

# *How To... Link Land Use and Transportation Planning*

*"Better land use planning can reduce our need for new roadways, and can make our infrastructure safer and more efficient."*

*NH Department of Transportation  
The Transportation/Land Use Relationship,  
Citizen's Guide to Transportation.  
Series, 2003*

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## **Introduction**

6:45 pm. Planning Board meeting night. Your thoughts are on the evening's agenda - packed again for the third month in a row. You review the list of items on the agenda: minor land subdivision, major land subdivision, preliminary site plan review for commercial development, public hearing for a residential subdivision of 25 units. You are concerned about the traffic impact from the residential development on a state highway and local roads. Also, you are wondering whether the newest proposed commercial development and related traffic issues will meet your Master Plan policies and implementation strategies. Nothing seems to be simple anymore.

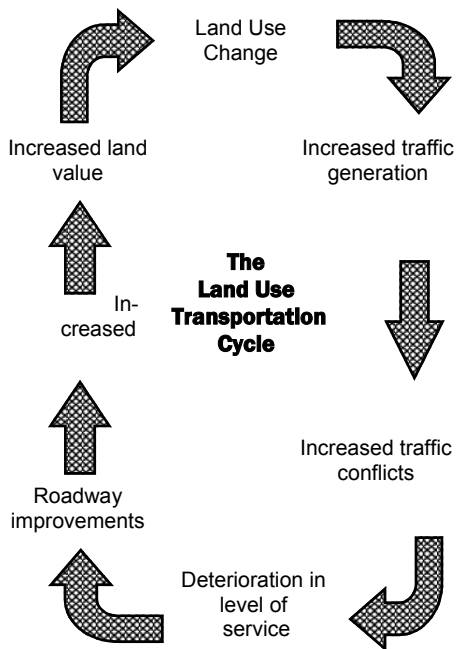
Over the last three decades, many communities in New Hampshire have become increasingly concerned about the amount and pace of growth in their community. Populations are increasing and large tracts of open lands are being developed into residential subdivisions or strip-style commercial areas. Roads are being widened and new roads constructed, while bike trails, sidewalks, and other facilities that link activities and uses are not present in sufficient quantities. How do we want to grow and how can we plan better to achieve sustainable development that balances land use and transportation needs?

## **Consider Land Use and Transportation Issues Together**

The design of transportation facilities such as roads, driveway access points, sidewalks, and bike routes has a major impact on your community's character. These facilities are the result of land use decisions. This Guide provides information on linking land use decisions with transportation facilities planning and development. It describes which transportation principles and strategies to use and how to incorporate them into the land use planning process. It discusses the critical relationship Planning Boards have with New Hampshire Department of Transportation (NHDOT) in permitting driveways along state highways. It prepares you to work with applicants, NH DOT, and residents to achieve Master Plan goals.



Town of Madbury: preserving rural character and considering new land use and transportation needs.



*“The land use-transportation cycle continues until it is physically or economically impossible to further expand highway capacity. Access Management, together with good land use control, can preserve highway capacity and effectively slow down or halt the development cycle.”*

*Federal Highway Administration  
Access Management Project*

*The average single family household generates approximately 10 vehicle trips per day. A street with 30 houses would generate an estimated 300 vehicle trips per day.*

*The average commercial drive-through fast-food restaurant generates approximately 496 vehicle trips per day per 1,000 sq. ft. of gross floor area.*

*The average office generates approximately 3.32 trips per employee per day.*

*(Trip Generation Manual, 1997)*

## The Land Use – Transportation Cycle

How we use our land (i.e., for agriculture, residential, commercial, industrial development) impacts our transportation facilities, modes of travel (i.e., cars, buses, bicycles or walking), services and vice versa. This land use-transportation relationship or cycle is illustrated by describing what commonly occurs when a road is built or improved. Land along the road becomes more accessible. This increased accessibility makes the land more valuable and attractive to developers. As land along the road is developed, traffic volumes and the number of driveways increase. This results in more congestion and a deterioration of the road’s capacity to efficiently move people and goods. The reduced efficiency of the road eventually necessitates roadway capacity improvements that may encourage additional development and the start of a new cycle.

## Land Use - Transportation Implementation Strategies

Improved integration of land use and transportation planning can reduce the need for highway expansion and maintain the quality of our communities. Three cost-effective strategies useful for integrating land use with transportation are: **Nodal Development/Zoning, Livable Walkable Communities, and Access Management.** Individually or together, these strategies can significantly improve your community.

Nodal Development/Zoning concentrates development (e.g., creates a village) to encourage walking or bicycle use so that land between nodes can be used for low density, low traffic land uses.

Livable Walkable Communities are municipalities that provide facilities to promote walking, bicycling, services, and activities that promote a healthier lifestyle.

Access Management is the ability to control the number and location of access points to a property.

Adopting these strategies in your Master Plan as land use and transportation policies and in your Zoning Ordinance as development standards, and implementing them via site plan and subdivision plan review will significantly improve your community.

## “How To” Planning Series

### Nodal Development / Zoning

Nodal development/zoning is a concentration of land uses around an existing intersection or village center that serves as a focal point for the community. Focusing development in nodes while maintaining open space between them accomplishes two goals. First, it helps maintain the desirable traditional New England community character. Second, it preserves traffic flow by reducing the number of potential conflicts along the roadway or corridor. Nodal development areas are identified in a community’s Master Plan land use section and promoted via a zoning ordinance district and development standards.

The Town of Wakefield has included nodal development/zoning principles in its Master Plan and in its Zoning Ordinance. The Town of New Durham participated in the Route 11 Access Management Planning Study with Rochester and Farmington. They are considering promoting nodal development by adopting nodal zones in key areas.

The Route 16 Corridor Study suggests using nodal development as one of five strategies for managing land use development and transportation. With compact development the share of trips made by other transportation modes can be higher and typical trip length can be shorter.

The end result are corridors better planned to meet goals.

### Livable Walkable Communities

In many communities across the country, streets designed over the past fifty years have placed the needs of the motorist foremost, making it unsafe for people walking or biking. This has often created stark, wide and fast roads that aim to respond only to the needs of motorists and that do not support healthy lifestyles.

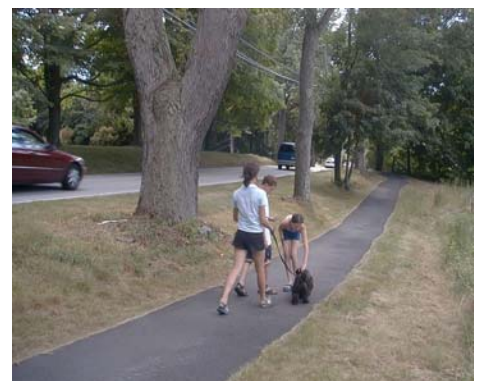
Communities that adopt street design standards to include sidewalks separate from the roadway and to accommodate bicyclists, create safer, more pleasant environments for everyone. Requiring both commercial and residential developers to incorporate bicycle and pedestrian walkways in their plans can significantly improve and maintain rural, small town character by decreasing the amount of vehicle trips. Trails, sidewalks, and space for bicycles create multiple modes of connectivity maintaining viable and diverse opportunities for development.



Town of Barrington: Nodal development



Town of Wakefield: Nodal zoning along the NH 16 Corridor



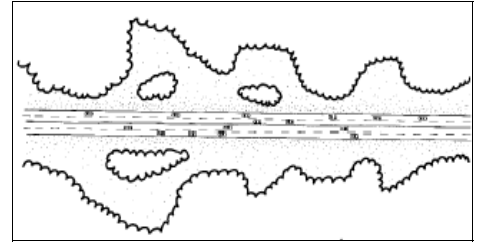
Safe pedestrian walkway adjacent to street

## Access Management

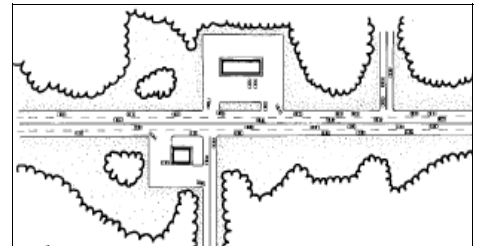
Access Management is implementing a set of planning strategies to ensure the safe and efficient flow of traffic, while maintaining the character of a community. Access Management strategies include: spacing and design of driveways, median openings, and interchanges; placement of abutting parking facilities; and use of instructional signage. Using Access Management strategies enables a community to maintain safety and quality of life for their residents and visitors.

Managing access can increase public safety by reducing accidents, travel time and congestion, while maintaining existing roadway capacity. Access Management strategies can lower road improvement costs, improve air quality, and preserve or enhance property values along a highway corridor. Additionally, there is growing evidence that Access Management is a cost effective planning strategy to limit a sprawl pattern of development.

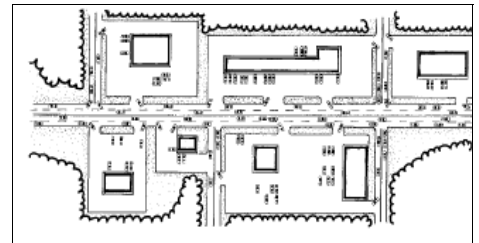
Access Management strategies can be applied to all roadways including: major and minor arterials, collectors, and local streets. These strategies are particularly useful for rural areas or areas not yet completely developed. Rural areas with large tracts of land are particularly vulnerable to incremental development resulting in linear or strip development and the associated roadway capacity reduction. The appropriate strategies vary with the roadway function, the character of the abutting land, and the long-term planning policies. Some sample Access Management issues and implementation strategies are listed below.



Road through undeveloped land.



Incremental development leads to increased conflict points along the roadway.



Without integrating land use and transportation planning, congestion and sprawl-like development may occur.

| Access Management Issues             | Strategies   |
|--------------------------------------|--|
| Distance between Driveways           | Require minimum distance between driveways based on the speed limit of the roadway consistent with FHWA guidance documented in "Access Management for Streets and Roads" FHWA, 1982. |
| Driveway Ownership                   | Require shared driveways whenever feasible.  |
| Number of Driveways                  | Limit the number of driveways per lot to minimize the conflict points on the roadway.  |
| Frontage Roads                       | Where feasible, encourage using of frontage roads to maintain traffic flow.  |
| Interconnection between Developments | Where feasible, provide connection between parcels to limit the need for traffic to reenter the roadway.   |

## Land Use –Transportation and the Master Plan

Local Master Plans describe a community’s vision for the future and how it plans to achieve that vision. There are several ways in which the Master Plan can address land use and transportation issues and establish a basis for future development.

Begin by adding a transportation section to your Master Plan. A well-developed transportation section will define how the community’s transportation system relates to the regional system, the vision for growth, and the intended function of the local transportation network. The transportation section for a Master Plan might include:

- Policies (i.e. what you want to achieve or commitments to do something—in the form of goals, principles and standards).
- Implementation Strategies (i.e. how you intend to achieve it).
- Background research and analysis for the policies and implementation programs (located in the Master Plan Appendix) including:
  - Description of existing conditions: types of roads; public transportation; location and condition of transportation facilities, bike routes, and sidewalks; the community’s place in the region; and issues of regional concern.
  - Traffic counts for major roads and intersections.
  - Identification of Scenic Roads under RSA 231:157. Are any community roads being considered for Scenic Road designation?
  - Description of existing sidewalk and trail network. Whom do they service and what is their condition?
  - Identification of current problems with access (driveways) on roadways by examining accident patterns.
  - Consideration of Master Plan land uses, zoning, and current land use as it relates to the intended function of a roadway.
  - Identification of nodal development / zoning strategies to limit the amount of development along less developed, rural roads.
  - Incorporation of access management strategies as part of site plan review and subdivision regulations to ensure that development along highways does not significantly reduce traffic safety and carrying capacity.
  - Recommendation for traffic impact analysis for all Site Plan Review and Subdivision applications exceeding a prescribed threshold.

To link transportation and land use, a Master Plan’s land use section should consider roadways as a type of land use. Development and zoning decisions should consider the existing capacity and intended function of a roadway and recognize the impact development will have on the transportation system and facilities.



City of Dover: Downtown district

*“New Hampshire’s rural character is part of the state’s bedrock appeal for residents and visitors. Our postcard scenery of white-spired villages, rolling farmland, wooded hills, mountains, and shorelines define the rural image of the Granite State. Use of the word character is no coincidence, for the phrase rural character suggests much more than visual images. When communities frame master plans around preserving rural character, people are seeking to hold onto and promote traditional rural or small town values of family, community, independence, responsibility, self-government, conservation, entrepreneurship, and strong work ethic in a fast-changing world”.*

*NH Office of State Planning*



Town of Strafford: Road with stonewalls

## Land Use and Transportation Issues During Site Plan or Subdivision Plan Review

When the Planning Board is reviewing site or subdivision plans, consider the following questions:

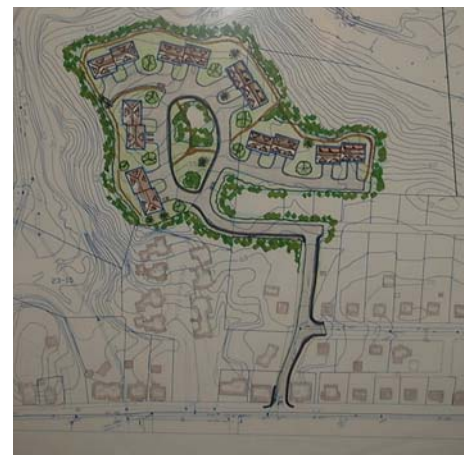
- What type of land use is being proposed? Each type of land use generates a different type and amount of traffic; understand those impacts. Estimates of the type and amount of traffic generated by a particular use can be found in the Trip Generation Manual, published by the Institute for Transportation Engineers.
- What is the function of this road (i.e. arterial, collector, local) on which the development is being proposed? Is the proposed development compatible with this function?
- Where are the driveways located? Could the design be improved according to some of the principles of access management?
- What impact will the development have on the amount and type of traffic on the abutting roadway?
- What are the incremental effects the development may have and especially on the access to neighboring and back lots.
- Is the roadway width appropriate?
- Are pedestrian walkways, sidewalks, paths, and crosswalks; bike routes; multi-use paths; and links to bus stops provided?

Require the developer to conduct a traffic impact analysis to help assess the impact the traffic generated by the development will have on the area and determine what measures must be taken to minimize the impacts. For a full description of what should be included in a traffic impact analysis see the Strafford Regional Planning Commission's Guide to Traffic Impact.

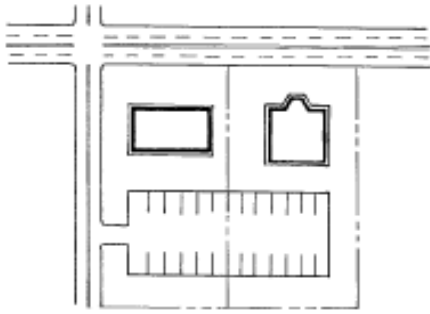
A traffic analysis may not answer all of your questions, or it may claim there are no impacts. A Planning Board can require a peer review by a professional traffic engineer. The cost of the review can be requested from the applicant.

**i** For specific examples of access management strategies and designs see:

- *Rockingham Planning Commission Local Access Management Manual*
- *The Route 16 Corridor Study: Access Management Manual*
- *A Policy on Geometric Design of Highways and Streets, AASHTO*
- *Route 11 Access Management Study Rochester, Farmington, New Durham*
- *Route 4 Access Management Study Lee, Barrington, Nottingham, and Northwood*



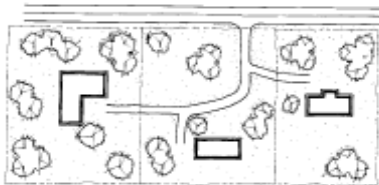
Example of conservation subdivision plan with existing residential development



A single access point from a collector road for two adjacent businesses

*The true reason curb cut permitting under RSA 231:13 is given to the Planning Board is not the design of the individual curb cuts (the highway agent can handle that), but the need to regulate numbers and use intensity of curb cuts as part of the overall road system planning"*

*Bernie Waugh, A Hard Road to Travel*



Use shared driveways where feasible

*"The fact that a subdivision has access onto a state highway, does not mean that the planning board must automatically grant the access to that roadway simply because a driveway permit has been received from the state. "*

*Bernie Waugh, A Hard Road to Travel"*

## Local Role in Driveway Placement

There seems to be a misconception that the NHDOT has total control over access to state highways, and that communities have little say in whether or not a permit is issued or where a driveway will be located.

While it is true NHDOT cannot deny access to properties abutting State highways by withholding driveway permits, the NHDOT District Offices issue permits on the basis of safety. Issues such as sight distance, numbers of permitted driveways, drainage, and maximum geometric standards for commercial driveways are considered. NHDOT is not required to know about local Master Plan, conservation or development goals. The Planning Board does know Master Plan goals, strategies and local regulations. Thus, a few key points to remember include:

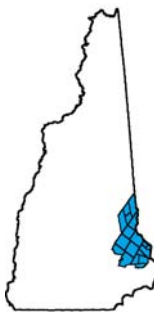
Driveway permits issued by the NHDOT do not override local regulatory requirements!

Planning Boards have the authority to enact policies and regulations that are stricter than NHDOT. They can review and possibly modify or reject a development's access even if access permits are granted by NHDOT. These actions can be executed through: site plan ordinance or subdivision regulation, preparation and adoption of an access management plan, or the signing of a Memorandum Of Understanding with NHDOT.

By sending a copy of your Access Management policies and implementation strategies and ordinances and regulations to the NHDOT District Office, they can better understand how the community is planning for development. So if your community has an Access Management Plan, send it to NHDOT!

Each NHDOT District Office sends copies of all driveway permit applications to the community for which a driveway permit is requested. These applications should be reviewed and, if necessary, comments sent to NHDOT expressing your concerns.

In 2002, NHDOT developed a model Memorandum of Understanding to formalize cooperation between communities and NHDOT in the driveway permitting process. For a copy of the MOU, contact the Strafford Regional Planning Commission.



**STRAFFORD  
REGIONAL  
PLANNING  
COMMISSION**

**Visit our website at  
[www.straftford.org](http://www.straftford.org)**

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**Addressee**

*Planning and action for sustainable  
development and an improved quality of life.*

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## **Land Use and Transportation Planning Must Be Linked!**

- The design of transportation facilities has a major impact on the rural New England character of a community. Conventional street design has tended to create roads with the motorist in mind, forgetting the needs of pedestrians and bicyclists. This has contributed to the loss of rural “small town” character in New Hampshire.
- Land use decisions directly impact the transportation system and facilities in the region. Land use generates vehicle trips leading to traffic congestion and costly, expansive roadway capacity improvements.
- To achieve sustainable development, planning decision-makers should adopt and implement Master Plan land use and transportation policies and implementation strategies and zoning ordinance and subdivision regulations that promote:
  - Nodal Development / Zoning
  - Livable Walkable Communities
  - Access Management

Together we can achieve sustainable development and improve the quality of life.