



R i v e r R u n

PRESENTATION TO THE PLYMOUTH PLANNING BOARD

HEARING #2

MARCH 31, 2008

March 10 Recap

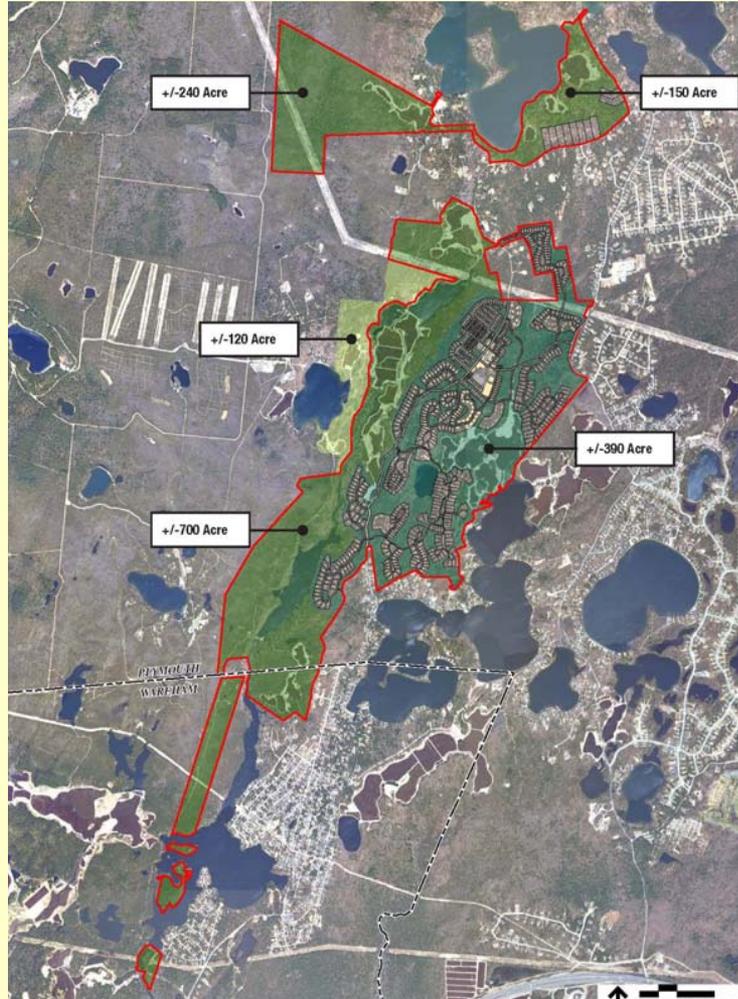
- Introduce A.D. Makepeace and our team
- Introduce River Run
- Review accomplishments to date
- Brief overview of use areas, including animation
- Outline our Special Permit application
- Identify topics for future discussion



March 31 Agenda

- Project Design Framework
 - Open space context/existing natural features
 - Natural Features
 - River Run Transportation Context
- Transportation
 - Process and Methodology
 - Transportation System Improvements
 - Internal Circulation
- Independent Peer Review Findings
- Questions and Answers
- Future Topics

Open Space Context



- Makepeace landholdings approximately 2,000 acres close to the Myles Standish State Forest
- Coastal plain ponds/rare pine barrens habitat
- Active cranberry production in the Agawam River corridor

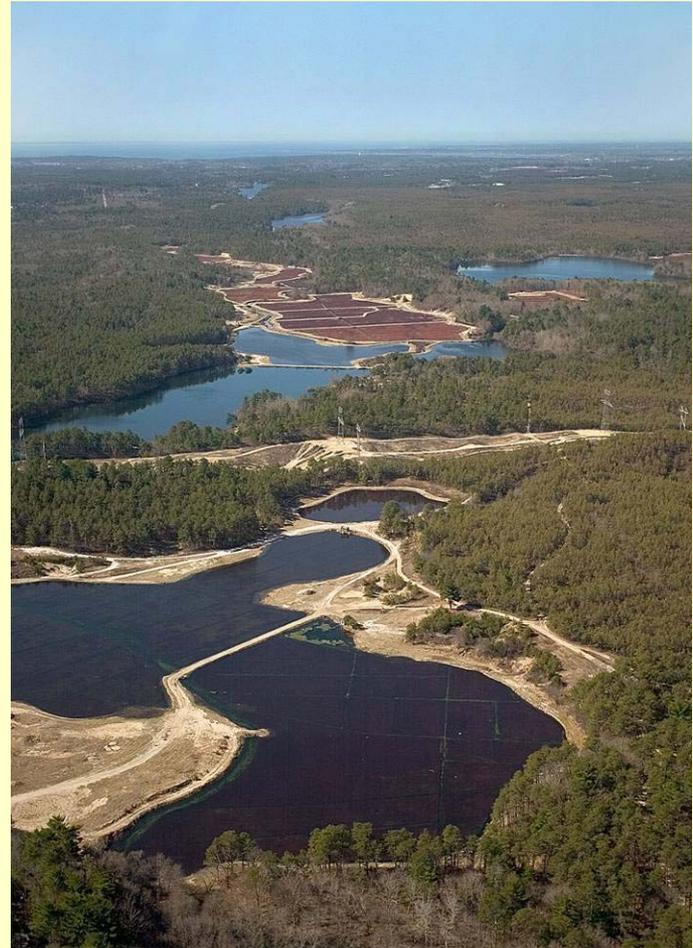
Legend

- Town Boundary
- Parcels

- ADM Property with CR +/- 1,090 Ac.
- Boy Scout Property with CR +/- 120 Ac.
- Open Space without CR +/- 390 Ac.

Existing Natural Features

- Proximity to Myles Standish State Forest and other protected open space
- Agawam River and Agawam Reservoir
- Deer Pond
- Cranberry bogs
- Numerous scenic vistas



Transportation Context



Transportation System Impact Assessment

Presented by:
Jeffrey S. Dirk, P.E., PTOE
Vice President
Vanasse & Associates, Inc.

Introduction

Jeffrey S. Dirk, P.E., PTOE

- Vice President of Vanasse & Associates, Inc. – A full service Traffic Engineering and Transportation Planning firm located in Andover, Massachusetts.
- Registered Professional Civil Engineer in the Commonwealth of Massachusetts as well as in the States of Connecticut, Maine, New Hampshire, Rhode Island and the Commonwealth of Virginia.
- Certified Professional Traffic Operations Engineer (PTOE).
- President of the New England Section of the Institute of Transportation Engineers.
- Over 16 years of experience providing Traffic Engineering and Transportation Planning Services to private and municipal clients throughout the United States – including municipal review services for the Town of Plymouth.

Process

- Initial data collection and transportation system evaluation commenced in 2006 in consultation with Town of Plymouth.
- Traffic Impact and Access Study filed with MEPA Office and Town in February 2007 as part of DEIR.
- Certificate issued on DEIR on April 20, 2007 indicating compliance with MEPA and providing scope for FEIR.
- Jacobs Edwards & Kelcey (JE&K) retained by Town to review DEIR traffic study – review letter issued by JE&K June 17, 2007.
- Several working sessions held with Town, JE&K, and neighborhood groups to discuss transportation issues in project area.
- DEIR Traffic Study refined to address JE&K and Town comments; incorporate plans depicting roadway and intersection improvements; and assess refinements to development program for project.
- Refined Traffic Study included as part of Special Permit filing and has been reviewed by JE&K.

Process

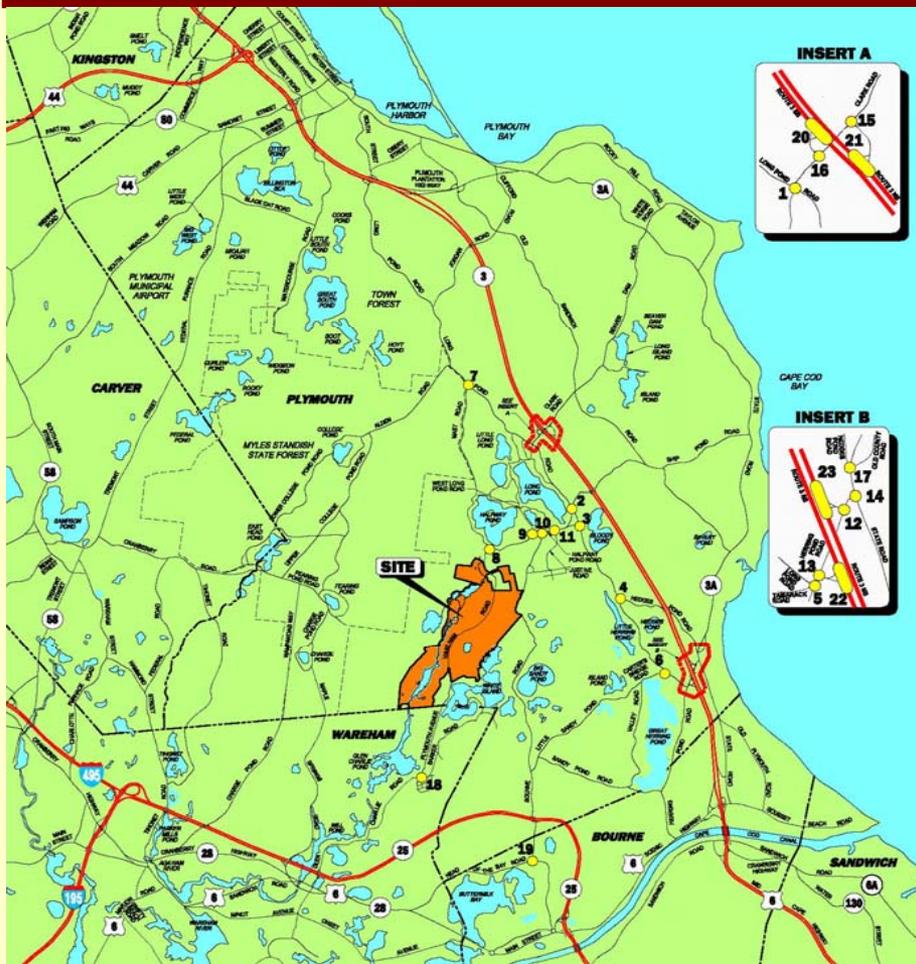
➤ MEPA

- Expanded ENF filed in June 2005 with Scope for DEIR issued in October 2005.
- DEIR filed in February 2007 with Scope for FEIR issued in April 2007.
- FEIR anticipated in May 2008.
- FEIR will incorporate updated information and studies included in Special Permit Application.
- MEPA review encompasses all aspects of the project that relate to the environment (land, air, water, wastewater, transportation and endangered species).
- MEPA review does not stop at town boundaries and addresses impacts to adjacent communities, including requirements for improvements as may be necessary.

Traffic Impact Assessment Methodology

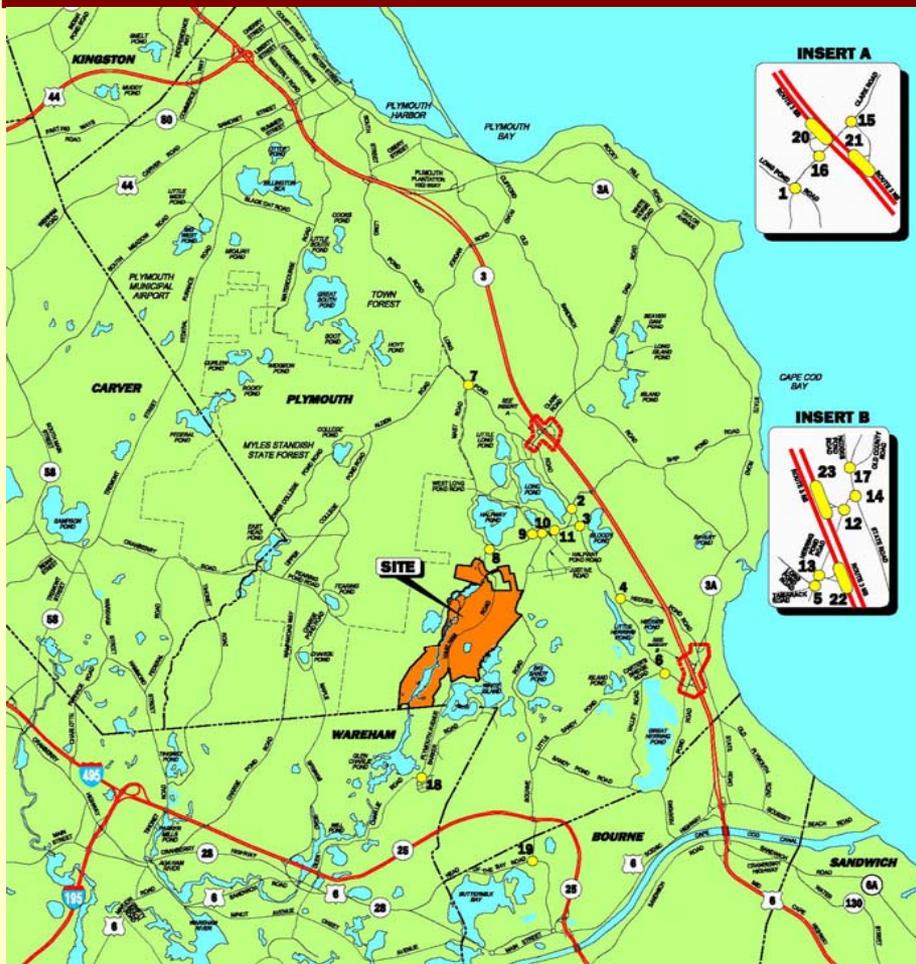
- Prepared in accordance with EOE/EPW&T/MassHighway Standards.
- Establishment of study area.
- Data Collection/Existing Conditions
 - Traffic Counts
 - Field Measurements
 - Pedestrian & Bicycle Facilities
 - Public Transportation Services
 - Speed Measurements
 - Motor Vehicle Crash Data
- Future Conditions
 - 2016 No-Build and Build
 - Specific Development Projects by Others
 - General Traffic Growth
 - Project-Generated Traffic
 - Project Trip Distribution
- Impact Assessment
 - Traffic Operations (motorist delays/vehicle queues)
 - Safety
- Transportation System Improvements
 - Definition
 - Timing/Schedule

Study Area



1. Long Pond Road at Clark Road
2. Long Pond Road at Ship Pond Road and Herring Way
3. Long Pond Road at Halfway Pond Road and Bloody Pond Road
4. Long Pond Road at Hedges Pond Road
5. Long Pond Road at Herring Pond Road and Tamarack Road
6. Long Pond Road at Carter's Bridge Road
7. Long Pond Road at Mast Road
8. Halfway Pond Road at Wareham Road and Mast Road
9. Halfway Pond Road at West Long Pond Road
10. Halfway Pond Road at Bourne Road
11. Halfway Pond Road at Justine Road and Private Driveway
12. Herring Pond Road at the Route 3 Northbound Ramps
13. Herring Pond Road at the Route 3 Southbound Ramps
14. Herring Pond Road at State Road and Private Driveway
15. Clark Road at the Route 3 Northbound Ramps
16. Clark Road at the Route 3 Southbound Ramps
17. State Road at Hedges Pond Road and Old County Road
18. Plymouth Avenue and Douglas Lane at Glen Charlie Road and Barker Road (Wareham)
19. Plymouth Lane at Head of the Bay Road (Bourne)
20. Route 3 Southbound at the Clark Road On- and Off-Ramps
21. Route 3 Northbound at the Clark Road On- and Off-Ramps
22. Route 3 Southbound at the Herring Pond Road On- and Off-Ramps
23. Route 3 Northbound at the Herring Pond Road On- and Off-Ramps

Data Collection/Existing Conditions

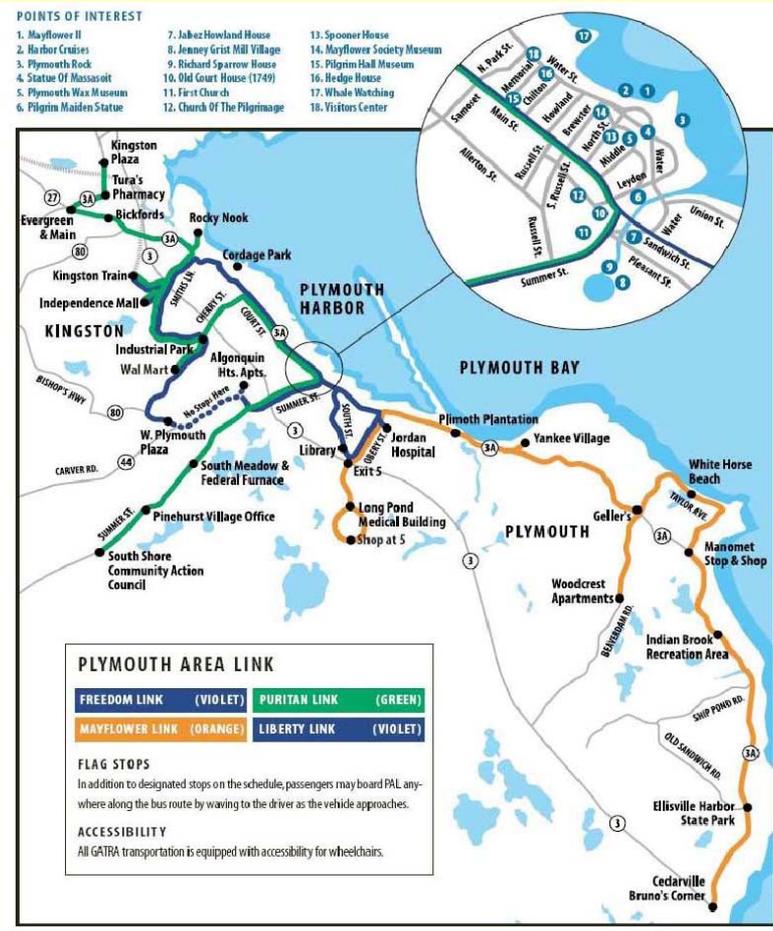


- Traffic Counts – June 2006.
- Adjusted traffic count data to average and peak summer month conditions, as appropriate.
- Baseline Information:
 - Halfway Pond Road - $\pm 1,010$ vpd
 - Bourne Road - $\pm 4,595$ vpd
 - Long Pond Road - $\pm 9,390$ vpd
 - Route 3 - $\pm 21,000$ vpd
- Spot Speed Data – Bourne Road
 - Average Speed: 38 mph
 - 85th Percentile Speed: 42 mph
 - Posted Speed Limit: 35 mph

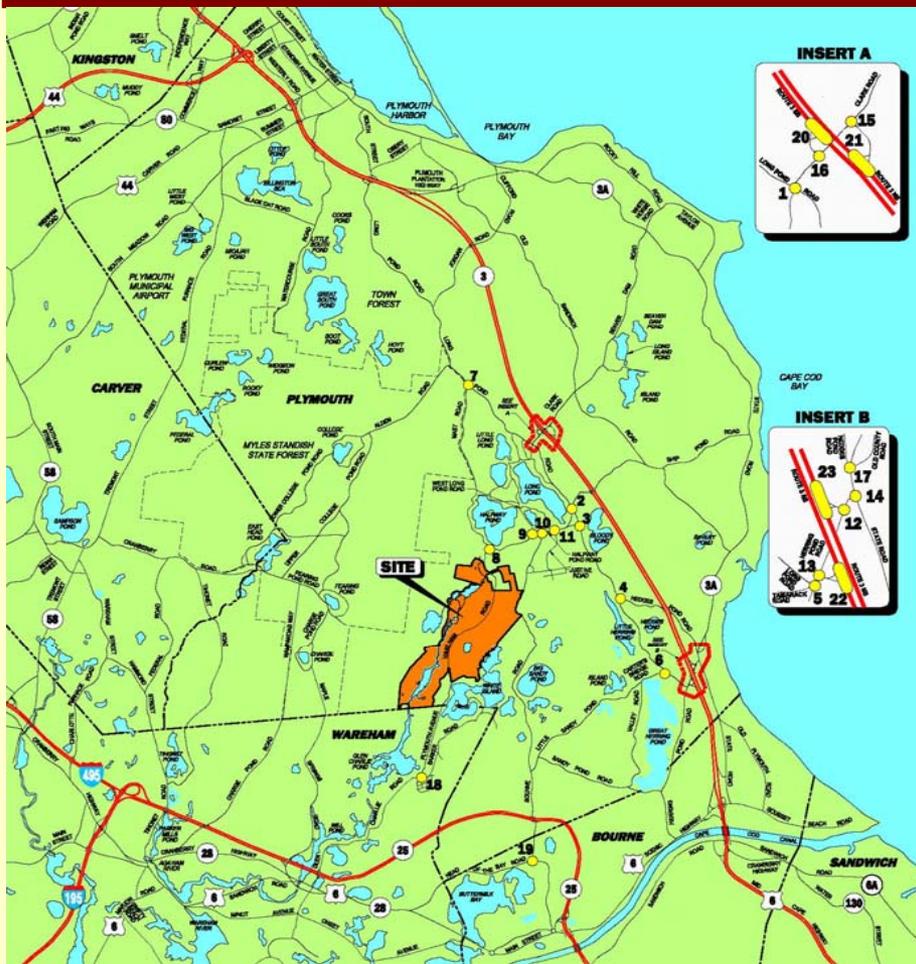
Pedestrian and Bicycle Facilities



Public Transportation Services



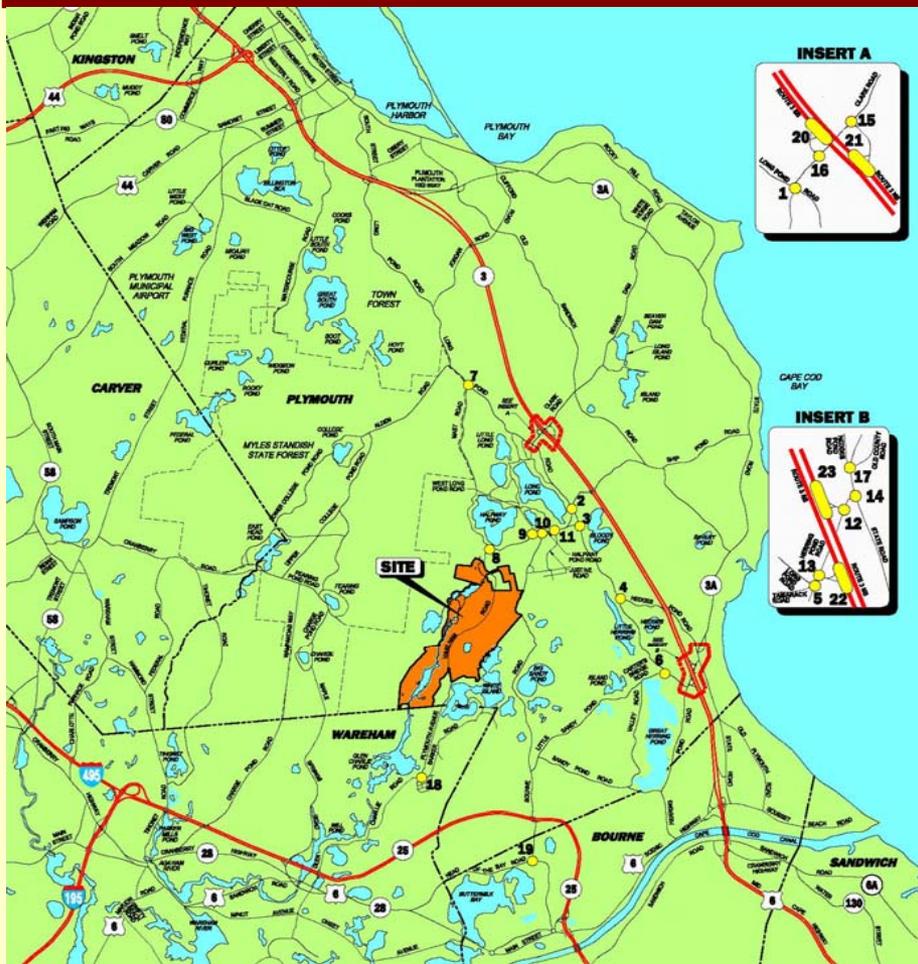
Motor Vehicle Crash Data



1. Long Pond Road at Clark Road
2. Long Pond Road at Ship Pond Road and Herring Way
3. Long Pond Road at Halfway Pond Road and Bloody Pond Road
4. Long Pond Road at Hedges Pond Road
5. Long Pond Road at Herring Pond Road and Tamarack Road
6. Long Pond Road at Carter's Bridge Road
7. Long Pond Road at Mast Road
8. Halfway Pond Road at Wareham Road and Mast Road
9. Halfway Pond Road at West Long Pond Road
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22. Route 3 Southbound at the Herring Pond Road On- and Off-Ramps
23. Route 3 Northbound at the Herring Pond Road On- and Off-Ramps

= Intersection exceeded MassHighway Crash Rate.

Future Conditions



- 10 Year projection to 2016
- Specific Development Projects by Others
- General Traffic Growth: 1.0 percent per year
- Roadway Improvement Projects
- Project-Generated Traffic
- Project Trip Distribution

Specific Development Projects



1. Bog View Estates
2. Camp Child Settlement
3. Chilton Park
4. Herring Pond Preserve
5. Ponds at Plymouth
6. Preserve at Halfway Pond
7. Tara Woods
8. Village Crossing
9. Wadsworth Estates
10. Watercourse Place
11. Bartlett Pond Pasture
12. The Trails
13. Pickerel Cove
14. Stone Gate Farm
15. Nestle Down
16. Gunning Point Road
17. Nye Acres Condos
18. Lighthouse Cove
19. Beaver Dam Ridge
20. Valley View Preserve
21. Orchard Hills
22. Alpine Road
23. Black Cat Estates
24. Cedarville Commons
25. Cedar Hill Park
26. Applewood Estates
27. Little Hios Hills
28. Colony Place
29. The Pinehills
30. Sawmill Woods
31. Twin Pines
32. South High School Expansion
33. Wareham Crossing (Wareham)
34. ADM Central Core Mixed-Use Development (Wareham and Carver)
35. Canalside Commons (Bourne)
36. CVS Pharmacy (Bourne)
37. Plymouth/Bourne Industrial Park

Project-Generated Traffic

Time Period/Direction	Residential					Commercial				
	(A) Single-Family Homes ^a	(B) Apartments ^b	(C) Residential Condominiums/ Townhouses ^c	(D) Architecturally Restricted Housing ^d	(E) Assisted Living ^e	(F = A+B+C+D+E) Total New Residential Trips ^f	(G) Community Retail Center ^g	(H) YMCA ^h	(I = G+H) Total New Commercial Trips	(J = F+I) Total New Trips
Average Weekday Traffic	4,782	1,052	1,400	686	348	7,028	1,030	1,286	2,316	9,344
<i>Weekday Morning</i>										
<i>Peak Hour:</i>										
Entering	94	15	18	11	4	97	19	58	77	174
Exiting	283	62	89	17	4	410	5	32	37	447
Total	377	77	107	28	8	507	24	90	114	621
<i>Weekday Evening</i>										
<i>Peak Hour:</i>										
Entering	301	65	85	29	7	430	40	21	60	490
Exiting	176	35	42	19	4	219	49	71	120	339
Total	477	100	127	48	11	649	89	91	180	829

^aBased on ITE LUC 210 – Single Family Detached Housing.

^bBased on ITE LUC 220 – Apartment.

^cBased on ITE LUC 230 – Residential Condominium/Townhouse.

^dBased on ITE LUC 251 – Senior Adult Housing – Detached; and LUC 252 Senior Adult Housing – Attached.

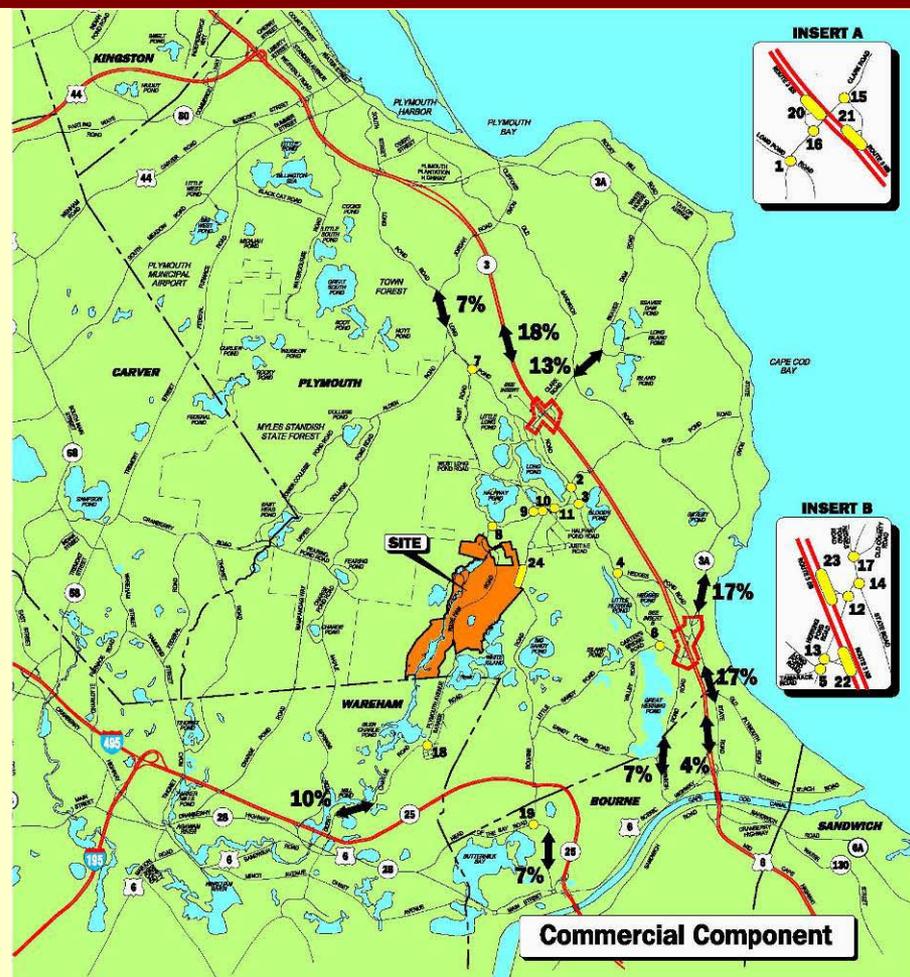
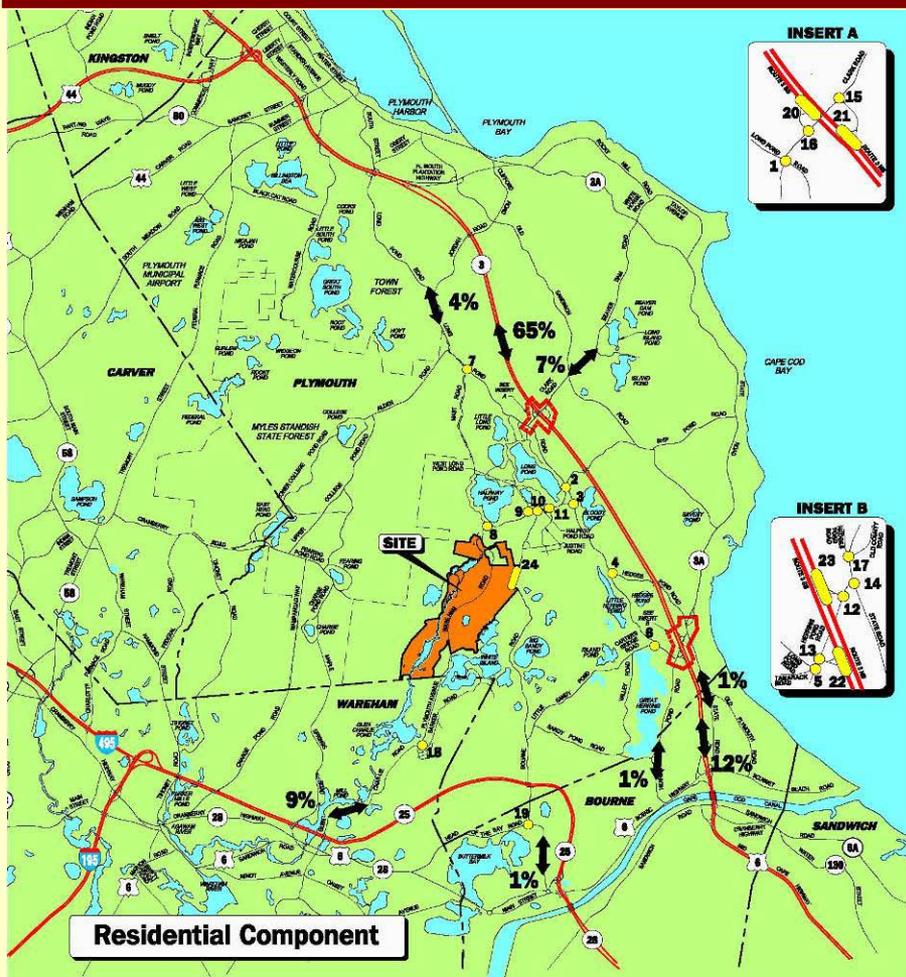
^eBased on ITE LUC 252 – Senior Adult Housing – Attached.

^fAssumes 15% internal trips.

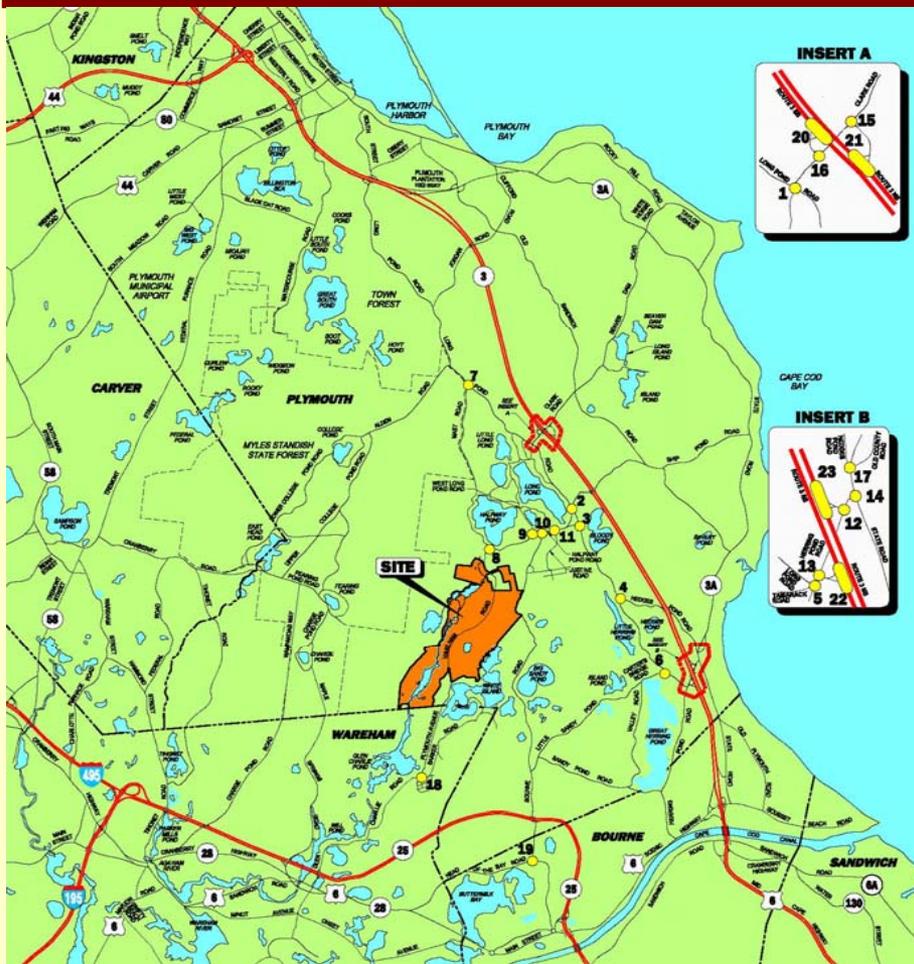
^gBased on ITE LUC 820 – Shopping Center. Assumes 60% internal trips.

^hBased on ITE LUC 495 – Recreational Community Center. Assumes 25% internal trips.

Project Trip Distribution



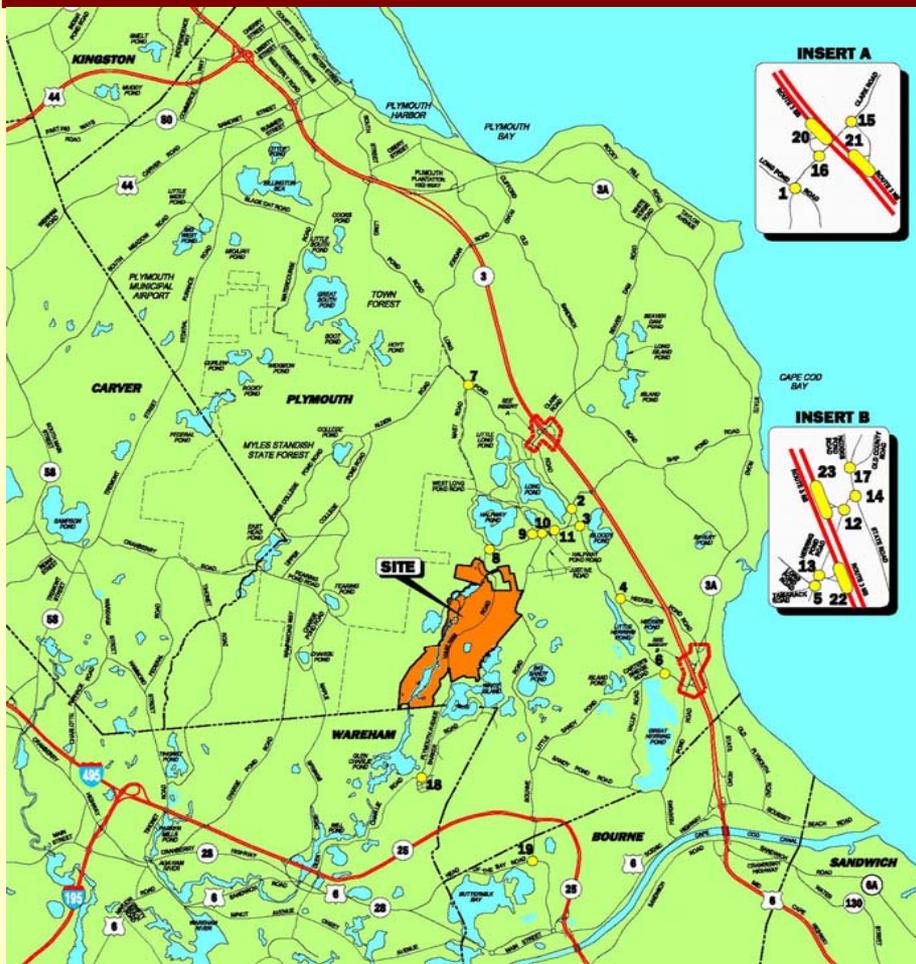
Transportation System Improvements



Intersections

1. Clark Road/Long Pond Road – Install traffic signal or compact roundabout.
2. Long Pond Road/Ship Pond Road – Geometric and sight line improvements.
3. Long Pond Road/Halfway Pond Road – Install traffic signal or compact roundabout.
4. Long Pond Road/Hedges Pond Road – No improvements required.
5. Long Pond Road/Herring Pond Road – Sign and pavement marking improvements and conduct follow-on study.
6. Long Pond Road/Carter's Bridge Road – No improvements required.
7. Long Pond Road/Mast Road – No improvements required.
8. Halfway Pond Road/Wareham Road/Mast Road – Sight line improvements.
9. Halfway Pond Road/West Long Pond Road – Sight line improvements.
10. Halfway Pond Road/Bourne Road – Realign intersection and traffic control improvements.
11. Halfway Pond Road/Justine Road – Monitor operations.
12. & 13. Herring Pond Road/Route 3 Ramps – Sign and pavement marking improvements.
14. Herring Pond Road/State Road – Sign and pavement marking improvements.
15. & 16. Clark Road/Route 3 Ramps – Improvements committed by others when needed.
17. State Road/Hedges Pond Road – Improvements committed by others.
18. Plymouth Avenue/Douglas Lane/Glen Charlie Road (Wareham) – No improvements required.
19. Plymouth Lane/Head of The Bay Road (Bourne) – Sign and pavement marking improvements.
20. & 21. Route 3/Clark Road Ramps – No improvements required.
22. & 23. Route 3/Herring Pond Road Ramps – No improvements required.

Transportation System Improvements



Roadways

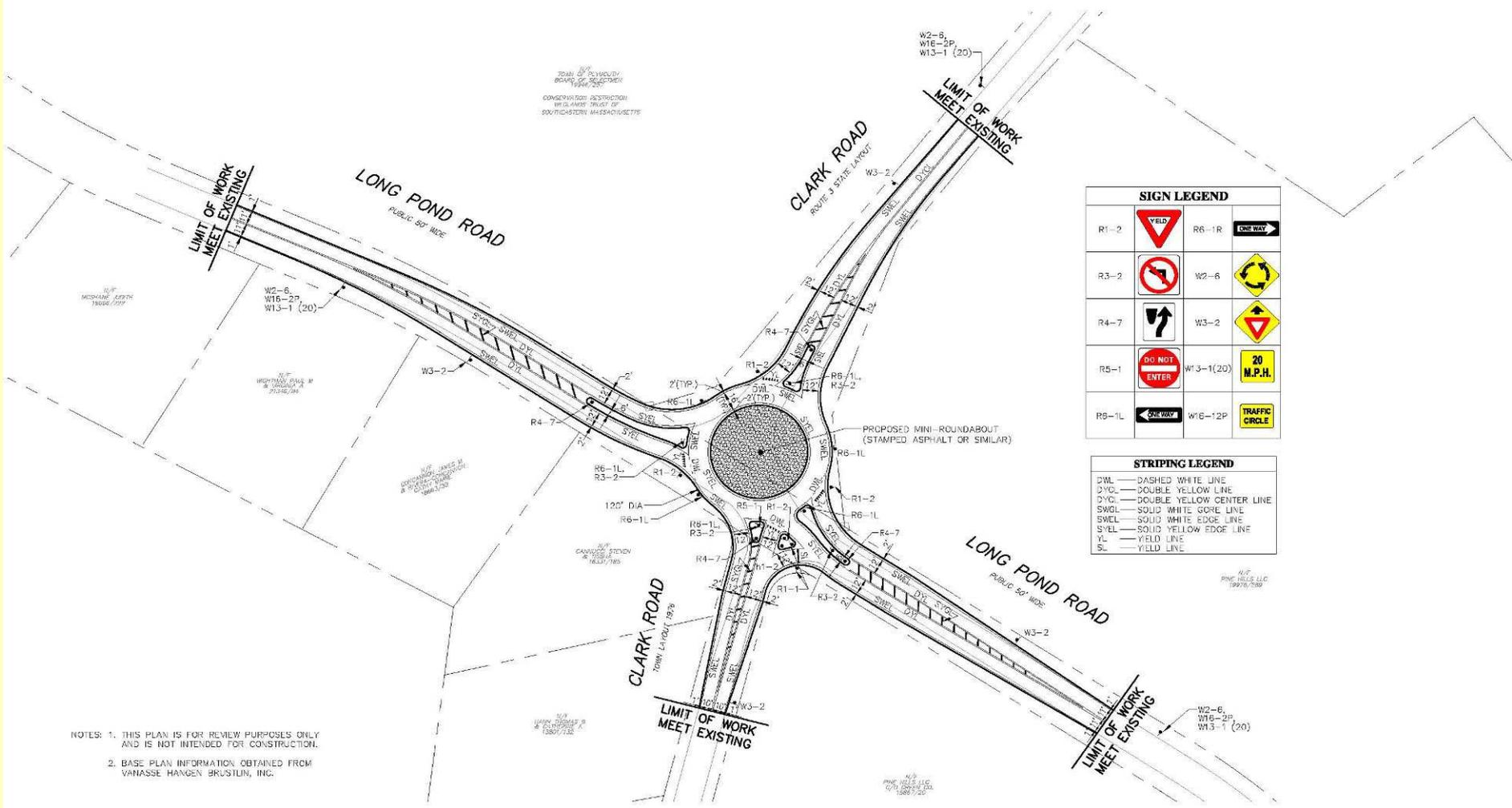
Wareham Road – Phased improvement strategy to address traveled-way, sight lines and drainage.

Bourne Road – Realignment and construction of Bourne Road Connector.

Transportation System Improvements

- All improvements will be accommodated within public right-of-way (i.e., no private land acquisitions required).
- All improvements accommodate pedestrians and bicycles.
- All improvements accommodate school bus and emergency vehicle travel.
- Transportation Demand Management program.
- Traffic monitoring and reporting program.

Conceptual Improvement Plan Long Pond Road at Clark Road Compact Roundabout Alternative



SIGN LEGEND

R1-2		R6-1R	
R3-2		W2-6	
R4-7		W3-2	
R5-1		W3-1(20)	
R6-1L		W16-12P	

STRIPING LEGEND

DWL	DASHED WHITE LINE
DYCL	DOUBLE YELLOW LINE
DYC	DOUBLE YELLOW CENTER LINE
SWEL	SOLID WHITE EDGE LINE
SWEL	SOLID WHITE GORE LINE
SYEL	SOLID YELLOW EDGE LINE
YL	YIELD LINE
SL	YIELD LINE

NOTES: 1. THIS PLAN IS FOR REVIEW PURPOSES ONLY AND IS NOT INTENDED FOR CONSTRUCTION.
2. BASE PLAN INFORMATION OBTAINED FROM VANASSE HANGEN BRUSTLIN, INC.

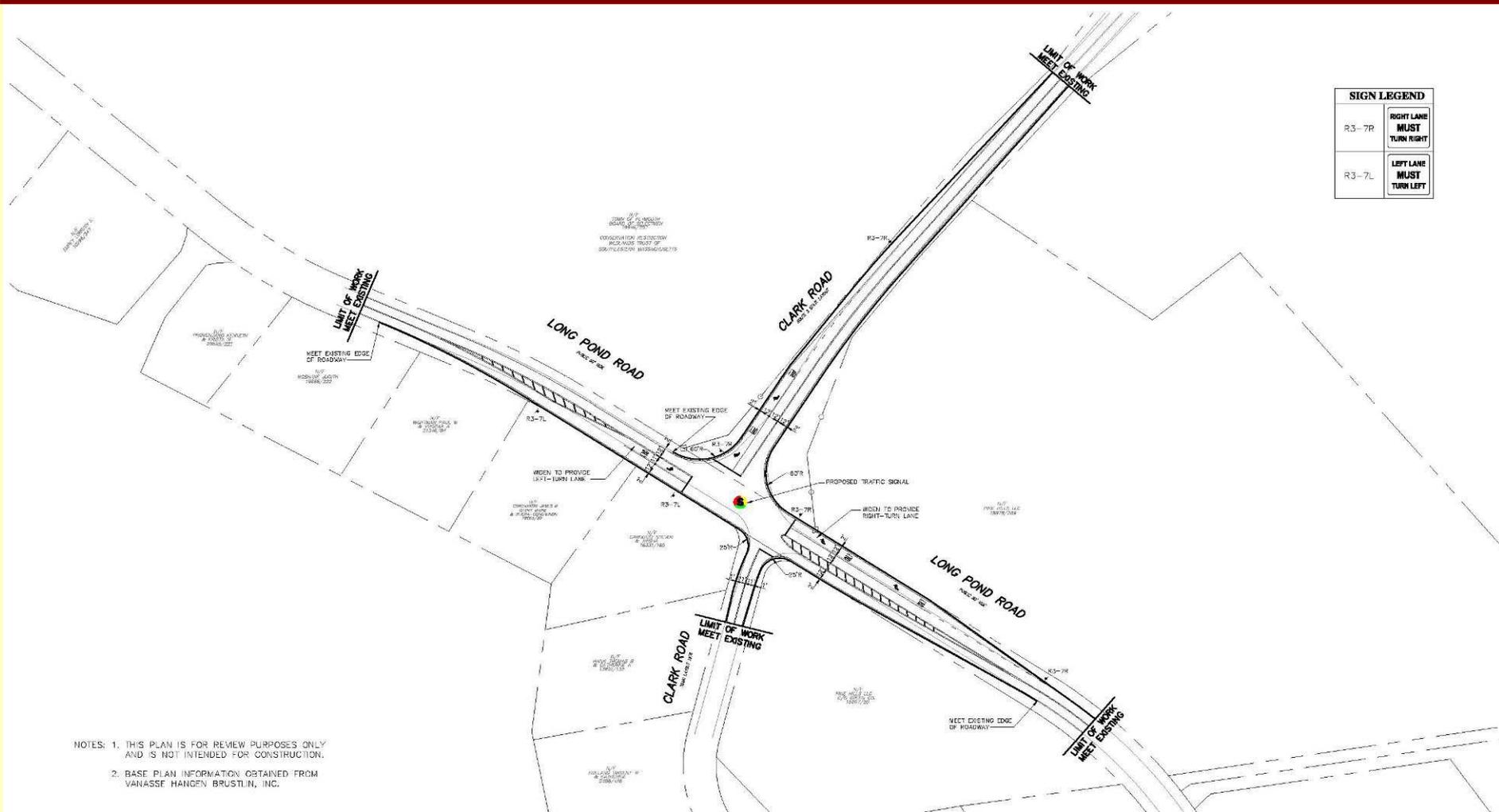
Intersection Photo-Simulation
Long Pond Road at Clark Road
Long Pond Road Northbound Approach
Compact Roundabout Alternative



Intersection Photo-Simulation
Long Pond Road at Clark Road
Clark Road Approach
Compact Roundabout Alternative



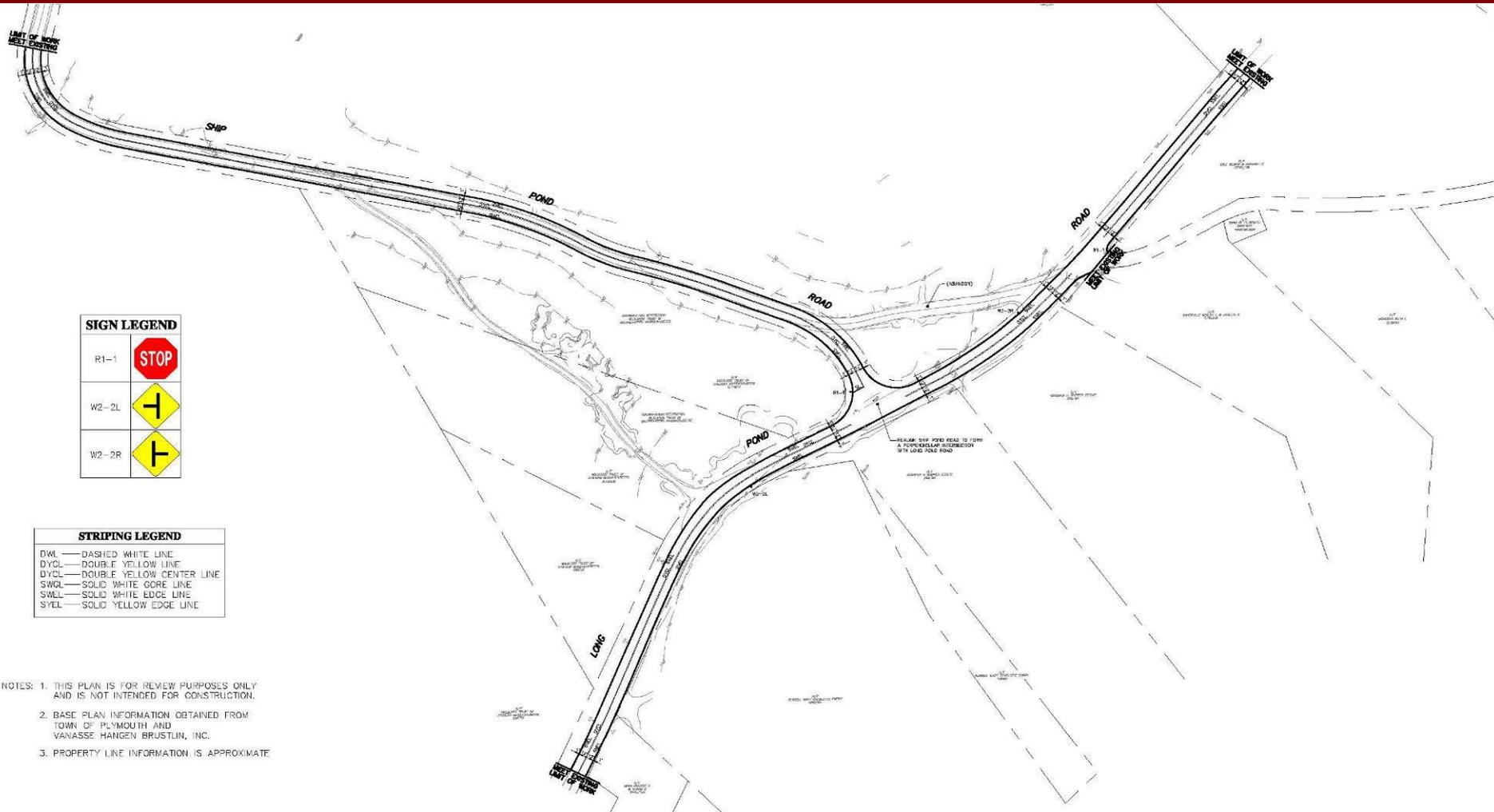
Conceptual Improvement Plan Long Pond Road at Clark Road Traffic Signal Alternative



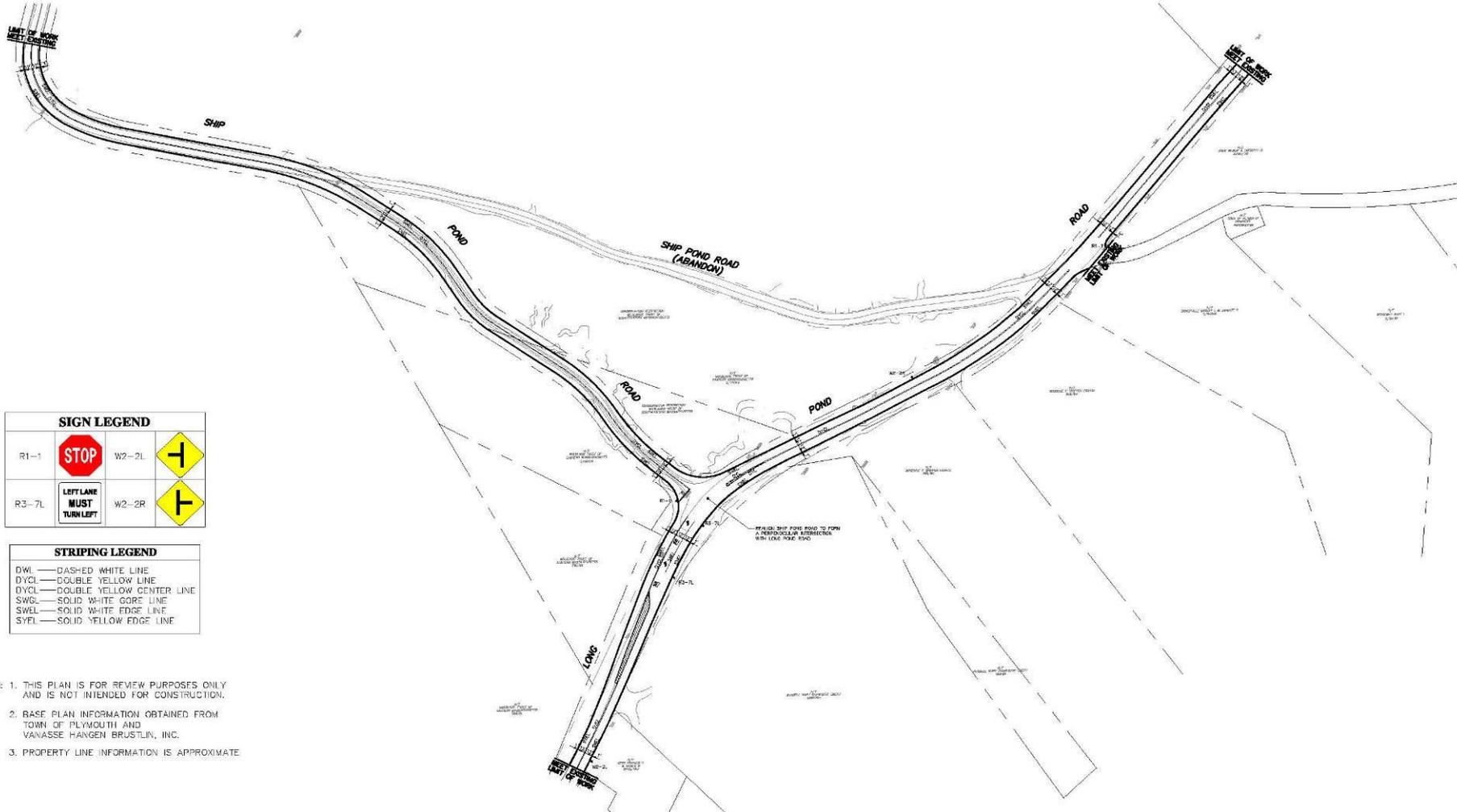
SIGN LEGEND	
R3-7R	RIGHT LANE MUST TURN RIGHT
R3-7L	LEFT LANE MUST TURN LEFT

NOTES: 1. THIS PLAN IS FOR REVIEW PURPOSES ONLY AND IS NOT INTENDED FOR CONSTRUCTION.
2. BASE PLAN INFORMATION OBTAINED FROM VANASSE HANGEN BRUSTLIN, INC.

Conceptual Improvement Plan Long Pond Road at Ship Pond Road Intersection Alternative 1



Conceptual Improvement Plan Long Pond Road at Ship Pond Road Intersection Alternative 2



SIGN LEGEND			
R1-1		W2-2L	
R3-7L		W2-2R	

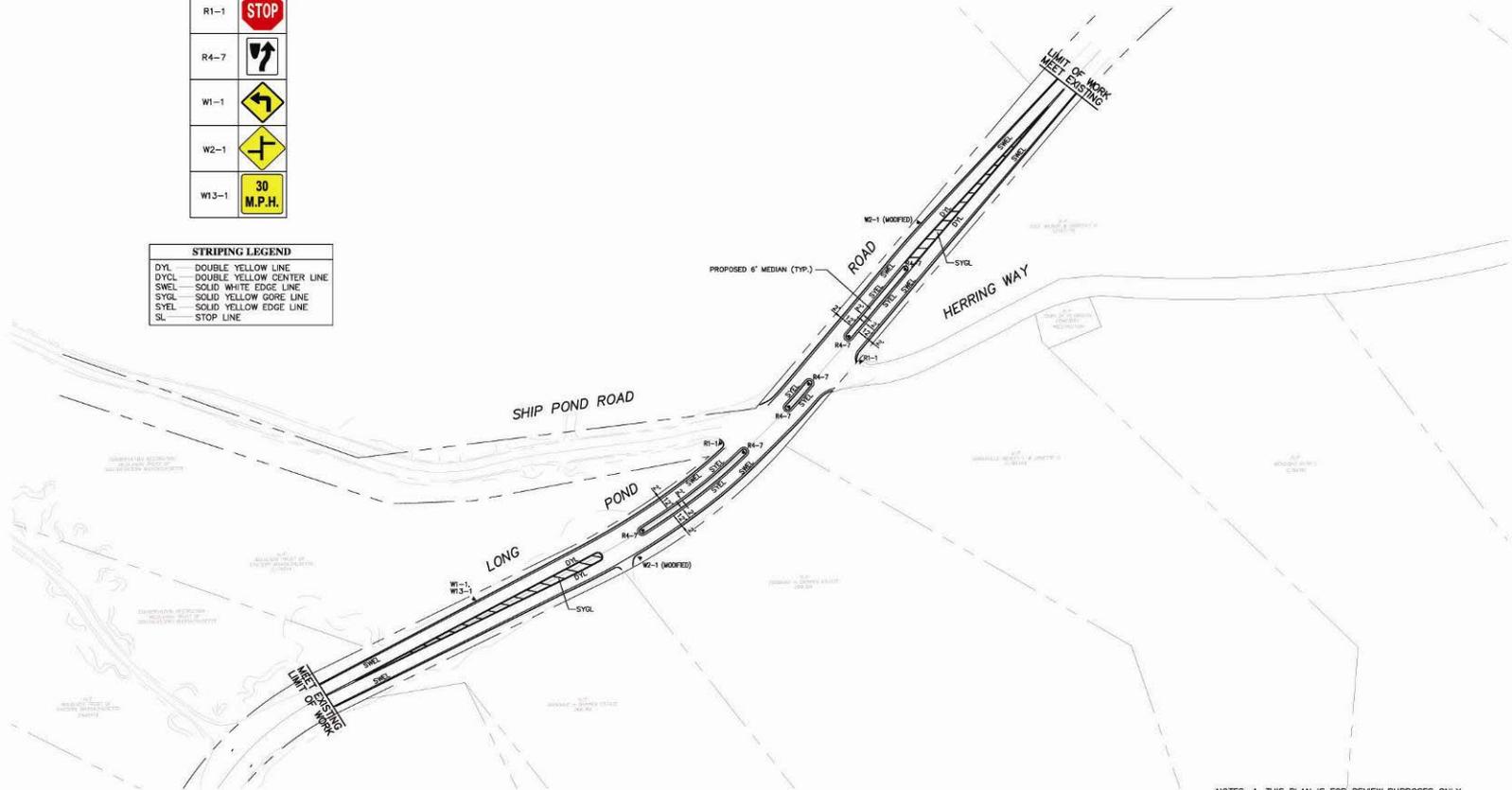
STRIPING LEGEND	
DWL	DASHED WHITE LINE
DYCL	DOUBLE YELLOW LINE
DYCL	DOUBLE YELLOW CENTER LINE
SWGL	SOLID WHITE GORE LINE
SWEL	SOLID WHITE EDGE LINE
SYEL	SOLID YELLOW EDGE LINE

- NOTES: 1. THIS PLAN IS FOR REVIEW PURPOSES ONLY AND IS NOT INTENDED FOR CONSTRUCTION.
2. BASE PLAN INFORMATION OBTAINED FROM TOWN OF PLYMOUTH AND VANASSE HANGEN BRUSTLIN, INC.
3. PROPERTY LINE INFORMATION IS APPROXIMATE.

Conceptual Improvement Plan Long Pond Road at Ship Pond Road Intersection Alternative 3

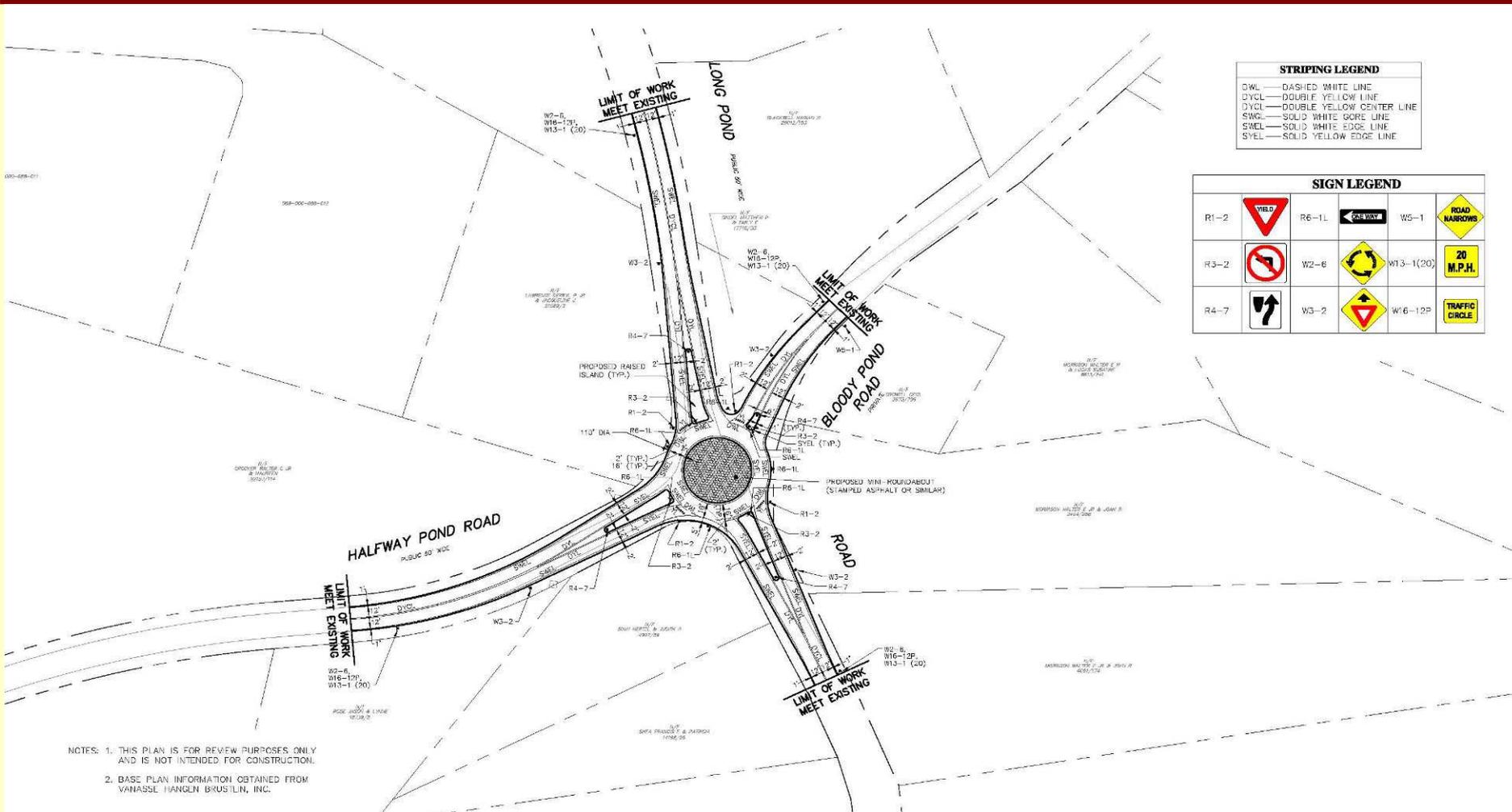
SIGN LEGEND	
R1-1	
R4-7	
W1-1	
W2-1	
W13-1	

STRIPING LEGEND	
DYL	DOUBLE YELLOW LINE
DYCL	DOUBLE YELLOW CENTER LINE
SWEL	SOLID WHITE EDGE LINE
SYGL	SOLID YELLOW GORE LINE
SYEL	SOLID YELLOW EDGE LINE
SL	STOP LINE



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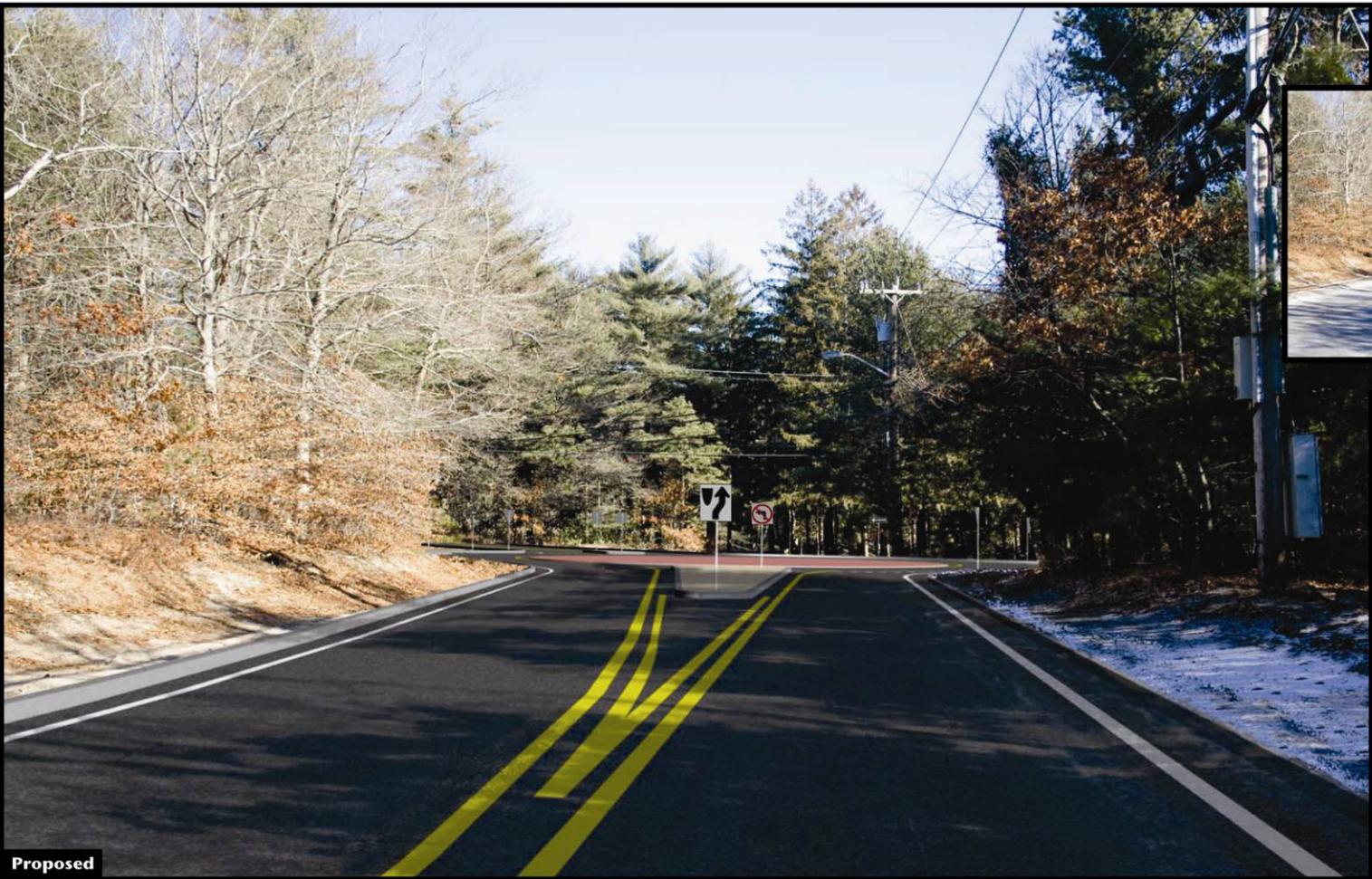
Conceptual Improvement Plan Long Pond Road at Halfway Pond Road Modern Roundabout Alternative



Conceptual Improvement Plan
Long Pond Road at Halfway Pond Road
Long Pond Road Southbound Approach
Modern Roundabout Alternative



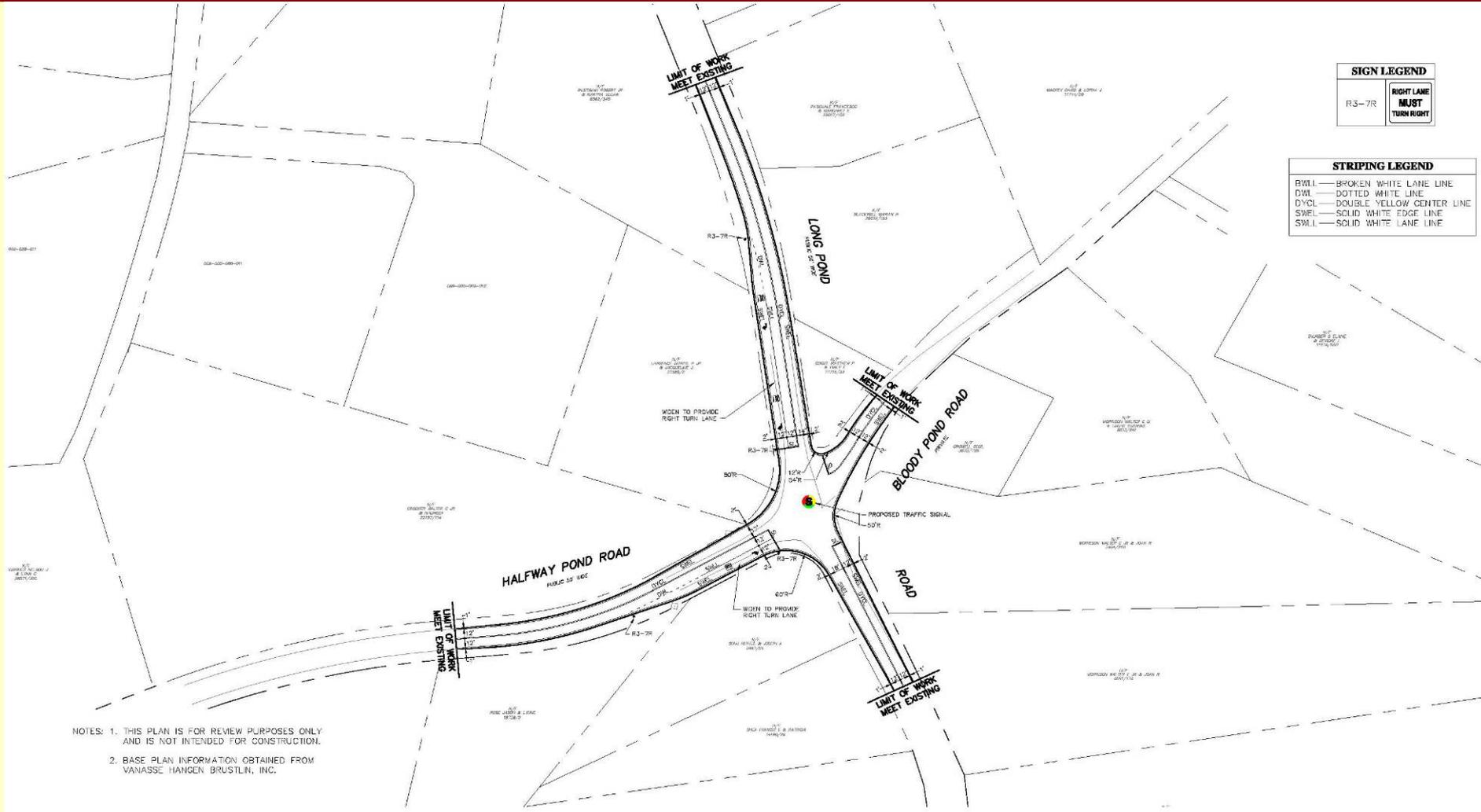
Intersection Photo-Simulation
Long Pond Road at Halfway Pond Road
Halfway Pond Road Eastbound Approach
Compact Roundabout Alternative



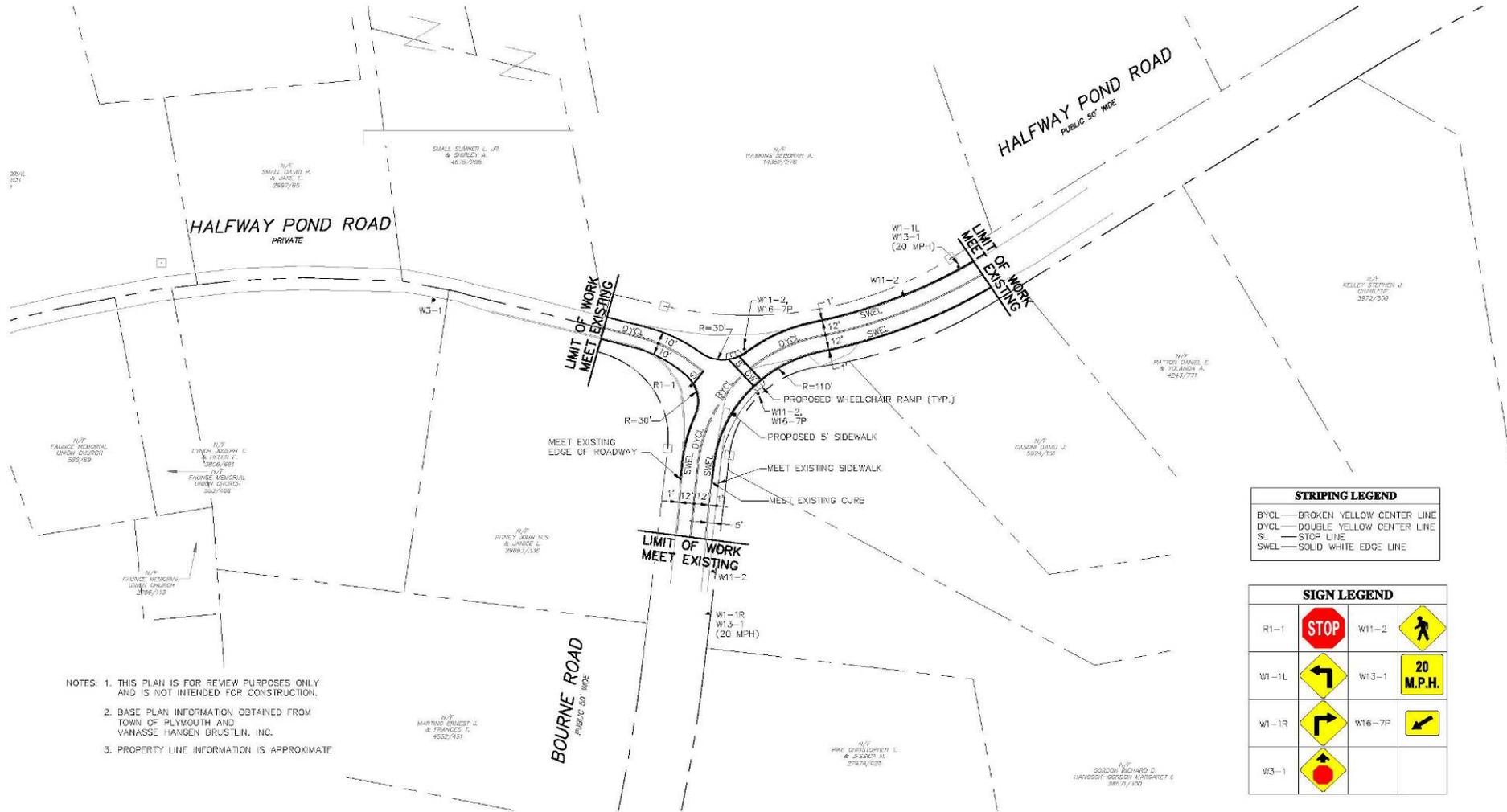
Conceptual Improvement Plan

Long Pond Road at Halfway Pond Road

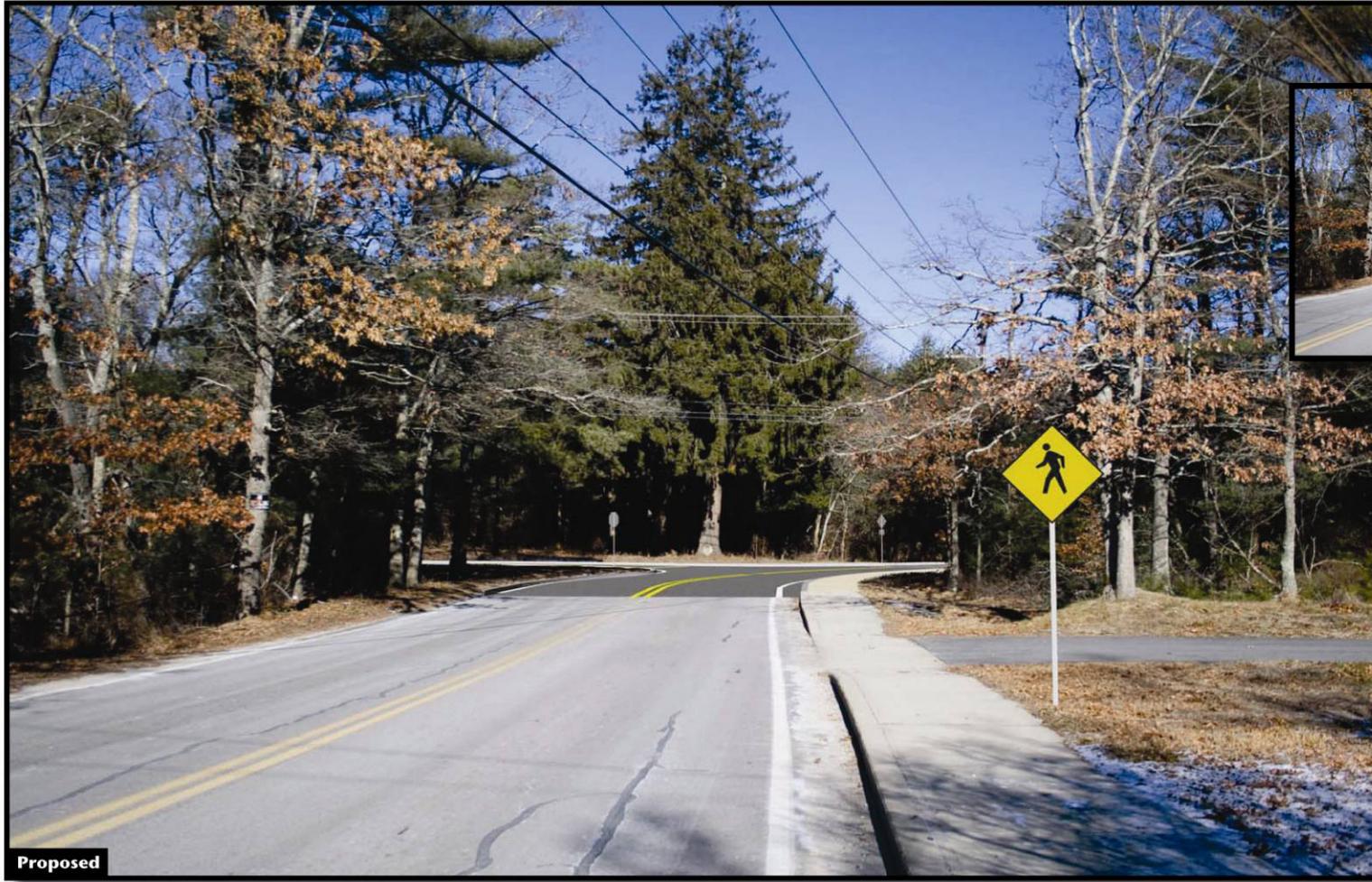
Traffic Signal Alternative



Conceptual Improvement Plan Halfway Pond Road at Bourne Road Unsignalized Intersection Alternative



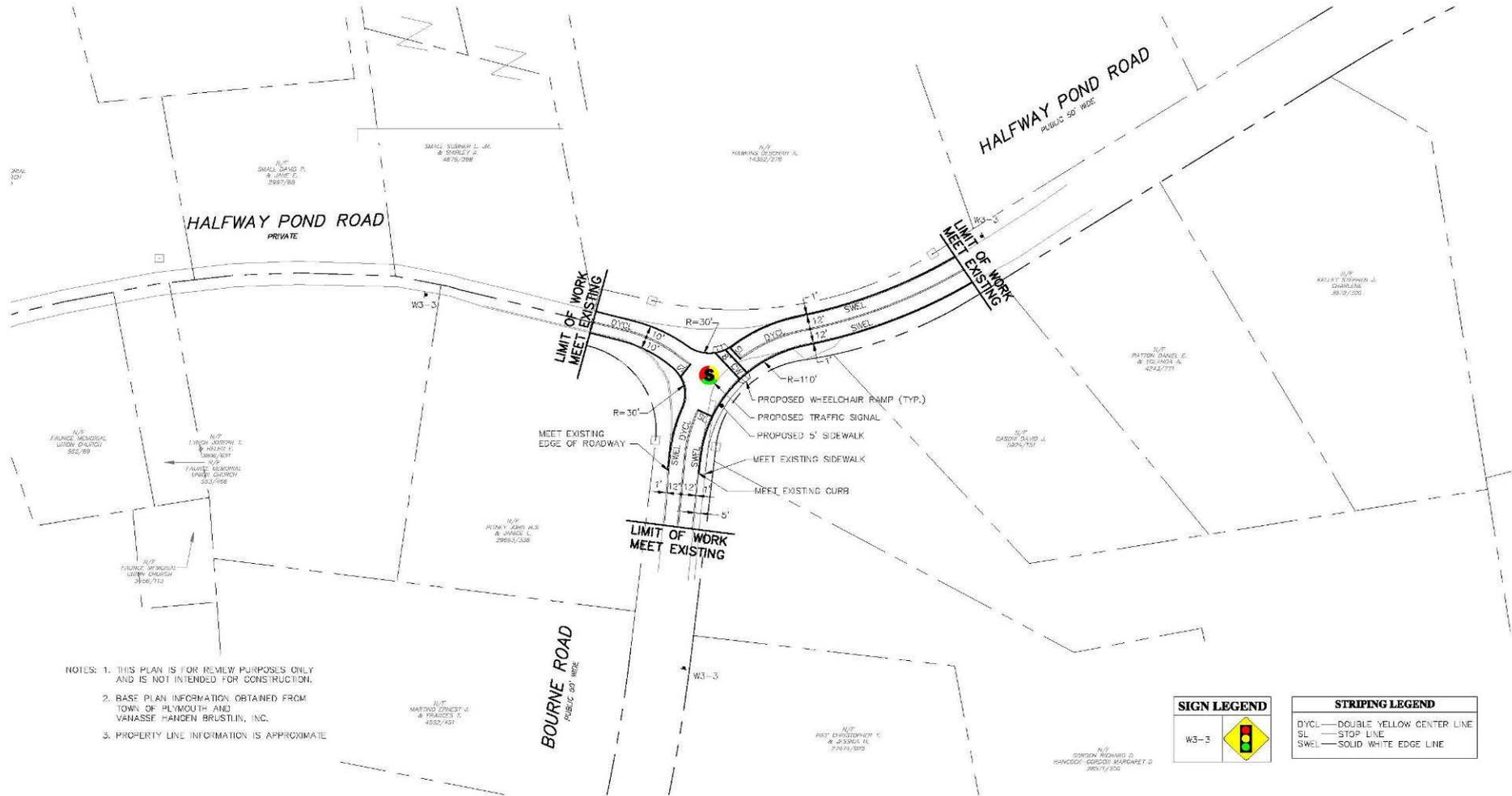
Conceptual Improvement Plan
Halfway Pond Road at Bourne Road
Bourne Road Approach
Unsignalized Intersection Alternative



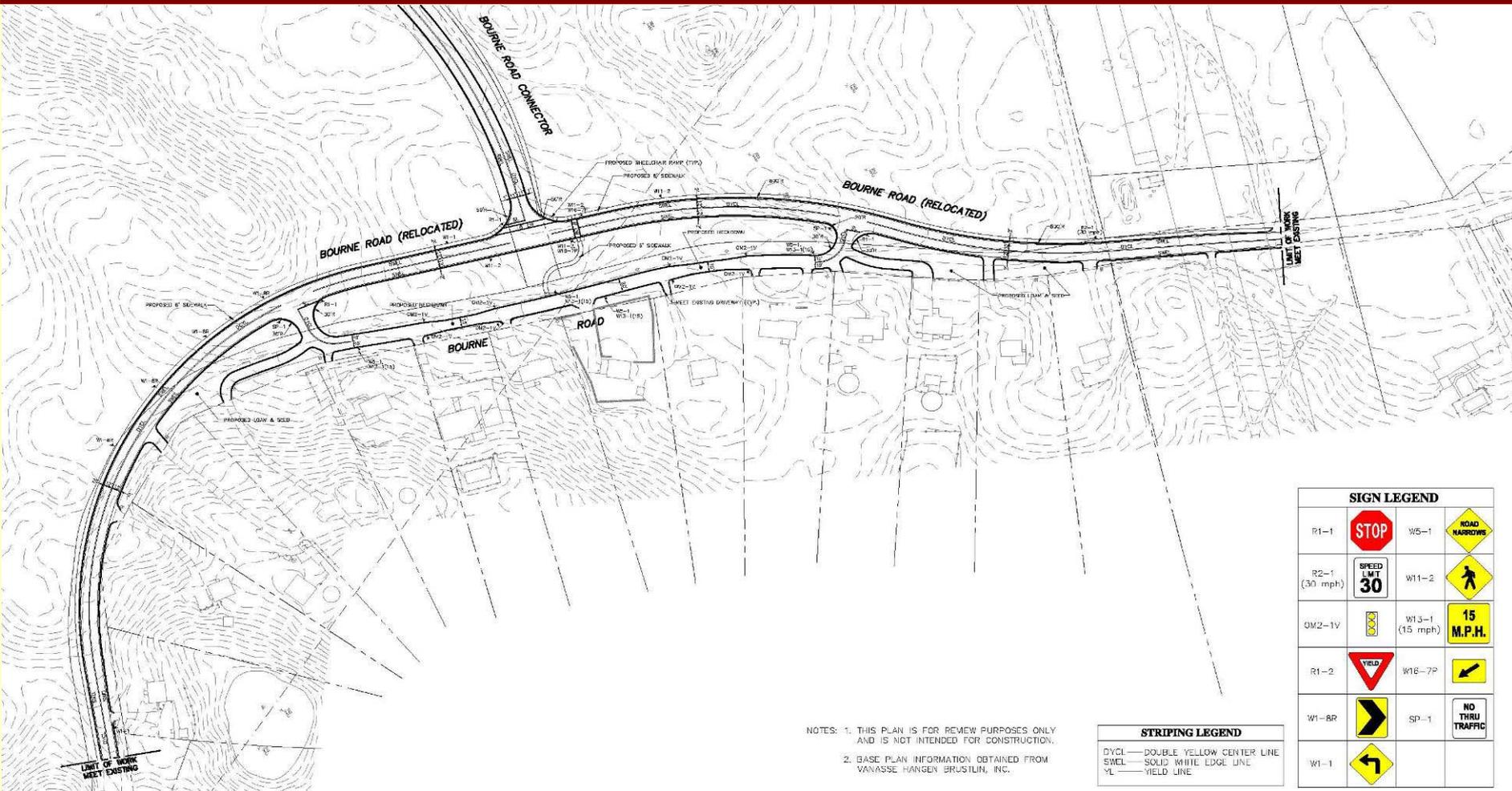
Conceptual Improvement Plan
Halfway Pond Road at Bourne Road
Halfway Pond Road Westbound Approach
Unsignalized Intersection Alternative



Conceptual Improvement Plan Halfway Pond Road at Bourne Road Signalized Intersection Alternative



Conceptual Improvement Plan Bourne Road at Bourne Road Connector Unsignalized Intersection Alternative



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STRIPING LEGEND	
DYCL	DOUBLE YELLOW CENTER LINE
SWEL	SOLID WHITE EDGE LINE
YL	YIELD LINE

SIGN LEGEND			
R1-1		W5-1	
R2-1 (30 mph)		W11-2	
OM2-1V		W13-1 (15 mph)	
R1-2		W16-7P	
W1-BR		SP-1	
W1-1			

Transportation System Improvements Schedule

Location	Improvement Description	Schedule of Completion	Anticipated Commencement Date (Dependent on Project Absorption)
Bourne Road Connector	Design and construct the Bourne Road connector.	Initial Site development.	Year 1
Bourne Road/ Bourne Road Connector	Realign Bourne Road and construct Bourne Road/Bourne Road Connector intersection.	Initial Site development.	Year 1
Internal Roadway Network	Install Traffic Calming Features	Commensurate with the Project build-out	Year 1
Wareham Road	<ol style="list-style-type: none"> 1) Upgrade Wareham Road cross-section, travel surface, sight lines, and add drainage improvements; pave with temporary binder course. 2) Final improvements to Wareham Road to Town standards; install signs and pavement markings. 	<ol style="list-style-type: none"> 1) Initial Site development. 2) Commensurate with the Project build-out along Wareham Road 	<ol style="list-style-type: none"> 1) Year 1 2) Year 3 to Project Completion
Long Pond Road/ Clark Road	Design and construct a single-lane modern roundabout.	Design prior to building permit issuance for the 101st residential unit or 20,000 sf of commercial space; construction prior to issuance of a Certificate of Occupancy for the 200 th residential unit or 75,000 sf of commercial space.	Year 1 or 2
Long Pond Road/ Ship Pond Road/ Herring Way	Design and reconstruct intersection to improve geometry per Town design subject to Town's ability to obtain necessary property rights/transfers and approvals.	Design prior to building permit issuance for the 200 th residential unit or 75,000 sf of commercial space; construction prior to issuance of a Certificate of Occupancy for the 400 th residential unit or 105,000 sf of commercial space and subject to Town's ability to obtain necessary property rights/transfers and approvals.	Year 1 or 2
Long Pond Road/ Halfway Pond Road/ Bloody Pond Road	<ol style="list-style-type: none"> 1) Upgrade signs and pavement markings. 2) Prepare Traffic Signal Warrants Analysis, Functional Design Report and design plans; construct a traffic control signal or single-lane modern roundabout 	<ol style="list-style-type: none"> 1) Prior to issuance of a Certificate of Occupancy for the 101st residential unit or 20,000 sf of commercial space. 2) Design and reports prior to building permit issuance for the 101st residential unit or 20,000 sf of commercial space; construction prior to issuance of a Certificate of Occupancy for the 200th residential unit or 75,000 sf of commercial space. 	<ol style="list-style-type: none"> 1) Year 1 or 2 2) Year 1 or 2

Transportation System Improvements Schedule

Location	Improvement Description	Schedule of Completion	Anticipated Commencement Date (Dependent on Project Absorption)
Halfway Pond Road/Bourne Road	Prepare Traffic Signal Warrants Analysis, Functional Design Report and design plans; construct a traffic control signal or single-lane modern roundabout	Design and reports prior to building permit issuance for the 101st residential unit or 20,000 sf of commercial space; construction prior to issuance of a Certificate of Occupancy for the 400 th residential unit or 105,000 sf of commercial space.	Year 1 or 2
Herring Pond Road/ Long Pond Road/ Tamarack Road	1) Upgrade signs and pavement markings and prepare a Traffic Signal Warrants Analysis. 2) If warranted prepare a Functional Design Report and 25% design plans for traffic signal control of the intersection. ^b	1) Prior to issuance of a Certificate of Occupancy for the 101st residential unit or 20,000 sf of commercial space. 2) Prior to issuance of a Certificate of Occupancy for the 400 th residential unit or 105,000 sf of commercial space.	1) Year 1 or 2 2) Year 3
Halfway Pond Road/ Wareham Road/ Mast Road	Upgrade signs and pavement markings; improve sight lines.	Prior to issuance of a Certificate of Occupancy for the 101st residential unit or 20,000 sf of commercial space.	Year 1 or 2
Halfway Pond Road/ West Long Pond Road	Improve sight lines and install signs and pavement markings.	Prior to issuance of a Certificate of Occupancy for the 101st residential unit or 20,000 sf of commercial space.	Year 1 or 2
Halfway Pond Road/ Justine Road	Monitor motorist delays during the weekday peak hours one-year after implementation of Halfway Pond Road/Bourne Road improvements and provide results to Town; design and implement improvements measures if operating conditions at intersection are significantly degraded by Project traffic.	1-year after completion of the Halfway Pond Road/Bourne Road improvements	Year 4
Herring Pond Road/ Route 3 Northbound Ramps	1) Upgrade signs and pavement markings. ^a 2) Install traffic control signals and improve intersection geometry	1) Prior to issuance of a Certificate of Occupancy for the 101st residential unit or 20,000 sf of commercial space. 2) By Others	1) Year 1 or 2 2) Year 1 or 2 (Estimated)

Transportation System Improvements Schedule

Location	Improvement Description	Schedule of Completion	Anticipated Commencement Date (Dependent on Project Absorption)
Herring Pond Road/ Route 3 Southbound Ramps	1) Upgrade signs and pavement markings. ^a	1) Prior to issuance of a Certificate of Occupancy for the 101st residential unit or 20,000 sf of commercial space.	1) Year 1 or 2
	2) Prepare a Traffic Signal Warrants Analysis. ^b	2) Prior to issuance of a Certificate of Occupancy for the 101st residential unit or 20,000 sf of commercial space.	2) Year 1 or 2
	3) If warranted prepare a Functional Design Report and 25% design plans for traffic signal control of the intersection ^b	3) Prior to issuance of a Certificate of Occupancy for the 200 th residential unit or 75,000 sf of commercial space.	3) Year 2
Plymouth Lane/Head of the Bay Road	Upgrade signs and pavement markings.	Prior to issuance of a Certificate of Occupancy for the 101st residential unit or 20,000 sf of commercial space.	Year 1 or 2
Clark Road/Route 3 Ramps	Install traffic control signals and improve intersection geometry (2 locations).	(By Others)	Year 2 (Estimated)
State Road at Herring Pond Road	1) Upgrade signs and pavement markings. ^a	1) Prior to issuance of a Certificate of Occupancy for the 101st residential unit or 20,000 sf of commercial space.	1) Year 1 or 2
	2) Install traffic control signals and improve intersection geometry.	2) By Others	2) Year 1 or 2 (Estimated)
State Road at Hedges Pond Road	Install traffic control signals and improve intersection geometry	(By Others)	Year 1 or 2 (Estimated)

^aIf improvements required as a part of the Cedarville Commons project are not completed.

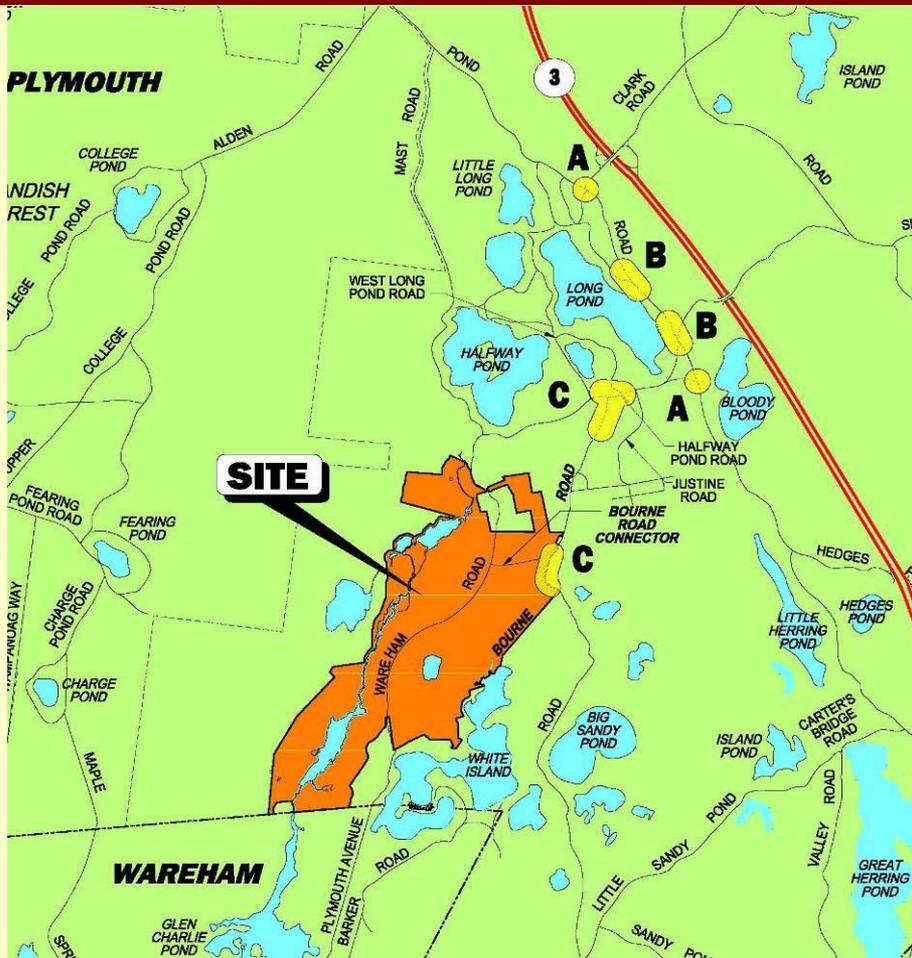
^bAn equivalent monetary value may be established for this element of the transportation improvement program to be used toward the completion of an alternative improvement measure more proximate to the Project site.

Note: Shaded items are committed improvements that are to be completed by others in conjunction with an associated approved development unrelated to the Project.

Internal Circulation Pedestrian and Bicycles



Traffic Calming Measures

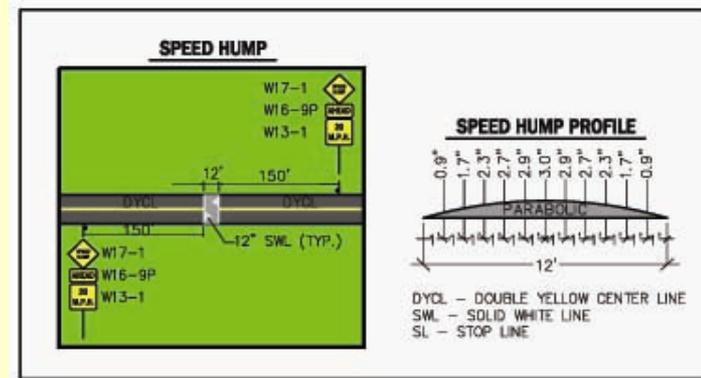
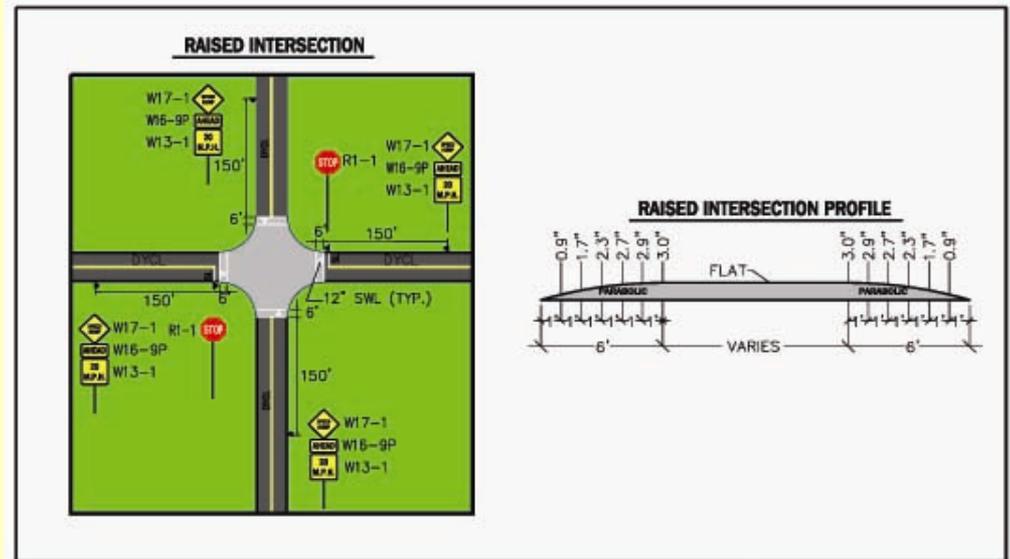
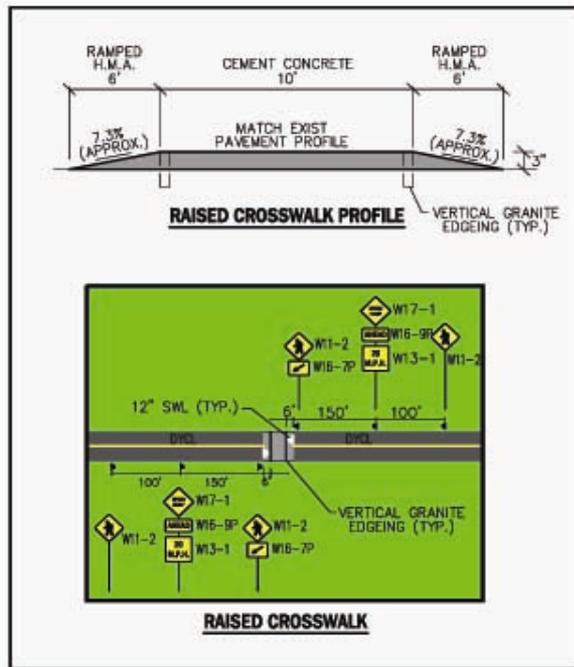


- A** – Install compact roundabout.
- B** – Install raised median or other horizontal deflection measure.
- C** – Realign roadway/intersection and incorporate raised median or other horizontal deflection measure.

Within Project:

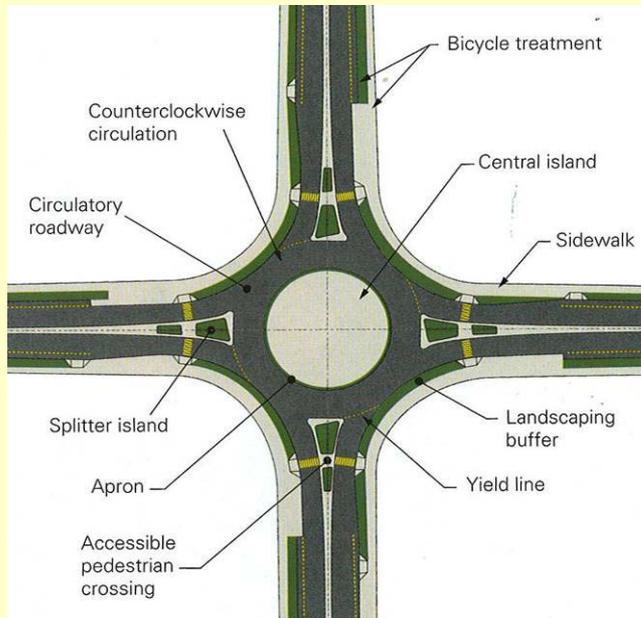
- Raised or textured crosswalks
- Speed tables (humps)
- Raised intersections
- Horizontal deflection (medians, neckdowns)
- Context sensitive roadway design

Traffic Calming Measures

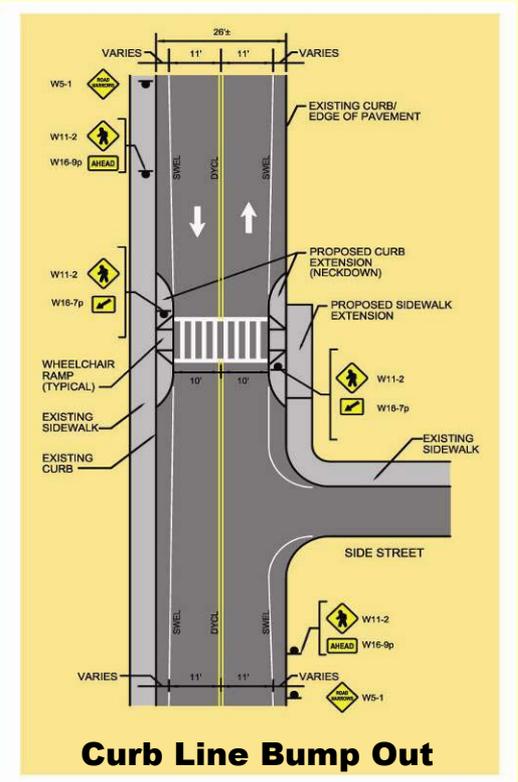
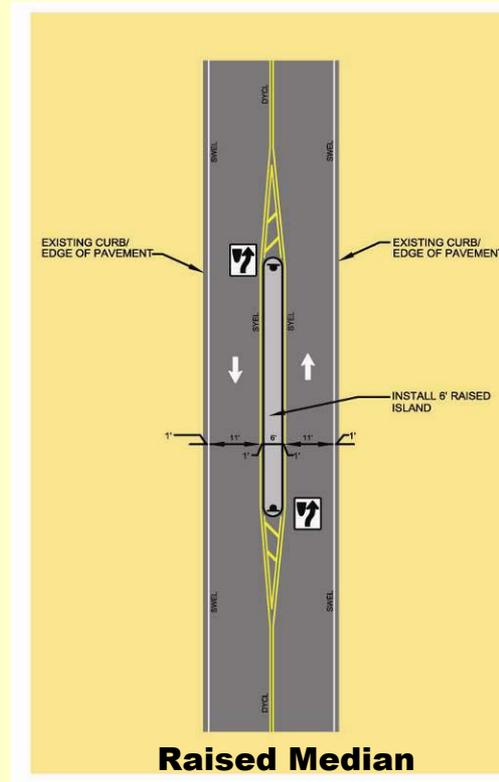


Traffic Calming Measures

Roundabout



Horizontal Deflection



Independent Peer Review

Questions and Answers

Future Meeting Topics

April 14, 2008

- Design/Master Concept Plan
- Project Infrastructure
 - Water Supply
 - Wastewater
 - Stormwater/Utilities
- Inclusionary Housing/Project Benefits
- Final Transportation Responses