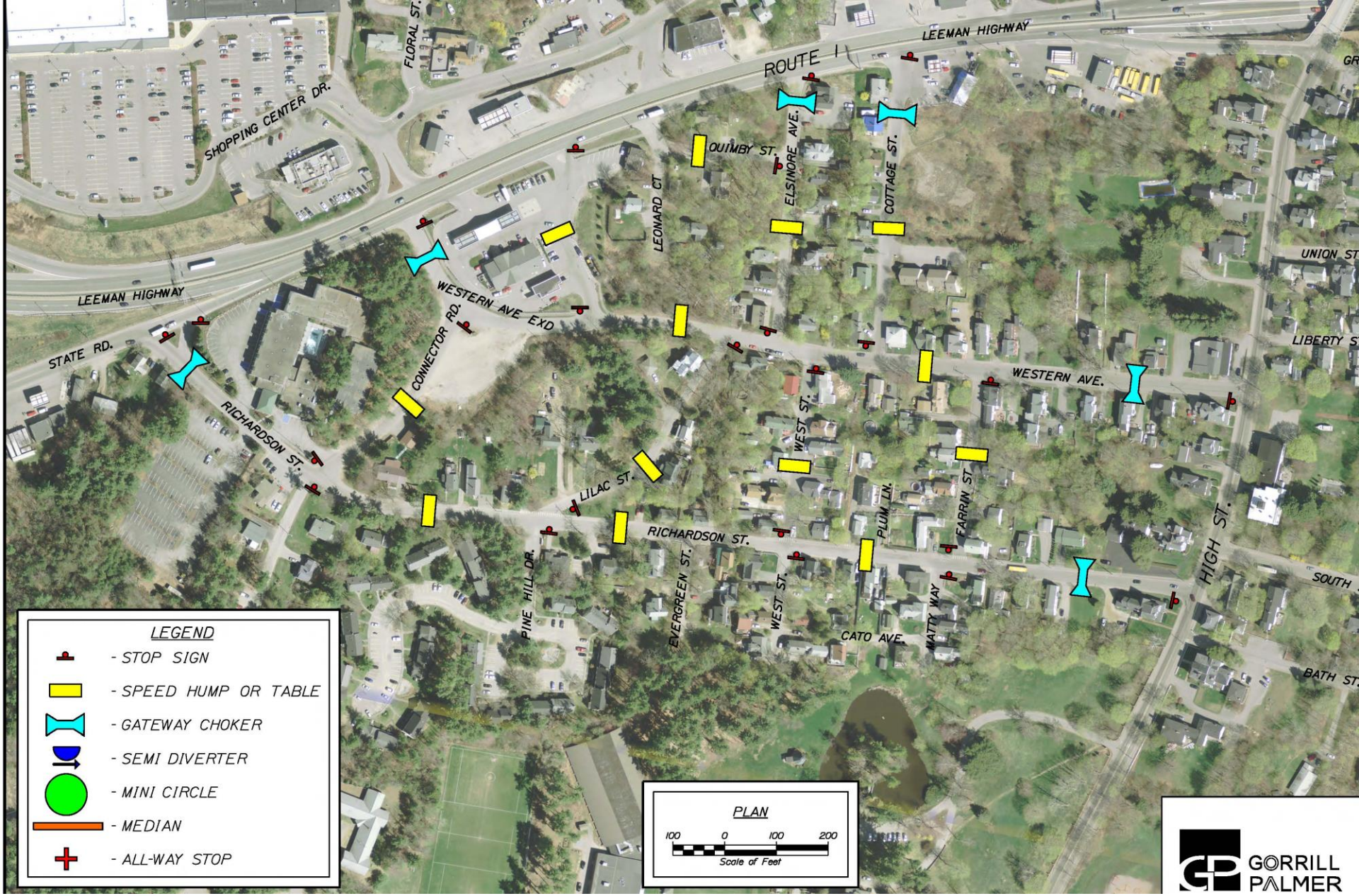

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Traffic Calming – Concepts

- Speed Humps
- Speed Tables

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Traffic Calming – Concepts

- Gateway Chokers

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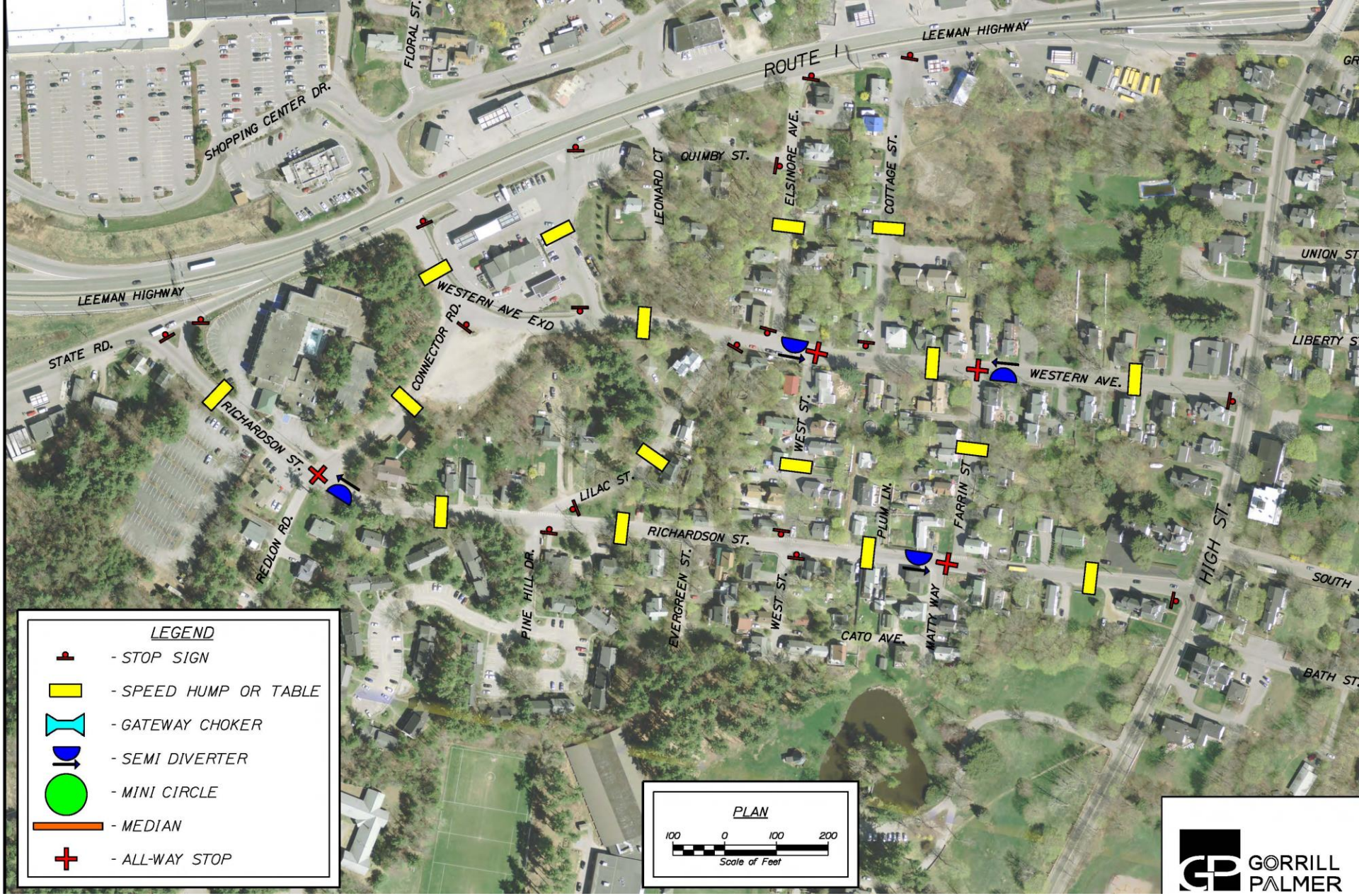

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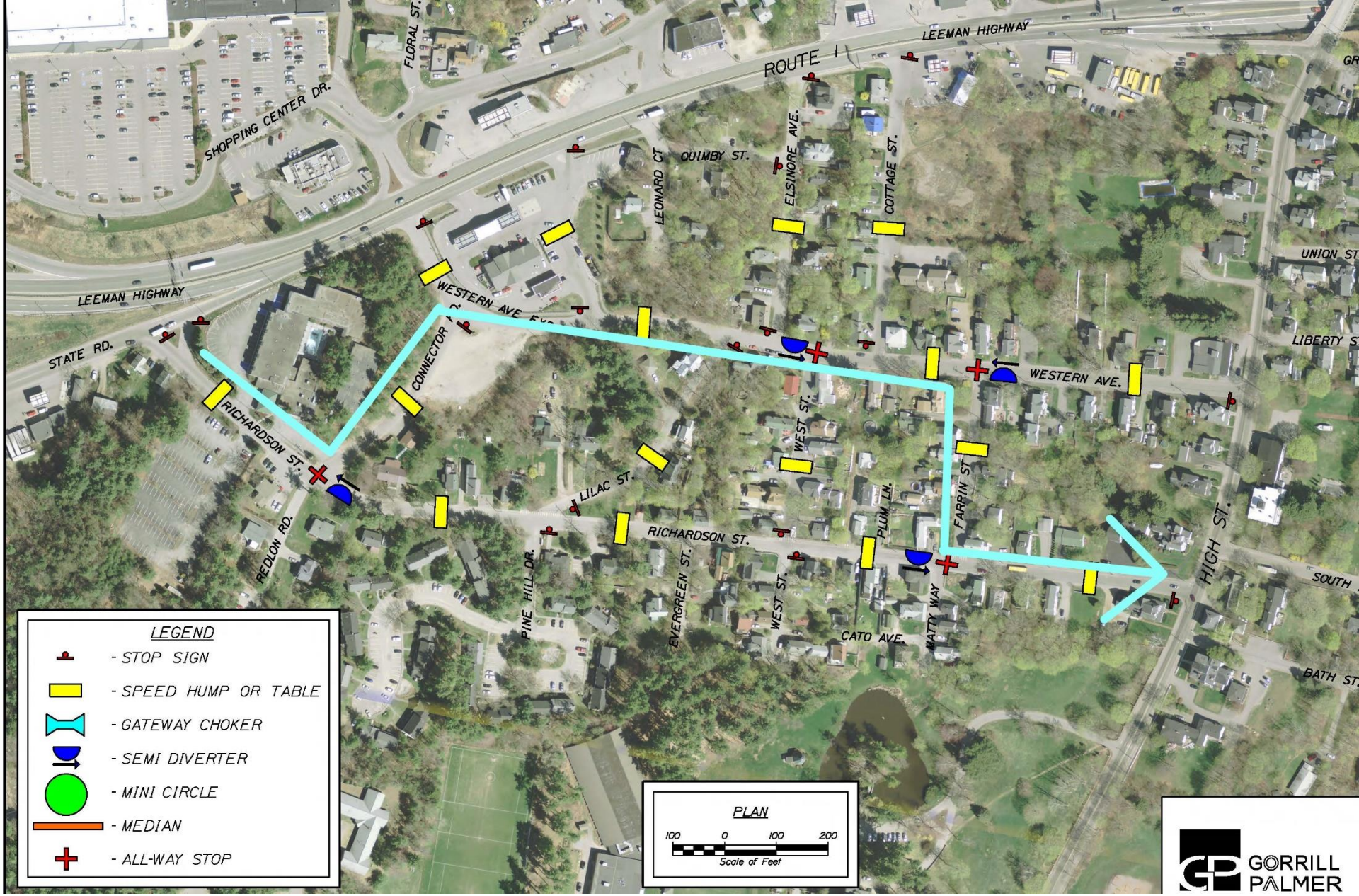

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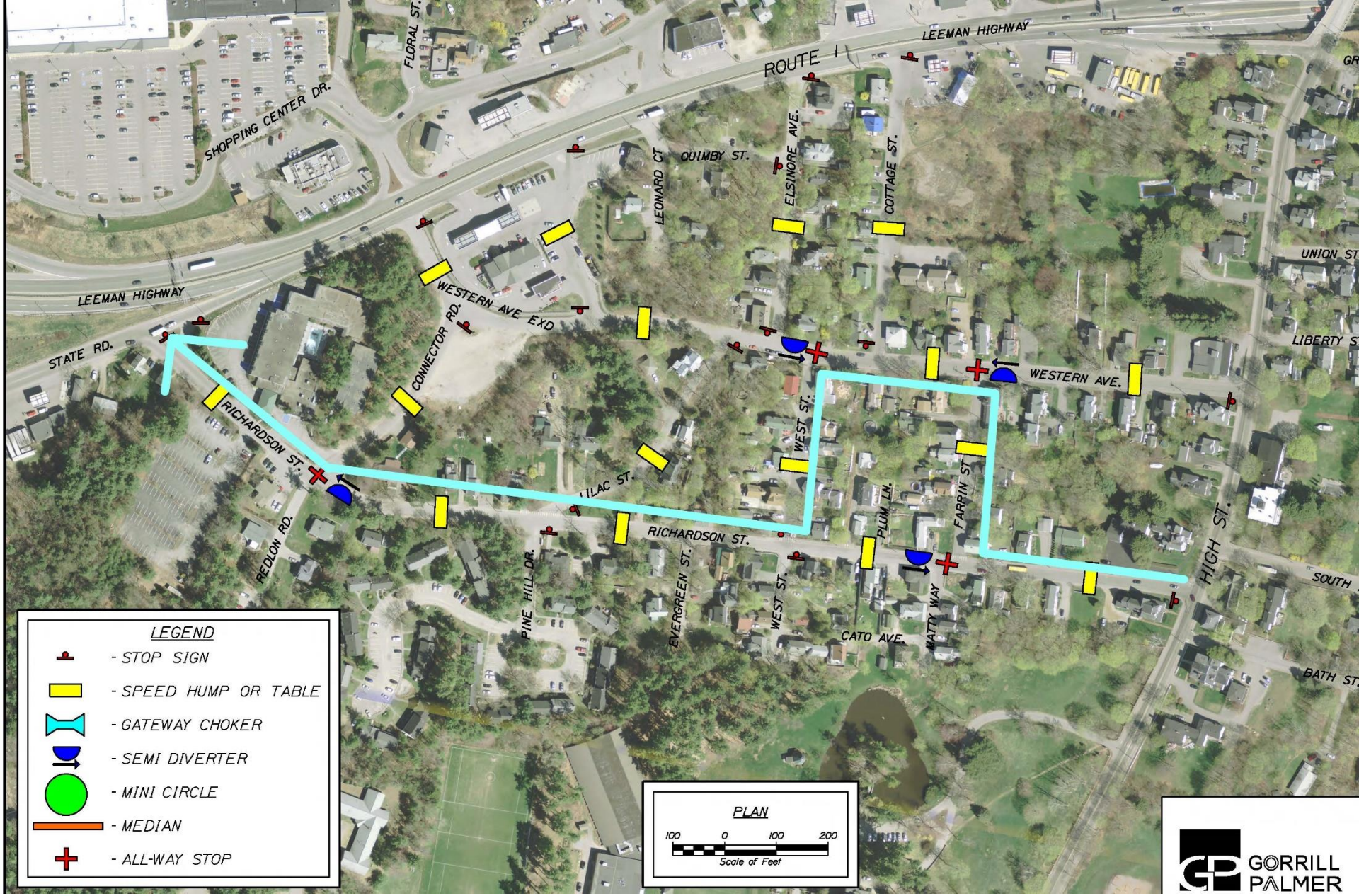
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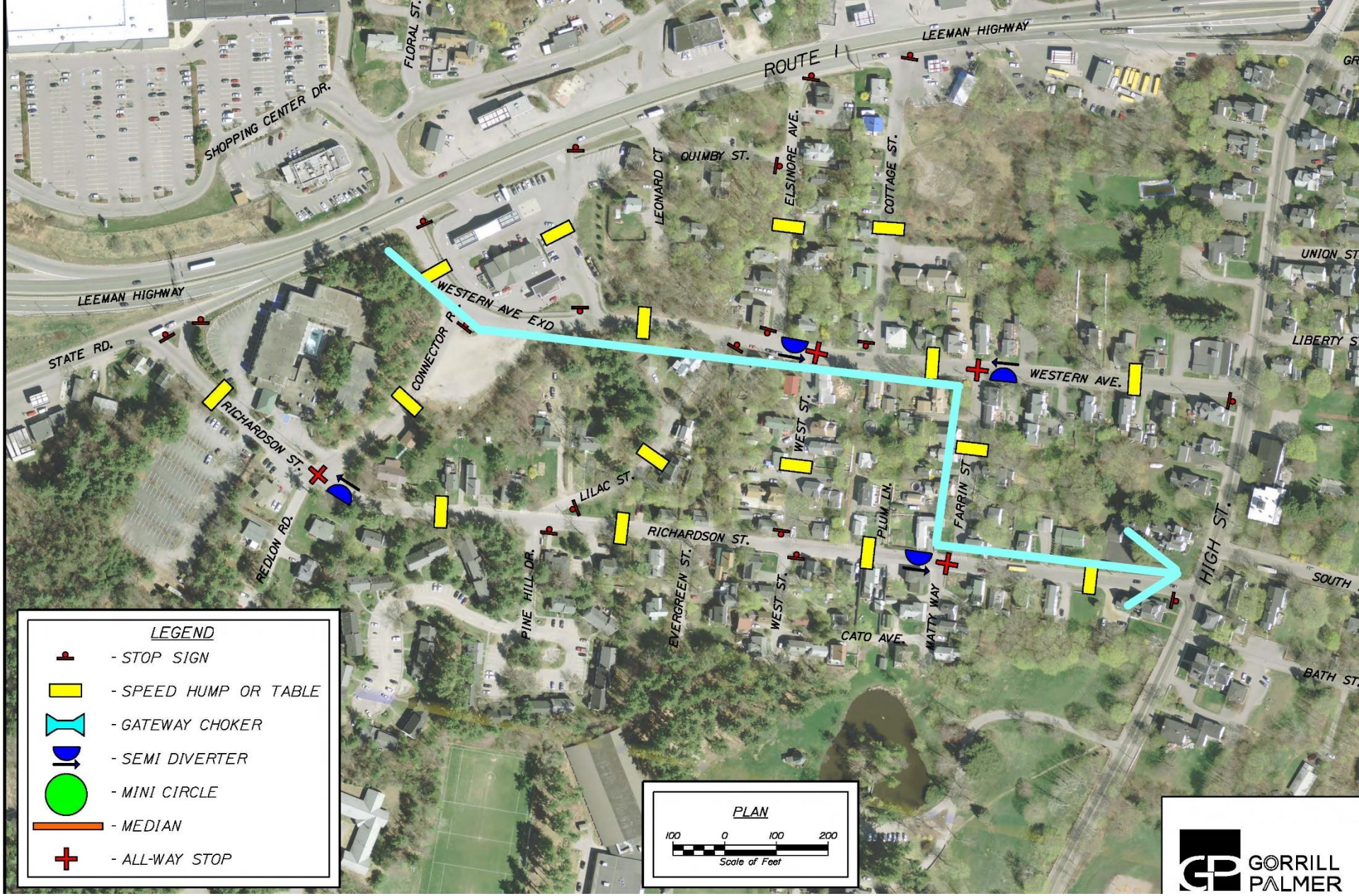

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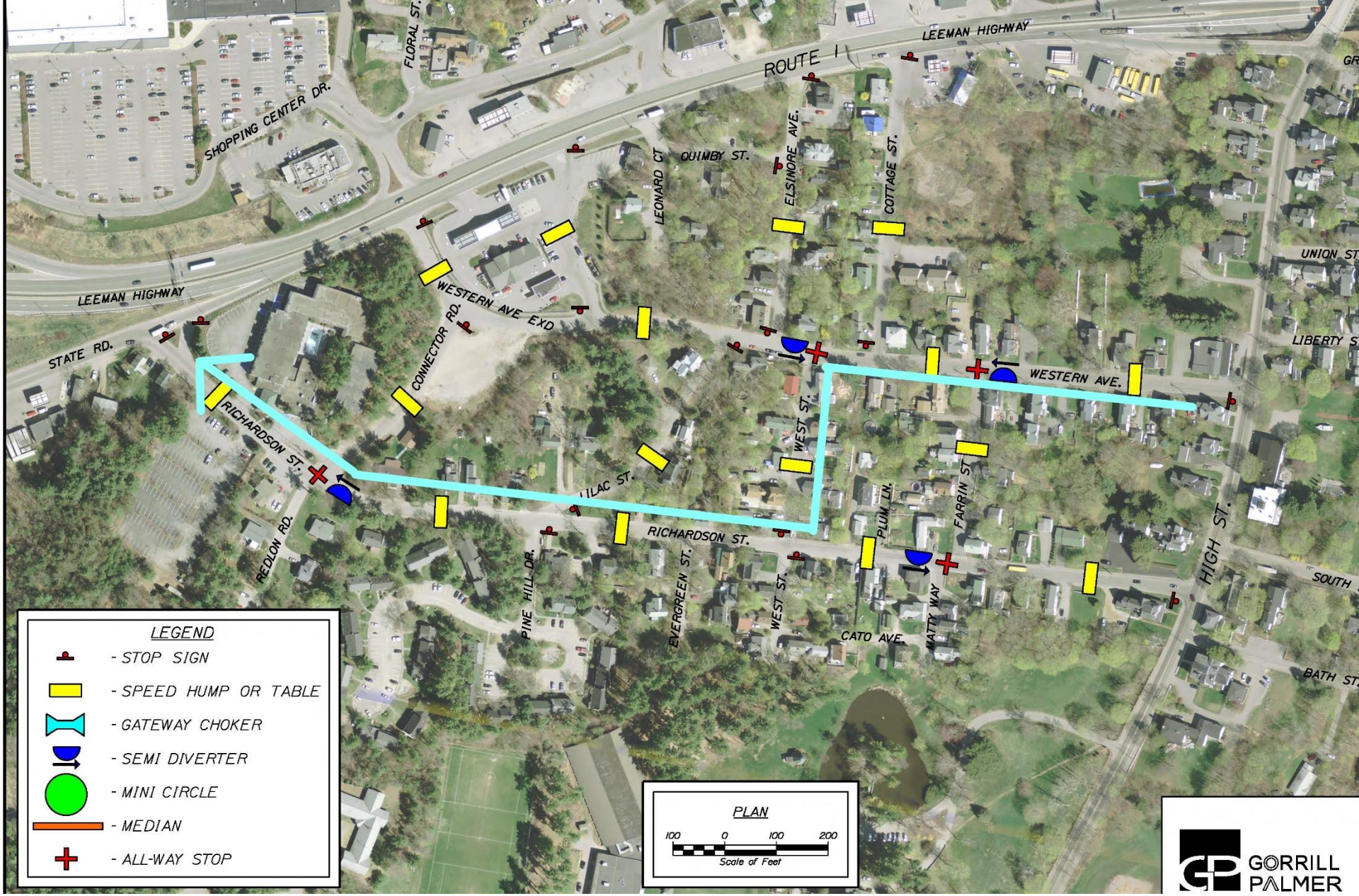

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Traffic Calming – Concepts

- Semi Diverter
- Partial Closure

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Traffic Calming – Concepts

- Semi Diverter
- Partial Closure

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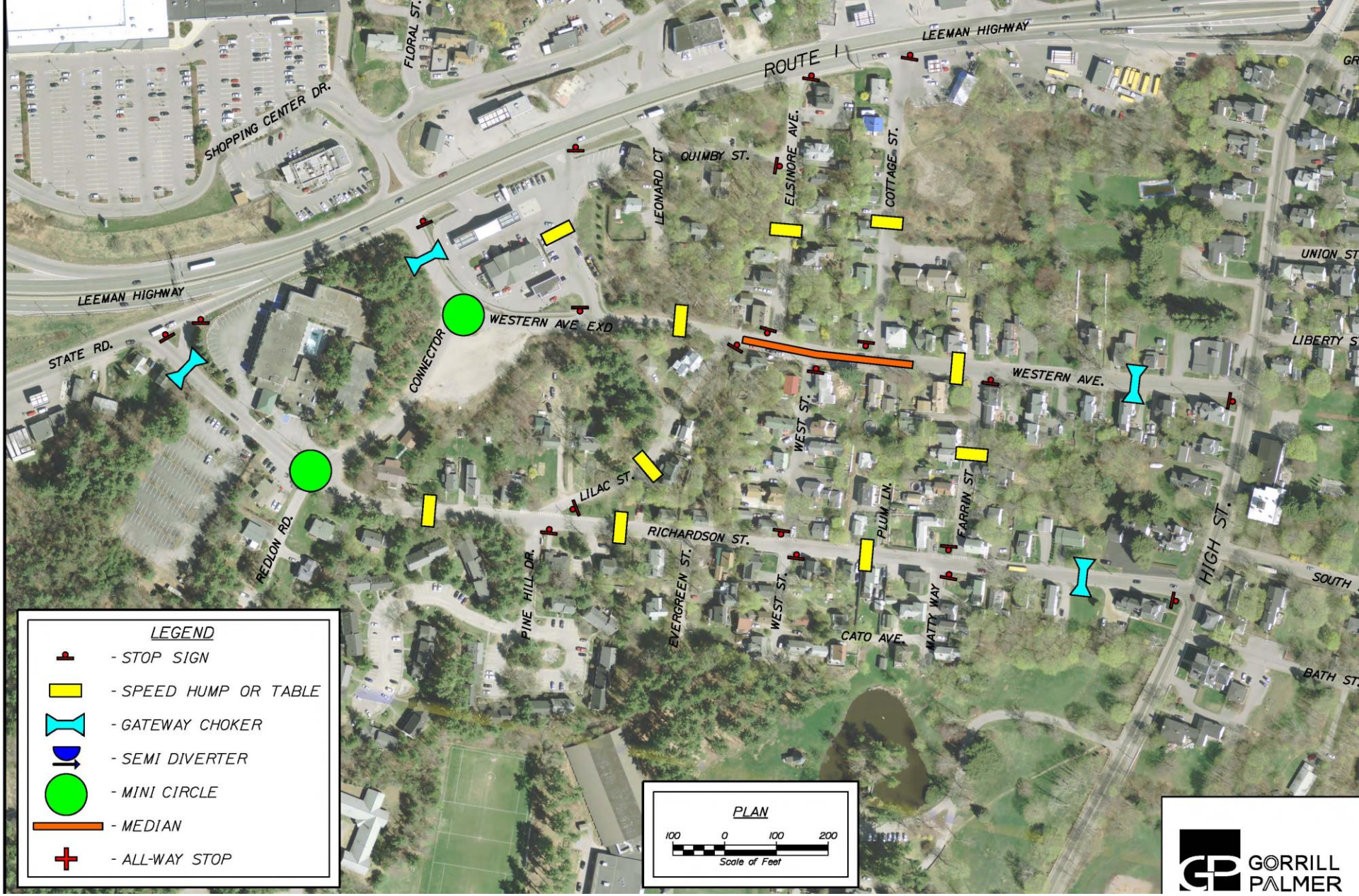
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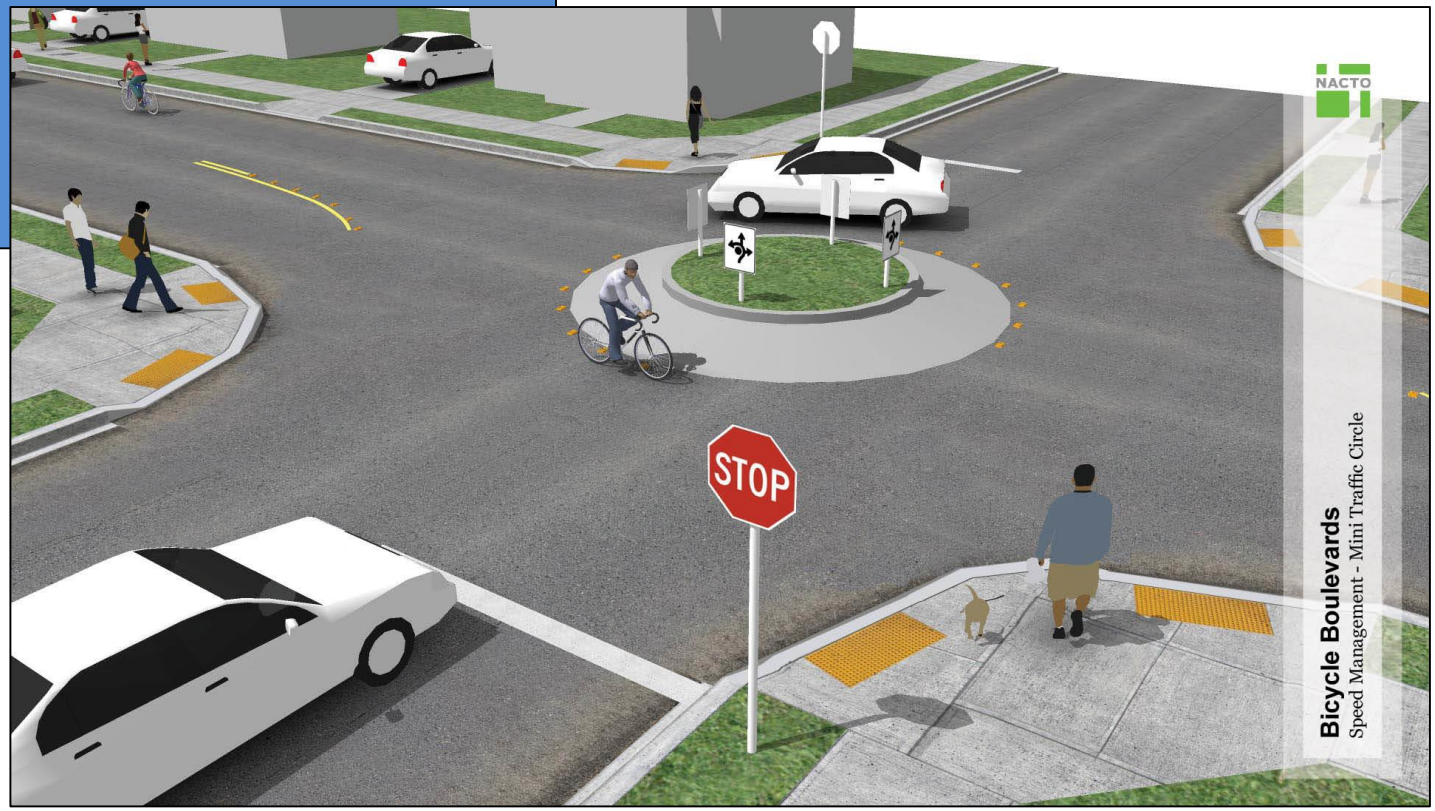
Traffic Calming – Concepts

- Mini Traffic Circles



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Traffic Calming – Concepts

- Mini Traffic Circles

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Traffic Calming – Concepts

- Median Islands

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Traffic Calming – Ongoing Activities

- Public Input
- Emergency Services Input
- Bus Service Input
- Public Works Input
- MaineDOT Input
  - Initial comments provided
  - Traffic assessment (Route 1/High St)

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Traffic Calming – Next Steps

- Gather Input
- Make Refinements, Finalize Concept Plans
- Additional Design Effort
- Traffic Assessment
- Cost Estimating and Funding
- Local and State Approvals
- Low Cost Temporary TC Installations

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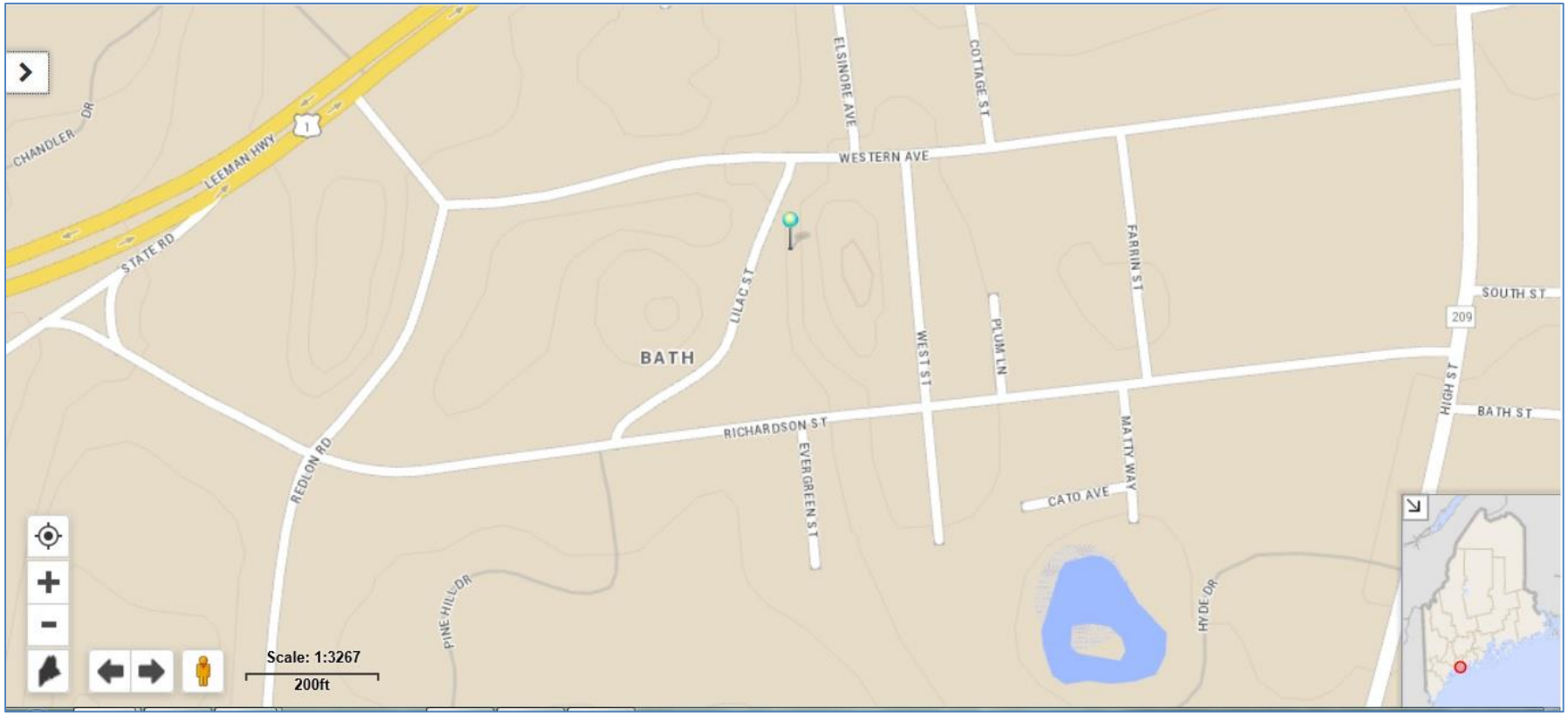
Traffic Calming – Feedback/Input



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