

Section 3: Regional Changes

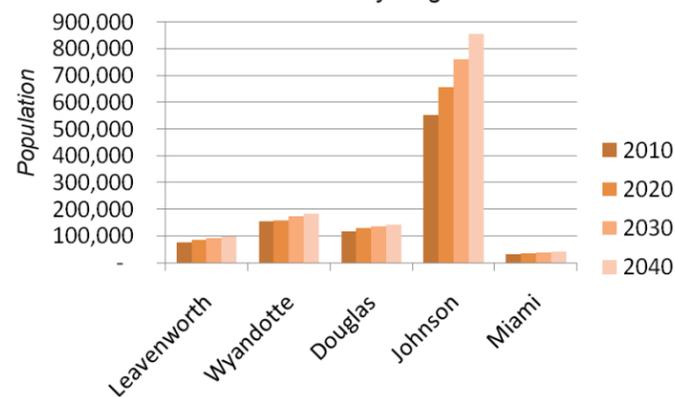
What is likely to change by the year 2040?

In addition to the challenges described in the previous section, significant changes to population demographics, development, travel demand, truck traffic, vehicles, transportation technology, and funding can be expected by 2040. All of these changes mean that the region's transportation system needs to adapt in order to meet the needs for tomorrow. To create and maintain a successful, and relevant, transportation system it will be important to develop strategies that account for the changes in where people want to live, where they want to work and how they want to travel.

POPULATION AND DEVELOPMENT PATTERNS

Population and employment within the 5-County region are expected to grow 41 percent by 2040. Figure 3-1 shows that the most significant growth can be seen in Johnson County. Many of the region's cities are planning city centers with compact spaces, mixed-use facilities, and localized resources which can minimize the need for longer distance commuting. However, even with

Figure 3-1: Demographic Changes in the 5-County Region

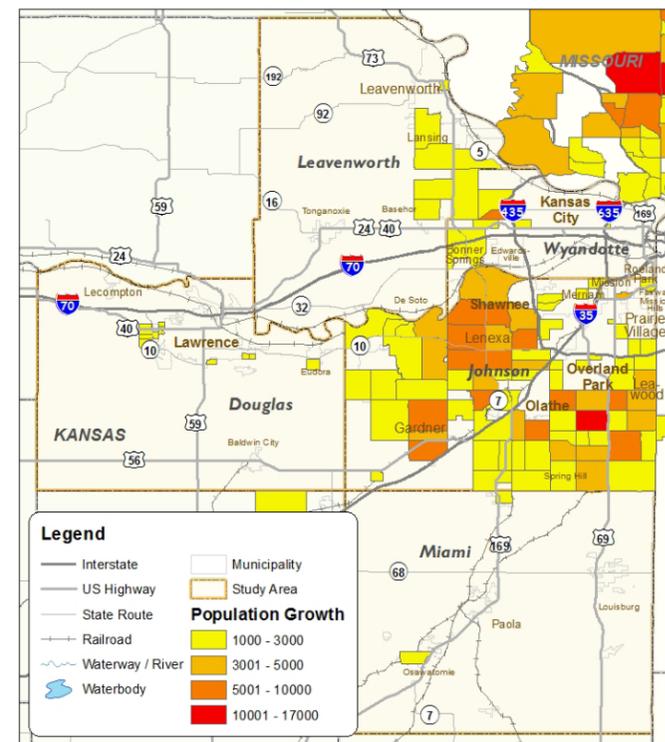


Source: MARC 2010 Population Forecast Source: Kansas Department of Transportation, Kansas GIS, US Census Source: Kansas Department of Transportation, Kansas GIS, US Census

the consolidation of community resources, the large employment centers such as downtown Kansas City, MO, Corporate Woods, and Village West will continue to draw commuters from throughout the region.

Figure 3-2 shows the areas forecasted to experience population growth between 2010 – 2040. The map illustrates the locations of increased population and the relative increase. The darker areas represent the most growth while lighter areas show less growth. Areas with no shading will not see significant growth, or may even

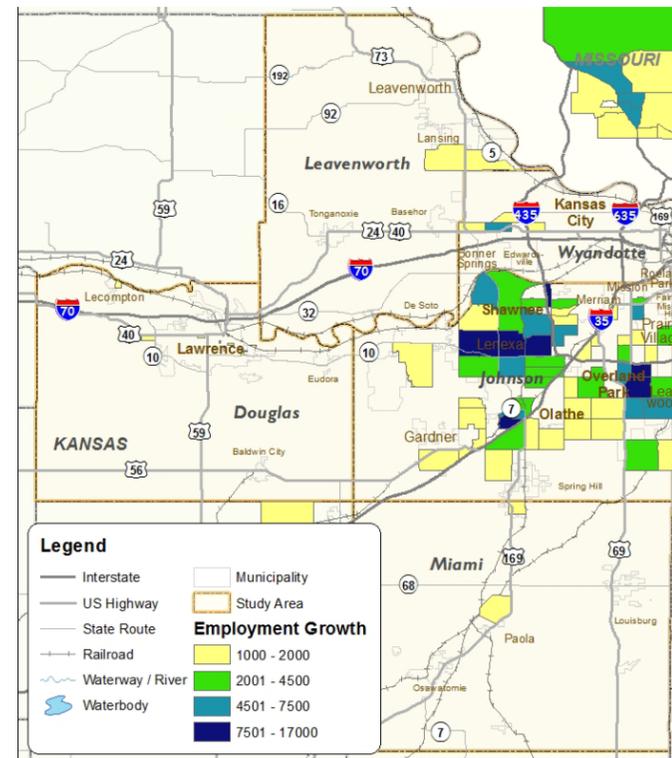
Figure 3-2: Forecasted Population Growth between 2010-2040



experience decreases in population. It is important to note that most growth is forecasted to occur around the perimeter of the metro area, mostly outside the I-435 ring. The location density, mix of uses and other development characteristics will determine how much traffic is generated by this additional growth.

Figure 3-3 shows the areas forecasted to experience employment growth between 2010 – 2040. The map illustrates the location of increased employment and the relative increase. The darker areas represent the

Figure 3-3: Forecasted Employment Growth between 2010-2040



most growth while lighter areas show less growth. Like the population maps, areas with no shading will not see significant growth or may experience decreases in employment. Major new employment hubs are projected along the K-10 corridor west of I-435, at Village West in Wyandotte County, and at the new BNSF Intermodal Facility near Edgerton. Employment is projected to increase near areas where population is projected to increase, however employees do not always have the choice to work close to home, so increased commute distances may be a factor for the region's residents as development occurs outside existing developed areas.

DEMOGRAPHIC CHANGES

The region will also see a change in the makeup of its population in the coming years. Nationally, from 2010 to 2040, there is expected to be a 72 percent change in the number of households in the 65+ age category and the number of seniors will grow from about 20 million in 1970 to just over 80 million in 2040.¹ These changes will be seen specifically in the inner ring suburbs and this age group will want to rely less on automobiles, live in smaller homes and will require access to medical and shopping needs via transit. In addition to a rise in the senior population, the other age group that is projected to grow are people aged 35 and younger. National data shows that this group aspires to use their automobile less and live in a more urban environment. The region will also see an increase in low-income and minority populations - these individuals are more likely to use transit. While planning for the future, strategies considered in the region should take into account these demographic shifts and plan for multimodal transportation.

¹ Nelson, Arthur C., Ph.D., FAICP, Kansas City Metro Market Trends, Preferences and Opportunities presented to MARC, November 2012

EMPHASIS ON SUSTAINABILITY

Sustainable transportation is often used to refer to transportation that contributes to the sustainable development of the community that owns and uses the system. It embraces the triple bottom line factors of the economy, environment and social quality of life and includes consideration of: accessibility; climate change and energy use; economic vitality; environment; place-making; public health; safety and security; system condition; and system performance.

Sustainable development relates primarily to achieving a satisfying life for all while staying within the limits of nature. The characteristics of quality of life are defined by the community and the community must recognize the limits of its natural surroundings. The ultimate goal is that the community enjoys a high quality of life while preserving the existing environmental resources.²

Financial sustainability means building only the infrastructure or providing only the services that can be adequately maintained in the future.

INCREASED TRAVEL DEMAND IN THE 5-COUNTY REGION

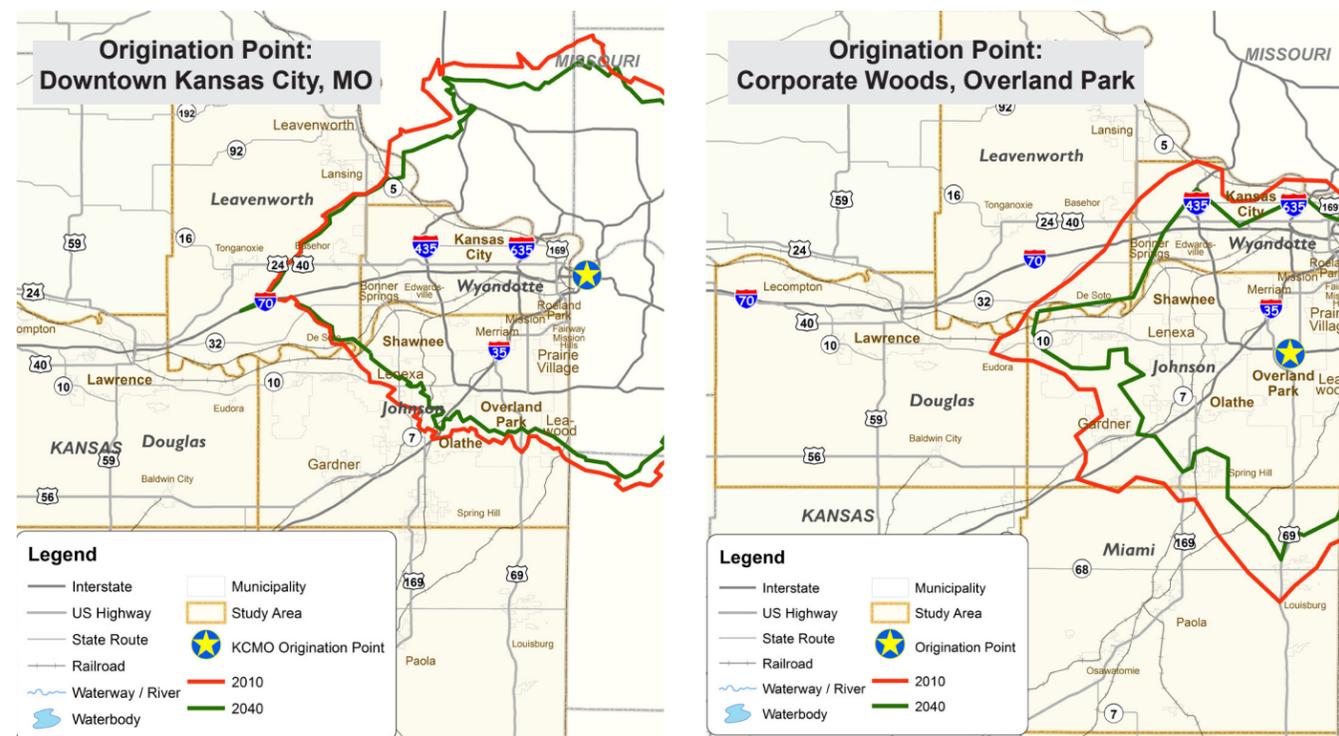
More people on the roads traveling farther will stress the transportation network.

As the population and employment increases and spreads throughout the region, the demand on the transportation network will also increase. The increases in demand will result in more recurring congestion and delay. To illustrate the significance of the changes, Figure 3-4 shows forecast automobile travel times for 2010 and 2040 from both downtown Kansas City, MO (on the left) and Corporate Woods in Johnson County (on the right). The colored bands show the travel time changes projected between 2010 and 2040.

In 2010, a commuter could leave origination point and reach anywhere inside the red lines within 30 minutes. By 2040, a commuter would only be able to reach areas inside the green lines.

² U.S. Department of Transportation, Federal Highway Administration, Office of Planning, Environment and Realty, Transportation Planning and Sustainability Guidebook. January 2011.

Figure 3-4:
Distances Traveled by Vehicle in 30 minutes in 2010 and 2040



By 2040, a commuter will not be able to get as far in a 30-minute drive as he or she can today. This means that commuters will face longer commute times to get to and from their jobs.

As the region's travel demand grows, the impact to the transportation network is likely to affect 5-County residents' quality of life. More demand means longer travel times, more congestion and a lessened quality of life.

INCREASE IN TRUCK TRAFFIC

While truck volumes are growing throughout the region, the development of the BNSF Intermodal Facility north of I-35 in Edgerton is anticipated to be a major destination and generator of regional freight rail and truck traffic. Traffic studies completed for this development have forecasted the combined intermodal and logistics activity to generate about 17,000 trips a day when it is fully developed. Just the intermodal site is expected to generate 7,000 truck trips per day when fully developed.

There could be an increase in truck traffic on the 175th Street/199th Street Corridor in Overland Park as a result of the new BNSF facility. The new BNSF facility combined with a planned Kansas City Southern Railroad logistics node (Centerpoint) in Missouri could result in warehousing and other logistic support activities arising in this corridor to support these two major intermodal transfer points.

CHANGES IN LAND USE

A major land use challenge facing the 5-County region is the sustainability of continued outward development. Local communities are struggling to provide basic services over a larger area. Low-density development patterns also result in more and longer distance vehicle trips, which create transportation needs that are often only addressed by high cost construction projects. In some cases, new growth at the outside of urban areas occurs at the same time established areas decline. The Mid-America Regional Council (MARC) has addressed this issue in the development of future year growth scenarios. MARC found that a more compact growth pattern would

result in significant savings in infrastructure costs to local governments.

When new growth, redistributed population and employment occur in new low-density developments, less of the activity has the potential to be served by transit. Transit service works best when there is a concentration of activity at the origin, destination or both of a trip. Low-density land use also creates an environment where higher amounts of motor fuel are used, more vehicle-produced air pollution can occur and more congestion occurs on roadways.

MARC found that if 40 percent of the region's population growth were accommodated in existing centers along established corridors, the region could save over \$3 billion in infrastructure costs. However, there are local development pressures and private financial opportunities that communities and residents pursue that can make it difficult to direct growth inward.

The developed area around Lawrence is also expanding, but planning efforts are being made to encourage development in a way to support financial sustainability. The Lawrence-Douglas County Long Range Transportation Plan states that "Within the context of the long range transportation plan, effectively integrating land use and transportation helps to reinforce each other to the greatest extent possible." One concept being encouraged is creation of new neighborhoods based on Traditional Neighborhood Design. This would increase connectivity and support walking, biking and transit travel.

CHANGES IN TRANSPORTATION FUNDING

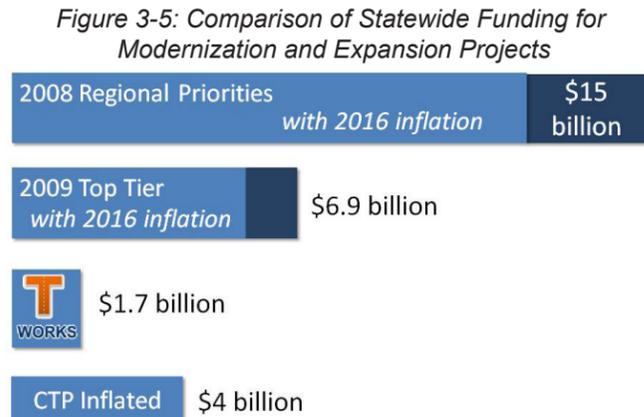
One of the items that can be expected to change is the availability of funding for transportation improvements and the revenue source that is used for them. With limited resources at the state and federal level, there is less funding available now than a decade ago for transportation improvements. This comes at a time when the earliest investments in the Interstate Highway Program are nearing the end of their useful life and will need to be replaced. By 2040, many of the initial transportation investments in the 5-County region will be aging and need rehabilitation or replacement. At the same time, needs have been

identified for new or expanded facilities to accommodate larger traffic volumes and new destinations throughout the region. Considerations for the ongoing operations and maintenance of these transportation investments needs to be calculated to have a full understanding of the financial obligation of investing in existing and new transportation resources. Because of this, transportation officials at the federal, state and local level are required to evaluate the relative benefit of projects against each other to determine which projects provide the best return on investment. These officials are also being required to think more creatively about how to use the existing system to its highest benefit through the use of technology and multimodal transportation.

As a companion challenge to the limited availability of funding for transportation, the sources used to fund the transportation program will probably change within the next thirty years. Currently, most transportation improvements are funded through motor fuels taxes, sales taxes and vehicle registration, or are financed through bonding. These sources of funding and financing are not sustainable. Motor fuels taxes will not sustain its purchasing power over time. With the rising fuel economy of vehicles, a per-gallon tax on fuel does not provide the same benefit it once did. And with the current price of fuel, there is little support nationally to raise the per-gallon tax rate to accommodate for the loss in revenue due to higher fuel economy and alternative fuel vehicles. Tolling continues to be considered as a funding option, and is currently utilized along I-70 in the 5-County region and is managed by the Kansas Turnpike Authority. While tolling remains a funding option, it has been found that the cost to construct and maintain a new roadway would necessitate much higher tolls than drivers would be willing to pay which means that the cost of new projects would have to be supplemented with other funds. While there have been other potential sources identified for future transportation funding, such as a mileage tax, no efforts have been made to transition away from the motor fuels tax.

Figure 3-5 shows a comparison of statewide funding for expansion and modernization projects in Kansas. The top bar represents all the projects communities listed as needs during the 2008 Local Consult meetings, a total of \$15 billion statewide. Those projects were prioritized and

in 2009 a list of top tier projects costing \$6.9 billion was developed. T-WORKS will fund \$1.7 billion of expansion and modernization projects (\$880 million in the 5-County region) and while it will address many transportation needs, there are many more that will not be funded. In comparison, the CTP, the previous funding program had \$4 billion available for modernization and expansion transportation projects when inflated to 2016 dollars.



Source: Kansas Department of Transportation

CHANGES IN VEHICLE TECHNOLOGY

Improvements in vehicle technology will result in improved safety and increased throughput within existing lanes.

Technology is being used to make vehicles smarter, safer and connected. Not only is in-vehicle communication with satellites common (e.g. in-vehicle navigation systems), but vehicles are now talking to each other and the roads. In August, 2012, the United States Department of Transportation launched the first connected vehicle technology test in the U.S. This test of 3,000 vehicles in Ann Arbor, Michigan is evaluating the effectiveness of vehicles communicating with each other and with the roads. Test vehicles have been equipped with a wi-fi signal that enables them to share data about road speeds, potential incidents and changing road conditions. The system can alert drivers to the movements of nearby vehicles, such as lane changes in blind spots, or stopped vehicles on the road ahead. These changes have the potential to significantly increase the safety on our roads by decreasing the number and severity of collisions; this can help relieve non-recurring congestion. Data collectors

with wi-fi signals on the roads track the number and speed of vehicles on major roads. This information is used by drivers to select alternate routes if their planned route is congested. More information about the study and connected vehicle technology can be found at www.safercar.gov/ConnectedVehicles.

Connected vehicle technology also has the potential to increase the capacity of existing roadways. As the vehicles communicate with each other they can travel with less space between them. Less space between vehicles, executed safely, can mean that more vehicles can be moved on the same space on the roads. And, with the increases in safety achieved through the same technology, this can result in roads with less recurring congestion and non-recurring congestion because there are fewer incidents.

Self-driving or autonomous vehicles take connected vehicle technology a step further, potentially offering personal mobility to those with disabilities and overall safety benefits by turning the controls over to computers. With studies showing that 90 percent of all highway crashes are caused by human error, autonomous vehicles could dramatically reduce the number of crashes and fatalities occurring each year. Research and testing of this technology has largely been driven by private companies with Google, Intel, Volvo and other organizations leading the way.

In response, the National Highway Traffic Safety Administration (NHTSA) has begun a 2-3 year research and study program aimed at developing standards for testing and regulating the technologies needed to make autonomous vehicles a reality. NHTSA is also working closely with various states that are interested in developing early regulations. Nevada and California have already signed legislation and approved a set of rules to allow for the on-road testing of autonomous vehicles, with five other states currently considering legislation. The California legislation does the following³:

³ Hirsch, Jerry. Brown signs bill regulating self-driving cars in California. The LA Times, September 25, 2012. Accessed October 2012: <http://articles.latimes.com/2012/sep/25/business/la-fi-mo-self-driving-car-law-20120925>

- Sets up safety and performance standards for the operation of autonomous vehicles on the state's public roads
- Allows for the operation of autonomous vehicles on the state's public roads by a licensed driver
- Requires that an autonomous vehicle meet all applicable safety standards and performance requirements in state and federal law
- Allows the Highway Patrol, in consultation with the Department of Motor Vehicles, to recommend to the Legislature additional requirements for the safe operation of such vehicles on the state's roads

This technology has implications for transit systems also. Driverless fixed guideway systems can currently be found across the world using rail and bus-type vehicles. These systems operate within a specifically designed guideway that is separate from vehicular roads. However, with adaptations of connected vehicle technology, it is possible that transit vehicles could be driverless sharing roads with other driverless personal vehicles in the future.

CHANGES IN VEHICLE FUEL MILEAGE

In 2011, the federal government changed fuel efficiency standards for passenger cars and light trucks starting with model year 2017 that require vehicles to have higher gas mileage. With these changes, it is expected that gas tax revenues will decrease sharply. The gas tax revenues flow to the federal and state governments for transportation projects, meaning fewer dollars could be available for transportation improvements in the future.

GROWTH IN ALTERNATIVE COMMUTE OPTIONS

Federal, state and local governments have historically made investments in new highway capacity and roadway infrastructure on the assumption that driving will continue to increase at a steady pace. The observed downward trend in Vehicle Miles Traveled nationally along with the changing transportation preferences of young people to link housing to work and a shift towards alternative work options, like telecommuting, throw this assumption into question.

Telecommuting or telework is a work arrangement in which employees do not commute to a central office and instead work from home one or more days a week. Other than driving alone, telecommuting has been the only commute mode to gain market share since 1980⁴. The Census Bureau has produced a number of statistics to support this trend⁵:

- The percentage of all workers who worked at least 1 day at home increased from 7.0 percent in 1997 to 9.5 percent in 2010.
- The percentage of all workers who worked exclusively from home increased from 4.8 percent in 1997 to 6.6 percent in 2010.

Telecommuting is not suitable to every job, person or situation. As a transportation demand strategy, the observed trends in telecommuting have the potential to decrease peak hour congestion by reducing the number of commuters on the road.

With this growth in alternative commute options, the transportation policy of the future should consider the implications of changing travel behaviors.

NEXT GENERATION OF TRANSPORTATION USERS

America's young people are decreasing the amount they drive and increasing their use of transportation alternatives. According to the National Household Travel Survey⁶:

- From 2001 to 2009, the annual number of vehicle-miles traveled by young people (16 to 34-year-olds) decreased from 10,300 miles to 7,900 miles per capita - a drop of 23 percent.
- In 2009, 16 to 34-year-olds took 24 percent more bike trips than they took in 2001, despite the age group actually shrinking in size by 2 percent.

⁴ Balaker, Ted. (2005). The Quiet Success: Telecommuting's Impact on Transportation and Beyond. Reason Foundation Policy Study 338. Accessed October 2012:

⁵ Landivar, Liana et al. (2012). Home-Based Workers in the United States 2010. U.S. Census Bureau, Accessed October 2012: <http://www.census.gov/prod/2012pubs/p70-132.pdf>

⁶ Federal Highway Administration. National Household Travel Survey.

- In 2009, 16 to 34-year-olds walked to destinations 16 percent more frequently than did 16 to 34-year-olds living in 2001.
- From 2001 to 2009, the number of passenger-miles traveled by 16 to 34-year-olds on public transit increased by 40 percent per capita.

Also, according to the Federal Highway Administration:

- From 2000 to 2010, the share of 14 to 34-year-olds without a driver's license increased from 21 percent to 26 percent⁷.

These observed trends have largely been attributed to a number of factors including lifestyle preferences, changes in technology, changes in licensing laws, and increased fuel prices which have a disproportionate effect on young people with less disposable income⁸.

MANAGEMENT OF TRAFFIC ON MAJOR ROADS

By 2040, many of the major roads across the country are expected to employ techniques to better manage traffic and optimize the existing transportation network. Many of the techniques improve the flow by managing the transportation network, provide alternative transportation options for commuters, and manage incident responses to minimize the impact to travelers. As funding for capacity increases may become more limited, many agencies/municipalities are turning to alternatives that can improve the throughput and reliability of travel on existing roads.

These techniques can increase capacity of the roads by managing the operation of the roads to increase throughput rather than building more lanes. These techniques can be divided into two categories: Transportation System Management (TSM) and Transportation Demand Management (TDM).

⁷ Federal Highway Administration. Highway Statistics 2010.—Table DL-20, Accessed October 2012: <http://www.fhwa.dot.gov/policyinformation/statistics.cfm>

⁸ Frontier Group, U.S. Public Interest Research Group. Transportation and the New Generation: Why Young People Are Driving Less and What It Means for Transportation Policy. Accessed October 2012: <http://www.frontiergroup.org/sites/default/files/reports/Transportation%20&%20the%20New%20Generation%20vUS.pdf>

TSM techniques contain a set of coordinated proactive strategies to maximize the transportation system performance. Techniques such as ramp metering, variable speed limits, signal coordination, access management, and intelligent transportation systems combine to proactively manage the transportation network.

TDM strategies focus on reducing the demand on the transportation system, specifically reducing the number of single occupancy vehicles. This can be done by consolidating trips of transportation system users or by redistributing the demand over time and distance. Techniques include transit service, park-and-ride networks, and bicycle and pedestrian improvements that offer transportation alternatives to allow people to be mobile without their personal auto.

TSM and TDM techniques have already been implemented in Kansas City and numerous metro regions. They have proven to be effective at managing the traffic flow to increase throughput on the road. Section 11: Transportation Management Toolbox Strategies provides detailed descriptions of TSM and TDM strategies.