Transportation and Land Use

A white paper

Prepared for the

Arizona Department of Transportation

March 26, 2002

By

Edward Beimborn, Ph.D.
Transportation / Land Use White Paper

Outline

1. Introduction
2. Land Use – Transportation Interactions
   Overview
   2.2. Emerging Land Use Concerns
3. Scope of State DOT Actions that Affect Land Use
   3.1. Land Use/Transportation Planning Requirements
   3.2. State Land Use Planning Capabilities
   3.3. Education and Technical Assistance
   3.4. Access Management
   3.5. Land Use Policy
   3.6. Economic Development
4. Examples from Other States
   4.1. State Land Use Planning Requirements – An Example From Florida
   4.2. Land Use Controls – An Example From Tennessee
   4.3. Access Management – An Example From Kansas
5. Application to Arizona
   5.1. Self Assessment of Current Status
   Coordination With Other Government Agencies
     5.2.1. Coordination with Local Government
     5.2.2. Coordination with State, Federal and Tribal Agencies
     5.2.3. Relationship with Private Sector
   5.3. Education/Technical Assistance
     5.3.1. Improve State DOT Expertise
     5.3.2. Technical Assistance from the State DOT
   5.4. Access Management
   5.5. Smart Growth
   5.6. Land Use Programs
     5.6.1. Secondary Impact Analysis
     5.6.2. Connectivity
     5.6.3. Transit Corridor Districts
     5.6.4. Interchange Area Planning and Deployment Strategies
6. Conclusions
1. Introduction

Sometime in the next thirty to forty years Arizona will double in population. This will mean the addition of five million more people. For every person and building now in the state, space will be needed for another. There will be enough people for another Phoenix, another Tucson, another Quartzite, another Bisbee and a duplicate of every community in the state. All that now exists will have to be duplicated in some way to accommodate this growth. In short the growth of the state means that a second Arizona will be need to be created to sit beside the present one.

The doubling of Arizona assumes that growth will continue at a rate similar to that of the past. Arizona has been one of the fastest growing states in the country. During the last forty years the population of Arizona has increased by 380%, going from about 1.3 million people in 1960 to over 5 million people by the year 2000 census. Most of this growth has come from migration. This has been primarily from the northern and eastern parts of the United States and other countries, especially Mexico and countries in South and Central America. The population of Arizona is not only much larger, but it is also far more diverse than it has been in the past.

People move to Arizona for a variety of reasons. It is a state of extraordinary natural beauty that draws people from all over the world as tourists and as permanent residents. The climate and environment make it a top choice for people seeking a place to retire or to escape harsh winters and cold weather. To those outside the state, Arizona is a state of great opportunity as a place to get a job or start a business. Growth leads to growth as more people arrive and who need more services and who provide jobs for the next round of arrivals.

If past patterns continue, the need for additional land for a doubling of population will be far more than twice the land now used for the current population. Recent growth patterns everywhere have led to lower densities and higher rates of land consumption. For example, since 1970, the population of the Los Angeles area increased by 45%, but at the same time the land area has increased by 300%. Similar patterns occurred in other major cities around the country including those in Arizona.

The population of the state will likely differ substantially from that of today. The population will be older and much more diverse. People who migrate to the state will include large numbers of people looking at it as a place of retirement and will also include large numbers of immigrants from other countries who will see the state as a place with good opportunities to work and live.

What the state does to deal with this growth will have a profound affect on the very nature of Arizona and what it means to its citizens. The impact of future
growth in the state will be profound, irreversible and massive. Major questions will arise about the adequacy of water resources, energy supply and impacts on the natural environment. The open spaces that draw people to the state will become increasingly more distant to those who live in metropolitan areas. Once an area is converted to urban and suburban use, it will remain that way forever. What the growth will do to the state is not known, but unless there are significant changes in migration and life style trends in the population, the fact that it will occur is a certainty. How it happens and how the state and local governments react is a critical question, for policies that are set now will shape the state in the future.

If past trends continue, the population growth will carry with it a growth in travel at least as great and most likely greater. Travel will more than double, adding major increases in traffic and congestion to state highways. This trend will only change if there are new patterns of development such as more compact land use or if there is a shift to other modes of travel besides the single occupant automobile. Other modes of travel will only play a minor role unless there are significant changes in how they fit into land use patterns. To deal with this in the normal way of doing business will require funding levels far beyond those available today. How the state deals with transportation and land use will be one of the most critical questions facing the state in the future. The transportation of the state will affect this growth and be affected by it. The decisions made now about transportation made now will have effects that will have major long-range effects. Good policy and plans (transportation for smart growth) should be a high priority. This will involve greater understanding of land use-transportation interaction by ADOT staff and local governments and a wider set of tools and options to work with.
2. Land Use – Transportation Interactions

2.1. Overview

The connection between transportation and land use is a fundamental concept in transportation. Everything that happens to land use has transportation implications and every transportation action affects land use. Actions by transportation agencies shape land use by providing infrastructure to improve accessibility and mobility. This increases the utility of land and leads to more intensive land use. Land development generates travel, and travel generates the need for new facilities, which in turn increases accessibility and attracts further development. The question of whether transportation influences development or whether land use dictates transportation has been a matter of ongoing concern among transportation professionals since the beginning of transportation planning.¹ There is no simple answer to this question, both happen together and there is a need to consider both simultaneously.

A state department of transportation is just one of the many organizations that influence land use. Land use decisions are the result of complex interaction of many forces involving individuals and organizations in both the public and private sectors. There are many factors in the land development process. These include overall population and economic growth, market

¹ This section has been adapted from "An Overview: Land Use and Economic Development in Statewide Transportation Planning", Report by the Center for Urban Transportation Studies, University of Wisconsin Milwaukee to FHWA, May 1999.
conditions, individual preferences and life style choices, other infrastructure, changing technology, local planning and zoning polices and geographic and topographic conditions.²

Figure 1. Transportation’s Role in Land Use

The easy response that a transportation agency could take to this situation is to ignore the land use implications of what they do with a feeling that it is beyond their control and impossible to deal with. Such an approach is short sighted, leading to long term consequences that negate the benefits of transportation investments. Transportation and land use are closely intertwined and the implications of transportation decisions on land use cannot be ignored.

A state DOT influences land development through providing infrastructure and through transportation-related regulations. State transportation projects are normally planned to improve safety, decrease travel time by alleviating congestion, and achieve other mobility-related goals. Seldom are projects

² Adapted from Indirect and Cumulative Effects Analysis for Project Induced Land Development; Technical Reference Guidance Document. Wisconsin Department of Transportation, 1996.
planned or designed with land use issues as a primary objective.
Transportation’s impact on land development occurs at many levels. This ranges from simple actions such as issuing a driveway permit to overall actions such as the development of strategic plans and programs. When improved access is provided to land, it raises its potential for development, and more development generates additional travel. Once access has been provided, land patterns begin to change over a period of time. The results of these changes are, for the most part, irreversible.

2.2. Emerging Land Use Concerns

Recently, concerns about urban sprawl have arisen in many areas of the nation. Many diverse groups have common concerns about the role transportation plays in exacerbating or combating the problems associated with urban sprawl, suburban congestion, and jobs/housing mismatches. Some people have argued that efforts to expand the highway system contribute to urban sprawl by decreasing travel times from urban to exurban/rural areas and making undeveloped areas attractive for residential and commercial uses. Often new highway facilities in urban areas have driving times and levels of congestion that exceed that of the highways they replace, suggesting that new or expanded facilities may be unable to solve long-term congestion problems.3

Several factors can be identified as contributing to sprawl, including the movement of jobs to suburbs, lower transportation costs versus lower housing costs, preference of many people to live in remote areas away from the problems of the city, and the desire for larger residential lots and units.

Sprawl is a concern for many because of its impact on open space and agriculture. Diverse groups including farmer organizations, inner-city community organizations, transit advocates and environmental organizations have worked together in some areas to deal with issues of sprawl. It can lead to adverse impacts in areas where people are moving as well as in the areas they are moving from. Of recent concern are labor shortages created by jobs/housing mismatches. Housing markets in the suburbs have excluded many skilled laborers who would traditionally be employed by the industries and commercial enterprises that develop in these areas. A combination of transportation and land use measures is needed to address this problem.

The concern about sprawl and transportation has led to a new debate in many states and communities about the relationship between transportation and land use. In some cases, local and statewide efforts are now beginning to take effect to limit sprawl in some of the nation’s fastest growing urban areas. The new debate invariably involves state DOTs, whose role in land use decision-making continues to evolve.

Perhaps one of the most useful documents about sprawl is Transit Cooperative Research Program Report 39, “The Cost of Sprawl Revisited”\textsuperscript{4}. This report offers a comprehensive review of literature related to urban sprawl and its effects. The report provides a working definition of the term sprawl and includes an analysis of nearly 500 documents that deal with the topic. Literature on sprawl is summarized under the categories of: public/private capital and operating costs, transportation and travel costs, land/natural habitat preservation, quality of life and social issues. Under each topic area the project team determined the degree of agreement among researchers if a condition existed, if it was positive or negative and if it was linked to sprawl. Forty-one issues were identified and many of them dealt with transportation directly or indirectly. It presents one of the easiest ways to gain a quick understanding of land use issues and provides a basic background on the topic.

The researchers concluded that there is a general agreement in the literature that sprawl leads to more vehicle miles of travel, more automobile trips and less cost effective transit services. There was also some agreement that sprawl means higher household costs of travel and greater social costs. No clear outcome exists in the literature reviewed that sprawl reduces congestion, requires longer travel times or lowers the government costs of transportation.

Other work\textsuperscript{5} compared the differences in infrastructure cost for ‘sprawl’ development (a tendency towards lower densities) vs. ‘planned’ developments (with somewhat higher densities and mixed uses) and found that costs of roadway infrastructure was about one fourth to one half lower with planned development. School infrastructure costs were similar in both cases while utility costs were also lower by one third to one tenth. Planned development can result in lower costs through more compact design and better viability for other modes such as transit, walking and bicycles.

One message not directly found in the literature is that how land use and transportation interact is something that is not beyond the control of local and state governments. How, where and when land use occurs is something that can be affected if there is the will to do it. If a transportation agency takes no actions that affect land use, then land use will dictate transportation. New facilities will tend to follow development and attempts will be made to provide facilities to meet population and economic growth. In such a case the transportation agency merely reacts to growth and stays out of land use issues.

On the other hand if an agency adopts a more aggressive policy towards land use, then land use will be affected. Such a policy requires cooperation and

\begin{quote}
  "there is a general agreement in the literature that sprawl leads to more vehicle miles of travel, more automobile trips and less cost effective transit services."
\end{quote}

\begin{quote}
\end{quote}

\begin{quote}
\end{quote}
agreement with local governments charged with making land use decisions. For example, if there is consensus that growth should not occur in a certain area, then local government has to take steps to direct it elsewhere or to lessen its impact. These steps might include very low-density zoning, purchase of development rights and other policies to reduce future trip making. Transportation agencies have to agree to not expand facilities in those areas and to work with local and regional organizations to implement their plans.
3. Scope of State DOT Actions that Affect Land Use

There are many ways in which a state DOT is involved in land use. These include project level activities as well as systems planning and policy. Project activities relate to how a project is designed, how access is provided and managed and how the project provides connections to other areas. Project level activities also include how provisions are made for a variety of travel modes, especially public transit, bicycles and walking. Systems level activities include land use and transportation planning, economic development and improving the capabilities of staff within the DOT as well as at the local level.

The role a state adopts in each of these areas can vary along a broad spectrum ranging from very active involvement in the coordination of transportation and land use to a very passive role, where the state leaves most of the decision-making to others. In order to help understand the spectrum of activity that states may undertake, a chart has been developed from previous work to show the range of state transportation activities that relate to land use. A state’s role can be defined along a continuum from active to passive in the following six categories.

- Land Use/Transportation Planning Requirements
- State Land Use Planning Capabilities
- Education/Technical Assistance
- Access Management
- Land Use Controls
- Economic Development

Each of these categories is described below.

3.1. Land Use/Transportation Planning Requirements

At the passive end of the continuum, a state could fund regional and local level planning and leave the decision making entirely to local jurisdictions. The option to do planning and how it is done is left to the local agencies. At the most active level, the state itself is responsible for planning and zoning, as is done in Hawaii. Between these two ends of the spectrum is state mandated local planning where the state sets mandatory standards for land use plans or may set guidelines reflecting the state’s interests. A passive approach would require the planning to take place but not require state approval of the plans. A more active strategy

---

would require that local land use decisions must have state approval and certification.

A critical issue related to this is the extent to which the state defers to local or regional planning agencies in transportation decisions. It is inconsistent on one hand to strongly believe that land use decisions should be made at the local level and then to build projects that weaken the ability to implement those plans. For example local plans may state the need to have a compact development pattern while state actions lead to the expansion of roadway capacity outside those areas.

3.2. State Land Use Planning Capabilities

The state DOT can provide a range of capabilities to assist local agencies, depending on how involved it wants to be in the planning process. As shown in the chart, these activities would range from providing data collection services for local government, at the passive end, to the utilization of sophisticated state land use models and basic research, at the active end. The purpose of transportation/land use models is to predict the future impact of transportation investments on land use. Oregon and New Jersey are two states using transportation/land use models. Intermediate state services would include providing GIS assistance, policy research and economic forecasting.

3.3. Education and Technical Assistance

State participation in education and technical assistance can take many forms. At the passive end of the continuum, states only react to local requests for assistance. A more active state participation would include formulating state guidelines, convening oversight committees, providing conferences, holding training sessions, issuing newsletters, organizing a hotline or Web site, providing public education, etc. At the most active level of participation, the state would provide one-to-one assistance to local government for the analysis of land use implications of transportation decisions.

3.4. Access Management

Access management is a systematic approach to providing appropriate access to land development on highways. The chart shows the range of access management programs that states have adopted. A passive approach is to allow unlimited access to the state highway system as long as access points follow site-specific guidelines. A more active strategy involves the development of comprehensive access management plans and policies. The most active strategy is to limit capacity expansion only to designated areas according to a statewide growth management policy.
Figure 2. State Local Coordination

PASSIVE-LOCAL OPTION < STATE / LOCAL COORDINATION > ACTIVE-STRONG STATE ROLE

STATE FUNDED REGIONAL AND LOCAL PLANNING
- STATE MANDATED LOCAL PLANNING
- STATE APPROVED LAND USE PLANNING

STATE LAND USE PLANNING REQUIREMENTS

DATA COLLECTION FOR LOCAL GOVERNMENT
- GIS ASSISTANCE
- RESEARCH
- ECONOMIC FORECASTING
- STATE LAND USE MODELS

STATE LAND USE PLANNING CAPABILITIES

REACT TO LOCAL REQUESTS
- STATE OVERSIGHT COMMITTEES
- GUIDEBOOKS
- CONFERENCE, TRAINING SESSIONS
- NEWSLETTERS, HOTLINE/WEBPAGE, etc.
- ONE-TO-ONE ASSISTANCE/CIRCUIT RIDERS

EDUCATION / TECHNICAL ASSISTANCE

DRIVEWAY PERMITS FOLLOWING GUIDELINES
- COMPREHENSIVE ACCESS MANAGEMENT PLAN
- CAPACITY EXPANSION LIMITED

ACCESS MANAGEMENT

LAND USE AS A TOPIC IN ENVIRONMENTAL IMPACT STATEMENTS, ETC.
- EMINENT DOMAIN AND RELOCATION
- SCENIC EASEMENTS etc.
- AGRICULTURAL AND OPEN SPACE PRESERVATION
- SMART GROWTH

LAND USE CONTROLS

(2) State Infrastructure for Growth Areas Following State Required LU Plans.

PROJECT DESIGN TO ASSIST LOCAL BUSINESSES
- STATE INFRASTRUCTURE BANKS

ECONOMIC DEVELOPMENT

BASIC EMPLOYMENT DEVELOPMENT FUNDING PROGRAMS
- INDUSTRIAL ROADS

(1) Experts Available for Brief Times on Site.

(3) Development of Regional Impacts- Developers must demonstrate sufficient infrastructure exists before proceeding with project.
3.5. Land Use Policy

Land use initiatives by a state encompass a broad range from simply including a topic in transportation plans or environmental impact statements to completely controlling land use. The various options available to a state involve different degrees of participation by state and local agencies in project-level land use policy and the project’s environmental impacts, land use policy in environmentally sensitive areas, smart growth, scenic easements, agricultural and open space preservation, growth management and influences on large-scale developments. Smart growth programs bias the provision of state infrastructure to designated growth areas following land use plans done at the local level. For example, the state of Maryland restricts the expenditure of state highway funds to areas designated for development according to local plans that have been written by governmental agencies, developers and local officials. A variety of states have adopted growth management programs. Developments of Regional Impacts (DRI) controls in some states require a developer to demonstrate that sufficient infrastructure exists before proceeding with the project.

3.6. Economic Development

Economic development spans a range of activities that includes project design assistance to local businesses, state infrastructure banks, funding programs to promote basic employment opportunities, industrial roads and provision of road facilities by the state for developments that generate both basic and non-basic employment. Examples of state funding programs that facilitate economic development are the RISE program in Iowa and the TEA programs in Wisconsin and California. State infrastructure banks (SIB) are funds for infrastructure investment generated at the state or regional level, as pioneered in Ohio and Florida. Industrial road programs pertain to the allotment of funds by the state towards improving existing road facilities that enhance accessibility to eligible industrial and agricultural facilities.
4. Examples from Other States

Every state has a unique history and setting. What works one place may not work elsewhere because of different legal frameworks, attitudes or population. What works elsewhere may not work in Arizona. Nonetheless, examples from other rapidly growing states provide possible land use policies that might apply to the Arizona context. Three states - Florida, Tennessee and Kansas - provide examples of state actions linking land use and transportation.

4.1. State Land Use Planning Requirements – An Example From Florida

The state of Florida has had rapid growth for long periods of time and has been struggling to provide transportation capacity to go along with the growth. Florida’s program to deal with land use transportation interactions was enacted through the Local Government Comprehensive Planning and Land Development Regulation Act. The central theme of this program, administered by the Department of Community Affairs, is to address the problem of urban sprawl.

The Florida legislation uses the following methods to address the interaction between transportation and land use:

- **Integrated planning**: Each MPO develops and updates a comprehensive plan including land use, highway and transit elements. These plans must be locally adopted and approved by the Department of Community Affairs according to its growth management standards. Four-fifths of the state is within an MPO.
- **Compliance**: All Florida DOT roadway projects must be in compliance with the local comprehensive plan for the specific project’s limits.
- **Coordination**: An FDOT district staff member sits as a nonvoting member at all MPO committee and board meetings.
- **Objectivity**: All goals, objectives, and policies, as well as the future land use and traffic circulation maps in local plans must be supported by and based on specific data and analyses.
- **Concurrency**: “Public facilities and services needed to support development shall be available concurrent with the impacts of such development.” New developments are not allowed if they prevent a local government from maintaining an established level of service. This is the cornerstone of the growth management process.
- **Large Developments**: All developments of regional impact (DRI) undergo a special state planning process. A DRI includes “any development which, because of its character, magnitude, or location, would have a substantial effect upon the health, safety, or welfare of
citizens of more than one county.” For example, for a proposed industrial park, the DRI review might be necessary for parking facilities of more than 1,500 vehicles or a minimum site extent of one square mile. Developers might be required to make contributions to the transit system that provides service to the area of development.

Experience with this process has been mixed. Developers have found ways to get around the regulations and communities sometimes find that there are unintended consequences. Developments have been sized to fit just under the limits or located just outside the boundaries of the MPO to circumvent the intent of the law. Furthermore, an initial shortage of state staff expertise led the state to rely on information provided by developers that minimized the negative impacts of their projects. Nonetheless, the legislation has changed the rules and led to a process for planning and growth in the state that considers how local communities cope with growth.

A partial solution was found in the adoption of the Florida Quality Developments Program. This provided developers with an incentive to use the DRI process, rather than design developments just below the threshold. The program allows the state to review and resolve problems early in the process, and to delegate the review of DRIs to local governments that show they have the capacity to review a DRI.

4.2. Land Use Controls – An Example From Tennessee

The Tennessee Growth Boundary Policy Act was intended to influence the distribution of TEA-21 funds within the state. This act required every county in the state to write a comprehensive land use plan adopted by the local governing body. These plans address transportation and public infrastructure needs in each county and must comply with the TDOT’s goals. Some of the goals of these plans include:

♦ Providing for adequate infrastructure prior to development;
♦ Reusing developed land within existing growth boundaries instead of adding infrastructure and annexing new areas for development;
♦ Redesigning the existing network of roads to revitalize urban centers;
♦ Avoiding exclusionary zoning; and
♦ Encouraging mixed-use development.

---

7 Ask DCA: Development of Regional Impacts (DRIs); Community Planning, Florida Department of Community Affairs, summer 1998. Vol. 7, Number 2. p. 10.
8 Adapted from: (a) CH 28-24 Developments Presumed to be of Regional Impact; (b) Development of Regional Impact (DRI) Review; (c) Rules of the Department Community Affairs Division of Resource Planning and Management Schedule for the Transmission and Submission of Local Government Evaluation and Appraisal Reports; (d) Development of Regional Impact Application for Development Approval under Section 380.06, Florida Statutes.
10 Ibid., p. 2.
According to this act, each Urban Growth Boundary (UGB) should demarcate a reasonably compact region with the capacity to accommodate 20 years of residential, industrial and commercial growth.\textsuperscript{11} It is the responsibility of the local planning agency to manage and control urban expansion outside of such established growth boundaries.\textsuperscript{12} The municipality must consider the impacts of urban expansion on the surrounding agricultural lands, forests, recreational areas and wildlife management areas.\textsuperscript{13} If growth cannot be accommodated within the specified growth boundary, then the municipality should identify potential new areas adjoining the existing high growth areas so that they can easily be incorporated into the network of road, utility infrastructure and public services.\textsuperscript{14} This act reinforces the need for smart growth, especially in those less-developed areas that are now growing rapidly.\textsuperscript{15} With the implementation of Tennessee’s Growth Boundary Policy Act, every county in Tennessee effectively adopted a comprehensive plan by July 2001.

4.3. Access Management – An Example From Kansas

The Corridor Management Policy adopted by the Kansas Department of Transportation (KDOT) is directed at achieving best use of the state highway system. The act establishes criteria and procedures necessary to obtain reasonable access to abutting properties while maintaining safety and efficiency in the movement of people and goods on the state highway system.\textsuperscript{16} The policy is also meant to establish uniformity in the management of state corridors in Kansas. The provisions of this policy act do not constitute a specific set of legal requirements. Rather, the act sets minimum standards for access installations and establishment of protected corridors.\textsuperscript{17} The main purpose of this policy is to establish methods of corridor management that lead to a minimization of vehicle conflicts, improvements in safety and traffic operations, a reduction of delays and smaller major capital expenditures.\textsuperscript{18}

\textsuperscript{11} \textit{A Guide for Conducting County Level Land Use Plans}; Tennessee Growth Policy Act Project: Fulfilling the Potential of Law; School of Planning, University of Tennessee, Knoxville. p. 1. \url{http://planning.cap.utk.edu/tgp/puc1101.html}

\textsuperscript{12} Ibid. p. 2.

\textsuperscript{13} \textit{Loc. cit.}

\textsuperscript{14} Ibid. p. 3.

\textsuperscript{15} \textit{Smart Growth}; Tennessee Growth Policy Act Project: Fulfilling the Potential of Law; School of Planning, University of Tennessee, Knoxville. p. 1. \url{http://planning.cap.utk.edu/tgp/puc1101.html}

\textsuperscript{16} \textit{Corridor Management Policy}; Kansas Department of Transportation. p. 1.

\textsuperscript{17} Ibid. p. 2.

\textsuperscript{18} \textit{Loc. cit.}
The Corridor Management Policy specifies four access management objectives:

- In order to minimize the number of conflicts, eliminate driveways by combining access points or providing access from other roads.
- Achieve better separation of conflict points by providing wide spacing between driveways and keeping driveways away from intersections.
- Allow for slower deceleration through geometric changes.
- Provide exclusive turning lanes so that turning vehicles and queues are separated from through traffic.19

KDOT can also purchase access rights to property or additional right-of-way.20 When choosing the strategy for access control, KDOT considers a wide range of factors, such as patterns of development, travel demand, environmental issues and efficient use of resources.21 All issues pertaining to corridor management are reviewed and managed by the Corridor Management Committee. The KDOT coordinates its efforts with local agencies and landowners in order to effectively implement the guidelines specified in this policy.

19 Loc. cit.
21 Loc. cit.
5. Application to Arizona

Figure 2 provides a framework for the state DOT to consider in evaluating its land use and transportation policies. The state DOT can take steps to implement transportation objectives seeking to improve the link between transportation, land development and economic development. Critical decisions about how the state DOT works with local and regional agencies and the private sector lie ahead.

Federal Transportation Planning Regulations also require analysis of land use impacts of transportation investment decisions at the project level. These regulations represent the most far-reaching call for coordinated land use and transportation planning. However, these are very flexible as no specifications are given as to how to analyze land use impacts of transportation investments or how land use characteristics or development policies should be integrated into the transportation planning process.

The following is a series of suggestions for actions that the state should consider to improve its role in transportation and land use.

5.1. Self Assessment of Current Status

The first step that the state can take in the review of its land use and transportation policies is to conduct a self-assessment of existing policies for consistency. Existing state DOT programs activities and regulations should be reviewed to determine where they fit into Figure 2. The state can use this analysis to determine areas where they should be more active in coordination transportation and land use concerns. The state should also review the chart to determine if they need to add options to each of the categories on the chart or entire new categories based on emerging issues in Arizona.

A hypothetical example of this process is illustrated in Figure 3. The thick line plotted on the chart displays the present position of the state. A review of Figure 3 indicates that the level of activity in outreach and technical assistance appears to be inconsistent with other activities. This hypothetical state could rethink its role in providing outreach and technical assistance to local government in relation to its programs. Similarly, the state could organize oversight committees, conferences and training programs to assist local agencies. With the implementation of these steps, the state could have a more consistent and balanced approach to land use actions.
5.2. Coordination With Other Government Agencies

The key element of Figure 2 is the level of coordination between the state and other government agencies. This section provides an analysis of coordination between the state and local governments, and the state and federal agencies.

5.2.1. Coordination with Local Government

In most states land use decisions are made by local governments. Most state DOTs defer to local governments on land use issues, but may have review authority when the development involves access to or causes impacts on a state highway. By providing transportation facilities and services – be it through building highways, providing grants for local transportation improvements, or providing assistance to transit services – the state DOT affects land use patterns in many different ways. Similarly, all development and land use decisions will ultimately affect travel patterns and influence the decisions made by state transportation officials regarding project planning and programming. Transportation is irrevocably tied to land use and land development.
A critical issue the state must face is how the state deploys projects in relation to locally adopted plans. To what extent should the state promote transportation projects that may conflict with local plans? Some have argued that additions to highway capacity should not be made unless it follows the local plan. In the state of Maryland, infrastructure funds are directed to priority funding areas designated by local governments according to state criteria.22 Funding programs are designed to provide for compact development and the state DOT follows the lead of local plans in designing its programs.

Even in states where the DOT feels it has no role in land use decisions, its staff members will find themselves heavily involved in land use concerns. These occur through the environmental review process, by issuing permits and by deciding where, when and how to expand highway capacity. Who takes the lead in planning and identifying projects at the local level is a critical decision for a state DOT in defining land use policy. It may be that there are different procedures for different areas of the state. In areas with experienced local and regional planning agencies, they can easily take the lead in identification of projects for all levels of government. In other areas of the state with less local expertise, the state may have to take more of a lead role.

No matter who takes the lead role in land use decisions, a state DOT will need to be a participant if for no other reason than to protect the state’s investment in transportation services and facilities so they operate in an efficient manner.

5.2.2. Coordination with State, Federal and Tribal Agencies

Many state and federal agencies and tribal governments take prominent roles in decisions that directly or indirectly affect land use in Arizona. Arizona is unique in that large amounts of land are under the direct jurisdiction of the state itself or a variety of federal agencies and tribal governments. This situation requires a coordinated effort to deal with future growth in a logical way while minimizing harm to the environment, preserving sensitive lands, and encouraging economic development. To do so requires a high degree of coordination and agreement on common goals and approaches. The state DOT is only one of many agencies that should take part in these coordinated efforts.

One method to increase coordination between agencies is to establish a state land council that provides a forum for discussion of state land use issues and

---

22 "What you need to know about Smart Growth and Neighborhood Conservation" Maryland Office of Planning, May, 1997.
works to establish consistency among agencies’ programs. The success of this effort depends on the commitment of various state, federal and tribal agencies to working together on transportation and land use topics. Hot issues in one agency or area of the state may not be salient to others. The state DOT should consider how they interact with other state, federal and tribal agencies and actively explore methods to increase coordination and consistency between agencies.

5.2.3. Relationship with Private Sector

A key question for the state to address is how they will work in partnerships with the private sector. Private sector developers seldom undertake projects that they feel are not financially viable. They react quickly to shifts in market demand and are generally open to change and innovation.

Improved communication with the private sector is essential for better coordination of land use and transportation. Clear guidelines and policies are needed to assist the private sector in making decisions. Uncertainty and project delays can cause severe financial problems and quick abandonment of projects. Good procedures are needed to involve the development community in transportation decisions. As in Florida, legal solutions may be more effective if developers are brought into the planning process early, instead of seeking ways to avoid the responsibilities of the process.

The changing nature of the population presents an opportunity for better coordination and cooperation with the private sector. Market potential for transit, walking and bicycle travel will likely increase. The future population will be older and more diverse. Older residents require places to live that provide alternatives to an automobile dependant life style. People born outside the United States often have a greater propensity to use public transit. Both groups present markets for more compact development.

5.3. Education/Technical Assistance

5.3.1. Improve State DOT Expertise

Smart growth requires smart people who make smart decisions. The state DOT should examine the level of expertise in land use policy. If the state is to develop transportation systems with an awareness of land use, staff needs to be better informed about this relationship. Coordination with local and state agencies requires more information about the policies of these agencies. Coordination with the private sector requires more information about how they make decisions.

“The state should examine the level of knowledge of their staff and determine how they can increase their expertise in land use. This should occur at all levels.”

“Smart growth requires smart people who make smart decisions”
People who design individual projects or supervise the maintenance and operation of transportation systems should be involved. It is especially important that the state have expertise in real estate economics and development procedures to be successful.

At the local level, the state DOT needs to take a more active role in examining the land use transportation interaction. Each district office of the state needs ready access to expertise in land use and transportation interactions and active participation in local land use decisions. This may be best accomplished through district land use coordinators. Such a person or persons would work with local government and ADOT to tie land use and transportation closer together. They would know early on the concerns of local governments and use this information to improve transportation policies and projects.

To some extent this may require a change in the self-image of the organization. If the state is to become more sophisticated in how it deals with land use, staff needs to think of the agency in a different way. It is not just a highway builder anymore, but also a service agency that provides resources for smart use of land and wise investment of resources. Life is more complex if transportation decisions need to consider how they will affect future land use and transportation efficiency.

5.3.2. Technical Assistance from the State DOT

A technical assistance and outreach program can be an effective way to increase the expertise of local governments and decision-makers. In some areas of the state, local and regional planning agencies are highly sophisticated and use state of the art techniques while other areas have fallen behind recent planning efforts and technologies.

The state can increase its involvement in land use issues by sponsoring conferences and training sessions. These programs are designed to make local government personnel more aware of good land use and transportation practices. For example, the state could sponsor local training sessions on access management for local government in order to convince local agencies of the need for better control of driveway entrances onto state highways. Typically, these training programs are run for one day and are held regionally to allow for attendance with a minimum of travel. Such programs may be offered by the state directly or by others with state sponsorship. The state DOT can be very effective as a catalyst for such programs if it actively encourages their development and promotion. Even if the
state feels that land use is entirely a local issue, training and conference programs can help local governments perform their jobs more effectively.

In addition, the state can develop guidebooks and technical assistance materials that are specifically directed to land use policies of local agencies. These materials can be used to help local government better understand best practices in planning and the interaction between transportation and land use. The materials can help create consistency in planning practice among local governments and be used to deliver information on emerging practices and techniques.23

5.4. Access Management

Access management is one of the most direct ways in which transportation agencies and local governments can deal with adverse effects of development on transportation system performance. Careful planning of access in newly developing areas and good policy for driveway spacing and design can avoid many problems of congestion and safety that would otherwise occur. Good traffic flow occurs if turning movements on and off arterial roads are minimized and concentrated at places where they can be done safely. The state should examine how it manages access on roads under its jurisdiction and also develop methods to encourage and assist local governments in their access management.

Access management is a way for the state DOT to protect its investments in transportation by preventing actions that deteriorate the function of the facility.24 State transportation facilities would be managed in such a way as to maximize their long-term benefits and to provide the greatest return on investment. In such a case the state could adopt strategies that protect investments from losing their value through poor land use and access policies.

For example, the department might pursue access management aggressively to protect facilities from losing their ability to provide mobility because of excessive access points. Similarly the department could engage in extensive interchange area planning to assure that traffic entering and exiting a major highway is not subject to extensive conflicts from interchange area developments. In such a case the department would develop rules for areas near interchanges as to types of land uses, complementary activities and sharing of off road facilities.

24 “Public Private Cooperation: Transportation Investment and Real Estate Development”, Report to Wisconsin Department of Transportation by the Center for Urban Transportation Studies, University of Wisconsin-Milwaukee, June, 1985
5.5. Smart Growth

The most recent response to the problem of sprawl has been the adoption of ‘smart growth’ legislation.25 This has occurred throughout the country and in places covering the political spectrum. Smart growth means different things to different places, but generally attempts to improve planning to avoid the adverse consequences of unplanned growth. These planning efforts are intended to continue to encourage growth, but with a better understanding of its long-term consequences. Smart growth legislation generally makes mandatory certain planning elements that were formerly optional for local government plans.

Smart growth conveys a new attitude towards planning that does not carry the stigma of imposing central control on land uses. A key feature of smart growth legislation is a strong reliance on local governments to make decisions. Ideally these are smart decisions that have a longer term view and weigh individual rights with the common good.

Smart growth legislation was first passed in more urbanized states on the east and west coasts with notable early efforts in Maryland and Oregon. Recently, states such as Tennessee and Wisconsin have adopted smart growth legislation. The Arizona legislature passed a series of laws to address smart growth, including the Arizona Preserve Initiative of 1996, the Growing Smarter Act of 1998, and the Growing Smarter Plus Act of 2000. These laws strengthen planning requirements at the local level and permit the use of tools such as purchase of development rights to protect critical lands. They also allow municipalities to set infrastructure service boundaries and indicate that municipalities may not annex an area unless they have a plan in place to provide the infrastructure within 10 years.26

The legislation is still new in the state and much of it remains to be implemented. Several communities have gone through plan ratification by voters and many others are in the process of developing plans that conform to the legislation. Time will tell if the legislation will make a difference in how Arizona grows and develops.

A critical question sometimes left out of smart growth legislation is what is the state required to do with smart growth. In some states, the legislation is silent about state agencies and programs, while in other places the state is required to conform to local plans. For example, the Maryland smart growth legislative package restricts most state infrastructure funding, economic development, housing and other program dollars to Priority Funding Areas27 designated by local governments. Smart growth policy objectives are integrated into the transportation system through the planning process. This may mean that

26 “Growth Management and Open Space Protection in Arizona: Current Tools and Progress”. Issues in Brief, the Morrison Institute, Arizona state University, June, 2001.
27 Ibid., p. 6.
highway expansion does not take place outside of the priority funding areas if it will lead to sprawl elsewhere.

It is obvious that transportation planning needs to be an integral part of smart growth at the local level. The state DOT needs to decide how they will participate in local smart growth planning and how state projects complement the implementation of local plans.

5.6. Land Use Programs

Smart growth provides a general framework for thinking about land use programs. Other practices can be used as individual measures to increase the tie between land use and transportation. These include improvement of connectivity between developments, consideration of transit corridor districts, and interchange area planning procedures. All provide common sense ways to avoid long term traffic congestion problems associated with growth. A rapidly growing state such as Arizona can use these steps to greatly reduce future problems.

5.6.1. Secondary Impact Analysis

The state might consider an extended environmental review of the land use impacts of transportation projects. For example, Wisconsin DOT developed a technical reference guidance document that its districts use to determine a project’s potential to change land development patterns. The document provides general information on land use planning, development regulation, and the relationship between transportation investments and land development patterns. The document provides a guide for evaluating land use impacts in the NEPA process.

The framework provides a means to assess impacts for potentially significant projects. Analysis of the indirect and cumulative effects on land development at the project level is different from local land use planning. Local land use planning merely studies and develops local goals and community vision, while project level analysis focuses on how the project alternatives affect local land use and land use plans. Local jurisdictions and consultants in the transportation planning process follow the guidelines provided in the reference guide.

5.6.2. Connectivity

An important topic for state and local governments is how they provide connectivity between adjacent developments and properties. Good practice includes providing multiple entrances and exists for residential and commercial

---

developments to permit internal circulation and movement within neighborhoods without the need to use surrounding arterial roadways. This can reduce the need for excessive travel for short trips and lead to more efficient travel over the overall network. This implies limited use of cul du sacs and multiple ways in and out of each individual development. Guidelines for neighborhood connectivity could be developed as a tool for local government to use in the planning of growth areas and neighborhoods.

Improved connectivity within neighborhoods will also make it easier to walk or use bicycles for travel since those trips can be made without the need to travel along busy arterial highways. Access to transit service is also enhanced since walk paths to stops are direct and do not require circuitous travel.

5.6.3. Transit Corridor Districts

A transit corridor district is an area where transit service will be provided in the future and a place where land uses are arranged to facilitate transit services. They include a mixture of land uses that relate well to transit and provide a street and pathway pattern that facilitates transit use, as well as bicycling and walking. Transit services would likely be bus-based with provisions to be upgraded to other technologies at a later date. To be effective they should be predesignated as part of a regional transportation planning effort. Early location and designation of the corridors is essential so that subsequent land use decisions can conform to the expected pattern of uses. They form the basis for the development of mixed use, pedestrian friendly places and provide a way for private developers to serve emerging residential and commercial markets.

Ideally, transit corridor districts include the physical separation of transit service and primary auto-oriented travel. Transit corridors are located parallel to major arterials but within areas zoned for mixed use neighborhoods and transit-oriented land uses. Street patterns could be arranged to facilitate walking and transit stop access with a limited control of through auto movement along the transit corridor. Advance knowledge of where transit services will be provided will permit private sector developers to utilize property in an efficient way to take advantage

---

29 For more information on this topic see "Guidelines for Transit Sensitive Land Use Design" Report to Federal Transit Administration by the Center for Urban Transportation Studies at the University of Wisconsin- Milwaukee, July, 1991, also see TRB Record #xxx
of the alternative transportation choices. Arterial access management is an important complementary policy that can help to focus activity centers, such as commercial development, near transit stops. Transit corridor districts may have different zoning provisions that permit more flexibility by developers. They can create a win-win situation for private development and transportation agencies as both benefit through more logical linkages between land use and transportation.

Transit Corridor District Concept

Arizona may be particularly suited to this concept. Rapid growth, a well-developed grid system of arterial highways, and a diverse and aging population make it an ideal place to use the concept. Success depends upon coordination between regional planning agencies, local government, and the state DOT. The state should consider this concept as a way to increase choices in both land use and transportation services. The state must work with local planning agencies to explain the process and should consider the development of prototype designs and model code revisions.

5.6.4. Interchange Area Planning and Deployment Strategies

Highway interchange areas are prime sites for development. They attract commercial and employment activity and become the focus for substantial growth and development. If this growth is poorly planned, the interchange area becomes a place with excessive traffic conflicts and poor connection between properties and developments. The state should produce guidelines on issues of interconnection, access spacing, shared driveways, transit service location, pedestrian movement and internal circulation. These guidelines set the stage and ground rules for all that follows and help to avoid haphazard interchange area developments.
6. Conclusions

Land use changes are the result of many small decisions and occur incrementally over time. What may appear to be minor decisions at the time will accumulate to result in major changes in the landscape with unintended consequences. For all practical purposes, these changes are permanent and irreversible. Because of its fast growth, Arizona residents see an accelerated version of this process and even relatively new residents of Arizona can see dramatic changes in the landscape as they first saw it when they arrived in the state. Land use changes occur continuously as communities evolve and grow over time and do not stop at any point in the future.

By contrast, planning and land use policy efforts typically focus on a particular date or milestone in the future. They involve a significant effort for a short time and then are put to rest until updated some years later. These different perspectives make it difficult to implement meaningful change over time and to keep policies in place for the long run. Plans can be perishable commodities that are soon ignored or placed aside. To sustain a long term change in direction requires a change in attitudes and awareness by those who will work with them over the long run. Stable policies have to make sense to many constituencies to survive changes in administration that will occur over time.

Transportation and land use will become an increasingly important issue in Arizona. Rapid growth in the future and limited transportation resources means that the state DOT will have to take a more active role in land use decisions and policies. Furthermore smart growth initiatives will require the state DOT to consider how it interacts with local communities and other agencies. Critical questions the state needs to address are the following:

- How actively should the state participate in local land use and transportation planning decisions?
- What does the state do about projects that do not complement the implementation of local land use plans?
- How does the state DOT interact with other state, federal and tribal agencies on land use issues?
- How does the state increase its level of expertise in land use issues at the central office level as well as in the district offices?
- What level of technical assistance does the state provide to local governments in land use issues?
- How does the state balance private interests with public interests in land use and transportation decisions?
- What can the state do to increase the management of access on the state highway system?
How does the state protect its investment in facilities to prevent their functional obsolesce?

How can the state help in providing good connectivity between neighborhoods and developments?

What can be done to provide a framework for transit oriented, compact development in growing areas of the state?

How should the state manage the development of activities around the interchanges on the state highway system?

How Arizona deals with these questions during development of the long range transportation plan, as well as during subsequent implementation of the plan, will have an impact on many related concerns of importance to the State such as preservation of transportation system investments, economic vitality, resource conservation, and overall customer satisfaction with the functionality of the transportation system.