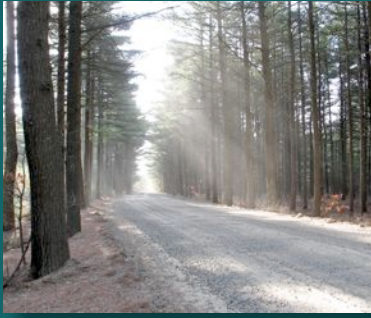




**GROWING SMARTER** *in Plymouth's Fifth Century*

*Report to 2006 Town Meeting from the Private & Gravel Roads Committee*



May 2006



## TOWN OF PLYMOUTH PRIVATE AND GRAVEL ROADS COMMITTEE

LARRY ROSENBLUM  
*Chairman, Member of Planning Board*

ANTHONY SCHENA  
*Vice-chairman, Member of Board of Selectmen*

DONNA ADMIRAND  
*Appointed by Board of Selectmen*

DANIEL GORMAN  
*Appointed by Board of Selectmen*

HARRISON (BUD) HOLBROOK  
*Appointed by Board of Selectmen*

DR. SANFORD LESLIE  
*Appointed by Board of Selectmen*

DANIEL O'NEIL  
*Appointed by Board of Selectmen*

GEORGE CROMBIE  
*Director, Department of Public Works*

RUSS FIRTH  
*Town Engineer*



CONSULTANTS  
**Goody Clancy**  
**VHB**



# Contents



EXECUTIVE SUMMARY	3
FORWARD	5
INTRODUCTION	7
KEY FINDINGS AND CHALLENGES	9
PRIVATE ROADS IN PLYMOUTH	11
FUNDING SOURCES FOR ROADWAY IMPROVEMENTS	17
COMMITTEE RECOMMENDATIONS	19
IMPLICATIONS FOR THE FUTURE	31
SUPPORTING DOCUMENTS	35



# Executive Summary

This report contains the recommendations of the Plymouth Private and Gravel Roads Committee, established by the Board of Selectmen in 2004. Many of the Town's private roads—paved and unpaved—are in poor condition, and many property owners on those roads want the Town to be responsible for upgrading and maintaining them. Gravel roads that collect traffic from local roads are deteriorating rapidly from increased traffic. In the past, the Town has plowed, cleared ice and performed emergency repairs without explicit authorization, but it lacks a plan and funding sources for maintaining private and gravel roads. The Board of Selectmen asked the Committee to formulate a plan for maintenance and upgrading of private roads and for financing improvements. This report recommends a new framework for managing private and gravel roads that provides:

- New road-classification categories and a public review process to protect roads with exceptional value to the Town's environment or character.
- An orderly upgrade path for private and gravel roads.
- Funding mechanisms that allow for Town contributions, private betterments, gifts, and developer contributions.
- Protections for environmental, scenic, and historic community assets.
- A public review process to insure community participation in the management of private and gravel roads.
- A road management plan.
- An advisory committee to assist in developing road policies and programs as the Town plans for its future.

## CONSIDERATIONS

In the course of its deliberations, the Committee considered a broad range of issues, including legal and ownership issues and obligations; road safety considerations; engineering and design; construction and maintenance costs; environmental concerns; community character concerns; growth and development concerns; and network management and public-use considerations.

## COMMITTEE RECOMMENDATIONS

1. **Continue current services**, such as snow plowing and limited minor repairs, on private roads that currently receive them, but provide explicit legal authorization for doing so.
2. **Adopt a new road-classification system.** New road categories specific to Plymouth's conditions—Minor Collectors of Special Character (such as Old Sandwich Road) and Rural Conservation Roads (such as Drew Road)—should be included in the new system.
3. **Define the criteria for inclusion of roads in two new road categories**, Minor Collectors of Special Character and Rural Conservation Roads. The criteria focus on the environmental and community-character importance of roads in these categories.
4. **Establish upgrade paths for Minor Collectors of Special Character, Rural Conservation Roads, and Private Local Roads** to ensure measured and orderly improvements. A process of petition to the Board of Selectmen, review by appropriate Town departments and boards, and a technical assessment of needs and costs should replace the Town's previous practices.
5. **Establish a Road Review Process for Minor Collectors of Special Character and Rural Conservation Roads.** Because these two categories have unusual significance for the Town, paving of Minor Collectors and any improvements to Rural Conservation Roads should include an evaluation process and public hearing.
6. **Create a cost-sharing Betterment Program** to help fund approved improvements to Minor Collectors of Special Character, Rural Conservation Roads, and Private Local Roads. The cost of bringing private and gravel roads up to an acceptable standard is almost \$28 million in current dollars, according to a consultant's report. A betterment program can fairly allocate costs among abutters, developers, the Town, and others.
7. **Establish decision criteria for paving certain gravel roads.** A systematic evaluation of the need, costs and benefits of paving will provide objective criteria for decision making.
8. **Establish a Roads Advisory Committee to refine policies and programs.** This new committee can play a critical role as Plymouth grows and implements its Master Plan. Coordination of transportation with land use is critical to preserving Town character, particularly in balancing the needs of rural areas with the desire for the mobility and access found in more urban areas.





# Forward

Plymouth is blessed with a beautiful and historic landscape that includes miles of coastline, numerous ponds, forests and natural habitats, cultural resources, and beautiful country roads. For over three centuries, growth was slow to come to Plymouth and, unlike many other towns in Massachusetts, it was able to retain many of its natural and cultural treasures. Over the last decade, however, Plymouth has grown dramatically. As Route 128, Interstate 495, and Route 3 South to Cape Cod saw explosive growth, Plymouth found itself in the path of major development. Now Plymouth is not only a destination for tourists, but also has become a bedroom community for workers in metropolitan Boston. MBTA commuter rail, highway connections to Interstate 495, and future plans to widen Route 3 have enhanced Plymouth's desirability as a place to live. Plymouth will continue to face significant growth pressures over the coming decades. If not properly managed, this growth can have significant negative impacts on the Town's natural and cultural landscapes.

Residential growth brings increased traffic to Plymouth, and stress on the transportation system has led to concerns about the future of Plymouth's many private and gravel roads: Who is responsible for the maintenance of private roads experiencing increased use? How do you transition former cart paths into more heavily traveled public ways? Should the Town's gravel roads be paved? How can needed improvements be funded?

The Committee on Private and Gravel Roads was appointed in 2004 to explore these questions. This report considers how Plymouth can provide consistent, efficient road maintenance and improvement services and obtain new sources of funding to support these activities. This framework should enable the Town to create a management plan for private and gravel roads that will help anticipate and respond to changes brought about by increased growth.

Special thanks go to Larry Rosenblum, a Planning Board member and Chairman of the Committee on Private and Gravel Roads, for creating an atmosphere that allowed thoughtful discussion and debate. Anthony Schena, Vice-Chairman, represented the Board of Selectmen and continually coached and fostered consensus through many of the most complex issues. Dr. Sanford Leslie, Donna Admirand, Daniel O'Neil, Harrison (Bud) Holbrook, and Daniel Gorman rearranged personal work schedules to accommodate committee business and worked tirelessly toward achieving our goal. Thanks also go to the Department of Public Works and Russ Firth of the Engineering Division for providing back-up resources to the Committee, and members of our consultant team: Vanasse Hangen Brustlin (engineering), Goody Clancy (planning), and Kopleman and Page, P.C. (legal).

Finally, special thanks to George Crombie, Director of Public Works, for his leadership in this effort. The recommendations made by the Committee reflect George's vision for managing long-term growth and change while protecting the qualities that make Plymouth special.





# Introduction

*“Many people come to know their community from the windshield of their car. Let’s make our roads as safe, comfortable, and attractive as we can, for drivers, pedestrians, and cyclists.”*

—PRIVATE AND GRAVEL ROADS COMMITTEE

## Plymouth Private and Gravel Road Committee

In the spring of 2004, the Plymouth Department of Public Works held a public hearing on infrastructure needs. At this meeting, Plymouth residents raised numerous concerns about



the Town’s management and care of private and gravel roads. Public comment reflected persistent concern about the Town’s gravel roads. In past Town Meetings, the issue of whether or not to pave gravel roads had often arisen but had never been resolved.

The Department of Public Works recommended to the Board of Selectmen that a committee be formed to address the management of private and gravel roads. In

response to this recommendation, in the summer of 2004 the Board of Selectmen appointed a seven-person Committee on Private and Gravel Roads. Several major challenges faced the Committee as it explored the private and gravel roads issues:

- Many of the Town’s private roads—paved and unpaved—are in poor condition.
- Many property owners on local private roads want the Town to be responsible for upgrading and maintaining private roads.
- Gravel roads that collect traffic from local roads are deteriorating rapidly from increased traffic.
- The Town lacks a plan and funding sources to maintain private and gravel roads.

The Board of Selectmen asked the Committee to respond to these challenges by:

- Formulating a plan for maintenance and upgrading of gravel and private roads in Plymouth;
- Identifying a strategy to finance improvements to gravel and private roads;
- Presenting a progress report to Town Meeting in Spring, 2005; and
- Presenting final recommendations at the 2006 Spring Town Meeting.

Since its inception, the Committee for Private and Gravel Roads has met over two dozen times. Discussions centered on the multitude of factors that require consideration when recommending a plan for managing and upgrading private and gravel roads. They include:

- Legal and ownership issues and obligations;
- Road safety considerations;
- Engineering and design;



- Construction and maintenance costs;
- Environmental concerns;
- Community character concerns;
- Growth and development concerns; and
- Network management and public use considerations.

The Committee received reports from the town’s professional staff on funding, environmental issues, and road systems management, and the Committee conducted site visits to “problem spots” around the community. In addition, town counsel reported on legal aspects of public and



private roads and consultants prepared analyses and recommendations for a gravel road improvement program. Public hearings were held on March 3, 2005, and February 15, 2006, to receive comment on gravel roads issues.

After numerous discussions, careful research, and public input, the Committee on Private and Gravel Roads developed the following findings and recommendations to manage private and gravel roads in the Town of Plymouth.

# Key Findings and Challenges

## Findings

- Development trends have a significant impact on gravel roads:
  - > Plymouth is growing rapidly;
  - > Growth results in increased traffic and rapid deterioration of gravel roads;
  - > Growth affects the Town's ability to provide services;
  - > Development pressures are strongest in the rural areas of Plymouth; and
  - > Growth impacts come both from individual homeowners and from developer activities.
- Over half of the road miles in Plymouth are private.
  - > Plymouth has 376 miles of roadways
  - > 176 miles (46%) are public; 200 miles (53%) are private
- Forty percent of private roads are unpaved.
  - > 79.7 miles of private roads are unpaved
  - > 10.6 miles of public roads are unpaved
- A large percentage of requests to the Department of Public Works for road repairs involve private roads.
- The Town has never had a consistent policy about its role in maintaining private roads.



## Challenges

- Many private roads are located in areas with significant build-out potential.
- Some private roads are increasingly being used as town-wide connectors.
- No design or development standards exist to ensure preservation of the visual character of private roads or to protect environmental and historic resources.
- Rapid growth in earlier decades was addressed by incremental decision-making that led to inconsistent policies and practices regarding private roads.
- Few funding sources are available to support adequate levels of Town maintenance on private roads.



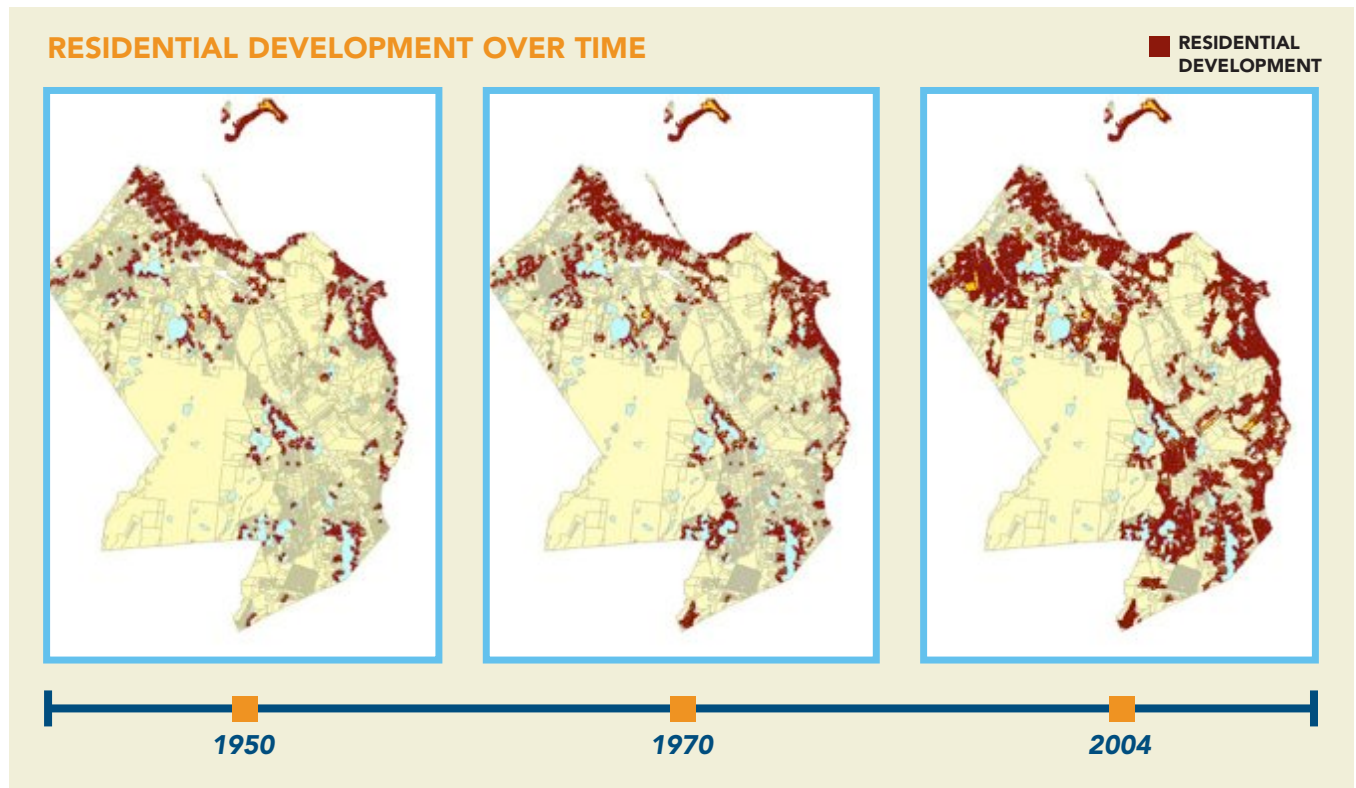




# Private Roads in Plymouth

## History

Many communities south of Boston, such as Barnstable, Falmouth, and Plymouth, have a significant number of private roads. Some of these roads date back to colonial times, originating as Indian trails or cart paths. As Plymouth and the Cape Cod communities grew, these paths developed into rudimentary roadways. In the nineteenth and twentieth centuries, the roadways primarily served summer cottages on Plymouth's numerous ponds and coastline. Other private roads were created as part of subdivision plans or as roads on private land intended for private use only. Limited town investment was made in these roadways because of their seasonal or exclusive use.





As more subdivisions sprang up in the late twentieth century, the number of private roads increased. In addition, beginning in the late 1980s, many new permanent residents moved into the area, and most of the summer cottages were converted to year-round homes. As a result,



increased traffic has resulted in the rapid deterioration of these private roads. This road deterioration is especially acute on gravel roads that carry more than 200 cars per day or truck traffic. The permanent population of Plymouth will continue to increase in the next decade, given the recently restored commuter rail service to Boston, plans to widen Route 3, and the opening of new Route 44. As a result, the Town's private roads will see greater use and faster deterioration. A management and maintenance plan must be created to deal with these increased impacts. One of the challenges will be finding new funding sources to

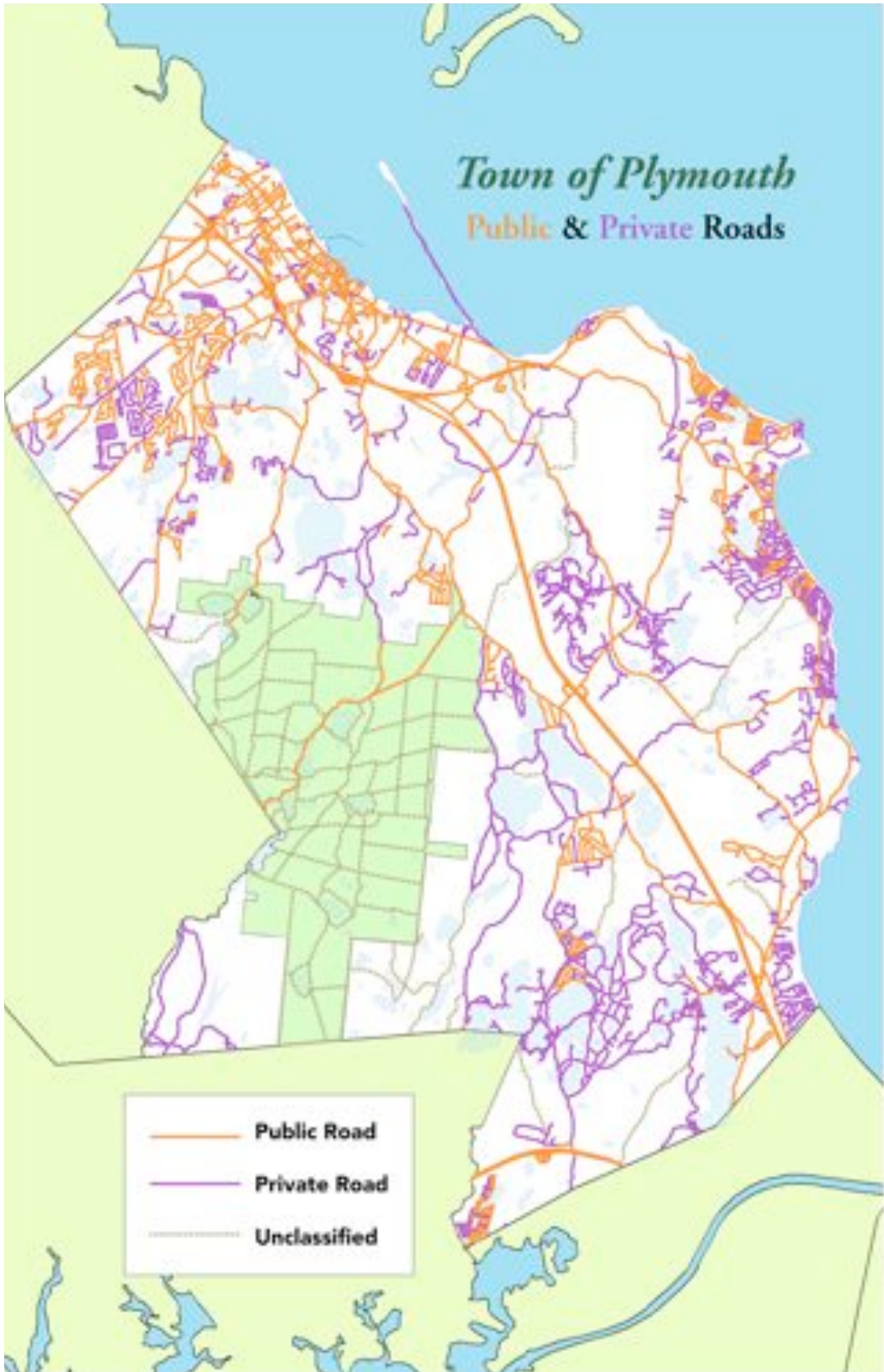
support management and improvement of private roads. According to a recent study for the Town by Vanasse Hangen Brustlin, Inc. (VHB), traffic engineers, the cost of upgrading private roads in Plymouth to acceptable conditions is on the order of \$28 million. The study, *Gravel Road Improvement Program*, is available for review through the Department of Public Works.

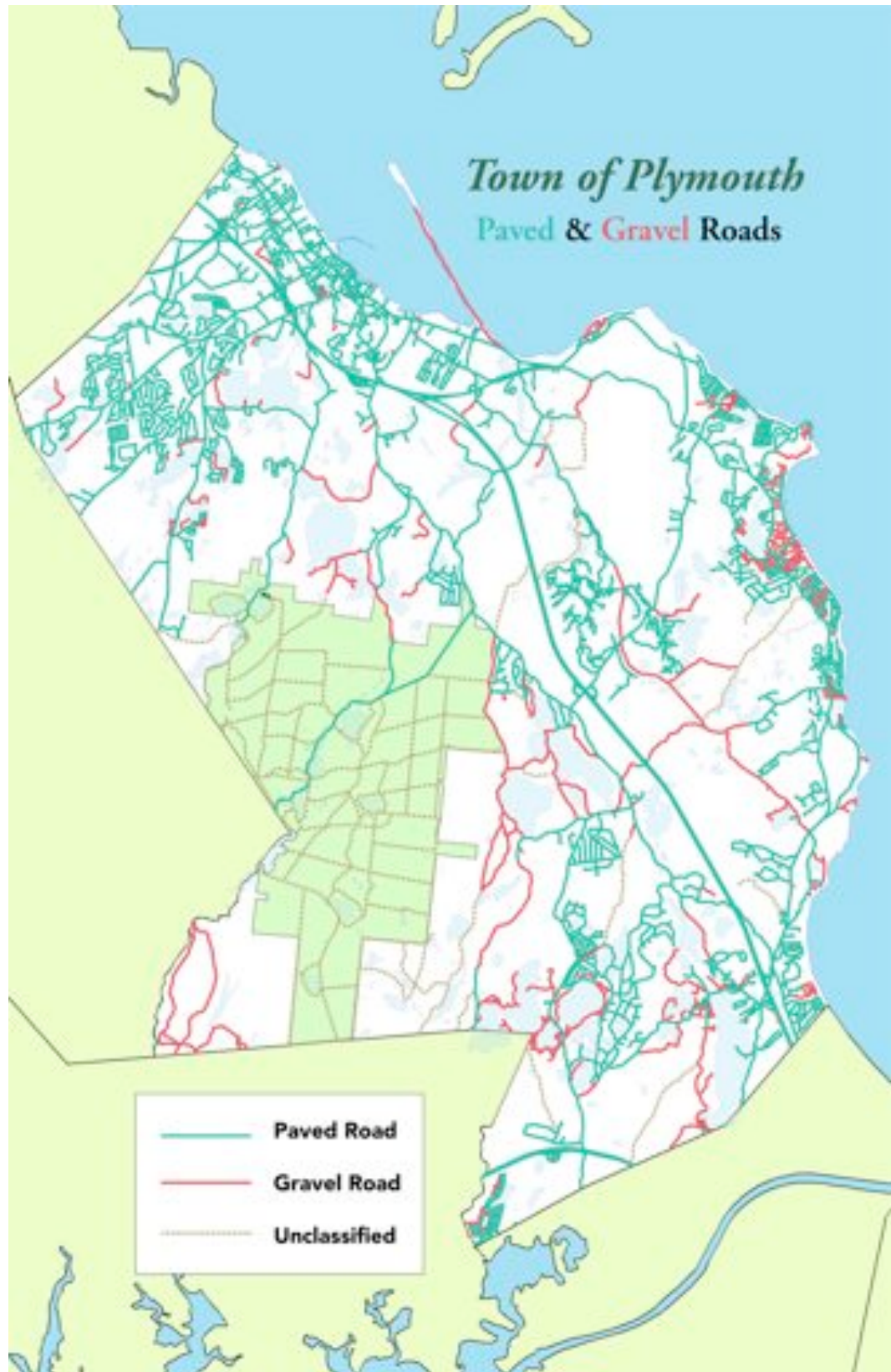
**Classification and Town Duties**

The Town of Plymouth has 376 miles of classified roadways: 176 miles are public roads and 200 miles are private roads. The Town also has approximately 70–132 miles of unclassified ways that are located mainly in the southwest in and near Myles Standish State Forest. The biggest differences between a public and private road are acceptance and ownership.

On a public way, the Town owns the road and has the duty to maintain, repair, clear snow and other obstacles, and provide for a reasonable standard of safety (M.G.L. c.84). Due to Town acceptance and ownership, the Town may be liable for injuries caused by a defect, or lack of repair in a Town way (M.G.L. c.84, Section 15). Private roads, by definition, are not owned or controlled by the town, and the Town has no obligation to maintain a private way. However, M.G.L. c. 40, Section 6(n) provides that a town may enact bylaws that permit the expenditure of funds for the temporary repairs or plowing of snow along private ways. The Town of Plymouth has enacted a bylaw authorizing limited temporary repairs to private ways, but not snow plowing. Pursuant to Section 162-12 of the Town Bylaws, the Plymouth Board of Selectmen and Town Meeting may authorize temporary repairs to private ways that have been open to public use for six or more years, upon certain conditions.

Repairs to private roads have been authorized many times in the past, but no clear policy exists regarding these repairs. This has resulted in several inconsistencies: some private roads receive limited maintenance, whereas others receive no maintenance at all, and snow plowing and maintenance often occur without specific authority.









### Town Acceptance of Private Roads

Most communities provide a process through which a new road constructed as a part of a subdivision can become a public road. When subdivision roads are constructed to town specifications, the developer may petition the town to take over the road. If the town accepts, it will receive title to the road right-of-way (which normally is 50 feet wide) and required drainage easements. Acceptance means that the town also assumes maintenance of the road and has the right to work within the right-of-way and drainage easements. Plymouth now uses this acceptance process, and approximately 176 miles of private roadways have been accepted by the Town. However, before the 1990s, the Town did not have an acceptance policy, which resulted in the construction of roads without standards or clear determinations of who owned the roadway right-of-way. The Town conducted maintenance based on informal agreements that were not tied to any authority or plan. More than half of the Town's roadways (200 miles) fall into this category. During the past decade, the Planning Board has worked to ensure that determinations about the acceptance of subdivision roads will be made before road construction. If the road is to become public, the developer must construct it with a minimum pavement life of 20 years in order for it to be accepted by the Town. If the road will remain private, then it is made clear that the Town will not plow or maintain the road in the future.



The Town cannot accept every private road within its boundaries. Acceptance brings legal liability for maintenance and repair, and the Town does not receive enough monies through Chapter 291 and local taxes to fund all needed improvements. Without adequate funding, the roads may not meet an acceptable standard of repair. Substandard roads equal increased liability for the Town; therefore, an acceptance policy must recognize the limits of the Town's ability to accept

and maintain private roads, ensuring that accepted roads will conform to applicable design standards.



In addition, the acceptance process for private roads brings its own costs. In order to accept a private way, the Town must have it surveyed and approved by Town Meeting. This can be an expensive and time-consuming process,



particularly if some residents who own property abutting the street object to acceptance, for objections can give rise to litigation or an eminent domain situation. Resistance to street acceptance can lead to legal and engineering costs that exceed the cost to accept and upgrade the private road.

# Funding Sources for Roadway Improvements

## Federal Sources

Federal transportation funding goes to the interstate highway system and state road systems and qualifying city and town roads. Federal funding to municipalities usually comes in the form of grants for bridge construction, urban highways, bike paths, and other designated projects. Federal money flows through the state, and each municipality must compete for these dollars through the regional Metropolitan Planning Organization (MPO). Plymouth's MPO is administered by the Old Colony Planning Council. Federal funds are allocated to each state through a formula. In some cases, funds may be earmarked for certain projects in federal transportation bills. Depending on the program, each municipality must provide matching funds for any federal funds received. Although some federal funding may be available for Town transportation projects, no federal funds can be used on private roads.

## State Funding Sources

Under M.G.L. c. 291, a public road is eligible for State funding to help defray some of the maintenance costs of a public way. In 2004, Plymouth received Chapter 291 funds totaling approximately \$5,113 per mile for its public ways. Additional state transportation funds may come from special grants to promote economic development, from earmarked projects in the budget, and from programs that support alternative modes of transportation, such as bicycles. Long Pond Road and Obery Street have received funds from these programs. As with federal funding, no state dollars may be spent on private roads.

## Local Funding Sources


Plymouth allocates a small portion of its General Fund transportation monies for maintenance and repair of private roads. The Department of Public Works spends about \$350,000 per year on maintenance of private and gravel roads, not including amounts spent on snow removal from private roads. Most of the expenditures for private roads go toward grading gravel roads and emergency repairs. There is a wide gap between the Town's annual allocation per mile and the actual maintenance costs expended on private roads. A new method of funding must be found in order to maintain private roads in the future.

**Table 1: Plymouth Highway Improvement and Maintenance Expenditures, 2004\***

	PRIVATE ROADS	PUBLIC ROADS	TOTAL
Annual General Fund expenditures	\$350,000	\$797,000	\$1,147,000
General Fund expenditures per mile	\$1,750	\$4,528	N/A
Chapter 291 funds	\$0	\$899,910	\$899,910
Chapter 291 Funds expenditures per mile	\$0	\$5,113	N/A
Infrastructure Management Program (IMP)	\$0	\$1,300,000	\$1,300,000
IMP expenditures per mile	\$0	\$7,386	N/A
<b>Total annual roadway expenditures</b>	<b>\$350,000</b>	<b>\$2,996,910</b>	<b>\$3,346,910</b>
<b>Total average expenditure per mile</b>	<b>\$1,750</b>	<b>\$17,027</b>	<b>N/A</b>
<b>Percentage of total roadway budget</b>	<b>10.5%</b>	<b>89.5%</b>	<b>100%</b>

\* These figures do not include costs of snow removal, estimated at \$900,000 (half public funds, half private funds).

Source: Town of Plymouth Department of Public Works



In the 1980s and 1990s, the Town funded some private road maintenance through a gift account program, in which owners of property abutting the private way would request maintenance and pay the Town to perform this maintenance. This was part of an attempt to establish a street acceptance program, but the program never gained momentum due to a lack of funding and the complexity of the street acceptance process. At present, many residents living on private roads expect that the Town should be doing more to maintain these roads, but no plan or adequate funding exists to make repairs and maintain private roads in the Town of Plymouth.

### **Upgrades to Gravel Roads**

About 79.7 miles of the Town's private roads are unpaved. One of the most significant issues in the private road debate is whether gravel roads should receive upgrades. Many of these roads already receive limited Town maintenance, but a growing number of residents would like to see these roads paved. These residents argue that gravel roads damage their cars, hinder school bus movement, and decrease response time for emergency vehicles. However, other citizens believe that widespread paving of the Town's gravel roads will detract from community character, permit increased vehicle speeds, and contribute to higher accident rates. In addition, questions exist about how the Town can fund extensive upgrades to gravel roads. This community division points to a clear need for a plan that will delineate a paving and maintenance policy and offer concrete funding sources.



# Committee Recommendations

## 1. Continue current services for all private roads.

The Town should continue to provide limited minor repairs on all private roads currently being maintained by the Town. In addition, snow and ice clearing should continue on all private roads currently being plowed by the Town. This practice, however, should receive legal clarification. Clear authorization of current practices will provide a sound basis for future maintenance decisions.

## 2. Adopt a new road classification system.

The Town should adopt a new road classification system that will help it determine its responsibilities for maintenance on public and private roads. This classification system should be based on transportation, land use, environmental, and aesthetic goals identified in this report and compatible with the Town's Master Plan. While functional road classification systems all reflect common transportation criteria, additional considerations can be incorporated into a classification system to reflect other specific needs. The proposed new functional classification system has eight categories:

- **State Roads:** Regional connector roads owned or controlled by the Commonwealth of Massachusetts, including but not limited to Routes 3, 3A and 44. Plymouth has 69.9 miles of state highways.
- **Principal Arterials:** Roads that provide direct access to state highways or serve as major connectors to neighboring towns and average over 5,000 vehicle trips per day. There are 35.4 miles of principal arterials in Plymouth. These roads include Beaver Dam Road, Upper Long Pond, South Street, and Commerce Way.
- **Major Collectors:** Roads that are used by general traffic and connect Minor Collectors or Local Roads to a Principal Arterial, with traffic counts averaging between 1,000 and 5,000 trips per day. These roads often provide access to commercial property and see increased traffic volumes as community growth occurs. Standish Avenue, Bourne Road, the northern portion of Long Pond Road, and Hedges Pond Road are examples of Plymouth's 39.6 miles of Major Collectors.
- **Minor Collectors:** Roads that provide access the major collectors and connect neighborhoods. These carry an average of 200 to 1,000 vehicle trips per day and include roads such as Charlotte Drive, Montgomery Drive, Ship Pond Road, Wareham Road, and Old Sandwich Road. Plymouth has 46.84 miles of Minor Collectors, not including Minor Collectors of Special Character (below).
- **Minor Collectors of Special Character (MCSC):** A type of Minor Collector, these roads have recognized environmental, historic and/or scenic characteristics. Some, though not all, are among Plymouth's earliest roads, abut historic properties, and provide close, intimate views of farm fields, pastures, traditional buildings, fences, vegetation, ponds, or other surface water bodies. The Private and Gravel Road Committee recommends designating 19.96 miles of gravel roads in this category. Minor Collectors of Special Character should include:



- > Little Sandy Pond Road, from Carter’s Bridge to Bourne Road (2.47 miles)
- > Long Pond Road, from Hedges Pond Road to Herring Pond Road, (2.00 miles)
- > Old Sandwich Road, from Jordan Road to Route 3A, (7.25 miles)
- > Roxy Cahoon Road, from Valley Road to Sandy Pond Road, (1.12 miles)
- > Ship Pond Road, from Long Pond Road to Route 3A, (3.07 miles),
- > Valley Road, from Carter’s Bridge to Roxy Cahoon Road (0.94 miles)
- > Wareham Road, from Mast Road to Town line, (3.11 miles).

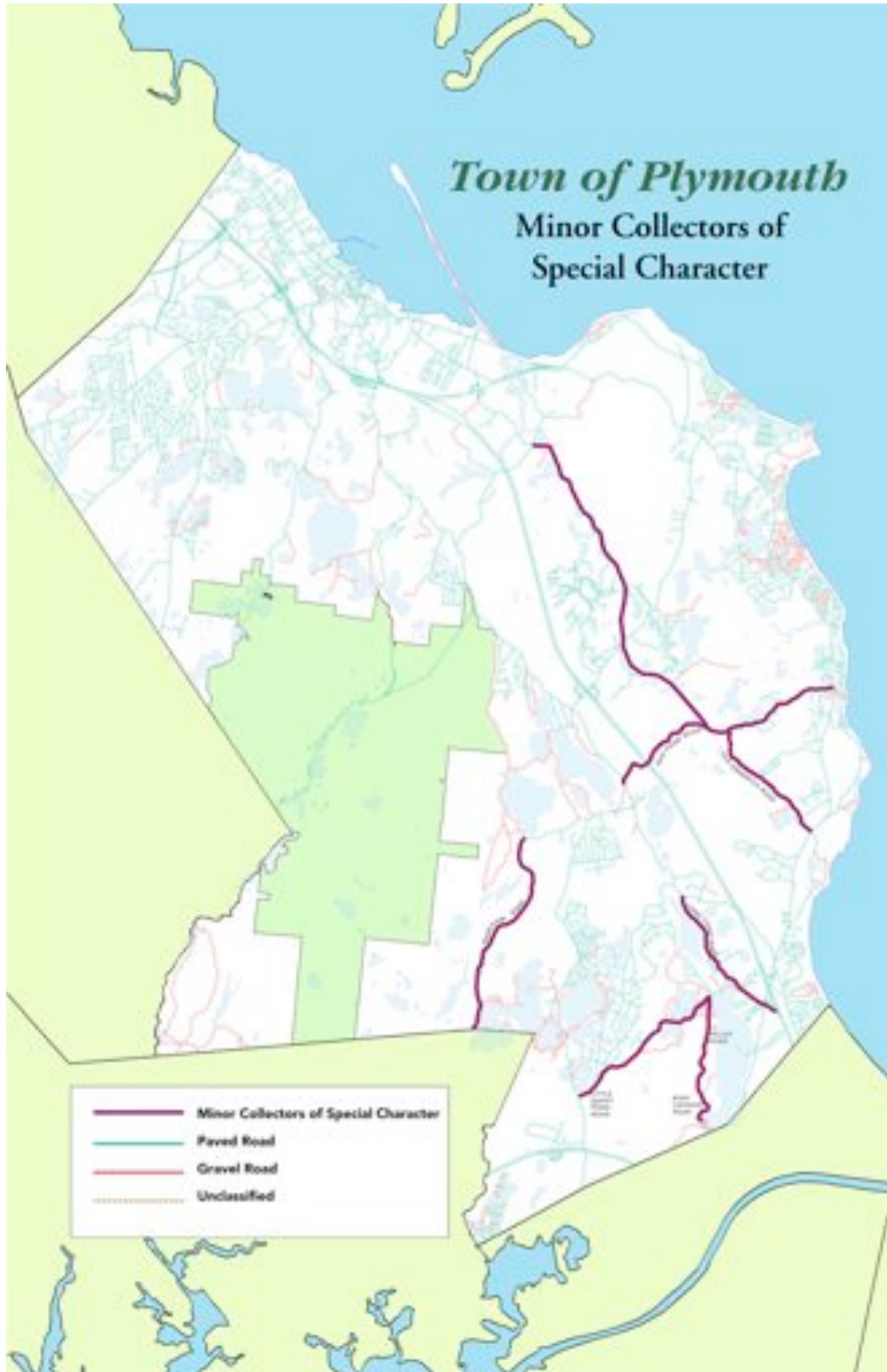
Because these roads are of special significance to the Town, no modification should occur—with the exception of upgrades to a Gravel Road Standard—without a review process including a public hearing described in this report as the “Road Review Process.” Inclusion or removal of roads in the MCSC category also will be subject to the Road Review Process. (A “gravel road standard” is the set of design, construction and maintenance standards for roads with a permeable—unpaved—surface. Generally this means an excavated base, graded and crowned subsurface, and a stabilized travel surface.)



- **Local Roads:** Used mainly by abutting property owners, these roads are not collectors and see low traffic counts and little through travel. Typically, fewer than 200 vehicle trips are made along these roads each day. This category includes the majority (227.6 miles) of Plymouth’s public and private roads.
- **Rural Conservation Roads (RCR):** These are low-traffic roads, whether or not currently paved, that traverse land significant to the environmental, historic and/or scenic heritage of the neighborhood in which they are located, or the Town, and whose character is threatened by significant unplanned and undesired traffic growth as a result of nearby development or overall town growth. The Committee believes that over 6 miles of roads qualify as Rural Conservation Roads:



- > Drew Road, entire length, (1.71 miles)
- > Mast Road, entire length, (3.15 miles)
- > West Long Pond Road, entire length, (1.54 miles)



Any modification of these roads—including upgrade to Gravel Road Standard and the inclusion of roads in, or their removal from this category—should be subject to the Road Review Process.

- **Unclassified:** Approximately 70 to 132 miles of roads in Plymouth do not meet the criteria for a public, private, or gravel road. These roadways generally include drives, cart paths, or other unusual travel ways, and many of them are located in Myles Standish State Forest. The Committee has not determined whether the Town should assume maintenance of any of these unclassified roads, deferring this issue for further study.

**Table 2: Proposed Road Classification System**

TYPE OF ROAD	ROAD MILES	AVERAGE TRIPS PER DAY
State Highways	69.9	Over 5,000
Principal Arterials	35.4	Over 5,000
Major Collectors	39.6	1,000 to 5,000
Minor Collectors (excluding MCSC)	46.84	200 to 1,000
MCSC: Minor Collectors of Special Character	20.0	200 to 1,000
Local Road	227.6	Low
Rural Conservation Roads (RCR)	6.4	Less than 200
Unclassified	70–132	N/A

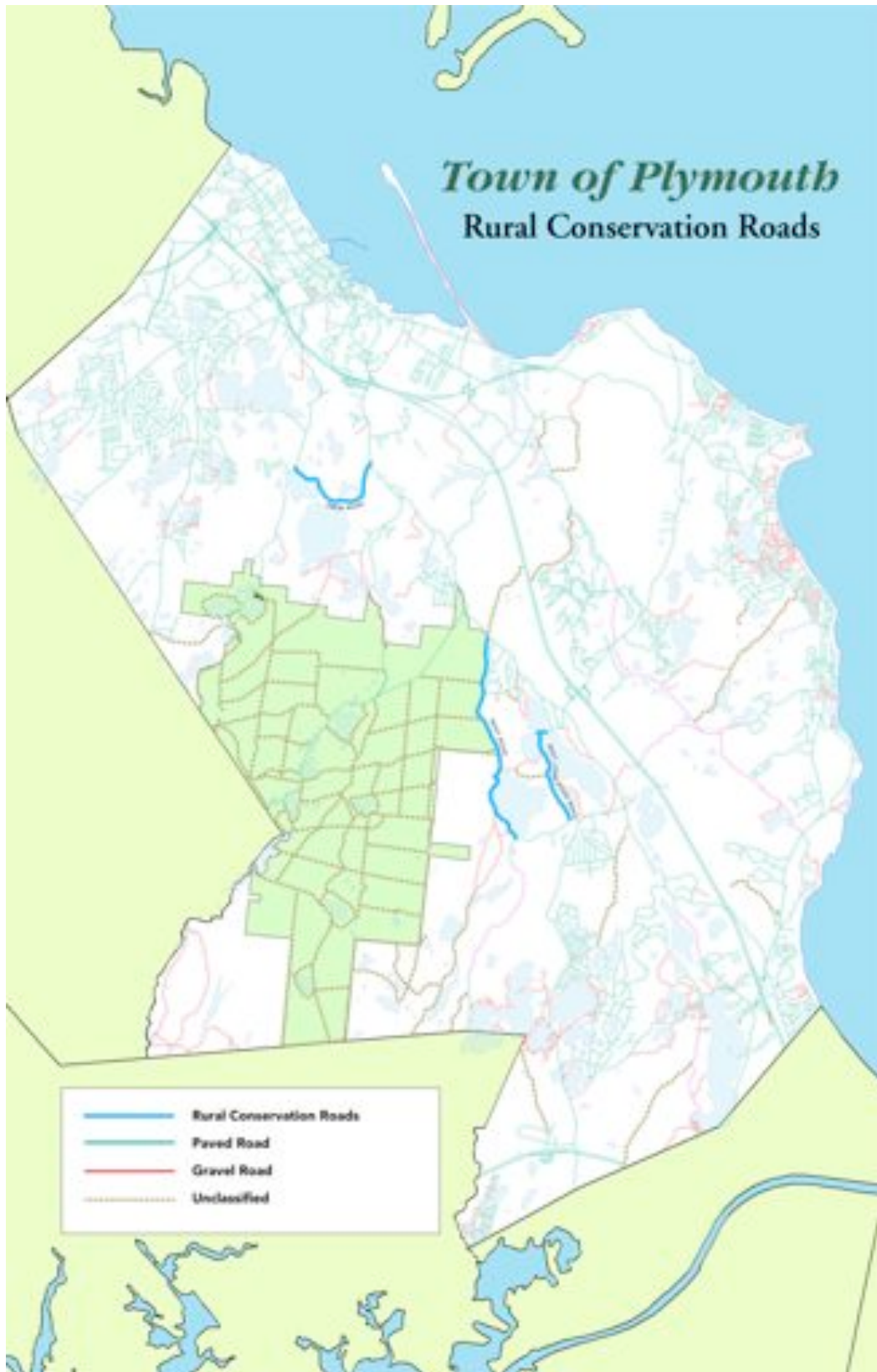
Inclusion of roads in the MCSC and RCR categories must be consistent with the Plymouth Master Plan and the roads must be evaluated for the following attributes:

- Proximity to surface water so as to be within the jurisdiction of the Conservation Commission
- Existence of rare or endangered species
- Proximity to historic attributes, including but not limited to ancient cemeteries, publicly recognized historic structures, and monuments
- Special landscape or scenic features, including, but not limited to, trees and canopies, scenic vistas, stone walls or other distinguishing constructed elements
- Abutting land designated as conservation land, State or Town Forest
- Proximity of residences within 50 feet of the traveled road edge that would be significantly impacted by changes to the road; and/or
- Presence of or suitability for pedestrian or bicycle use that may be threatened by proposed changes.

### **3. Define qualifications for inclusion of roads into the categories Minor Collector of Special Character (MCSC) and Rural Conservation Road (RCR).**

The following characteristics make Minor Collectors and other low-volume roads subject to inclusion in the MCSC and RCR categories. Roads in these categories will be inventoried by the Roads Advisory Committee (described below) to determine the specific attributes of each worthy of re-





view, should changes to the road or portions of the road be proposed. One or more of the following attributes will qualify roads for this category:

- Proximity to surface water so as to be within the jurisdiction of the Conservation Commission.
- Existence of rare or endangered species.
- Proximity to historic attributes, including but not limited to ancient cemeteries, publicly recognized historic structures, and monuments.
- Special landscape or scenic features, including but not limited to trees and canopies, scenic vistas, stone walls, or other distinguishing constructed elements.
- Abutting land designated as conservation land, State or Town Forest.
- Proximity of residences within 50 feet of the traveled road edge that would be significantly impacted by changes to the road; and/or
- Presence of or suitability for pedestrian or bicycle use that may be threatened by proposed changes.



**4. Establish upgrade paths for Minor Collectors of Special Character, Rural Conservation Roads, and Local Roads to ensure measured and orderly improvements.**

The Committee recommends adoption of a system for initiating, reviewing and implementing improvements to different categories of roads. Under this system, road improvements might be generated by a petition of 75% of abutters or action by the Board of Selectmen, Planning Board, or Director of Public Works. Funding for such improvements could be through Town funds (with



budget appropriation and Town Meeting approval), betterments, gifts, or developer contributions. A Road Review Process, including a public hearing, would be required for certain kinds of improvements.

- Minor Collectors of Special Character would be upgraded to gravel road standard without going through the Road Review Process. This would allow upgrading of the seven major private Minor Collector Roads in the community to meet the needs of increased traffic and development on these roads. Upgrading to paved road standards would require public review through the Road Review Process.



- Upgrading of Rural Conservation Roads would require public review through the Road Review Process both for upgrading to gravel road standards and for paving.
- Local Roads could be upgraded to either gravel road standards or paved without a public review.

**5. Establish a Road Review Process for Minor Collectors of Special Character and Rural Conservation Roads.**

The Town should establish a process to review changes that affect roads in the MCSC or RCR categories. This Road Review Process would cover the following situations:



- Inclusion, removal or reclassification of MCSC and RCR.
- Requests for paving of a MCSC.
- Requests for upgrading to a Gravel Road Standard and paving of a RCR.
- Road management issues related to MCSC and RCR.
- Betterment assessments related to MCSC and RCR.
- Other road-related issues at request of Board of Selectmen.

The Road Review Process begins when 75% of abutters to a road petition the Board of Selectmen for changes or when the Board of Selectmen, the Planning Board or the Director of Public Works request it. Before the Board of Selectmen considers the request, the Director of Public Works will report to the Board of Selectmen and a new Roads Advisory Committee (to be established by the Board of Selectmen and described later in this report) on the following questions:

- Has there been prior public input to the Director on the question and to what effect?
- Is the requested change, such as paving of the road, consistent with the Department’s Road Management Program?
- Has the road been previously improved to Gravel Road Standard?
- Is the change warranted given traffic demand, road design and other safety considerations?
- What are the estimated costs of the improvement to users and to the Town?



The Planning Board will then conduct a public hearing to solicit comment. After the hearing and consultation with the Director of Public Works and the Director of Planning and Development, the Planning Board will prepare a written report for the Board of Selectmen with a copy to the Roads Advisory Committee. The Roads Advisory Committee will also submit a report to the Board of Selectmen and the Selectmen will review the reports and act on the petition. If Town funds are to be expended, the funds would be subject to Town Meeting appropriation.

**6. Create a cost-sharing Betterment Program to help fund desired and approved improvements to Minor Collectors of Special Character, Rural Conservation Roads, and Private Local Roads.**

The Committee has determined that adequate funding is not available for the maintenance and repair of Plymouth's private roads. The VHB gravel road study estimated that \$27,950,000 in today's dollars would be needed to bring private roads in Plymouth up to acceptable standards. Using a portion of the monies already allocated for public road maintenance and repair could hamper the Town's ability to maintain its public infrastructure.

The Committee recommends that improvements be undertaken incrementally through a combination of private betterments, gifts, developer contributions, and current and future Town funds with voter and Town Meeting approval. The Town should create a Betterment Program that would require those who receive the benefits of road upgrades to pay some or all of the costs of the improvements. Betterment Programs have been instituted successfully in nearby towns such as Barnstable and Falmouth. Based on the VHB analysis and assuming availability of funds, a 15-year program would require \$1,863,333 annually, with additional interest and administrative costs of \$288,733 per year. The total annual cost to run the Betterment Program would therefore be \$2,152,106. The Betterment Program would allow for the improvement of an estimated 7 miles of road annually at an average cost of \$58 per foot (including administrative and interest costs). Initiating a Betterment Program in Plymouth would require a new bylaw approved by Town Meeting, a ballot question for voters to fund the program, and an annual appropriation for any contribution of Town funds to the program.



Where appropriate, improvements should be financed by developer contributions. In order to ensure that the cumulative effects of new development are taken into account, developers should contribute to an escrow fund according to a set formula. Monies in this fund would be used if the Town traffic counts require that gravel standards be put into place or the Town approves improvements such as paving before the Town is ready to perform the work.

For citizens of Plymouth on private roads, there are a number of advantages to working with the Town on private road improvements:

- The DPW has the technical knowledge and management skills to provide oversight for the process.
- The Town can borrow funds at more favorable rates than can private citizens.
- The Town's management of the betterment process can allow private payback to be stretched over the life of the improvement, with the obligation transferred with the property to new owners as part of their property-tax assessment, should they so choose.
- The Town can coordinate public and private investment in the improvements, including developer contributions.
- The DPW has the administrative skills to manage the design, bidding, and contractual process as well as the construction, ensuring quality design and workmanship.



The Betterment Program should be applied to the following road categories:



- **Private Minor Collectors of Special Character (19.96 miles):** These minor collectors provide access to major collectors and enhance Plymouth's community character; therefore, these roads provide a wide public benefit. When a private Minor Collector of Special Character has been in existence for more than 20 years, is open to the public, is experiencing increased development and traffic, and has been plowed and maintained by the Town, the Town should have the right to upgrade the existing roadway, modifying the alignment and drainage easements, if necessary. The Committee recommends that these roads be improved to Gravel Road Standard for better driving performance, improved drainage, and ease of maintenance, with the upgrades to be funded by a combination of Town, developer, abutter, gift, or other funds. This will enhance the Town's travel network by facilitating easier car travel, better emergency access, and safer bus use.
- **Rural Conservation Roads (6.4 miles):** These roads provide access to resources important to the preservation of Plymouth's environmental, scenic and/or historic character. If these roads remain low-traffic roads, this character is more likely to be conserved. The RCRs therefore benefit the public as a whole, despite their low traffic volumes. If they were to become more heavily traveled, their public benefit would be reduced because of the attendant loss of community character. The Town should continue its current level of maintenance on RCRs. This includes any grading and plowing, along with minor improvements and alterations. Requests for upgrades should be carefully evaluated, as they could negatively affect community character, the rural environment, and driving conditions along these roads.
- **Private Local Roads (151.2 miles):** Because these roads handle small traffic volumes and are usually used by abutters for access to their properties, they do not benefit a large number of Plymouth residents.

Under a Betterment Program, the Town would undertake upgrades for Private Local Roads that have been open to the public for vehicular travel for at least the preceding six years through the following process:

- 75% of the property owners and abutters on a particular eligible road petition the Board of Selectmen to improve the road.
- The Board of Selectmen may, though it is not required, refer the petition to the Director of Public Works to investigate the request, examine options, and provide a report with cost estimates for the options and recommendations of a possible source of funds, including betterments.
- The Director of Public Works meets with the petitioners to outline options, costs, and funding sources.

- If 75% of the abutters agree to a specific option, assume the financial and other obligations associated with that option, sign a written waiver of any claim to public way status or liability, and agree to pay any costs in excess of costs estimated by the Director of Public Works, the Town proceeds with the legal, engineering and other work to implement the road improvement.

In the case of numerous requests, the Department of Public Works would prioritize requests according to a set of criteria to be developed as part of the program. Betterment costs to be paid by abutters would be determined by one or more of the following methods:

- A fixed uniform rate based upon the estimated average costs of the work according to the length of road frontage.
- According to the area of land within a fixed depth from the road.



- According to valuation in the most recent annual tax assessment.
- According to the potential number of residential units that could be developed on land that would benefit from the road improvement.
- According to trip generation projections based on the guidelines of the Institute of Traffic Engineers (ITE).
- Or by other reasonable methods.

#### **7. Establish decision criteria for paving certain gravel roads**

Many of the Town's gravel roads, particularly Minor Collectors of Special Character, are in poor condition. Past grading practices have damaged base materials to the degree that some gravel roads break down only days after they have been graded. In addition, loss of material has left many of these roads 2 feet below the natural grade, which causes drainage problems. The low grade allows water to build up in the road and wear away more base material. Grading has also exposed the root systems of many of the trees that line the gravel roads.

Although paving of gravel roads is a controversial issue, the Committee recognizes the benefits of paving. One of the major reasons for paving a road is to prevent the sub-base material from deteriorating from vehicle use and weather. Holding gravel roads together is particularly difficult when many cars or heavy vehicles (such as trucks) use the roads on a daily basis. Paving could eliminate some of the continuing problems associated with gravel road maintenance. These considerations, though, must be weighed against possible loss of aesthetic character, negative environmental impacts, and increased traffic.

*The Gravel Roads Maintenance and Design Manual*, prepared by the South Dakota Local Transportation Program for the Federal Highway Administration (FHWA), identifies ten standards that must be met before paving a gravel road. This guidebook recommends that communities pave only if:



1. A road management program—which includes an inventory, condition assessment, priorities, and management plan—has been established.
2. The local government is committed to effective management.
3. Traffic counts justify it.
4. Design, construction, and maintenance standards have been adopted.
5. Safety and design inadequacies have been corrected.
6. The road base and drainage have been improved.
7. Preparation, construction, and maintenance costs have been determined.
8. Maintenance costs of gravel and paved roads have been compared.
9. User costs for vehicle operation on gravel and paved roads have been analyzed.
10. And public opinion has been solicited and considered.

This evaluation framework should be followed in the Road Review Process as the Town weighs whether to pave Minor Collectors of Special Character or Rural Conservation Roads.

Additional, Town-specific criteria should also be added to paving decisions. If all of these standards can be met, the Town will be able to show compelling basic evidence to justify a decision to pave a graveled road.

#### **8. Establish a Roads Advisory Committee to refine policies and programs.**

The Board of Selectmen should create an ongoing committee that will work with DPW and the Planning Board on road improvement and management issues. The committee should include at least one member each from the Board of Selectmen and the Planning Board, or their designees, and should provide review and recommendations to the Board of Selectmen on the following issues:

- Classification or reclassification of gravel or private roads
- Request for paving of a Minor Collector of Special Character
- Requests for upgrading to Gravel Road Standard and paving of a Rural Conservation Road
- Road management issues
- Betterment issues
- Other road-related issues at the request of the Board of Selectmen.

Among the issues that this committee might consider are:

- Developing policies, guidelines, and programs for roads that receive no public maintenance or repair services;
- Creating road design guidelines for different road categories and settings in order to protect community character;
- Developing betterment programs for non-residential areas;
- Formulating policies on heavy truck use on local roads (e.g., gravel trucks); and
- Ensuring consistency between road policies and planning and zoning policies and regulation and the Town's master plan.





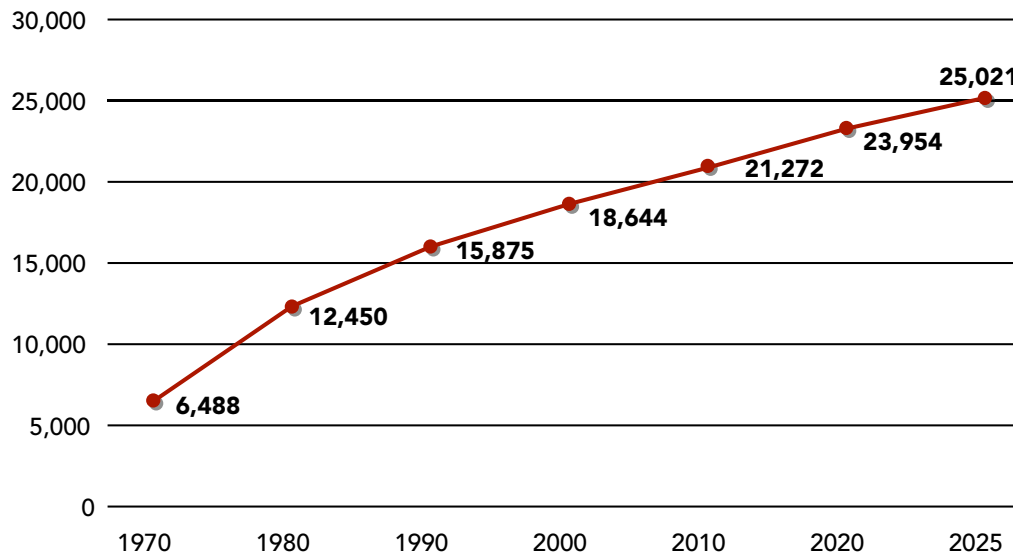
# Implications for the Future

The recommendations in this report represent a first step in implementing a comprehensive set of transportation policies for Plymouth. The report proposes functional classifications for different types of roads to reflect local conditions and recognizes that the Town's previous informal role in repairing and plowing private roads no longer serves the best interests of Plymouth or its residents. The new systems recommended for improvements to private local roads and for roads with a special role in the community (the MCSC and the RCR) allow the Town to ensure that improvements to roads open to the public meet safety standards, undergo review for environmental and cultural characteristics, and are paid for through a fair allocation of costs and benefits.

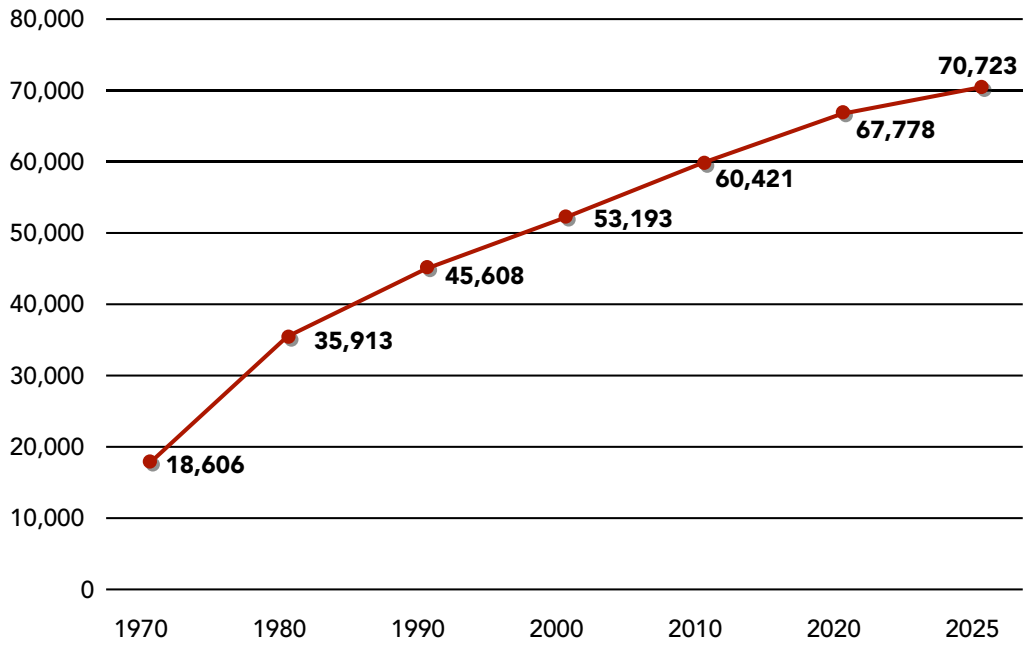
One of the most important aspects of any community is how it provides for mobility: how residents and others can get around town and reach outside destinations. The recommendations in this report resolve pressing problems resulting from past practices, but they also provide a framework for future decisions about roads and other transportation modes in Plymouth through creation of the review process and the Roads Advisory Committee.

Plymouth is one of the fastest-growing communities in New England and this growth is projected to continue into the next decade.

**Projected Growth in Households (MAPC data)**

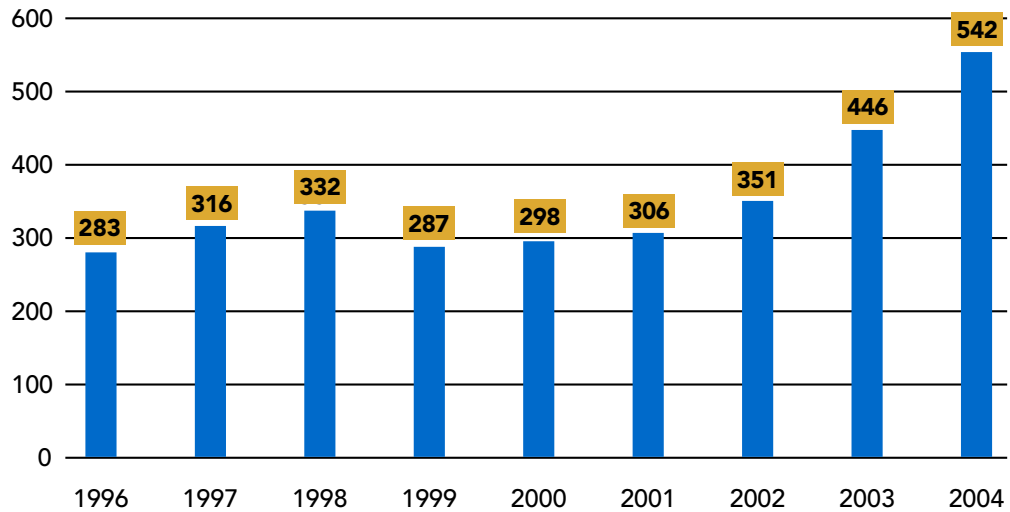


**Projected Growth in Population (MAPC data)**



As a relatively affordable historic and waterfront community on the way to Cape Cod, Plymouth has been attracting substantial residential growth to more rural parts of town, with the number of building permits almost doubling between 2000 and 2004.

**Building Permits Issued (compiled by the Building Department)**





This growth in the number of people and households—and their vehicles—has resulting in increasing traffic. Recent traffic studies in Plymouth estimate that traffic is growing at about 2% per year. Although many roads in Plymouth continue to serve the Town well, future growth will create new challenges for the Town's transportation infrastructure. The Town's 2005 Master Plan recognized this through its emphasis on more efficient land use, on creating alternatives to single-occupant-vehicle travel (for example, additional transit opportunities and transportation demand management strategies), and on developing pedestrian and bicycle trails and routes to link Town destinations.

Most Plymouth residents, however, will continue to depend on the car for most of their travel in the foreseeable future. The dilemma that faces town residents, officials and staff is that the same people can act in a variety of roles—commuter, abutter, local resident, environmentalist—that promote different interests. As traffic and congestion increases, people want roads that are fast, safe, convenient, efficient, and well-maintained. But the traditional road engineer's single-minded focus on creating more road capacity by making straighter, flatter and wider roads has resulted in the destruction of natural and historic resources that are critical to community character. In a geographically large community like Plymouth, most people get to know the Town from the road. If roads in Plymouth are engineered only with traffic capacity in mind, the Town will lose the combination of town, village and rural character that makes it so distinctive.

In identifying locally-significant road categories, the Minor Collectors of Special Character and the Rural Conservation Roads, the Committee is bringing Plymouth into the new road design movement known as "context-sensitive design." Roads and other transportation infrastructure such as rail lines and separate pedestrian or bike paths support the variety of activities that require travel between and among home, work, school, recreation, shopping, and so on. They also create the framework for new development and redevelopment by providing access to development sites. Because transportation systems are significant landscape features, how they are designed has a disproportionate impact on the character of the areas they traverse.

Context-sensitive design has been adopted on both the federal and state levels. MassHighway's 2006 design manual discusses context-sensitive design in this way:

"Historically the highway design process has focused on a project's transportation elements, particularly those associated with motor vehicle travel. A context-sensitive design should begin with analysis of the contextual elements, such as environmental and community resources, of the area through which a roadway passes....Once the designer has an understanding of the area surrounding the road and the road's users, the designer should consider the transportation elements of the roadway, its function within the regional transportation system, and the appropriate level of access control....Land use is the fundamental determinant in the function of a road; as land use changes along a road, the road's functions also change. Roadways must be designed in a manner that serves the existing land use while supporting the community's future land use goals." (MassHighway, *Project Development and Design Guide*, section 3.2-3,.2.1 (2006))



Community involvement and discussion is critical to context-sensitive design. The Private and Gravel Road Committee's recommendations for creation of a Road Review Process, including a public hearing, a participatory process between and among the Department of Public Works and road abutters requesting road improvements in determining changes and costs, and creation of the Roads

Advisory Committee are all important to establishing a system for context-sensitive road design in Plymouth. It is particularly important to reach a community consensus on what problem needs to be solved, because the features of the design will reflect an understanding of the nature of the problem. In the case of roads like the Minor Collectors of Special Character, balancing traffic demand and safety issues with preservation of rural character will be central to decision making about road improvements.

More compact and land-efficient development patterns are recommended in the Town's Master Plan as a way to preserve the more rural and environmentally sensitive areas of Town. Many of the areas that remain available for development are located near the proposed Minor Collectors of Special Character. The decision-making process about roads must also be coordinated with land use decisions as people continue to seek both a rural lifestyle in Plymouth and the mobility and transportation access found in more urban areas.



# *Supporting Documents*

Available for review in the Offices of the Plymouth Department of Public Works

Legal Facts about Public and Private Ways

M.G.L. Chapter 291: City/Town Distribution of Road Funds

Plymouth Code, Article II: Repairs to Private Roads (1976)

Federal Highway Administration *Gravel Roads Maintenance and Design Manual*, “Appendix D: When to Pave a Gravel Road” (April 2005)

“Protecting the Rural Landscape: Visual Quality Guidelines for Plymouth, Massachusetts and the New England Region” (2000)

*Gravel Road Improvement Program*, Vanasse Hangen Brustlin, Inc. (2005)





