CHAPTER 4: 
TRANSPORTATION GUIDELINES FOR LOCAL LAND USE DECISIONS

PURPOSE

Local land use decision-makers are more than ever faced with increasingly complicated decisions. With new initiatives in many states to create comprehensive land use plans, it is ever more important that they have a general understanding of how transportation issues are closely inter-related to those of land use planning. The purpose of this paper is to create a guide for local land use decision-makers which helps them make informed decisions about transportation facilities in conjunction with local land use. These guidelines can be used to form a strategy to preserve or improve the local transportation network and in particular improve safety in their community. With a clear strategy, future decisions can be made more confidently and effectively.

INTRODUCTION

• Are transportation and development always incompatible?
• Can viable developments be made without compromising the transportation network?
• Do road improvements automatically attract uncontrolled development?
• Can roads be safe and efficient at the same time?

These are some of the questions local land use officials across the country have to face each day. Combined with traffic problems, limited rights of way, rising construction costs, and revenue shortfalls, the job of a local land use official seems impossible. A recent headline in the Washington Post read: *More Lanes Better? Not Necessarily.* Washington D.C. planners have found that even when roads are expanded with great expense, congestion and safety are not necessarily improved. A further complication is the growing
trend for citizens to oppose road widening and expansion. In the Milwaukee area residents are protesting the Wisconsin DOT’s efforts to expand to Wauwatosa Road in Mequon and Highway 164 in Pewaukee and Sussex.

Increasingly, the issue of transportation and land use planning is hard to ignore. Wisconsin’s Smart Growth Initiative requires municipalities to adopt a comprehensive plan for their community. This comprehensive plan must contain a transportation element that provides "an integrated efficient and economical transportation system that affords mobility, convenience, and safety and that meets the needs of all citizens, including transit-dependent and disabled citizens."

Fortunately by understanding how land use and transportation work together, many problems can be mitigated through careful and innovative planning. With proper and thorough planning, development and transportation facilities can be designed together so that development is successful and the transportation system safe, effective and accessible to all citizens. With effective techniques, such as land use planning, site plan review standards, and corridor preservation, safety and efficiency of traffic flow can be improved while encouraging the use and economic development of the land which abuts the public roadways.

ACCESS VS. MOBILITY  THE TWO OPPOSING PURPOSES OF A ROADWAY

A road has two major functions:
1) To provide access to land.
   --Roads have entrances to the places we want to go, our homes, businesses, places of recreation and workplaces.
2) To provide mobility.
   --Simply put, roads are needed to travel long distances efficiently.

Roads cannot have both a large number of driveways and accommodate cars at high speeds safely at the same time. The graphic on the right illustrates this. A cul de sac is an example of a local road. Cul de sacs only provide access to the properties around them. They do not act as through roads and are not designed to be driven on at high speeds. They fall into the category of a local road, as the graphic at the right shows.

At the opposite extreme are roads that do not provide access to the land they run through. For example, freeways have no driveways and serve to transport people and goods long distances at high speeds. They fall into the category of arterial roads. (See right.)
Collector streets provide both mobility and access with an emphasis on access. They serve to connect local streets to the arterial roadways. They provide access but on a somewhat more limited basis than local streets. They also provide mobility but at a lower level than highways. Speeds are lower and there are more access points.

In order for a road to provide good mobility like a highway, it will have multiple lanes and higher traveling speeds and few intersections where cars need to stop or slow down frequently. These characteristics allow the road to accommodate high numbers of vehicles without stopping. The more access points or driveways a road has, the more often cars enter and leave the roadway, causing more frequent stops, delays and accidents. A road cannot efficiently provide both access to land and allow a high degree of mobility at the same time. “These functions become increasingly incompatible as more and more commercial, industrial and residential development locates on major arterials seeking the advantages of high visibility and easy access to the motoring public. Eventually, both the land access and traffic service functions of arterial streets are degraded by congestion resulting from conflict between turning and maneuvering vehicles, and through traffic.”

This confusion in the function of a road can lead to congestion and accidents involving serious damage to both car and driver. Studies show a strong correlation between an increase in accidents, an increase in the number of commercial establishments and an increase in the total number of driveways per mile, and 11.2% to 14.4% of accidents involve driveways on arterial streets. Other studies show these numbers are underestimating the true number of accidents.

A study of property damage and personal injury by the Michigan State Police MALI section (Michigan Accident Location Index) compiled some information concerning West Saginaw St. which will serve as an illustration of the problem's magnitude. “On West Saginaw St. from Waverly Rd. to Creyts Rd. during an 18 month period, January 1978 through June 1979, there were a total of 353 accidents resulting in 186 personal injuries and an estimated $879,300.00 in economic loss. This translates into 20 accidents, 10 personal injuries, and $48,850 loss per month on a two mile stretch of arterial.”

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1 Arterial Street Access Control Study, Capital Area Regional Transportation Study Technical Committee, p. 2.
2 Loc cit, pp. 5-6.
3 Loc cit, p. 7.
THE HIERARCHY WITHIN A ROAD NETWORK

By categorizing roadways by their function, a classification can be made of all the roads in a transportation network. The diagram at the right shows how a street network can be classified by function. Four categories are used: expressway, arterial, collector and local. While many streets cannot be as readily categorized as expressways and cul de sacs can be, it is important to understand that all types are needed in an efficient transportation network. A hierarchy is created with expressways at the top providing travel over long distance at high speeds, local streets within neighborhoods connecting driveways, and collectors connecting arterial and local streets. As in the discussion above, the function of expressways and arterials is mainly to provide mobility or efficient travel, while collector and local streets mainly provide access to properties.

It is important to note that any future growth will affect the working functions of the roadway, as well as the entire system. By creating this classification the roadway network is organized as a whole to provide both functions of access and mobility. The classification by function then directs any future decisions made for each road.
LAND USE AND TRANSPORTATION INTERACTION

Changes in the transportation system can have significant impacts on local land use patterns. While transportation is not the only factor local land use patterns, it can be a major one. (See a land use transportation primer for more discussion on this topic.) As the diagram on the right shows, accessibility to land can be changed by improving or adding a road. When land values are low or the location particularly desirable or there is a shortage of lands for new development, this vacant land attracts development. In this way, new roads open up large areas of vacant land for development. The new development, whether it is commercial, industrial or residential, attracts more people and therefore more trips are made to and from the area. This creates ‘Transportation Needs’ because of congestion on the roadway and soon, the area needs more ‘Transportation Facilities,’ often in the form of adding additional lanes. This makes the area easier to get to, more accessible, and therefore more attractive to development, starting the cycle anew.

This is the traditional history of strip development. Commercial or industrial development seeks highly visible and accessible properties, preferably on an arterial street with a large amount of cars passing by, maybe at an important intersection. This one development attracts a significant amount of business, so much so that other businesses move to the area. With the increased number of trips comes more cars entering and leaving the roadway, stopping, starting, causing congestion and back ups. Soon the road needs and gets improvement, this attracts more businesses, more people, more congestion. Eventually the road can no longer be expanded and becomes a traffic nightmare. People start avoiding the area and the businesses move out.

Fortunately by understanding how land use and transportation work together, many problems such as this can be mitigated through careful and innovative planning. With proper and thorough planning, development and transportation facilities can be designed together so that development is successful and the transportation system safe, effective and accessible to all citizens. Safety and
The efficiency of traffic flow can be improved while encouraging the use and economic development of the land which abuts the public roadways.

FOURTEEN GUIDELINES FOR TRANSPORTATION IN LOCAL LAND USE DECISIONS

The following guidelines, divided into four categories, are designed to aid local decision makers coordinate transportation and land use planning. Transportation planning should be coordinated with local land use in four particular areas: Comprehensive Planning, Corridor Preservation, Preservation of Safety and Mobility on Arterials, and Subdivision Regulations and Site Design Review Standards. Sound planning can provide for “an integrated, efficient, and economical transportation system that affords mobility, convenience, and safety and that meets the needs of all citizens, including transit-dependent and disabled citizens...” as Wisconsin’s Smart Growth Initiative requires. These guidelines incorporate ideas to improve safety and reduce congestion, plan for future transit facilities, and create pedestrian and bike friendly roadways. A strategy based on these guidelines can improve the transportation network in a community and in particular improve safety for its travelers.

THE COMPREHENSIVE PLAN

A comprehensive plan is the ideal tool to assess a municipality as a whole and determine where transportation facilities fit into your community. “Local comprehensive plans establish how the community will balance mobility with access and designate corridors that will receive special treatment. These plans evaluate long-term trends; provide data on traffic accidents and related considerations... By establishing the relationship between regulatory strategies and public health, safety, and welfare, these plans can serve as the legal basis for access controls.”

“The comprehensive planning process is an opportunity to increase community awareness of the forces of change and determine a strategic course of action. What level of growth can the community expect? What are the future land use and capital improvement needs? And what type of land development patterns do citizens prefer? Public opinion surveys, town meetings, and visioning workshops may be used to identify

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5 Land Development and Subdivision Regulations that Support Access Management, Center for Urban Transportation Research, University of South Florida, pg.1-1.
citizen concerns and build political support for regulatory change. Citizen dissatisfaction with commercial strips, for example, can be translated into (various) policies…

1) Classify the Roads in Your Community

Where are the arterials in your community? Identify arterial and collector streets so that rights of way can be properly determined, particularly in growth areas and areas in need of reconstruction. Allow for varying width and types of roads for each different class. Be sure roads meet projected traffic demand and fit in with hierarchy of streets according to their function. Roads that are major arterials should have a building setback that would permit 120-foot right of way in the future. Even if that is unlikely in the foreseeable future, a provision for a larger setback will avoid very major problems for future generations if the road ever needs to be widened.

2) Define the Problem Areas of your Transportation Network

Where are the problem areas in your community? Identify areas of congestion, high accident rates, and areas inaccessible to pedestrians and bicycles. Adopt a density policy that promotes centers of commerce, where strip development is a problem. Data on crashes and traffic volumes should be regularly collected to identify trouble spots and to track trends.

3) Designate Pedestrian and Bike Paths

Are all of the major activity centers in your community connected by pedestrian and bicycle paths? Pedestrian and bicycle path systems should link schools, commercial districts, parking areas, entrances, open space, recreation, transit stops and residential areas. A good local transportation plan identifies these routes so future projects can easily accommodate bicycles and pedestrians. Promote safe bicycle and pedestrian networks by separating them from the road network as much as possible. Create space between these paths and the road with terraces wherever possible.

6 Loc cit, pg.1-2.
4) Include Transit in Your Comprehensive Plan

Transit is advantageous to include in comprehensive plans even, if it is not planned to be implemented in the foreseeable future. Like bicycle and pedestrian paths they should connect all major activity centers. Allow for high density developments along the future transit corridor so it will serve the most people. Planning for transit allows for its future development at a much lower price and higher operating efficiency. School bus operation should also be considered by developing a street pattern that can have efficient school bus service.

PROMOTE CORRIDOR PLANNING AND PRESERVATION

Corridor planning considers the land uses surrounding a roadway, as well as the roadway itself. By doing this, a community can examine the land use conditions, traffic patterns, and transit options along its major corridors. “The goal is to prohibit, or at least minimize, development in areas which are likely to be required to meet transportation needs in the future. These areas include lands adjacent to existing roadways which are projected to require capacity expansion; areas which might be needed to construct entirely new routes for urban bypasses or to serve new neighborhoods or commercial developments; and land needed for bicycle, transit and pedestrian facilities (e.g. bikeways, walkways, transit, turnouts, busways and light rail corridors).”

5) Work with Neighboring Communities to Solve Mutual Problems

Coordinate planning with neighboring communities across shared boundaries. Problems along an arterial are best solved along the whole corridor, not just up to the border.

6) Create Setbacks for future Road Expansions on Arterials

Ask developers and individuals to dedicate a portion of their land for necessary transportation improvements.

7 Corridor Preservation and Access Management Guidance, Wisconsin Department of Transportation, January, 1994, p. 3.
7) Map Future Corridors

Does your community know where future roads will be placed? “Cities and villages in Wisconsin have the most extensive official mapping authority. They can legally map any road (including state highways), railroad or public transportation facility within their jurisdictions and in the areas over which they have extraterritorial jurisdiction.” Official mapping of future rights of way can be useful to inform the public and prevent development of future facilities.

PRESERVE SAFETY AND MOBILITY ON ARTERIALS WITH ACCESS MANAGEMENT TECHNIQUES

Access management, simply, is managing access to land in order to promote safety and improve mobility on roadways. Principles of access management can be applied to new land developments to ensure sound land use planning in conjunction with good transportation planning. It also can be used when making improvements to older areas of development, in order to improve traffic conditions such as congestion and high accident rates. Some studies have even indicated that businesses in access-managed corridors had significant growth in sales tax revenues. “When access management and land use planning are coordinated, it is possible to ensure that when properties are developed, site designs are compatible with efficient movement of traffic on to and off of public roadways and, at the same time, are conducive to pedestrian movements, bicycle traffic and transit usage.”

8) Regulate the Location, Spacing, and Design of Driveways

Wisconsin statutes give all levels of government the authority to require a permit for the construction of a private driveway onto a public road. Limit the number of driveways allowed on a lot and the minimum distance between driveways. Too many driveways cause confusion and conflicts. Whenever a pedestrian or bicycle crosses a driveway there is potential for an accident. Locate driveways in safe areas, away from intersections, where

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8 Ibid, p. 5.
10 Corridor Preservation and Access Management Guidance, Wisconsin Department
11 Loc cit, p. 15.
entering and exiting the roadway will be safe for drivers and where drivers have no obstructions in their view. Driveways should be designed to get cars off the road into a safe area.

9) Connect Parking Lots and Promote Shared Drives

Again the goal is to minimize the number of driveways for safety purposes, especially in commercial areas on arterials. By connecting parking lots, pedestrians, bicycles and cars can travel between businesses without getting on the arterial. Paths between buildings allow pedestrians to walk the shortest distance, while away from traffic. Temporary driveways can be used until further development is completed.

Source: Univ of South Floirda, CUTR, ten ways to manage roadway access
10) Increase Minimum Lot Frontages along Arterials

Minimum lot frontages should be higher on arterials and collectors to allow for greater spacing between driveways.

CREATE SUBDIVISION REGULATIONS AND SITE PLAN REVIEW STANDARDS

“Subdivision regulations help ensure proper street layout in relation to existing or planned roadways; adequate space for emergency access and utilities; adequate water, drainage, and sanitary sewer facilities; and appropriate site design. The subdivision ordinance establishes the administrative review and evaluation procedure for processing conceptual, preliminary, and final plats; information that must be included on the plat; design principles and standards for lots, blocks, streets, public places, pedestrian ways, and utilities; required improvements, including streets, sidewalks, water, sewer and curbs and gutter; and financing and maintenance responsibilities. These regulations help justify decisions made and help developers have a clear idea of what is expected in the community.

Particular attention to safety and efficiency of the roadway network should be built into these regulations.

12 Land Development and Subdivision Regulations that Support Access Management, Center for Urban Transportation Research, University of South Florida, pg.1-3.
11) Promote Connected Developments

A connected street system has many benefits:
- A connected street system allows for more direct routes to more places and with shorter trips.
- With more choices in paths to take, congestion can be relieved.
- Walking and biking is encouraged through direct routing.
- Neighborhoods are connected, fostering a greater sense of community.
- Routes for services such as garbage pick-up are shorter.
- School bus routes for children are safer and shorter.
- Emergency service response times are shorter.
- Facilitates roadway maintenance, particularly snow removal.

The community should establish connectivity rules. A simple rule is that each development parcel has at least two access point to adjacent parcels.

Require ‘stubs’ in developments so that future developments may be connected to the road way network. Limit the use, length and maximum number of lots for cul de sacs and dead ends. Require pedestrian and bicycle paths at end of cul de sacs which connect to activity centers. These stubs should be built out to the property boundary at the time of initial development. “Temporary” cul du sacs have a tendency to become permanent. By building out to the property edge, there is no confusion about the fact that the road will be extended in the future.

12) Avoid Flag Lots on Arterial Streets

Avoid flag lots and long narrow lots except in exceptional circumstances. Spacing between driveways is usually inadequate. Similarly, by limiting lot width-to-depth ratios, narrow lots on arterials are avoided.

Source: Univ of South Florida, CUTR, ten ways to manage roadway access

13 Ten Ways to Manage Roadway Access in Your Community, Center for Urban Transportation Research.
13) Provide Residential Properties Access within Development, Not On Arterials

Access for residential lots should be provided on the interior of developments, not arterial streets. This reduces the number of driveways on the arterial street, preserving safety and efficiency. In addition, children playing in driveways are far from high-speed traffic.

Source: Univ of South Florida, Ten ways to Improve Access

14) Require Reviews of All Minor Replats

Provide for local planning department review of all minor splits or replats of lots. Little by little arterial streets become lined with driveways from small divisions of properties. By reviewing all minor splits and shared driveways can be encouraged.
BENEFITS OF INCLUDING TRANSPORTATION FACILITIES IN LOCAL LAND USE DECISIONS

The benefits of including transportation in comprehensive planning, corridor preservation, access management, and subdivision regulations and site review standards are multiple:

- Improve safety for automobiles, bicycles and pedestrians by reducing accidents.
- Congestion is reduced.
- Options for future transit are created.
- The need for capacity improvements is reduced before the end of a road's planned lifetime.
- Roadway maintenance is facilitated.
- Community image and business climate are enhanced by a good transportation system.
- Routes for services such as garbage pick-up are shorter.
- School bus routes are shorter and safer.
- Emergency service response times are shorter.

Many communities are affected by the problems of strip commercial development, haphazard residential developments and the traffic problems associated with them. Planning ahead for transportation facilities in local land use decisions has great assets, particularly, improved safety for citizens, and mitigates many of the problems associated with retrofitting transportation systems to land uses.

For More Information

The National Transportation Library  http://www.bts.gov/NTL/


Arterial Street Access Control Study CAPITAL AREA REGIONAL TRANSPORTATION STUDY (CARTS) TECHNICAL COMMITTEE  http://www.bts.gov/ntl/data/plan-policy/access/00222.html
Corridor Preservation and Access Management Guidance, Wisconsin Department of Transportation, January, 1994
http://www.bts.gov/ntl/data/plan-policy/access/00223.html - size 49.6K

Land Development and Subdivision Regulations that Support Access Management (PDF file) [Served by Center for Urban Transportation Research - University of South Florida] http://www.cutr.eng.usf.edu/research/land_dev.pdf

Model Land Development and Subdivision Regulations that Support Access Management

Oregon Department of Transportation—Access Management Overview [Served by Oregon Department of Transportation]
http://www.odot.state.or.us/access2000.htm

Center for Transportation Research, University of South Florida http://www.cutr.eng.usf.edu

Ten Ways to Manage Roadway Access in Your Community, Center for Urban Transportation Research
http://www.cutr.eng.usf.edu/research/10ways.pdf

The Bike Federation
http://www.bikefed.org/design.htm
http://www.bikefed.org/isteanews.htm
http://www.bikefed.org/PDF/Select.PDF

Transportation for Livable Communities Network
http://www.tlcnetwork.org/

Planners Web, Planning Commissioners Journal
http://www.plannersweb.com/access/accintro.html


Costs for the State Bicycle Transportation and Pedestrian Walkways Plan, Washington State DOT,

1998 FHWA Report: Implementing Bicycle Improvements at the Local Level
http://www.bikefed.org/local.htm
