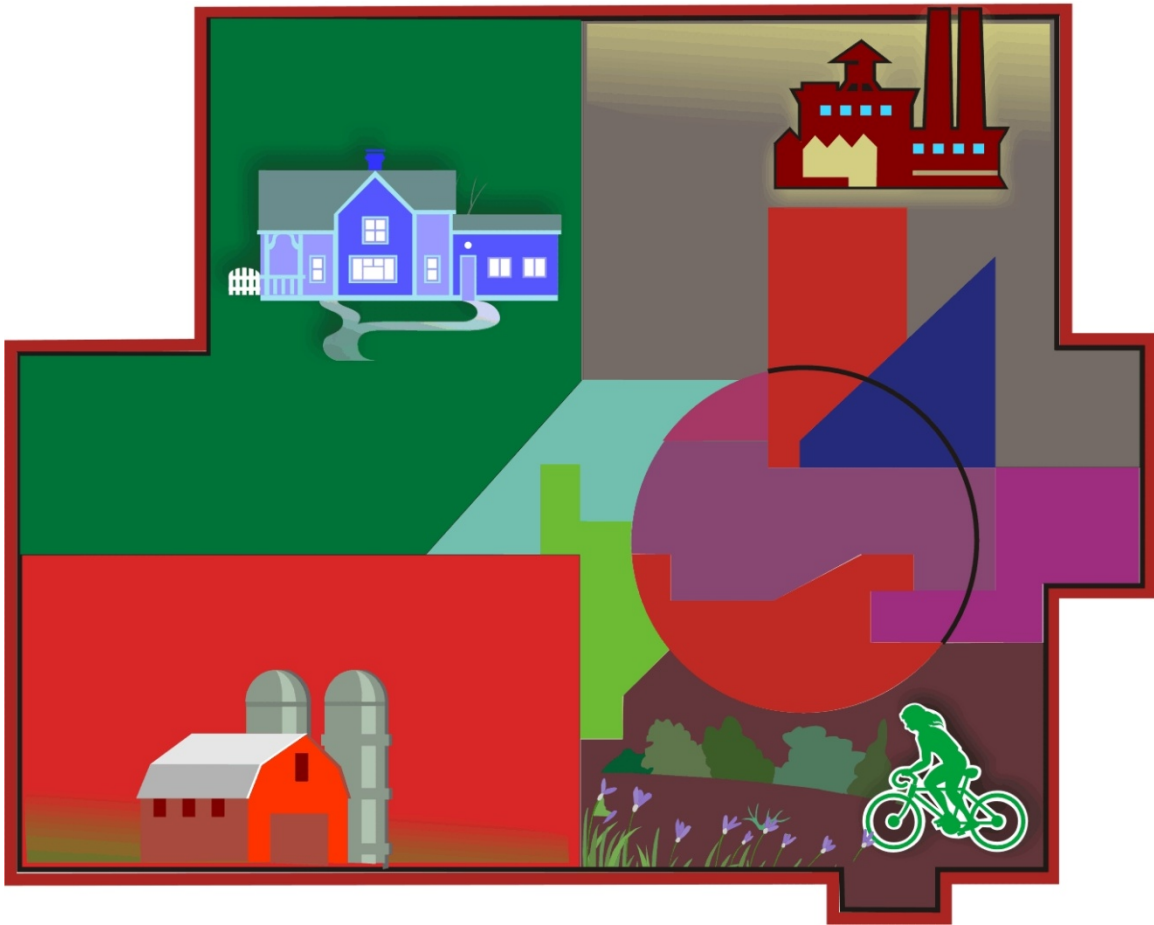


CHAPTER 5

LAND USE AND TRANSPORTATION CONNECTION



W A M P O

Wichita Area Metropolitan Planning Organization

CHAPTER 5: LAND USE AND TRANSPORTATION CONNECTION



Overview

The previous chapter (**Chapter 4: People, Jobs, and Land Use**) introduced where people live and work today, and the number of new residents and new jobs expected to be added to the WAMPO region over the next 25 years. This chapter will identify the connection between where people live, work, and carry out other daily activities and the transportation system. It also identifies some of the side effects of the connection, such as how it impacts our finances and how much time we spend in our cars.

Land Use

Land use refers to what is happening at specific locations. Where people, live, work, shop, learn, and play determines how land is used, known as land use. Single family homes and apartments are residential uses, while shopping centers, office buildings, and strip malls are commercial land uses. A map of existing land uses in the region can be found in the previous chapter (**Exhibit 4.7**).

Land uses provide the region with destinations. The specific areas designated for commercial uses provide us with essential goods and services. Areas designated as residential provide us with places to live. Access is needed to all land uses to provide linkages for people in the region. This access is provided by the **transportation system**.

Transportation

The regional transportation system is made up of roads, bus routes, bike paths, airports, railways, and sidewalks. These parts work together to form the transportation system, which is used by residents and businesses to move people and goods through the region every day.

Land Use and Transportation Connection

The connection between land use and transportation is evident on the daily basis. The land uses are connected by the transportation system. We use the transportation system to get the goods and services we need, which are provided at different land uses throughout the region. We



Commercial Land Use



Residential Land Use

What is a transportation system?

The interconnected network used to move people and goods. The network includes roads, bus routes, bike paths, airports, railways, and sidewalks.



New Single-Family Residential



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What are zoning codes?

Zoning codes regulate what kind of land development can happen at a certain location.

What are subdivision requirements?

Subdivision requirements provide standards for new residential and commercial land development projects. An example is the number of parking spaces required for a business.



Built Environment

What is the built environment?

It is everything that people have constructed that allows for activities such as buildings, streets, and utilities.

also use the system to go to work, school, and places to play.

There are many factors that influence the connection. Two major factors are land use patterns and travel patterns. Other factors include historic land development patterns, economic factors, and local development markets. This chapter focuses on the major factors; land use patterns and travel patterns.

Land Use Patterns

Land use patterns refer to the typical location and arrangement of different places (land uses) in the region, such as homes, stores, offices, parks, and factories. These patterns are guided by local **zoning codes** and **subdivision requirements**. The land use patterns require a certain type of transportation system because of the locations and distance between certain land uses.

Travel Patterns

Land use patterns have a major influence on the region's travel patterns. Travel patterns include where people travel, at what time, and how frequently. They also include what form of transportation is being used, such as car, bus, bike, or on foot. Travel patterns play a major role in determining the transportation system needed for the efficient movement of people and goods.

Built Environment

Different land uses, the transportation system, other infrastructure such as water and electric lines, and the connections between them make up the **built environment**.

The built environment in the WAMPO region is quite different from that of other areas, like New York, Los Angeles, or Dodge City, Kansas. The way people in other areas live is different than how we live, which also makes the way we travel different than in these other areas.

Even though people in different regions have the same basic needs, such as housing, buying groceries, and going to work or school, the way these needs are met can vary significantly from one region to the next. The reason the



built environment, including the transportation system, looks like it does today has a lot to do with how a region has historically accommodated growth.

What Are the Characteristics of the Region's Built Environment?

The region's built environment has a lot to do with the past. However, changes can be made as the region moves towards the future.

Past Trends

The current built environment in the WAMPO region is the result of many decades of accommodating population and employment growth using one general approach, **suburbanization**. Suburbanization refers to the process of locating new houses and businesses on the edges of the existing **urban area**. This effect is evident at different scales throughout the WAMPO region, including Wichita, and all of the surrounding cities, like Andover, Derby, and Park City.

Historically, suburbanization has resulted from negative perceptions of the central area of the city and positive perceptions of the suburbs. Negative perceptions of the downtown included high levels of traffic, pollution, and population density. Positive perceptions of the suburbs included lower costs, newer housing, better schools, larger lots, and more open spaces. These perceptions combined to attract residents to the suburbs from the downtown.

Expansion of the highway network and improvements in communication technology also played a large role in encouraging suburbanization. These improvements made it easier to live further from employment areas. Each of these factors affected the current built environment in the region.

Current Characteristics

The current built environment in the region includes many characteristics common to typical suburbanization across the nation, including:

What is suburbanization?

A form of land development, characterized by mostly residential uses, that typically occurs at the outskirts of a city or town.



Suburban Housing Development

What is an urban area?

The portion of a metropolitan region with a population density of greater than, or equal to, 1,000 people per square mile.



Suburban Development Pattern



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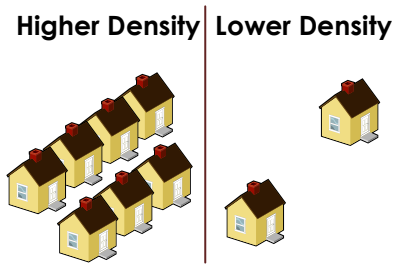
What are single use land uses?

Land developments composed of exclusively one land use, like residential subdivisions or shopping centers.

- **Single use land uses** clustered together.
- Locations of daily activities are spread out.
- Dispersed growth and growth on urban fringes.
- Low **density** residential development.
- Areas where people live are separated from areas where people work.
- Reliance on expanding the road network, sewers, water, power, and other utilities to accommodate growth.
- An increasing reliance on cars for daily travel needs.

What is density?

A measure of how many or how much of something is located within a given area. Population density is commonly measured as the number of people per square mile. Employment density is the number of jobs per square mile.



The region is dominated by areas of single use land uses, such as residential neighborhoods and shopping centers. For example, residential areas include only houses and commercial areas include only stores. There are some areas in the region that are high density with mixed uses. However, the typical pattern is low density and single use. Single use areas are typically separated from areas of other uses, causing the need to travel farther to get goods and services.

Density of land development also affects travel patterns and the built environment. Like many urban areas, the population density of the Wichita urban area decreased over the last several decades. Density went from 1,718 people per square mile in 1985 to 1,338 people per square mile in 2007. This means that the people in the region have spread out. Decreasing population density, in addition to the spreading out of land uses, means that people in the region need to go farther to get from their home to work and other common destinations.



Reliance on Cars

Single use land uses, low density, and separated developments often do not support biking or walking because of the travel distance. Low density and spread out developments make transit services costly to provide because they typically do not generate enough riders. This land use pattern has resulted in an almost exclusive and increasing reliance on cars as the primary mode of transportation in the region. The number of miles traveled per person by car has also increased over time. This trend is anticipated to continue, which will require major investments to provide roads. Another option is to

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consider alternative transportation modes and land use patterns. **Exhibit 5.1** shows what type of transportation people use to get to work, and how many people use each type.

Exhibit 5.1: Means of Transportation to Work

	Private Vehicle	Walked	Public Transit	Bicycle	Other Means
Trips	211,287	3,083	1,467	352	1,187
Percent	97.2%	1.4%	0.7%	0.2%	0.5%

Future Opportunities

How will land development and the transportation system account for new people, houses, and businesses? Will they follow the same patterns that have occurred since the 1940s? Will they continue the current built environment or change it? Growth in the WAMPO region has not stopped and it is only expected to increase in the future. Therefore, it is important that the MTP 2035 addresses connections between future land uses and transportation improvements. The way the future built environment looks could affect the MTP 2035 vision: a safe, efficient, affordable, and accessible transportation system.



High Density Residential

Regional residents are becoming more aware of the connection because of the resulting costs. Providing water, sewer, power, roads, transit, and other infrastructure all come with a price.

Who Decides How Land Use and Transportation Are Related?

There are many people involved in deciding how to accommodate growth as well as how to move people and goods. Those involved include citizens, public officials, land developers, banks, and others. Each has a different responsibility and effect on the built environment.

- Individuals and families make decisions everyday from where they choose to live, what type of housing they choose to live in, where they work and go to school, and how they get there.



Commercial Development



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- Public officials decide where to put roads and buildings through the land use regulations, zoning codes, and other local plans they adopt. They can provide financial subsidies or incentives to land developers, land owners, home owners, and businesses.
- Land developers chose where, when, and how to develop land. These decisions are primarily based on market forces. The market consists of many factors including regional preferences, demand for housing and commercial development, the economy, and competition.
- Banks choose what land developments and mortgages to finance and which not to finance.

The decisions made by members of a community greatly affect the built environment. As a result, the region can collectively chose to continue the current land use and transportation connection, or transform it.

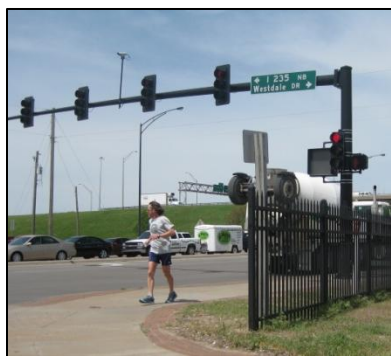
What Are the Effects from the Current Built Environment on our Quality of Life?

Suburbanization has led to a built environment characterized by single use land uses, a decreasing urban population density, long distances between places, and the expansion of the road network. Many people are becoming aware of the costs of this type of land development because evidence of these costs is starting to emerge. The current built environment affects many aspects of our quality of life, including:

- Public health.
- Natural resources.
- Cost of providing and maintaining infrastructure and public services, such as roads, water utilities, sewer, power, and schools.
- Transportation system.

Public Health

Researchers are beginning to link the widespread nature of a variety of diseases to the way our communities have been built. The current built environment is cited as a



Runner at Intersection



Walkable Old Town Square

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contributor to increasing rates of chronic diseases like diabetes, depression, asthma, heart-disease, and obesity. Researchers are looking at how regional air and water quality, pedestrian safety, and the amount of daily physical activity are affected by the built environment.

Natural Resources

As the region spreads out and rural land continues to be developed, the ability to preserve its rural character and natural resources decreases. This transformation affects the quantity and quality of the remaining wildlife habitat and water resources. People want community parks, outdoor hiking trails, recreation areas, and other natural areas. While these features are planned as part of development projects, they do not replace the natural environment.



Rural Character

Cost of Infrastructure and Public Services

Many communities are starting to examine the total financial cost to provide basic services to new developments. Communities are also determining how to provide service to new houses and businesses while continuing to provide high quality services to existing homes and businesses.



New Infrastructure

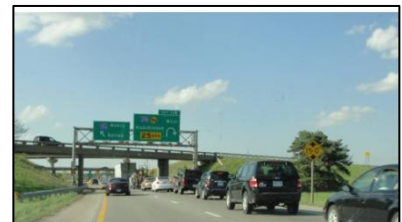
Public officials are finding that lower density areas tend to have higher costs for public services. People and businesses pay for these services through taxes, homeowner association fees, and utility bills.



Powerlines

Transportation System

Traffic congestion is one of the results of the current connection between transportation and land use. Congestion results when there are too many vehicles on a given road. Traffic congestion, commonly referred to as traffic jams or gridlock, often results in travel delays.



Congestion at I-135/K-96/
K-254 Interchange Area

Researchers have shown that the number of miles driven per person increases as the urban area becomes less dense. Due to the long distances between places, the car has become the most feasible option. As new suburban growth



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What is livability?

It refers to the social and environmental quality of the community as it is perceived by residents and visitors.



Congestion approaching I-135/K-96/K-254 Interchange

What is a travel demand model?

A computer program that uses land use characteristics and typical travel patterns to determine future demand on the transportation system.



Traffic on US-54/400 (Kellogg)

continues, more cars will be on the road, and either more roads will be needed or congestion will increase. Alternative modes of transportation should be considered as a solution to future congestion.

Trends

The effects of the issues listed above on the **livability** of the WAMPO region can be expected to increase over time. Population in the region is growing and becoming less dense. As this continues, policy makers will need to balance the popularity of the suburban land development with quality of life effects.

How Do We Measure Traffic Congestion?

As stated above, one of the everyday effects of the built environment is potential traffic congestion. Knowing how much congestion exists today, and how it might be expected to change in the future, can be helpful in deciding how to improve the transportation system.

Travel Demand Model

One of the tools to look at traffic congestion is a **travel demand model**. It estimates the amount of regional traffic congestion that results from trips people make to work, home, and other destinations. The model looks at current activity and forecasts future activity. The model is a computer software package that uses the road and transit networks to link land use activities (home, work, school, shopping, and recreation). It forecasts how the regional travel demand will respond to changes in population and employment, land use, and the transportation system.

The WAMPO model uses current (2008) and future (2035) data such as population, employment, and the road and transit networks. It also uses existing regional travel patterns, including the number of trips per person per day and the types of transportation used.

The model estimates future regional traffic congestion. It also identifies general areas of potential congestion. It is helpful to planners, engineers, and public officials as they

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weigh the pros and cons of different land use and transportation project decisions.

Over the next 25 years, it is anticipated that there will be an increase in number of miles and amount of time people drive and number of trips throughout the region. It is likely that this will result in a slight increase in congestion, lowering the ability to efficiently move people and goods.

How Can Future Growth Be Accommodated While Improving Livability?

WAMPO area residents, businesses, public officials, and other stakeholders are faced with some tough questions. How can we welcome new growth while maintaining healthy communities, a quality environment, and a safe, efficient, affordable, and accessible transportation system? How can we minimize traffic congestion and provide better access to the places people need and want to go?

Coordination between land use and transportation decision makers is vital. As the region grows and develops, land use and transportation decisions should be compatible and complimentary to achieve a high-quality built environment.

Growth management strategies are used to enhance the livability of the community while planning for new growth. Travel demand management strategies are a sub-set of growth management strategies that focus on reducing vehicles on the road during peak travel times. Complete streets policies provide alternatives for accommodating multiple modes of transportation. These strategies and policies focus on decreasing congestion, improving mobility, and enhancing livability.

Travel Demand Management Strategies

Many regions are implementing programs that focus on enhancing livability by changing driving habits and providing a transportation system that encourages biking and walking. Many regions are implementing travel demand management strategies to reduce congestion. These strategies attempt to reduce the number of cars on the road during rush hours by changing when and how



Transit Service



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people get around. For example, some local governments subsidize businesses that provide incentives to their employees to carpool or take transit. Other travel demand management strategies include:

- Promoting flexible work hours.
- Encouraging residents to take fewer trips by combining trips.
- Introducing express bus routes connecting outlying suburbs to large employers.



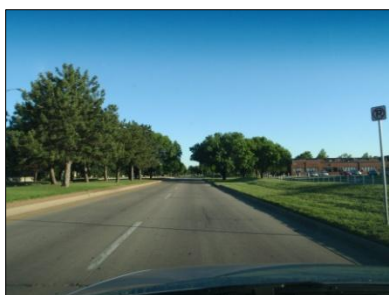
Crosswalk

The WAMPO Congestion Management Process also provides additional detail on travel demand management strategies.

Complete Streets

Complete streets policies aim to reconfigure local roadways to better accommodate many transportation system users. This program calls for increasing the number of safe transportation choices available to residents and businesses. Specific features of a complete street include:

- Sidewalks, crosswalks, and bicycle lanes.
- Bus accommodations on roads or specially designated bus lanes.
- Trees and other plants located in medians and in between sidewalks and curbs.
- Integration of businesses and the transportation system.



Trees Located in Median

Growth Management Strategies

For many decades, new growth in the WAMPO region has been accommodated primarily through suburbanization. Other ways of accommodating growth can help to minimize the costs associated with development. Some alternative land use and growth management strategies are mixed-use developments, traditional neighborhood developments, smart growth, and transit-oriented developments.

Mixed-Use Development

Mixed-use developments allow more than one type of use, rather than clustering single land uses. A mixed-use



Bike Lane

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development integrates residential, office, commercial, service, and employment with the intent to achieve a reduction in traffic. Mixed-use can occur within a single building or set of buildings, along a street, a corridor, or for an entire neighborhood.

Areas in downtown Wichita, including Old Town, are examples of mixed-use development in the region. These are compact developments with a mix of uses, such as office, retail, entertainment, and residential. These areas encourage walking and have better access to transit.

The region has other examples of mixed-use developments at a larger scale, such as Bradley Fair. The Bradley Fair development in Wichita is a planned development that integrates retail, office, and residential. This development is larger and less dense than those in downtown Wichita, yet still serves the primary mixed-use goals of integrating everyday uses and reducing trips by car.

There are other clusters of business and activity centers surrounded by residential areas throughout the region. The mixed-use land use pattern is one option that can help to decrease traffic congestion in the region and greatly improve livability.

Traditional Neighborhood Developments

Traditional Neighborhood Developments (TNDs) are an attempt to reproduce the urban characteristics which were common in the United States until the 1940s. New Urbanism is a term often used interchangeably with this concept. TNDs typically include the following characteristics:

- Compact developments.
- Well-connected grid street system.
- Wide range in housing types and prices.
- Mix of land uses including public gathering spaces.
- Amenities such as stores, schools, and places of worship within walking distance of housing.

In the WAMPO region, the College Hill neighborhood in Wichita is an example of a traditional neighborhood. It was first planned in the late 1800s and built through the 1930s.



Mixed-Use Development

What are Traditional Neighborhood Developments (TNDs)?

A development pattern that attempts to reproduce the urban characteristics which were the norm in the United States until the 1940s, including compact development, well-connected grid system of streets, wide range in the types and price of housing, mix of land uses and public gathering spaces, and amenities such as stores, schools, and places of worship within walking distance of housing.



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It has a mix of housing types around a clearly identifiable open space (College Hill Park).

There are opportunities in the future for communities in the region to develop in a traditional neighborhood design. The TND concepts can also be used when redeveloping an area.

Smart Growth

Smart growth is an approach that concentrates growth in the center of a city. Smart growth promotes using land resources more efficiently through compact development, infill development, and more efficient site design.

Smart growth links land use patterns to the transportation system by supporting walking, cycling, and transit as attractive alternatives to driving. It typically includes more local and arterial roads to move traffic instead of highways.

Long term, regional considerations of **sustainability** and **livability** are the core values promoted by smart growth. Smart growth development goals include:

- Using infrastructure efficiently.
- Preserving and enhancing natural and cultural resources.
- Achieving a unique sense of community and place.
- Expanding the range of transportation, employment, and housing choices.
- Promoting public health.

Transit-Oriented Development

Smart growth principles generally include transit-oriented developments (TOD). A TOD is a mixed-use residential or commercial area designed to maximize access to public transit. They often incorporate features to encourage transit use and/or have a center with a transit station or bus stop surrounded by higher density development.

Ideal areas for TODs are typically within a one-quarter-mile radius of a transit stop/route. The areas typically include higher densities and a mix of uses that can generate sufficient transit ridership. TODs can reduce traffic

What is sustainability?

An approach to the use of resources that aims to meet people's needs without compromising the environment so that basic needs can also be met in future generations.



Trail and Landmark along the River

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congestion, particularly by increasing the transportation choices for people.

Conclusion

Land uses and the transportation system are very closely related. The WAMPO region is primarily dominated by the suburban development pattern. As the region grows, further suburbanization could lead to more traffic congestion, as well as other effects on the public. Public health, natural resources, the transportation system, and the cost of providing and maintaining infrastructure will all be affected.

Regional strategies and policies such as travel demand management, complete streets, and growth management strategies can help create a more livable and sustainable region. Other MTP 2035 strategies include:

- Support local jurisdictions and agencies in developing land use policies that support programs such as transit-oriented development and complete streets. Typically these land use policies include focusing on increasing land use density, re-using or redeveloping existing sites, and locating stores, homes, and community facilities near each other to encourage more walking and use of transit.
- Promote efficient roadway, transit, and non-motorized connections between communities in the region.

Chapter 3: Implementation discusses all of the strategies in depth.



Downtown Redevelopment