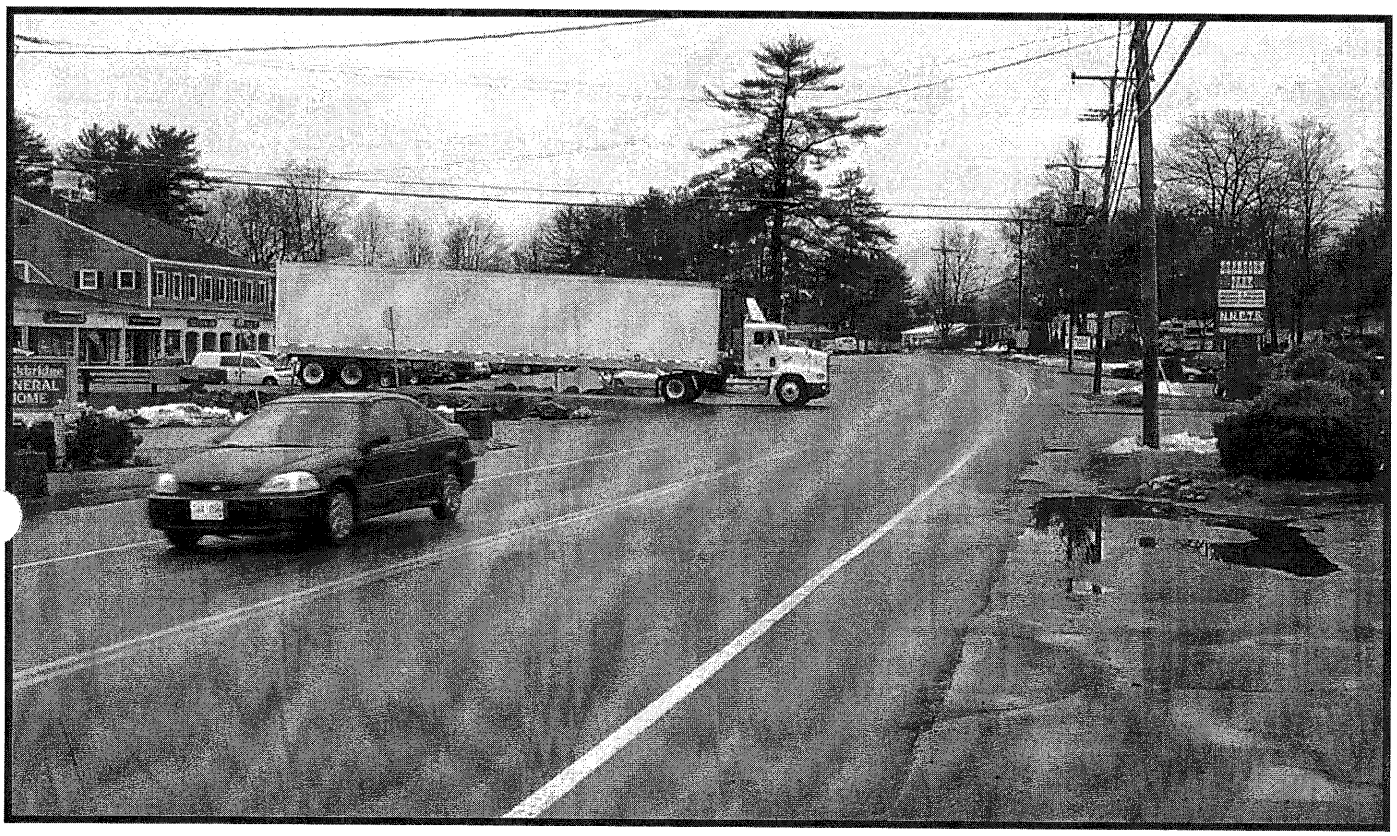
EPPING ROAD ACCESS MANAGEMENT STUDY



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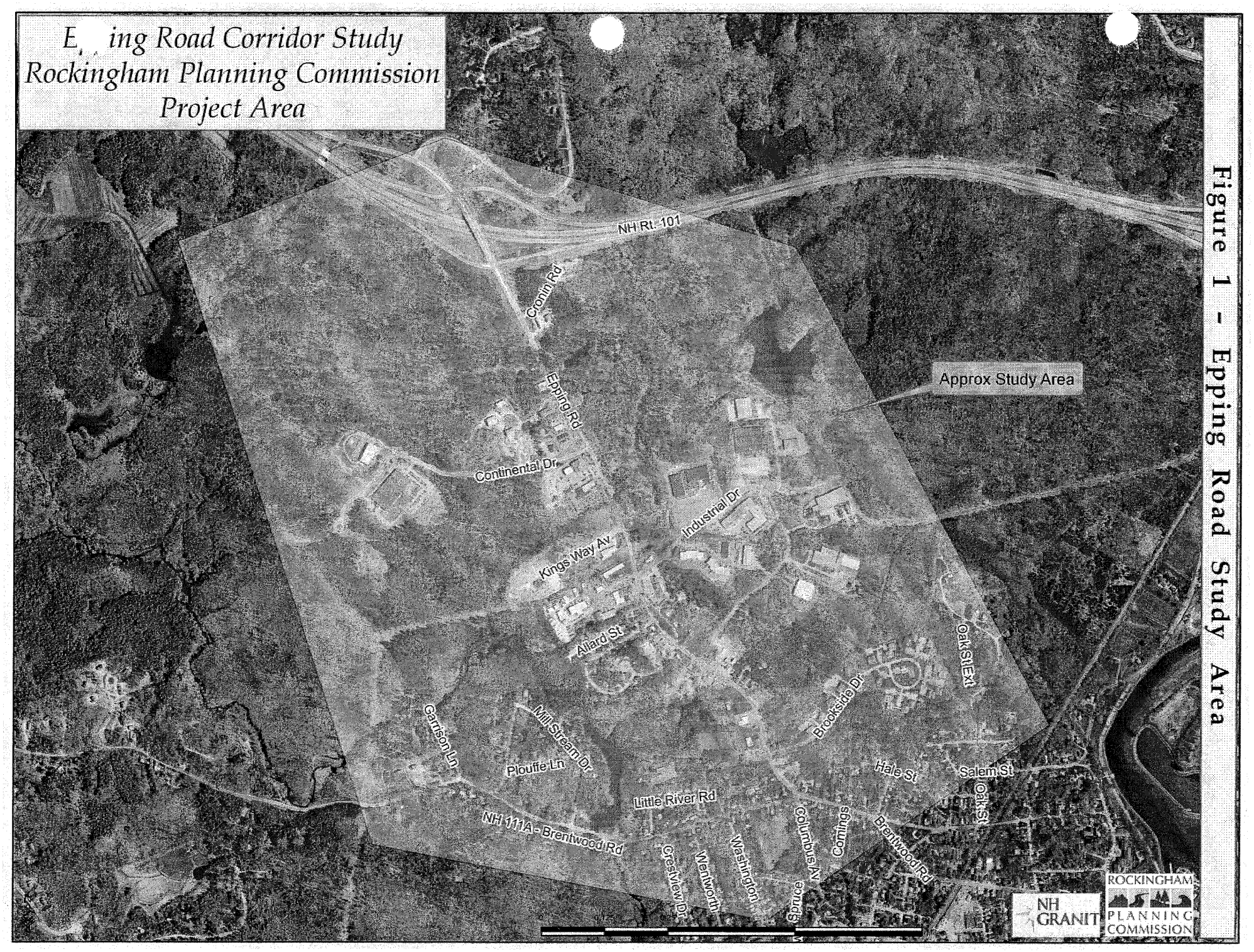


Figure 1 - Epping Road Study Area

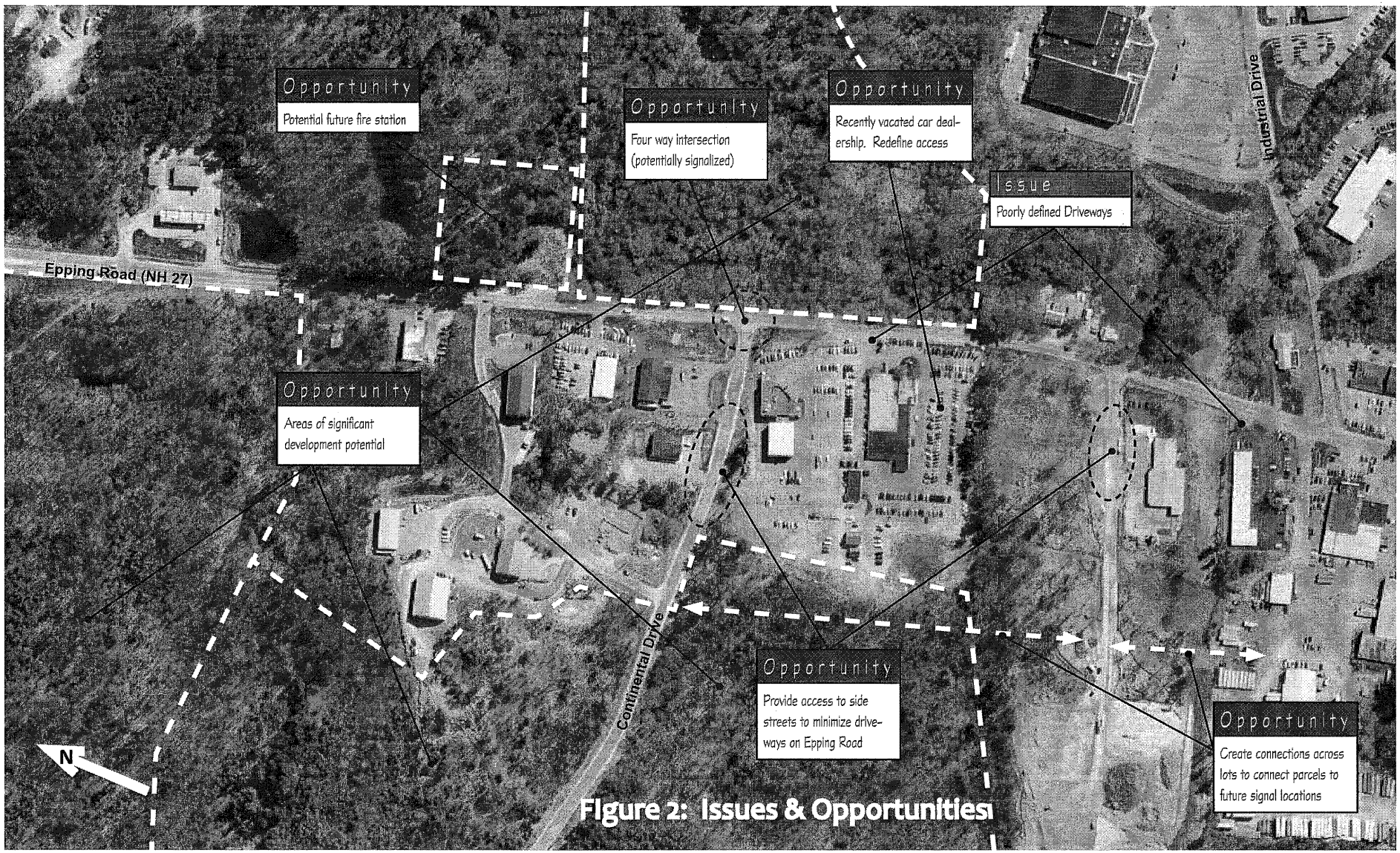


Figure 2: Issues & Opportunities

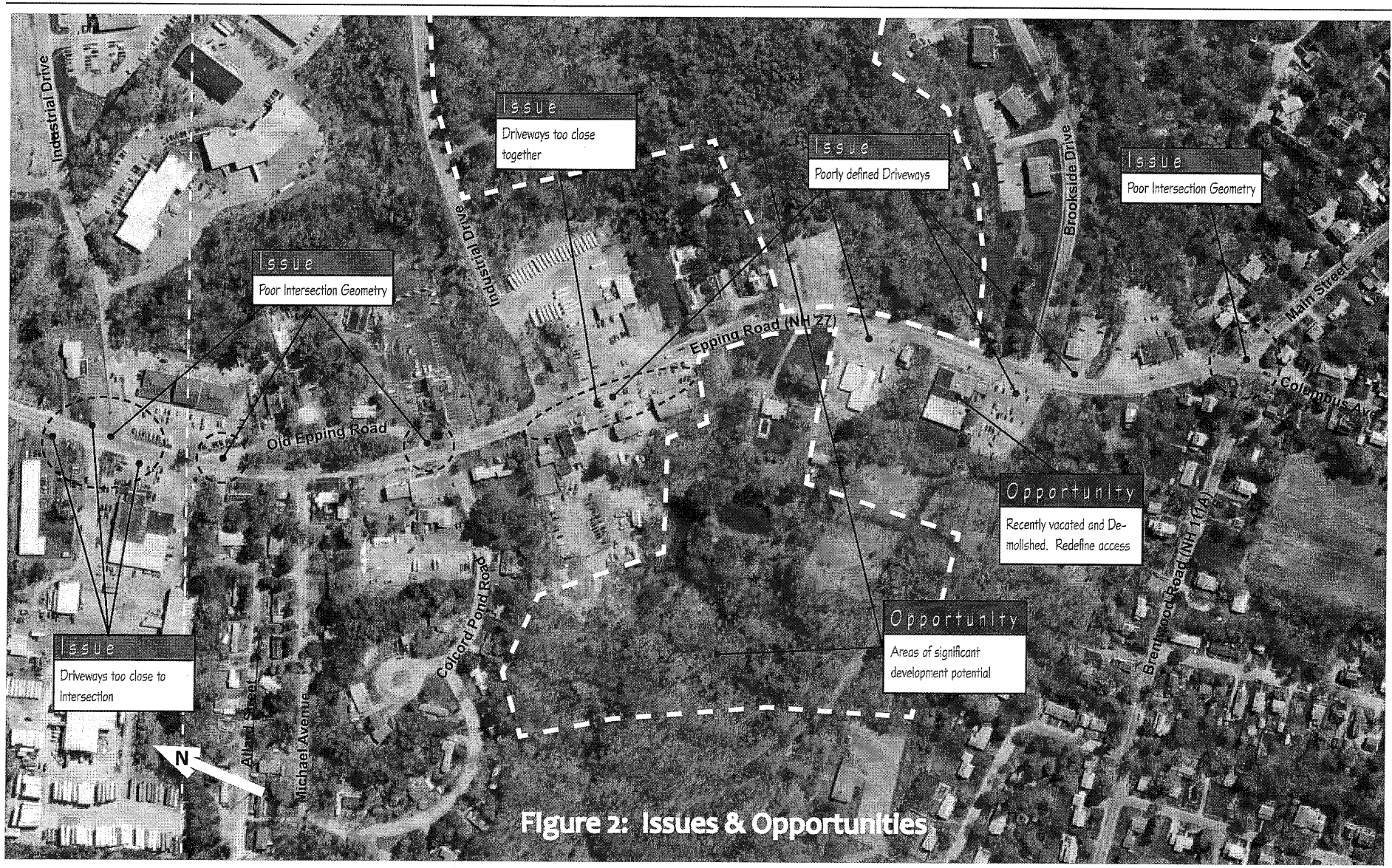


Figure 2: Issues & Opportunities

Introduction

The Epping Road Access Management Plan is intended to update and build upon previous work completed in 1994 and 1995 to determine the extent of the problems facing the corridor and the impact that growth and development is having. The result will be an Access Management Plan that will guide both a long and short range transportation planning in the corridor. The intent of recommended improvements is to balance safe and efficient traffic flow with reasonable access to individual properties along that roadway. This plan also will serve as the basis for further engineering and right-of-way studies necessary to implement physical changes to the roadway as part of the Access Management Plan. The work has several components:

1. Data collection to ascertain current conditions for comparison to the previous study data as well as to determine corridor issues and opportunities.

2. A reexamination of the assumptions and recommended improvements from the 1994-95 studies current conditions.

3. A proposed Access Management Plan to maintain safety and improve the flow of traffic on Epping Road without large scale widening of the corridor.

Study Area Description

Epping Road (NH 27) is functionally listed as a minor arterial roadway but in practice provides a critical connection between the Town of Exeter and NH 101 at Exit 9. The portion of Epping Road that is considered part of this study is the slightly over 1 mile length between the intersection with NH 111A and the interchange with NH 101 as shown in ***Figure 1***. The land area under analysis includes all parcels that could generate traffic onto the corridor or one of the connecting roads within the segment. The study area is within the established Urban Compact of the town meaning that although it is a State owned highway, the community has maintenance and operations responsibility, as well as control over the driveway permitting for the facility.

The corridor has mixed land uses and includes retail, residential, commercial office, services sector, transportation, and industrial uses. The residential uses are almost completely located south of Michael Avenue with a few single family homes scattered along the remainder of the corridor. Retail and service uses are generally directly adjacent to the roadway along much of the length, while industrial uses are generally grouped around the Industrial Drive and Continental Drive areas. The Exeter Regional High School recently located to Epping Road outside of the study area beyond the NH 101 interchange and has had an impact on traffic patterns and volumes.

Goals and Objectives

The overall goal of this plan is to establish an Access Management Plan for the corridor. There are a number of objectives that must be completed:

- Verify the need for previously recommended improvements
- Establish Access Management Policies and Standards
- Promote modifications that improve the safety of the roadway
- Promote modifications that improve the effectiveness and efficiency of the roadway in moving vehicles.
- Enhance the character and aesthetics of the roadway and the Epping Road corridor.
- Provide a basis for engineering future improvements.

Issues and Opportunities

There are a number of issues that are currently influencing travel along the corridor. Of primary concern to the community is that without proper management, growth along the corridor will result in similar traffic and land use characteristics that currently exist on Portsmouth Avenue. Based on observation, data collection and discussion of Epping Road with interested parties, the issues that the corridor faces are shown in ***Figure 2*** and can be categorized as the following:

- ***High volume of trucks:*** 12% of vehicles on the roadway are trucks, which is high for the type of roadway and reflects the industrial use of land along the corridor and the connection that Epping Road provides between NH 101 and the downtown. It is also indicative of the restrictions on truck traffic necessitated by the low and narrow railroad bridge on NH 85 (Newfields Road) at Exit 10.
- ***Traffic Growth:*** Traffic has increased approximately 41% over the last ten years from 7621 vehicles per day in 1995 to 10,720 per day in 2005 north of Continental Dr. There was also a significant increase in traffic from 2005 to 2006 due at least in part to the opening of the new Exeter Area High School on Epping Road outside of the study area.
- ***Difficult access:*** Left Turns from side streets to Epping Road are difficult during peak hours of traffic on the corridor.
- ***Poor driveway design:*** Many driveways along Epping Road are Ill-defined and/or too close to other driveways.
- ***Development pressure:*** The area is close to the NH 101 interchange and features several large industrial and commercial parcels with significant traffic generating

potential, particularly the parcels along Continental Drive which has the potential to add approximately 660 PM peak hour trips if all parcels are fully developed. This is 50% of the development potential on the corridor.

- ***Poor roadway geometry:*** Some of the intersections and driveways along the corridor create difficulties for turning traffic, especially trucks.
- ***Limited Right-of-Way***: Epping Road is a "4 Rod Road" with a 66 foot right-of-way. While parcel-by-parcel information has not been collected, this width limits roadway expansion without potentially significant land acquisitions.

At the same time, there are some opportunities present on Epping Road that when taken advantage of, can help shape the nature of improvements:

- ***Mixed Land Use:*** The mixed residential, commercial, and industrial are complimentary and with the proper supporting infrastructure can reduce travel and generate economic growth on the corridor.
- ***Set-backs***: Most of the buildings along the corridor are substantially set back from the roadway, reducing the impacts of any improvements, and adding flexibility in what can be implemented.
- ***Development potential:*** There is significant development potential along and adjacent to the corridor, especially along Commercial Drive. This provides an opportunity to have necessary improvements constructed as part of development agreements, impact fees, or other financing mechanism.
- ***Pedestrian & Bicycle improvements:*** Currently shoulders are limited in width and sidewalks only extend a short distance into the study area, ending just north of the intersection with NH 111A. Improvements along the corridor should look to include pedestrian and bicycle improvements as appropriate.
- ***Aesthetics:*** Epping Road serves as one of the primary gateways into the community and there is an opportunity to improve the aesthetics of the roadway in that regard.

Previous Studies

In 1994 and 1995 a two phase study of the Epping Road corridor was undertaken to analyze existing conditions, project future traffic volumes, and develop a cohesive plan for the corridor that could be use to guide growth and development and issues 20 years into the future. Some of the noted conditions from that study were:

- Left turn departures from any intersecting street or driveway on the corridor involves the most delay, have the least capacity, and the lowest level of service.
- Worst conditions (LOS C) on left turn departures from Industrial Drive (North and South) and from NH 111A/Columbus (LOS E)

The horizon year of the 94-95 study was 2014 and a 75% buildout of land use along the corridor was projected to develop the future traffic volumes. This buildout was based on standardized trip generation rates applied to the current (in 1995) land uses and the potential full utilization of any undeveloped land. This was added to a 3% background growth rate for the region and then reduced to 75% of full buildout to reflect 2014 conditions. Based on that buildout and the expected 2014 evening peak hour volumes of 4,900-6,900 vehicles, the following improvements were recommended:

Table 1: 1995 Traffic Volumes

Location	Average Weekday Traffic (VPD)	AM Peak Volumes (VPH)	PM Peak Volumes (VPH)
North of Continental Dr	7621	615	674
North of NH 111A	9178	645	746

- Signalization of NH 101 Interchange (this was prior to the construction of the current grade separated interchange)
- Construct two through lanes in each direction and a center two-way left-turn lane should be considered as well.
- Accommodate u-turns via jug handles and other methods to mitigate difficult left-turn departures from side streets and driveways.
- Right-turn lanes at some intersections.
- Dual exit lanes at side streets.
- Signalize Epping Road/Brentwood Rd/Columbus Ave
- Signalize Industrial Drive North Intersection
- Expand right-of-way significantly to accomplish recommended improvements.

A final phase of work was proposed to design the specific improvements recommended in the corridor study. The design work has not yet been initiated however some funding from NH DOT (matched with local resources) is currently programmed for Fiscal Year 2008 for engineering work along the corridor.

Table 2: 2005 Traffic Count Data

Location	Average Weekday Traffic (VPD)	AM Peak Volumes (VPH)	PM Peak Volumes (VPH)
North of Continental Dr	10720	843	1006
South of Industrial Dr (North Entrance)	9708	690	830
North of NH 111A	12512	820	1196
South of NH 111A	8928	807	749

Current Data Collection Efforts

During July and September of 2005, the Rockingham Planning Commission set out automatic traffic recorders to capture traffic volumes and vehicle types traveling the corridor. There were a total of seven counters set out at the following locations to capture directional traffic as well as classify vehicles utilizing the corridor:

- Between the Mobil gas station and Portland Glass (2 counts)
- Between the northern Industrial Drive entrance and Continental Drive
- Between the northern Industrial Drive entrance and Michael Ave.
- Between the southern Industrial Drive entrance and Brookside Drive.
- Between Brookside Drive and NH 111A
- South of NH 111A

Table 3: Unsignalized Intersection Level of Service (LOS)

LOS	Delay Range
A	<= 10.0 seconds
B	> 10.0 and <= 15.0
C	> 15.0 and <= 25.0
D	> 25.0 and <= 35.0
E	> 35.0 and <= 50.0
F	> 50.0 seconds

During September of 2005 turning movement counts were conducted at the primary intersections along the corridor. Four counts were conducted at the following locations:

- Continental Drive & Epping Road
- North end of Industrial Drive & Epping Road
- South end of Industrial Drive & Epping Road
- Epping Road/ NH 111A/ Columbus Ave intersection

Counts were completed in July to get summer volumes, and again in September to have traffic counters in place during the turning movement counts. This allowed the verification of the volumes from the automatic recorders against those gathered during the turning movement counts.

In September 2006, an additional traffic count was undertaken to compare volumes from before and after the opening of the new Exeter Area High School west of the study area on NH 27. A single location at the northern end of the study area was chosen as the location to establish the comparison count and data was collected from September 18th to the 25th.

Table 4: Comparison between 1994 and 2005 Intersection Analysis

Location / Movement	1994 - PM Peak Analysis Volume	Capacity	Delay	LOS	2005 - PM Peak Analysis Volume	Capacity	Delay	LOS
Epping Rd/Industrial Drive (North)								
WB Left Turn Departures	23	281	NA	C	29	90	63.0	F
WB Right Turn Departures	95	683	NA	A	128	427	19.9	C
WB Combined Departures	118	534	NA	A	157	517	25.7	D
SB Left Turn Arrivals	32	772	NA	A	84	845	9.7	A
Epping Rd/Industrial Drive (South)								
WB Left Turn Departures	28	276	NA	C	36	209	25.8	D
WB Right Turn Departures	26	657	NA	A	45	581	11.7	B
WB Combined Departures	54	382	NA	B	81	790	18.0	C
SB Left Turn Arrivals	8	743	NA	A	5	1041	8.5	A
Epping Road/Brentwood Road								
EB Left Turn Departures	139	140	NA	E	144	164	96.6	F
EB Rights Turn Departures	195	671	NA	A	120	600	12.5	B
EB Combined Departures	NA	NA	NA	NA	263	764	58.4	F
NB Left Turn Arrivals	256	694	NA	A	204	992	9.6	A

Data Analysis

Intersection Capacity Analysis was completed on the primary intersections within the study area. ***Table 4*** compares the critical turning movements (those that have the greatest impact on intersection operations) of the PM Peak period data of 1994 and 2005 and shows that the intersections are currently performing worse than they were in 1994, but are still well below the projected 2014 volumes discussed in the earlier report. Currently there are two turning movements that are operating under failing conditions; the left turn departures from the northern Industrial Drive access point and the left turn from the Brentwood Road (NH 111A) and Columbus Avenue both individually. Looking at the overall impact of these turning movements on the operation of those two intersections shows that the delays to left turns are also impacting right turn departures as well due to the lack of exclusive left and right turn departure lanes. The southern Industrial Drive intersection is functioning at a better level of service, although this is also degrading over time as traffic increases. Level of service "D" is the minimum that is generally acceptable for operations.

Table 5: 2005-2006 Comparison

Day	2005[1]	2006[2]	Difference
Monday	10526	13524	2998
Tuesday	10900	13640	2740
Wednesday	10549	14217	3668
Thursday	11219	13696	2477
Friday	11146	13441	2295
Saturday	8071	9407	1336
Sunday	6719	7426	707
Ave Weekday Traffic	**10948**	**13748**	**2800**

[1] September 7-14, 2005
[2] September 18-24, 2006

In September, 2006, an additional traffic count was conducted near the northern end of the study area to gauge the immediate traffic impacts

of the recently opened Exeter Area High School on travel through the corridor. The new school was constructed on Epping Road approximately 2.5 miles west of the study area and was expected to change school related traffic patterns within the community. The 2006 numbers were compared to the 2005 counts from the same location, and show a large increase in traffic volumes (***Table 5***). Weekday volumes increased an average of 2800 vehicles; Saturday volumes just over 1300; and Sundays show a smaller increase at just over 700 vehicles per day. Given the pattern of traffic throughout the day, this can't solely be due to the change in school location, but it is clear that there is an impact from the shift.

Traffic Accidents

A quick survey of the NH Department of Transportation Traffic Accidents database turns up a small set of accidents in and around Epping Road. Over the six year period from 1999 to 2004, there were a total of 61 reported accidents involving 111 motor vehicles. ***Table 6*** shows that aside from "No Improper Driving", the most common contributing factors for these accidents were "failure to yield right of way" (approximately 31%), and "driver inattention/distraction" (11.5%). Table 7 illustrates that over 44% of the accidents on Epping Road were intersection or driveway (a type of intersection) related (27 of 61). Eighteen of those accidents occurred at the Brentwood Road (9) and Industrial Drive (9) intersections. The second most common accident location was along the roadway including the shoulder (29.5%) followed by accidents related to parking lots (21.3%).

Table 6: Contributing Factors to Traffic Accidents

Contributing Factors	Number of Vehicles
No Improper Driving	41
Not coded/Other	20
Failure to Yield ROW	19
Driver Inattention	7
Illegal/Unsafe Speed	5
Physical Impairment	5
Skidding	5
Unknown	3
Unsafe Backing	3
Following Too Close	3
Total	111

A high percentage of failure to yield accidents is generally indicative of traffic control and congestion issues. However, the overall numbers of accidents are very low given the volume of traffic on the corridor. Based on current volumes, the accident rate is approximately 2 per million miles of travel through the study area which is significantly lower than the state average of 2.78 per million miles of travel (2003). While there is no serious safety issue on Epping Road at this time, it should be noted that the database utilized for the analysis does not contain some property damage only accidents, and contains significant coding errors throughout that may have placed some accidents elsewhere in Exeter that actually occurred within the study area. It should also be noted that as development continues, and traffic increases, the control and geometry deficiencies on Epping Road will likely result in more and more accidents.

Table 7: Accident Locations

At Intersection/ Intersection related/ driveway related	Along Roadway/ shoulder	Parking Lot	Other
27	18	13	3
44.3%	29.5%	21.3%	4.9%

Land Use & Zoning

As shown in the ***Figure 3*** there is a mix of commercial, industrial, and residential uses along Epping Road within the Study area. The southern portion of the area has most of the residential development as well as significant small commercial along Epping Road itself. From Industrial Drive north, the land use shifts to primarily commercial use with only a few residences north of Michael Ave. There significant industrial properties on Industrial and Commercial Drives. As of 2005, there were approximately 328 acres of developed property within the study area with the capacity for developing an additional 540 acres. While some of this acreage has been built upon in the last few years, other parcels along the corridor have been idled as businesses close or residents move. Current development includes approximately 1 million square feet of light industrial, athletic facilities, general office, and retail and service sector uses, as well as 371 housing units. The vacant land on the corridor has the potential to add over 700,00 square feet of development mostly of the light industrial and retail/services type as well as approximately 100 new housing units. A summary of this information is included in ***Table 8*** and more detailed information is included in the appendix to this document.

Table 8: Trip Generation Characteristics

General Land Use Type	Current volume (ft^2)	Calculated PM Peak Trips	With Vacant Parcels (ft^2)	Calculated PM Peak Trips
Industrial	689,300	**593**	1,281,349	**1214**
Residential (units)	371	**291**	471	**350**
Athletic	103,300	**302**	103,300	**302**
Office	124,600	**364**	164,600	**432**
Retail/Services	108,330	**717**	229,330	**1045**
Total	1,025,530	**2267**	1,778,579	**3343**

To gain a better idea of the potential of existing and future growth to generate traffic from within the corridor, the current land use trip generation characteristics were calculated based square footage of development, and utilizing the Institute of Traffic Engineers (ITE) Trip Generation methodology (7th Edition). The trip generation potential of currently vacant parcels were also calculated with their maximum likely use. This method indicates that the existing development on the corridor could generate approximately 2,300 motor vehicle trips during the PM peak hour, which calculates to a daily volume of about 24,500 vehicle trips per day assuming the peak hour is 9.2% of daily traffic. When all currently vacant parcels are added, this grows volumes by 47% to 3,350 vehicles during the PM peak hour and 36,000 daily.

Epping Road Strip Management Ordinance (C-3 Districts)

The community has developed an overlay district for a portion of the study area and this is codified in Article 6 of the Exeter Zoning Regulations. Article 6.8 establishes the zone with the purpose of lessening congestion and providing for safe and orderly traffic flow within the developing commercial area on Epping Road. The regulation prescribes the following

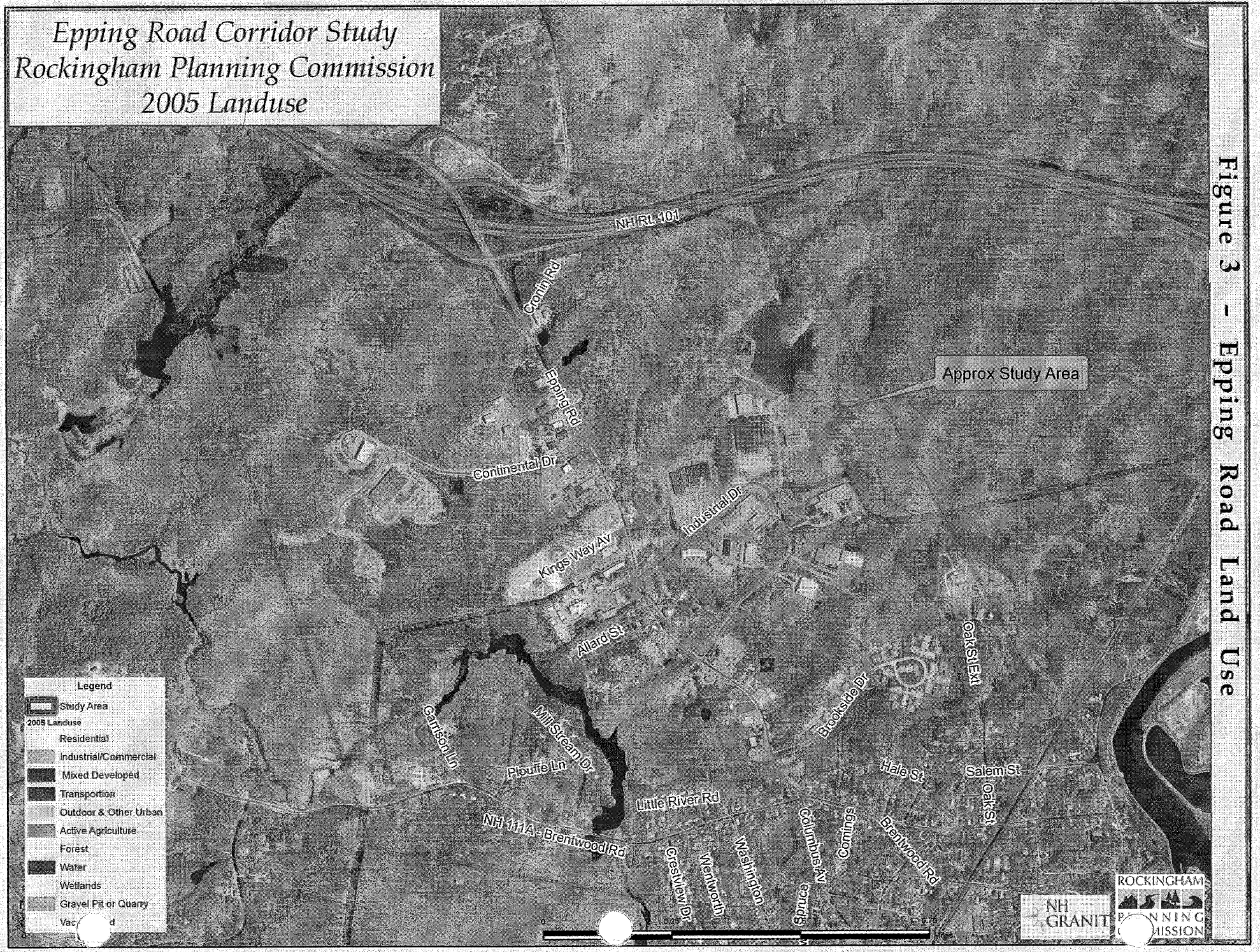


Figure 3 - Epping Road Land Use

standards:

- Access Points located directly opposite each other on Epping Road
- Single access point to Epping Road from each parcel unless the parcel has greater than 1200 feet of frontage at which time it may have 1 for every 600 feet of frontage
- Consolidate access points at abutting property lines to facilitate shared access and reduce the number of driveways on the corridor.
- 25 foot undeveloped front yard that is clear of obstructions to sight followed by 25 feet of landscaped area in which signage is permitted with a minimum setback of 35 feet.
- Minimum building setback of 85' from the Epping Road right-of-way.
- Minimum access road setback of 50'
- Minimum parking area setback of 75'

This overlay applies to the areas in ***Figure 4*** that are labeled as C-3 which is the section of the corridor from approximately the northern intersection of Old Epping Road with Epping Road through the end of the study area at NH 101. As shown in ***Table 9***, the other zoning districts along the corridor are less restrictive in many of the control aspects such as minimum lot width and setbacks.

In addition, Section 10 of the Exeter Subdivision and Site Plan Regulations provide for additional requirements for the C-3 district. Foremost in these is that the design and location of driveways within the corridor will be specified by the Planning Board with the ultimate goal of limiting driveways along the corridor as much as possible. In addition to the access requirements, the regulations also work to move parking to the rear and side of buildings

Table 9: Corridor Zoning Districts

District		Minimum Lot Area (sq ft)	Dwelling Unit (sq ft)	Min Lot Width (ft)	Minimum Front Setbacks (ft)
R-4 Multi-Family					
	Detached Single Family	12000	12000	100	25
	Two Family	15000	7500	100	25
	Three or More	21000	7000	100	25
MS	Mobile Home Subdivision	10000	10000	100	25
C-2	Highway	20000	Not Permitted	150	50
C-3	Epping Road Highway	40000	Not Permitted	175	50 (85 ft from Epping Rd)
CT-1	Corp/Tech Park-1	4 Acres (174240 sq ft)	Not Permitted	250	75
I	Industrial	2 Acres (87120 sq ft)	Not Permitted	150	50

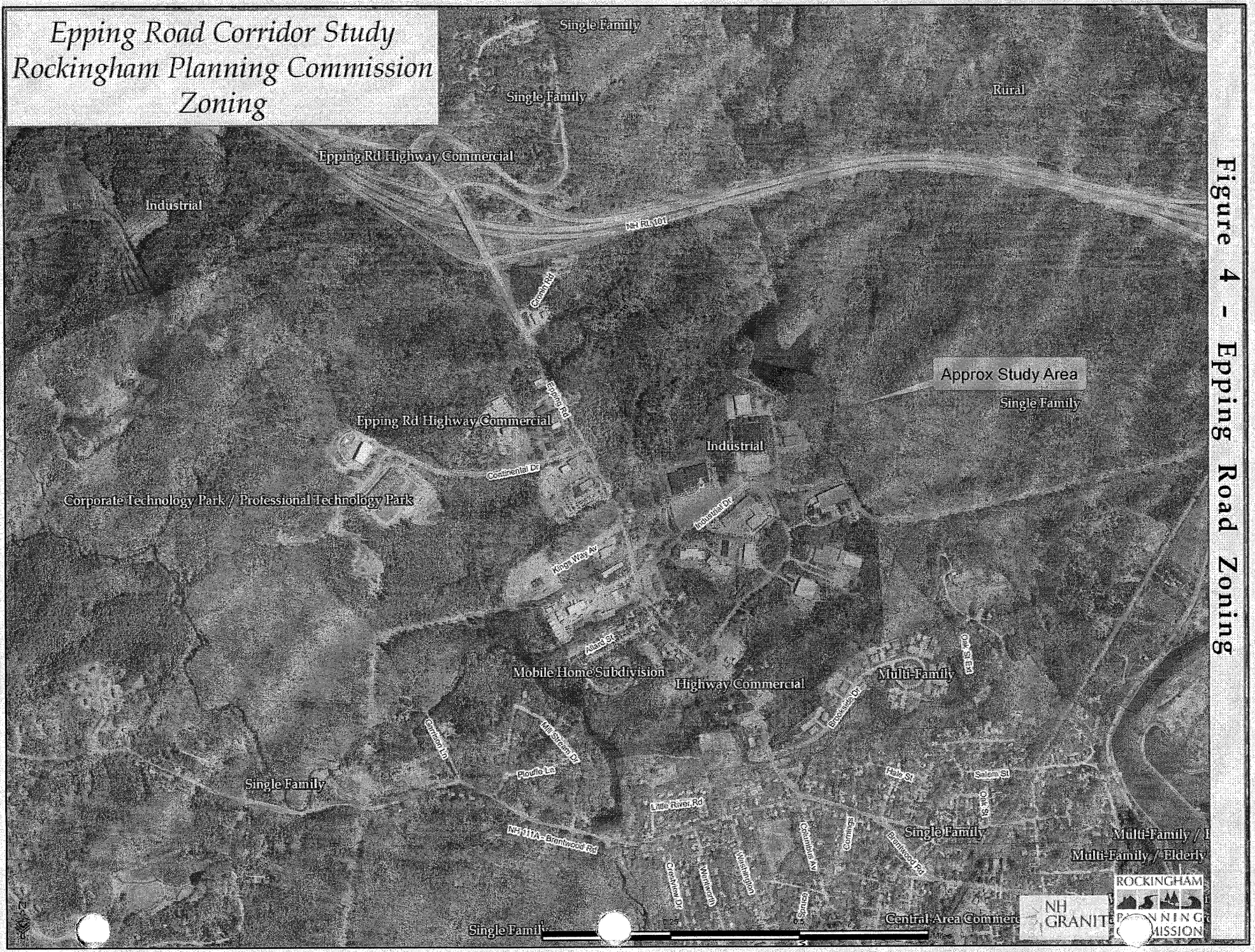


Figure 4 - Epping Road Zoning

when possible, place utilities underground, and to conform the landscaping requirements to the established setbacks.

Given the existing zoning and land use along the corridor, the remaining potential developable land, and the general background growth in the area, it is not expected that the land in the corridor will reach buildout within the next 10-20 years or that the traffic volumes projected in the 1994-95 study would be reached. Even if this level of development were reached, it is not the desire of the community to expand the roadway to five lanes along its entire length given the right-of-way impacts, disruption to existing businesses and residences, as well as the tremendous cost.

Access Management

Access Management involves maintaining control over the location and design of all entrance points to a public highway. The intent is to preserve the safety and efficiency of the roadway, while at the same time providing reasonable access to adjacent properties. Practically, it means appropriately spacing or limiting the number of driveways as well as ensuring proper design the roadway and all access points so that traffic moves as safely and efficiently as possible. Access management tools are both preventative; designed to be implemented prior to the development of a highway, and retroactive; designed to improve the function of existing roadways. The tools are comprehensive and range from changes to a community's existing regulatory scheme, to prescribed design standards, to physical improvements to the roadway. The benefits are widespread and provide something for all users of the transportation system as well as the community as a whole:

- ***Motorists*** gain from reduced numbers and severity of traffic accidents and improved traffic flow which both saves time and money through reduced fuel consumption.
- ***Businesses*** benefit from preserving their market and or delivery areas. Customers find it easier to access a business due to reduced stress from less congested roadways and lower accident potential. Often corridors with good access management are friendlier to pedestrian traffic which can create additional business opportunities.
- ***Land Owners*** benefit from the increased economic development potential of their property on an efficient transportation corridor as well as increased property values from the enlarged market area created by congestion reductions.
- ***Developers*** gain from having pre-determined access and design criteria in advance of any proposals which reduces their design costs and delays.
- ***The General Public*** gain from prolonging the life of the existing roadway through preserving or increasing the capacity which allow funds that might have been spent on new facilities to go into maintaining the existing network. In addition, there can be benefits for both public transportation travel times and accessibility. Finally,

good access management can create a more aesthetically pleasing area with fewer signs, more green space, and an overall more walkable community.

Access Management Principles

With the ultimate goal of Access Management being to find the appropriate balance between safe and efficient traffic flow, and access to individual properties, there are some guiding principles that should be kept in mind when developing access management plans and proposed improvements.

- ***Maintain Reasonable access to property:*** An abutters access to a highway is a given property right that cannot be taken away without compensation, although it is subject to regulation by municipalities and the NH Department of Transportation under RSA 236:13 which provides them authority to determine where and how that access occurs, design standards, and to limit the number of driveway connections.
- ***Provide benefits to the greater community:*** Users of the roadway should not be the only beneficiaries from access management. Proper application should benefit businesses through safe and convenient access for customers and employees, and taxpayers by utilizing low cost techniques that preserve the capacity of the roadway while saving tax dollars.
- ***Classify roadways based on their function:*** More critical arterials that serve greater traffic volumes and provide important connections should have a higher degree of access management applied. This ensures that the road continues to perform according to the function it was designed to serve.
- ***Establish Good Design:*** Implementing standards that promote a well designed roadway, intersections, and driveways is the backbone of access management. These standards set the foundation for correcting existing access issues as well as establishing a consistent basis for all future improvements.
- ***Maintain interconnected streets:*** Interconnections between adjacent sites and between new subdivisions and the existing street system are important to maintaining safe and efficient traffic flow. Road networks that work the best are those that provide the user with some options for getting from place to place.
- ***Incorporate planning and zoning:*** The foundation for good access management is based in integrating the concepts into community plans and zoning regulations. Access management goals should be included in the community master plan, and in local zoning and land development regulations to help prevent access problems.
- ***Educate the public:*** If the citizens and business owners understand the benefits of access management, and are involved in development of plans and implementation activities, then support for the specific improvements will be greater.

General Practices

There are six general practices that are applied at different regulatory and operational lev-

els to facilitate good access management:

- Limiting the number of conflict points, primarily the intersection of driveways with a street, or the intersection of two or more streets.
- Separating conflict points by providing sufficient space (time) between them.
- Removing turning vehicles from through traffic lanes with left or right turn lanes.
- Reducing conflicting volumes of traffic by providing alternative ways to travel between sites without having to access the roadway network.
- Improving roadway operations by preserving the function of the roadway and providing standards appropriate to the volume and type of traffic.
- Improving driveway operations through better designs.

Access Management Techniques

The six practices above have resulted in a large number of specific techniques that can be utilized to manage access on a roadway. This section details these techniques and provides appropriate standards and thresholds for the community to implement.

RESTRICT THE NUMBER OF DRIVEWAYS PER LOT

Lots which have frontage on one highway only should be allowed a single driveway. An exception can be made when two, one-way driveways are substituted for a single driveway. Lots with frontage on both an arterial highway, and an adjacent or intersecting road should not be permitted to access the arterial highway, except where it can be proven that other potential access points would cause greater environmental or traffic impacts. The current Epping Road Strip Management Ordinance requires that any development within the district have no more than one driveway on the roadway unless frontage is greater than 1,200 feet in which case one access per 600 feet of frontage would be allowed.

RESTRICT THE NUMBER OF LOTS

Currently lot size and frontage requirements within the study area are dependent upon the zoning district that the parcel is included in. Minimum frontages range from 100 to 175 feet, and minimum parcel sizes range from as small as 20,000 square feet (approximately ½ acre), to as large as a 4 acres (See Table 8 for details). The differing standards create inconsistencies along the corridor that allow for a much greater density of driveways on the southern section than in the northern section.

REGULATE THE LOCATION, AND SPACING OF DRIVEWAYS

Traffic safety studies have shown that traffic accident rates increase as driveways and road access points become denser. By establishing a minimum distance between access points on the roadway as shown in ***Table 10***, conflicts are separated and drivers are provided with more opportunity to assess and react to potential conflicts, improving safety for all users. Driveway alignment on opposing sides of the street can have impacts on the safety and ef-

Table 10: Minimum Spacing of Access Points

Posted Speed Limit (mph)	Centerline to Centerline Driveway Spacing (t)	Approx. number of driveways per 500 feet	Approximate number of driveways per mile
20	85	6	62
25	105	5	50
30	125	4	42
35	150	3	35
40	185	3	29
45	230	2	23
50	275	<2	19

From Iowa State University Access Management Tool Kit, http://www.ctre.iastate.edu/Research/access/toolkit/index.htm

ficiency of exiting maneuvers, particularly left turns. The ideal situation has driveways on opposite sides of the roadway spaced adequately for the speed of the roadway so that exits from one driveway are not blocked from one opposite it. The greater the speed, the greater the offset between driveways, ranging from approximately 250 feet at 25 MPH to 750 feet at 50 MPH. Driveways directly opposite each other are less desirable, but establish the proper layout for future traffic signals. The worst conditions for driveway movement are those that are slightly offset so that movements across the roadway from one driveway to the other are possible but difficult. In addition, this type of close layout causes left turning traffic entering the driveways to block traffic exiting from the other drive. Currently, the Epping Road Strip Management Ordinance requires that access points be located directly opposite each other across Epping Road where possible. For low volume driveways and locations where future traffic signals are likely this is effective, however at higher volumes the left turning traffic from the driveways can interfere with each other creating delay and safety issues.

ENCOURAGE SHARED ACCESS TO PARCELS AND DRIVEWAY CONSOLIDATION

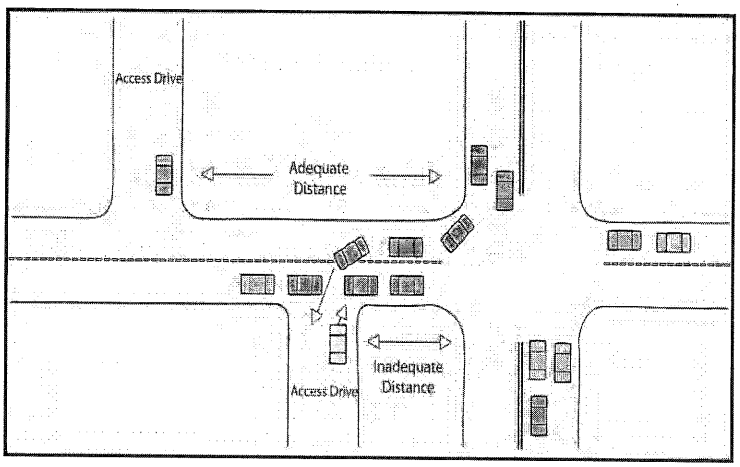
Adjacent properties can often share driveways and parking lots with only minor modifications to site plans and this can have a significant impact on the number of driveways on the roadway. Cross lot connections allow drivers and pedestrians to access multiple adjacent properties without utilizing the arterial roadway, lowering the volume of traffic and reducing conflicts. This is required by the Epping Road Ordinance and has been applied to a limited extent along corridor as development has occurred, but most often each parcel has its own access point to the roadway.

LOCATE DRIVEWAYS AWAY FROM INTERSECTIONS

Ensuring that the functional area of an intersection is free of driveways has a positive impact on both the operation of the intersection as well as safety. The exact distance that a driveway should be from the intersection is highly dependent upon the type of intersection (signalized or not), it's configuration, signal timing, presence of turning lanes, traffic volume and speed. It will also be dependent upon whether the access point is located on the

intersection approach or exit.

Figure 5: Corner Clearance



PROVIDE ADEQUATE SIGHT DISTANCE

One of the most critical safety requirements is for adequate sight distance and ensuring that access points have the ability to see far enough to ensure that the roadway is clear is also an important access management technique. The critical measure in ensuring adequate sight distance is termed Stopping Sight Distance and is the distance required for a driver, traveling at the design speed, to stop before colliding with an object in the roadway. As shown in ***Table 11***, this distance increases with speed and ranges from 115 feet at 20 MPH to over 700 feet at 70 MPH. There is one curve in the center of the study area that limits sight distance and combined with oblique angle intersections on each end of the curve creates safety issues.

Another aspect of appropriate sight distance is ensuring that the visibility provided at intersections is great enough that drivers stopped and waiting to enter, have enough distance (time) to make the decision, accelerate, and safely cross or enter the roadway. Intersection Sight Distance is impacted by horizontal and vertical road curvature, fencing, signs, landscaping, utility locations, and even snow levels and storage. The requirements necessary for ensuring clear sight distances at intersections is usually determined at the local level and are included in the Zoning Ordinance.

Epping Road is currently designed for speeds in the neighborhood of the established speed limit of 30 miles per hour and with any improvements this should remain predominantly unchanged. As individual projects are implemented along the corridor it will be important to consider the safety impacts of changes that increase the design speeds and the need for greater sight distances in already developed areas.

RESTRICT TURNING MOVEMENTS INTO AND OUT OF DRIVEWAYS

Restricting turning movements from specific driveways can make great improvements in safety and traffic flow by reducing conflicting movements near intersections. The most effective method is a center raised median which prohibits any left turns into or out of adjacent driveways and eliminates the most difficult and unsafe traffic movements. Another method involves designing the specific driveway to be directional (right in, right out), but this is often difficult to construct in a manner that eliminates the restricted movement. There are currently no turning movement restrictions on the Epping Road corridor.

PROPER INTERSECTION SPACING

Adequate and consistent intersection spacing promotes improved access to property and

better traffic progression along a roadway. This is especially important in the case of signalized intersections where improper placement can create additional areas of conflict, traffic queues, and congestion. Signalized intersections are ideally spaced at ½ mile (2640 feet) but can operate effectively at distances as close as ¼ mile apart (1320 feet) before traffic becomes disrupted. In conjunction with proper spacing, the length of cycles at a traffic signal can greatly influence the congestion and delay along the corridor. In fact, the cycle times should be determined not solely based on volume of traffic, but on the distance to adjacent signals and the desired speed of travel through that section of the roadway. There are currently no traffic signals located within the study area.

MEDIANS

A raised median separates opposing directions of traffic and reduce conflicts (and accidents) by eliminating left turns except for specifically prescribed locations. This allows for better traffic flow and less congestion as one direction of traffic is not affected by the other except at signalized locations. The raised median also provides pedestrians a refuge in the center of large roadways making crossing a safer movement. In addition, with appropriate vegetation, a raised median can add tremendous aesthetic value to an area and transform the perception of the area by all visitors. Often medians are resisted by business owners who fear that installing a raised median will have negative impacts due to the "inconvenience" that customers will face trying to access their property. Various studies have examined the issue and shown that customers will accept some additional "inconvenience" to have steady traffic flow and improved safety and that most often the largest negative effects where felt during the actual construction. This is especially true in locations where motorists have difficulty making left turns into or out of driveways. There are currently no medians on the Epping Road corridor.

Table 11: Stopping Sight Distance

Design Speed of Roadway (MPH)	Stopping Sight Distance (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730

Source: AASHTO, A Policy on Design of Highways and Streets, 2001

RIGHT-TURN AND LEFT-TURN LANES

Right-turn lanes are typically installed at intersections with high turning movements or they can be utilized at mid-block locations at high volume driveways. They can also be retrofitted into areas where poor driveway or site circulation has caused traffic backups. Left turn lanes provide critical safety and capacity improvements to a corridor, especially under heavy traffic conditions. Isolated left turn lanes are designed to move turning vehicles out of the through lanes at intersections. These can be either protected by a raised median to separate opposing directions of traffic, or unprotected adjacent to the opposing traffic. Continuous left turn lanes are constructed along an entire segment of the road, and can either be dual left turn lanes that carry a single direction of traffic (known as a Left Turn Lane or LTL), or a single center turning lane that carries traffic from both directions (known as a Two Way Left Turn Lane or TWLTL).

REQUIRE UNIFIED INTERNAL CIRCULATION

The goal of unified internal circulation is to provide the most efficient and safe design of parking lots, loading zones, refuse storage and pickup areas for access by both pedestrians, passenger cars, as well as the large vehicles that provide services to the site. This is particularly an issue at establishments with drive-thru services where queues can spill out onto the street and hinder traffic movement.

FRONT AND REAR ACCESS ROADS

Access roads, whether in the front or rear of a development, eliminate the need for multiple driveways and offer connections between parcels that don't require the use of the arterial roadway. These types of connections are especially useful in that they can provide access to many parcels via a single traffic signal on the arterial.

ROUNDABOUTS

In certain circumstances roundabouts can provide an alternative to signalizing an intersection on an arterial roadway. They are particular effective at slowing traffic into a district such as a downtown or other transition point in the roadway. The primary advantage that roundabouts have over traditional traffic signals is that they can often perform as effectively as a signal with fewer lanes and less overall widening (length) and that aesthetically they are generally considered superior. They are also much safer and result in less delay than traffic signals at volumes up to 2000 vehicles per hour and are designed to accommodate large trucks and emergency equipment. On the other hand, roundabouts generally require more right-of-way width at the intersection than a traffic signal which in areas of high land values can make them more costly than a signal installation at the same location.

DRIVEWAY DESIGN

There are several driveway design components that work together to allow smooth and safe movement of vehicles on and off the roadway.

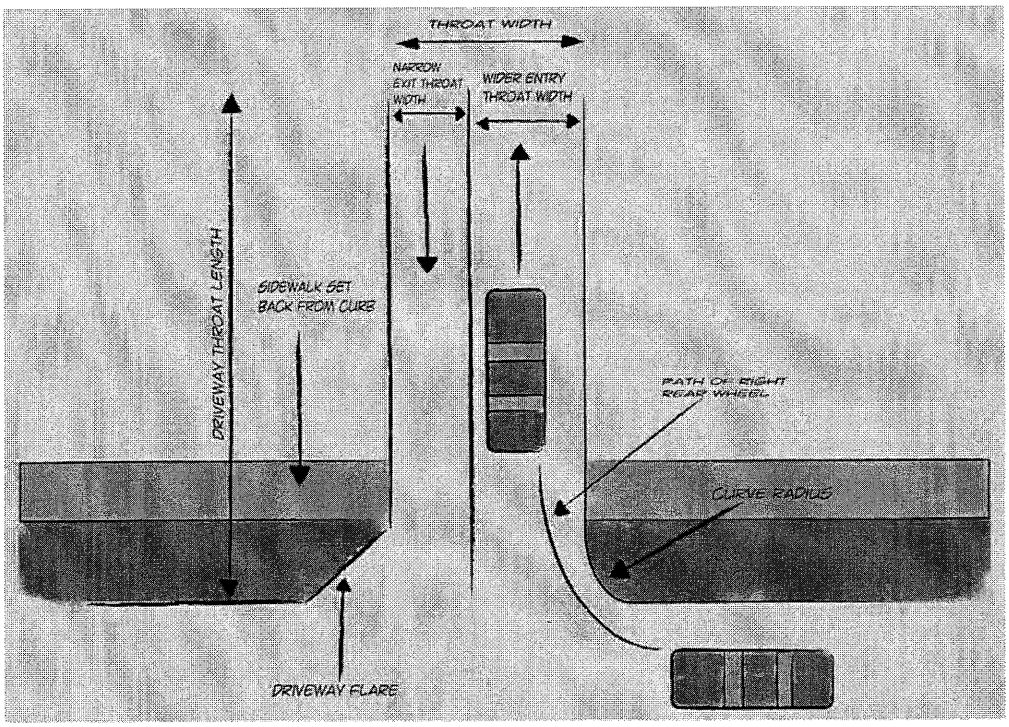
- ***Throat Length:*** Throat length refers to amount of driveway available for stacking incoming and outgoing vehicles and is measured from the street to the end of the driveway within the development. When there is insufficient distance to manage this traffic, entering vehicles can back up into the street and exiting vehicles can be stuck in the parking lot. The minimum length of a driveway needs to be of adequate length to accommodate the queuing of the maximum number of vehicles, as defined by the peak period of operation identified in the traffic study for the development. For driveway with one entry lane and one exit, this value ranges from 30 to 75 feet while for driveways with multiple exit lanes the minimum value increases to 50 to handle the higher expected traffic volumes. For signalized access points, the throat length is much longer ranging from 75 to 300 feet dependent upon the number of exiting lanes.

- ***Angle of Entry:*** The angle of entry or exit of a driveway impacts the speed at which a vehicle can maneuver through it and the quicker that this movement can happen, the less impact there is on traffic on the roadway. This must be balanced however as too much of an angle reduces sight distances to the left for exiting traffic. Adding

a flare or taper to the driveway access can make this a much more efficient process as well.

- ***Throat Width and Turn Radii:*** The appropriate combination of driveway width and turn radius is critical for vehicles to smoothly transition from the roadway into a driveway. As the driveway width is increased, the turn radius can be decreased while maintaining smooth maneuvering. The range of radii is generally from 15 feet in already developed areas with heavy pedestrian traffic (for safety) or space constraints, to 25 feet in areas where more space is available. Sites with significant truck traffic could see turn radii of up to 50 feet to accommodate the large vehicles. Throat width will be dependent upon the number of lanes entering and exiting but should range from around 15 feet for single lane residential driveways to 40 feet for driveways with a single entry lane and two exit lanes. It is critical that the radii and width be designed to the type of vehicles that will be utilizing the driveway, and that it also be considered in conjunction with the other aspects of driveway design such as angle of entry.

Figure 6: Driveway Design



- ***Type of Curb Opening:*** The type of curb return design can have a large impact on driveway operations. Driveways using the dropped curb design or a dustpan design have generally had to be much wider than necessary or have operational issues due to drivers making wide turns to avoid the curbing that juts out into what would be the natural turn radius. Driveways should utilize the curb return style opening which allows for a much more natural turning movement, narrower drives, and improved operations.

PEDESTRIAN & BICYCLE FACILITIES

Pedestrians and cyclists are best served by limiting the number of crossing points (driveways) and by making the crossings as narrow as is feasible. Crosswalks and user activated pedestrian crossing signals should be included at any signalized intersection. Shoulders should be a minimum of four feet and should be designed to accommodate bicycle traffic. Sidewalks and crosswalks should be set back from the mouth of the driveway, and the volume of pedestrians and cyclists should be a consideration in the determination of the driveway taper, turning radius, and speeds of entry and exit.

Recommendations

Given changes in the expected growth and community desires, some modifications to the recommendations from the 1994-95 studies are required. This Access Management plan includes improvements which are detailed in this section and access management policies and recommendations. The recommendations can be categorized into three aspects: Policy Changes, Roadway Changes, and Areas of Further Study.

Policy Changes

- ***Extend the Epping Road Strip Management Ordinance (C-3 Districts):*** Extending the ordinance to cover all parcels fronting on Epping Road between the NH 111A (Brentwood Rd) intersection and NH 101 would provide for consistent and appropriate access management and design along the entire length of the corridor. There are several parcels in the area not currently covered by the C-3 District that would be unable to meet the standards and a process should be developed that allows for exceptions for the redevelopment of these parcels as appropriate.

- ***Modify the access management requirements in the C-3 District:*** The content of the Epping Road Strip Management Ordinance (C-3 Districts) should include additional access management aspects. Specifically, it should modify the driveway location requirements and include additional driveway spacing and design standards, as described in the detailed access management component of this document.

- ***Improve Driveway Design:*** Many driveways along the corridor are poorly defined allowing for access and egress at many points along the parcel frontage. Other drives have poor access angles or other geometric issues that create turning movement difficulties, safety issues, and other inefficiencies. Detailed requirements for driveway design are discussed under the Access Management section of this document.

- ***Number of Driveways:*** Adjust the requirement limiting parcels to a single driveway to allow for two one-way access points as well as placing primary access points on connecting streets, such as Continental Drive and Industrial Drive, where possible.

- ***Minimum Lot Size:*** For lots within zoning districts with a minimum lot size less

than 1 acre, the recommended minimum frontage is 250'. Lots in districts requiring larger minimum lot sizes should be required to have ±400' of frontage. Because the southern portion of the corridor already has small parcels, increasing the minimum lot frontage is not likely to have a significant effect on the number of driveways. On the northern section (North of Michael Avenue) however, increasing the frontage requirements should limit to some extent the subdivision of the larger parcels along the roadway.

- ***Minimum Access Spacing:*** Establish a minimum distance between driveways on the same and opposing side of a highway, including all road intersections that is measured from the centerline of the driveways at the right-of-way line and is a function of the posted speed in accordance with the Minimum Spacing of Access Points table (Table 9) and include these requirements in the Epping Road Strip Management Ordinance. A process for granting exceptions to this requirement for low volume driveways and future signalized intersections should be allowable on a case by case basis via the Planning Board.

- ***Shared Access:*** For improvements in traffic flow and safety, shared access should continue to be the default on the C-3 portion of the corridor as it is the most effective way to reduce the number of driveways along this already saturated corridor. This requirement should be extended to all parcels with frontage on Epping Road within the study area as well. All projects subject to subdivision Review should provide interconnecting driveways or easements for future construction of driveways that will provide and promote both vehicular and pedestrian access between adjacent lots without accessing the highway, and should be designed to provide safe and controlled access to adjacent developments where they exist. Every effort should be made by the Planning Board to require construction of these driveways in anticipation of future developments.

- ***Protect Functional Areas of Intersections:*** Provide an additional requirement in the Epping Road Ordinance that requires driveways to be located outside of the functional area of an intersection where possible so as to minimize interference with the operation of the intersection. Allowances should be made for directional driveways and right-in/right-out restricted driveways within the functional area at the discretion of the Planning Board.

- ***Minimum Sight Distance:*** Incorporate minimum sight distances into the Epping Road Ordinance that at are appropriate for the design speed of the roadway. There is currently one area on the corridor in the vicinity of the Old Epping Road intersections where sight distances are somewhat limited.

- ***Raised Medians:*** Expand the access management component of the Epping Road Ordinance to include provisions for raised medians at signalized intersections that extend along Epping Road to the extent of the functional area of the intersection. Right-in/Right-out driveways and single direction driveways should be allowable within the functional area on a case by case basis as considered appropriate by the Planning Board.

Recommended Roadway Changes

- ***Widen Epping Road to 3 lanes:*** Current traffic conditions indicate a need to provide for left turn lanes at a number of intersections along the corridor. The community should pursue widening the roadway to a 3 lane typical cross section implementing left turns at intersections and considering a two way center turn lane for the length of the study area. At a minimum, raised, landscaped medians should be included at intersections to protect traffic making left turns as well as provide aesthetic benefits to the corridor. Extended lengths of median should be considered to further limit driveways, manage traffic and give the area character as a gateway into Exeter.

- ***Improve Roadway Geometry:*** Currently the approach angle and narrowness of the Intersection of Industrial Drive (north) with Epping Road creates problems for truck access and requires these vehicles to cross lane boundaries to complete the turning movements. While there is less demand, the Brentwood Road intersection also has similar turning difficulties due to its current configuration. Further, The oblique angle of the intersections of Old Epping Road with Epping Road are problematic and should be closed off and replaced with a single access point for those parcels in between the two current locations. This removes the safety issues currently present near the northern approach due to somewhat limited sight distances as well as consolidates multiple, low volume access points.

- ***Add traffic Controls:*** The intersections of Industrial Drive (North) and Brentwood Road/Columbus Avenue currently meet requirements for signalization and improvements to improve their function should be pursued. For signalization to work at the Brentwood Road intersection some significant realignment may need to occur. Preliminary engineering on these projects should include discussion of alternatives available (including a roundabout), their benefits, and their impacts. Future development along and near the Continental Drive intersection may also make that location appropriate for a future signal, especially if access to currently undeveloped property opposite the Continental Drive intersection can be incorporated and a four way access point created.

- The community should consider the use of roundabouts in place of traffic signals along the corridor. The use of traffic signals or roundabouts has an impact on the travel along the corridor as well as the character of the area.

Further Study

- ***Right-of-way Needs:*** While this study makes numerous recommendations regarding changes to the roadway, it does not address the right-of-way needs implicit in these changes. The areas where right-of-way is available should be established as well as areas where it is needed but not available.

- ***Setback Requirements:*** The Epping Road Strip Management Ordinance establishes specific setbacks along the corridor. These setbacks should be re-examined in light of both recommendations to widen the roadway as well as a general desire to establish a more aesthetically pleasing and pedestrian friendly environment along the

corridor.

- ***Engineering of Improvements:*** The study recommends a number of physical changes to the roadway that need to be engineered to ensure that they are viable and appropriate. The engineering process should include design alternatives for the various intersections, including the potential for utilizing a roundabout instead of traffic signals.

Financing

One of the biggest challenges facing the community will be in financing the recommended improvements. The traditional method to fund large scale improvements such as those proposed in this plan has been to utilize Federal and State sources via the State 10 Year Plan and the Metropolitan Planning Organization Transportation Improvement Program. Recent construction cost inflation and limited availability of funding on the State level have put this source in question to provide any assistance in the near future. Given existing and expected resources on the Federal and State level, the community will likely need to find alternate means of financing the majority of the proposed improvements. This will entail developing innovative methods of financing to get projects constructed either via local funds or as part of development agreements.

Local Funding Sources

There are a variety of resources available that can be raised locally through either the development process or via the community budgeting process. The advantage of generating the funds locally is primarily the speed at which they can be raised and put towards improvements as well as the flexibility of the use of the funds. Some of the options for financing improvements on the Epping Road corridor include:

- Warrant Article: The Warrant Article has been the primary approach to locally funding transportation improvements in New Hampshire. This involves placing the proposed project on the ballot for the community to approve funding via local property tax. This can be utilized to fully fund a project or to pay for projects that will be reimbursed by federal, state, or even developer funds.
- Local Option Fee: The Local Option Fee for Transportation Funding is one means of generating local funding via local vehicle registration fees. A New Hampshire law passed in 1998, commonly referred to as HB 648, allows a municipality to collect an additional motor vehicle registration fee of up to $5.00 for the purpose of supporting a municipal transportation improvement fund to fund projects on the local or regional transportation system including roads, bridges, bicycle and pedestrian facilities, parking and intermodal facilities and public transportation. In 2005 Exeter voted via a Town Meeting warrant article to establish a Municipal Transportation Improvement Fund however implementing the fee itself was not approved and the account remains unfunded.

- Traffic Impact Fee: A onetime fee shared to new developments to pay for the cost of serving the additional traffic generated by the new development. These fees are based on traffic studies and plans, and the fees are calculated based on the number of trips generated by various land uses. The cost of correcting existing deficiencies is usually excluded from the calculation for equity and legal reasons. A Roadway Impact Fee is a similar mechanism but is levied on a fair share basis determined by the developments anticipated portions of the total traffic on a roadway instead of just what is being added. Exeter currently has a Public Capital Facilities Impact Fee in place (Article 11, Exeter Zoning Ordinance) that allows the Planning Board to assess development fees to address the effect on the infrastructure of the community or school district (Exeter School District and the Exeter Regional Cooperative School District). This fee can be assessed for water treatment and distribution and disposal facilities; sanitary sewer; storm-water, drainage and flood control facilities; public road systems and right-of way; municipal office facilities; public school facilities including a proportional share of capital facilities of the Exeter Region Cooperative School District; public safety facilities; public library facilities; and public recreation facilities not including public open space.

- Development Agreements: These agreements are negotiated during a project's local approval stage, when the local government is able to request conditions as part of its approval process. These conditions are usually applied during zoning or subdivision approval, when local government has broad discretion in approving a project.

- Transportation Development District: Creates a public-private partnership to plan and finance transportation improvements in high growth areas. Fee formulas can be based upon either vehicle trip generation, occupied area, number of employees, or number of parking spaces.

- Tax Increment Financing (TIF): This type of financing utilizes the projected increase in property value to pay for off-site improvements over a period of time. A developer pays for initial off-site improvements and the expenditure is recouped from the difference in the developed and undeveloped tax base over a specified period of time.

- Special Assessment Corridor or District: Abutting properties along designated sections of roadway are assessed for their fair share of the cost of the public road improvement. Fees can be assessed on linear frontage, area, or by trip generation and are usually for specific improvements benefiting property within the corridor or district. Applies to all properties fronting the arterial to be improved but can be expanded into a larger district if benefits or impacts are wider than just to those fronting the corridor.

- Transportation Utility Fees: Roads are treated as a public utility and developed properties are charged a fee for service, similar to water, sewer, and other utilities. They are imposed on a jurisdiction-wide basis and continue in perpetuity. The fee varies by type and size of land use and is assessed to all property owners.

State Funding Sources

Funding from the state is somewhat more flexible in how quickly it can be obtained and programmed for construction of improvements and somewhat less flexible and how the funding can be utilized. The fact that the study area is within an "Urban Compact" limits to some extent what state funding can be utilized for any improvements to the following:

- ***Highway Block Grant Aid Funds (RSA 235:23 & :25)*** come from a portion of the total road toll and motor vehicle registration fees collected by the State and given to municipalities for the purpose of constructing, reconstructing, or maintaining Class IV and V highways. These funds are apportioned to all municipalities, and on a yearly basis Exeter receives approximately $239,000 to maintain and improve roadways.
- ***State Betterment Program:*** These funds are used for highway and bridge improvments on the state system and are typically utilized for smaller (less than $1 million) projects.
- ***Urban Compact Funds:*** In 27 of the larger communities around the state, state owned highways are maintained by the locality within an "urban compact" boundary where the roadways are assumed to handle local (rather than regional) traffic. In this case, the state provides limited funding to the community on a per mile basis to assist with the cost of maintaining the roadway. In addition, there is an "Urban STP" set aside of $5 million within the Ten Year Plan for funding improvement projects on Urban Compacts roadways. This funding is extremely limited and but may be a source to pay for some smaller projects.

Federal Funding Programs

There are a number of different categories of Federal transportation funding that could be utilized to construct improvements along the corridor. Some of these are general funds that can be utilized for just about anything, while others are more specialized and limited. Most any use of these funds will require that the project be listed in the State Ten Year Plan as well as the Metropolitan Planning Organization (Rockingham Planning Commission) Transportation Improvement Program and will mean that that they are competing for priority with other projects around the state.

- ***Surface Transportation Program (STP):*** This program is the source of most of the funds apportioned to the State and is the most flexible in what the money can be used for. STP funds may be obligated for construction, reconstruction, rehabilitation, resurfacing, restoration, and operational improvements for highways and bridges. They also may also be used to pay capital costs for intercity transit and related projects, bicycle and pedestrian facilities on any public roads and the modification of public sidewalks to comply with the Americans with Disabilities Act of 1990.
- ***Transportation Enhancements (TE):*** This fund is a mandated set aside from the STP and may be used for any activities that provide facilities, safety improvements and education for pedestrians and bicycles, and scenic beautification or other environmental mitigation. In New Hampshire, TE funds are programmed on a two year cycle through a competitive project selection process that begins with communities

submitting project proposals to the Regional Planning Commission where they are prioritized on the regional level. Projects then are sent to the state TE committee for review and prioritization on that level where the top projects are added to the State Ten Year Plan. The next TE cycle is not expected to begin until 2009.

Implementation

This access management plan was developed to account for existing conditions and expected future growth within the Epping Road corridor. Implementation of the recommended roadway improvements will be dependent on adjacent development, and the general growth of the area. While traffic volumes meet warrants for installing signals at multiple locations along the corridor, the roadway is currently functioning well other than during peak hours. Given that there is no public or private funding currently dedicated to construct the proposed improvements, all projects need to be considered long range until resources are identified. It is unlikely that enough funding will be available at any given time to construct the recommended improvements as a single project and an incremental approach will need to be taken to address deficiencies as needed.

In the short term, the Town has secured some funding via NH DOT to conduct some engineering and right-of-way work along the corridor, and with recommendations in place for improvements, this should move ahead. In addition, the community should begin to implement the recommended changes to the Zoning Ordinance and Site Plan/Subdivision regulations so as to immediately begin shaping the impacts of development proposals on the design of the roadway and connecting driveways. This will also allow the incremental improvement of the corridor as redevelopment occurs. Finally, the community should explore potential financing mechanisms in more detail to determine the options that best fit the community based on expected growth levels, development patterns and project needs.

Long term priorities for roadway improvements should begin with the addition of left turn lanes and traffic controls (signals/roundabout) at the northern Industrial Drive intersection and be followed by the realignment and addition of controls at the Brentwood Road/ Columbus Avenue intersection. Left turns and controls at the Continental Drive intersection should be implemented as necessitated by demand from development along that road. Other improvements, such as center turn lanes and sidewalk improvements should accompany these projects as appropriate.