TRAFFIC AND TRANSPORTATION ANALYSIS[1]

The transportation system is one of the most important and expensive parts of a town's infrastructure. This infrastructure has a direct and profound influence on land use throughout the entire town. All land use activities require some sort of access via suitable transportation routes and will most likely locate where access has proven to be the easiest. Following this pattern, improvements to the transportation system can change existing land use and the dispersion pattern by providing access to once inaccessible areas - either by the construction of new roads, or by the improvement of non-maintained roads.

The purpose of this section of the Master Plan is to describe the existing road network and traffic patterns, and to identify and analyze the current and future transportation needs of the town. By looking at the existing road network, analyzing the impact of local and regional growth on traffic volumes, identifying road deficiencies, and outlining specific objectives, this section should provide data that will contribute to an orderly schedule of road improvements.

A secondary purpose of this document is to enable the Town of Francestown to fully participate at all levels of transportation planning - not only local, but regional, state and federal as well. Transportation infrastructure is heavily dependent on public funds. The New Hampshire Department of Transportation (DOT) sets the priorities for infrastructure spending through the development and implementation of a statewide Transportation Plan and a statewide Transportation Improvement Program. Both of these are required under 1991 federal legislation known as the Intermodal Surface Transportation Efficiency Act (ISTEA). ISTEA prescribes the federal DOT disbursements to the states. In order to qualify for New Hampshire's full allocation of funds, NH DOT must comply with the planning requirements.

To accomplish its task, NH DOT has asked each of the nine New Hampshire regional planning commissions to develop a regional transportation plan which describes existing state road conditions, identifies problems and concerns, declares goals and objectives for the regional transportation network and makes specific recommendations for improvements. These regional plans provide the town with an opportunity to link municipal planning, state spending and federal policy. This local transportation analysis will therefore take the regional issues into account in the process of ensuring that Francestown's transportation network supports and promotes the Town's overall community plan.

HIGHWAY CLASSIFICATION

The first step in evaluating a transportation network is to define the roads by the type of service they provide or by the funding which is available to build, maintain and repair them. There are three classification systems used to accomplish this: federal aid; state-aid and functional use.

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[1] The omission of the Middle New Boston Road from the text, tables and mileage/density calculations in the Traffic and Transportation section of the Master Plan - as well as from the related appendices - was noted too late in the review process to allow for correction. That portion of the Middle New Boston Road which is in Francestown is short in length and without dwelling units. Its omission has no impact on the analysis presented.

A. FEDERAL-AID CLASSIFICATION

This classification determines whether or not a particular road is eligible for a share of federal funding for reconstruction, rehabilitation and resurfacing activities. At this time, Francestown has no roads that fall within this classification.

B. STATE-AID CLASSIFICATION

This system is used by the NH DOT for determining funding levels and maintenance responsibilities. RSA 229:5 specifies the following seven classes of road within the state system:

Class I:	State Primary System*
Class II:	State Secondary System
Class III:	State Recreational Roads*
Class IV:	Town Roads within Urban Compacts*
Class V:	Town Roads regularly maintained
Class VI:	Town Roads not regularly maintained
Class VII:	Forest Development Roads*

*Francestown has no roads in these classes

The state has the responsibility to construct and maintain Classes I-III; the state and towns share responsibility for Class IV roads; and towns alone have responsibility for Class V roads. Towns have no responsibility to maintain Class VI roads. Class VI roads are public ways which either have been formally discontinued as open highways and made subject to gates and bars or which have not been maintained by the town in suitable condition for travel for a period of 5 successive years or more.

In addition to the basic road classifications, RSA 231:157 provides that a town may designate any road other than a Class I or Class II highway as a Scenic Road. The law, first enacted in 1971, provided that, except in cases of emergency, tree cutting and alteration of stone walls may not be done by the town, the state or a public utility without the written approval of the Planning Board - such approval being granted only after a public hearing has been held. In 1991 the legislation was amended to allow a town to adopt additional and/or different provisions for scenic roads than those originally allowed.

Francestown residents were quick to respond to the initial scenic road legislation and between 1972 and 1973 voted to designate approximately 32 miles of Class V road - or 63% of total Class V mileage - as scenic. To date, the town has not adopted any additional criteria needing Planning Board approval.

Table 1 describes Francestown's road network in terms of state classifications:

Table 1
Road Mileage by Road Classification[2]

Road Classification	Scenic Mileage[3]	Non-Scenic Mileage	Total Mileage
State Secondary System	-	10.4	10.4
Town Class V			
Paved	11.35	7.55	18.9
Gravel/Dirt	20.55	11.25	31.8
Class VI Roads[4]	-	9.91	9.91
Total Public Roads	31.9	39.11	71.01

(Source: Francestown Planning Board)

Typical for most NH towns, the greatest amount of road network is comprised of Class V roads. Perhaps less typically, winter driving conditions on State Route 47 are the worst in Francestown.

C. FUNCTIONAL USE CLASSIFICATION - US DEPT. OF TRANSPORTATION

A functional classification identifies roads by the type of service provided and by the role of each highway within the state system based upon standards developed by the US Department of Transportation (USDOT). There are two categories of functional classes: Rural Areas and Urban Areas. In Francestown's case, only the Rural definitions apply:

Principal Arterial/Controlled Access: These ways are interstates and some primary state routes designed to move large volumes of truck and car traffic through, and between, population centers without disturbing local traffic and land uses. They are usually multi-laned, divided highways with few, if any, at-grade intersections.

Major Arterials: These ways are designed to carry the largest percentage of traffic entering and leaving a region as well as the greatest amount of traffic traveling through the region. Since arterials are intended to segregate regional from local traffic, the majority of trips throughout a region that do not require a stop in the area should be handled by the major arterial highway. Major arterials also provide direct access to big traffic generators, e.g. malls, factories and recreation areas.

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[2] Class VI numbers in this table were provided by the state. Numbers for Class V roads were developed by or for the Planning Board in 1988 and 1995; in both years, odometer readings were taken using two different standard station wagons. Field based odometer readings show 1.76 fewer miles of Class V roads than indicated by NH DOT figures. Possible explanations for this discrepancy include differences in odometer readings and/or unreported reversions to Class VI roads.

[3] It is unclear at this time whether or not Class VI continuations of Class V roads were designated as scenic. In either case, since accurate mileage readings on Class VI roads were not possible, no scenic mileage numbers are shown for Class VI roads.

[4] The 1978 and 1988 Master Plans indicate that the State reported 8.3 miles of Class VI road. Since there have been no changes in the Class V mileage, it is unclear what occasioned this reported increase. In either case, the mileage is probably inaccurate and both road history and road condition make accurate verification impossible.

Minor Arterials: Minor arterials serve trips of moderate length at a somewhat lower level of travel mobility than principal arterials. They provide access to geographic areas smaller than those served by the higher systems and while they provide intra-community continuity, they do not penetrate identifiable neighborhoods.

Collectors (Major/Minor): The collector system provides more in the way of land access than do arterial highways. Collector streets may enter residential areas, business districts and industrial areas. A collector street will often act as a funnel by channeling traffic onto a minor arterial highway which in turn may channel this traffic to a major arterial. These streets differ in another way from arterial highways in that they are more likely to carry traffic to it ultimate destination.

Local Streets: The local street system includes all other streets not already classified by the higher systems. The primary function of the local system is to provide direct street access to the higher systems and to abutting properties. It offers the lowest level of mobility and through traffic is generally deliberately discouraged.

Map # 1 illustrates this functional classification system as it pertains to the entire Southwest Region. The regionally significant roads in Francestown are State Route 136 (a.k.a. locally as the Greenfield and New Boston roads), State Route 47 (a.k.a. locally as the Bennington Road) and the Second NH Turnpike South, a Class V Road[5]. The latter two roads are considered Minor Collectors while 136 is defined as a Major Collector. Route 47 and Route 136W pick up and deliver traffic to Route 202 to the west and north; Route 136E and the Second NH Turnpike South service the urbanized corridor to the east and southeast of Francestown.

D. FUNCTIONAL CLASSIFICATION - LOCAL

Since the regional/state functional classification system is of limited use in understanding the relative importance of roads within Francestown's Highway Network, two efforts at a local classification system have been undertaken.

In 1987 and 1988 the following classification system was established based on the work of Caron Engineering and of Michael Donovan[6]:

Major Arteries: Major arteries are those highways which generally cross through a town and carry the highest volumes of both local and regional traffic. In Francestown, State Route 136, State Route 47 and the Second NH Turnpike South are the major arteries. These 13.7 miles of highway impose an "X" pattern with axes oriented generally northwest to southeast and southwest to northwest. These highways are the primary routes connecting Francestown with the neighboring communities and points beyond.

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[5] The Second NH Turnpike South, which is really an extension of Route 47, passes through four towns on its way to Mont Vernon. In the past, the state offered to assume responsibility for the highway provided that each town brought its section of road up to certain standards. Some or all of the towns involved were unwilling to do so.

[6] Cost per foot estimates are in 1988 dollars.

Collectors: Collectors are roads which collect traffic from intersecting roads and streets or from other significant sources of traffic generation. Caron considered Bible Hill, Red House, Pleasant Pond, Mountain, School House and the paved section of Poor Farm to be Francestown's major roads; Donovan added the Second NH Turnpike North to the list.

Caron also recommended improvement standards of at least 3 inches of hot bituminous pavement and of a 24 foot travel width and estimated the cost of achieving the improved cross section at $75 per foot.

Local Access Roads: Local access roads function almost solely as access to abutting properties. All Francestown's other roads fell into this category. Caron broke this category down further into paved and unpaved. Paved road standards were 2 and 1/2 inches of hot bituminous pavement and a 20 foot travel width. The cost of achieving the standard was estimated at $65 per foot.

The rest of the roads were considered those which should/could remain either unpaved or surface treated with a penetration coat. An 18 foot travel way was recommended and the costs of achieving that standard were estimated at $45 per foot if surface treated and $39 per foot if untreated.

Although the Caron improvement standards have been used as general guidelines for road improvements, there are some practical limitations to their application such as close proximity of homes to the travel way. In other cases, adherence to strict engineering standards have been deemed cost prohibitive or contrary to scenic road policy and resident values. Although in 1989 the Planning Board adopted strict standards for the construction of new subdivision roads, to date, the town has not officially adopted standards for any Class V road.

In 1995, the Planning Board reviewed the above classifications[7] and made the following recommendations:

Major Arteries: No change.

Collectors: Collectors are roads which collect traffic from intersecting roads and streets, which connect major arteries, which are used as secondary connectors to abutting towns and which collect traffic from other significant sources of traffic generation, e.g. the ski area - if reopened.

The following roads were added to the 1987 list: Dodge Hill/Scoby Pond, Gillis Hill/Wilson Hill, Old County Road North, Russell Station and South New Boston.

Bible Hill, Red House and Poor Farm roads were downgraded from Collectors to Local Collectors and sections of the Second New Hampshire Turnpike North were downgraded to Local Shortcuts.

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[7] Classifications may not reflect relative traffic levels. For example, Todd, Poor Farm and Bible Hill roads are believed to be more heavily travelled than Gillis Hill Road or Russell Station Road.

Local Collectors: Local collectors are roads which collect traffic from intersecting roads and streets and/or connect Collectors or Arteries. Red House, Dennison Pond to the intersection with Candlewood, that section of Scoby Pond formerly known as 100 Acres Road, Bible Hill, Reid, and the paved section of Poor Farm and Todd roads were classified as Local Collectors.

Local Shortcuts: Local shortcuts are roads which are primarily used for access to abutting properties and which are not intended for use by through traffic but are increasingly being used by local residents as short cuts between larger roads. Sections of the Second New Hampshire Turnpike North, Birdsall, Cross, Chandler, Ferson, Stevens, Old County South, Back Mountain, Bible Hill Extension, Clarkville, Gerrish, Journey's End, Potash, Tewksbury Lane and Woodard Hill were classified as being Local Shortcuts.

Local Access Roads: No definitional change was made and all roads - or sections of roads - not given a higher classification fall in this category.

A large number of these roads either dead-end or dead-end into a Class VI or abandoned section of road: Campbell Hill (from both directions), Dennison Pond (from the intersection with Candlewood Hill), Candlewood Hill, Farrington, Hay Hill, Juniper Hill, Oak Hill (from the intersection with Perley), Mountain (from the intersection with Back Mountain), Muzzey, Palmer, Poor Farm (from the intersection with Bible Hill), Town Line, Udall, King Hill (from the intersection with Perley), Old County South (from the intersection with Stevens), and Peter King. Other roads in this category are: Avery, Champagne, Oak Hill (to the intersection with Perley), Abbott, King Hill (to the intersection with Perley), and Perley.

Roads of Uncertain Status (RUS): RUS roads are ways which appear at some point to have been public, maintained ways and which may or may not still have visible roadbeds. Although some roads are known to be Class VI, in many cases records are unclear as to their legal status, e.g. Class VI, abandoned, etc. Whatever the exact status, for reasons of health, safety and public welfare, development is not allowed on these ways.

Private Roads: Private roads are roads which a) have not been laid out by the Town or which, if laid out, subsequently reverted to private status, b) serve three or more lots[8] and c) are maintained for use by standard automobiles[9]. Such roads may or may not have been approved as part of a subdivision plan. While newer roads within an approved subdivision must meet fairly rigorous standards, older roads are generally narrow, dirt, dead-end ways passable on a seasonable basis only.

Private roads primarily servicing a) seasonal camps along Pleasant Pond and Scoby Pond and b) the ski area on Crotched Mountain have existed - for the most part nameless and uncharted - for years. Now named and appearing on maps as a result of the advent of the 911 emergency system, private roads are starting to receive the land use planning attention they deserve: in Francestown,

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[8] Ways serving less than three single family dwelling units are defined as common driveways.

[9] Private roads which are not maintained and do not service any dwelling units fall in the Roads of Uncertain Status category.

although private roads total about 5 miles - or 6% of total town mileage - 15% of town dwelling units are located on private roads.

The Master Plan Questionnaire and other empirical evidence suggests that traffic on all classifications of road has increased since the early/mid 1980's and supports the 1995 reclassifications.

No improvement standards were set for any of the road classifications.

Map 2 reflects the classifications established in 1995. Classifications mentioned subsequently in the text refer to this 1995 town classification system.

LOCAL ROAD NETWORK

A. OVERVIEW OF DEVELOPMENT HISTORY OF FRANCESTOWN'S ROAD NETWORK

An understanding of the development history of Francestown's roads is essential to an understanding of the assets and liabilities of today's infrastructure. Much of the town's charm and many of the bottlenecks on its roads derive from the fact that a majority of roads were laid out prior to the twentieth century - many in the eighteenth century[10]. Most roads are lined by stonewalls which are presumably contemporaneous with the period of the layout and which in some cases appear to be within the legal right of way. Roughly 20% of today's housing stock was built prior to 1880 much of it close to the travel way. While concentrations of earlier housing are found on Main Street, Old County South, Clarkville and Birdsall roads and on Village sections of Oak Hill, Poor Farm, Greenfield, New Boston and the 2nd NH Turnpike South, isolated historic buildings contribute to narrow spots along most other roads[11]. In the first half of this century, a lack of zoning added more homes set close to the travel way - if not in the right of way, e.g. Pleasant Pond and Scoby Pond Roads. In some cases the situation is complicated further by the fact that the width of the legal right of way is unknown. The implications of these early development patterns will be discussed more fully below.

Early roads did not avoid the wetlands, streams and steep slopes which are pervasive throughout Francestown. The town even had an auto road that went almost to the summit of Crotched Mountain. However, over time - as a result of a number of factors, including abandonment of homesteads, consolidation of lots and the 1938 hurricane - most of the roads which serviced the more remote, less developable of these areas have since been discontinued as maintained public ways; many are believed to have reverted to private status. As a result, a number of sizable areas in town have no active infrastructure, e.g.: the area defined by Mountain Road, Campbell Hill Road, Greenfield Road and the westerly town line; the area defined by Wilson Hill Road, the 2nd NH Tpk. North, Fisher Hill Road, Old County Road North and the northerly town line; the area

[10] See Map 5 in the Land Use Section.
[11] Roads with width constraints are identified in Appendix III, Table 1.

defined by Old County Road North, the Pleasant Pond Road and the northerly town line; the northeast corner of the town, and; the area defined by Birdsall Road, Old County Road South, Russell Station Road and the southwesterly town line. Although economic conditions do not appear to favor development of these areas at this time, many of these limited access areas have attractive attributes, e.g. fine views, two great ponds, etc. Future development pressures should be anticipated.

In addition to creating limited access areas in town, the downgrading of sections of roads to a Class VI or private status has produced a large number of Class V roads that dead-end into roads which are no longer maintained. Part or all of 16 roads - or about 1/3 of the number of Class V roads - dead-end in this fashion. Additionally, 16 private roads - some of which are abandoned public ways - are dead-ends. Planning issues and implications related to dead-end roads are discussed in greater detail below.

B. INVENTORY OF TOWN ROADS

As part of the 1987 Caron Engineering Study and of the 1988 Master Plan update, a detailed inventory of all Class V roads in Francestown was completed. In 1995 this inventory was updated and expanded to include private ways and Roads of Uncertain Status (RUS)[12].

Housing Density and Distribution. Table 2 on the next page excerpts housing density related information from Appendix III, Table 1. Table 3 summarizes Table 2 data according to state classifications:

Table 3
Housing Density by Road Type

Road Type	Surface	Mileage	% of Total Miles	# Dwelling Units	% Total D.U.'s	Average Density[13]
Private	Various	4.7	6%	103	15%	21.9 D.U./Mile
RUS Roads[14]	Dirt	9.91	13%	0	N/A	N/A
State Class II	Paved	10.4	14%	126	20%	12.1 D.U./Mile
Town Class V	Paved	18.9	25%	180	28%	9.5 D.U./Mile
Town Class V	Gravel/Dirt	31.8	42%	239	37%	7.5 D.U./Mile
Total	N/A	75.71	100%	648	100%	9.8 D.U./Mile*

(Source: Francestown Planning Board, 1995)

The average density figures by road type which range from 7.5 dwelling units/mile on Class V gravel roads to 10.0 units/mile on state roads - excluding Main Street - are surprisingly close to the overall average density on all public roads of 8.9 units/mile. This suggests that neither road surface type nor road classification have been key variables in directing housing development in

[12] See Appendix III, Table 1.
[13] Housing density of state roads is 10.0 if Main Street is excluded and 13.5 on private roads if East Road is excluded. Total average density on public roads is 8.7 units/mile. Total density calculation excludes Class VI mileage
[14] Accurate mileage for Roads of Uncertain Status is not available. 9.91 miles is a NH DOT figure.

Table 2
Housing Density by Road[41]

Name[42]	Classif.	Surface Type	Length Miles	# of Dwelling Units	Dwelling Units/Mile[43]
Main Street (Rte 47)	A	P	.9	34	37.78
Bennington (Rte 47)	A	P	3.2	34	10.63
Camp. Hill - Sect. I	*L*	*M*	*.6*	*11*	*18.33*
Fisher Hill	*PR*	*G*	*.3*	*2*	*6.67*
Old Tpk	*PR*	*G*	*.2*	*2*	*10.00*
New Boston (Rte 136W)	A	P	3.4	37	10.88
Davis Lane	*PR*	*G*	*.1*	*0*	*N/A*
Dennison Pond	*LC/L*	*G*	*1.5*	*16*	*10.67*
Candlewood Hill	*L*	*G*	*1.4*	*12*	*8.57*
Greenfield (Rte 136E)	A	P	3.1	21	6.77
Spencer	*PR*	*G*	*.01*	*2*	*N/A*
ROW (aka Marino)	*PR*	*G*	*.25*	*3*	*12.00*
Champagne	*L*	*G*	*.25*	*2*	*8.00*
Farrington	*L*	*G*	*.4*	*2*	*5.00*
Muzzey	*L*	*G*	*.5*	*8*	*16.00*
Town Line	*L*	*G*	*.2*	*3*	*15.00*
Udall	*L*	*G*	*.3*	*3*	*10.00*
2nd NH Tpk S	A	P	3.45	22	6.38
Red House	C	P	1.2	7	5.83
South New Boston	C	P	.8	11	13.75
Pleasant Pond	C	P	2.9	39	13.45
Hiram Patch Ln	*PR*	*G*	*.25*	*4*	*16.00*
Sleeper Mill Ln	*PR*	*G*	*.5*	*7*	*14.00*
School House	C	P	.4	2	5.00
Mountain	C	P	1.3	16	12.31
East	*PR*	*G*	*1*	*53*	*53.00*
Camp. Hill -Sect. II	*L*	*G*	*.1*	*1*	*N/A*
Scoby Pond	C/LC	G	.95	10	10.53
Scoby Point	*PR*	*G*	*.4*	*5*	*12.50*
Dodge Hill	C	G	2.25	22	9.78
Gillis Hill	C	G	.3	0	N/A
Wilson Hill	C	G	.9	7	7.78
Old County North	C	G	2.6	16	6.15

[41] A = Arterial; C = Collector; LC = Local Collector; LS = Local Shortcut; L = Local; PR = Private; P = Paved; G = Gravel/Dirt; M = Combination of Gravel and Paved.

[42] Italicized roads are dead ends or, in the case of Champagne Road, a short loop; all italicized roads feed into more heavily trafficked roads.

[43] Density figures for roads less than 1 mile long should be used only for the purpose of relative comparison.

Table 2 (continued)
Housing Density by Road

Name	Classif.	Surface Type	Length-Miles	# Dwelling Units	Dwelling Units/Mile
2nd NH Tpk North	C	G	2.9	14	4.83
Russell Station	C	M	2.9	22	7.59
Reid	LC	P	.6	6	10.00
Bible Hill	LC	P	3.05	30	9.84
Palmer	*L*	*G*	*.15*	*1*	*6.67*
Hay Hill	*L*	*G*	*.3*	*2*	
Poor Farm	LC/L	M	3.8	22	5.79
Woodbury Lane	*PR*	*G*	*.35*	*7*	*20.00*
Hillside Lane	*PR*	*G*	*.45*	*8*	*17.78*
Woodland Lane	*PR*	*G*	*.5*	*3*	*6.00*
Todd	LC	M	1.1	2	1.82
Clarkville	LS	G	.55	6	10.91
Gerrish	LS	G	.3	3	10.00
Potash	LS	G	.3	3	10.00
Old County South	LS/L	G	1.7	15	8.82
Bible Hill Extension	LS	G	1	6	6.00
Birdsall	LS	G	1.1	6	5.45
Juniper Hill	*L*	*G*	*.3*	*5*	*16.67*
Journey's End	LS	G	1.3	6	4.62
Scoby Woods	*PR*	*G*	*.35*	*7*	*20.00*
Ferson	LS	G	.8	3	3.75
Cross	LS	G	.6	2	3.33
Chandler	LS	G	.4	1	2.50
Stevens	LS	G	.4	1	2.50
Back Mountain	LS	G	.4	1	2.50
Tewksbury Lane	LS	P	.02	0	N/A
Woodard Hill	LS	P	1.35	13	9.63
Oak Hill	L	G	.7	14	20.00
King Hill	L	G	.6	8	13.33
Perley	L	G	.7	8	11.43
Abbott	L	G	.2	2	10.00
Avery	L	G	.7	4	5.10
Peter King	*L*	*G*	*.15*	*3*	*20.00*

(Source: 1988 Master Plan Update/ Planning Board 1995)

Francestown. As a review of Table 2 and Map # 3 in the Land Use section of this plan indicates, however, although development has occurred along all roads since 1980, the housing stock is not distributed evenly between roads or along the same road[15]. Further, there is at least 1 non-seasonal dwelling unit at, or near, the farthest point of every road necessitating a minimum level of year round maintenance as well as a minimum road standard set by emergency vehicle access needs as well as by local traffic.

Contributing to the scenic and rural character of the community so valued by its residents is the fact that houses in Francestown are either fairly spread out or concentrated in clusters separated by stretches of undeveloped road frontage- typically reflecting either historic development patterns or more recent subdivision activity.

Speed Limits. Speed limits are regulated by statute, RSA 265:60. The speed limit for Class V roads in Francestown is 35 MPH. RSA 265:62 specifies, however, that whenever "local authorities determine, on the basis of engineering and traffic investigation that the 35 MPH speed limit is greater or less than is reasonable and safe, they may establish a safe limit which may not exceed 60 MPH nor be less than 25 MPH"[16]. Speed limits may be altered in accordance with the provisions of RSA 265:62-63.

The only Class V road with a posted speed limit is the 2nd NH Turnpike South, in the area of the Village. This road which is the only Class V arterial is posted at 35 MPH.

Accident Patterns. According to Police Chief Peter Flood, most accidents on Francestown roads are the result of speed and/or drinking. Viable prospects for reducing speed appear limited in the near term:

> Flood believes that Francestown already does a more than respectable job with traffic patrols given its part time police force, 70+ miles of road and departmental budget in the area of $45,000 per year.
>
> Only Francestown's arteries have posted speed limits. Just a little over 40% of year round residents favor posted speed limits on all town roads and only 16% of year round residents favor decreasing the 30 MPH speed limit on Main Street[17].

Approximately 70% of accidents occur on state roads - a fact which may reflect some combination of higher usage, type of user and generally greater speed. Since the closing of the ski area, the number of accidents has decreased on Mountain and Back Mountain Roads. As a result the number of annual accidents, town wide, has declined.

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[15] Density figures for roads less than 1 mile long should be used only for the purpose of relative comparison. Theoretical trip factors based on the number of houses may prove more useful as a measure of residential traffic.

[16] "1986 New Hampshire Roads & Highways Manual", published by the New Hampshire Municipal Association, and updated to reflect changes in the law.

[17] See Appendix VI, Individual Survey #C13: "Would you be in favor of all town roads having posted speed limits?" This question would have been better worded if it had distinguished between existing legal speed limits and the posting of signs which indicate that limit.

Where road conditions contribute to accidents on Town roads, blind hills are reported to be the most common cause at this time. However, there are not a sufficient number of accidents in any given place to establish clear patterns.

On state roads, "Murray's corner" on the New Boston Road - just to the north of the intersection with Red House Road - has been a recurrent problem over the years; the intersection of the New Boston Road with Red House has been a less frequent problem with less serious accidents. The other major recurrent accident spot is at the intersection of the Greenfield Road with Old County Road South. Flood is uncertain as to whether the new access to the town ballfields will improve or exacerbate the accident profile of this area.

To the extent road conditions are responsible for accidents in these areas, road banking in the wrong direction contributes to "Murray's corner" problems, while the sharpness of the curve contributes to accidents near the tennis courts.[18]

Surface Conditions. The NH DOT's "Minimum Geometric and Structural Guides for Local Roads and Streets" sets out standards for road surface type based upon average daily traffic (ADT): gravel surfaces are acceptable for roads with an ADT of 200 trips per day or less; hot bituminous pavement is specified for roads with an ADT of more than 200 trips per day.

Surface conditions of Francestown's Class V roads are categorized as gravel/dirt or paved.[19] Conditions on both types of road as well as on state paved roads vary considerably, depending on the season and the level and quality of maintenance.

In the judgment of the Road Improvement Subcommittee, approximately nine of Francestown's 19 miles of paved road - the 2nd NH Turnpike South, Pleasant Pond Road, Poor Farm Road and Mountain Road - need, or are shortly to need, resurfacing due to aging - a problem sometimes compounded by inadequate subsurface beds. Frost heaves and pot holes are common problems on paved roads. In addition the practice of putting unscreened sand on newly sealed roads, results in stones being embedded in the pavement - sort of a cobblestone effect. However, voter resistance to reconstructing these roads has been high due partly to cost and partly to the fact that the condition of state roads tends to set a pragmatic standard of adequacy: Not only are the town's paved surfaces, in general, not perceived to be significantly worse than the surfaces of state roads, but also Route 47 has the worst winter riding quality of any paved road in town. A reserve for road improvements was established in 1994 in an effort to mitigate the cost of reconstructing paved roads and of other high cost projects - which have historically been funded by direct appropriations over a 1 or 2 year period. Also, paved roads are now on a routine 3 year sealing program which - except as noted above - is helping to prevent incremental damage.

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[18] All roads in the national highway system that qualify for federal/state funding are rated according to a quantitative system that measures how well a road or intersection functions in the accommodation of traffic taking into account geometry, travel speeds and vehicle delay. Route 136 holds an A & B level of service rating. An "A" means that there is optimum free-flow conditions with no delays or maneuverability restrictions. A "B" is stable flow, but with some restrictions on speed and maneuverability.

[19] Only 1 road - Ferson - has a dirt surface. Caron described the surface of the town's paved roads as "surface treated gravel".

Traffic counts are not currently available for any of Francestown's gravel roads. If a minimum hypothetical ADT is calculated based on dwelling units only - using a theoretical trip rate of 10 trips per day per dwelling unit, only Dodge Hill and the "chute" on Dennison Pond Road would appear to be in danger of exceeding an ADT of 200 trips per day. Based on responses to the 1994 Master Plan questionnaire and other empirical evidence, it would appear that seasonal traffic might put Scoby Pond and Poor Farm roads in the vicinity of an ADT of 200. It does not appear that commuter or special destination traffic, e.g. the transfer station and the Kingsbury Hill Riding Camp, would put any other gravel roads in the over 200 ADT category at this time. Road Agent Clayton Foote has indicated that it may be cost effective at some point in the future to pave some of the town's major gravel collectors, but he does not believe that, at this time, traffic levels themselves necessitate the paving of any road.

Gravel roads inherently have more on-going variation in riding quality between roads and along a given road than do paved. Key variables include the amount of traffic, the quantity and quality of the finished surface, the quality of the subsurface bed, the degree of slope and drainage. Considerable progress has been made during the past 7-8 years: The quality and quantity of gravel have improved, in general. This, in turn, has improved passability on roads such as Old County Road North and greatly reduced mud complaints on most roads. In addition, a number of steep hills have been paved or treated with stone dust which has reduced erosion problems.

Since the 1994 Master Plan Questionnaire indicates that at least 66% of year round residents appear to prefer gravel to paved surfaces, gravel, itself, does not appear to be an issue with resident users.[20] However, general road maintenance, as measured by evaluations in the 1994 Master Plan Questionnaire, appears to remain a problem. Slightly less than 50% of year-round residents rated general maintenance as good or very good; nearly 20% rated it as poor or very poor; these opinions do not differ significantly based on whether residents live on paved or gravel Class V roads.[21] Currently general road maintenance is usually performed on an ad hoc - although not necessarily squeaky wheel - basis as need is determined by the Road Agent and/or the Board of Selectmen. A regular program of summer/fall scraping/raking, culvert cleaning, etc. as well as a better financed regraveling program which would allow for more frequent resurfacing appear to be in order for gravel roads.

Where 1994 survey data is available from at least 5 road residents and at least 5 other users, the three worst rated gravel roads in town were Dodge Hill , Dennison Pond and the Second New Hampshire Turnpike North[22]. Although it was not paved, as it appears a majority of road residents might prefer, major work was done on Dodge Hill in the spring of 1995. Resurfacing - either with crushed gravel or pavement -of the 2nd NH Turnpike North, especially between Tory Pines and the paved hill leading into Deering, is a priority of the Road Agent. Problems with Dennison Pond seem to be primarily of a maintenance nature.

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[20] Percentage based on # of year round residents who answered the question.

[21] Year round resident opinions on winter maintenance - i.e. snowplowing - were more favorable: Nearly 65% rated it as good or very good; only 8% rated it poor or very poor.

[22] See Chart 1 later in this section.

Scoby Pond, Back Mountain and the gravel sections of Todd and Russell Station Roads were heavily criticized by non road resident users; the main focus of complaints however appeared to be on general condition and maintenance not on the lack of a paved surface.

Road Width. The NH DOT's "Minimum Geometric and Structural Guides for Local Roads and Streets" sets out standards for road width based upon average daily traffic (ADT): a minimum pavement width of 18 feet for roads with an ADT of 0-50 roads per day; a 20 foot width for roads with 50-750 trips per day, a 22 foot width for roads with an ADT count of 750-1500 trips per day and 24 feet for roads with 1500 trips or more per day.

The only Class V road in Francestown which currently may have an ADT of greater than 750 trips per day average is the Second NH Turnpike South. A 1993 traffic count at the Lyndeboro town line by NH DOT provided an ADT of 510; a 1995 count south of Potash Road conducted by SWRP indicated an ADT of 992. There is no apparent reason that nearly twice as much traffic would use the 2nd NH Turnpike South in 1995 than in 1993. The higher 1995 count may reflect the length of time the counter was in place - i.e. an unidentified special event skewing the results of a short-term count - a seasonal variation and/or the difference in the location of the counts i.e. the NHDOT count would pick up through traffic only while the SWRP count would reflect local trips to the town center or to Routes 47 and 136.

Based on traffic counts and on the fact that none of the 193 defect complaints about the 2nd NH Turnpike South reported in the 1994 Master Plan Questionnaire related to width, this road's travel way of 20 feet appears adequate at this time.

Based on NH DOT's ADT standards, most of Francestown's other paved roads should have a travel way of 20 feet. Only Todd Road a portion of which was reconstructed in 1995 meets that standard. According to the Caron Engineering report, Francestown's other paved roads range from between 14 feet and 18 feet in width:

- From a practical point of view, the width of 6 of these - Bible Hill, Russell Station, Woodard Hill, Reid, School House[23] and Pleasant Pond - appears adequate for current and foreseeable future use.

- Tewksbury Lane, which is less than a tenth of a mile long, should be made one way - less because of width than because of its blind intersection with Oak Hill Road. Other solutions do not appear to be cost effective or otherwise desirable.

- The two paved collectors with the most serious absolute width problems are Red House and Campbell Hill Road. Although the Caron report recommended widening Red House Road between 1 and 2 feet, to date, the limited gain in width has not

[23] SWRP traffic counts in June of 1995 on School House Road, which Caron indicated had a width of 16 feet, produced an ADT of 588. The Tory Pines Resort is required to make a number of improvements to this road if more hotel units are opened.

seemed to the Road Improvement Subcommittee to be cost efficient[24]. Improvement of the intersection with the New Boston Road has a higher priority. Campbell Hill is a dead end road with significantly less traffic than Red House. However, on Campbell Hill road, a relatively narrow width of 14 feet, is combined with steep hills, corners, limited shoulders and deep ditching. Nevertheless, 65% of Campbell Hill road residents responding to the 1994 Master Plan questionnaire indicated they were satisfied with their road and improvements to the paved section of the road have not been a concern for the Road Improvement Subcommittee - at least in regard to width.

- The most serious width problem with the paved section of Poor Farm Road occurs near the Town Hall Annex where a blind corner coincides with opposing houses both close to the travel way. While Caron recommended improvements to this road - particularly between Todd Road and the town center, increasing the width was not among the recommendations. The Road Agent, the Road Improvement Subcommittee and town residents - as reflected in the 1994 Master Plan Questionnaire - all agree some priority should be given this section of Road.

- Because its 18 foot width is combined with steep hills, poor drainage and drop-offs, Mountain Road is the most inadequate paved collector relative to its potential traffic. In 1988, it and Back Mountain Road had the highest accident ratings in town. According to the Chief of Police, the accident rate has declined since the closing of the ski area. Mountain Road services its own 16 dwelling units plus 53 dwelling units - many seasonally occupied - on East Road, a restaurant (now closed) and the Inn at Crotched Mountain which has rooms, a restaurant and a seasonal pool and tennis club. A traffic count by SWRP in July of 1995 showed an ADT of 185 trips per day; winter traffic is believed to be lower at this time. Mountain Road was one of the 4 four lowest rated roads in terms of user satisfaction in the Master Plan Questionnaire. However of the 47 defect ratings for this road, only 1 specified width as a concern. Although the improvements recommended by Caron - guard rails plus improved drainage and erosion control measures - may be adequate, from a safety point of view, for current traffic levels, it appears that resurfacing would be required to satisfy user complaints. Further, traffic to the ski area, if it reopened, might well put the winter ADT over 750 trips per day and necessitate widening of the road.

The width of most Class V gravel roads has been increased since 1987. The travel way of the majority of Francestown's gravel roads is typically 16 feet or more, including shoulders which are not usually well defined. Width of the usable travel way varies by season depending on the amount of snow, the quality of the subsurface base of the shoulders and several maintenance variables. Because most roads were laid out a long time ago - some over 200 years ago - many have narrow spots caused by houses close to the travel way, bridges, terrain, right of way issues, etc. The most problematic of these situations persist and will probably continue to persist as long

[24] The results of the 1994 Master Plan indicate that 70% of road residents and approximately 60% of other year round users are satisfied with the general road conditions on Red House Road.

as voters find traffic levels manageable, accident rates low/acceptable and proposed engineering solutions neither cost effective nor otherwise desirable.

Appendix III, Table 1 lists 19 roads or road sections which are, for the most part, less than 16 feet in width. 11 of these "narrow areas" are on dead end roads - none longer than .6 miles - servicing 5 or fewer houses. Aside from issues of maintenance, these 11 roads/road sections are considered adequate for the foreseeable future. 7 of the 19 roads are local shortcuts; 6 of the 7 have 5 or fewer dwelling units; one - Avery Road - has 4 dwellings but also services 3 houses on Peter King Road. 6 of the 7 are scenic roads, and 2 are in the Old County Road South National Historic Register district. Although all of these roads appear adequate for existing local road resident travel, they are increasingly being used as local short cuts. Nevertheless, given foreseeable usage levels and overall budgetary constraints it does not appear to be cost effective to widen 4 of these - Avery, Cross, Ferson and Scoby. Birdsall, Stevens, and the 2nd NH Turnpike North - appear particularly in danger of becoming collectors. Unless through traffic is discouraged in some way, the width of the travel way in these areas may soon need to be addressed.

The last of the 19 road sections - that area on Dennison Pond Road known as the "chute" - has received considerable attention over the years as a potential problem area. Correction of the problem would require the cutting of specimen trees, removal or relocation of a stone wall and the acquisition of land. Both Dennison Pond Road and Candlewood Hill Road residents - who must use the "chute" for access - have adamantly opposed any upgrade of this scenic stretch of road. In the late 1980's voters refused to fund the acquisition of the abutting land needed to make any significant improvement to the area.

The discussion of Class V gravel roads/road sections with a travel way 16 feet or wider will focus on the three roads which appear to have overall - as opposed to spot - width problems relative to current or foreseeable usage.

- Scoby Pond Road services the town beach the only parking for which is along the road. This road also appears to be experiencing an increase in through traffic between the 2nd NH Turnpike South and the New Boston Road. The conflict that often exists between standards for road residents and other users is reflected in the results of the 1994 Master Plan questionnaire: 64% of road residents indicated they found the condition satisfactory while only 40% of other users were satisfied. It should be noted, however, that width was not cited as a problem; dissatisfaction appears to be more related to general maintenance and surface condition, particularly during mud season.

- Back Mountain Road runs between Mountain Road and Route 47. It has steep hills and is lined by stone walls. While it had the lowest rate of total year round resident satisfaction - only 18% being satisfied - specific complaints focused on general maintenance or other non-width issues. Although it has only one dwelling, it is used as a short cut by residents of East Road and others going to and from the Inn at Crotched Mountain and, prior to 1989, the ski area. When the ski area was open, Back Mountain was a one way road. If Crotched were to resume operation, the

width of Back Mountain Road will need to be addressed in context with any necessary improvements to Mountain Road.

- Todd Road accounted for slightly over 40% of all complaints about width expressed in the 1994 Master Plan Questionnaire. Although Todd Road also has a paved section it appears that width complaints were primarily directed at the gravel section of the road. Todd Road currently has only 2 dwellings, both quite near the intersection with Pleasant Pond Road. Given apparent development potential along Todd Road, it would seem that most of the traffic on this road will come from vehicles destined for the transfer station or the paved roads on either end. Although there has been considerable discussion about making this section of road one way, most of the town's experiments with one way roads have been unsuccessful. On the assumption that Todd would remain a 2 way road, Francestown's Capital Improvement Program (CIP) recommends a major upgrade of this section of road in 1996.

Potential width problems on roads that dead-end into non-maintained RUS roads connecting with other towns will be discussed below.

Dead End and Class VI Roads. Francestown has 16 Class V roads which either dead end or dead end into non-maintained RUS roads. While turnarounds have been established to meet the needs of emergency access, 3 of these roads pose serious, planning problems. Two of these roads dead-end into Class VI roads which connect with neighboring towns; one into a RUS road that connects with another Francestown Class V road.

Of particular concern are Dennison Pond and Candlewood Hill Roads which continue into fairly developed sections of the town of Weare. Not only are these roads not adequate to support significant levels of through traffic, but also the Dennison Pond "chute" - at which both roads converge before entering Route 136 - is already seriously overtaxed.

A RUS section of road connects Old County Road South with Russell Station Road. Opening this section of road for through traffic could cause serious problems on Old Country Road South which is a scenic road in the National Historic Register District.

The town has several other sections of road which are of uncertain status and which continue into neighboring towns: Cressey Hill into Lyndeboro; Poor Farm into Deering and Muzzey Road into Greenfield. None of these roads seems likely to be under development pressure in the foreseeable future.

Scenic Roads. 32 miles of Class V road - 60% of Class V paved road mileage and 65% of Class V gravel road mileage - have been designated by the town as scenic. Scenic roads include 1 artery, 6 - or half- of the 12 collector roads, and 4 of the 5 local collector roads. Although the traffic levels on all these roads have increased since the early 1970's when they were designated as scenic, the functional classifications of these roads - based on local standards - have not changed. And although most of the town's roads have undergone major upgrades since the

1970's, today scenic road hearings even for minor work are still generally well attended by road residents.

The road agent believes that the number of scenic roads should be reduced because they no longer retain many of their original scenic attributes. Although this may be true, it may also be true that, in an ever changing world, "scenic", like "rural character" is a moving target. It appears from the 1994 Master Plan Questionnaire that residents - about 50% of whom are new to town in the last 10 years - consider their roads generally to still have scenic value, regardless of whether or not they have been legally designated as scenic. Further, the scenic road hearing process is one of the few ways in which road residents and other users are assured of being able to have input on construction projects - before the work is actually done.

Bridges and Tunnels. Francestown has 10 bridges and 9 major culverts[25]. 4 bridges are on state roads; 5 bridges and all the culverts are on Class V town roads; 1 bridge is on Cressey Hill, a Class VI road[26]. The NH DOT rates all bridges - but not culverts[27] - in the state based upon a variety of factors. Francestown's bridges were all built between 1926 and 1962 and, based on the last inspection in October of 1992, have federal sufficiency ratings of between 25.9% and 77.9% - 100% being the highest score possible[28].

Several bridges and culverts handle one lane traffic, e.g. Cross Road, Old County Road South, Scoby Pond, Clarkville and Russell Station Road. These are not particularly high traffic roads and they were not cited by Police Chief Flood as safety problems.

In 1992 a line item was established in the Highway budget specifically for minor bridge and culvert work. The Cross Road bridge, which had the lowest rating of 25.9% - recently had major repair work done. The Scoby Pond Road bridge - with a rating of 47.3% - is scheduled to be converted from a bridge to a culvert in 1996. The Russell Station bridge - which currently has the 2nd lowest sufficiency rating and a 3 ton load limit - is scheduled for major structural repairs in 1997-1998[29]. An upgrade of the Russell Station bridge could result in an increase in through traffic from Greenfield as well as increased development in one of the town's more remote areas. The Road Agent believes all town bridges and culverts to be safe under current conditions.

The town has one tunnel - a stone lined sheep crossing of historic value and general interest which passes under Poor Farm Road.

Hazardous Conditions. Although the number of accidents on town roads is currently low, this does not mean there are not a number of potentially hazardous situations and spot problems on

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[25] The NH DOT includes the Pleasant Pond crossing over Collins Brook on it's Mini-bridge list. This is, in fact, a culvert and has been counted as such here.

[26] The locations of culverts and bridges are shown on Map 2.

[27] The state does not rate the sufficiency of culverts.

[28] The State of New Hampshire's bridges are "ranked 49th in quality among the states by the Federal Highway Administration", Boston Globe, January 7, 1996.

[29] It is possible that state funds may be made available for local bridge repair. If so, the Russell Station bridge and the Pleasant Pond culvert may be repaired in 1996.

Francestown's Class V roads. Blind intersections, steep slopes combined with curves and poor drainage, narrow shoulders, narrow "pinch points", limited sight distance, narrow bridges, potholes, deep ditching and utility poles close to the travel way are examples. Within budgetary and other political constraints, these problems are being addressed by general maintenance and repair, road policy, e.g. one-way roads, the Capital Improvement Plan and, when appropriate, road impact fees for new development.

Main Street. One of the most problematic sections of road in Francestown is Main Street (the southerly section of Route 47). The most densely populated area on a public road, Main Street is the heart of the town and critical to its attractiveness and rural charm. Most of the structures on the Main Street have historic value and are setback as little as 6-10 feet from the travel way. Existing and potential off street parking is severely limited; marginal shoulders provide all the parking for the Francestown Village Store, the Library and the Community Church - all of which are concentrated in the center of town. Overflow parking from the elementary school, the Old Meeting House and the Town Hall also uses Main Street shoulders. In addition: school buses picking up and discharging students must stop in the travel way; delivery trucks to the Village Store protrude into the travel way when parked along the curb. Until the fall of 1995, the Village Store's gas pumps were located in the shoulder-way; they have now been moved back onto the sidewalk. While the danger of the pumps being hit by a passing car has been reduced, the general congestion in this area will probably not be significantly reduced.

Congestion problems are aggravated during the winter because there is limited room for snow removal. Snow, in fact, is pushed onto sidewalks which are not plowed; in turn, pedestrians use the street creating additional safety problems. A regional representative from NHDOT indicated that there are frequent complaints from state employed snowplowers about difficulties clearing Main Street due to parked cars, particularly in the area of the Village Store.

Northbound traffic from the town's three other major arteries - the 2nd NH Turnpike South, the Greenfield Road (Route 136W) and the New Boston Road (Route 136E) all converge on Main Street at approximately the same point by the Town Common. The town's largest active, or potentially active, local trip generators - Tory Pines and the ski area - both are located north of the Village on Route 47; most traffic to these areas is believed to be routed from the south through town. However, no traffic counts are available for this short .9 mile stretch of road.[30]

The posted speed on Main Street is 30 MPH and although the police department runs regular speed traps - notably on weekends - speed is typically excessive, which, in turn, may contribute to the stop sign by the Old Meeting House being frequently ignored.

In the 1980's - before the closing of the ski area - when the amount, noise and speed of traffic was extremely high relative to the capacity of the street, complaints from village residents and a concern that structures might become undesirable for residential purposes resulted in exploration of the idea of a Main Street bypass. Although no engineering study was done, it is obvious that

[30] Although the state now takes regular traffic counts on state roads, none of the counters are placed in such a way to provide meaningful data for Main Street. It must be assumed that the Main Street Count is considerably higher than either the state ADT counts at the various town lines.

the logistical problems of siphoning traffic from all three of the southerly arteries either to the northwest of the Village or to a Poor Farm/Todd/Pleasant route would be severe and the costs great - if not prohibitive. The history of efforts to bypass the center of Dublin did not encourage pursuit of this project at a state level.

Sidewalks

The only sidewalk in Francestown is on the east side of Main Street. It was laid down around 1890 and made into a permanent concrete walk in 1915. Today, concrete slabs are badly cracked, uneven and out of line with the current height of the street. It appears that improvement of the sidewalks will be difficult unless the street can be brought into proper alignment with the walkways. The Selectmen report that they are currently holding discussions with representatives of NH DOT in an attempt to accomplish this.

Private Roads. Private roads already account for approximately 15% of Francestown's dwelling units and this number can be expected to increase: As the amount of Francestown's undeveloped Class II and Class V road frontage decreases, future development will become more dependent upon new roads within subdivisions. Unlike many area towns, Francestown has policies and regulations that allow - if not encourage - the private status of roads within a subdivision.

Prior to the late 1980's, this policy - due to a lack of construction standards and/or bonding/approval procedures - added some substandard roads to a private road stock that was already severely inadequate.[31] It is now the policy of the town to permit new construction only on state roads, Class V roads and roads within an approved subdivision. Further, in 1989 the Planning Board adopted stringent road construction and improvement standards designed to prevent future health, safety and welfare problems on new subdivision roads. In combination, these developments should stabilize or improve the overall situation with private roads. Nevertheless, the town should anticipate that, in the future, residents of existing private roads may petition the town to accept these ways.

User Satisfaction. The best pragmatic measure of the overall adequacy of Francestown's Class V roads may be the satisfaction ratings given by road residents and other Francestown users in the 1994 Master Plan Questionnaire. Further, these ratings are one of the more accurate ways to assess the political viability of particular projects. Chart 1 shows the percentage of road residents who are satisfied with the general condition of their road compared to the percentage of other users who are satisfied on roads which had at least 5 total respondents in each user category[32].

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[31] It was originally intended that East Road - which services the ski area and 53 dwelling units - be accepted by the Town when it had been brought up to specified standards. The standards were not met and the road remains private.

[32] Although the data is inconclusive, there is some indication in the 1994 survey that road residents have an alter ego as commuters, i.e. Francestown's roads are generally satisfactory - even desirable - to live on; but on our way to work, shop, etc. we want to go as fast as possible with no bumps or riding discomfort. If true, voter priorities may change in the not so distant future. On the other hand, the Master Plan survey data may be skewed by the facts that a) satisfied respondents may have been less likely to answer the question about roads other than their own and b) respondents may have been more likely to list more heavily trafficked, usually paved, roads.

Chart 1
Satisfaction Levels with General Road Conditions
Year Round Residents
(Percentages for Roads with 5 or more Users in Each Category)

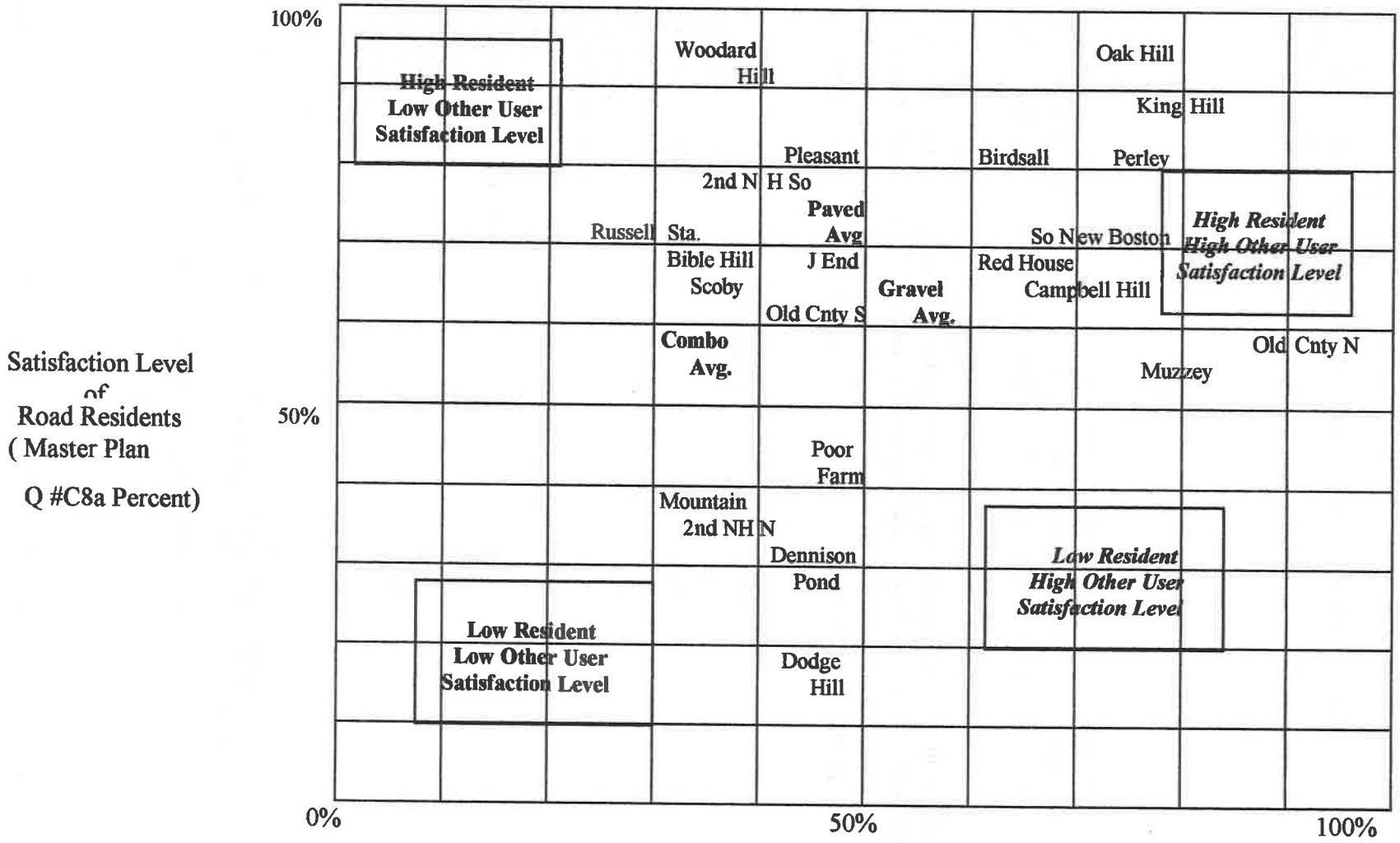


Table 4 below shows the percentage of total satisfied users on other roads which had at least 5 total respondents:

Table 4
Satisfaction Level with General Road Conditions[33]

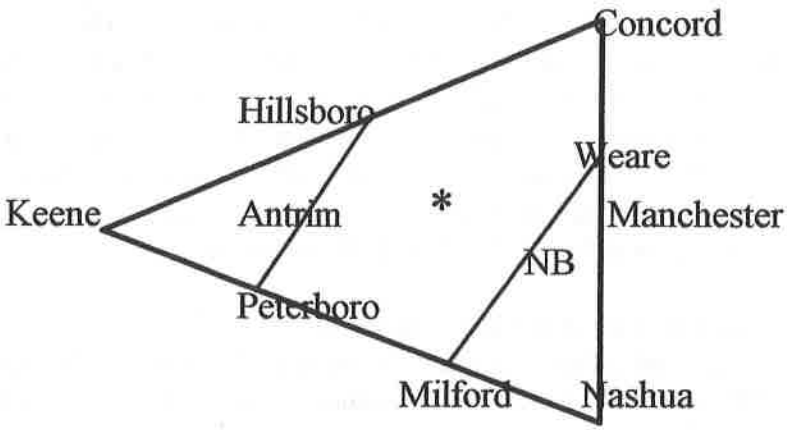
Road	Total Users Satisfied - Percent
Reid	100%
Ferson	100%
Clarkville	91%
Cross	77%
Potash	77%
East	68%
Juniper Hill	67%
Bible Hill Extension	63%
Gerrish	57%
Stevens	57%
School House[34]	50%
Todd	41%
Chandler	38%
Wilson Hill	33%
Back Mountain	18%

(Source: 1994 Master Plan Questionnaire)

Extensive comments, which are more specific as to reasons for dissatisfaction, on all roads can be found in the results of the Master Plan Survey[35]. Generally, there is a reasonably good correlation between user satisfaction levels and adequacy issues of width, surface condition, maintenance, etc. which were discussed earlier. These results will be used by the Road Improvement Subcommittee in updating the Capital Improvement Program.

C. Traffic Patterns. Once a major stop on the stage coach route north from Boston, Francestown, for better or worse, fell into, and remains in, an infrastructure backwater as economic development followed the region's larger rivers and the train tracks and roads followed:

[33] Readers should consult the tabulations of survey results for a consideration of possible limitations as to the validity of the numbers in both Chart 1 and Table 4.
[34] Based on comments, it appears that part of the gravel portion of the 2nd NH Turnpike North was frequently believed to be part of School House Road.
[35] Statistical results of the 1994 Master Plan Survey may be found in Appendix VI. The 160 pages of comments may be found in the Planning Board files.



Today, Francestown's primary links with the world at large are State Route 136 - a road of 3rd degree importance in the regional transportation scheme - and Route 47 and the 2nd NH Turnpike South - roads of the 4th, or lowest, level of regional importance.

A complete description of traffic patterns in Francestown can only be accomplished by means of a thorough traffic study - the cost and magnitude of which are currently beyond the resources of the Planning Board. Nevertheless, considerable insight into traffic patterns can be gained by supplementing information on housing density and local use classifications with data from available traffic counts, local traffic generators, the 1990 census and the 1994 Master Plan Questionnaire.

On-going traffic counts are available only for the three state arteries (local use classification). The NH DOT reports reasonably consistent data taken at the Bennington, New Boston and Greenfield town lines (Location #s 1, 2 and 5). Some supplemental data, collected by NH DOT (location #s 4 and 7) and SWRP (Location #s 3 and 6), for these roads and the 4th arterial is also available. This data is summarized in Table 5 below:

Table 5
Francestown ADT, Main Arteries: 1988 - 1995

Loc. #	Road	Counter Location	Year							
			1988	1989	1990	1991	1992	1993	1994	1995
1	Greenfield Rd	Town Line		1200	1000				1400	
2	Bennington Rd	Town Line	1000	1000	800		920		940	
3	Main Street	So of Pleasant Pond Rd								1668
4	New Boston	Cemetery # 2						1300	1300	
5	New Boston	Town Line			1100	1200	1200	1600		
6	2nd NH Tpk S	So of Potash Rd.								992
7	2nd NH Tpk S.	Town Line						510		

(Sources: NH DOT and SWRP[36])

[36] SWRP counts were taken in June and July of 1995; state counts are taken for a period of 1 week sometime between May and October - not necessarily at the same time each year. The brief period the counters are in place and a possible lack of seasonal consistency may cause considerable distortions in the data.

Without additional data at subsequent dates, it is impossible to determine whether the most recent traffic counts on the Greenfield Road and on the New Boston Road at the town lines are random and/or methodological aberrations or whether traffic has, in fact, shown significant increases during the past several years; i.e. there is no apparent reason that traffic counts would have increased so sharply over the 1990 - 1994 period. Similarly, without more data and information, it is difficult to assess the reported drop in traffic at the town line in Bennington; i.e. one would have expected to see a greater decrease due to the closing of the ski area.

It is also unfortunate that consistent data is not available for the late 1970's/early 1980's - before the growth period which is suspected to have significantly changed Francestown's demographic profile. Results from the 1978 and 1994 Master Plan Questionnaires - both of which had response rates in the range of 80% plus - suggest that Francestown's geographic orientation may be shifting from the west to the south and east, and that the Peterborough/Keene area, while still an important regional center for Francestown, may be of less importance today. In terms of year round resident employment and shopping:

- 5 people reported working in Keene in 1994 - the same number as in 1978
- The number of people working exclusively in Peterborough appears to have increased by only 15% while the total number of employed has increased by 215%
- Nearly 10% of workers commuted into Massachusetts in 1994 compared to 5% in 1978
- More people travel out of state today than worked in Peterborough in 1978
- The Nashua, Milford, Manchester areas employ about 30% of the work force today compared to 18% in 1978
- About 75% of year round residents report doing some or all of their shopping in Manchester although only 8% go there to work
- 155 year round resident commuters reported using the New Boston Road; 151 used the 2nd NH Turnpike South and 123 used the Greenfield Road[37]

If 1994 commuter responses to the Master Plan questionnaire are compared to 1993-1994 ADT counts by the NH DOT, Francestown residents would account for somewhere in the range of 20% of total traffic on the New Boston and Greenfield roads, and around 50% of the ADT on the 2nd NH Turnpike South. If incremental shopping, as well as other personal and school related[38], excursions could be more accurately taken into account, it is clear that the percent of traffic on these roads attributable to Francestown residents would rise significantly, especially on the New

[37] Figures for the Bennington Road are not used because of the ambiguity in Route 47 and Main Street responses.
[38] High school students attend Conval High School in Peterborough; since 1992 the majority of middle school students have attended Great Brook in Antrim. Prior to that time, all post elementary students went to Peterborough.

Boston Road which is the most commonly used route to Manchester. Whatever the percent of traffic accounted for by Francestown residents, the data does not reveal whether the balance of the traffic is through traffic, with no personal or commercial business in Francestown, and how much is traffic with special Francestown destinations.

Before it closed Crotched Mountain was probably the largest - seasonal - local destination stop in Francestown. Tory Pines - then the second largest destination location - is currently the largest non- resident trip generator. A one week traffic count on School House Road by SWRP in July of 1995 produced an ADT of 588 - some unknown percent of which can be explained by local and commuter traffic. Other considerably lesser destination locations in Francestown include: the Pleasant Pond boat landing; Kingsbury Hill Riding Camp - which generates in the range of 60 round trips every other weekend during the summer months - the Inn at Crotched Mountain - especially during the summer - Harmony Hill riding school and several antique shops. The Labor Day celebration generates a once a year traffic peak.

Employment also creates a limited - but unknown - number of trips by out of town workers; the 1990 - census reported 51 people commuting into Francestown; the census also reported 133 employed/self employed residents working in Francestown. The town may well be the largest year round employer with 4 full time, 4 part time and a number of seasonal employees. Currently the largest winter employer is probably the Conval School District[39]; the largest summer employer Tory Pines. Kingsbury Hill's seasonal employees come largely from abroad. The Inn at Crotched Mountain, Maitre Jacque's Restaurant - prior to its closing - the Francestown Village Store, Francestown Sand and Gravel and a number of home occupations, agricultural/livestock/forestry pursuits and home based businesses also provide some employment opportunities[40]. It is unknown how stable most of these employment opportunities are or how many locally generated jobs are filled by residents.

While employment of non-resident workers probably has the greatest impact on the town's major arteries, it also impacts other town roads. However, the number of out of town workers probably accounts for a small percentage of the spot ADT counts which are available for a small number of town collectors. The information in Table 6 was collected by the NH DOT and SWRP between 1993 and 1995; given the lack of historical context, counts are helpful as a base line, but not conclusive.

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[39] Prior to its closing, Crotched Mountain was probably the largest winter employer.

[40] See the Land Use section for an estimate of the number and type of home occupations and home based businesses.

Table 6
Francestown ADT, Collector Roads: 1993 - 1995

Loc. #	Road	Counter Site	Year		
			1993	1994	1995
1	Pleasant Pond	Collins Brook	170		
2	Pleasant Pond	Town Line			99
3	Pleasant Pond	Route 47			346
4	Mountain				126
5	Mountain				185
6	School House	2nd NH Tpk			588
7	So New Boston	Piscataquog bridge		300	
8	Russell Station	Rand bridge	50		
9	Clarkville	Piscataquog bridge	50		
10	Poor Farm	Piscataquog bridge	140		
11	Woodard Hill	Brennan Brook bridge	70		

(Sources: NH DOT and SWRP)

D. Road Impact Fees[41]

Planning Boards have the authority to levy impact fees for off-site development under their subdivision and site plan power as set forth in RSAs 674:36 and 674:43. Provisions for assessing such fees are provided in Section V.A.7 of both the subdivision and site plan regulations of the Town of Francestown.

The Francestown Planning Board has been assessing road impact fees on a case by case basis since the mid 1980's.

In 1994 the state legislature authorized towns to adopt an impact fee ordinance (RSA 674:21:V). However, the legislation makes clear that "neither the adoption of an impact fee ordinance, nor the failure to adopt such an ordinance, shall be deemed to affect existing authority of a planning board over subdivision or site plan review . . . " The Planning Board has no plans at this time to adopt an impact fee ordinance and will continue to assess fees in accordance with the policies and procedures it has been following for the past several years.

It must be noted, however, that impact fees are not a panacea and that there are serious limitations to the town's ability to utilize impact fees, e.g.: Impact fees cannot be collected unless improvements to the road(s) in question are scheduled to be done within the subsequent 6 year time frame. Problems can also arise if the absolute dollar amount of the town's fair share of costs is beyond its financial means.

[41] It is not the intention of the Master Plan to provide a detailed discussion on the very complicated subject of impact fees. Extensive information on the subject is available through the Planning Board for those who wish to learn more about this topic.

ALTERNATIVE MODES OF TRANSPORTATION

A comprehensive picture of a town's transportation system must consider all available modes of transportation; this would include public transit, e.g. rail, bus and air service.

In Francestown, as in most all of the towns in the Southwest Region, the personal automobile plays the largest role in meeting the transportation needs of the residents. Although it is reported that some limited door-to-door services are offered by a few social/welfare agencies on an as need basis, for all intents and purposes there is no public transportation available in the town of Francestown itself.

The nearest rail service for Francestown to the west is in Brattleboro, Vermont which is on the Amtrack line between New York City and Montreal, Canada; a 1 -2 hour drive is entailed. To the south, Boston is nearly as accessible as Brattleboro.

The nearest public air service is out of Manchester or Keene, both of which are about 35 miles from Francestown. Keene offers flights to Newark, Boston and Rutland, Vermont. The Manchester airport has recently undergone a major expansion and accommodates seven commercial airlines and four cargo carriers. Ground transportation to Logan Airport in Boston is available from both Manchester and Nashua. Of these three, Manchester and Boston are probably the most frequently used by Francestown residents. In addition, there are several private airfields in the area - Jaffrey and Antrim being two of the closest.

Concord, Manchester, Nashua and Brattleboro are the closest departure points for busses.

Responses to the 1994 Master Plan Questionnaire indicate that there is not a high level of perceived need or support for public transportation at a local level. However, Francestown has a number of residents, most elderly, who do not drive. In many cases these people are assisted by family and friends. However, there is, no doubt, a certain level of need that is not being met. Although some towns in the region have started private, volunteer groups to provide door-to-door service for special need groups, Francestown does not currently have such services available[42].

IMPLICATIONS FOR FUTURE LAND USE AND DEVELOPMENT

1. Although changing technology may alter future economic development patterns, at present the quality of the arterial roads that connect Francestown with the world at large - in conjunction with a small population, an increasing, but still limited, labor pool and a lack of infrastructure - would appear to make Francestown an unattractive site for medium to large scale non-recreational commercial or industrial uses. That these roads - particularly those to the south - are found acceptable to commuters is evidenced by Francestown's growth during the 1980's which was

[42] On January 4, 1996, the Monadnock Ledger reported that an area citizen group, Project Care Coalition of the Eastern Monadnock Region, is planning a study of regional needs for public transportation. The paper quotes a member of this organization as saying "Although a Red Cross group called Cars and Neighbors offers rides to seniors with medical appointments, residents, old and young, need rides for a variety of other reasons."

fueled by economic development in the Manchester-Nashua corridor. It seems likely that future growth in Francestown will continue to be residential in nature.

2. Given its rural location and small population, Francestown will continue to be dependent upon personal - i.e. automotive - transportation. All development will need to be carefully reviewed in terms of its impact on both the state and town road infrastructure. Unless a by-pass of the Village area proves feasible, large scale development north of the Village area will need special scrutiny.

3. In upgrading its roads to accommodate future development, the town needs to develop sensible, but sensitive, road policies and practices - if not standards - based on contemporary engineering and landscaping techniques, which will reconcile the need for road improvements as traffic increases with the town's desire to retain its scenic, rural and historic character.

4. At some future point in time, some comprehensive transportation plan may need to be developed for those areas of town which are serviced only by RUS roads. In the meantime, care needs to be taken by the Selectmen and the Highway Department not to maintain roads for which it has no responsibility.

ROAD IMPROVEMENT PROGRAM

A highway improvement program should be based upon an evaluation of all elements affecting the transportation system. Beyond just scheduling these projects, a transportation plan should try to make evaluations as to their direct or indirect influence on the town road system and also the impact on the related land use plan. In establishing priorities, a number of factors should be considered, including year round passability, the state of disrepair, accident history , width, traffic levels, the amount of existing and potential development in the area and alternative solutions, such as making a road one-way or limiting through traffic. In a town like Francestown, the desires of voters must also be taken into account. Further a cost-benefit analysis should be done for all major projects. Given the 6 year time horizon of the typical capital improvement program and the town's limited financial resources, care must also be taken not to allow a severe financial backlog of work to accumulate - in Francestown's case, specifically the reconstruction of its paved roads.

The town's first road improvement plan was adopted as part of the Capital Improvement Program (CIP) in 1988. To provide knowledgeable input and to attempt to establish consensus between often conflicting town departments, the Planning Board established a Road Improvement Subcommittee. Members consist of representatives from the Board of Selectmen, the Planning Board, the Budget Committee, the Conservation Commission, the Fire Department and Emergency Management, the road agent and a small number of ad hoc members who have typically been members of the Highway Safety Committee. The Capital Improvement Program is updated annually.

Establishing a new program, like the CIP, securely within the political life of a small town takes time, experience and patience; initially, process is as important as product. Since 1988, policies have sometimes given way to pragmatics as the price of building consensus and in response to voter rejection of particular recommendations; analysis/discussion has been thorough, but not very

sophisticated. On the other hand, perceptions of needs, priorities and financial resources have also been legitimately rethought as a result of the sharp falloff in the economy and rate of development. Despite unavoidable setbacks and changes in direction, the process appears to have been reasonably well integrated in both planning and budgeting cycles and the program, itself, has on balance been successful. Improvements have been more coherent and better and more consistently financed than they were prior to 1988; in addition, the quality of implementation appears to have improved and, with it, the credibility of the Highway Department.

Although the 6 year road improvement program is published annually in the Town Report in an effort to increase voter awareness and participation, more work needs to be done in this area. As a start, a large section of the 1994 Master Plan questionnaire was devoted to road and traffic issues and problems. All improvement plans except those for Todd Road scheduled for 1995-1996 were put on hold until the survey results were available.

Decision making might also be enhanced by the use of new computer programs and or more use of existing technology. The Road Surface Management (Software) System, created by the Technology Transfer Center of the University of New Hampshire, provides a means to visually inventory and evaluate a number of various road surface problems such as: surface cracking, inadequate drainage, etc. The program calculates an estimated cost of repairs and an approximated average traffic level from each road. Based on this, the program generates a priority list for repairs. Since Francestown's Highway Department is not computerized - even for basic purposes of inventory control and job scheduling - use of this program is probably premature.

Perhaps more immediately valuable to the development and maintenance of a sensible road improvement program would be more frequent ADT data for more town roads. Either the purchase of traffic counters or regular contracting for outside traffic counts would address this informational void.

In developing the 1996 road improvement program - which will cover the years 1996 through 2001 - it appears that the Planning Board and Road Improvement Subcommittee should give particular attention to the following roads (not in order of importance):

- Dodge Hill
- 2nd NH Tpk North
- Mountain
- Dennison Pond
- 2nd NH Tpk South
- Poor Farm (paved section)
- Todd (gravel section)
- Back Mountain
- Wilson Hill
- Chandler

Visual inspection of the roads in conjunction with the extensive comments from the Master Plan survey should help identify which problems can be corrected by improved maintenance and which need to be addressed by the Capital Improvement Program.

POLICIES AND RECOMMENDATIONS

The primary transportation objective is the maintenance of safe ways for Francestown residents which also contribute to and enhance the Town's scenic and historic attributes. To achieve this objective, it is recommended that:

- Road policies, practices and standards should be based on contemporary engineering and landscaping techniques which will reconcile the need for road improvements with the Town's desire to retain its scenic, rural and historic character.

- Given the limits of fiscal resources relative to the magnitude of currently - or potentially - needed road improvements and the desirability of retaining the rural charm of the community, alternatives to major construction work should be evaluated on a case by case basis. Such alternatives might include:

  - Making a road one-way

  - Posting/enforcing speed limits

  - Restricting through traffic

  - Installing stop signs

- Alternatives should also be explored if safety gains to be achieved by proposed road improvements will be significantly offset, or neutralized, by a consequent increase in through traffic

- The use of certain gravel roads as local shortcuts or as connectors should be discouraged or prohibited.

  - Immediate consideration should be given to restricting through traffic on Birdsall, Stevens and Old County Road South. Signs indicating "National Historic Register (or Old County South) District - Local Traffic Only" might achieve this objective. Similar measures on Clarkville Road, which has a narrow bridge and passes through an historic area, may be appropriate.

  - Unless improvements are intended to upgrade a local short cut to a collector, proposed improvements should be reviewed carefully in regard to their potential to increase non road resident traffic.

- The upgrading of a non-maintained road to Class V status should not be allowed where such improvements have the potential to create through traffic which would overtax the capacity of existing Class V roads and/or place an undue financial burden on the town. Upgrades of non-Class V sections of Dennison Pond, Candlewood Hill and Old County South are specifically recommended against.

- Building permits should not be issued for structures which do not have access to roads which provide legal frontage as defined in the Zoning Ordinance.

- All development proposals should be carefully reviewed in terms of their impact on both state and town road infrastructure. Off-site development fees should be assessed where appropriate.

- A task force should be established to work with SWRP to assure that the critical problems related to state roads are reflected in the Regional Transportation Plan. Resurfacing of Route 47 and the Main Street by-pass should receive particular attention.

- A program should be established to provide base line traffic data for all town roads and to regularly update that information. Initial priority should be given to more heavily trafficked roads and to Main Street.

- The Town should continue to explore possible additional locations for public parking on Main Street. If the elementary school site is eventually sold by Conval, the Town should purchase the site for parking - and other civic - purposes.

- A regularly scheduled resurfacing program for gravel roads - comparable to the sealing program for paved roads - should be established and funding for gravel increased as necessary. As part of developing this program analysis should be done to project the town's gravel needs over the next 15 - 20 years and to identify probable sources. Establishment of a town gravel pit operation should be considered in this regard

- A seasonal maintenance program should be established for all roads, e.g. scraping every X number of weeks, culvert cleaning X time per year, etc.

- The Conservation Commission should work with the Highway Department to determine if additional scenic road criteria are necessary and/or desirable.

- Tewksbury Lane should be made one way with a directional traffic flow from Oak Hill to Route 47.

- The Selectmen should explore the practicalities of computerizing the Highway Department for purpose of improving both operational controls and road improvement planning.

- In approving roads within new subdivisions, the Planning Board should assure that not only are engineering specifications adequate but also that design factors are compatible with the rural and scenic nature of the community.

- When possible, the amount of road signage should be minimized to preserve rural character; e.g. if speed limits are posted on town roads, a sign at each town line crossing should suffice at this time.

- A bi-annual questionnaire should be sent regularly to residents to identify user problems, to assist in the preparation of the Capital Improvement Plan updates and to assess the success or failure of various new maintenance and capital programs.