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16. Abstract Smart growth is planned growth that integrates land use and transportation to create urban development that conserves resources and improves quality of life while providing adequate mobility. The primer provides a basic background on smart growth and is intended to be an introduction to smart growth for transportation professionals. This primer reviews the origins and background of smart growth development in the United States and describes smart growth programs, practices, and applications at various levels (state, region, municipality, neighborhood, site, etc.). The primer provides a basic background on smart growth and is intended to make smart growth accessible to professionals at all levels of experience and in all scopes of urban and transportation planning.					
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**INTRODUCING SMART GROWTH TO TEXAS:
PRIMER**

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TABLE OF CONTENTS

LIST OF FIGURES	VIII
CHAPTER 1. BACKGROUND.....	1
ORIGINS OF SMART GROWTH.....	1
Growth Management.....	1
Quality of Life.....	1
MOTIVATIONS TOWARD SMART GROWTH.....	2
Smart Growth Transportation for Improving Quality of Life.....	2
Smart Growth for Managing Limited Resources.....	2
CHAPTER 2. DEFINING SMART GROWTH.....	3
CHAPTER 3. COMPONENTS OF SMART GROWTH	5
CHAPTER 4. CHARACTERISTICS OF SMART GROWTH	11
What Smart Growth Is Not	12
Purported Benefits of Smart Growth	12
CHAPTER 5. SMART GROWTH TRANSPORTATION.....	15
Statewide and Regional Planning	15
State-Level Growth Management and Land-Use Planning	15
Regional Growth Management and Land-Use Planning	19
CHAPTER 6. ROLE OF TRANSPORTATION IN SMART GROWTH PLANNING AND DEVELOPMENT.....	21
Transportation influences Land Use	21
Land Use influences Transportation	21
Smart Growth and Transportation	21
Smart growth transportation applications at various scales.....	22
Neighborhood.....	22
Municipality	22
Region.....	22
State.....	22
Federal.....	23
CHAPTER 7. TRANSPORTATION IMPACTS OF SMART GROWTH.....	25
CHAPTER 8. CONCLUSIONS.....	27
REFERENCES.....	29

LIST OF FIGURES

Figure 1. Live-work units put housing and employment together in this high-density, mixed-use neighborhood.....	5
Figure 2. Residential infill development in downtown Austin helps balance housing with jobs and increases density to maximize existing infrastructure.....	6
Figure 3. Narrow streets, continuous sidewalks, and well-delineated crosswalks make this neighborhood pedestrian friendly.	7
Figure 4. Dallas’ North Central Expressway and the Staples Street bus transfer center in Corpus Christi are designed in context with their surroundings. Source: Left photo – Texas Freeway (www.texasfreeway.com)	7
Figure 5. The old Sears Building, now private residential, is an example of the redevelopment spurred by the Dallas Area Rapid transit rail line.	8
Figure 6. The Staples Street Bus Station in Corpus Christi, a low-cost transportation project, improved access and helped revitalize the surrounding area. Source: Project for Public Spaces (www.pps.org).....	8
Figure 7. An aesthetically pleasing bridge blends with natural environment. Source: Texas Freeway (www.texasfreeway.com)	9
Figure 8. Multimodal transportation includes bike lanes on Houston streets; rail transit with pedestrian facilities in Dallas.	10
Figure 9. A planning charrette can help stakeholders identify common goals and build consensus. Source: National Charrette Institute	10
Figure 10. Growth management states included in discussion.....	16
Figure 11. An illustration of how smart growth transportation improvements serve to support adjacent land uses and provide a safer and more comfortable pedestrian environment without compromising traffic operations.....	28

CHAPTER 1. BACKGROUND

“Smart growth” has become a popular term used to describe what many feel is the way they want to see their community grow. To many it is a label for a living environment that is uncongested, attractive, and comfortable. It provides a desirable quality of life that will stay that way (i.e., be sustainable) over time.

Many labels have been applied to smart growth development. Some of these are sensible growth, intelligent growth, balanced growth, and sustainable growth (*1*). Although somewhat less comprehensive, transit-oriented design, traditional neighborhood design, and new urbanism have also been associated with smart growth terminology. The objective of smart growth development by any name is to better integrate transportation and land use to produce the desired results. Smart growth starts with consensus on objectives and land and transportation planning, but it must also include implementation through supportive policies, proper design, locally established priorities, and appropriate projects and operations

ORIGINS OF SMART GROWTH

Smart growth appears to have grown from two basic and related directions: management of urban growth and a desire for improved quality of life.

Growth Management

Growth management is a term initially used in the 1960s to describe a proactive approach to shaping land use development. Growth management was intended to guide land development for the best use of land to meet community goals and to conserve natural resources. This new approach to land use planning shifted the local government’s role in the land development process from passive to active involvement by requiring a more direct role in the planning process (*2*). Growth management monitors the timing, location, and character of land use and development, and includes community design, economic development, environmental, housing, public facility management, and transportation elements (*3*).

Quality of Life

Some quality of life concerns giving rise to the search for new forms of urban design are traffic congestion, time consumption, and safety. Conventional low-density urban development that segregates land uses increases the distances between housing, jobs, and daily necessities and makes driving necessary. These long travel distances, combined with associated increases in traffic congestion, increase driving time and reduce the amount of free time available to spend with families, and friends, and pursuing personal activities. Additionally, traffic on wide, straight conventional neighborhood streets tends to move faster, creating safety hazards for pedestrians, bicyclists, and residents. The desire to reduce the impacts of vehicle use is a major factor in the pursuit of pedestrian-friendly, compact, mixed-use development associated with smart growth.

MOTIVATIONS TOWARD SMART GROWTH

Two community desires have caused smart growth to gain popularity:

- to improve quality of life, and
- to do so with today's limited available resources.

Smart Growth Transportation for Improving Quality of Life

A key reason why smart growth has come to the forefront is increasing concern over what is perceived to be declining quality of life, particularly in urban areas (*I*). Included among the transportation-related reasons for concern are:

- increasing congestion and travel time,
- traffic intrusion into neighborhoods, and
- related safety hazards.

Smart Growth for Managing Limited Resources

In the past it was possible to build basic transportation infrastructure more easily. Land was more available. A higher percentage of project funds went into implementation of the facility or service. Environmental and other constraints were fewer and less costly to address. Today many transportation agencies' resources are not sufficient to support desired improvement programs due to higher costs for:

- land for right of way;
- infrastructure (construction of expanded and new facilities, maintenance, rehabilitation, or replacement);
- enhancements to meet environmental and aesthetic needs; and
- operations and maintenance.

In addition, tendencies for development to "leapfrog" from developed areas to new territory beyond closer-in undeveloped land has caused sprawl. This leapfrogging requires some infrastructure to be extended through undeveloped areas to the newly developing areas. The result is increased cost for basic infrastructure and services, increasing the burden on resources.

CHAPTER 2. DEFINING SMART GROWTH

Smart growth is an integrated approach to development that seeks to fairly and efficiently allocate public infrastructure investments in such a way that economic, mobility, social, and environmental interests are balanced to achieve sustainable growth. Smart growth fosters the development of compact, attractive, successful communities where various transportation options, including walking, bicycling, and transit, are viable forms of transportation and where mobility needs are balanced with other objectives.

Smart growth addresses issues related to transportation – the influences of transportation and land use on each other and the characteristics of transportation systems and services that can encourage and support smart growth. Land use and urban form can affect mobility and accessibility by influencing trip lengths and travel mode choices. Increasingly, efforts are underway to integrate land-use and transportation planning to reduce vehicle travel and emissions.

The United States Environmental Protection Agency (EPA) identifies the following five characteristics of urban form as influences on travel and air quality (4, p. 16):

- transit accessibility,
- pedestrian-environment/urban design factors,
- regional patterns of development,
- density, and
- land use mix.

Each of these characteristics is discussed later in this document.

The Clean Air Act (CAA) requires state air quality agencies to prepare plans, known as State Implementation Plans (SIPs), for the implementation of actions that will improve air quality. Land-use activities that change urban form in ways that decrease motor vehicle use and encourage alternative forms of transportation and can be shown to both increase mobility and reduce emissions can be included in the SIP (4, p. 27). States can account for the air quality benefits of land use activities for non-attainment and maintenance areas in one of three ways (4, p. i):

- including land-use activities in the initial forecast of future emissions in the SIP,
- including land-use activities as controls strategies in the SIP, or
- including land-use activities in a conformity determination without including them in the SIP.

Land-use activities may be regulations or projects.

Planning and implementing smart growth may require more flexible development regulations and zoning ordinances to accommodate such smart growth characteristics as mixed land uses, increased densities, and more compact development (5). Non-standard transportation approaches such as improving transit availability and service, or modifying roadway cross sections to

CHAPTER 3. COMPONENTS OF SMART GROWTH

In 1999, the National Governors' Association (NGA) adopted a smart growth policy that is intended to provide guidance to states to help them make the best possible use of land while protecting the natural environment and encouraging sustainable growth. The policy encourages the creation of state-local partnerships to address growth issues, and includes the following 10 "Principles for Better Land Use," which have been stated as principles of smart growth (6):

1. mixing land uses;
2. maximizing the use of existing infrastructure and resources;
3. creating a range of housing opportunities;
4. fostering walkable neighborhoods;
5. encouraging distinctive community character, including historic preservation;
6. strengthening and encouraging growth and development within existing communities;
7. making development decisions predictable, fair and cost-effective;
8. preserving open space, natural beauty, farmland and critical natural environments;
9. providing a variety of transportation choices; and
10. offering opportunities for citizen involvement and stakeholder participation in planning decisions.

Each of these principles has transportation-related components. Some of the transportation-related aspects of these smart growth principles are as follows:

1. **Mixing land uses** – Mixing complementary land uses can reduce trip lengths by putting more origin-destination pairs in close proximity to each other. This mix can also increase non-vehicular accessibility. In combination, these land uses reduce both vehicle trips and vehicle miles of travel (VMT). Having necessary retail and service-oriented businesses near employment-based developments increases the likelihood of making midday trips without the use of a car, as workers in mixed-use developments may find that they can walk to restaurants and do some errands on foot (7). The reductions in vehicle trips and increases in pedestrian activity spurred by mixed-use development (Figure 1) will create the need to encourage and accommodate pedestrian travel and, thereby, affect the transportation system's design.



Figure 1. Live-work units put housing and employment together in this high-density, mixed-use neighborhood.

2. **Maximizing the use of existing infrastructure and resources** – Smart growth strategies prioritize investment in existing roadway infrastructure as opposed to investment to extend transportation infrastructure into outlying areas. Maximizing the use of existing roads reduces long-term transportation system maintenance costs, and improvements to existing facilities are typically less costly (when right of way is already available) than construction of new facilities.
3. **Creating a range of housing opportunities and choices** – Providing a range of housing choices enables workers at all income levels to live close to their jobs. Balancing housing and jobs within a region or sub-region and locating a variety of housing options in close proximity to employment centers provides an opportunity to reduce work trip length and VMT, as more people will be able to live near where they work. (Figure 2) Achieving a proper balance may also permit the use of alternate forms of travel, such as walking, bicycling, and transit. All of these forms of travel can reduce the need for highway expansion and transit improvements.



Figure 2. Residential infill development in downtown Austin helps balance housing with jobs and increases density to maximize existing infrastructure.

4. **Fostering walkable neighborhoods** – Certain characteristics of neighborhood street layout, such as short block lengths, grid-patterns, connectivity, and continuity, can reduce vehicle trips and encourage pedestrian and bicycle use by decreasing travel distances for local convenience trips. A properly designed street system can result in more effective transit service; fewer driving and more pedestrian, bicycle, and transit trips; reduced VMT; and improved livability. In addition to street layout, designing to facilitate bicycle and pedestrian mobility encourages these forms of travel. Providing sidewalks along streets increases pedestrian convenience and safety (Figure 3). Design features, such as increasing sidewalk width and decreasing walking distances across streets, can increase pedestrian comfort, convenience, and enjoyment, and encourage walking.



Figure 3. Narrow streets, continuous sidewalks, and well-delineated crosswalks make this neighborhood pedestrian friendly.

5. **Encouraging distinctive community character, including historic preservation** – Building transportation systems within the context of their surroundings can preserve or create a distinctive community character (Figure 4). When rebuilding or improving streets and transportation systems, designs should be developed that meet the needs of the specific site, a concept often referred to as “context sensitive design.” Efforts should be made to not only improve mobility but to preserve and enhance environmental and cultural factors affected by the transportation facilities. Successful efforts have been made in New York, Maryland, California, Oregon, and Texas (the reconstruction of Dallas’ North Central Expressway south of Park Lane, and Ft. Worth’s I-30 downtown are examples), among others, to modify urban road improvement projects to respond to public concerns for community livability (8).

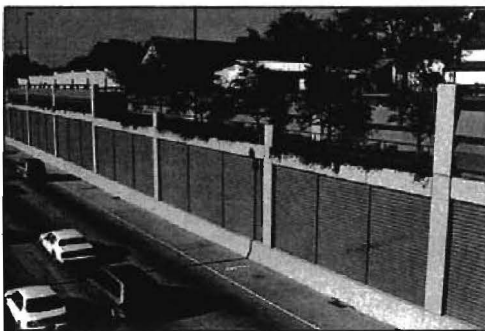


Figure 4. Dallas’ North Central Expressway and the Staples Street bus transfer center in Corpus Christi are designed in context with their surroundings. Source: Left photo – Texas Freeway (www.texasfreeway.com)

6. **Strengthening and encouraging growth and development within existing communities** – Transportation investments can encourage economic redevelopment as well as provide access (9). Improvements and investments in existing transportation infrastructure can encourage redevelopment and infill development projects within communities (Figure 5). This type of redevelopment can lessen sprawl and reduce

necessary investment in infrastructure by requiring fewer new roads, creating more compact development, increasing density, and improving transit opportunity.



Figure 5. The old Sears Building, now private residential, is an example of the redevelopment spurred by the Dallas Area Rapid transit rail line.

- 7. Making development decisions predictable, fair, and cost-effective –** Accessible and equitable transportation facilities are essential to creating sustainable communities (10). Smart growth encourages citizen involvement in decision-making to ensure that community concerns are addressed. Transportation officials can work with communities to accurately and fairly assess access and mobility needs (Figure 6). These data, used in conjunction with information on how new or proposed transportation systems will affect health, aesthetics, mobility, and noise, can influence development of a transportation system that will serve the entire community equitably (9). In a smart growth transportation plan, funds should be invested in transportation services that benefit all members of the community equally. Smart growth activities should also be consistent so they can be predictable for developers and citizens of the community.



Figure 6. The Staples Street Bus Station in Corpus Christi, a low-cost transportation project, improved access and helped revitalize the surrounding area. Source: Project for Public Spaces (www.pps.org)

- 8. Preserving open space, natural beauty, farmland, and critical natural environments –** The extension of roads to land at the periphery of cities has enabled more people to live farther from where they work and shop. Since World War II, millions of acres of farmland, open spaces, and natural areas in the United States have been used for often fragmented development away from city centers and even beyond established suburbs —

a trend known as “urban sprawl” (11). To reduce sprawl and preserve green space from development, smart growth encourages investment in the redevelopment of inner-city properties through investments in infrastructure improvements and in undeveloped infill areas before building new roads farther out.

When the construction or improvement of rural roads is necessary, smart growth encourages the use of contextual highway design, which is a collaborative, interdisciplinary approach that meets service, safety, and structural requirements while adapting the highway to its setting and preserving or enhancing the surrounding area (12) (Figure 7). Contextual highway design considers such elements as topography, vegetation type, sensitive landforms, critical habitats, cultural and aesthetic factors, and stakeholder input in the design process to minimize the impact of transportation systems on natural and built environments.

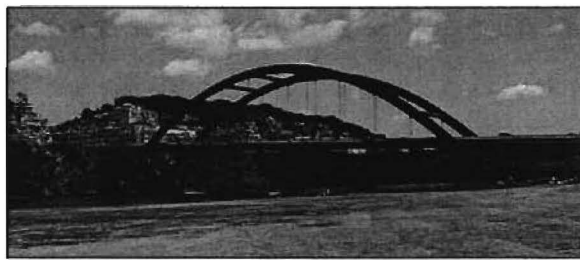


Figure 7. An aesthetically pleasing bridge blends with natural environment. Source: Texas Freeway (www.texasfreeway.com)

9. **Providing a variety of transportation choices** – Multimodal transportation options are essential to a smart growth development plan, and to transportation efficiency. Transportation systems should be designed to make walking, biking and transit viable means of transportation (Figure 8). Creating safe and continuous pathways of streets, bikeways, and pedestrianways, as well as providing transit routes and services that meet the needs of the majority of people, will increase transportation options.



Figure 8. Multimodal transportation includes bike lanes on Houston streets; rail transit with pedestrian facilities in Dallas.

- 10. Offering opportunities for citizen involvement and stakeholder participation in planning decisions** – Collaboration is a key characteristic of smart growth. Collaboration between public officials, developers, environmentalists, civic organizations, and citizens can identify common goals and determine the most appropriate ways to accommodate growth (13). Smart growth encourages transportation officials and planners to work with citizens in developing system and project visions before creating formal designs. Respectful communications, consensus building and community participation (Figure 9), negotiation and conflict resolution are part of the smart growth transportation planning process (14).



Figure 9. A planning charrette can help stakeholders identify common goals and build consensus. Source: National Charrette Institute

promote pedestrian and bicycle travel, are also often needed to achieve smart growth concepts and objectives.

CHAPTER 4. CHARACTERISTICS OF SMART GROWTH

Smart growth is growth management that has evolved to include aspects of development such as quality of life, transportation efficiency, and the aesthetics of the developed environment. More importantly, smart growth emphasizes:

- developing land and transportation consistent with regional goals and objectives, and
- collaborative efforts between the public and private sectors to achieve the goals.

Smart growth can be implemented on a site, neighborhood, municipality or area, regional, or statewide basis. Regional and statewide applications are discussed in Chapter 5.

Smart growth characteristics include:

- compact development;
- complementary land uses within an area;
- mixed-use developments;
- higher development densities;
- priority on land redevelopment (land recycling) and infill;
- broad range of housing types;
- pedestrian- and bicycle-friendly provisions;
- interconnected street, pedestrian, and bicycle networks;
- efficient transit;
- job/work force/housing balance;
- economic vitality;
- attractive aesthetics;
- environmental sensitivity;
- building upon existing infrastructure where possible to provide sufficient but not excess capacity; and
- sustainability over time.

Smart growth includes creating compact, pedestrian- and transit-friendly developments where housing and commercial (or other complementary) establishments are mixed for maximum convenience and accessibility. Integrating housing and convenience retail facilities in a smart growth development can reduce auto dependence by providing the ability to walk to more destinations, housing choices, and transportation choices (13). Continuous street networks (rather than dead-end streets, cul-de-sacs, and excessively circuitous streets) with sidewalks and pedestrian and bicycle paths to make pedestrian-, bicycle- and transit-friendly environments are characteristic of smart growth design. Again, they provide transportation choices and make non-motorized modes more convenient.

Smart growth also encourages land redevelopment as a means of infilling underutilized areas, increasing density, maximizing infrastructure use, and minimizing land consumption. Smart growth incorporates a broad range of housing types and prices so that most housing needs can be met in every community, which will reduce traveling to jobs. Smart growth includes making transit feasible, available, and accessible to everyone.

WHAT SMART GROWTH IS NOT

Smart growth is *not* “no growth.” Smart growth does not call for an end to growth, road improvements, or road building. Smart growth is not traffic calming, although it may include some of the concepts involved in traffic calming. Smart growth is not intended to prevent new vehicle trips. Smart growth is not intended to hinder growth and development or impede progress.

Smart growth is merely a comprehensive way of making the best use of available resources to provide a quality of life consistent with locally developed objectives in a way that is environmentally sensitive, economically advantageous, and sustainable over time.

No-growth (or anti-growth) policy in its strictest application opposes the construction of new housing, commercial buildings, and roads. Most advocates of growth controls recognize that growth is inevitable and encourage development using smart growth principles that reduce land consumption, such as increased densities and compact development.

PURPORTED BENEFITS OF SMART GROWTH

When properly implemented, smart growth creates urban form that is purported to reduce sprawl, encourage alternative forms of transportation, reduce transportation and other infrastructure requirements, conserve green space, create “livable” environments, and reduce development-related pollution (7).

Smart growth encourages urban redevelopment and infrastructure improvements, rather than the expansion of city boundaries and the construction of new roads. New roads that provide access to land on the periphery of a city encourage development in peripheral areas. VMT will increase along with such urban expansion. From 1980 to 1997, VMT in the USA increased by 63 percent, and VMT per capita grew at approximately three times that rate. About half of this VMT growth can be attributed to the expansion of the urbanized area due to increases in population and economic development. The other half may be attributable to lower densities and sprawl (7).

Utilization of alternative forms of transportation, such as walking, bicycling, and transit, can reduce VMT. Reductions in VMT can reduce auto-related forms of pollution, such as air pollution from emissions and water pollution from road run-off (4, 15). In 2000, the National Renewable Energy Laboratory (NREL) calculated emission reductions for employees traveling to work by various means. Using 1999 average vehicle emissions calculations from the Colorado Department of Health Statistics, NREL estimated that five employees walking to work an average of 2.5 miles per round trip would produce emissions savings of 1075 pounds of Carbon monoxide (CO), 155 pounds of oxides of nitrogen (Nox), and 135 pounds of volatile organic compounds (VOC) per year (16). Many characteristics of smart growth are intended to increase the use of alternative forms of transportation and reduce VMT.

Proper (smart growth) neighborhood design can reduce automobile travel by way of improving transportation options. Design characteristics, such as compact development, increased densities, mixed uses, connectivity, and networked pedestrian and bicycle pathways, can create compact development with shorter trip lengths that is conducive to walking, bicycling, and

transit use, particularly in regions with concentrated job centers well served by transit. Properly designed smart growth developments with networked streets, well-connected pedestrian and bicycle trails, and dense, mixed land uses improve mobility and accessibility and make walking, bicycling and transit viable forms of transportation (17). Studies in California comparing new “traditional” neighborhoods with direct street connections to conventional suburban subdivisions with curvilinear street patterns and cul-de-sacs, estimated that daily VMT could be as much as 50 percent lower, and CO emissions more than 40 percent lower than traditional design (18). Continuity of selected streets and connectivity of streets and paths within these neighborhoods also increases transit accessibility. The higher levels of transit use associated with traditional forms of neighborhood design results in a reduction of VMT and emissions.

CHAPTER 5. SMART GROWTH TRANSPORTATION

Numerous agencies, organizations, governmental entities, and individuals are involved in smart growth planning. At the local level, local, county, and regional governments, transportation providers, funding agencies, Metropolitan planning organizations (MPOs), regional councils of government (COGs), interested private-sector groups, utility districts, land developers, interest groups, consumers, and others influence decisions that contribute to urban form and transportation system decisions. At the state level, when undertaking transportation projects in urbanized areas, state departments of transportation (DOTs) and their MPOs must, under TEA-21, consider seven factors. These factors include such smart growth elements as increasing accessibility and mobility, protecting and enhancing the environment, connecting and integrating the transportation system between modes, and promoting efficient system management and operations (19).

At the federal level, the EPA, the U.S. Department of Transportation (USDOT), the Federal Highway Administration (FHWA), the Federal Transit Administration (FTA), the American Association of State Highway and Transportation Officials (AASHTO), and other federal agencies have developed collaborative planning approaches in working with local and regional planning staffs and decision-makers to support local initiatives for improved design and operations of transit and roadways and for making better transportation and land development decisions. The EPA, AASHTO, FHWA and FTA have published brochures, papers, and other documents to guide transportation decisions consistent with smart growth concepts (20).

STATEWIDE AND REGIONAL PLANNING

State-level and regional planning for the conservation of land and resources began in a few states as early as the 1920s. The effort intensified in 1934, when President Franklin D. Roosevelt appointed a National Planning Board that encouraged the formation of state planning boards. By 1938, 47 states had established planning agencies. World War II redirected federal funds and attention away from the state planning effort, and most of these state agencies disappeared. The Housing Act of 1954 offered incentives for state planning and by 1960, 39 states had state planning agencies. Comprehensive planning for urban areas was widespread during the 1960s under the HUD Section 701 program. The land use-transportation relationship was an important aspect of plans prepared under this program. However, in the 1970s, federal funds were again withdrawn from this endeavor, and many of the comprehensive planning efforts went dormant (21). It was in the 1970s, however, that Florida and Oregon initiated their state planning efforts that are still being used today.

State-Level Growth Management and Land-Use Planning

At least 10 states have now passed legislation to initiate statewide growth management programs. Transportation is a part of many of these programs. TEA-21 requires statewide transportation plans to be developed, and these plans can become part of the growth management concept. The following is a summary of several state growth management programs with statements of some of their goals (Figure 10).

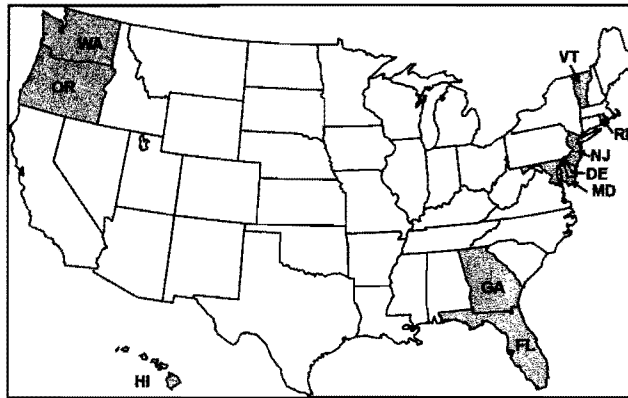


Figure 10. Growth management states included in discussion.

Delaware's Cabinet Committee on State Planning Issues, established in 1994, manages the "Shaping Delaware's Future Act," a statewide planning effort that was signed into law in July 1995. This act requires that counties prepare comprehensive plans that are consistent with 10 statewide planning goals adopted by the committee. These goals include land protection, natural resource protection, directed state investment in community development projects, and a mobility element for the promotion of a balanced, multimodal transportation system. The mobility element of county comprehensive plans must provide for a balanced transportation system for the movement of people and goods, and must promote a "range of sustainable transportation choices for future transportation needs" (22).

Florida, with more than 25 years of statewide growth management, has a long tradition. Florida's most recent legislation, enacted in 1985, led to the creation of the current plan that addresses 29 statewide planning goals. The State Department of Community Affairs must review all local comprehensive plans for compliance with the State Comprehensive Plan and the Strategic Regional Policy Plan. Additional review agencies for local comprehensive plans include regional planning councils and state departments of environmental protection, agriculture, and transportation (23). All development projects must meet the terms of the local comprehensive plans, and proposed major developments must also be analyzed to ensure that adequate public facilities, including transportation, exist so the area is adequately served (24). Local communities may grant exceptions to the transportation facilities concurrency requirement for projects designed as infill development, urban redevelopment, and downtown revitalization, or if a development supports public transportation, if these projects meet the objectives of the local comprehensive plan (25).

Georgia's growth management plan is in the process of being implemented on a "bottom-up" basis. Under the Georgia plan, local governments that choose to plan are required to meet "Minimum Standards and Procedures for Local Comprehensive Planning" in order to receive certain state funding. The Georgia Department of Community Affairs (GDCA) reviews comprehensive plans and amendments to make certain that they comply with these standards. When local plans were completed in 1995, work began on regional plans, which build upon the local plans (26). The Georgia plan requires that each local and regional plan include a

transportation component that is specific to the area. According to the GDCA, the regional plans were completed in 2002 and will become the state's growth management plan if such a plan is adopted by legislature (telephone conversation, Mike Gleaton, Director of the Office of Coordinated Planning, July 22, 2002).

The **Hawaii** State Plan, adopted in 1978, is a statement of goals, objectives and policies supporting the state vision. The State Plan is statutory, although there is no enforcement mechanism, and includes a requirement that state transportation projects for highways, airports and harbors be consistent with the state vision (telephone conversation, Mary Lou Kobayashi, Hawaii DOT, July 2002).

Hawaii was the first state to implement a State Land Use Law (Chapter 205). That law, adopted in 1961, was originally intended to protect Hawaii's limited agricultural land and to preserve the state's natural resources, and it remains among the strongest direct state implementation and review programs in the U.S. (27). The act places all land into one of four specific land-use districts: urban, rural, agricultural, or conservation. Permitted uses for each district are defined by statute. The state assumes exclusive responsibility for land-use management in the conservation districts, counties have sole responsibility for managing land uses in the urban districts, and the state and county governments share management of the rural and agricultural districts. An appointed nine-member Land Use Commission (LUC) administers the State Land Use Law to ensure that state concerns are addressed in land-use decisions, which must comply with the goals of the Hawaii State Plan. The LUC is responsible for the reviewing and deciding on proposed amendments to state land-use district boundaries (28).

Although **Maryland** has regulatory authority over local plans only when state laws are violated, communities that fail to meet state planning objectives may lose state funding for noncompliant projects (21). The state Smart Growth Areas Act of 1997 is an effort to coordinate the disbursement of state funds with local growth planning. This act established Priority Funding Areas (PFAs), outside which the state cannot fund growth-related projects. Additionally, the Smart Growth and Neighborhood Conservation Policy (SGNCP) was adopted by Executive Order in 1988. The SGNCP requires that state agencies consider whether the development proposed for funding supports existing communities and promotes mass transit use before making funding decisions. Maryland has central and regional planning assistance offices to advise local governments when creating and assessing their comprehensive plans. Every six years these plans are assessed, amended, and submitted to the state to be reviewed for compliance with state law (29).

The State of **New Jersey** passed a State Planning Act, creating the State Planning Commission and Office of State Planning, in 1986. The current State Development and Redevelopment Plan, which is a composite of area plans, was adopted in 2001. It is not a regulatory document but works through capital investment incentives and disincentives for municipal compliance (30). Cooperation between levels of government and public and private sector interests is accomplished through a cross-acceptance system mediated by the counties (27). The goal of this plan is to guide urban design to accommodate growth in such a way that natural and historic resources are preserved, and existing infrastructure is efficiently utilized. The plan encourages infill development, such as reclamation of brownfields, and the construction

of housing and businesses in close proximity to maximize the use of alternative forms of transportation. The statewide planning policy includes improving the transportation system by coordinating land-use and transportation planning, integrating transportation systems, developing and enhancing alternative forms of transportation, improving management, and utilizing transportation as an economic development tool. Through this plan the State hopes to save \$870 million in road costs by the year 2020 (31).

Oregon adopted a statewide growth management program in 1973. The plan addresses 19 statewide planning goals and is managed by the Department of Land Conservation and Development (DLCD). The plan requires that all local governments prepare comprehensive plans and that these plans be consistent with state goals (29). In 1992, the DLCD and the Oregon Department of Transportation (ODOT) collaborated on the Transportation and Growth Management Program (TGMP), through which transportation planning was integrated into the growth management plan. The mission of the TGMP is “to enhance Oregon’s livability, foster integrated land-use and transportation planning, and encourage development that results in compact, pedestrian-, bicycle-, and transit-friendly communities” (32).

Rhode Island’s Comprehensive Planning and Land Use Act of 1988, amended in 2001, requires that all 39 of the state’s communities prepare comprehensive land-use plans (29). These plans must be consistent with state planning goals and must receive state approval. Plan requirements include a provision for public design and improvement standards that include specifications for rights-of-way, streets, sidewalks, lighting, and landscaping (33). Rhode Island’s Statewide Planning Program’s Transportation Planning Section (TPS) is the designated MPO for statewide transportation planning. The TPS’ efforts include environmental analysis, long-range planning, and modeling and the state’s transportation improvement plan (TIP). Efforts to ensure that plans and programs meet the citizens’ needs include public outreach programs such as focus groups, newsletters, surveys, workshops, and monthly meetings (34).

Vermont’s Land Use and Development Law, Act 250, enacted in 1970 and last amended in May of 2002, is intended to protect air, soil, water, wildlife, and historic sites by ensuring that new development does not overly tax the state’s natural resources or overburden available infrastructure, including the transportation system.

The Vermont Planning and Development Act 200, enacted in 1989 and reviewed annually, was created to ensure that local and regional plans are consistent with the state’s plans under Act 250. Act 200 does not require cities to plan but offers financial incentives for them to do so. Act 200 provides for technical assistance to local governments to plan in accordance with statewide goals and policies for land use, transportation, and natural and historical resource conservation and helps coordinate land-use planning among cities, regions, and states to meet these goals (35,36).

Washington is a recent addition to the list of states enacting growth management legislation. The state initially enacted its Growth Management Act in 1990 and significantly amended it in 1991. As an evolving document, the act has been amended every year since 1995 (37). The act applies to counties based on a combination of population and growth. County plans are required to establish Urban Growth Areas, outside of which infrastructure expansions are prohibited until amendments are made to accommodate projected growth (which can be done

annually) (29). Counties not falling under mandatory growth management regulations may volunteer to participate in the program but, once in, cannot opt out (38). The act is administered by the Washington Department of Community Development, which reviews local plans for consistency with state policy. The state has 14 planning goals primarily pertaining to environmental protection, livable cities, and the designation of urban growth areas for efficient use of land and infrastructure. Under the Growth Management Act, counties engaged in growth management planning must establish a collaborative process for review and coordination of state and local permits and multi-jurisdictional approval of transportation projects that cross a city or county boundary (39).

REGIONAL GROWTH MANAGEMENT AND LAND-USE PLANNING

Transportation planning is an integral part of growth management and land development goals for smart growth. The following paragraphs discuss some of the more common types of agencies involved in regional planning and their growth management and land-planning roles.

State Departments of Transportation are responsible for transportation planning statewide and in areas with populations below 50,000 and for the planning, design, location, construction, and maintenance of the state's transportation system (planning and programming done cooperatively with MPOs in areas of populations over 50,000; see section below regarding MPOs). The responsibilities of the state DOT are varied and include ensuring an appropriate statewide focus and coordination of MPO, regional, and local plans. In many states, the DOT has a major role in transportation decisions including airport, roadway, and transit projects.

Regional Planning Councils (RPCs), often called ***Councils of Government***, are the most common type of regional planning agency nationally and exist in every state. COGs are usually comprised of local governmental bodies and their elected officials. The responsibilities of the COG vary and may include transportation planning for the area, including coordinating plans with the State DOT. COGs have no regulatory authority, and their decisions are not binding on member governments. In Texas, more than 2000 local governments, conservation districts, and special interests are members of the 24 Texas COGs, including all 254 Texas counties (40).

Metropolitan Planning Organizations are transportation planning and programming agencies required by the Federal Aid Highway Act of 1962 for metropolitan areas with populations exceeding 50,000. MPOs are responsible for regional transportation planning and for allocating state and federal transportation funds within the region. MPOs are planning and advisory agencies only, as they have no power to implement plans (21). Texas has 25 MPOs of which 12 are cities, seven are regions, and six are area committees (40).

Regional Environmental Conservation Agencies are federal or state chartered commissions or authorities responsible for protecting the environment. These agencies operate under inter-governmental cooperation and are often given limited power to supersede local development policies. Regional conservation agencies are often responsible for supervising and managing large-scale development activities, including transportation improvements and expansions (21). Texas has more than 50 conservation agencies currently working in cooperation with the United States Geographical Survey (USGS) on conservation issues of importance to their regions (41).

Other regional agencies involved in growth management land planning include regional public service authorities, such as airport or transit authorities or water districts, regional business and civic leadership groups promoting planning, ad hoc groups established by inter-jurisdictional agreements for selected purposes, consolidated city/county governments, and, in some states, county planning organizations (21).

CHAPTER 6. ROLE OF TRANSPORTATION IN SMART GROWTH PLANNING AND DEVELOPMENT

Transportation is often considered the force with the single greatest impact on shaping land use. An important concept is that the mode and nature of transportation available can determine the type of development of the land it serves, and that transportation can, likewise, be influenced by land use. The goal of smart growth is to integrate land use and transportation to create development patterns that mix complementary land uses in a form that will encourage the use of alternative forms of transportation.

TRANSPORTATION INFLUENCES LAND USE

When transportation was mainly by foot, development tended to be compact and travel distances short. As innovations in transportation made long-distance travel feasible, development began to spread out, and a greater separation of land uses resulted. Due to both ease of transportation and the evolution in zoning practices over the past 60 years or more, typical modern development patterns place trip origins and destinations (e.g., residential and commercial development) further apart, making travel by vehicle necessary for ordinary errands. During the past 20 years, nationwide growth in VMT was three times the growth in population. (7).

LAND USE INFLUENCES TRANSPORTATION

In the 1960s, transportation and land-use planners attempted to use transportation accessibility to accomplish land-use objectives. Now, as part of smart growth, planners are attempting to alter land-use patterns to achieve transportation goals. It is expected that new patterns of land-use development will change travel behavior to improve transportation efficiency (42).

Mixing complementary land uses increases non-vehicular accessibility and should reduce both vehicle trips and VMT. Research has shown that in typical single-use office parks, walking trips accounted for only 3 to 8 percent of mid-day trips, while walking increased to 20 to 30 percent of mid-day trips in pedestrian-accessible mixed-use centers (17). Mixed-use development in association with transit hubs tends to concentrate development around activity centers. This concentration not only reduces travel distances to most attractions but also encourages transit use. A well-connected mixed-use corridor should provide access to a variety of goods, services, and recreational opportunities (43).

SMART GROWTH AND TRANSPORTATION

The goal of smart growth is to create development patterns that mix complementary land uses in a compact form that will encourage the use of forms of transportation other than driving personal vehicles. It is anticipated that these land use changes will increase pedestrian, bicycle, and transit travel, and reduce VMT. For example, creation of a mixed-use transit corridor in downtown Portland, Oregon, in conjunction with a moratorium on street construction and limitations on parking, has increased transit use in the downtown area by 260 percent since 1971. The mix of uses includes housing, retail, commercial, and convenience services, all of which are easily accessible by transit. A 1984 study estimated that without the integration of land use and

transportation modifications, six 42-story parking structures and two additional lanes to every highway entering the downtown area would be needed to serve demand (44).

SMART GROWTH TRANSPORTATION APPLICATIONS AT VARIOUS SCALES

Smart growth concepts and principles can be applied at all levels of planning and development. Smart growth can be implemented on a single land parcel or development site, or in areas as large as regions and states. At the site level, smart growth takes the form of more compact development, mixed land uses, proximity to transit, reduced parking requirements, and site design characteristics, such as placing parking to the sides and rear of buildings, and creating areas that are attractive and conducive to walking and transit use.

Neighborhood

Smart growth can be applied at the neighborhood level through mixing land uses, making development more compact, creating networks of streets and pedestrianways, improving transit options, and increasing amenities for pedestrians, bicyclists, and transit patrons. Additional neighborhood smart growth practices include narrower local streets, well-connected street networks with protection from through traffic, directing major traffic flows to the edges of neighborhoods and beyond, and utilizing access management techniques.

Municipality

Smart growth can be employed in corridors, areas, and cities through transportation measures including:

- creating multimodal transportation options,
- establishing street hierarchies,
- giving through traffic priority on major roads but discouraging major traffic volumes on minor roads,
- utilizing context sensitive design,
- creating joint development projects containing integrated transportation infrastructure,
- employing intelligent transportation systems (ITS),
- and involving the public in objectives and plan development.

Region

Smart growth at the regional level includes corridor area features with the addition of attributes such as a jobs-housing balance, interagency coordination of goals and policies, regional integrated transportation/land-use planning, efficient multimodal connectivity between regions, and funding priorities supporting smart growth.

State

At the state level, smart growth consists of the regional features mentioned above as well as policies supporting and promoting locally and regionally adopted smart growth concepts, a state growth policy, statewide multimodal plans for the movement of goods and people, policies for

the protection of corridor rights of way, and others as can be designed and applied within the state.

Federal

Smart growth has taken the form of federally sponsored initiatives and grants to states and communities. TEA-21 contains provisions for funding locally planned and implemented transit systems and grants for transit-oriented development. The Congestion Mitigation and Air Quality Improvement Program (CMAQ) and the Transportation Enhancements Program are programs through which the federal government offers support for state and local initiatives such as improving transit facilities and creating pedestrian and bicycle trails. The Transportation and Community and Systems Preservation Pilot (TCSP) program provides grants to state and local planning agencies for the coordination of transportation and land-use planning, with considerations for economic development and environmental impacts (4, p. 26).

CHAPTER 7. TRANSPORTATION IMPACTS OF SMART GROWTH

Smart growth policies and planning impact land-use and community development and likewise affect travel and the transportation system. Smart growth can be shown to reduce per capita automobile travel through the effects of compact, mixed-use, transit-oriented development.

Vehicle travel reductions occur in several ways:

- Fewer vehicle trips are made when shorter trips can be made conveniently by foot, bicycle, or transit.
- Trip lengths are reduced when residential, retail, business, and entertainment activities are located in a compact space.
- Shorter distances between activity centers encourage walking and bicycling for some trips rather than driving.
- Clustered development promotes efficient transit service, which can shift even more trips from automobiles into alternate modes.
- Compatibility between land uses and transportation facilities, such as locating commuter rail stops in areas of densest development, and developing land at highway interchanges as retail/commercial uses, improves through careful and cooperative planning.
- Vehicle ownership lessens in dense pedestrian- and transit-friendly developments, due to the higher availability of other modes and the lower availability of parking (45).
- Accident potential may be reduced with the slower vehicle speeds characteristic of smart growth neighborhoods.

CHAPTER 8. CONCLUSIONS

This primer provides background information on smart growth and its applications. The following conclusions can be drawn from the information presented in this report.

When properly implemented, smart growth creates urban form that may:

- reduce sprawl,
- reduce automobile travel by way of improving transportation options,
- encourage alternative forms of transportation,
- reduce transportation and other infrastructure requirements,
- conserve green space,
- create “livable” environments, and
- reduce development-related pollution (7).

Smart growth encourages:

- urban redevelopment and infrastructure improvements, rather than the expansion of city boundaries and the construction of new roads,
- utilization of alternative forms of transportation, such as walking, bicycling and transit,
- reducing VMT and auto-related forms of pollution, such as air pollution from emissions, and water pollution from road run-off (4, 15); and
- many characteristics intended to increase the use of alternative forms of transportation and reduce VMT.

Smart growth design characteristics can create compact development with shorter trip lengths conducive to walking, bicycling, and transit use. Some of these characteristics are:

- networked streets,
- well-connected pedestrian and bicycle trails,
- compact development,
- increased development and population densities,
- mixed land uses to improve mobility and accessibility, and
- integrated transportation and land uses.

Figure 11 provides an example of applied smart growth treatments.

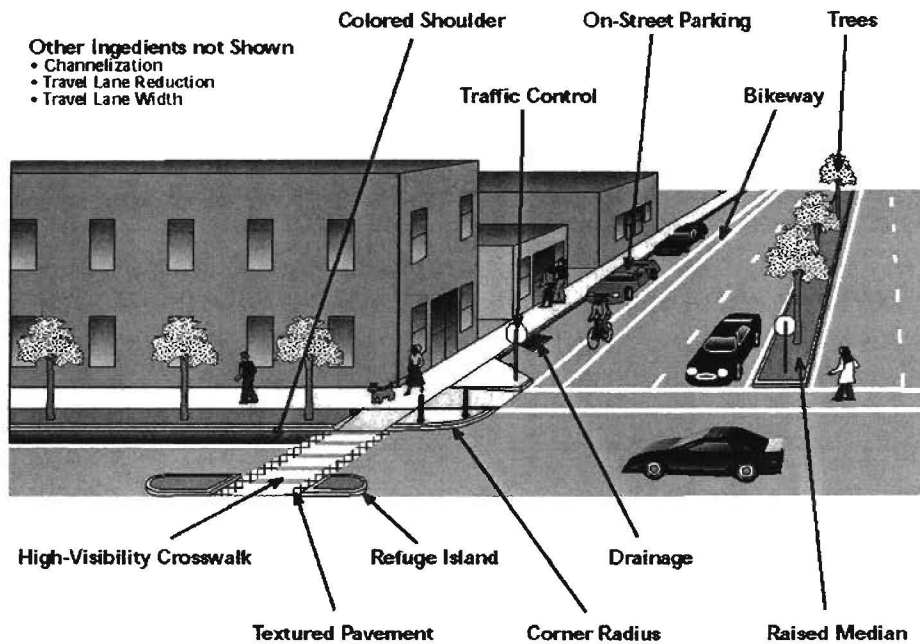


Figure 11. Smart growth treatments improve the compatibility of transportation and land use. Source: Main Street...A Handbook for Oregon Communities

Several states in the United States have adopted smart growth policies as a means of managing growth to maintain or improve quality of life. Smart growth requires a transportation element and thus presents opportunities to transportation agencies. Smart growth can be an asset to TxDOT by promoting efficient transportation through transportation and land-use/development relationships, and by being a vehicle to improve the efficiency of transportation service by making land use/development more transportation friendly.

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