Tulsa Metropolitan Area

Destination 2030

LONG RANGE TRANSPORTATION PLAN

Indian Nations Council of Governments
August 2005

CONTACTING INCOG

In developing the *Destination 2030* Long Range Transportation Plan, INCOG's Transportation Planning Division has concentrated on producing a document that is both useful and comprehensive. If during your review of this document you have any questions or need additional information, please feel free to contact the Transportation Planning Division using the contact information below.

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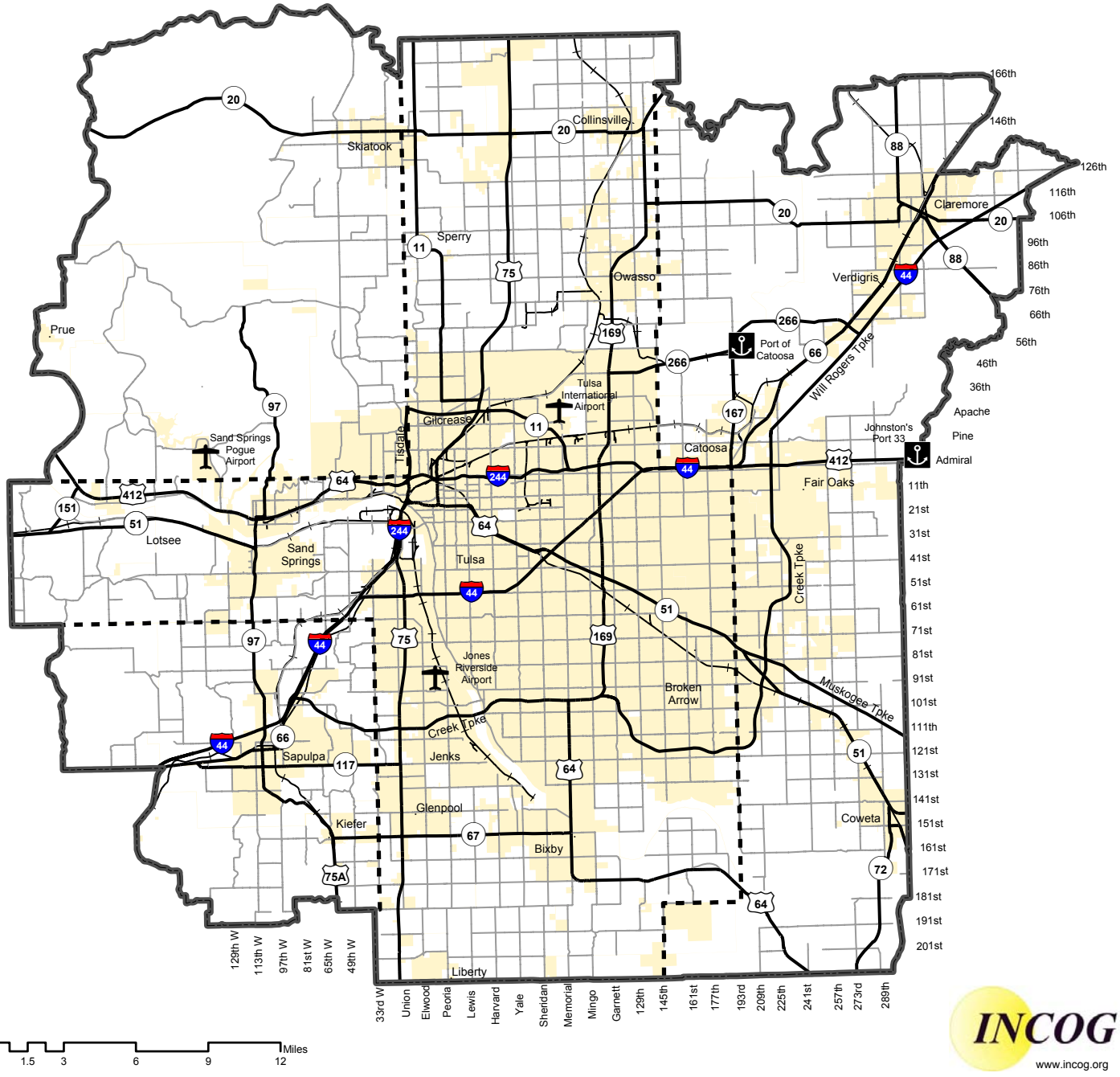
INTRODUCTION

Chapter 1

Tulsa Transportation Management Area



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Highways
Arterials
Rail
County Boundary
Corporate Limits
Transportation Management Area

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Map Scale - 1:410,000

Location Map

BACKROUND

The 1,200 square-mile Tulsa Transportation Management Area (TMA) is comprised of Tulsa County and portions of 4 adjacent counties: Creek, Osage, Rogers, and Wagoner. The area includes the cities of Bixby, Broken Arrow, Catoosa, Claremore, Collinsville, Coweta, Fair Oaks, Glenpool, Jenks, Kiefer, Owasso, Sand Springs, Sapulpa, Skiatook, Sperry, Verdigris and Tulsa (*Tulsa Transportation Management Area* map, Page 1). According to year 2000 census data, the Tulsa metropolitan area boasts 701,580 residents, all needing reliable, convenient, and safe transportation opportunities.

Transportation History

Even before its incorporation in 1898, the City of Tulsa laid the groundwork for today's freight transportation system. Rail and primitive roadways served early needs to carry cattle, and later oil, to market. As the economy grew, so did the population, which required new means of personal transportation. In 1906, Tulsa's first street cars moved residents across town through a system of unpaved roads. Brick-paved streets led to today's street and highway system. The beginnings of Tulsa's grid-based road system was designated soon after Oklahoma gained statehood, and today the north-south and east-west main arteries, placed at 1 mile intervals, allow motorists to quickly and easily navigate the community relative to similar regions throughout the nation.

By the early 1920s, automobiles replaced horses and wagons as the town's preferred means of travel. Automobiles allowed motorists to take their families on vacations or conduct business in once remote locales at their convenience. Route 66 built on this desire, linking Chicago to Los Angeles through a series of small communities, including Tulsa, that welcomed visitors and their wallets. The route was also popular with truckers and farmers transporting produce and other products. The "Mother Road," still visible on parts of 11th Street and other streets in the TMA, was slowly replaced in popularity by larger, faster toll roads and federal highways.

The Turner Turnpike, Oklahoma's first toll road, was one such roadway. Opened in 1953, the turnpike provided a direct route between Tulsa and Oklahoma City. The Skelly Bypass, built to relieve Route 66 traffic, provided further conveniences. After the Interstate Highway System was enacted in 1956, the bypass was renamed I-44 and became the first interstate route in the TMA.

Just before Route 66 was first recognized by the state, another means of personal and freight transportation was set into motion. Tulsa's first airfield was built in 1921, a year before Tulsa's first motorized bus appeared in the city. Later, Skelly Oil Company President William G. Skelly funded the municipal airport now known as Tulsa International.

The Port of Catoosa, part of the McClellan-Kerr Navigation Channel, was the next chapter in the TMA's transportation history. Completed in 1971, the McClellan-Kerr system created ports in Arkansas and Oklahoma cities through a series of locks and dams connecting the Mississippi and Arkansas rivers.

Today's effective and diverse transportation system is founded in the ingenuity and foresight of residents throughout the region's rich history. It is the vision of the *Destination 2030* Long Range Transportation Plan (LRTP) to build on these past accomplishments to meet the needs of future TMA travelers.

Purpose

The LRTP looks 25 years into the future to anticipate transportation needs for the TMA. The plan is predicated on demographic and economic assumptions and forecasts for the region. It identifies the various elements of the

desired for the metropolitan community and investigates how these transportation modes interrelate. To ensure financial feasibility, the LRTP summarizes implementation costs and presents practicable funding scenarios. The LRTP also summarizes the resulting impacts of these investments on society and the natural environment.

The LRTP will serve as a guide for the investment of local, state and federal resources and will become a component of the Oklahoma Statewide Intermodal Transportation Plan.

Finally, the LRTP meets the requirements of federal law authorizing the adoption of a long-range transportation plan for the metropolitan planning area. This is an important requirement for the expenditure of federal transportation resources.

Plan Development Process

The Indian Nations Council of Governments (INCOG) is a voluntary organization of local governments and was designated by the governor as the area's Metropolitan Planning Organization (MPO). MPOs maintain lead responsibility for developing transportation plans and programs for urbanized areas of 50,000 or more residents.

Community Planners from the Tulsa TMA discuss the upcoming Long Range Transportation Plan process.

Additionally, federal regulations recognize metropolitan areas with a population of 200,000 or more as Transportation Management Areas, which places further requirements on the MPO for congestion management, air quality attainment, increasing safety, and other issues.

All TMA transportation plans and programs are based, in cooperation with local and state governments, on a continuous, coordinated, and comprehensive planning process. Representatives of each member community's principally elected officials are appointed to INCOG's Board of Directors, which serves as a forum for cooperative decision-making on issues of regional significance, including transportation.

The development of the LRTP began in September 2002 with public outreach activities during the Tulsa State Fair. A variety of public-involvement strategies were used to obtain broad-based input from interested citizens and targeted populations at key decision points in the plan development process.

Prior to adoption of the final LRTP by the INCOG Board in August 2005, 2 transportation committees monitored and reviewed the products at each critical planning stage. It is anticipated that the LRTP will be updated every 3 to 5 years.

Committee Oversight

The transportation-planning process is overseen by the Transportation Policy Committee (TPC) and the Technical Advisory Committee (TAC). Committee members, who meet monthly, represent federal, state, tribal, and local governments and agencies; state and local authorities; and modal interests.

The TAC, an advisory group to the TPC, provides technical expertise related to development of urban transportation plans and programs for the TMA.

The TPC is an ongoing forum for policy development and adoption related to urban transportation planning, programming, and operation. Upon TPC approval, transportation plans and programs are forwarded to the INCOG Board of Directors for endorsement.

Public Participation

Public involvement activities for the LRTP began with an unscientific opinion survey of 2002 Tulsa State Fair patrons. Survey results were tabulated and distributed, along with additional transportation-related information, to area leaders, interest group representatives, and transportation experts during a *Destination 2030* visioning retreat.

A TMA resident studies information at a Destination 2030 Open House.

Retreat participants were asked questions regarding regional connections, congestion, alternative modes, livability and land use, and area project funding.

Their comments, in conjunction with the survey responses, helped establish the vision and goals for *Destination 2030*. Throughout the planning process, presentations were given to area clubs and organizations to educate the residents about the LRTP and how they could become involved in the process.

In August/September 2003, 13 open house meetings were held throughout the region. The open house format provided participants with the vision and goals passed by committees, along with known demographics and data for the TMA and the region at large. A second survey was distributed, which asked participants for their comments regarding trails/pedestrian systems, roadways, transit, and freight movement. The survey was also available online through INCOG's website (www.incog.org). At key points in the planning process, a newsletter was published and distributed via email and mail. The newsletter was also available in area libraries and online through INCOG's website.

In August/September 2004, 8 transportation road shows were held throughout the region. The road shows were an open format for the public to come and view what had emerged as priorities from earlier public-input sessions with regard to roads, transit, and the bicycle/pedestrian system. Participants were asked to rank the priorities in order of importance to them.

In September/October 2004, INCOG staffed a booth at the Tulsa State Fair, where a third public-opinion survey was conducted pertaining to current transportation issues in the area as well as the recommendations and priorities developed to that point. The survey also was made available online through INCOG's website.

In May 2005, 15 community meetings were held. INCOG staff made presentations during city council meetings, and the final draft plan was distributed for review. Four focus group meetings, one for each modal element of the LRTP (roadways, transit, freight, and bicycle/pedestrian) were held. Attendees were able to review the draft plan and make final comments.

Final review of the LRTP was made available through area branch libraries, Chamber of Commerce offices, INCOG offices, and the INCOG transportation web page. The TPC approved the LRTP in July 2005 and the INCOG Board of Directors endorsed it in August 2005. Comments received during the draft LRTP review process are listed in the *Plan Effectiveness* chapter. A full explanation of the public involvement process is available in the *Supporting Documents*.

REGIONAL OVERVIEW

Economic and population projections provided a framework for predicting the transportation needs for 2030. Data were collected and analyzed for this purpose from the Census Bureau, Bureau of Economic Analysis, Oklahoma Employment Security Commission, and the Nationwide Personal Transportation Survey (Federal Highway Administration). Information is included for the Tulsa TMA and Metropolitan Statistical Area, both outlined in the *Tulsa TMA and MSA Location* map on this page.

Tulsa TMA and MSA Location

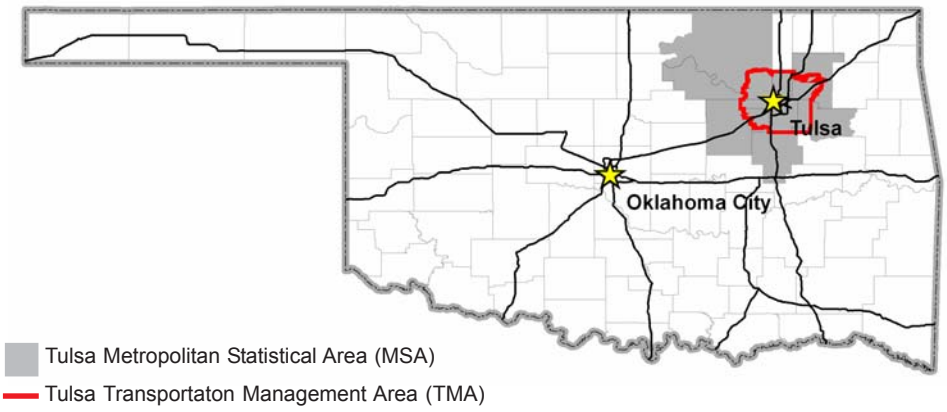
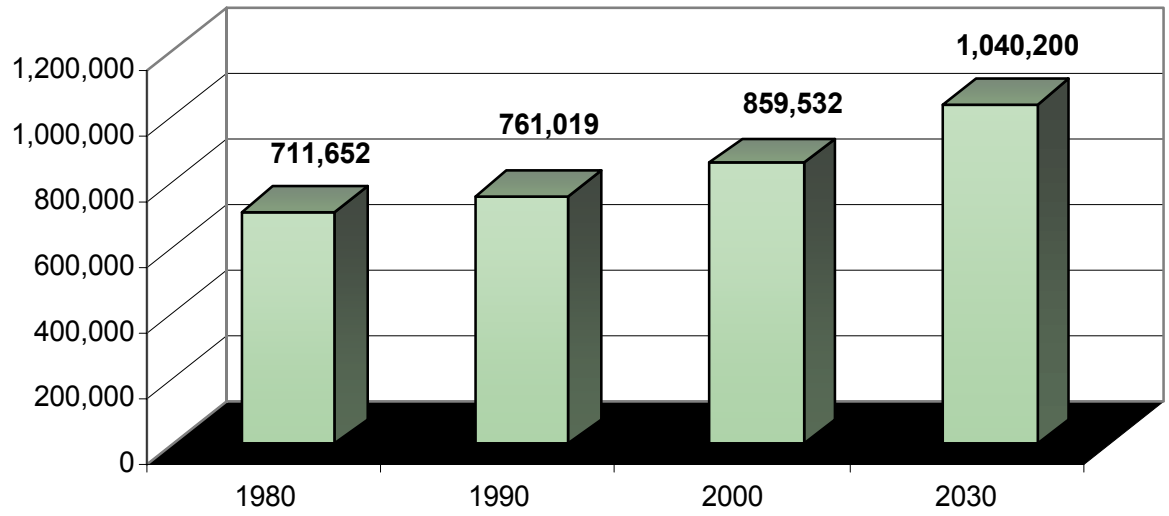


FIGURE 1
Tulsa MSA Population and Projection - 1980 to 2030



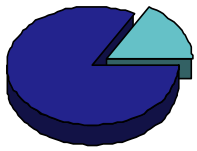
Growth and Travel Patterns

POPULATION

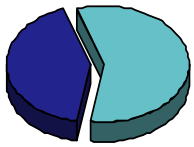
The Tulsa MSA, comprised of Creek, Osage, Okmulgee, Pawnee, Rogers, Tulsa, and Wagoner counties (the Office of Management and Budget formally added Okmulgee and Pawnee Counties in 2002) reached a population of over 859,000 in 2000. This figure is projected to grow to over 1 million residents, a 21% increase, from 2000 to 2030. The TMA is projected to grow by 23% during the same time period, with an average annual growth rate of 0.8%. The 2000 TMA population of 701,580 represents 81% of the 2030 forecasted population (*2030 Population Projection, Page 9*). *Figure 1* depicts the annual population of the MSA, and *Figure 2* shows the MSA increases relative to city and state population totals.

The population's composition is also changing. As can be viewed in *Figure 3*, the median age of residents has risen in the past decade. In addition, as seen in *Figure 4,* the youth population (19 years of age and younger) is decreasing as the older population (65 years of age and older) increases, a shift that is further explored in *Figure 5*, which shows how the percentage of older adults, as compared to other adult age groups, will increase. These changes will have significant effects on transportation needs.

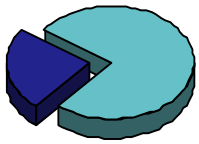
FIGURE 2
Tulsa MSA's Population Continues to Grow



The population in 2000 represents 83% of the year 2030 forecast.



City of Tulsa represents nearly 46% of the MSA's current population.



In 2000, the Tulsa MSA represented 24% of the state population.

FOCUS ON:
POPULATION

FIGURE 3
Resident Median Age by County - 1980 and 2000

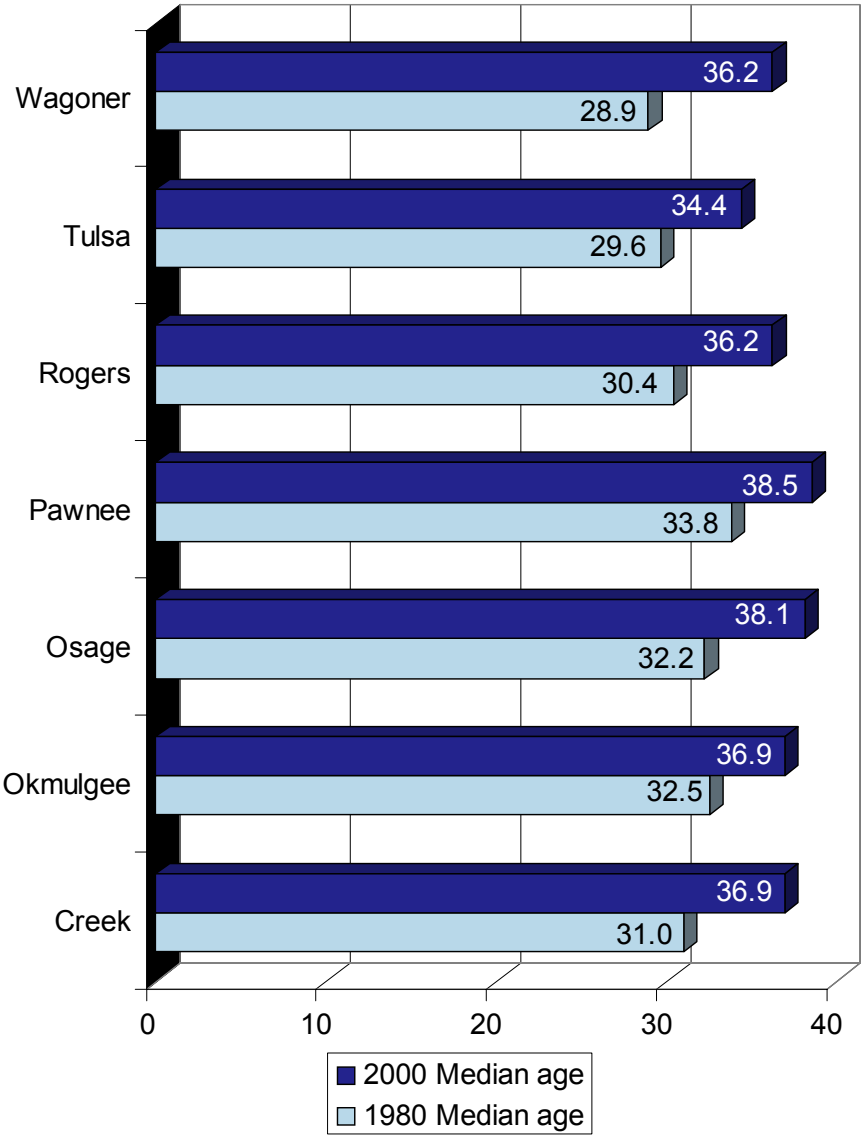


FIGURE 4
Population Composition - Youth vs. Elderly

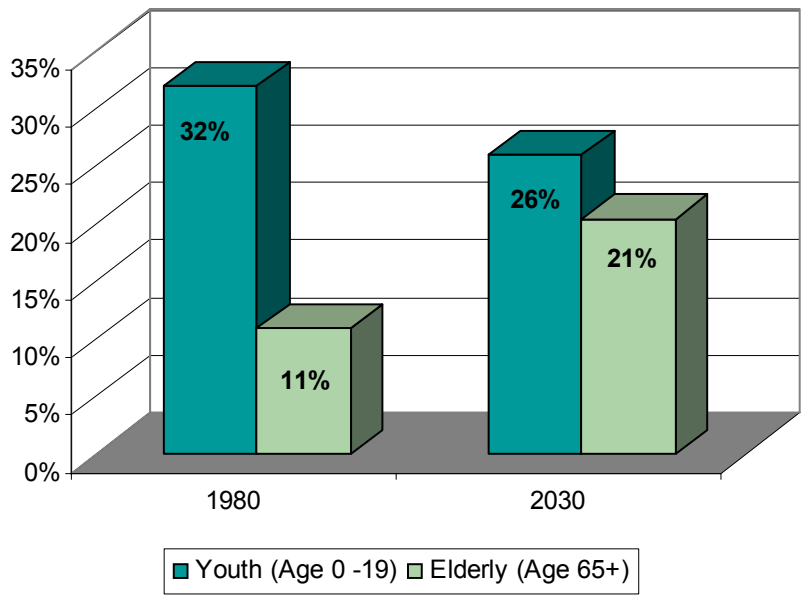
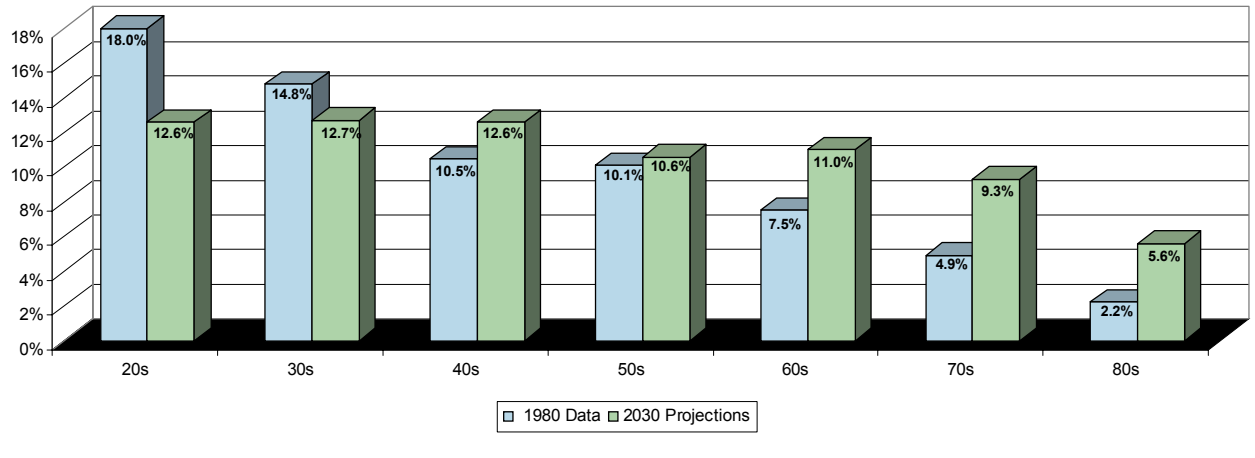
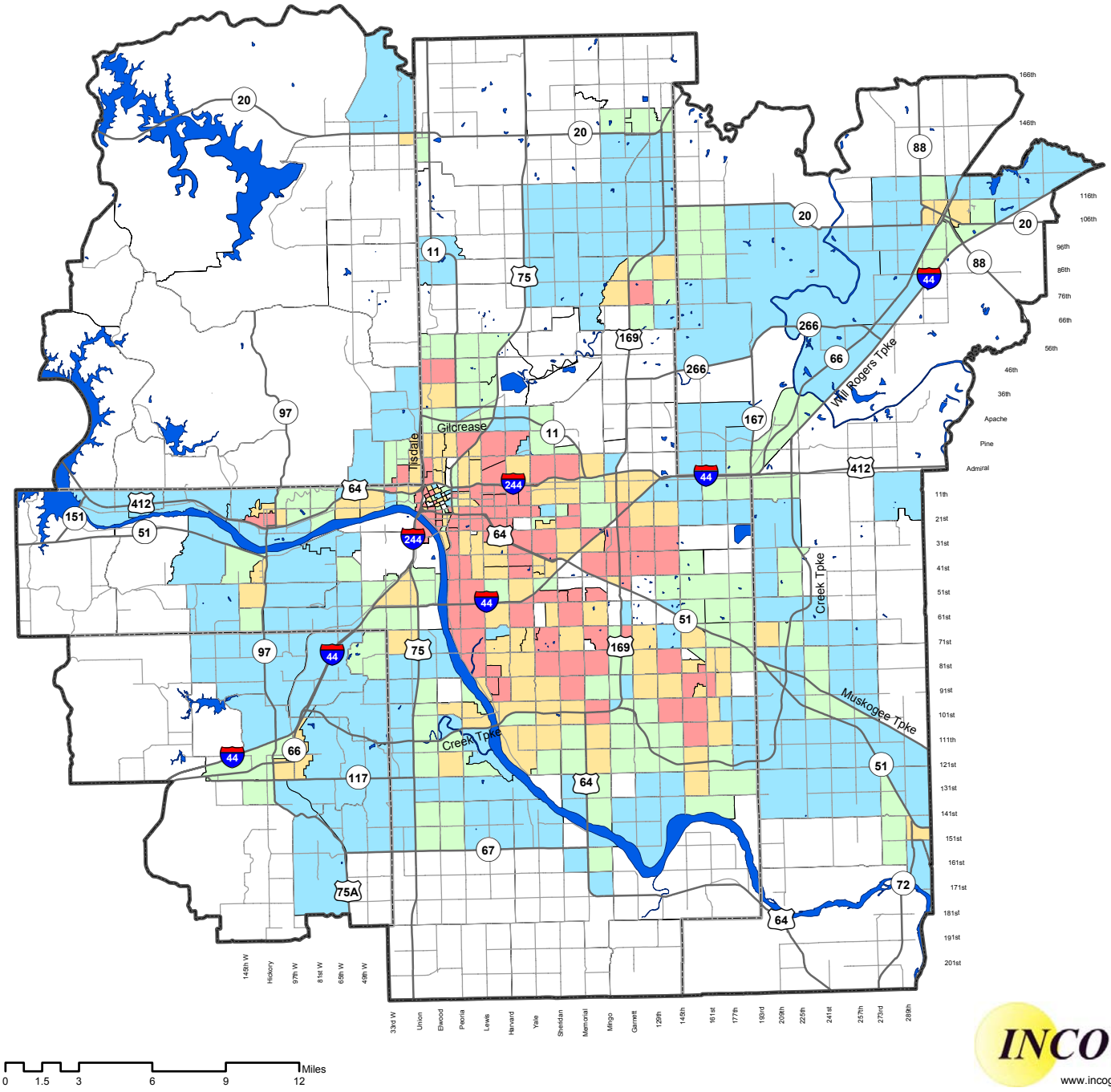


FIGURE 5
Percentage of MSA Population by Age Group



2030 Population per Square Mile



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Transportation Management Area
County Boundary
Arterials
Highways
Lakes and Rivers

Population 2030

Persons per Square Mile

- 0.0 - 242.2 (lowest 20%)
- 242.3 - 791.8
- 791.9 - 2,192.4
- 2,192.5 - 3,816.1
- Over 3,816.2 (highest 20%)

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Map Scale - 1:410,000

Location Map

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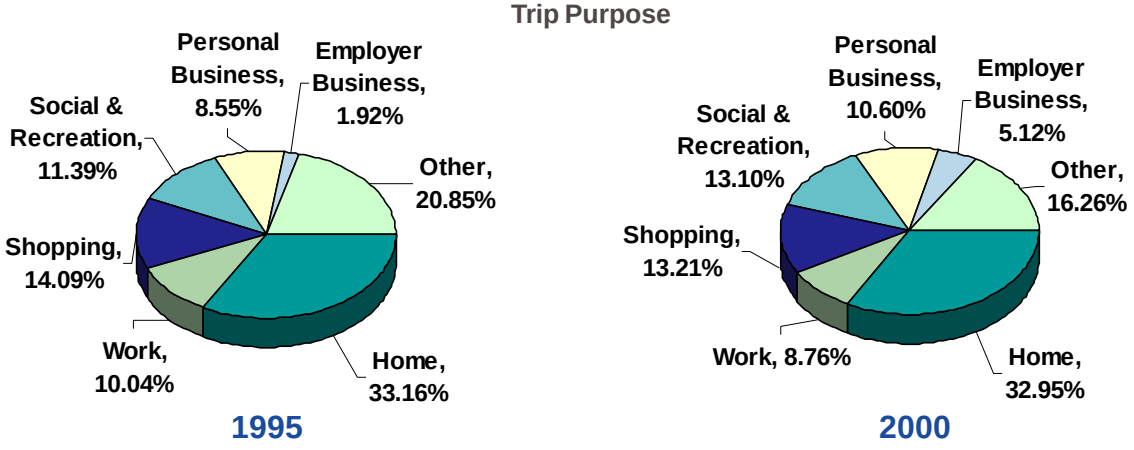
FIGURE 6
Trip Purpose



EMPLOYMENT

Strong long-term employment growth is expected to continue for the Tulsa region based on Bureau of Economic Analysis forecasts. In 2000, total employment reached over 411,000 – an increase of approximately 50,000 (over 461,000) is projected for 2030 (*2030 Employment Projection* map, Page 13). Downtown employment has steadily grown after a sharp drop in the 1980s (*Figure 7)*.

The Service industry sector is projected to hold the largest share of 2030's total employment at 36%. Two industries face significant projected declines between 2000 and 2030: Farming (projected to decline by 40.4%) and Mining (projected to decline by 15.6%). The Farming (0.53%); Agricultural, Forestry and Fishing (1.39%); and Mining (1.87%) industries have the smallest projected share of 2030 total employment *(Figure 9)*.

Approximately 94% of MSA employment falls within the TMA boundary. The base-year employment represents 89% of the 2030 employment forecasts. Employment growth is anticipated throughout the metro area, with significant increases in several major employment centers including the 21st Street and Utica Avenue Corridor, the South Yale Avenue Corridor (from 61st to 71st Street South), the US-64/SH-51 (Broken Arrow Expressway) and US-169 Corridor, the Tulsa International Airport area, the Cherokee Industrial Park, and the Port of Catoosa.

TRAVEL CHARACTERISTICS

Tulsans heavily rely on personal automobiles for transportation. During the 20 year period from 1980 to 2000, households with 0 or 1 vehicle declined dramatically, while households with 2 or 3 vehicles increased from 43% to 58% of all households. During the 1980s and 1990s the increase in trips per household was a major factor in the growth of the Vehicle Miles of Travel (VMT). In 1995 and 2000, the number of daily trips per household has stabilized at around 9 trips per household, according to the Nationwide Personal Transportation Survey (NPTS). Little has changed in trip purposes with work trips accounting for approximately 9% of all trips (*Figure 6).*

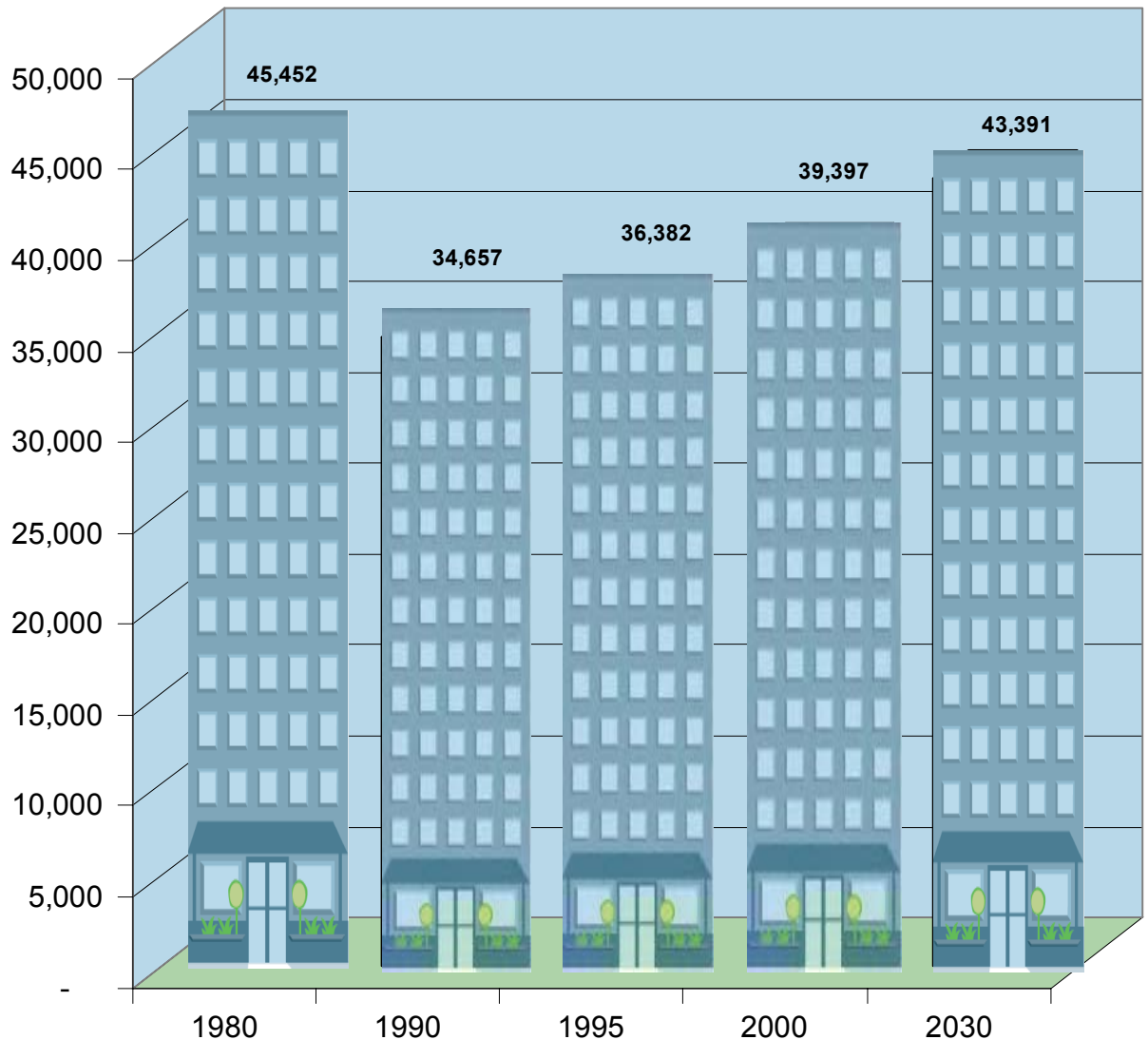
Commuter driving patterns indicate that the vast majority of commuter trips are made alone. In 1980, 72% of drivers in the Tulsa MSA drove alone, which increased to 81% in 2000. Carpooling, transit, and walking have all decreased as a result of this increase. Also during this time, employees working from home increased. Trips are increasingly being spread throughout the day rather than concentrated in the traditional morning and evening rush hours (*Figure 10*). In 2000, the median trip length (in time) in the Tulsa area was 12.3 minutes.

Population, households, workers, and the number of vehicles have all increased significantly while trip lengths in minutes and trip lengths in miles have only changed slightly. Increases have occurred in the number of vehicle trips made and the total miles traveled, increasing from 1990 to 2000. Along with an increase in the number of households, Tulsa drivers are driving slightly further distances per trip, thus increasing the total number of vehicle miles traveled. *Figure 11* reveals the change in key transportation indicators from 1990-2000.

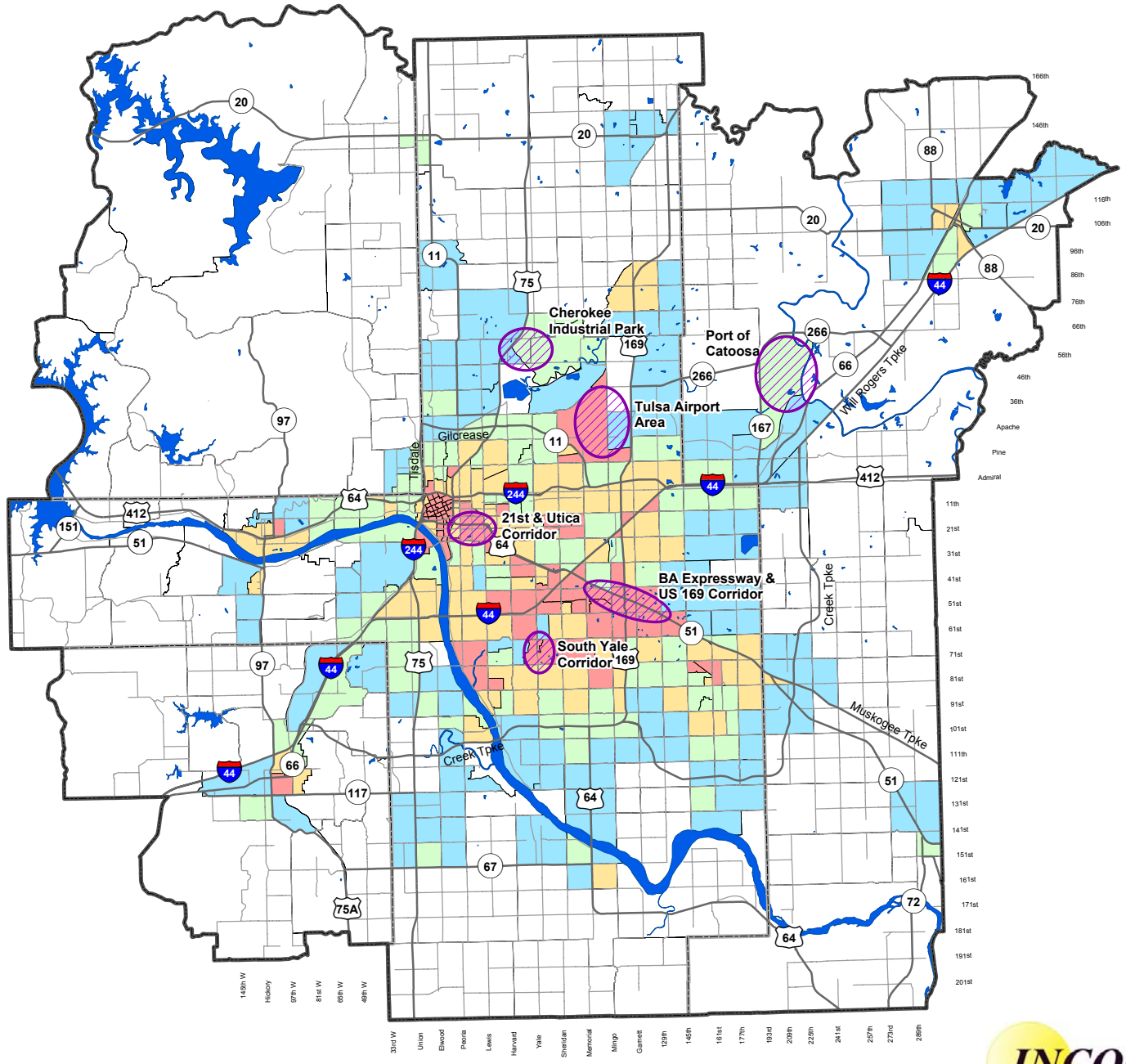
National trends also reflect an increase in the use of alternative modes, which is attributed to the significant increase in total trips. Despite this increase in the number of uses, the percentage of alternative mode uses, in relation to other transportation modes, has actually decreased.

FOCUS ON:
EMPLOYMENT

FIGURE 7
Employment In Downtown (within Inner Dispersal Loop) by Year



2030 Employment per Square Mile



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Transportation Management Area
County Boundary
Arterials
Highways
Lakes and Rivers
Employment Center

2030 Employment
Employees per Square Mile

- 0.8 - 85.7 (lowest 20%)
- 85.8 - 396.5
- 396.6 - 1,169.8
- 1,169.9 - 2,723.6
- Over 2,723.7 (highest 20%)

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Map Scale - 1:410,000

Location Map

FIGURE 8
Number of Employees by Sector

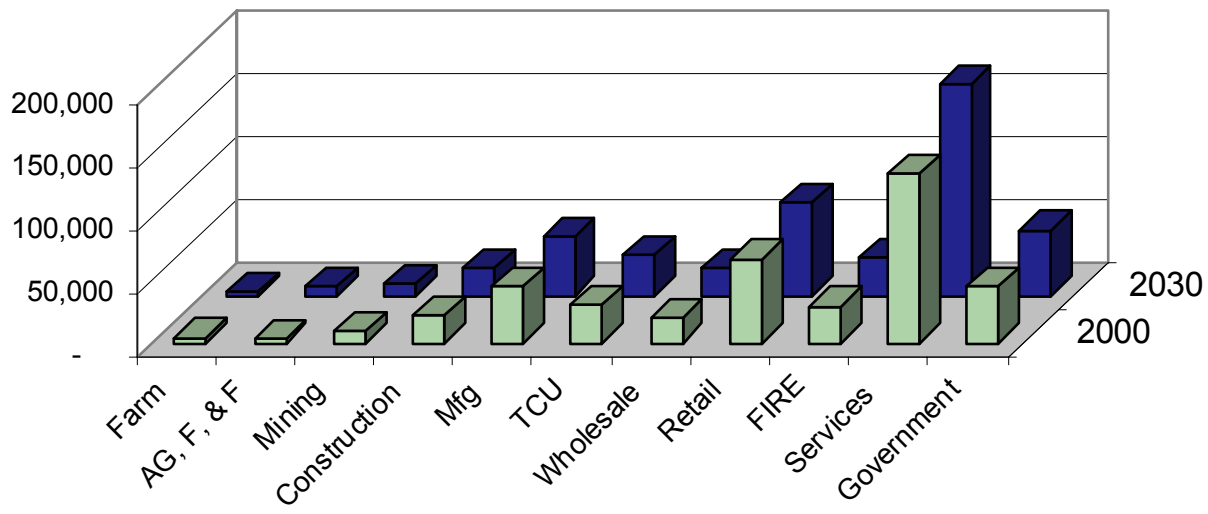


FIGURE 9
Projected Percentage Share of 2030 Employment

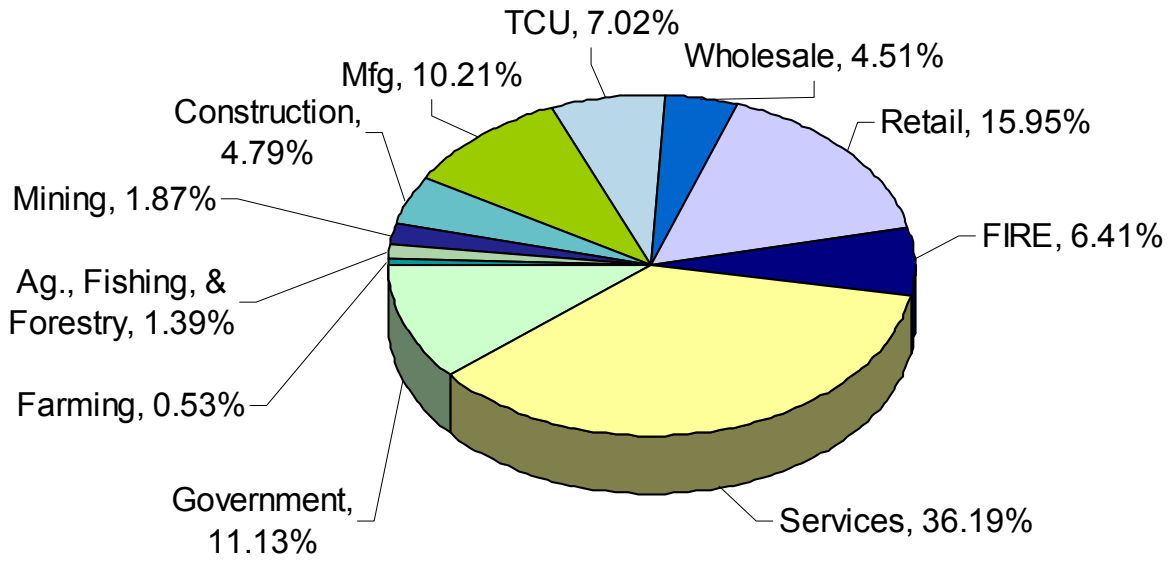
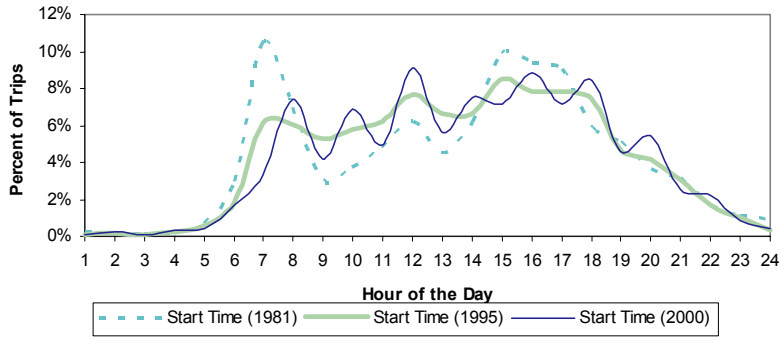


FIGURE 10
Percent of Trips by Time of Day



LAND USE AND DEVELOPMENT

How available land is used or developed has an obvious impact on transportation facilities and systems, and vice versa. Commercial developments typically have been designed to accommodate automobiles, with limited consideration for public transit, bicycles, and pedestrians. Close coordination of land-use planning and transportation planning is increasingly important.

Other Considerations

ALTERNATIVE MODES

The roles of carpooling, vanpooling, transit, bicycling, walking and telecommuting in the overall transportation system have taken on greater importance. These modes become more attractive when environmental impacts and cost-effectiveness are evaluated. Major obstacles exist, however, in the expansion of these modes. Key challenges to expansion include competing with the automobile's convenience and retrofitting residential and commercial development to provide convenient access to bicycle and pedestrian networks and transit services. The benefits and challenges of these modes are discussed in subsequent chapters.

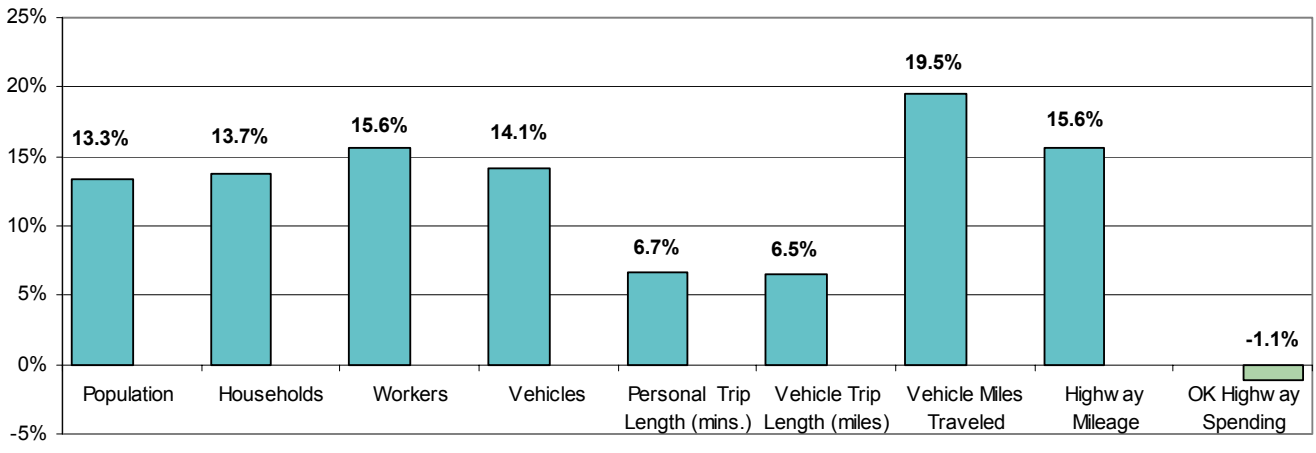
CONGESTION

Traffic congestion is relative depending on user experience and orientation, and acceptable levels must be defined locally. The region must then decide how best to address congestion from both demand reduction (carpooling, alternative mode usage, flexible work schedules) and supply provision (new and expanded roadways) approaches.

RESOURCE UTILIZATION

Resource management will greatly affect how the transportation vision for 2030 will be realized. Systems must be efficient. Planners, engineers, and policymakers must be innovative and flexible in order to maximize resources and community benefits. Priority uses and preferred facility funding streams must be identified.

FIGURE 11
Percent Change of Key Indicators - 1990 to 2000



PUBLIC INPUT SUMMARY

INCOG sought input from various groups across the region in accordance with procedures detailed in the *Public Input Process for the Tulsa Transportation Management Area*. The input received was used to form the vision and goals for the LRTP. The two early outreach activities below formed the vision and goals that determined the direction of this plan. More information on this process is available in the *Plan Effectiveness* chapter and the *Supporting Documents*.

Tulsa State Fair/Online Survey – 2002

Fair attendees were given information on the plan-development process and were asked to complete a short survey at the INCOG booth. The survey was also available on the INCOG website until the year's end. This was the first outreach activity undertaken in relation to the LRTP.

PRIORITY CONCERNS – *Condition of Neighborhood Streets* and *Congestion of Arterials and Expressways* ranked as the highest concerns for those surveyed.

ALTERNATIVE TRANSPORTATION – Forty percent of respondents said they would like more trail and transit options available.

CURRENT CONDITIONS – The majority agreed that congestion has worsened, roadway maintenance should be given higher priority, and adequate bike/pedestrian facilities are needed.

FUNDING – Many respondents showed a willingness to fund expenditures for street & highway maintenance as well as bike/pedestrian, transit, and technology enhancements. Although there was a great interest in implementing passenger rail, responses showed little willingness to fund it. Respondents were more willing to increase sales tax for transit than to increase fuel tax for highways.

TRAFFIC FLOWS – Respondents said they are willing to accept higher levels of traffic during rush hour. Area residents still support suburban living and want transportation improvements to be oriented toward suburban locations.

AIR QUALITY – When asked what steps they take to improve regional air quality during *Ozone Alert!* days, almost a third of respondents said they avoid mowing the lawn, and about a quarter each limit their travel or avoid refueling their vehicle. Just over 5% said they ride the bus.

Vision Retreat – February 2003

Retreat invitees included community and business leaders, transportation mode advocates and users, and others interested in environmental justice, the natural environment, and related topics. Attendees were asked to register their responses to a series of survey questions using an electronic receiver. The results were immediately displayed for attendees to view and discuss.

REGIONAL CONNECTIONS – Attendees voted that Dallas/Fort Worth was the most important regional highway connection, and they agreed the current connection was sufficient. The most important air connection was determined to be Washington, DC, and respondents voted that the current connection was inadequate. Other important connections (also ranked as poor) were Los Angeles and New York. Oklahoma City, followed by Dallas/Fort Worth, was selected as the most important passenger rail connection.

CONGESTION – Attendees agreed with state fair responses by saying current congestion levels during peak hours are acceptable.

ALTERNATIVE MODES – When asked what the role of transit should be in 2030, the majority of respondents agreed it should *Serve Major Activity Center*s. Many also responded that it should be a *Viable Option for Anyone*. When asked which transportation alternatives had the most promise, and that respondents would personally consider using, telecommuting received the highest votes; pedestrian modes received the lowest.

LIVABILITY AND LAND USE – Attendees were asked to rank elements of transportation systems (excluding functionality and safety) that they found most important. *Environmental Impacts* and *Ease of Use* were selected.

TRANSPORTATION SYSTEM PRIORITIES (ROADS) – Attendees selected *Condition* to be the aspect of the current transportation system that needed the most improvement for neighborhood and residential streets. For arterial streets and highways, respondents selected *Congestion*. On turnpikes, *Condition* received the most votes, followed closely by *Congestion*.

TRANSPORTATION SYSTEM PRIORITIES (BICYCLE/PEDESTRIAN) – Respondents overwhelmingly chose *Availability* as the element that needed the most improvement in regards to trails, sidewalks, bike facilities and routes, and public transit.

RESOURCES AND THEIR USE (GENERAL) – Attendees were asked what they thought were the priority uses for resources, and they selected *Use Advanced Technologies.*

RESOURCES AND THEIR USE (SPECIFIC MODES) – Respondents selected the stream of funding they felt was most appropriate for specific transportation modes. Respondents selected *Increased State Motor Fuels Taxes* and *Tolls and Other User Fees* for Transit, *Tolls and Other User Fees* for Light-Rail/Monorail, *Increased State Motor Fuels Taxes* for Highway Maintenance & Construction and for Arterial Improvements.

THE 2030 VISION AND GOALS

During the public outreach efforts mentioned in this chapter, residents have defined the course INCOG should take in terms of strategic goals for the regional transportation system. There are 2 sets of equally important goals. The Core Goals are distinct and easily categorized, while the Cross Cutting Goals fit multiple categories and affect many aspects of the transportation system.

Destination 2030 Vision:

The paramount purpose of the transportation system is to enhance and sustain the quality of life and economic vitality of the region. This will be accomplished by judiciously developing, maintaining, and managing a transportation system that meets the accessibility needs of people and goods in the region through safe, environmentally prudent, and financially sound means.

Core Goals

ACCESSIBILITY – Create a multimodal system that provides reasonable mobility for all persons in the region

ECONOMIC DEVELOPMENT – Advance and support the economic well-being of the region

ENVIRONMENT – Respect the natural environment, support social justice, respect and serve the built environment, and be compatible with land development throughout the region

FINANCE – Ensure by minimizing cost, wisely applying the existing resources while seeking new and innovative sources, and expanding opportunities for greater partnership with the private sector for investing in the system

Cross Cutting Goals

SAFETY – Develop a transportation system that reduces fatalities and injuries and minimizes harm without compromising the benefits of the system

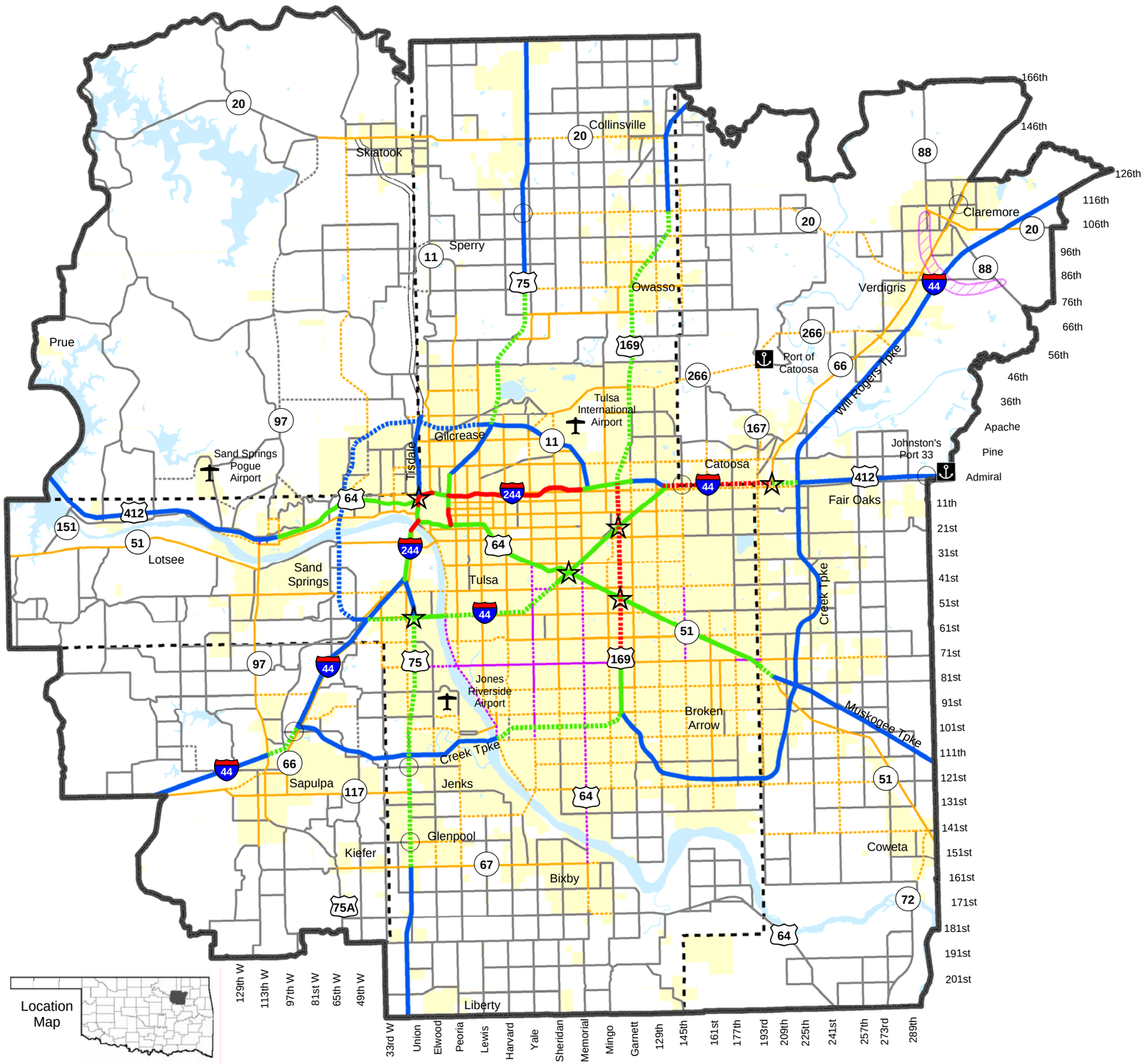
MAINTENANCE – Preserve and improve the condition and function of the transportation system

EFFICIENT AND EFFECTIVE – Promote a transportation system that provides mobility throughout the region easily, quickly, reliably and at the least cost

MANAGEMENT AND OPERATION – Maximize the use of technology options to advance the mobility of users and improve the management and operation of the transportation system

ROADWAYS

Chapter 2



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2030 Roadways Plan

- Expressway 8-lane, Existing
- Expressway 8-lane, Planned
- Expressway 6-lane, Existing
- Expressway 6-lane, Planned
- Expressway 4-lane, Existing
- Expressway 4-lane, Planned
- Arterial 6-lane, Existing
- Arterial 6-lane, Planned
- Arterial 4-lane, Existing
- Arterial 4-lane, Planned
- Arterial 2-lane, Existing
- Arterial 2-lane, Planned
- Proposed Corridor Beyond 2030
- Expressway Interchange
- Grade-Separated Interchange
- ODOT SH-88 Study Area
- County Boundary
- Corporate Limits
- Transportation Management Area

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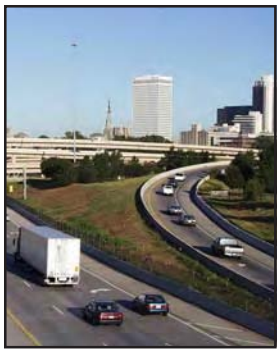
Map Scale - 1:275,000



INTRODUCTION

Personal transportation in the Tulsa Transportation Management Area (TMA), as in many regions across the country, is predominantly oriented toward the automobile. A well-developed network of arterial streets based on a 1 mile grid interspersed with expressways makes the TMA's roadways a relatively convenient system. Expressways provide the necessary linkages to jobs and housing, while the arterial corridors are saturated with shopping, social and recreational facilities serving neighborhoods and communities.

The region is committed to providing mobility and access to all people in a safe and convenient manner, and historically this has been provided in large part by the automobile. Because of the traditional development, and other factors, the reliance on the automobile will continue in the future. However, as the region grows and matures the focus will shift to greater consideration for other forms of transportation in the development process and simultaneously there should be increasing emphasis on making the roadway system safer, more efficient, and easier to use (*2030 Roadways Plan* map, Page 21).

Roadway planning in the TMA is a continuous and coordinated process rooted in solving the community's anticipated challenges related to growing demand and limited supply of infrastructure. Environmental considerations play a major role in transportation planning as the region's long-term vitality is strengthened only with improved livability and quality of life.

Resident Priorities

During a public outreach process spanning 3 years, residents identified and prioritized roadway recommendations for the *Destination 2030* Long Range Transportation Plan (LRTP). The results, in order of priority, were:

1. Make the maintenance of existing roadways and bridges an increasing priority
2. Focus on improving safety at arterial street intersections, including signalization at intersections and signal coordination in corridors
3. Effectively finance the development and maintenance of the transportation system and optimize the use of transportation funds
4. Include alternative transportation features in the design of traffic improvements
5. Increase the coordination of transportation planning and land-use planning or development
6. Continue needed expansion of highways and major roadways
7. Enhance safety by increasing or improving enforcement of existing laws and regulations, improving the education of new drivers, and increasing education for existing drivers
8. Give priority to roadways serving significant regional economic centers
9. Consideration should be given to minimizing the mix of vehicles (separating tractor-trailers from smaller vehicles) on highways and major roadways
10. Improve access across the Arkansas River

PLANNING FOR ROADWAYS

The roadways plan utilizes a computerized model for analyzing traffic at the TMA level. Specific land-use forecasts for 2030 based on projected population and employment have been developed with consultation from local public- and private-sector representatives. The results from the land-use forecasting process were incorporated into the transportation modeling through trip generation, trip distribution, and traffic assignment to test various alternatives and ultimately recommend an optimal roadway network for 2030.

The procedures involved data development for the base year, 2000, and the horizon year, 2030. The household trip-related data was determined using local household survey data collected for the Tulsa metropolitan area in conjunction with the 1995 Nationwide Personal Transportation Survey (NPTS) for the region. This data was further validated using sample 2000 NPTS data for the region. The household-level data specifically includes trips per household and vehicle occupancy rates from the households surveyed.

To determine how trips are dispersed throughout the region, a computer model was used to distribute trips between small geographic areas called transportation zones. The model then assigns the trips to the roadway network to determine where and how much travel demand occurs. The result of the modeling process is a roadway network with 2030 forecasted volume of traffic (*Figure 12).*

CURRENT AND FUTURE ROADWAYS SYSTEM

The TMA roadway system is primarily comprised of expressways and arterial streets on a roughly 1 mile grid system. The roadway system, as shown in *Figure 13*, is well-served by Interstate highways (I-244 and I-44) and National Highway System routes (US-75, US-169, US-64, US-412, SH-51and SH-266), as well as numerous other state and federal highways in the region.

In 2000, the roadway system comprised approximately 872 lane-miles of expressways, 286 lane-miles of turnpikes, 8,800 lane-miles of arterial streets, and numerous miles of local streets.

FIGURE 12

Roadway Modeling Procedure Summary Flow Chart

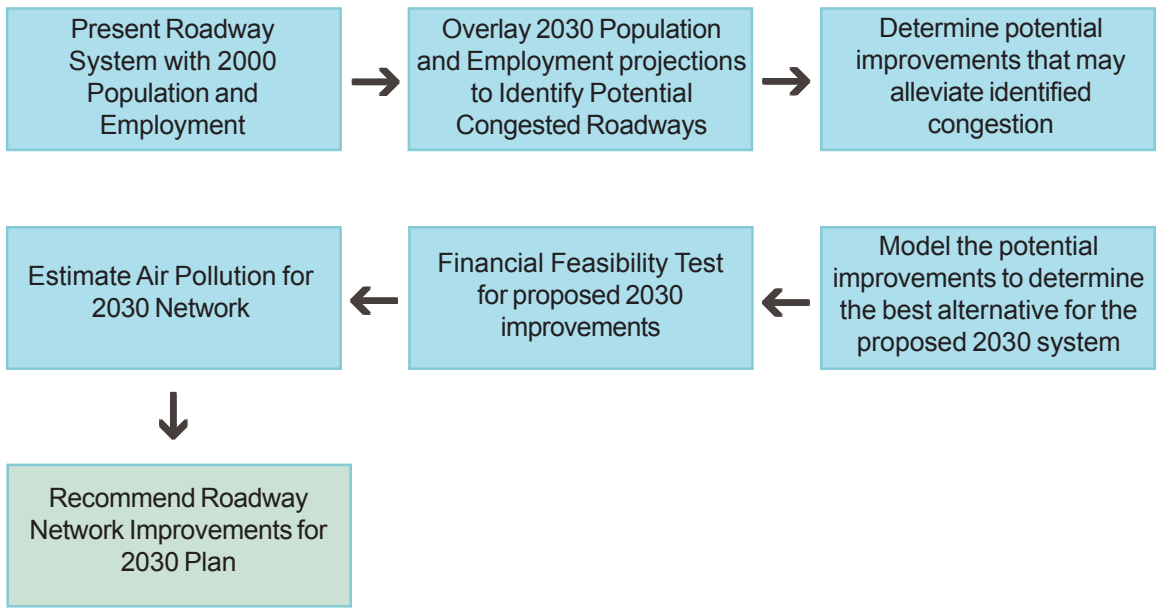
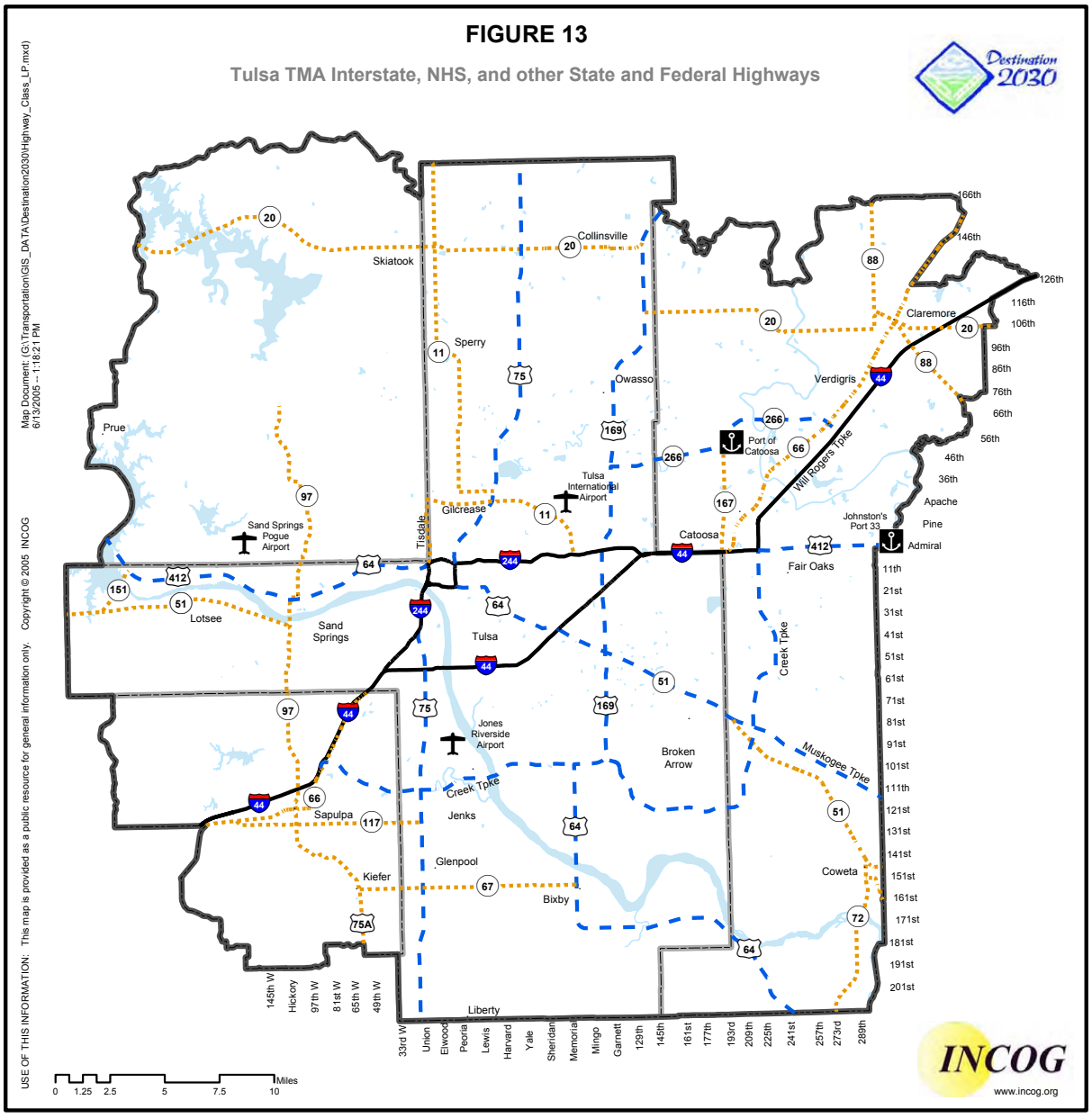


FIGURE 13

Tulsa TMA Interstate, NHS, and other State and Federal Highways



The Tulsa central business district is well-connected, with expressways radiating out from all directions. Southeast from downtown, 2 primary circumferential loops are constructed to serve as expressways. Several area expressways connect suburban communities with downtown Tulsa and other major shopping and industrial districts.

The arterial street system is essentially laid out on a 1 mile grid following township/range section lines that run east-west and north-south. Most of the arterial system is built on the section lines, and the Expressway system is built to provide faster routing for longer area trips and to complement the arterial system.

The TMA has adopted a Congestion Management System (CMS) plan for the region using two indicators for local, recurring congestion: Volume to Capacity Ratio and Observed Travel Speeds. Based on these two indicators, local expressways and arterials were mapped to identify congested corridors within the TMA (*Congestion Management System* map, Page 27). The plan recommends evaluating the congested corridors at regular intervals to measure results of improvements and to plan for additional improvements.

The Tulsa area expressway system carries some of the heaviest traffic in the state of Oklahoma. A few expressways with current and forecasted traffic volumes are shown in *Table 1*. Approximately 21 million vehicle miles of travel (VMT[1]) occurred daily in 2000 on TMA roadways. Expressways carry approximately 39% of the total VMT. The increases in trips per household and non-work trips have grown considerably over the years, outpacing the increase in population and employment. In other words, the same population and employment base come to support increased vehicular travel as well as the burden that comes with maintaining the higher usage of facilities.

A comparison of the 2000 and the 2030 roadway system characteristics are shown in *Table 2*.

TABLE 1

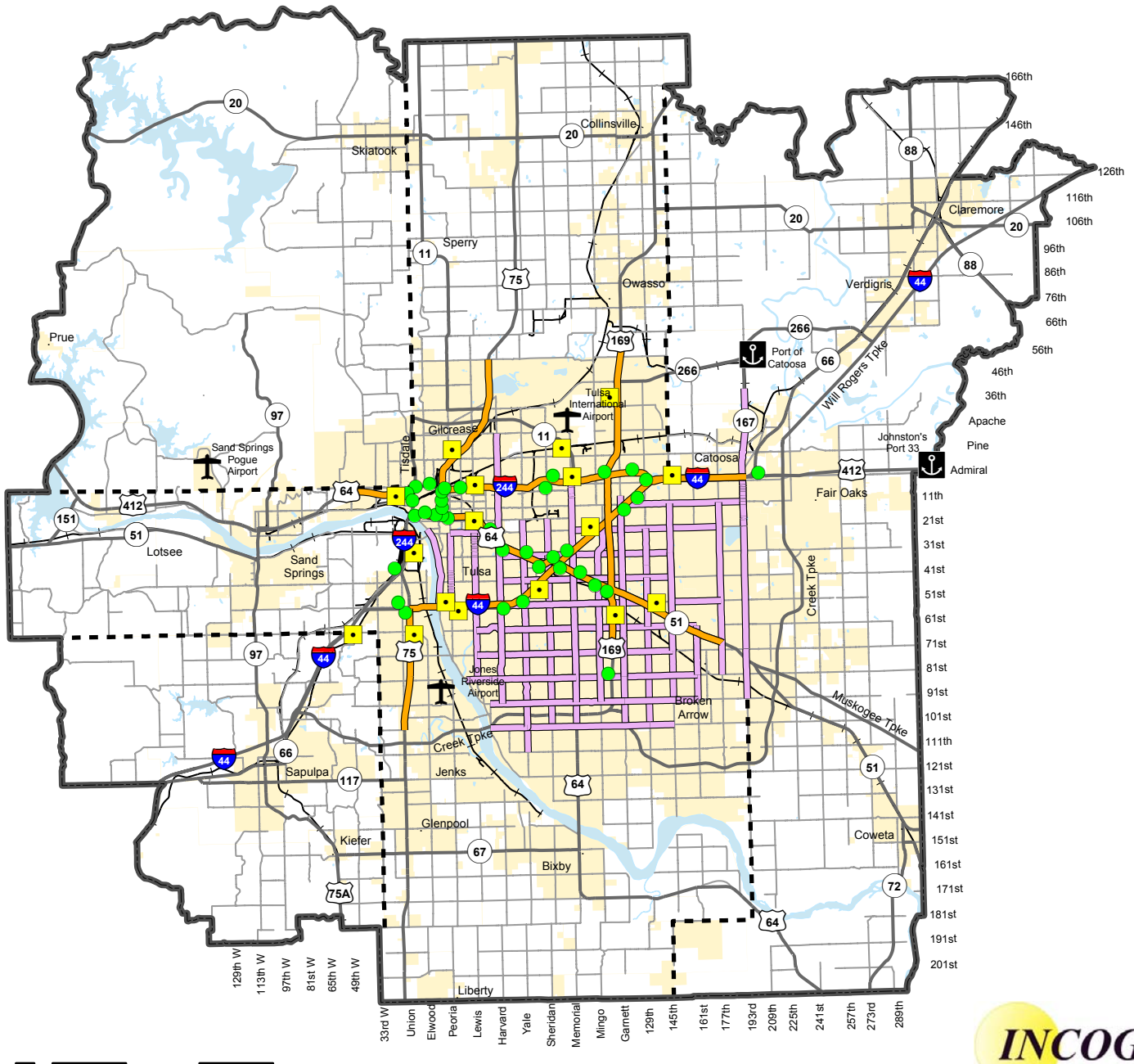
Tulsa Area Expressways: Current Traffic Counts and 2030 Forecast

Expressway Segment	Current Traffic*	2030 Forecast Traffic*
US-64/SH-51 Broken Arrow Exp. (21st St. to Harvard Ave.)	112,000	123,000
US-169 (51st St. to 61st St.)	114,000	140,000
I-244 (SH-11 to US-169)	103,000	122,000
I-44 (Harvard Ave. to Yale Ave.)	81,000	120,000
US-64/SH-51 Broken Arrow Expressway (I-44 to US-169)	90,000	143,000
I-44 (177th E Ave. to 193rd E Ave.)	76,000	110,000
US-412/US-64 (33rd W Ave. to Downtown Tulsa)	72,000	76,000
US-75 (I-44 to 61st St. South)	49,000	80,000
US-75 (36th St. North to 56th St. North)	41,000	82,000

*Source: City of Tulsa (*2002/03 traffic is a weekday traffic count unadjusted for seasonal or other factors) and INCOG (2030 traffic is an average weekday forecast volume of traffic).*

[1] Vehicle Miles of Travel (VMT) is a measure of travel obtained by multiplying the total volume of traffic with the average distance traveled by using an automobile.

Congestion Management System



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- Existing and Planned Video
- Existing and Planned Video and Dynamic Message Signs
- Congested Highways
- Congested Arterials
- Highways
- Arterials
- Rail
- County Boundary
- Corporate Limits
- Transportation Management Area

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Map Scale - 1:410,000

Location Map

TABLE 2
Roadway System Characteristics and Performance

		2000 (Base Year)	2030	Difference	Percent Change
Lane Miles					
	Expressways	872	966	94	10.7%
	Turnpikes	286	300	14	4.8%
	Arterial Streets	8,815	10,015	1,200	13.6%
	Total Lane Miles	9,973	11,281	1,308	13.1%
Travel					
	Vehicle Miles/Day	21,209,000	28,172,000	6,963,000	36.14%
	Vehicle Hours/Day	576,000	750,000	174,000	30.2%
	Average Speed (mph)	36.8	37.5	0.7	1.9%

THE 2030 PLAN FOR ROADWAYS

The development of a roadway plan has been a coordinated process involving focus group sessions and extensive consultation with community representatives and other policymakers in the region. Based on that input, the community's priorities concerning roadways are increases in maintenance, safety, and the efficiency of the system. Congestion is a concern, but it appears the public believes that addressing these priority issues will help congestion in the process.

Since 2000, several significant changes have occurred in the TMA with regard to planned roadway improvements. The opening of the Creek Turnpike from the Turner Turnpike to the Will Rogers Turnpike is a major advancement in that regard. Also, initiation of the Gilcrease North Expressway and planning on the Gilcrease West and Gilcrease Northwest essentially leaves few new alignments to consider in the TMA for the near term. In addition, progress was made in expanding a number of heavily congested two-lane arterial streets, including several South Tulsa and Broken Arrow streets.

The roadway facilities planned for the year 2030 are shown in *2030 Roadways Plan* map on Page 21. The system reflects 94 new expressway lane-miles and 1,200 new arterial lane-miles. The LRTP shows completion of the expressway system with construction of the Gilcrease Northwest Expressway, expansion of portions of I-44/US-412 and US-169 to 8 lanes, expanding I-44 and portions of US-169 and US-75 to 6 lanes, and reconstruction of 6 major interchanges (including I-44 and US-64/SH-51, I-44 and US-169, I-44 and SH-66, I-244 and US-412/US-64 at the Northwest corner of the Inner Dispersal Loop, I-44 and US-75, and US-169 and US-64/SH-51).

The expressway recommendations include the improvements identified in existing engineering designs, functional plans, or environmental clearance documents where appropriate. Riverside Parkway is identified as a Scenic Parkway to be designed and rebuilt to ensure safe passage for motorists, specifically where lane width and sight distance are inadequate. Numerous area arterials are recommended for expansion to 4 through lanes; Yale Avenue and Memorial Drive will need to be expanded to 6 lanes from US-64/SH-51 (Broken Arrow Expressway) to the Creek Turnpike and SH-67/151st Street, respectively. US-64/SH-51 (Broken Arrow Expressway) east of I-44 was modeled to accommodate auxiliary lanes as built, which helps to ease congestion substantially.

In addition, the LRTP recommends reconstruction of the 2 highway-to-highway interchanges along the US-64/SH-51 (Broken Arrow Expressway) corridor, which should also

help alleviate congestion. The third and most important recommendation along the corridor would be to conduct an in-depth feasibility study during the period of the plan for a multimodal facility incorporating commuter transportation options.

The travel demand along the proposed L.L Tisdale/Osage Expressway corridor has not proven to warrant the construction of an expensive freeway in this planning period. The Black Dog Trail Road/North 41st West Avenue/North 52nd West Avenue has been recommended to be improved to 4 lanes to connect with the planned Gilcrease Expressway in the northwest quadrant of the planning area. This facility will provide the much-needed connection to Skiatook, and therefore the Osage Corridor is identified as a future corridor for the purpose of this LRTP.

The cost to build the Osage Expressway is not taken into consideration in the financial feasibility portion of the LRTP since its implementation is not warranted during this planning period based on the underlying assumptions included in this LRTP.

Three additional bridge crossings of the Arkansas River are recommended at the Gilcrease Expressway in the vicinity of 57th West Avenue, 41st Street South, and Yale Avenue to Yale Place. See *Table 3* for a complete list of roadway improvements. Daily Vehicle Miles of Travel are forecast to increase from approximately 21.2 million in 2000 to 28.2 million in 2030. The roadway system, when completely built as planned for 2030, will experience less congestion than in 2000.

Congestion is relative. Tulsa, when compared with many major metropolitan areas, has limited congestion. The congestion in Tulsa is essentially very short term over busy travel hours. Arterials and expressways during peak hours show considerable slow down in vehicular speeds. Recurring congestion does not extend beyond a half-hour period on any major street, as evident from many travel speed studies conducted by INCOG over the last decade. Nonrecurring congestion does occur due to crashes on highways and city streets, and construction-related congestion is also evident.

The TMA adapted 2 specific measurable congestion indices with respect to volume and travel speed since the advent of metropolitan area management systems. The congested roadways, identified using the 2 adapted measures for the TMA, are discussed later in this element.

As the roadway system ages and anticipated maintenance needs increase, timely roadway maintenance has become a growing priority for the region, particularly regarding I-244, the Inner Dispersal Loop around downtown, and the numerous bridges throughout the region. The financial element (*Chapter 6*) discusses the capital, operating, and maintenance costs for the recommended roadway system.

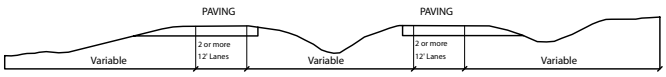
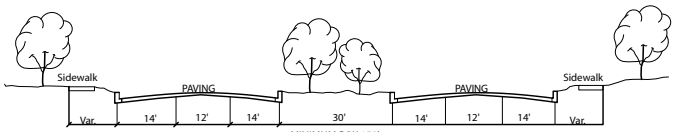
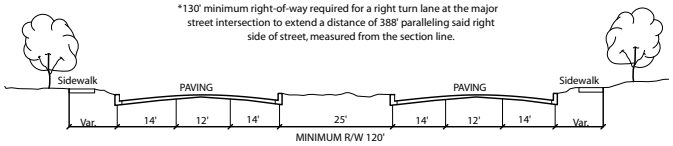
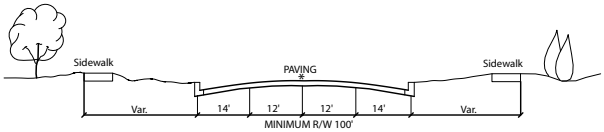
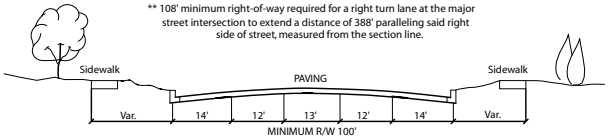
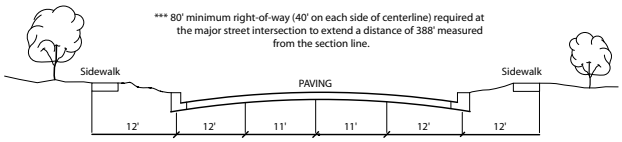
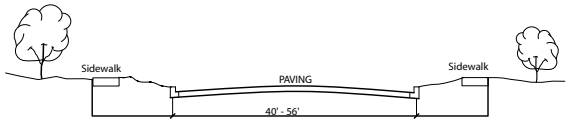
There are several maintenance priorities in the region that have become evident over the past decades. Apart from clearly marked and identified needs for reconstructing 6 major interchanges, a few of the expressways need reconstruction within the 2030 plan horizon. I-244 and the Inner Dispersal Loop are the 2 facilities that need immediate attention. Costs to rebuild these 2 facilities have been considered in the financial section of the plan.

The Tulsa Region possesses a well-coordinated comprehensive land-use plan element that addresses roadways in the form of the *Major Street and Highway Plan* (MSHP). The MSHP identifies the ultimate build-out for roadways as adopted by each of the communities represented in the plan. The MSHP is considered a guiding document for any LRTP recommendations.

For the purposes of environmental streamlining and economic feasibility analysis, the recommended capacity improvements for the LRTP will have the same standards of development identified in the MSHP typical cross sections. These 2030 capacity improvements and typical cross sections are cross-referenced as shown in *Figure 14.*

FIGURE 14

Roadway Cross Sections as Adopted by the MSHP (recommended for all capacity improvements identified in the LRTP)

ROADWAY	LANES	DIAGRAM
FREEWAY/ EXPRESSWAY	Expressways 4 - 8 Lanes	 AS PER OKLAHOMA DEPARTMENT OF TRANSPORTATION STANDARDS
PARKWAY	Arterials 6 Lanes	 MINIMUM R/W 150'
PRIMARY ARTERIAL	Arterials 6 Lanes	 MINIMUM R/W 120'
SECONDARY ARTERIAL	Arterials 4 Lanes	 MINIMUM R/W 100'
SECONDARY ARTERIAL ALTERNATE	Arterials 5 Lanes	 MINIMUM R/W 100'
URBAN ARTERIAL	Arterials 4 Lanes	 MINIMUM R/W 70'
COMMERCIAL/ INDUSTRIAL COLLECTOR	Arterials 2 - 3 Lanes	 MINIMUM R/W 80' COMMERCIAL/INDUSTRIAL STREET WITH OPEN DRAINAGE (COUNTY) CENTRAL BUSINESS DISTRICT STREET

ROADWAY SYSTEM ISSUES AND ACTIONS

The automobile continues to dominate the transportation system and thus continues to be a major investment issue. The TMA roadways have benefited from construction undertaken over the past decade by the Oklahoma Transportation Authority (OTA), the Oklahoma Department of Transportation (ODOT), and numerous successful municipal general obligation bond issues and sales tax funded capital improvement programs in conformance with the region's LRTP. The expressway facilities in the region are nearly fully developed, with the major capital investments now shifting to eliminating the bottlenecks at major interchanges and greater investment in the maintenance and operating efficiency of the system.

Air quality in the TMA has also been a concern, especially since 1998. The Tulsa region went through a phase of detrimental weather patterns followed by successive years of mild weather, and currently the threat of nonattainment designation seems to have diminished somewhat. A proactive approach by the region in working on an interim plan with the EPA to develop an Early Action Compact (EAC) has been successful. The specific modeling efforts that were undertaken since 2002 have demonstrated that the region can be successful in avoiding the nonattainment designation, particularly with a successful public involvement campaign aimed at minimizing pollution. Even as air quality improved over the past decade it seems likely that the area will continue to be challenged in meeting the 8 hour ozone standard, particularly if there is a pattern of bad weather.

The combination of the successful *Ozone Alert!* program, increased activity with the region's public transportation system, and limited funding for building or expanding roadways should cause the region's citizens and leaders to focus more attention on developing benign travel-demand management alternatives. Transportation system management will also continue to be a key priority for the region with improved signalization, more express bus routes, park-and-ride locations, and other mass transit options.

Safety will be a top priority for the region as well, with focus on applying technology to improve system efficiency, user education, and law and regulation enforcement. Also, the Intelligent Transportation System (ITS) Architecture, developed in 2003, and the adopted ITS Implementation Plan will increase safety and help alleviate the region's congestion with less emphasis on further capacity expansion.

Regional Connections

The economy of the TMA, to a large extent, relies on effective connections with other urban and rural markets. The TMA is well-connected, with roadways to surrounding regions and states. To build on the current level of service and to expand opportunities as available is appropriate and necessary.

- Support roadway maintenance activities by all agencies involved to ensure reliability and adequate service level with respect to grade crossings and bridges
- Encourage development and improvement of key metropolitan roadway linkages to Kansas City and Dallas to achieve an improved level of service
- Support a detailed Major Investment Study, in cooperation with ODOT and/or OTA and the Kansas DOT, of a direct route connecting Tulsa with Wichita, Kansas and the I-70 corridor to the northwest
- Encourage development and real-time dissemination of information related to connections and education regarding Tulsa area services to through-travelers, including truckers

Environmental Sensitivity

Quality of life in the long term is affected by the region's concern for environmental quality. Vehicular pollution should be addressed in the primary context of automobiles and efficiency. Fuel-efficient, less-polluting automobiles are possible with the advent of improving and new technology. It is also important to address the problem with a more complete range of transportation alternatives including removal of bottlenecks, completion of the area expressway and arterial systems, alternative fuels, and alternative modes of travel. Land use plays a primary role in such decision-making. The following are recommended actions for promoting environmental opportunities and further enhancing livability in the region.

- Encourage and support the region's award-winning *Ozone Alert!* program in its efforts to educate stakeholders and the public and to influence public policy that addresses health concerns related to vehicular pollution
- Support increased public education related to flexible work schedules, alternative modes of travel, and a competitive transit alternative
- Promote nonmotorized modes of travel including bicycling and walking
- Support efforts to alleviate noise impacts with improved facility design that is compatible with land use and mitigation of construction-related noise
- Minimize environmental impacts to wetland acreage and disruptions to wildlife and encourage consideration of environmental impacts due to any changes in the transportation system
- Reduce visual impacts of roadway facilities to help improve aesthetics by planting trees in the roadway rights-of-way, placing electrical power lines underground, and encouraging designs that are aesthetically appealing and conducive to urban environments
- Minimize roadway impacts to neighborhoods, commercial areas, industrial sites, cultural centers, and other establishments, both existing and planned, and encourage consideration of future transportation system plans in land use decision-making
- Encourage employment location centers to develop around the existing transportation infrastructure
- Involve the private sector and other stakeholders in making land-use and transportation decisions
- Coordinate land development and transportation infrastructure development and investigate opportunities to involve the private sector in cost-effective development practices
- Minimize displacement of residents and businesses in implementing the LRTP through corridor studies and environmental review

Congestion

In 2000, approximately 30% of the vehicle miles traveled in the TMA occurred on congested roadways. Congestion will continue to worsen if the area lags behind in investment and expansion to meet the future demand. Lost time in traffic will not only cause loss in economic productivity but also will decrease driver judgment and increase driver stress. The following actions are recommended.

- Support funding for roadway expansion as appropriate to address existing and anticipated congestion
- Actively seek funding to eliminate bottlenecks, particularly at expressway-to-expressway interchanges, identified and prioritized by regional stakeholders
- Support incident-management programs with the aid of local law enforcement agencies to reduce incident-related travel delays
- Periodically review and revise the congestion management system plan for the TMA to identify and review recurring and nonrecurring congestion issues
- Promote utilization of flexible work schedules, carpool and vanpool programs, and other alternative modes of travel
- Continue to enhance roadway capacity with technology initiatives, such as deployment of Intelligent Transportation Systems, by requiring corridor studies to consider ITS as an integral part of building a roadway

Technology Options

Intelligent Transportation Systems will provide drivers with adequate information to plan a trip and ensure safer and quicker travel. Roadways, as a static infrastructure, need to evolve to be dynamically linked with user needs. The majority of urban areas in the country are moving forward with ITS implementation, providing variable message signs, video monitoring of incidents, dispatch of emergency personnel in real time to incident locations, and alternative transportation routes to motorists. The shrinking share of resource spending on capacity expansion will compel transportation policy to expand or use capacity in a more effective manner. ITS deployment will begin with a simple road map to include all stakeholders involved and development of a comprehensive ITS strategic plan, also called ITS Architecture, for the region.

- Implement the newly developed ITS Strategic Plan (*Tulsa Intelligent Transportation Systems Architecture, 2003*) for the TMA with input from roadway users and stakeholders
- Actively pursue the development of a regional Traffic Management Center
- Develop a list of potential ITS projects and support agencies in capacity building
- Utilize technology to provide real-time information to users about roadway conditions including incidents, construction and major events

Integration with Other Modes

Personal transportation modes such as bicycling, walking, transit, and carpooling often interact with automobile transportation. Roadways need to be designed and maintained to accommodate all modes of transportation.

- Strongly encourage and support development of park-and-ride facilities along major travel corridors
- Support provision for bicycle/pedestrian facilities in all projects from the planning stage through final design
- Maintain and improve truck routes to rail, waterway, and air terminals/facilities
- Incorporate Intelligent Transportation Infrastructure Technology options to integrate the use and function of each transportation mode

Safety

- Pursue a region-wide accident investigation task force, comprised of professionals with a commitment to improving intersections at high collision locations, to study causes; also encourage the use of standard designs for intersections throughout the TMA
- Maintain the existing roadway systems; coordinate performance measures monitored by various entities in the region
- Study and report collisions to the public in an effort to bring attention to specific problem areas
- Support federal and state road safety education programs in ways that improve public communication and comprehension
- Encourage enforcement of existing traffic regulations, including speed limits, along with the newly adapted quick-clearance legislation
- Address appropriate driving education for youth and elderly to enhance safety
- Improve signage to accommodate an aging population and support consistent traffic signage on roadways and intersections throughout the region
- Support adequate lane width standards and provision of safer shoulders in the TMA
- Encourage expansion and enhancement of an incident management program including courtesy patrols on major expressways
- Investigate truck-related safety issues and railroad crossings for improved safety consideration

TABLE 3
LRTP Recommended Roadway Capacity Improvements

EXPRESSWAYS		Through Lanes
I-44	I-44/I-244 Junction to SH-66	8 Lanes
I-44	Arkansas River to Sheridan Rd.	6 Lanes
I-44 (east)	SH-66 to Creek Turnpike	6 Lanes
I-44/Turner Turnpike	SH-97 to Creek Turnpike	6 Lanes
I-44 (west)	I-244 to US-75	6 Lanes
US-169	I-244 to 71st St. South	8 Lanes
US-169	I-244 to SH-20 (116th St. North)	6 Lanes
US-169	91st St. South to Memorial Drive	6 Lanes
US-75	I-44 to SH-67 (151st St. South)	6 Lanes
US-75	SH-11 (Gilcrease Exp.) to 86th St. North	6 Lanes
US64/SH-51 (Broken Arrow Exp.)	71st Street South to Muskogee Turnpike	6 Lanes
Gilcrease Expressway	I-44 to Lewis Ave.	4 Lanes
Creek Turnpike	Arkansas River to Memorial Drive	6 Lanes

EXPRESSWAY INTERCHANGE RECONSTRUCTION
I-44 and US-64/SH-51 (Broken Arrow Expressway)
I-44 and US-169
I-44 and SH-66 (east)
I-44 and US-75
I-244 and US-412/US-64 at the northwest corner of the Inner Dispersal Loop
US-169 and US-64/SH-51 (Broken Arrow Expressway)

GRADE-SEPARATED INTERCHANGE CONSTRUCTION
I-44 and 145th East Ave.
I-44/Turner Turnpike and Hilton Rd. (96th St. South)
US-75 and 116th St. North
US-75 and 111th St. South
US-75 and 141st St. South
US-412 and 305th East Ave. (US 412P)
Blue Starr Road and SH-66/BNSF Railroad (Claremore)

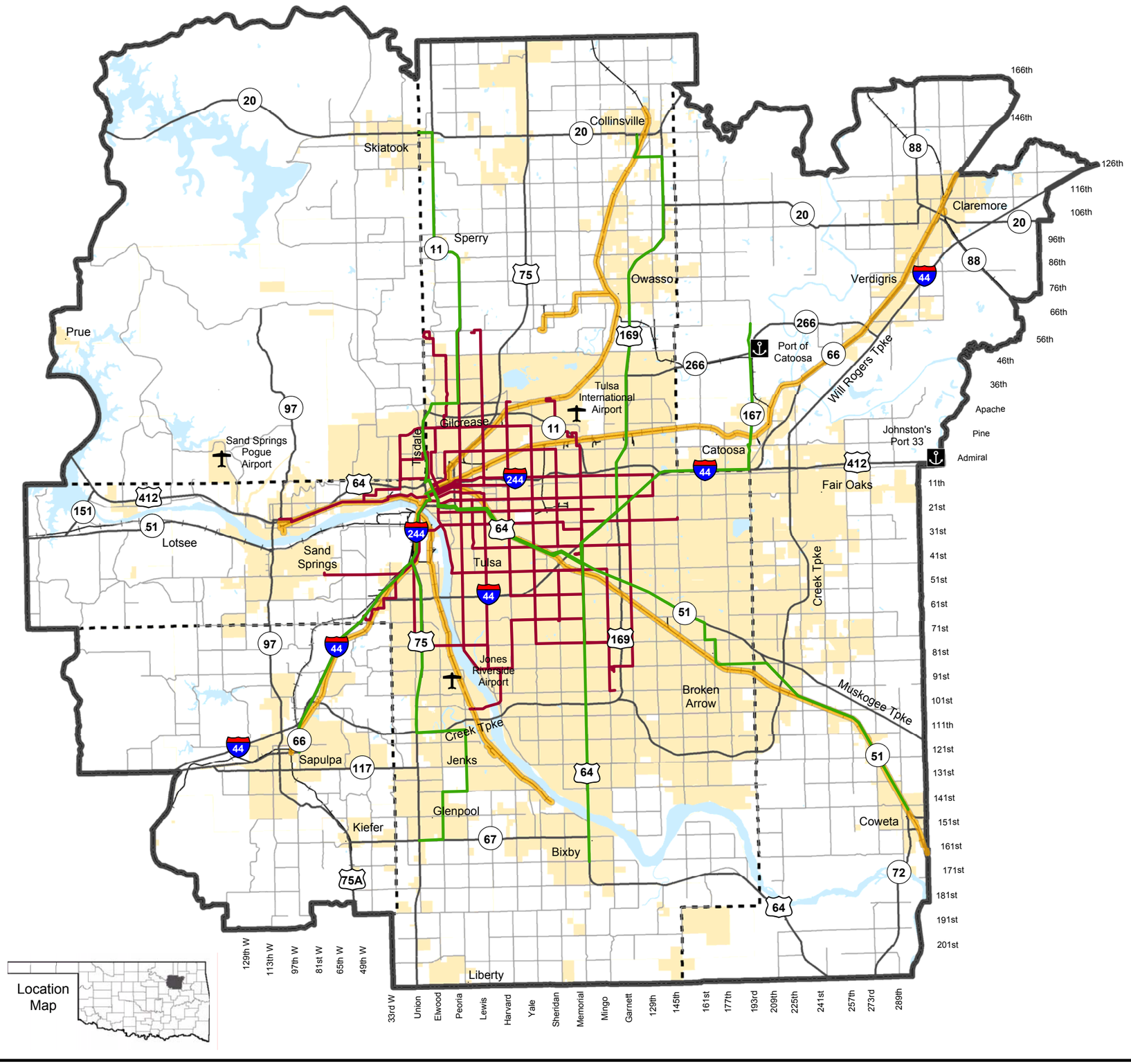
ARTERIALS		THROUGH LANES
SH-20	US-169 to I-44/Will Rogers Turnpike	4 Lanes
SH-20	SH-66 to SH-88	4 Lanes
SH-20	US-75 to US-169	4 Lanes
SH-66	SH-33/SH-66 to SH-97/Main St.	4 Lanes
SH-72	SH-51 to 161st St. South	4 Lanes
SH-88	Blue Starr Rd./116th St. North to SH-20	4 Lanes
SH-97	Existing SH-97 to SH-20	2 Lanes
SH-97	2nd St. to 12th St.	4 Lanes
SH-97T East	SH-97 to Old North Rd.	2 Lanes
SH-97/Wilson Rd.	2nd St. to Morrow Rd.	6 Lanes
SH-167/193 East Ave.	I-44/US-412 to SH-266	4 Lanes
SH-266	US-169 to SH-167/193rd East Ave.	4 Lanes
SH-266	SH-167 to I-44/Will Rogers Turnpike	4 Lanes
11th St. South	129th East Ave. to 145th East Ave.	4 Lanes
12th St.	SH-97 to Adams Rd.	4 Lanes
25th West Ave.	Edison Rd. to Pine St.	4 Lanes
31st St. South	Garnett Rd. to 145th East Ave.	4 Lanes
33rd West Ave.	61st St. South to 71st St. South	4 Lanes
33rd West Ave.	41st St. South to I-44	4 Lanes
36th St. North	Cincinnati Ave. to Osage Dr.	4 Lanes
41st St. South	Garnett Rd. to 177th East Ave.	4 Lanes
41st St. South	33rd West Ave. to 65th West Ave.	4 Lanes
41st St. South	Yale Ave. to Sheridan Rd.	6 Lanes
41st St. South	Riverside Dr. to 33rd West Ave. (incl. River bridge)	4 Lanes
41st West Ave.	Apache St. to Newton Rd.	2 Lanes
43rd St. North	Black Dog Trail Rd. (N. 41st - 52nd West Ave.) to SH-97	2 Lanes
49th West Ave.	Creek Turnpike to 91st St. South	2 Lanes
49th West Ave.	61st St. South to I-44	4 Lanes
49th/41st West Ave.	Edison Rd. to Newton Rd.	4 Lanes
51st St. South	Garnett Rd. to 145th East Ave.	4 Lanes
61st St. South	Riverside Dr. to Harvard Ave.	4 Lanes
61st St. South	145th East Ave. to 193rd East Ave.	4 Lanes
61st St. South	US-75 to 49th West Ave.	4 Lanes
71st St. South	225th East Ave. to 273rd East Ave.	4 Lanes
71st St. South	33rd West Ave. to US-75	4 Lanes
71st St. South	US-75 to Arkansas River	6 Lanes
76th St. North	US-169 to 129th East Ave.	4 Lanes
81st St. South	Lewis Ave. to SH-51	4 Lanes
81st St. South	SH-66 to SH-97	4 Lanes

ARTERIALS - Continued		THROUGH LANES
86th St. North	20th West Ave. to Cincinnati Ave.	2 Lanes
86th St. North	US-75 to US-169	4 Lanes
86th/91st St. South/Canyon Rd.	49th West Ave. to SH-66	4 Lanes
91st St. South	Delaware Ave. to 193rd East Ave.	4 Lanes
91st St. South	Elwood Ave. to Peoria Ave./Elm St.	4 Lanes
96th St. North	US-169 to 145th East Ave.	4 Lanes
96th St. North	Memorial Dr. to Garnett Rd.	4 Lanes
96th St. South	US-75 to Peoria Ave./Elm St.	4 Lanes
101st St. South	Riverside Drive to SH-51	4 Lanes
103rd/106th St. North	Osage Dr. to Cincinnati Ave.	2 Lanes
106th St. North	US-169 to 145th East Ave.	4 Lanes
106th St. South	161st West Ave. to 153rd West Ave.	2 Lanes
111th St. South	Yale Ave. to Garnett Rd.	4 Lanes
116th St. North	US-75 to US-169	4 Lanes
121st St. South	Riverside Drive to SH-51	4 Lanes
129th East Ave.	21st St. South to 121st St. South	4 Lanes
129th East Ave.	76th St. North to 96th St. North	4 Lanes
131st St. South	Peoria Ave./Elm St. to Yale Pl.	4 Lanes
141st St. South	193rd East Ave. to SH-51	4 Lanes
141st St. South	Elwood Ave. to Peoria Ave./Elm St.	4 Lanes
145th East Ave.	I-44 to 41st St. South	4 Lanes
145th East Ave.	71st St. South to 121st St. South	4 Lanes
145th East Ave.	76th St. North to 126th St. North	4 Lanes
145th East Ave.	41st St. South to 71st St. South	6 Lanes
153rd West Ave.	106th St. South to 111th St. South	2 Lanes
161st East Ave.	Admiral Pl. to Tiger Switch Rd.	4 Lanes
161st East Ave.	51st St. South to 61st St. South	4 Lanes
161st East Ave.	111th St. South to 131st St. South	4 Lanes
177th East Ave.	51st St. South to 101st St. South	4 Lanes
193rd East Ave.	I-44 to 121st St. South	4 Lanes
241st East Ave.	101st St. South to 141st St. South	4 Lanes
Adams Rd.	10th St. South to 12th St. South	4 Lanes
Admiral Pl.	Garnett Rd. to 129th East Ave.	4 Lanes
Admiral Pl.	145th East Ave. to Creek Turnpike	4 Lanes
Anderson Rd.	177th West Ave. to Shell Creek Rd.	2 Lanes
Armstrong Rd.	Memorial Dr. to Riverview Rd.	4 Lanes
Delaware Ave.	81st St. South to 91st St. South	4 Lanes
Elwood Ave.	SH-67/151st St. South to 141st St. South	4 Lanes
Elwood Ave.	96th St. South to 111th St. South	4 Lanes
Black Dog Trail Rd. (N. 41st - 52nd W Ave.)	Gilcrease Expressway to SH-20	4 Lanes

ARTERIALS - Continued		THROUGH LANES
Garnett Rd.	116th St. North to 86th St. North	4 Lanes
Garnett Rd.	11th St. South to Pine St.	4 Lanes
Garnett Rd.	81st St. South to 111th St. South	4 Lanes
Harvard Ave.	91st St. South to 101st St. South	2 Lanes
Harvard Ave.	61st St. South to 91st St. South	4 Lanes
Lewis Ave.	81st St. South to 91st St. South	4 Lanes
Memorial Dr.	161st St. South to Mingo Rd.	4 Lanes
Memorial Dr.	I-44 to 151st St. South	6 Lanes
Mingo Rd.	21st St. South to 41st St. South	4 Lanes
Mingo Rd.	71st St. South to 121st St. South	4 Lanes
Peoria Ave.	61st St. South to Riverside Dr.	4 Lanes
Peoria Ave./Elm St.	91st St. South to SH-67/151st St. South	4 Lanes
Pine St.	SH-11/Gilcrease Expressway to SH-66	4 Lanes
Pine St.	25th West Ave. to Union Ave.	4 Lanes
Pogue Airport Access Rd.	SH-97T to Airport Rd.	2 Lanes
Port Rd. Extension	SH-11 to Sheridan Rd.	4 Lanes
Riverside Dr.	101st St. South to 121st St. South	4 Lanes
Riverside Dr.	I-44 to 101st St. South	6 Lanes
Riverside Dr. (Scenic Parkway)	Houston Ave. to I-44	4 Lanes
Sheridan Rd.	Apache St. to 36th St. North	4 Lanes
Sheridan Rd.	81st St. South to 101st St. South	4 Lanes
Union Ave.	51st St. South to 91st St. South	4 Lanes
Wekiwa Rd.	SH-97 to 129th East Ave.	4 Lanes
Yale Ave.	101st St. South to 121st St. South	4 Lanes
Yale Ave.	Pine St. to Apache St.	4 Lanes
Yale Ave.	US-64/SH-51 (Broken Arrow Exp.) to I-44	6 Lanes
Yale Ave.	61st St. South to 101st St. South	6 Lanes
Yale Ave./Yale Pl.	121st - 131st St. South (incl. River bridge)	4 Lanes

PUBLIC TRANSPORTATION

Chapter 3



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2030 Public Transportation Plan

- Planned Urban Routes
- Planned Suburban Routes
- Commuter Corridor Study Areas
- Highways
- Arterials
- Rail
- County Boundary
- Transportation Management Area
- Corporate Limits

N W E S

INCOG
www.incog.org

0 0.5 1 2 3 4 Miles

Map Scale - 1:275,000

INTRODUCTION

Public transportation is a critically important element of the transportation system that expands capacity and options, and addresses the needs of a growing and aging population. The enhancement of the area's transportation network and the strategic development of a multimodal system will not only respond to the needs of the economically disadvantaged, transit-dependent population, but will also benefit the overall population by providing affordable, safe and convenient transportation alternatives that help alleviate congestion, conserve energy resources, and improve air quality.

The public transportation element of the *Destination 2030* Long Range Transportation Plan (LRTP) reviews the existing conditions of transit in the Tulsa Transportation Management Area (TMA) and recommends the expansion of the system (*2030 Public Transportation Plan* map, Page 41), a step fundamental to the implementation of the LRTP goals and policies for the Tulsa Region. During a public outreach process spanning 3 years, TMA residents named and prioritized transit element recommendations to be included in the LRTP. The resulting priorities are listed below.

Resident Priorities

1. Implement a dependable public transportation system that provides greater frequency of service
2. Secure dedicated funding for public transportation in the region
3. Provide for transit infrastructure in land-use development
4. Improve and increase public transportation facilities (bus shelters, bike racks, security, and electronic fare collection)
5. Increase public education regarding the availability of transit service
6. Greatly increase suburban connectivity to the City of Tulsa
7. Promote and develop park-and-ride service and facilities throughout the region
8. Explore and implement commuter/light rail where feasible
9. Consider alternative modes in the transportation system development (carpooling, bike racks on buses, etc.)

EXISTING PUBLIC TRANSPORTATION SERVICES

Historically, the Tulsa region was served by passenger rail and trolley services, but today public transportation service is provided exclusively by bus. Interregional bus service is operated by Greyhound Bus Lines (one of the largest intercity transportation providers in the country), TNM & O, and Jefferson Lines. They operate from a terminal located in downtown Tulsa, providing services from Tulsa to other Oklahoma communities as well as to other states.

Taxi service, an important source of demand-response transportation, is available primarily in Tulsa and Sand Springs, providing mobility for those who may not have other means of transportation available. Rural public transportation is federally subsidized for eligible local transportation providers in rural areas and communities with population less than 50,000 and is available for some communities in the TMA.

Cimarron Public Transit System, a division of United Community Action Program, Inc. located in Pawnee, provides transportation to and from work destinations for Sapulpa citizens. Within the Claremore city limits, transportation is provided by Pelivan Transit Service for health care, shopping, employment, and recreation.

Metropolitan Tulsa Transit Authority's Denver Avenue Station

Within the TMA, bus and paratransit services are operated by the Metropolitan Tulsa Transit Authority (MTTA). The City of Broken Arrow also operates the Broken Arrow Bus System (BABS), a small scale system started in 1998 with 1 bus and 2 vans. BABS provides service to Broken Arrow's Seniors Center, Broken Arrow Neighbors, Department of Human Services (DHS), and the southeast campus of Tulsa Community College. Also included are sites for medical needs, shopping, and other service agencies.

The *Existing Public Transportation System* map on Page 45 shows the current MTTA system.

METROPOLITAN TULSA TRANSIT AUTHORITY

MTTA was formed in 1968 when the City of Tulsa purchased the Tulsa bus system from MK&O, a private operator in Chicago. As a public trust governed by 7 trustees appointed by the Mayor of Tulsa, it is authorized to plan, finance, construct, and operate a public transportation system either within or without the boundaries of the City of Tulsa.

In May 1998, MTTA opened the Denver Avenue Station in downtown Tulsa. With the opening of the Memorial Midtown Station in June 2001, MTTA was able to implement a dual-center system. This approach to transit service allowed buses to transfer outside the downtown area, providing better transportation to the south and east parts of Tulsa. MTTA also has a centralized call center, with the objective of providing customer information, reservations and dispatch for all MTTA services. Information throughout the Public Transportation element of the LRTP was provided by MTTA or INCOG unless otherwise noted.

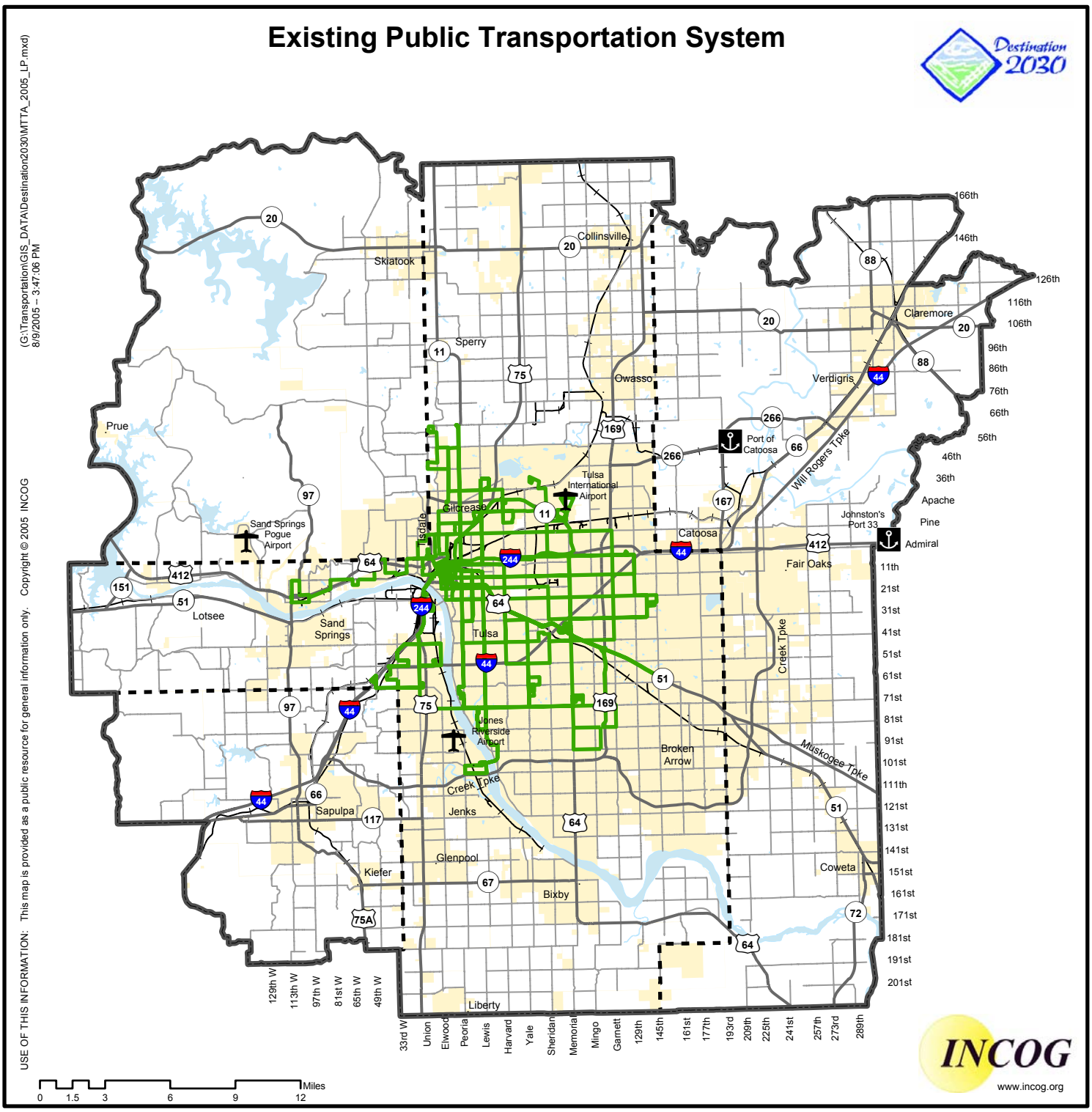
Transit Services

With a fleet of about 100 vehicles, MTTA offers fixed route and paratransit services primarily for most of the City of Tulsa and part of Sand Springs and Jenks. Of these vehicles, 56 traditional transit buses are used for the Fixed Route service. About 32 minibuses/vans and 12 dedicated cars are used for the Lift service. There are approximately 16 fixed routes, 4 nightline routes, and 2 express routes operating 6 days a week. MTTA services consist of the following.

FIXED ROUTE

The fixed route program uses 56 buses. Of these vehicles, 55 traditional buses are used during peak hours and 43 are used during off-peak hours. The service is operated from 5:00 a.m. to 7:00 p.m. on weekdays and 6:30 a.m. to 6:00 p.m. on Saturdays. There is no service on Sundays. Frequency of service varies from route to route, however peak service ranges between 20 - 90 minutes and off-peak ranges from 30 - 120 minutes. The fixed route

Existing Public Transportation System



MTTA Routes

Highways

Arterials

Rail

County Boundary

Corporate Limits

Transportation Management Area

N

W E

S

Map Scale - 1:410,000

Location Map

buses provide service to major employment, shopping and entertainment locations. The buses are also an important element of the *Ozone Alert!* program, providing 50 cent fares on designated days.

LIFT PROGRAM AND PARATRANSIT SERVICES

The Lift Program offers curb-to-curb paratransit service for people with disabilities who are not able to ride a regular fixed-route bus, have been determined ADA Paratransit Eligible, and are 5 years of age or older. This service utilizes lift-equipped mini-buses and taxi cabs. The Lift Program drivers are trained in the special needs of persons with disabilities and can provide help to passengers getting in and out of the vehicle.

Metropolitan Tulsa Transit Authority's Memorial Midtown Station

NIGHTLINES

MTTA operates 4 nightline services from Monday to Friday. These routes cover the north, south, east, and southeast areas of Tulsa. The bus can deviate ¾ of a mile from the route to pick up passengers who make reservations in advance. Service frequency in each route varies from 1 hour and 25 minutes to 2 hours.

HEALTH CARE TRANSPORTATION SERVICES

Low cost curb-to-curb transportation service is provided to medical appointments for low-income individuals who do not have access to an automobile and who are not satisfactorily served by the fixed-route service.

CONTRACTING SERVICES

MTTA contracts with a variety of local businesses and organizations to provide specialized transportation services, tailored to users' needs, depending on vehicle and driver availability. Service is provided to organizations, such as Community Care (HMO/PPO), DHS-TANF, Southern Hills Retirement Village, INDEX, OASIS, Broken Arrow Medical Center, and Healthy Start.

OTHER PROGRAMS

SafePlace Program, offered in conjunction with Youth Services of Tulsa, takes children to a safe place when they feel they are lost or in danger. Kids can catch any bus and ask to be taken to a safe place.

Bonus Bucks Program is offered to companies of all sizes to help their employees pay for transit fares by providing Bonus Bucks transit vouchers. This program allows employers to pay half or all an employee's monthly bus fares and deduct the cost as a business expense.

Reduced Fare Programs are offered to senior citizens (age 62 or older) and persons with disabilities. A special photo ID card is issued, with proof of age and/or disability, which permits holders to use the city bus system at half price. Senior citizens 75 years of age and older can receive free bus rides for life on MTTA's fixed-route bus system.

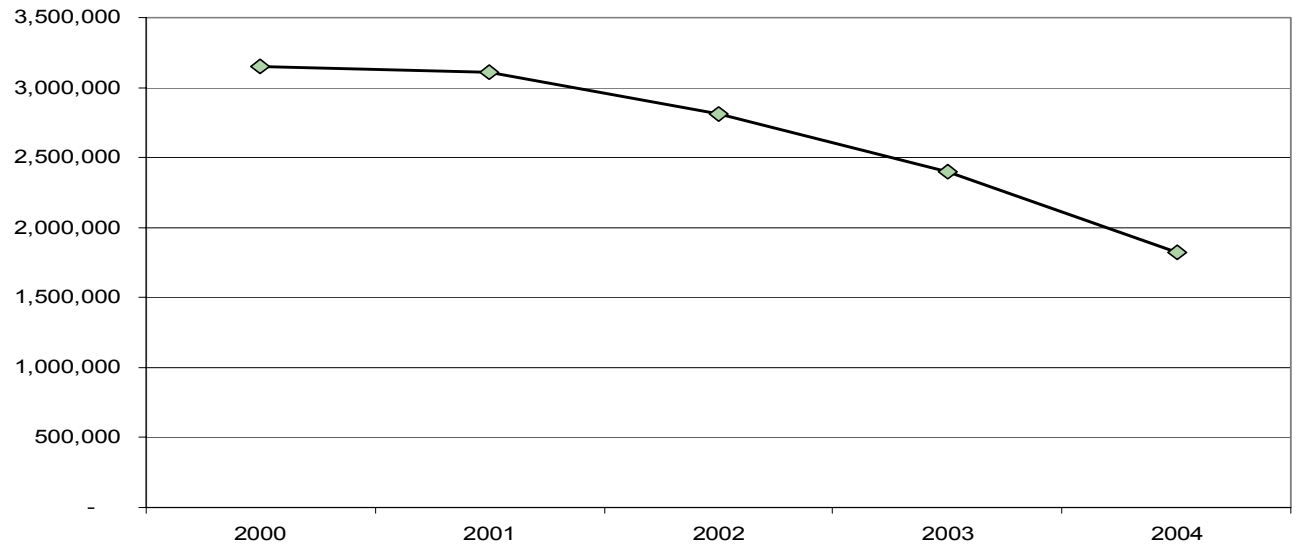
In addition to these public transportation services, INCOG operates *Tulsa Commuter Choice*, a free carpool matching service. A computer system matches customers that live in the same area and have a similar commute. Currently, there are 428 people listed in the database and 63 operating carpools.

Performance Measures

Over the past few years, MTTA ridership has fallen after a period of modest growth. Ridership between 2000 and 2001 was over 3.2 million (*Figure 15*). Economic constraints forced a significant reduction in services implemented in Fall 2002 and Spring 2003. Between 2001 and 2004, MTTA was forced to cut fixed route service hours by almost 50%, and as a result, ridership decreased 41%. Average daily ridership is approximately 6,000 users for the fixed route service and under 650 for the lift service (*Figure 16*).

Another measure of performance is the annual transit vehicle miles of travel, which is the average trip length times the total number of trips. According to MTTA data,

FIGURE 15
MTTA Ridership – 2000 to 2004



from 2000 to 2004, the annual transit vehicle miles of travel decreased 24%, going from 5.17 million to 3.93 million. Total transit vehicle revenue miles decreased from 4.69 million in 2000 to 3.62 million in 2004. The Lift Program only decreased 10% of the total transit vehicle revenue miles from 2000 to 2004, while the fixed route program decreased 30%. Total passenger miles also decreased considerably from 2000 to 2002 when service reductions were implemented (*Figure 17*).

Evaluating costs and revenue can indicate the effectiveness of transit service. According to MTTA data, total operating

FIGURE 16
Daily Average Ridership by Service – 2000 to 2004

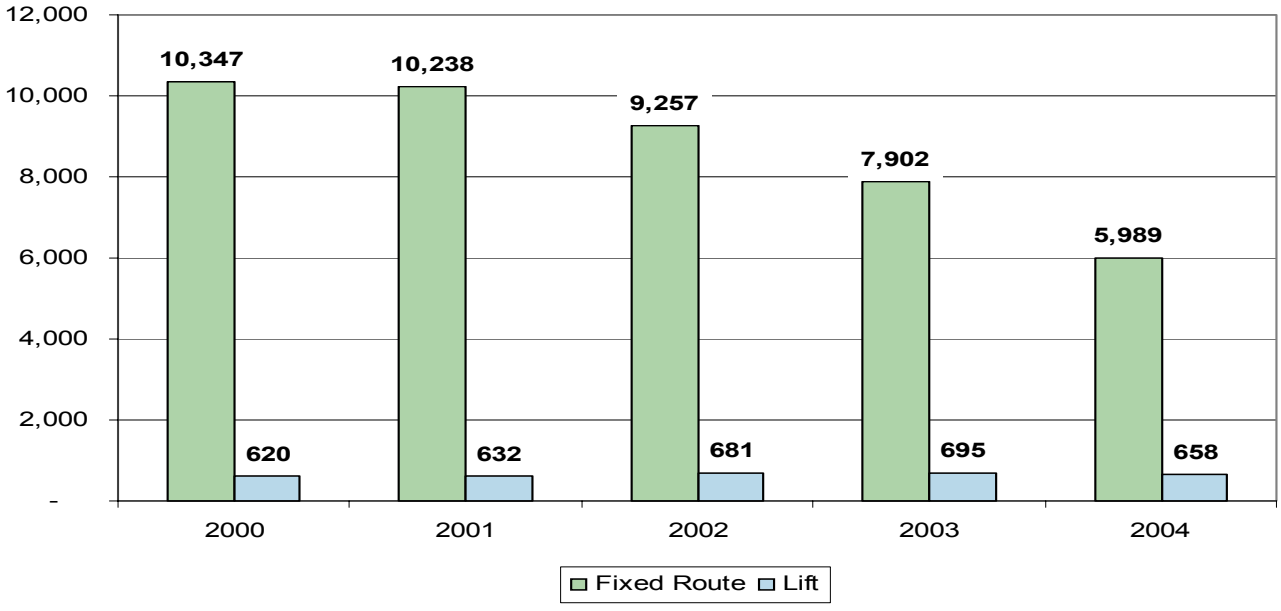
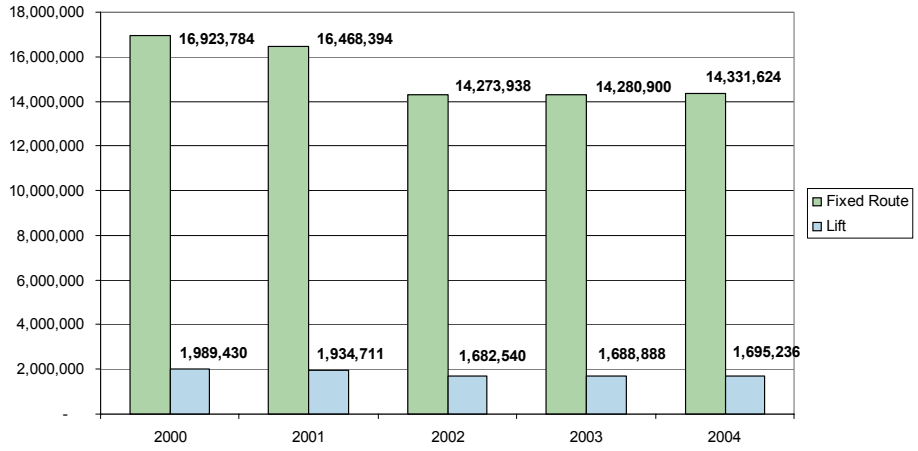


FIGURE 17
Total Passenger Miles by Service – 2000 to 2004



costs for the fixed route service have increased considerably (25%) from 2000 to 2002 and decreased 15% from 2003 to 2004. However, from 2000 to 2004, there was a total increase of 1.37%. The lift service, as well as the nightline service, have remained relatively flat (*Figure 18*). About 72% of the costs are for the fixed-route system and 28% for the Lift Program.

Capital costs have averaged $7.9 million annually. However, in 2001, because of the Midtown Memorial Station construction, capital costs reached $13.2 million.

MTTA has several sources of revenue including fares, advertising, contracts, federal assistance, and City of Tulsa general funds. Total revenues from 2000 to 2004 averaged $16.9 million. From 2000 to 2001, revenues increased 39% but decreased 24% from 2001 to 2003.

In 2004, total revenue reached $16.2 million, a 2% increase from the previous year. MTTA revenue projections from 2006 to 2010 assume an annual growth of 3.2%. MTTA projects a steady increase for each revenue source (*Figures 19a and b*).

FIGURE 18
Total Operating Cost by Service – 2000 to 2004

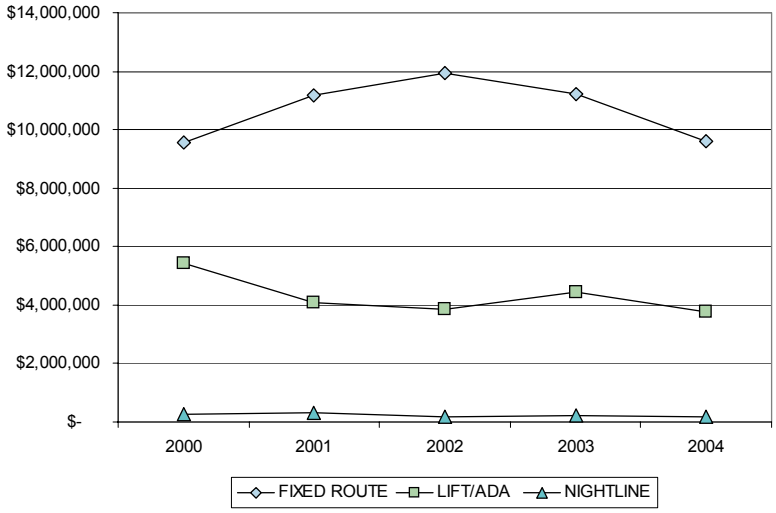


FIGURE 19A
2000 to 2004 Average Revenue by Source

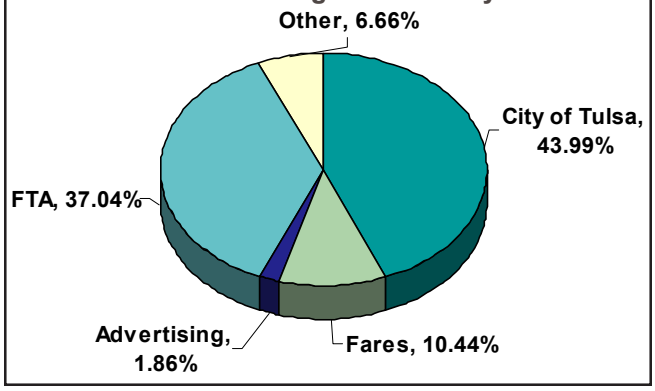
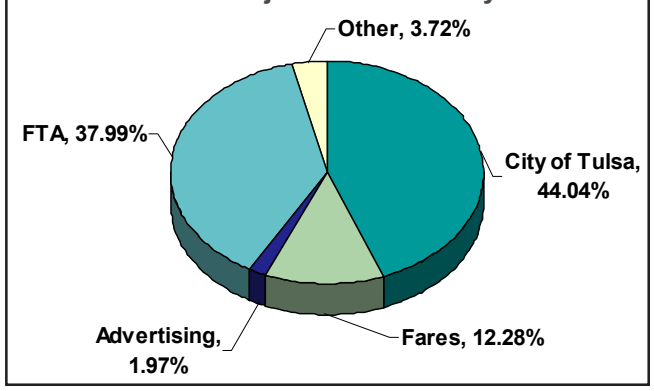


FIGURE 19B
2006 to 2010 Projected Revenue by Source



Public Opinion

In December 2002, for the purpose of analyzing the existing transit network, a telephone survey was undertaken to identify Tulsa residents' perceptions and attitudes about transit. The random sample of 201 households provides data that may be projected to the total population with an error range of +/- 7% and a 95% confidence level.[2]

MAJOR FINDINGS[3]

From those surveyed, 88% believe that "a good public transportation system is important to the economic vitality of the area." Most people (64%) say they live 4 or more blocks from a bus stop, have no bus available, or simply do not know where a bus stop is in relation to where they live.

Only 10% of those interviewed have someone in the household who has used the bus system within the last 6 months. Sixty-four percent of Tulsa residents believe that people use transit due to lack of choice. Other major reasons given for transit usage include: it saves money (29%); and is convenient for those who use it (19%). Many suggested improvements for MTTA were supported, with the majority of the respondents (69%) choosing more bus shelters and benches (*Table 4).*

TABLE 4
Most Desired Transit Improvements

IMPROVEMENT	PERCENT
More bus shelters and benches	69
Express service to major employers	67
Service to outlying areas	63
Better route and schedule information	56
Make the bus system easier to understand	55
Light rail transit where feasible	54
More frequent bus service	53

Forty-eight percent of the people surveyed say they are very (15%) or somewhat likely (33%) to begin riding MTTA buses if the improvements they believe are important are made. Twelve percent say they are somewhat unlikely and 40% say they are very unlikely to use transit. When it comes to willingness to support transit with tax dollars, 52% would be somewhat or very likely to vote for funding to provide transit improvements. Thirty-four percent of the respondents have experience using transit in other cities in the previous 5 years, and 41% say they have ridden light rail in another city.

Many residents have difficulties finding transportation. Twelve percent have a member of the household who has a health condition making it difficult to travel in the area. Because of lack of transportation, some reported having someone in their household who has experienced difficulty seeking employment (9%) and some have reported having someone stranded in their household (18%). Residents that experienced difficulties with transit access were more likely to say they are willing to ride the bus if improvements are made. Detailed survey results, tables and findings, and a copy of the survey questionnaire can be found in The New System Design plan in the *Supporting Documents*.

[2] Tulsa Transit New System Design - Perteet Engineering, Inc, September 2003
[3] Ibid

COMPARABLE SYSTEMS IN OTHER COMMUNITIES

For the purpose of evaluating the performance of MTTA's service, twelve cities of similar size, based upon their population, were identified for comparison. The comparison was made using the National Transit Database for 2003, the year of most recent available data (*Table 5)*.

Most of the transit systems in comparable communities have a higher percentage of revenue sources when compared to MTTA. Eight of the 12 systems used for comparison have a dedicated source of funding. It is noteworthy that comparable transit systems with the highest amount of dedicated funding also generally have the highest annual passenger trips and annual passenger miles. Because MTTA has no dedicated funding source, passenger trip and mile levels are far below the median.

Most of the dedicated funding comes from sales taxes, but some comes from property taxes, income taxes and/or gasoline taxes. Using the National Transit Database, INCOG identified several other transit agencies using local taxes dedicated at their source for operating funds.

In 2002, the National Transit Database (NTD) ranked the top 10 transit agencies considered the most cost-effective transit providers in the nation that have achieved the highest passenger growth rates. The majority of the transit providers listed by the NTD have competitive contracts. Instead of cutting services, increasing fares and demands for subsidies, these transit service providers have chosen to utilize competitive contracting to provide transit services in a more cost-efficient manner. The private sector has been very successful in reducing costs and increasing the quality of services provided.[4] Competitive contracting services have resulted in operating cost savings well below public costs, increased ridership on the contracted routes, increased bus service levels, and improved service resulting in reduced passenger complaints.

TABLE 5

Comparable Communities Transit Systems

City	Service Area Population (UZA)	Service Area (sq. mi.) (UZA)	Annual Passenger Trips (Millions)	Annual Passenger Miles (Millions)	Annual Vehicle Revenue Miles (Millions)	Total Vehicles	Dedicated Funding (Thousands)
Wichita, KS	422,301	526	2.51	11.31	3.19	42	-
Toledo, OH	426,230	149	4.43	20.64	4.79	155	$6,217
Colorado Springs, CO	466,122	197	3.36	12.3	3.62	50	-
Albuquerque, NM	498,000	124	7.8	21.41	5.54	135	$4,537
Omaha, NE	544,292	193	4.7	16.5	3.9	114	$9,499
Fresno, CA	554,923	133	11.3	38.1	4.9	83	$43
Tulsa, OK	**558,329**	**261**	**3**	**16**	**4.2**	**66**	**-**
Long Beach, CA	573,734	96	26.37	71.35	7.44	169	$26,143
Tucson, AZ	720,425	291	16.87	62.44	8.81	147	-
Oklahoma City, OK	747,003	322	4.12	21.42	4.45	80	-
Kansas City, KS-MO	756,557	396	13.55	53.65	10.16	264	$26,909
Cincinnati, OH	845,303	262	24.14	132.21	13.92	359	$38,651
Sacramento, CA	1,393,498	369	28.9	124.7	12.6	197	$61,534
MEDIAN	558,329	261	7.8	21.42	4.85	141	$17,821

[4] An Analysis of Proposed CTA Service Cuts: New Public Sector Management Alternatives, Anthony M. Pagano, May 1997.

PROPOSED PUBLIC TRANSPORTATION SERVICES

Several long-range studies and reports have been completed, including the *Tulsa Transit New System Design* and the *High Speed Passenger Rail Service Study*. In addition, a commuter rail service study has also been contemplated.

Tulsa Transit New System Design

In October 2002, MTTA conducted a study to identify a modified design for its public transit service network. With this study, MTTA aimed to restructure and revitalize public transportation in the Tulsa region and be an element of the City of Tulsa's plans to redevelop and stimulate downtown Tulsa.

The New System Design plan was redesigned and developed to, initially, operate with existing resources and improve travel times to major destinations, increase ridership and operating cost efficiency, support and promote the initiatives included in the City of Tulsa's visioning process, and serve as the basis for an improved service network as available funding resources expanded in the future.

A detailed number of demographic analyses were conducted to assist in the identification of important transit corridors. Regions of the Tulsa region with high concentrations of demographic sub-groups were identified as significant sources of transit riders. These sub-groups included households having no access to private vehicles, households with incomes below the defined poverty level, elderly citizens, youth (less than 16 years old), non-English-speaking individuals or households and areas having a higher-than-average population density.

The sub-groups were outlined on the map of the region and then overlaid with existing and proposed bus route alignments to make sure that the transit dependent population was represented in the modified service system. Existing transit rider groups were also outlined to minimize impacts and ensure they would continue to be served by the new system.

Current MTTA riders include a significant number of hospitality industry employees and low-income residents. A second major commuter group is represented by the healthcare industry. These commuters tend to live in similar areas of the region. Transit access to other major employment locations was also maintained for the convenience of another significant proportion of MTTA riders.

It was determined that the network should concentrate on employment and retails centers, as well as existing transit facilities, while taking advantage of the grid street network. This approach was the basis for the design of the system of routes included in the modified route network.

The modified system design combines pure grid-designed routes following Tulsa's existing street grid network, straight-line routes beginning and ending at the Tulsa CBD and L-shaped routes connecting neighborhoods and frequent destinations with the 2 bus stations – Denver Avenue Station and Memorial Midtown Station

The urban system is composed of 22 routes serving the City of Tulsa, Jenks, and Sand Springs. The system is conceived to operate between 5:30 a.m. and midnight on weekdays, between 7 a.m. and midnight on Saturdays, and between 8 a.m. and 11 p.m. on Sundays and holidays. Frequency of service varies from 2 trips per hour to more frequently depending on peak hours. Operating speeds were assumed to be 15 miles per hour with the exception of the fast track service via the Broken Arrow Expressway that is assumed to operate at 25 miles per hour over its entire alignment.

The demand response service, in the demand response zones (*Figure 20*), is assumed to operate at an average speed of approximately 10 miles per hour. These zones have insufficient transit demand potential for fixed route services and, therefore, transportation is provided by advance request within the same zone or by connecting individual origins within each region to the nearest transfer station or major transfer points.

These MTTA buses, added to the fleet in 2005, are more fuel-efficient.

FIGURE 20
Recommended Demand Response Service Zones

Sixteen routes serve the Denver Avenue Station while 10 routes serve the Memorial Midtown Station. Five routes serve both stations and only 1 does not serve either transfer station.

Annual variable operating costs for the urban network are estimated at $17.6 million in constant 2003 dollars. Another $4.3 million represents the system fixed costs, a total annual operating cost of $21.9 million (in 2003 dollars) for the urban network.

The urban system provides approximately 485,000 annual platform hours of service, using 95 buses in service during peak periods and 75 buses during weekday off-peak periods. Refer to *Table 6* for a summary of the urban network.

Service to a number of communities adjacent to the City of Tulsa is possible through a secondary network (*2030 Public Transportation Plan* map, Page 41), which is to be funded by the individual communities that it is designed to serve.

This secondary, suburban network consists of routes serving 7 additional suburban corridors:

- Catoosa
- Owasso / Collinsville
- Skiatook
- Sapulpa
- Jenks / Glenpool
- Bixby
- Broken Arrow / Coweta

The suburban routes frequency of operation is 30 minutes during peak hours and hourly during off-peak hours. Owasso, Jenks, Bixby and Broken Arrow routes are designed to operate from 6 a.m. to 8 p.m. weekdays, from 7 a.m. to 7 p.m. on Saturdays and from 8 a.m. to 6 p.m. on Sundays (*Table 7).* Reduced services are offered to Catoosa, Skiatook and Sapulpa—communities farther away from the City of Tulsa.

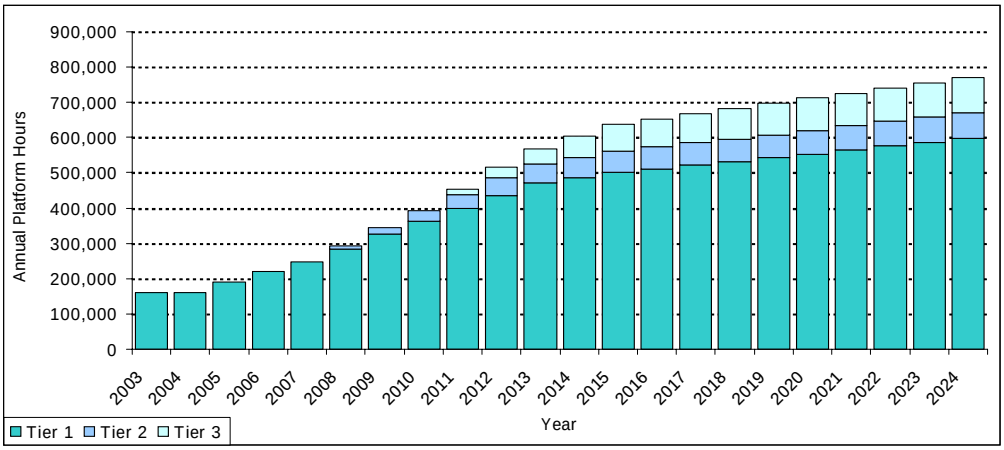
TABLE 6
Urban Network Summary

Service Span	Weekday	5:30 a.m. to midnight
	Saturday	7 a.m. to midnight
	Sunday	8 a.m. to 11 p.m.
One-Way Route Miles		249.1
Revenue Hours	Weekday	1,345
	Saturday	1,101
	Sunday	965
Maximum Vehicles	Weekday	95
	Saturday	72
	Sunday	69
Variable Operating Cost	Weekday	$13,300,000
	Saturday	$2,200,000
	Sunday	$2,100,000
Fixed Costs		$4,300,000
Total Cost		$21,900,000

TABLE 7
Suburban Network Summary

Service Span	Weekday	5:30 a.m. to 8 p.m.
	Saturday	7 a.m. to 7 p.m.
	Sunday	8 a.m. to 6 p.m.
One-Way Route Miles		161.9
Revenue Hours	Weekday	410
	Saturday	217
	Sunday	168
Maximum Vehicles	Weekday	43
	Saturday	19
	Sunday	19
Variable Operating Cost	Weekday	$4,300,000
	Saturday	$433,000
	Sunday	$380,000
Fixed Costs		Included in urban system costs
Total Additional Cost		$5,126,000

FIGURE 21
Proposed Service Implementation Schedule



The new System Design is recommended for implementation in relatively small incremental stages beginning in 2005, as depicted in *Figure 21.* Tier 1 includes all the urban routes. Tier 2 includes the suburban routes connecting to Jenks, Bixby, Broken Arrow and Owasso. Tier 3 includes the suburban routes connecting to Catoosa, Skiatook, Sapulpa, Collinsville, and Coweta.

INCOG compared the New System Design with the existing service provided by MTTA, calculating the employment and population served by the 2 systems using the Traffic Analysis Zone (TAZ) data (*Table 8*).

With the implementation of the New System Design, almost 50% of the TMA population and almost 80% of the employment will be served by public transportation with a quarter-mile radius. Detailed individual routes and detailed operation, costs, and implementation plans can be found in the Tulsa Transit *New System Design – Report of Findings* in the *Supporting Documents.*

Commuter Rail Service

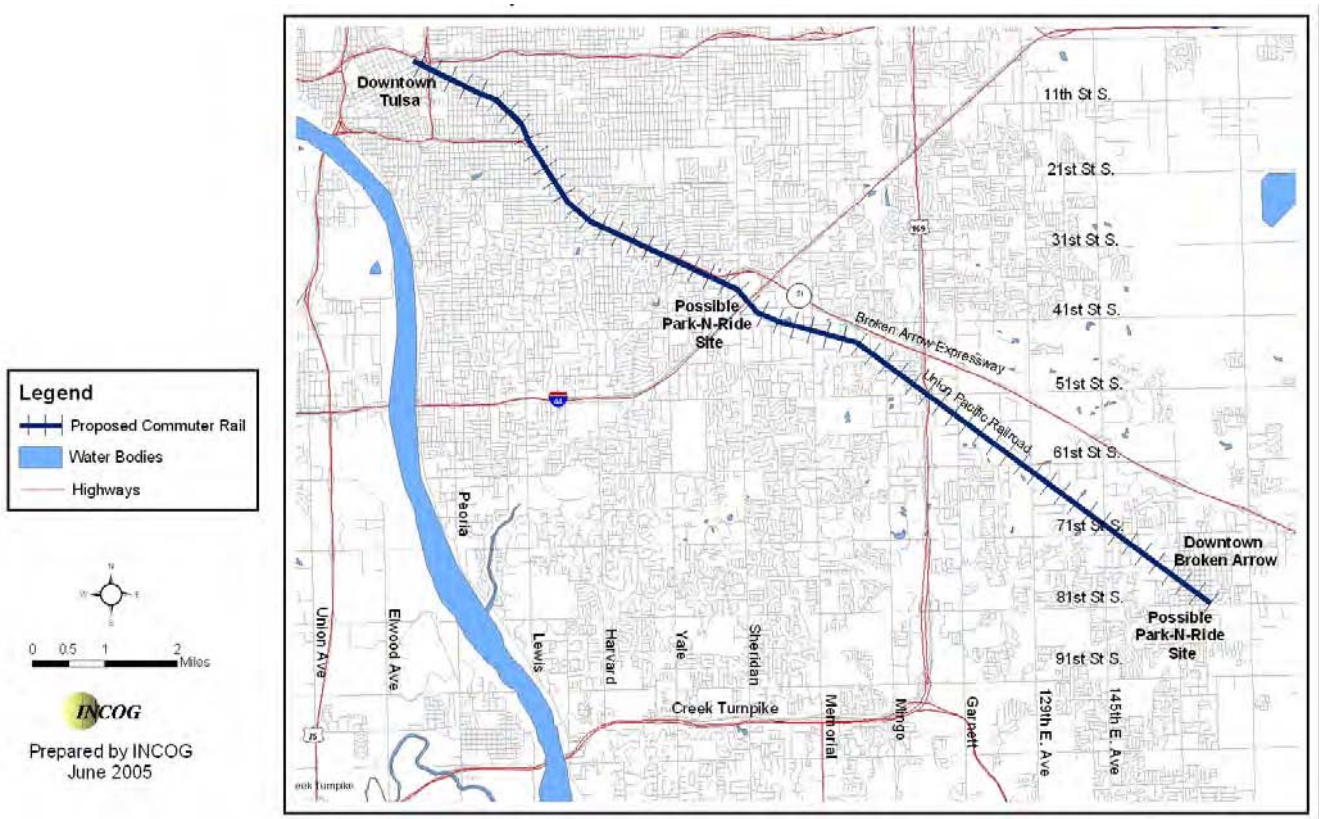
A commuter rail line between Broken Arrow and downtown Tulsa has been contemplated for over 10 years. Detailed engineering studies to determine the feasibility of the plan have not been conducted but the Regional Mobility Plan, a study developed by consultants in June 1993 for the MTTA, recommends implementation of the system. According to the plan, enough riders would likely be attracted to the system to support the capital and operating investment required to build it.

Figure 22 shows the proposed location of the commuter rail line. The system would have a total of 14 miles running from the vicinity of Main Street in Broken Arrow to the vicinity of Union Station in downtown Tulsa. Park-and-ride lots would be located at the Broken Arrow Station and also at an intermediate stop located near Skelly Drive. The bus system and the paratransit system would support

TABLE 8
Existing and Future Transit Route Analysis Based on a ¼ Mile Buffer

Existing Service		New System Design	
Employment 2000	**Population 2000**	**Employment 2030**	**Population 2030**
313,400	325,600	370,300	422,400

FIGURE 22
Proposed Broken Arrow Commuter Rail



the commuter system connecting the lines with the 3 rail stations, providing convenient feeder transit service.

The proposed commuter rail system would operate during peak periods with 3 trips inbound in the morning and 3 trips outbound in the evening. Service levels would depend on achieved ridership. In 1993, when the report was prepared, preliminary suggested capital costs, based on experience in other cities, ranged from $25 million to $35 million. Currently the capital cost estimate is $40 million and the operation and maintenance cost estimate over the life of the plan is $66 million.

These costs included upgrading the track and signals to Federal Railroad Administration standards, building 3 stations, and buying or leasing 5 vehicles. Operating costs would be in the range of $2 million to $3 million annually.

To operate passenger service on these lines, operating agreements would be required since the tracks are currently being used for freight operations by Union Pacific and Burlington Northern Railroads.

In addition to the Broken Arrow Commuter Rail corridor, several other rail corridors that parallel commuter corridors in the TMA should be analyzed to determine the feasibility of implementing rail, bus rapid transit, high occupancy vehicle lanes, or high occupancy toll alternatives to highway expansion. Those corridors include: the Arkansas River West Bank rail line to Jenks and Bixby to relieve US-75; a northeast Tulsa rail line to the Tulsa International Airport, Catoosa, and Claremore; the SK&O rail line to Owasso, Collinsville and the Cherokee Industrial Park to relieve US-169; the rail line to Sand Springs parallel to US-412; and the rail line to Sapulpa parallel to I-44.

TABLE 9
Travel Time Comparisons (minutes)

	Phase	Signal Phase	Travel Time	Reduction in minutes	Estimated Cost (millions)	Total Cost (millions)
Tulsa to OKC [1]			159		26	
Tulsa to OKC [2]	1		143	16	26	52
Tulsa to OKC [3]	2	1A	130	13	56	108
Tulsa to OKC [4]	3	1B	114	16	35	143
Tulsa to OKC [5]		2	103	11	10	153

[1] Includes initial track resurfacing and the purchase of one conventional train set.
[2] Includes the completion of Construction Phase 1.
[3] Includes the completion of Construction Phase 2 and signal installation Phase 1A.
[4] Includes the completion of Construction Phase 3 and signal installation Phase 1B.
[5] Includes the purchase of two additional train sets and the implementation of Cab Signal Control.
Source: High Speed Passenger Rail Feasibility Study – Final Summary Report - Carter-Burgess, March 2001

High Speed Passenger Rail Service

In March 2001, ODOT completed a study assessing the feasibility of providing high speed passenger rail service throughout the state of Oklahoma and connecting the state with the national passenger rail network. The findings of this study recommended long-term expansion service between Tulsa and Oklahoma City, providing passenger rail connection between the 2 metropolitan areas of the state, and promoting the development of an additional connection to the national passenger rail system east of Oklahoma. Two possible eastern corridors were recommended, Kansas City and St. Louis, with Kansas City being the most feasible since it could potentially be implemented on existing rail routes with only average improvements.

The implementation of a desirable connection service to St. Louis would require vast capital improvements and would only become more feasible if the State of Missouri implemented service between Springfield and St Louis.

The distance between Tulsa and Oklahoma City is slightly over 100 miles, so only 1 stop, in either Stroud or Bristow, is being considered.

The State owns over 80% of the existing track between Tulsa and Oklahoma City, making their rail connection competitive with other transportation modes. Improvements and realignments on the tracks would be required, resulting in a total travel time of 1 hour and 45 minutes using conventional equipment at a speed of 79 mph. The total cost is anticipated to be approximately $139.5 million. According to the study, estimated potential daily ridership for the Oklahoma City – Tulsa corridor is 600 passengers/day.

Services would be implemented incrementally, with a 2 hour 39 minute initial service implemented at the outset. This initial service would be either a basic peak day or daily service with 1 train set providing 1 run in each direction per day of operation. The estimated time of completion for all 3 phases is approximately 7 years. A summary of the travel times and anticipated costs associated with each phase of development are shown in *Table 9*.

Table 10 shows passenger train travel times. The Tulsa to Kansas City corridor is 267.8 miles in length and has a projected travel time of 4 hours 44 minutes with an operating speed of 54 mph, using conventional equipment. Estimated ridership is 700 passengers daily. The implementation of this service is anticipated to take 12 to 18 months and is recommended to be completed after the implementation of the Tulsa to Oklahoma City service.

TABLE 10
Passenger Train Travel Time

Destination	Trip Length (Miles)	Travel Time (Hours, min.)	Average Speed	Projected Daily Ridership
OKC to Tulsa	117	1h, 49min.	64.8	600
Tulsa to Kansas City (MO)	256	4h, 44min.	54	700
Tulsa to St. Louis (MO)	428	8h, 39min.	49.5	500

The Tulsa to St. Louis, Missouri would have a travel time of approximately 9 hours and 30 minutes using conventional equipment in a 400 mile corridor. Estimated ridership is 500 passengers daily.

PROJECTED TRENDS

Various trends play an important role in shaping the future of the transportation system and should be considered when addressing public transit issues. Social factors, environmental issues, economic circumstances, and personal travel behavior are some of the trends that influence the public transportation system.

Social factors influencing transit include population growth, age, employment and the region's development patterns. The region growth, population and employment are increasingly dispersed at activity centers throughout Tulsa and the Metropolitan Area. Tulsa's population is aging and, therefore, more individuals 65 years and older are likely to be using public transit.

From 1995 to 2000, travel purpose has become diversified. The percentage of home trips has remained flat while the percentages of work and shopping trips have increased. Social and recreational trips have decreased somewhat. Public transportation is used primarily for trips to work, so the increase in other trip destinations, as well as the fact that trips are increasingly being spread throughout the day rather than concentrated in traditional morning and evening rush hours, present a challenge to the traditional transit system.

Transit improvements and any resulting reduction in traffic can play an important role in overall air quality. Transit ridership usually increases approximately 30% on *Ozone Alert!* days. According to the Oklahoma Department of Environmental Quality, the region's air quality has improved with only 9 exceedences (days) of the Environmental Protection Agency's (EPA) 8-hour ozone standard in 2003 and no exceedences in 2004. The TMA remains in attainment for national air quality standards.

Fixed-route bus service is expected to continue to carry the largest share of passengers. The demand-response service (lift program and other paratransit service providing curb-to-curb assistance) ridership is continually increasing, as are vehicle miles of travel and operating costs per vehicle.

To meet the increasing demand and to revitalize public transportation in the region, MTTA intends to expand and restructure its transit system, as well as enhance its partnerships with the surrounding communities.

ISSUES AND ACTIONS

Public transportation is essential for the accessibility and mobility of all residents in the region. Although it serves a relatively small segment of the population, the demand for transit services is expected to increase and evolve over the next 2 decades. A number of actions should be taken to meet the challenges and opportunities that are anticipated as the TMA grows and advances.

Dedicated Funding

- Establish a dedicated local source of transit funding that is independent of discretionary appropriations and thus can be used to develop long-term, multiyear capital and operating programs/plans; the funding should be collected at a regional level to support public transit services at a regional scale
- Identify and advance new and innovative revenue sources, particularly dedicated fuel tax and utility fees
- Explore the feasibility of utilizing competitive contracting to provide transit services in a more cost-efficient manner
- Expand partnerships with universities, colleges and businesses to increase revenue
- Be more aggressive in pursuing state and federal grants
- Exercise the option of "flexing" federal transportation funds, as appropriate, to fund public transportation
- Take advantage of opportunities to incorporate transit capital improvements into broader transportation projects
- Implement the *New Transit System Design Plan* in an incremental process, as funding is available

Expanded Public Transportation Service

- Expand the fixed-route system to suburban areas of the region for implementation of a regional service, according to the New System Design plan
- Explore and pursue, where feasible, development of Bus Rapid Transit or commuter rail service in various corridors in the TMA, and passenger rail service to areas outside the TMA
- Encourage public transportation agencies to take a proactive and early involvement in the regional and local land-use development process to integrate public transportation elements into future developments and to preserve corridors as much as possible

Enhanced Services

- Establish and maintain a development strategy of transit services to meet a variety of travel needs/travel patterns. The strategy should include:
    - Local fixed-route/fixed-schedule service
    - Timed-transfer routes providing cross-region travel with minimal transfer delays
    - Demand response/subscription service providing door-to-door service to mobility-impaired citizens as well as to low-density/rural areas of the region
    - Express-route service for long distance, traditional commuters to the central business district and other major employment centers
    - A vanpool program for long-distance, traditional commuters to the central business district and/or outlying employment centers
    - Commuter rail service, beginning in the US-64/SH-51 (Broken Arrow Expressway) corridor, to introduce rail transit to the Tulsa metropolitan area pending completion of a feasibility analysis
    - Expanded service operation to cover early morning, evening, and nighttime; increased service on Saturdays; and the introduction of Sunday service
    - Maintain services to the Tulsa International Airport Terminal
- Establish park-and-ride facilities on the fringes of the region to provide convenient access to the public transit system
- Provide convenient pedestrian and bicycle access to transit facilities and continue implementation of the “bike-on-bus” program
- Coordinate a sidewalk improvement program, emphasizing access to bus stops and sidewalk connections from bus stops to major destinations
- Cooperate in statewide/national efforts to return passenger rail service to the Tulsa region; provide convenient access between any future passenger rail station and the local commuter rail and other public transit services
- Continue to develop and expand Demand-Response service
- Expand the role of the existing transit call center and actively expand contract services

Customer Service

- Continue the implementation of technology enhancements such as real-time passenger information, automated fare payment, etc., as availability and resources allow
- Install streetlights as needed along pedestrian routes to bus stops to enhance security for early morning and evening riders
- Encourage, through appropriate policies and procedures, site design/layout of new development (or redevelopment) that is "transit friendly", *i.e.,* incorporates shelters/ passengers waiting areas, provides safe pedestrian passages, and is oriented to the street to minimize walking distances
- Increase efforts to engage and involve the general public, business leaders, and elected officials in transit issues

INCOG staff discuss the LRTP process with MTTA riders during an open house in May 2005.

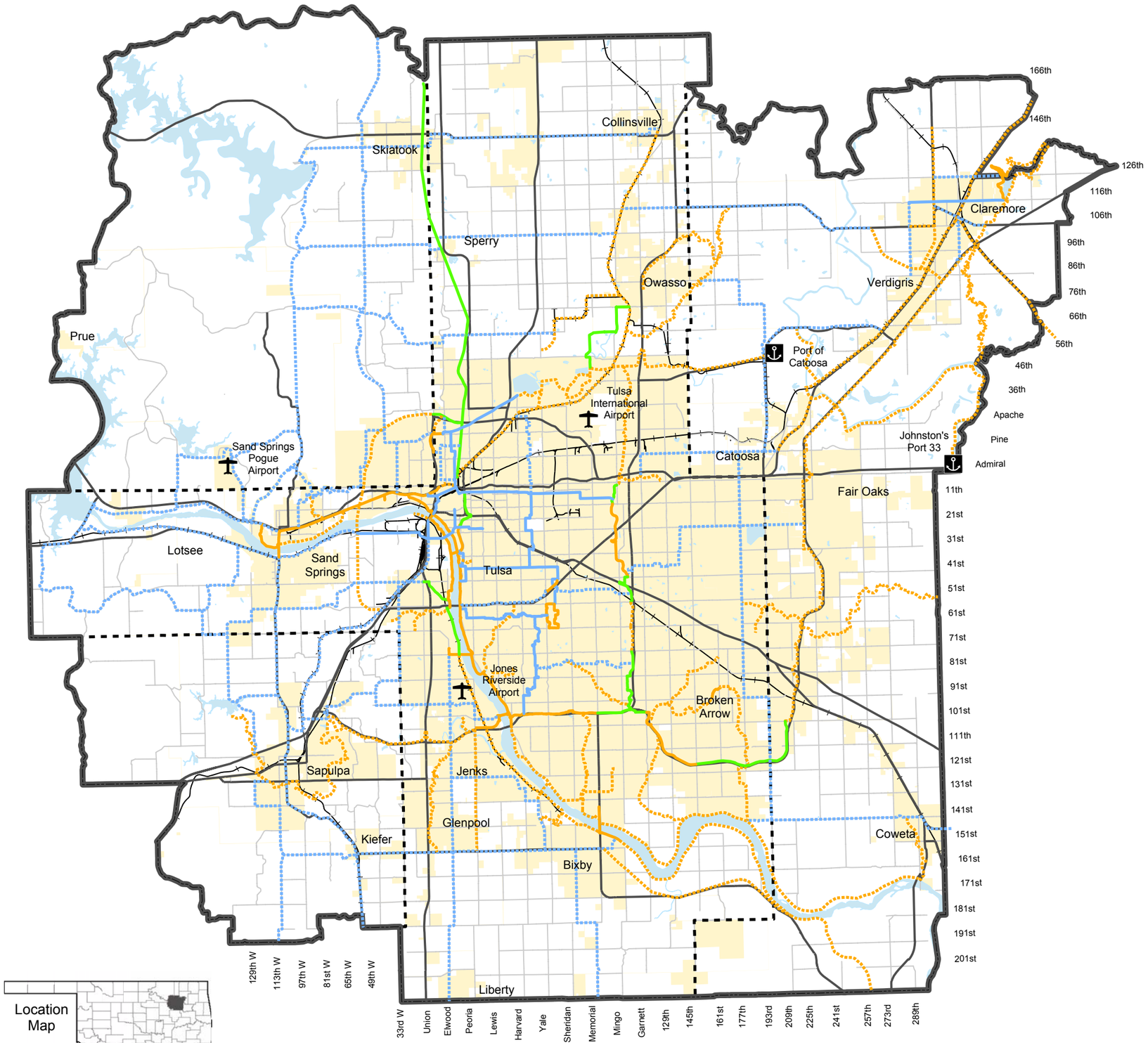
AMENDMENT: Coordinated Service

The following were added during the development of the Coordination Transportation Plan for the Tulsa Region, as required by federal law.

- Develop a Mobility Management Center - one scheduling and dispatching center for all trips
  - Community based van program (give accessible vans to non-profit organization for their use if they also transport elders/disabled) estimated $55,000 per van
  - Integrate providers to increase sharing of vehicles, drivers, passengers
  - Joint Service Planning: reduce overlapping, fill in underserved gaps
  - Coordinate with private sector: joint scheduling and sharing of vehicles
  - On-line ride reservation system and companion call-in center
  - Assist users to plan trips with multiple stops and chain trips
  - Projects that utilize technology to share ride demand data between agencies and nonprofits while maintaining rider privacy
  - Allow coordinated trip scheduling and billing among and between school districts, transit agencies, and human service agencies
  - Utilize technology to connect providers to transportation system dispatch
  - Hire drivers to be shared among providers
  - Help small transportation providers with developing quality programs
  - Provide training classes or expand existing programs for new and existing operators, staff, and travel hosts including sensitivity for affected populations
  - Simplify the ability for riders to use multiple systems (such as universal pass/smart card), instead of using different vehicles for different purposes
  - Allow bulk purchase of vehicles and equipment
  - Provide maintenance for all vehicles in pool
- Increase human service agencies capacity for scheduled services
- Encourage provision of Travel Hosts to assist people making transfers or have other transit concerns
- Create and implement an emergency/disaster plan and an inclement weather plan that address the need of those without personal transportation
- Allow mixing of funding so agencies aren't restricted to serving specific target populations or specific destination types
- Increase the ability of school districts and churches to be part of the community transportation provider pool

BICYCLE/ PEDESTRIAN TRANSPORTATION

Chapter 4



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2030 Bicycle/Pedestrian Plan

- Existing Bikeway
- Proposed Bikeway
- Existing Trail
- Proposed Trail
- Funded
- Highways
- Arterials
- Rail
- Corporate Limits
- County Boundary
- Transportation Management Area

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0 0.5 1 2 3 4 Miles

Map Scale - 1:275,000

INTRODUCTION

Transportation planning has typically focused on streets and highways as the traditional means for transportation. Bicycling and walking facilities have generally been considered recreational amenities and have not yet realized their potential as transportation modes. As a result of air quality issues, public advocacy, and the increase in traffic congestion, the integration of bicycle and pedestrian planning into the overall transportation planning process is gaining momentum. The result is an emerging focus on a more balanced transportation system among all modes of travel. In the Tulsa Transportation Management Area (TMA), bicycle and walking facilities can complement motorized transportation and provide another travel choice for many users, particularly for short trips, throughout much of the year.

Resident Priorities

The bicycle and pedestrian planning process has included public involvement through focus group meetings, area-wide planning sessions, and opinion surveys. An inventory of local comprehensive plans, policies, requirements and the identification and assessment of existing facilities was also conducted. Several key recommendations originated from the public outreach effort and they are listed as follows in order of priority:

1. Improve pedestrian circulation and multimodal connections in the land development process by acquiring trail access easements, creating additional sidewalk connections, and incorporating planned transit stops
2. Continue development of the multi-use regional trail system
3. Finance the development and maintenance of bicycle/pedestrian facilities including sidewalks, trails, and bikeways
4. Provide connectivity between the trail system and neighborhoods
5. Ensure that trail and on-street bikeway design standards are implemented consistently
6. Provide additional trail lighting
7. Improve the maintenance along the trails
8. Provide for directional, locational, and safety signage throughout the trail system
9. Construct a dual trail on the River Parks East Bank Trail where needed

The aforementioned recommendations coincide with the vision and goals of the *Tulsa Transportation Management Area Trails Master Plan,* adopted in May 1999. The Bicycle and Pedestrian Element of the *Destination 2030* Long Range Transportation Plan (LRTP) incorporates and expands upon the trail plan (*2030 Bicycle Pedestrian Plan* map, Page 63).

In 2000, a survey of communities within the TMA was conducted to determine local sidewalk requirements. The twelve communities surveyed were: Bixby, Broken Arrow, Catoosa, Collinsville, Coweta, Glenpool, Jenks, Owasso, Sapulpa, Sand Springs, Skiatook, and Tulsa. With the exception of Catoosa, every community had some form of requirement regarding sidewalks on residential collector streets and arterials.

Most suburban communities require concrete sidewalks on both sides of arterial and collector streets, typically with a minimum width of 4 feet on collectors and as much as 8 feet on arterials. Although sidewalk requirements are present in subdivision regulations, the enforcement of the regulations have not been universal. For those communities strictly enforcing sidewalk regulations, it has been the responsibility of the developer to construct sidewalks. Sidewalks or access to trails is often viewed as an amenity by the public, and neighborhoods with sidewalks and trails often boast higher property values due to the presence of these facilities.

In commercial and office districts, a public sidewalk generally abuts the adjacent street. Internal sidewalks to commercial or office development often provide access to and from parking areas. Often, these sidewalk designs are not connected and do not accommodate pedestrians from the public sidewalk to the building. To this end, the LRTP encourages transportation and area city planners to ensure the continued construction of more sidewalks as well as the elimination of sidewalk gaps between public sidewalks and commercial or office developments, which can be efficiently achieved through the land development process in each of the communities.

Citizens provide feedback on trails and bikeways in the Tulsa TMA during an open house meeting at Hicks Park.

Trails Master Plan

In 1998, INCOG initiated development of a trail master plan for the TMA to delineate an interconnected system of trails and complementary bikeways with the goal of enhancing transportation choices. The proposed trail route plan resulted from the evaluation of existing conditions, including a review of physical features, park locations, urban activity corridors, residential neighborhoods, schools, colleges and universities, special use areas (*e.g.,* libraries, cemeteries, and museums), utility easements, and employment centers.

The resulting Trails Master Plan proposed a 283 mile network of off-road multipurpose trails and a 207 mile system of on-road bikeways throughout the TMA area. Access to the trails or bikeways was an important evaluation criterion in the development of the trail route plan. According to the Trails Master Plan, 98% of the population within the TMA will be served by a planned trail or bikeway within 2.5 miles of their homes, and 87% will be served by a trail or bikeway within 1 mile of their residence.

The overall system was divided into 3 phases: *near-term* to be built in the next 5 years, *mid-term* to be built in 5 to 10 years, and *long-term* to be built in 10 or more years. Near-term trail projects were estimated to cost between $17 and $20 million to fully develop, mid-term projects would cost between $16 and $18 million to develop, and the long-term projects would range from $28 to $32 million to fully develop. The entire system was estimated to cost between $62 and $71 million based on 1999 dollars.

The 283 mile network of off-road multipurpose trails is extensive and comprehensive, and at the same time provides a realistic program for satisfying the needs of local residents regarding access to outdoor resources and transportation bikeways to many destinations. In the *near-term* phase, it is envisioned that local government agencies will work in partnership with neighborhoods and private sector organizations to develop

an estimated 78 miles of trail projects. Near-term projects began development in 1999. During the *mid-term* phase, an additional 77 miles of trail projects would be developed, and the *long-term* phase envisions that the remaining 127 miles of trail projects would be implemented.

The 207 mile system of on-road bikeways is divided into 2 phases. In the *near-term* phase, it is envisioned that 99 miles of bikeways would be constructed. The remaining 108 miles would be implemented in the *mid-term* phase. In addition, the City of Tulsa has prepared a conceptual on-street bike route map that serves as the basis for a comprehensive citywide bikeway system.

Tulsa's on-street bicycle route plan has been enthusiastically embraced by numerous members of the bicycling community and will be updated as new connections are warranted and traffic conditions change. The *Existing and Planned Regional Bikeways* map on Page 69 is a composite of existing and planned bikeways in and around the City of Tulsa.

As of 2005, approximately 65% of the total planned miles for the near-term trails (totaling 78 miles) have been funded, with many of the projects either in the design or construction phases. *Table 11* provides a snapshot of recently funded trail projects in the TMA. The *Existing and Planned Regional Trails* map on Page 71 illustrates existing and planned trail routes.

TABLE 11
Recently Funded Trail Projects in the TMA

Trail	Miles
West Bank I & II Trail	4.00 miles
Cherry Creek Trail	1.18 miles
Broken Arrow South Loop Trail	8.92 miles
Jenks River Trail	2.50 miles
Katy Downtown Trail Extension	0.93 miles
Midland Valley Extension Trail	1.73 miles
Mingo Trail	7.70 miles
Osage & Osage Prairie Trail	17.43 miles
River City Trail	1.80 miles
Mohawk Owasso Trail	4.25 miles
Mingo Creek Trail (3 segments)	1 mile/each
TOTAL	**53.44 miles**

Table 12 compares the total population served by the trails and on-street bikeways in years 2000 and 2030. This analysis looks at the number of existing and funded trails versus those trails proposed. In 2000, 63.1% of the TMA population resided within 1 mile of existing and funded trails or bikeways. In 2030, assuming full LRTP implementation, the population residing within 1 mile of a trail or bikeway will increase to 89.7%, slightly above the 87% level projected in the Trails Master Plan. The *Existing Regional Trails and Bikeways* map on Page 73 includes the trails funded and/or built to date.

On-Street Bikeways

During the development of the Trails Master Plan, the need for providing on-street bikeways in the region was frequently discussed. As a response to public input and to maintain connectivity between trails, it was determined that on-street bikeways should be established. Arterial streets are not appropriate for most riders due to safety concerns far outweighing the benefits. Residential collectors and trails provide the best routes, in terms of user safety and system connectivity, for a continuous bicycle/ pedestrian network.

As part of the Trails Master Plan, the City of Tulsa's Public Works and Traffic Engineering divisions proposed a network of on-street bicycle routes that utilize collector streets as their primary corridors. In most cases, the planned on-street bicycle

TABLE 12
Comparisons of Bike/Pedestrian Trail Access in Years 2000 & 2030

Year 2000 Total TMA Population	Year 2000 Population Within 1 mi.	% Total TMA Population in 2000	Year 2030 Total TMA Population	Year 2030 Population Within 1 mi.	% Total TMA Population in 2030
701,600	442,500	63.10%	865,500	776,700	89.70%

routes intersect primary arterial streets at signalized locations for safe crossings. By linking the off-street trails and on-street facilities, an efficient and cost-effective system was created. The Conceptual On-Street Bike Route Plan anticipates over 200 miles of proposed on-street bikeways, while existing routes currently comprise approximately 30 miles.

For more information regarding the background and design aspects of the regional trail and bicycle facility system in the TMA, refer to the *Overview of the Tulsa Trails Master Plan* section located later in this chapter.

Funding

Historically, multipurpose trails have been funded primarily with local sales tax revenue and city bond issues as a part of park development. Sidewalks are included in new development, construction, and expansion projects. The newest source of funding for bicycle/pedestrian facilities and, to a much more limited degree, sidewalk renovation, is Transportation Enhancement funds available through the Transportation Equity Act for the 21st Century (TEA-21). Transportation Enhancement funds have provided improved opportunities for expansion of the bicycle/pedestrian system. In recent years, there has been a marked increase in the issue of sidewalk funding. Neighborhood residents are strong advocates for sidewalk construction or repairs, and sidewalks have typically been the most requested projects in local capital improvement programs (*i.e.,* sales tax and bond issues).

The proposed system for 2030 should be funded by continuing aggressive pursuits of Transportation Enhancement funds and by incorporating bicycle/pedestrian needs into the design of future construction and expansion projects. Specific dollar estimates have been included as a part of the overall financial strategies for the LRTP. In addition, several funding sources have been proposed, such as:

- Local Government Initiatives
- Capital Programs (bond issues and sales tax)
- Federal Trail Programs
- Enhancements and Recreational Trails
- State Programs
- National and Local Foundations
- Public/Private Partnerships

Gaining Public Support

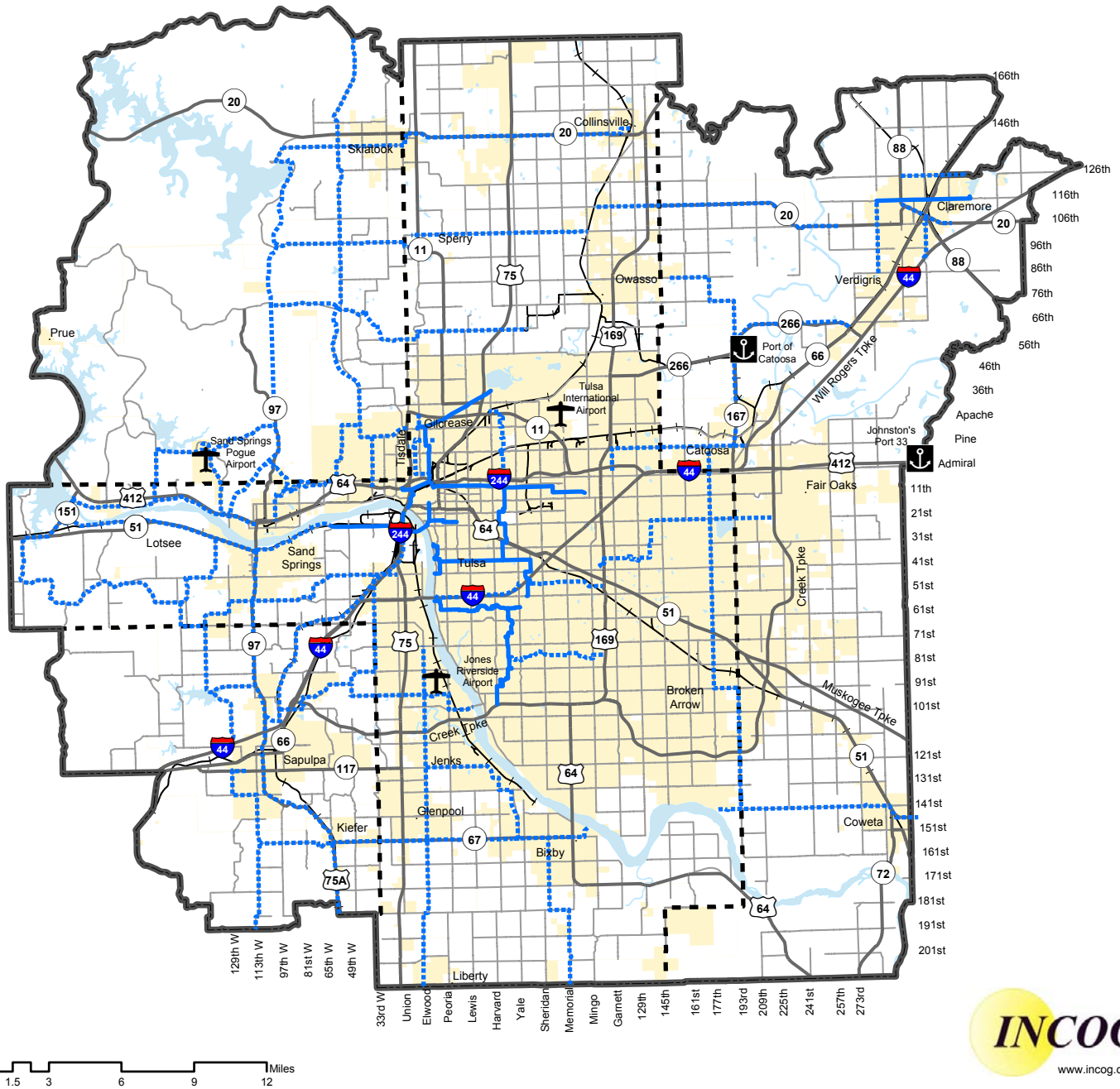
Following the national trend of public support and advocacy for improved bicycling and walking conditions, there has been greater concern by groups in the TMA that more should be done locally to enhance the safety, comfort and convenience of nonmotorized travelers. Over the past decade, public opinion survey results throughout the nation have demonstrated strong support for increased planning, funding and implementation of trails, pathways and on-street facilities. The Bicycle and Pedestrian Element of the LRTP seeks to endorse and incorporate the objectives set forth by the federal government, which states "bicyclists and pedestrians shall be given due consideration in the planning process and that bicycle facilities and pedestrian walkways shall be considered, where appropriate, in conjunction with all new construction and reconstruction of transportation facilities except where bicycle use and walking are not permitted."[5]

Bicycling and walking are important elements of an integrated, intermodal transportation system. Constructing sidewalks, installing bicycle parking at transit stations, equipping local public transit buses with bike racks, teaching children to ride and walk safely, installing curb cuts and ramps for wheelchairs, designating and signing bikeways and building trails—all contribute to achieving national, as well as local, transportation goals of safety, mobility, economic growth, and enhancement of communities and the natural environment.

Trails have long been recognized as a part of a multimodal transportation system that has proven to add to, not detract from, a community's quality of life. In addition to providing pedestrians of the Greater Tulsa metro with another choice for short commuter trips, other benefits of trails can include improving property values, promoting healthy lifestyles, producing recreational venues, enhancing air and water quality, jumpstarting economic opportunities via tourism and providing educational opportunities for our leaders of tomorrow.

[5] U.S. Department of Transportation, *A Summary Bicycle and Pedestrian Provision of the Federal-Aid Program*, 1998, Page 8.

Existing and Planned Regional Bikeways



Destination 2030

INCOG
www.incog.org

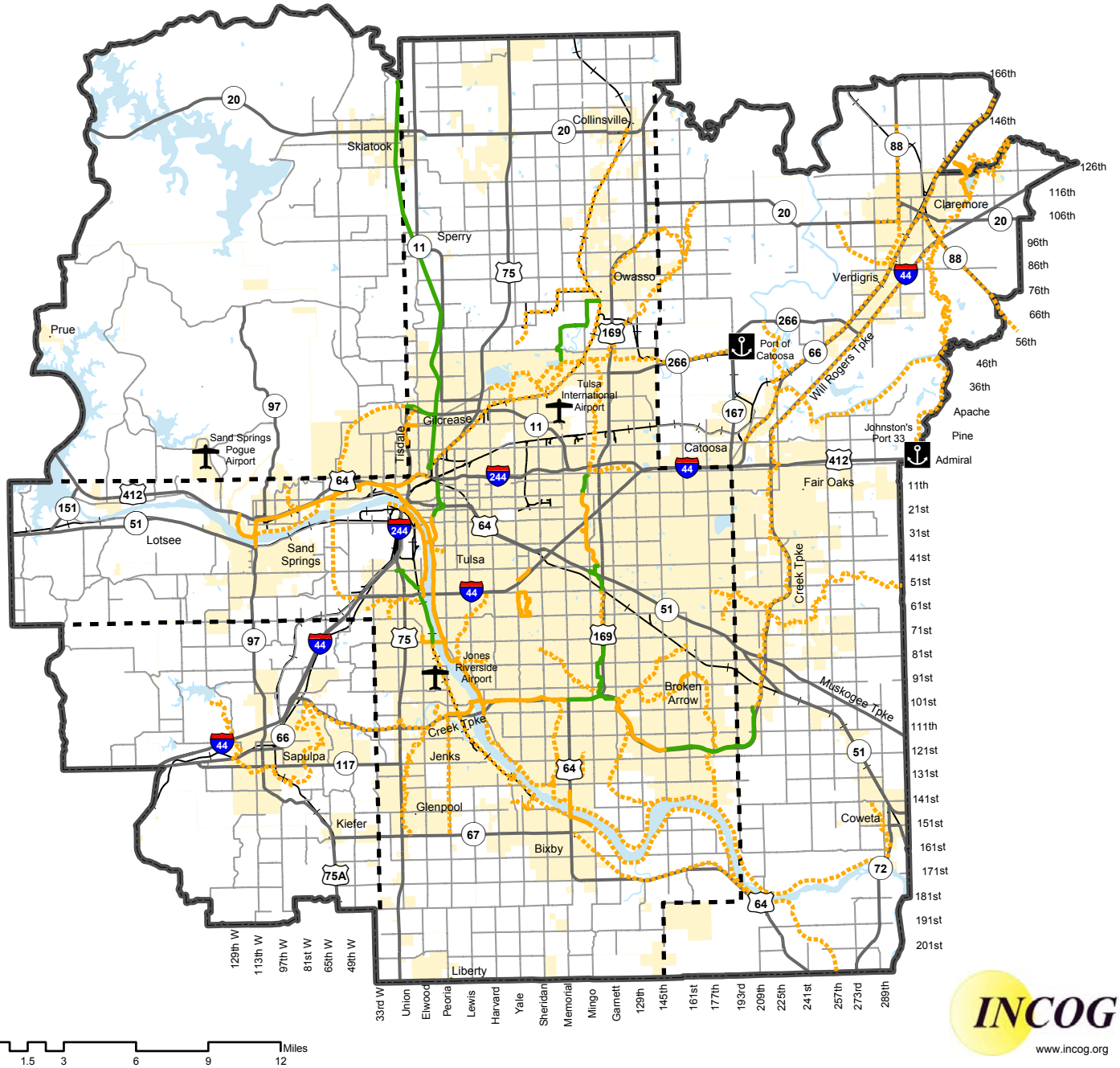
- Existing Bikeway
- Proposed Bikeway
- Highways
- Arterials
- Rail
- County Boundary
- Corporate Limits
- Transportation Management Area

N W E S

Map Scale - 1:410,000

Location Map

Existing and Planned Regional Trails



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USE OF THIS INFORMATION: This map is provided as a public resource for general information only.

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INCOG
www.incog.org

- Existing Trail
- Proposed Trail
- Funded
- Highways
- Arterials
- Rail
- County Boundary
- Corporate Limits
- Transportation Management Area

N
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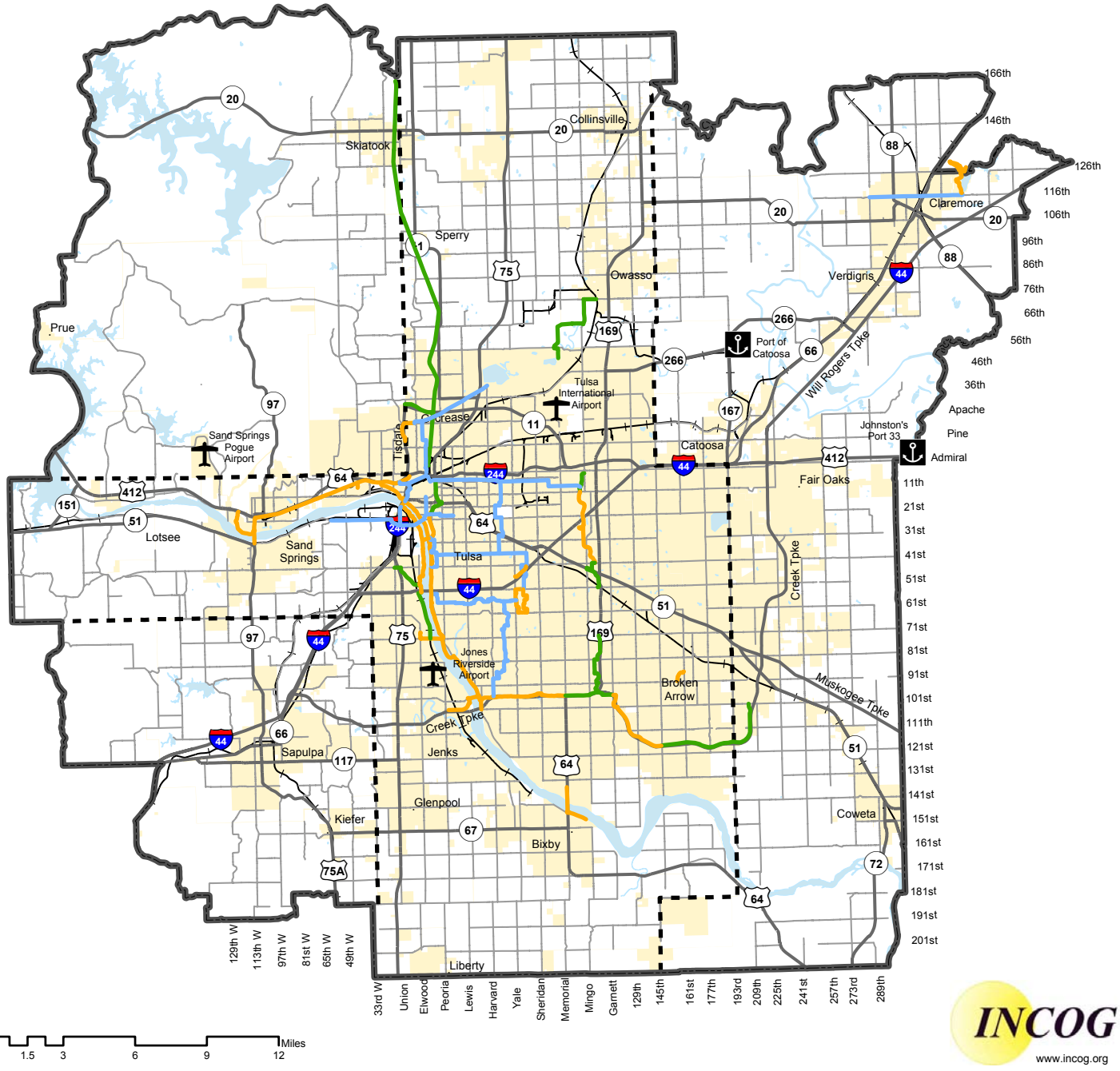
Map Scale - 1:410,000

Location Map

Existing Regional Trails and Bikeways



Destination 2030

INCOG
www.incog.org

- Existing Bikeway
- Existing Trail
- Funded
- Highways
- Arterials
- Rail
- County Boundary
- Corporate Limits
- Transportation Management Area

N W E S

Map Scale - 1:410,000

Location Map

In short, trail corridors are:

- Alternative transportation routes connecting homes, workplaces, schools, parks and cultural attractions
- A measuring stick used by many industries, investors, and cities to help determine a community's quality of life
- Economic assets that increase the real estate value of adjacent properties
- Important ecological tools for the protection and enhancement of the natural environment
- Multi-use facilities that can accommodate different types of activities, such as bicycling, walking, running, hiking, in-line skating and wheelchair use
- Recreational assets that can include parking areas and other amenities such as benches and informational signage[6]

TRAILS MASTER PLAN OVERVIEW

In this section of the Bicycle and Pedestrian Element, an overview of the Trails Master Plan is provided, focusing on the master plan executive summary, the vision, goals and objectives, the design guidelines, a description of trail system, and implementation. The full Trails Master Plan is included in the *Supporting Documents.*

Trails Master Plan Executive Summary

The *Tulsa Transportation Management Area Trails Master Plan* offers recommendations for improving community access to outdoor resources by building a network of off-road multipurpose paved trails and bikeways. The Trails Master Plan was developed by INCOG in association with a steering committee of citizens, a team of national and local consultants, and residents of the metro area. It responds to specific needs that were defined by residents through a series of public workshops. Of particular interest to local residents was the issue of safety, especially as it applies to the safety of bikeways and trail uses for corridors that parallel roadways. Using the information gathered during the public workshops and other available information, the consultants worked for 3 months to define a comprehensive community-wide system of trail corridors that would support a variety of trail uses and meet the needs that were described by residents.

Vision Statement

The vision statement below for the Trails Master Plan was crafted for the TMA as an overall guide to developing the proposed trail/bikeway system. Goals that support this vision, and a series of objectives that would be implemented to achieve each goal, are also presented.

"A trail system throughout the TMA will provide safe and convenient facilities for walkers, runners, bicyclists, skaters, and wheelchair users within 2.5 miles of their homes. It will connect residential areas to significant outdoor recreation areas, including area lakes and parks. The system will offer citizens an alternative to automobile travel, providing routes to popular destinations, including employment centers, retail establishments, tourist attractions, medical facilities and schools. Since trails promote nonpolluting forms of transportation, the trail system will improve air quality and reduce congestion in the area. Greenway trail corridors will improve water quality and reduce the impacts of flooding by preserving floodplain lands and streamside buffers. The local economy will also benefit from trail development through increased tourism revenues, property values and business attractions. In all, the TMA Trail System will make the region a cleaner, greener and better place to live, work and play for generations to come."

[6] LandPlan Consultants, Inc. and Greenways, Inc., *Metro Trails Master Plan Newsletter*, June 1998.

Goals and Objectives

The goals are listed below. The full description of the goals and objectives are included in the *Supporting Documents.* The goals and objectives serve to support the vision statement. Goal categories are representative of trail benefits related to the environment, transportation, education, recreation/fitness, safety and trail maintenance. Goals are not listed in order of priority.

ENVIRONMENTAL GOAL - Enhance the local environment by improving air and water quality, conserving floodplain lands, restoring landscapes and protecting wildlife habitat

TRANSPORTATION GOAL - Provide alternative transportation facilities for residents and visitors to the TMA

EDUCATION GOAL - Highlight and enhance significant historical and natural resources in the area. Trail users and potential supporters will be made aware of the trail system and its rules and benefits

RECREATION/FITNESS GOAL - Improve opportunities for safe, close-to-home recreation in the TMA

SAFETY GOAL - Design and manage so as to maximize safety and security of users

ECONOMIC GOAL - Improve the economic health of the area through increasing property values, attracting businesses, providing tourism revenue and reducing the costs of flooding

MAINTENANCE AND MANAGEMENT GOAL - Properly manage and maintain to increase user safety and enhance the quality of facilities

Design Guidelines

This section provides guidelines to both public and private entities for the development of trail facilities throughout the TMA. The regional guidelines herein are based on the best practices in use throughout the United States as well as accepted national standards for trail facilities.

The general attributes of the TMA regional trail system have been determined through the master planning process. These attributes include, but are not limited to: 10-foot wide (minimum) paved trails with a center line stripe, a comprehensive signage system, grade separated crossings where feasible, safe at grade crossings where necessary, and trail heads with drinking fountains, benches, and landscaping at appropriate intervals. Some trails may have phased construction, being built initially with limestone screenings as the surface, with asphalt or concrete being installed later as the permanent surface.

The guidelines should be used with the understanding that each trail project is unique, and that design adjustments may be necessary in certain situations in order to achieve the best results. Such projects should be evaluated on a case-by-case basis, in consultation with local or state bicycle and pedestrian coordinators, a qualified landscape architect, and/or an engineer. Refer to the *Supporting Documents* for descriptive information regarding trail design.

Description of Trail System

This section provides descriptions of the 85 specific trails and bikeways that have emerged from the Trails Master Plan. These trails and bikeways were selected based on their potential to accommodate bicycle and pedestrian facilities, as well as their location as part of the overall trail system. The proposed system, which totals 509 miles, provides access to many of the TMA's schools, parks, neighborhoods, retail and employment areas, as well as accomplishing the overall goal of linking the TMA communities together via off-road trails and on-street bikeways.

PROPOSED OFF-ROAD TRAILS

Fifty-five off-road trails have been identified as part of the Trails Master Plan. Thirteen of these trails currently exist or are funded, while 42 are proposed. These trails would

be aligned along roadways with ample rights-of-way that would accommodate a bicycle/pedestrian trail, along the edges of creeks, or within existing utility or railroad rights-of-way. The trail corridors identified in this plan should be considered the spine of the trail system and should accommodate bicycles, in-line skaters, and runners, as well as pedestrians. Additional trails, such as nature trails or trails with alternative surfaces for horseback riding, jogging, or mountain biking, are considered secondary to the overall trail system and may be identified within the individual community trail plans. In addition, local trails providing connections to the regional system or serving a particular destination such as a trail around a park or stormwater detention area will also be identified within individual community trail plans.

CONCEPTUAL ON-STREET BIKEWAYS

During the numerous public meetings, the topic of providing on-street bikeways in the region was frequently discussed. In fact, during the citizen mapping of trails and bikeways, over 1,000 miles of on-street routes were delineated for the TMA region. Even though the purpose of this master plan is primarily for off-street multi-use trails, it is important to recognize the need for on-street bikeways in the area. Based on the identified bikeway corridors, the proposed bikeways are recommended for further evaluation. It is anticipated that further refinement to the bike route plan will be made by various local governments from time to time as further field inspections are made and as traffic patterns change. Current copies of the on-street bike route plan can be obtained from INCOG or the City of Tulsa Traffic Engineer.

Plan Implementation

The Metro Trails System offers tremendous potential to improve the quality of life for community residents. The Trails System will improve access to outdoor resources, link people to their favorite destinations, stimulate economic growth, expand opportunities for education, and shape community growth in the 21st Century. All of this is possible as the trail system is successfully developed during the coming years. The key to this success is implementation. This section describes an innovative and strategic plan for building, managing, and operating the Metro Trails System.

BUILDING THE METRO TRAILS SYSTEM

The Master Plan is only the initial step in the future development of a Metro Trails System for the TMA. More detailed design development work is required before actual trail tread is constructed and residents are able to use the trail corridors. Therefore, the continued involvement of citizens, businesses, and neighborhoods is vital to the ongoing development of a successful design.

Each trail corridor and/or segments of each corridor will require a more detailed site design process to determine the appropriate routing and alignment of the actual trail tread. Additionally, the location of trail amenities, such as seating, landscaping, restrooms, parking, and lighting need to be defined and positioned throughout the corridor.

The Trails Master Plan proposes the development of an interconnected system of asphalt/concrete paved trails and on-street bikeways within each of the corridors. Detailed site plans and design development documents should be prepared for all trail segments. Staff resources and/or professional design consultants with previous experience in trail/on-street bike route design and construction should be employed to prepare the necessary site plans and design development documents for each of the trail and on-street linkage (bikeway) corridors. A full description of the phasing strategy is included in the Trails Master Plan in the *Supporting Documents.*

ESTIMATED COSTS FOR FACILITY DEVELOPMENT

The following cost estimates are general in nature and are based on national industry or Oklahoma state averages. A listing of the industry averages are provided below and on the following pages. The purpose of these cost estimates is to provide general guidance for budgeting and developing trail segments. The estimates are reliable to the extent that a general expectation can be derived from their use. Specific site development factors unique to each corridor will influence final design development costs. More detailed costs should be developed as a part of corridor specific conceptual plans. Final construction cost estimates should be based on final design plans.

Preliminary construction cost estimates are provided in tabular form for the *near-term*, *mid-term* and *long-term* trail projects. The unit costs are provided for budgeting purposes only. Adjustments will have to be made to these costs on a project by-project basis to compensate for changes in unit price trends over time. All cost estimates have been adjusted for inflation to 2005 costs (*Table 13*).

TABLE 13
Typical Costs for Off-Road Multi-Use Trail Facilities

Category/Description of Facility		Unit	Unit Costs
Trail Treads			
	6-foot Bare Earth Hike/Mtn. Bike Trail	Linear Feet	$6
	8-foot Bare Earth Equestrian Trail	Linear Feet	$9
	8-foot Woodchip Pedestrian Trail	Linear Feet	$11
	10-foot Soil-Cement Trail	Linear Feet	$14
	10-foot Aggregate/Stone Trail	Linear Feet	$17
	10-foot Asphalt Multipurpose Trail	Linear Feet	$29
	10-foot Concrete Multipurpose Trail	Linear Feet	$40
	10-foot Wood Deck/Boardwalk Trail	Linear Feet	$285
Signage			
	Information Signs	Each	$1,140
	Direction Signs	Each	$230
	Warning Signs	Each	$230
	Mile/Kilometer Markers	Each	$290
Furniture/Furnishings			
	Benches	Each	$680
	Trash Receptacles	Each	$460
	Security Bollards	Each	$290
	Bicycle Racks	Each	$570
	Fencing (Board-on-Board)	Linear Feet	$23
	Gates	Each	$860
	Emergency Phones	Each	$1,100
	Drinking Fountains	Each	$2,900
	Restrooms	Each	$68,500-$102,700
	Landscaping	Per Mile	$28,500

Parking Lots

Capacity	Unit	Gravel Lot*	Asphalt Lot
10 cars	Each	$8,600	$16,000
20 cars	Each	$17,100	$32,000
40 cars	Each	$34,200	$63,900

**Gravel lots are prohibited in some jurisdictions*

In limited circumstances, it may be necessary to install on-road bicycle facilities in order to connect the off-road trail system defined by the LRTP. Itemized below are costs for facilities that would most likely be needed to provide linkage (*Table 14).*

TABLE 14

Typical Costs for Bicycle and Pedestrian Facilities

Re-striping		
Conducted as part of a regularly scheduled roadway resurfacing project and does not include right-of-way acquisition and changes to signal actuation.		
	Bicycle Lanes	$8,200/mi
	Wide Outside Lanes	$7,400/mi
Independent Projects		
The following listing is for development of various facility types as independent projects. These costs do not include right-of-way acquisition. Real estate values fluctuate dramatically and will need to be adjusted on a parcel-by-parcel basis as right of way is needed.		
	Share the Road Bikeways (signage, pavement symbols, bicycle actuated signals)	$17,100/mi
	Urban Bike Lanes (4' wide, both sides)	$228,000/mi
	Rural Bike Lanes (4' wide, both sides)	$126,000/mi
	Paved Shoulders (4' wide, both sides)	$126,000/mi
	Wide Curb Lane (14' wide, both sides)	$148,000/mi
Other Bicycle Facilities		
	Class I Parking (Bicycle Lockers - per 2 bicycles)	$570-$1,700
	Class II Parking (Secure wheels and frame-per bike)	$75-$170
	Class III Parking (Inverted U's or rail racks- per bike)	$75-$90
	Bike Route/"Share the Road" sign (each)	$280
Typical Costs for Pedestrian Facilities		
	Sidewalks (6' wide, 2 sides)	$148,000/mi
	Pedestrian Signal Heads (for 2 corners)	$2,000/ea
	Pedestrian Signal Heads (for 4 corners)	$4,200/ea
Other Pedestrian Facilities		
	Prefabricated Pedestrian Bridge/Overpass	$115/sq ft
	Constructed Bridge/Overpass	$75/sq ft
	Crosswalk Striping	$280 each
	Curb Extensions	$5,100 each

Developing the Trails Master Plan

If the momentum generated by the Trails Master Plan is sustained over the next 15 years, the opportunity exists to implement a total of 491 miles of multi-use trails in near-term, mid-term, and long-term phases. A detailed listing of trail costs estimates is included in the *Supporting Documents.*

The on-street bikeways identified as a part of the Trails Master Plan are intended to provide bikeways between various off street trails and allow greater access to the overall regional trail system. The cost estimates for these types of facilities is general in nature and based on national industry or Oklahoma state averages. The estimate includes items such as share the road signs, bike route signs, bicycle activated traffic signals, on-street share the road pavement markings, replacement of drainage grates and other minor street construction items.

Operations and Management

Maintenance and management of individual trail segments will be the responsibility of the local governments and their partners. It is anticipated that these maintenance and management duties can be shared among trail supporters in the public and private sectors. For example, currently the City of Tulsa owns the land where River Parks has developed the existing trails system.

River Parks maintains the system of trails, even though the land is owned by Tulsa. The following costs are provided as a guide to establishing a budget for the operation, maintenance and management of trail segments (*Table 15*).

TABLE 15

Typical Maintenance Costs (For a 1 Mile, Paved Trail)

Description	Cost per Mile
Drainage and storm channel maintenance (4 x/year)	$800
Sweeping/blowing debris off trail tread (24 x/year)	$1,800
Pick-up and removal of trash (24 x/year)	$1,800
Weed control and vegetation management (10 x/year)	$1,540
Mowing of 3-ft grass safe zone along trail (24 x/year)	$2,000
Minor repairs to trail furniture/safety features	$570
Maintenance supplies for work crews	$340
Equipment fuel and repairs	$900
Estimated Maintenance Costs Per Mile of Paved Trail	**$9,750**
Re-Surfacing of Asphalt Trail Tread (10 year cycle)	$57,000 - 69,000

ISSUES AND ACTIONS

In the TMA, community planners and citizens are continuing to work together to activate the trails system for our communities, as established in the Trails Master Plan. As a part of maintaining this quality approach to achieving a balanced transportation system, key issues regarding bicycle and pedestrian transportation have been identified. These issues include: safety and education awareness, legal considerations, development practices, facilities and support facilities.

Development Practices

Examination of existing laws, ordinances, and land-use planning would help provide legitimacy of bicycling and walking as transportation modes. The following addresses the legal considerations and development practice issues.

- Encourage the multiple use of transportation rights-of-way, including safely designed facilities for use by bicyclists and pedestrians
- Encourage development of residential collector streets that address bicycle/ pedestrian needs
- Advocate compliance with subdivision regulations requiring sidewalks in new development
- Consider incentives for new office/commercial development that integrates bicycle/ pedestrian facilities in the design
- Consider incentives for residential development that integrates trails and sidewalks into the design
- Encourage the consideration of transit and pedestrian planning in the land development process
- Advocate transit and pedestrian/bicycle connections during the subdivision design process – through the acquisition of trail easements, sidewalk extensions, and planned transit stops with associated amenities
- Work with staff and development community to further improve and integrate pedestrian circulation plans
- Encourage the provision of transit stops/shelters during development design
- Encourage the provision of pedestrian/bicycle amenities such as benches, street furniture, bicycle racks/lockers, support facilities, etc.

LEGAL CONSIDERATIONS

- Work with state and local officials to develop consistent laws and guidelines for bicyclists
- Advocate rails-to-trails conversions on existing rail corridors that are no longer economically viable

Facilities and Support Facilities

Improvements must be made to existing and planned facilities to provide intermodal connections, a continuous regional network of bicycle routes, and supporting facilities such as storage areas, showers, and bus-mounted bicycle racks.

FACILITIES

- Encourage implementation of the Tulsa Transportation Management Area Trails Master Plan
- Support implementation of the City of Tulsa's on-street bikeways system and encourage other area cities to develop and implement similar plans
- Pursue Transportation Enhancement funds for projects that provide facilities to encourage bicycling and walking as alternate modes of transportation
- Encourage provision of bicycle and pedestrian facilities that connect residential areas to parks, churches, employment centers, schools, libraries, and other services
- Identify gaps in the arterial sidewalk system and implement a plan to fill those gaps giving priority to schools, churches, libraries, shopping, and other major destinations
- Encourage removal of physical barriers and provision of facilities (such as ramps, curb cuts, and adequate sidewalks) for persons with physical disabilities
- Design and implement transportation enhancement projects that better integrate the transportation system into the community and encourage use of alternate modes of transportation (*e.g.,* bicycling and walking)
- Identify and develop strategies to mitigate major physical barriers, such as expressways, that pose obstacles to the bicycle and pedestrian network

SUPPORT FACILITIES

- Pursue development of a major trailhead in downtown Tulsa in proximity to the planned connections of the Katy Trail, SKO Trail, Midland Valley Trail, Osage Trail and various on-street bicycle routes
- Publish bicycle facility/roadway suitability maps, safety information, and other promotional materials, and encourage their dissemination through user groups, local bicycle shops and other central locations
- Encourage provision of access to showers and bicycle storage at employment centers
- Encourage provision of aesthetic and functional amenities on bicycle/pedestrian routes (*e.g.,* water fountains, benches, and restrooms)
- Encourage secure and convenient parking for bicycles at major employment centers and other destinations
- Pursue Transportation Enhancement funding for projects to develop bicycle/pedestrian support facilities

Safety and Education Awareness

Bicycling and walking should be viable and important modes of everyday transportation, but ever-increasing auto traffic and planning to accommodate the automobile have greatly reduced the opportunity for safe and pleasant bicycling and walking.

SAFETY

- Evaluate the appropriateness of posting additional instructional signs for bicycle users to improve the safety of bicycle travel and to increase motorists' awareness of bicycle activity
- Require safe design and construction practices on all roadways, and use consistent standards (American Association of State Highway and Transportation Officials - *e.g.*, perpendicular grates, modified railroad crossings)
- Encourage installation of traffic signal devices that are bicycle sensitive, particularly along designated bicycle routes
- Encourage installation of pedestrian-actuated crossing signals at intersections that currently do not have them, lengthening the crossing time where necessary
- Encourage maintenance on bridges and outside curb lanes to eliminate debris for cyclists

SAFETY - CONTINUED

- Improve collection and use of accident data for vehicle accidents involving bicycles and pedestrians (*e.g.,* helmet usage, accident site characteristics/conditions, etc.)
- Encourage installation of street lights, as needed, along pedestrian routes to bus stops to enhance security for early morning and evening riders
- Review local municipal bicycle/pedestrian ordinances and recommend updates as appropriate to provide a safer riding or walking environment

EDUCATION/AWARENESS

- Work with local user groups and the media to increase public awareness of bicycle laws, safety, user courtesy/protocol, cost-effectiveness of bicycling and walking, and positive environmental and health benefits
- Encourage training for area students on all aspects of safe bicycling and walking
- Support improved skills training for cyclists
- Encourage employers to provide employee incentives and facilities (showers, bike storage, etc.) to promote bicycling as a commuter option
- Support posting "Share the Road" signs and pavement markings on designated bikeways; also launch a media campaign that informs cyclists and motorists about "Share the Road" laws
- Encourage curriculum changes in driver education classes to include sections related to motor vehicle drivers' responsibility to bicycles and pedestrians
- Encourage the adoption of universal design for both roadway construction and land development, such as the application of ITS – lit crosswalks, audible pedestrian signals, infrared detection, visual countdown pedestrian crossing signals, surface treatments
- Advocate safety improvements during development design by encouraging staff and the development community to look at physical improvements, such as traffic calming, public sidewalk connections to office/commercial developments, and pedestrian safety improvements (*e.g.,* median pedestrian crossings, bump outs, raised medians, etc.)
- Develop an informational brochure that addresses the benefits of trails, including economic development, lower crime rates, and improved quality-of-life

FREIGHT MOVEMENT

Chapter 5

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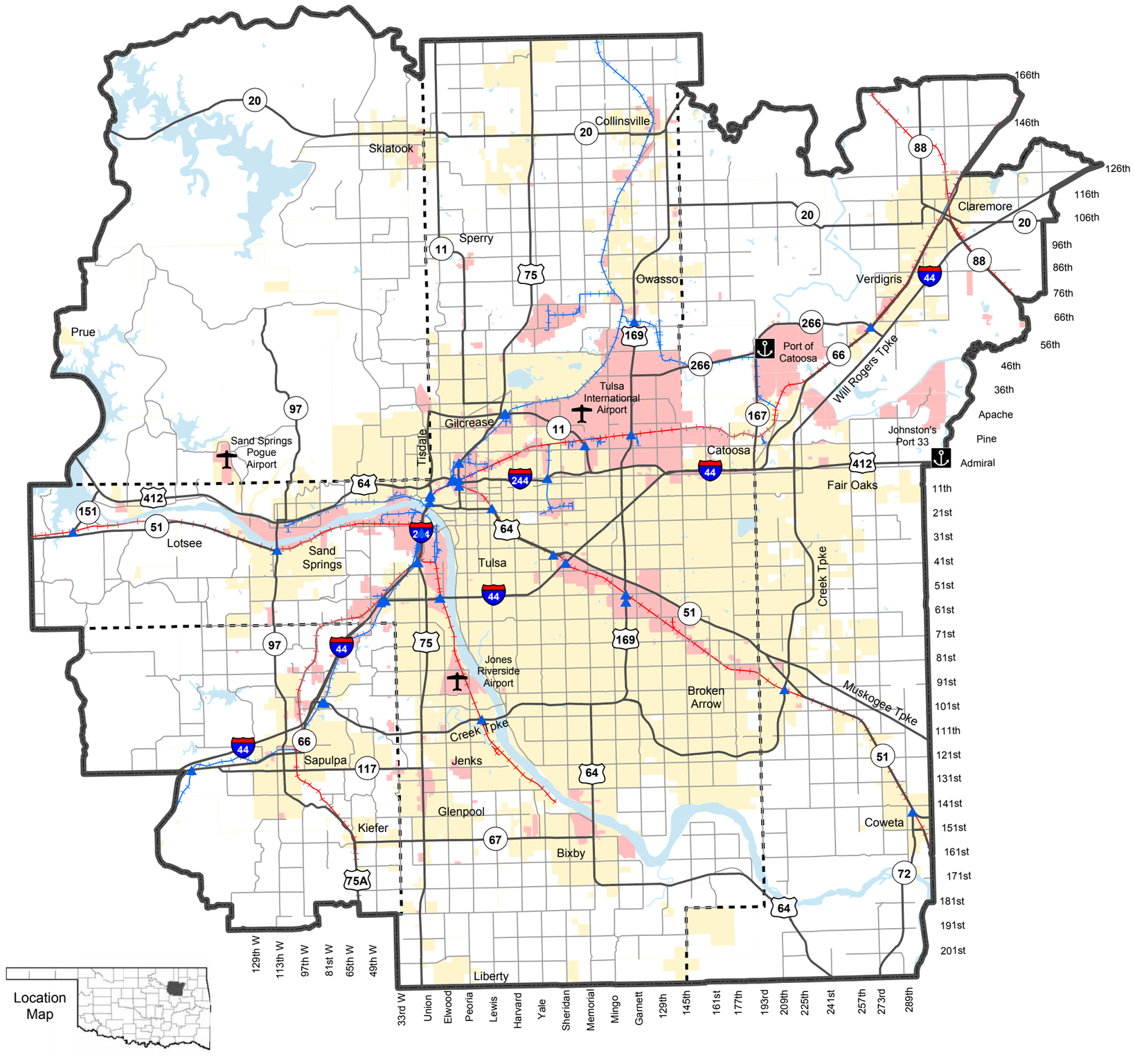

2030 Freight Movement Plan

- Class 1 Railroad
- Class 3 Railroad
- Grade Separated Highway/Rail Crossings
- Industrial Areas
- Highways
- Arterials
- County Boundary
- Transportation Management Area
- Corporate Limits

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Map Scale - 1:275,000

INTRODUCTION

The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, and its successor, the Transportation Equity Act for the 21st Century (TEA-21), provided the basis for states and metropolitan areas to examine and address freight transportation issues in the context of metropolitan Long Range Transportation Plans. The *Destination 2030* Long Range Transportation Plan (LRTP) Freight Transportation Element highlights the multimodal aspects of the infrastructure that facilitates freight movement in the region, including 2 internal water-ports, an international airport, 2 Class I railroads, several short-line railroads, and trucking. These strategic regional facilities are well-connected to one another and to the National Highway System (NHS).[7] The *2030 Freight Movement Plan* map is shown on Page 85.

Due to the increasing size and complexity of urban areas, intra-regional goods movements have outpaced goods movement between regions. According to the Bureau of Transportation Statistics (BTS), the market share of U.S. freight movement in 2002 consisted of approximately 58.2% truck, 14.8% barge/ship, 12% rail, 10.5% pipeline, about 0.1% air, 1.3% multimodal combinations, and 3.2% undetermined.

Development Process

The freight movement element development process involved the collection of data related to the 5 modes of moving goods in the Tulsa area, including trucking, rail, water and air transportation. The local freight operators and stakeholders, including the Tulsa Port of Catoosa and Johnston's Port 33, Tulsa International Airport, Burlington Northern Santa Fe Railway, Union Pacific and several local Short-Line operators were consulted. These visits, data acquisitions and data collection efforts provided information that was used in developing the freight element.

A Freight Transportation Model for the Tulsa Transportation Management Area (TMA) was developed by the University of Oklahoma and Oklahoma State University to forecast freight flow in the region. The freight model provides insight into the nature of freight transportation useful to generate the policy recommendations desired.

It also provides the ability to forecast the effects of changes in demand or other variables on freight transportation and the impact of network changes, including inter-model freight flows between the major modes, such as rail-to-truck and barge-to-truck. The outcome of the freight model was used in the development of the roadway model as well as the freight element of the LRTP.

RAIL

History

Tulsa, Oklahoma's second largest city, became attractive to railroad companies when a Federal Post Office was opened and there was a huge influx of goods and money from ranchers and farmers. In 1871, the Atlantic and Pacific railroads extended their lines into Vinita and Muskogee. The Frisco Railroad acquired the Atlantic and Pacific Rail Company, extending its line to Tulsa, and the first train crossed the Arkansas River. The implementation of the railroad resulted in easy access to the city and, consequently, rapid growth. Tulsa became one of the most significant oil towns of the Southwest, and the favorable economy brought one of the most prestigious railroads of the country, the Santa Fe Railway, to Tulsa in 1905. The railroad had a profound impact on the development of the city, which can be seen in the expansion of the city including several businesses established along the rail tracks. It can also be seen on the alignment of downtown streets oriented in northeast-southwest and northwest-southeast directions at right angles, parallel and perpendicular to the Frisco railroad tracks. With the expansion of the city, new streets and blocks were added but still conformed to the rectangular system established by the rail tracks.

[7] The National Highway System (NHS) consists of the Interstate Highway System, plus selected other US and state highways, links, and connections that serve the major population centers, ports, airports, public transportation facilities, intermodal transportation facilities, and major travel destinations. The NHS network of significant highways was approved by congress in 1995.

Rail Corridor Overview

Today Rail Transportation in the Tulsa area is provided by 2 Class-I[8] carriers and 5 short-line[9] carriers. The Class-I carriers are Union Pacific (UP) and Burlington Northern Santa Fe Railway Company (BNSF). Together, they operate in approximately 200 miles of track in the area. The 5 short lines that operate in the Tulsa Region are the Southern Kansas and Oklahoma Railroad (SKO), Tulsa-Sapulpa Union Railroad (TSU), Sand Springs Railroad (SS), Port of Catoosa (PC) and Stillwater Central. The short lines operate on approximately 66 miles of track in the area.

The 2 major commodities transported by the railroads in Oklahoma are coal and grain, with coal terminating in the state and grain being shipped beyond Oklahoma. Most of the freight movement within the state is between the Oklahoma City and the Tulsa areas.

Class-I Carriers

BURLINGTON NORTHERN SANTA FE RAILROAD (BNSF):

BNSF has the largest rail yard in the area, located southwest of downtown Tulsa. Access to the BNSF yard is from US-75. Approximately 5,400 tons of freight and 160 rail cars are operated daily, originating and terminating in the Tulsa area. The trains generally run east-west, and destinations vary greatly, with bulk industrial products being the primary cargo. BNSF provides rail access to the Port of Catoosa and the manufacturing plants near the Tulsa International Airport.

BNSF operates on about 150 miles of track in the Tulsa region with traffic consisting of mineral ore (15%), chemicals (30%), autos/metals (15%), forestry (5%), consumer (10%), agricultural (15%), and general products (10%).[10] Two BNSF spurs in the area provide rail access to the Tulsa Port of Catoosa, and the manufacturing plants near the Tulsa International Airport, respectively.

UNION PACIFIC (UP):

The Union Pacific runs between Muskogee and Tulsa. Their warehouse is the former KATY yard near 51st Street South and Mingo.

The Union Pacific Railroad operates on about 40 miles of track at 2 train yards in the Tulsa area. The UP processes 4 trains per day, including support operations for the UP regional terminal facility in Muskogee, Oklahoma. The local UP cargo consists of sand, lime and dolomite, pulp, wood, lumber, plastics and miscellaneous products including syrup and sugar. In addition, the UP transports most of the coal utilized at electric generating plants outside the Tulsa metropolitan area in Chouteau, Muskogee, and Oologah.

Short-Line Carriers

The short-line railroads serve primarily as the connection between shippers and Class I rail carriers. The Sand Springs Railroad is owned by Sheffield Steel, which is also their primary customer. It operates service between downtown Tulsa and Sand Springs with 32 miles of track connecting freight cars daily with the Burlington Northern Santa Fe Railroad, Union Pacific Railroad, and the South Kansas Oklahoma Railroad (SKO). Their covered storage facility is multimodal and is 68,000 square feet. The primary commodities transported are silica sand, steel, pulp board, scrap iron, scrap paper, petroleum products, chemicals, plastic, lumber and other merchandise.

The South Kansas and Oklahoma Railroad is a segment of the former Santa Fe line to Kansas City. The Company warehouse is located in Owasso between 76th Street North and 86th Street North, 1 mile west of Highway US-169. The trains run north out of Owasso and south to Tulsa connecting with BNSF and UP. It also serves the Port of Catoosa daily via an 8 mile track that goes from Owasso to the Port (*Table 16*).

The Tulsa-Sapulpa Union Railroad is primarily a switch carrier between Class I carriers (BNSF and UP) and customers located on TSU railway. It serves the Metropolitan area, running from Sapulpa to West Tulsa to Jenks on a total of 23 miles of track. It is considered one of Oklahoma's oldest and smallest operating railroads. Ninety-five percent of rail traffic is inbound to customers. The railroad serves St. Gobain Glass Plant, Prescor Inc. (maker of steel tank ends), Greenbay Packaging Inc, Atlantis Plastics, C.G. Martin Company (steel fabricator) and Technotherm Corporation (produces boilers and heat-recovery equipment). In January 2001, TSU became operator of Union Pacific Railroad (UP) track connecting

[8] The Federal Surface Transportation Board defines Class-I Railroads as those with annual revenues of $256 million or more.
[9] Short Line Railroads are those with annual revenues between $2 and $40 million. All switching and terminal railroads, regardless of their miles of track or annual revenues are classified as short lines.
[10] Data used from the 2025 Mobility Plan.

TABLE 16
Characteristics of SKO in the TMA

CHARACTERISTICS	
Number of Railcars Daily	Average of 25
Primary Destination of Trains	Tulsa, Kansas Cement Plants, Port of Catoosa
Tons of Freight Daily	2,517 (average)
% of Traffic Terminating in the Tulsa Area	42.72%
% of Traffic Originating in the Tulsa Area	2.93%
% of Traffic Routed Through Tulsa	54.35%
COMMODITIES HANDLED	**% TOTAL TRAFFIC**
Aggregates	29%
Cement, Steel Products	17%
Asphalt	10%
Gypsum, Beer	9%
Fertilizer	7%
Pipe	5%
Wastewater, Wood Products, Chemicals, Flour, Wheat, Others	10%

Tulsa and Jenks and serving Sinclair Oil Refinery, Kentube, Pepsi Cola Co., and Kimberly Clark Corporation. TSU also has connection with the Burlington Northern Santa Fe (BNSF) railroad at Sapulpa. With about 6,700 cars per year, the primary commodities transported are silica sand, pulpboard, limestone, and sodium carbonate (*Table 17*).

TABLE 17
Characteristics of TSU in the TMA

Location	Sapulpa
Highway Access	SH-66 – Access from I-44 and local streets
Truck Service	Yes – truck to rail
Miles of Track in the Tulsa region	23 miles
Number of Rail Cars Daily	Average of 26 (6,700 annually)
Primary Destination of Trains	Sapulpa – West Tulsa – Jenks Industries
Tons of Freight Daily	2,500
% of Traffic Terminating in the Tulsa Area	61%
% of Traffic Originating in the Tulsa Area	39%
% of Traffic Routed Through Tulsa	None

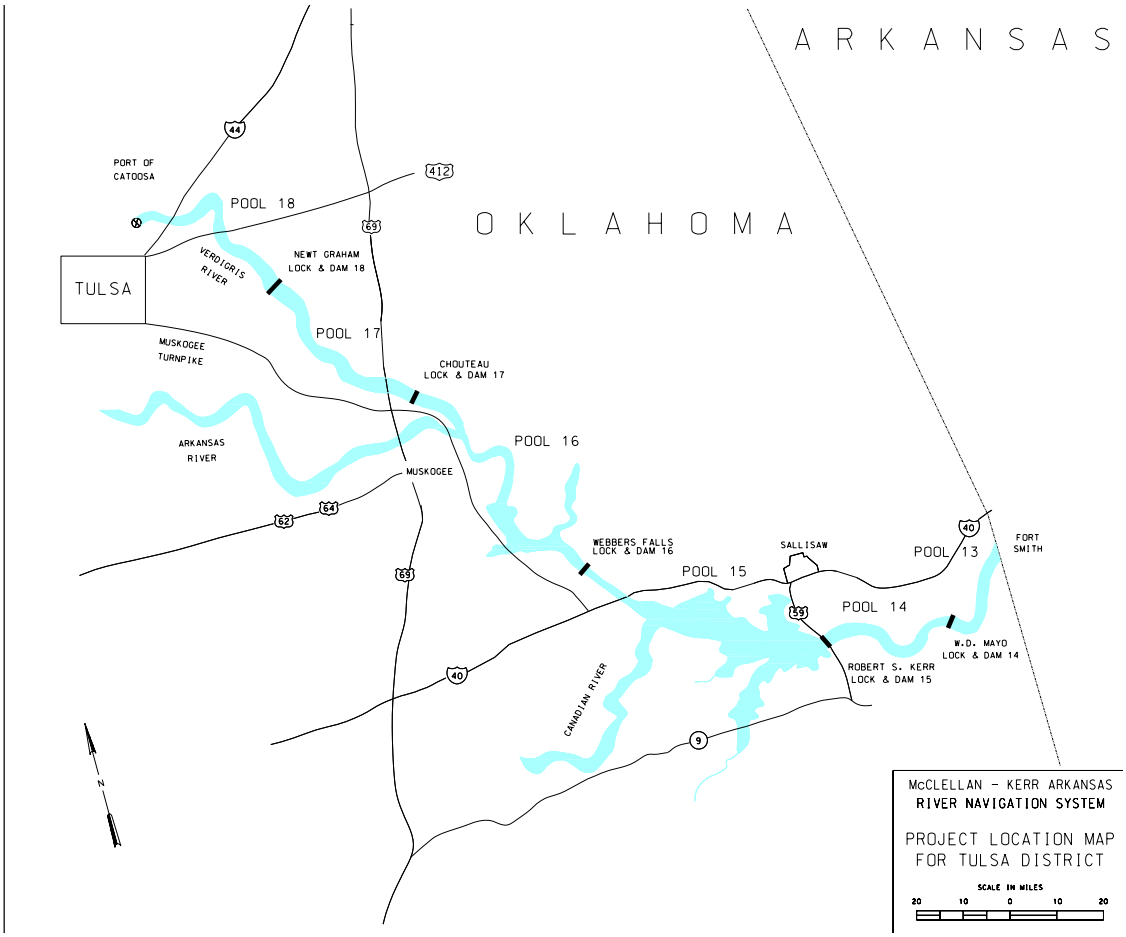
Stillwater Central operates a 97 mile line between Sapulpa and Oklahoma City. In Sapulpa, it interchanges the cars to BNSF, which then distributes the cars accordingly. In cases where Stillwater Central interchanges cars with SKO, SKO carries the traffic across to Tulsa.

The Port of Catoosa, 5 miles from Tulsa and the country's most inland port, has its own railroad. It has 2 switch engines and serves customers on 13 miles of rail track. The Port is also served directly by BNSF and SKO.

WATER TRANSPORTATION

The Tulsa Port of Catoosa is located at the head of the navigation channel for the McClellan-Kerr Arkansas River Navigation System. The 445 mile waterway links Oklahoma and the surrounding five-state area with ports on the U.S. inland waterway system, and foreign and domestic ports beyond, by way of New Orleans and the Gulf Intra-coastal Waterway. The Port is owned jointly by the City of Tulsa and Rogers County and operated through a public authority appointed by both governments. The Port complex encompasses a 1,500-acre industrial park, offering fully developed sites for prospective industry, and a 500-acre terminal area for public and private barge handling operations.

The port channel is 1.5 miles long, and the port facilities include 2 towboats for barge switching, liquid cargo loading and unloading docks, a grain handling facility, a dry cargo wharf, an overhead traveling crane, and dolphins for barge mooring. The port area also contains dry bulk storage compartments, sites for warehousing and fabrication, and other terminal operations within the 1,500-acre industrial complex. The Port's intermodal capabilities include barge



The McClellan-Kerr Arkansas River Navigation System - Image courtesy of the Army Corps of Engineers.

switching service, in-port rail operations, pipelines, and access to Class I rail service. The Port is accessible from I-44 and US-169 via SH-266 (Port Road), and SH-167, and is located about 8 miles northeast of Tulsa International Airport.

In December 1979, the Port was designated as a duty-free port or Foreign Trade Zone No. 53. This designation covers an area of 52 acres, including an area that may be used by individual companies for construction of their foreign trade-zone facility. A foreign trade zone is an area considered outside the customs territory of the United States where foreign and domestic merchandise may be admitted for storage, exhibition, assembly, processing, manipulation, relabeling, sampling or manufacturing, duty-free and without quota, while being processed for the consumer market. Payment of customs duties on foreign goods is not required unless and until the merchandise enters customs territory for domestic consumption.

The port handled over 2.2 million tons of freight in 2004. Of this, nearly 1 million tons or approximately 45% was inbound, while 1.23 million tons or 55% was outbound (*Figure 23*). Every year, 13 million tons of cargo is transported on the McClellan-Kerr by barge. This ranges from sand and rock to fertilizer, wheat, raw steel, refined petroleum products and sophisticated petrochemical processing equipment.

Additionally, Johnston's Port 33, a privately owned and operated port facility, is located at the eastern boundary of the TMA near the intersection of US-412 and the navigation channel. It consists of 5 separate docks for simultaneous loading/unloading, 2 service boats, and capacity for several barges; conveyor systems, barge unloading excavators, and scrap handling magnet. The port has capacity for open bulk storage, including fertilizer and grain storage. The port's primary outbound shipments consist of liquid bulk and agricultural products, as well as grain trucked-in from Enid, Oklahoma. Fertilizer, dry bulk, steel & pipe are the primary inbound commodities.

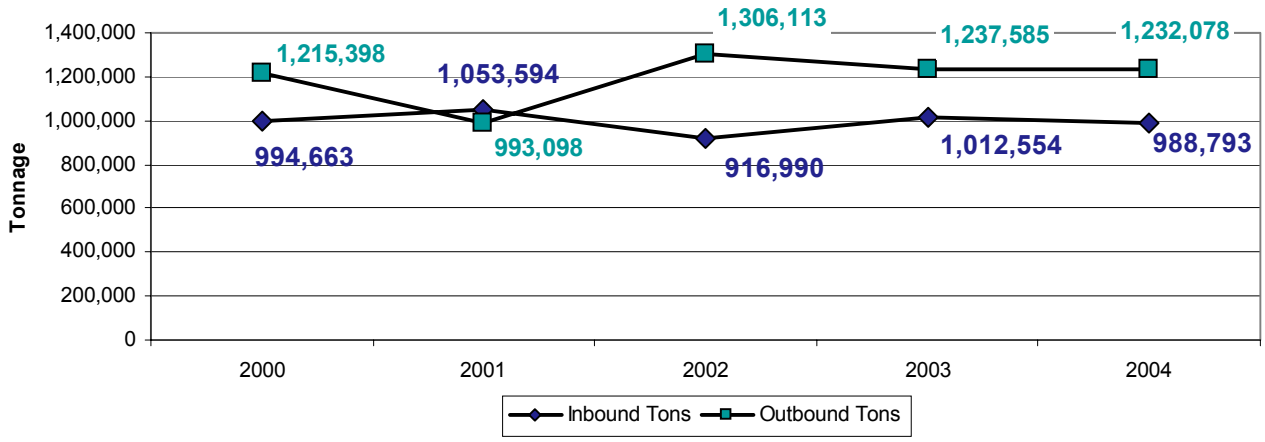
Water transportation will continue to play an important role in the Tulsa area. According to figures provided by the Tulsa Port of Catoosa, the total annual tonnage grew almost 5% during 2000-04. The number of businesses located at the port also continues to grow, and now stands at over 60. The port is involved in an ongoing marketing program offering prime industrial sites for lease or sale in the adjacent Riverview Business Park. Port officials are predicting that the growth in total tonnage transported and in the number and variety of industries at the port will continue. In turn, the port facilities will be expanded to keep pace with projected growth.

The Port is served by most of the nationwide contract carriers and averages over 450 trucks per day. Truck shipments are usually "next-day" requirements and average 20 short tons. Most truck shipments are to or from bulk storage at the Port's terminals or for plants in the general industrial park.

Over the next 5 years, the port plans to set up a truck staging area on the north side of the port, along SH-266,

FIGURE 23

Tulsa Port of Catoosa Inbound/Outbound Tonnage



to control truck traffic within the port facility. The port also plans to add 3 more docks to facilitate cargo transfer, including a short-range plan for an additional general cargo/ steel dock; an intermediate plan for an inbound dry bulk dock; and a longer range (8-10 years) plan for a container dock. Other anticipated improvements include widening the Verdigris River to 300 feet from Muskogee to Port of Catoosa to enable routine passing of 8 barge tows (current channel width is 150 feet) and, also, deepening of the waterway from the current 9 feet to 12 feet for greater shipping volumes per barge.

The port facilities are currently adequate to transfer cargo quickly and easily to the next mode of transportation (truck, rail, or barge). However, based on current growth trends, port officials are predicting that even with the dock development plan fully implemented, the region may need another port by the end of the planning horizon (2030).

AIR TRANSPORTATION

The Tulsa International Airport (TIA) is owned by the City of Tulsa and operated by the Tulsa Airport Authority. Established in 1928 on a 390-acre tract, Tulsa International today encompasses more than 4,000 acres just 10 minutes northeast of downtown. The airport complex employs more than 17,000 people and is classified as a medium hub, primary commercial service airport by the FAA's National Plan for Integrated Airport Systems (NPIAS). It presently operates with 3 runways, along with parallel and connecting taxiways that provide aircraft access to the airport terminal and other airport facilities. Air Carrier, General Aviation, Military, and Air Taxi aircraft utilize these runways.

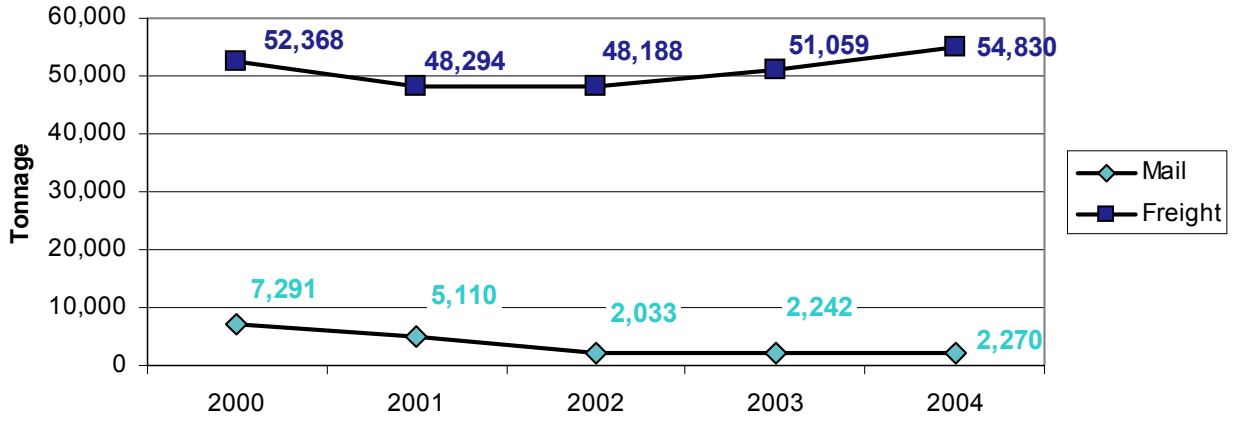
The airport's air carrier terminal is currently set up to operate as many as 22 passenger loading gates, serving 10 passenger air carriers, and processing about 3 million passengers in 2004, including 1,475,000 enplanements and 1,469,000 deplanements. From 2000 to 2004, enplanements decreased about 20% and deplanements decreased about 18%. Total operations by air carrier, air taxi, general aviation, and military aircraft decreased from approximately 199,000 to 167,000 (*Figure 24*). This is indicative of using larger aircraft with greater seating capacity and more efficient scheduling, as well as the effects of the terrorist attacks on September 11, 2001.

The airport facilities include passenger terminals serving the major air carriers, including American, Continental, Delta, Southwest, United Airlines, and regional commuter air carriers including Northwest Airlink, American Eagle, Comair, and Atlantic Southeast. In addition, Sun Country and Champion Air schedule regular charter flights to Las Vegas from TIA.

The air cargo terminal facility is located directly south and east of the passenger terminal building. The air cargo terminal consists of a landside and an airside, where incoming and outgoing cargo is processed and loaded from trucks to aircraft and vice versa. The air cargo terminal is currently occupied by Airborne, Burlington, Emery, Federal Express, Martinaire, and United Parcel Service. In addition, some freight and mail, including US Postal Service mail, is transported on scheduled air carrier and

FIGURE 24

Tulsa International Airport – Annual Activity



commuter airlines serving the airport.

The TIA handled approximately 57,100 tons of cargo in 2004 including airmail, and airfreight, transported by airfreight carriers, and in the cargo-hold of passenger aircraft. This total included about 50% inbound and 50% outbound cargo. Total air cargo activity at TIA has decreased by about 5% since 2000.

Direct access to Tulsa International Airport is provided via SH 11/Gilcrease Expressway, which runs east west along the southwest corner of the air carrier terminal. Access is also provided from the north by SH 266 or Port Road. The airport is accessible from I-244, and US-75 via SH-11/ Gilcrease Expressway. In addition, the airport is accessible from several major north-south arterials in the area, including Memorial Drive, Sheridan Road, and Mingo Road.

The Burlington Northern Santa Fe Railway (BNSF) operates a line that runs east-west along the south edge of the airport. Another rail line operated by the SK&O is located north of the airport and veers in a northeasterly direction. A rail spur that branches out from the BNSF rail line provides rail access to the manufacturing plants adjacent to the airport. However, there is no direct rail connection with the airport terminal facility at this point.

A general aviation airport in the area, Richard Lloyd Jones, Jr. Airport, (Riverside) is designated by the Federal Aviation Administration (FAA) – as a reliever for Tulsa International Airport. This reliever is part of the Tulsa metropolitan area Airport System Plan and is located approximately 15 miles south and west of TIA near Jenks. This airport is equipped to handle potential excess capacity at Tulsa International Airport.

According to the TIA, future air cargo development will either involve reconfiguration of existing buildings, or take place in the north development area. The current access to the airport is adequate and provided through a variety of roadways and streets from the south and east. However, as the airport grows and expands, design and engineering will be initiated as necessary to improve any traffic bottlenecks. According to the TIA, specific areas requiring redesign include entrance/exits to parking areas and strategies to minimize weaving along the airport terminal road.

FREIGHT FLOW MODEL

In the current project, freight attraction is analyzed for the Tulsa TMA and the 4 groups of commodities below:

1. Food/consumable products (*e.g.,* Live animals, cereal grains, animal feed)
2. Mining products (*e.g.,* Building stone, natural sands, gravel, coal)
3. Chemical products (*e.g.,* Chemicals, Fertilizers)
4. Manufactured products (*e.g.,* Plastics, Wood products, Mixed freight)

A detailed listing is provided in the *Supporting Documents*.

Classification of the Databases

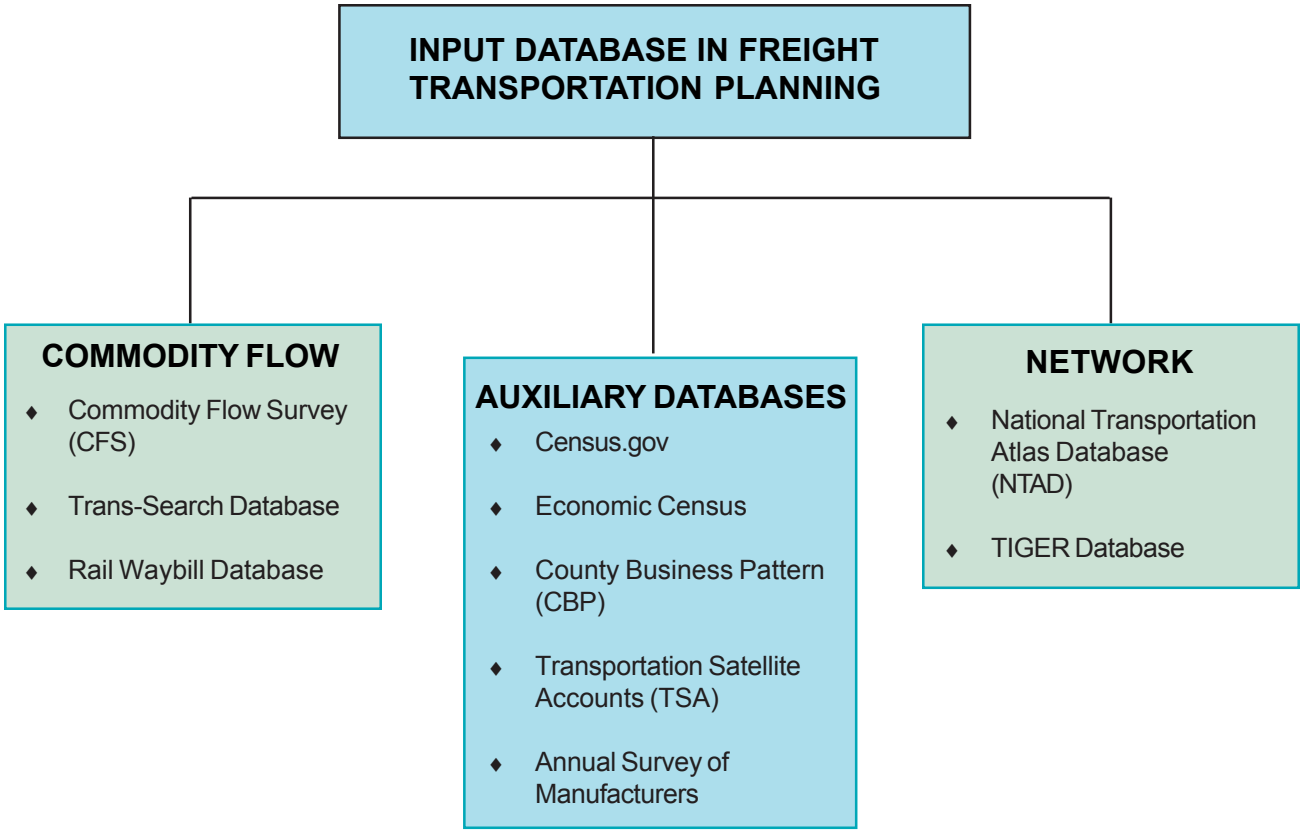
Based on the nature of the databases and their application, the databases have been classified into 3 categories. The schematic representation is shown in *Figure 25*.

Commodity Flow: These types of databases quantify/ describe the flow of commodities based on various attributes like origin, destination, mode, reliability, weight, dollar value, distance shipped, etc.

Auxiliary Databases: These types of databases quantify the factors that are either responsible for the generation of freight flow or are affected by the change in freight flow. They cover areas of the economy such as businesses, manufacturing, and trading that may contribute to the flow of freight and include demographic data such as population, income and other socioeconomic factors.

TULSA INTERNATIONAL AIRPORT (TIA)	
Highway Access	SH 11, I-244, US 169, US 75
Rail Proximity	BNSF, S K & O
Activity Indicator	57,100 Tons
Primary Cargo	Mail, Light Parcels, Computers, Electronics

FIGURE 25
Classification of Databases



The *Supporting Documents* contains tables showing *To* and *From* freight flows from Tulsa TMA.

Projected total flow for the year 2030, in total tonnage, is highest from Tulsa to Midwest and Great Lakes region, specifically to Missouri, Illinois, and Ohio. That flow is complemented with the flow to and from Texas and California. The flows in tonnage are also significant to Florida and Northeastern states.

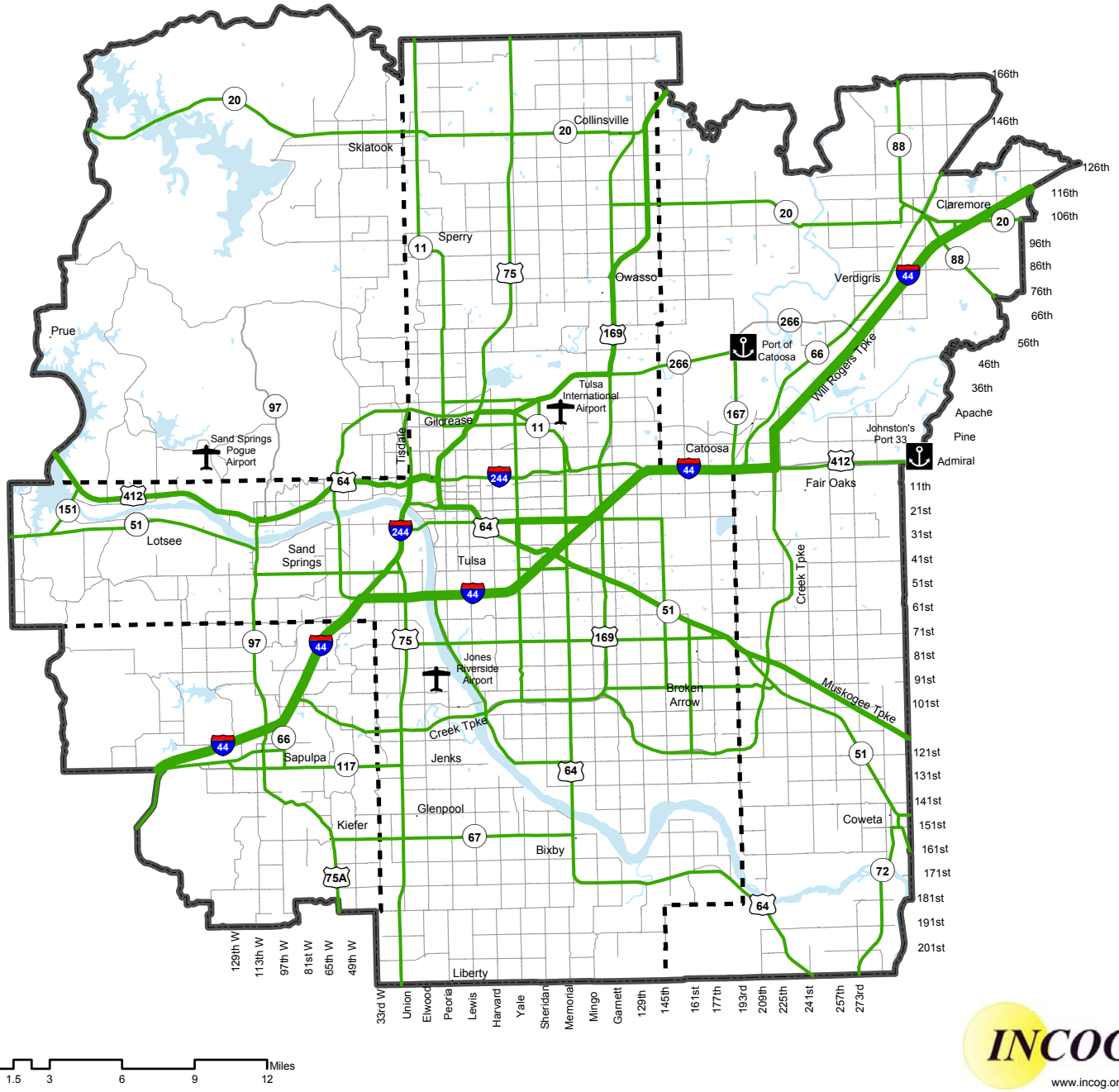
In general, freight flow is predominant via highway followed by rail and water. Tonnage by air is limited in comparison. Total tonnage by highway alone, to/from Tulsa TMA, is expected to grow to 29.6 million tons in 2030 from 18.3 million tons in 1997. Similarly, by rail, it is expected to grow to 10.9 million tons in 2030 from 7.8 million tons in 1997. It is important to plan for such a heavy growth forecast in freight flow when implementing the LRTP.

Trip Assignment for Total Flow by Road

Based on trip assignment for the freight origins and destinations reported in the freight study conducted by the University of Oklahoma, highest flows by road are estimated to be on Turner Turnpike/I-44, I-44 in the urbanized area of Tulsa TMA, Will Rogers Turnpike/I-44, US-412 and on US-75.

The highest flows by rail are by Union Pacific and Burlington Northern and Santa Fe rail lines.The 2030 forecast and the trip assignment virtually follow the existing flow by highway. Highest flows again are expected on I-44, US-412 and US 75 N. and US 75 S. The highest flows by rail are by Burlington Northern and Union Pacific rail lines. See the following Commodity Flow maps for more information.

Freight By Highway
2030 Forecast



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INCOG
www.incog.org

Highway Flows in Total Tons

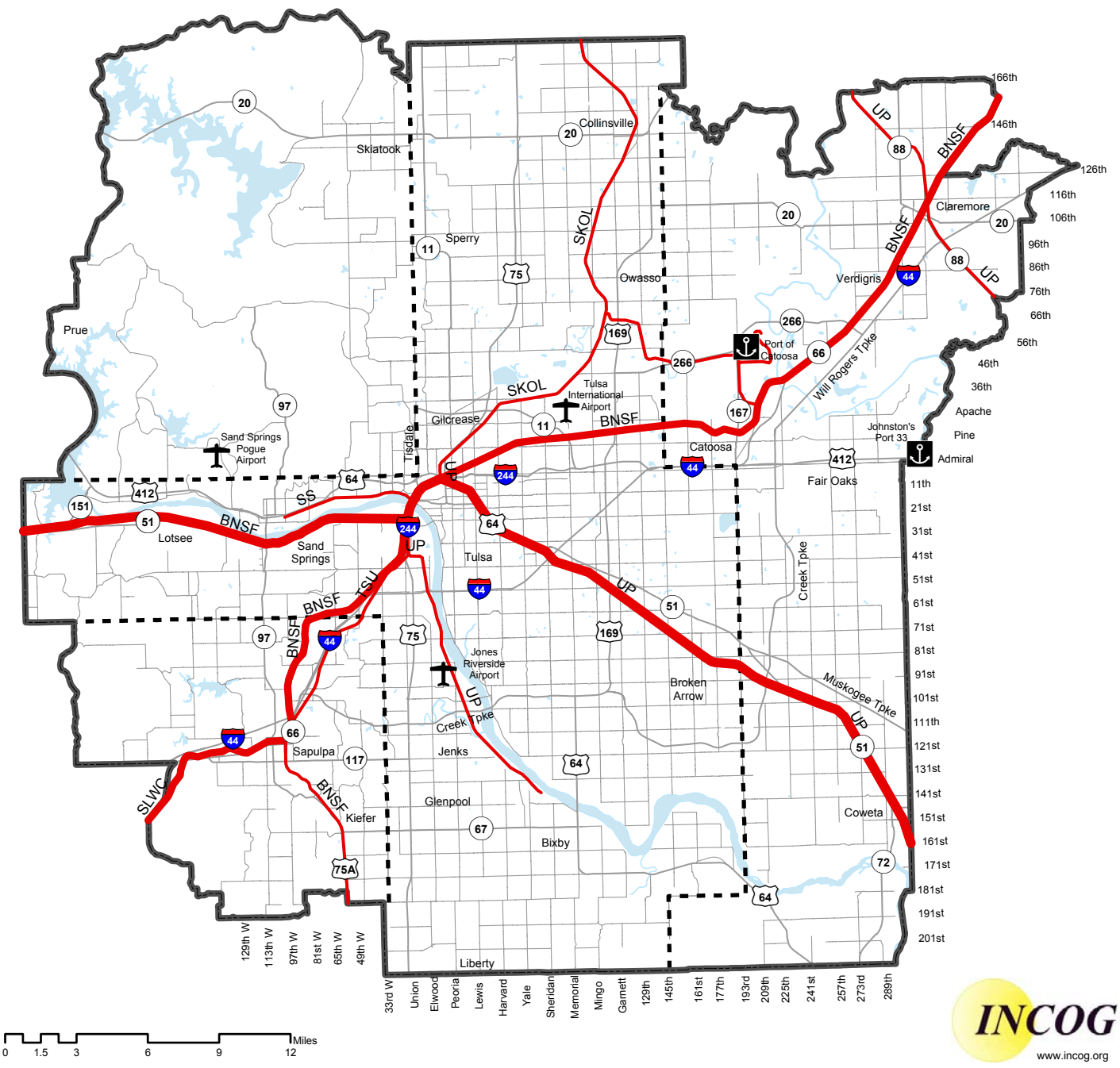
- 0 - 5,000
- 5,001 - 10,000
- 10,001 - 15,000
- Over 15,000
- Highways
- Arterials
- County Boundary
- Transportation Management Area

N
W
E
S

Map Scale - 1:410,000

Location Map

Freight By Rail
2030 Forecast



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INCOG
www.incog.org

Rail Flows in Total Tons

- 0 - 5,000
- 5,001 - 10,000
- 10,001 - 15,000
- Over 15,000
- Highways
- Arterials
- County Boundary
- Transportation Management Area

N W E S

Map Scale - 1:410,000

Location Map

ISSUES AND ACTIONS

Since freight transportation is a means to various regional economic ends, changes to the regional economy, such as manufacturing and retail, directly impact freight transportation and vice versa. In addition, access to raw materials and markets are key factors in the location decision of most manufacturing and distribution companies. Building an efficient freight infrastructure will require coordination among the various modes of freight transportation. An efficient freight movement system would expand markets, increase opportunity, production, and competition. The major issues associated with freight transportation in the TMA can be grouped into 5 broad categories, including government regulations, safety, energy consumption, economic impact, and infrastructure development and maintenance. These issues have been evaluated, and the following actions are proposed.

Legal and Regulatory Issues

According to an Oklahoma trucking industry survey, the most burdensome issue in the goods movement process continues to be government regulation. In spite of federal deregulation of the trucking and airline industries in the late 1980s and early 1990s, individual states have continued to maintain restrictions on the weight and size of trucks that can operate within their borders. The following actions are recommended:

- In conjunction with the Chambers of Commerce, and local freight transporters, identify any legal and regulatory impediments to freight movement in the Tulsa area
- Developing Oklahoma's Commercial Vehicle Information Systems Network (CVISN) effort has undertaken major steps toward streamlining permitting and other regulatory needs with help from Department of Commerce, Oklahoma Tax Commission, Department of Public Safety and Oklahoma Department of Transportation. These recommendations will be supported through the planning process.

Energy and Efficiency Issues

The current system for moving freight relies heavily on trucking, which is one of the least fuel-efficient modes. Trends in freight transportation (just-in-time, next day delivery, etc.), appear to suggest that trucking and airfreight are the wave of the future. One prominent goal of ISTEA was to develop a Transportation System that ensures energy efficiency. In order to advance such a goal, the freight element of the LRTP identifies resources that foster the development of more efficient freight vehicles, better technology, or operational strategies that minimize the use of energy. An energy-efficient goods movement plan should focus on the following actions.

- Encourage the testing of less-polluting alternative sources of energy and their potential application in the goods movement process, particularly truck stop electrification
- Support the development of more efficient freight vehicle technology and the use of energy-efficient alternatives such as double stacked railcars, longer trailers, electronic sorting and tracking of packages, freight consolidation techniques, satellite distribution centers, etc.
- Support the local emergency/hazardous materials management agency in identifying alternative routing options in the area, for transportation of potential hazardous materials
- Encourage the use of new technology applications and practices that maximize efficiency
- Support efforts to maximize efficiency in the goods movement process, including handling and transporting goods to minimize air emissions and achieve air quality goals

Safety Issues

The goods-movement process is concerned with issues of safety. Freight movement involves safety at terminal facilities, vehicle operational safety, and safety along the roadways. The safety issues associated with individual terminal facilities are the responsibility of terminal operators. However, drivers must be certified, and vehicles must pass safety inspections in order to operate on the roadways. Similarly, the local roadway network must meet the minimum design standards to maximize safety for vehicles and other road users. Therefore, the freight transportation plan for the region must address the issue of safety from the perspective of the driver, the vehicle, and the roadway. The LRTP must also address safety as it relates to trains, barges, and other freight transportation modes.

- Identify the high accident locations involving freight movement in the region, including highways, railroads, railroad crossings, and waterways. Work with the local freight operators to identify and address safety-related issues on the road network and elsewhere
- In conjunction with ODOT, rail operators and local governments, develop and maintain an inventory of rail/highway crossings in the area, including at-grade and grade-separated crossings, and use the results to guide the prioritization and selection of potential projects
- Collect and maintain data related to truck accidents and truck safety on the region's primary roadways
- Encourage the development and use of improved vehicle technologies to enhance safety and support ongoing vehicle safety inspection programs for all modes

Economic Development Issues

Because the movement of freight is closely related to regional economic activity, changes in the economy are likely to affect the volume and pattern of regional goods distribution. Trends in regional production, manufacturing, and distribution will be closely monitored and characterized to get a better understanding of freight activity in the Tulsa area. As the region grows and expands economically, so will the need for freight service. Therefore, the goods movement planning process must support regional economic development activities.

- Work with local businesses, Chambers of Commerce, local governments and authorities to identify freight-related long-range and short-range transportation projects and encourage their funding and implementation
- Support the use of state and local economic development programs to develop regional transportation facilities, improving industrial areas and other freight activities that have the potential to strengthen the local economy
- Encourage public/private partnership ventures that provide leverage for local freight-transportation projects

Physical Infrastructure Issues

The regional freight infrastructure consists of networks, vehicles, and terminal facilities. These include airports, port facilities, and roadways that are built, maintained, and operated by the public sector. A significant portion of the infrastructure belongs to the private sector, including airplanes, barges, towboats; trains, rail facilities, trucks, truck terminals, pipelines, etc. This difference in ownership may present some challenges when it comes to planning for future infrastructure needs. The focus of the freight element is on the infrastructure that are built, maintained and operated by the public sector. Following are some actions that would facilitate the smooth flow of goods into and through the Tulsa region.

- Work with the Oklahoma Department of Transportation and other agencies to continue development and maintenance of the roadways in the area, including those that connect the manufacturing, storage, and distribution centers in the area to other market areas beyond the TMA; also continue to monitor the performance of airports, water ports, and rail facilities
- Identify bottlenecks, missing links, safety hazards, and other needed components of the regional infrastructure
- Continue to track the performance of airports, water ports, and rail facilities. Develop criteria to evaluate and monitor the performance of the freight movement infrastructure including roadways, railways, airports, and other networks in the area.
- Encourage feasibility studies along the Osage/NW passage, and investigate opportunities to improve US-75, US-169, and I-44 to facilitate freight movement between Tulsa and the surrounding metropolitan areas of Dallas/Ft. Worth, Texas; Kansas City and St. Louis, Missouri; and Wichita, Kansas
- Support development of regional ITS applications, in compliance with national ITS architecture for truck facilities and operations in the TMA
- Enhance the development of the Tulsa International Airport and the Port of Catoosa through implementation of planned physical infrastructure improvements, including additional air cargo facilities and improved landside access, and additional dock capacity at the Port of Catoosa for general cargo, dry bulk, and container cargo; support efforts to widen and deepen the water channel between the Port of Muskogee and the Port of Catoosa
- Conduct a study on how full container importers have functioned since the closing of the rail intermodal facility, and what can be done in the future to accomodate these importers

PLAN EFFECTIVENESS

Chapter 6

INTRODUCTION

This element reviews the anticipated social and environmental concerns and analysis of the planned *Destination 2030* Long Range Transportation Plan (LRTP) improvements. It also presents the cost and revenue forecasts for implementing the LRTP as well as mechanisms to evaluate the progress and status of the LRTP goals, objectives, and actions. Finally, it presents a summary of the public involvement process and the public comments on the LRTP.

SOCIAL ENVIRONMENT

"The effort to prevent discrimination must address, but not be limited to a program's impacts, access, benefits, participation, treatment, services, contract opportunities, training opportunities, investigations of complaints, allocations of funds, right-of-way, research, planning and design."

- Title VI of the Civil Rights Act of 1964 and the Civil Rights Restoration Act of 1984

Overview of Issues, Regulations and Mission

A key consideration of any transportation-planning process is the potential effects on communities that historically have not participated in decision-making. Such communities are herein referred to as Socially Sensitive Groups (SSG). A SSG is a population within the Tulsa Transportation Management Area (TMA) that encompasses a majority percentage of minorities, Hispanics, low-income, elderly and/or children of single-parent female-headed households. As part of the National Environmental Policy Act (NEPA) process and the Executive Order on Environmental Justice (1994), the LRTP identifies any SSG (particularly minority and/or low-income populations) that reside in proximity to planned improvements and examines issues and impacts associated with the proposed improvements.

REGULATIONS

Title VI of the 1964 Civil Rights Act states: *"No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance."* Title VI prohibits intentional discrimination as well as any discriminatory policy or practice that has a negative impact on protected groups. In 1994, then-President Clinton signed Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority and Low-income Populations." The Executive Order focuses federal attention on the environmental and human health conditions of minority and low-income populations, promotes nondiscrimination in federal programs affecting human health and the social environment, and provides minority and low-income populations access to public information and an opportunity to participate in matters relating to the environment. In 1999, the Federal Highway Administration and the Federal Transportation Administration drafted a memorandum titled *Implementing Title VI Requirements in Metropolitan and Statewide Planning*. This document clarifies the process by which metropolitan and statewide planning agencies evaluate long-range plans and potential effects on communities with high percentages of minority and low-income populations. Both orders relate directly to addressing environmental justice activities in the transportation-planning process.

MISSION STATEMENT

It is INCOG's intent to ascertain during the planning process if any SSG would be disproportionately affected by the recommended transportation projects in the LRTP. In order to accomplish this end, it is essential for both planning organizations and implementing bodies to be conscious of possible impacts from improvements to the transportation system. Informed planners and engineers will be able to make better decisions if the LRTP includes information identifying locations of socioeconomic groups covered by the Executive Order on Environmental Justice and Title VI provisions.

TABLE 18

Proportional Impact Analysis (Estimated Miles of Roadways, Trails & Bikeways and Transit Routes)

ROADWAYS	Linear Miles		
	TMA	SSA's	
Total	2,011	509	25%
Planned	404	108	26%
Existing	1,607	401	24%

ROADWAYS	Lane Miles		
	TMA	SSA's	
Total	6,070	1,913	31%
Planned	1,913	507	26%
Existing	4,157	1,406	33%

TRAILS & BIKEWAYS	Linear Miles		
	TMA	SSA's	
Total	821	387	47%
Planned	683	299	43%
Funded	38	20	63%
Existing	100	68	68%

BUS ROUTES	Linear Miles		
	TMA	SSA's	
Total	382	212	55%
Urban Routes	247	157	63%
Suburban Routes	135	55	40%

An analysis was conducted to determine if the 2030 LRTP fulfilled its mission of not disproportionately affecting any SSG. Research involved examining total linear miles for each of the transportation modes. In each of the modes, 2005 mileage was compared with projected 2030 mileage. This analysis was done for both the Socially Sensitive Areas (SSA) and the regional planning area. As *Table 18* shows, the proportionality levels between the TMA and SSAs for the different transportation modes are almost identical.

Although there are no clear ways to justify that absolute equity of transportation project planning was achieved, the table above combined with information presented in this section, suggests quantitatively and qualitatively that the planned improvements do not disproportionately affect any SSG.

Methodology for Identifying SSGs

A review of the 2000 US Census data was conducted for the TMA for potential environmental justice issues including:

1. Displacement/relocation of minority and low-income residents
2. Availability of affordable and low-income housing
3. Impact on local commute times and availability of public transportation
4. Access to bike/pedestrian trails
5. Increase in noise levels
6. Separating/bisecting minority and/or low-income neighborhoods.

The *Socially Sensitive Areas* map on Page 105 shows the greatest concentration of all the groups in the TMA comprising socially sensitive areas, particularly minority and low-income populations.

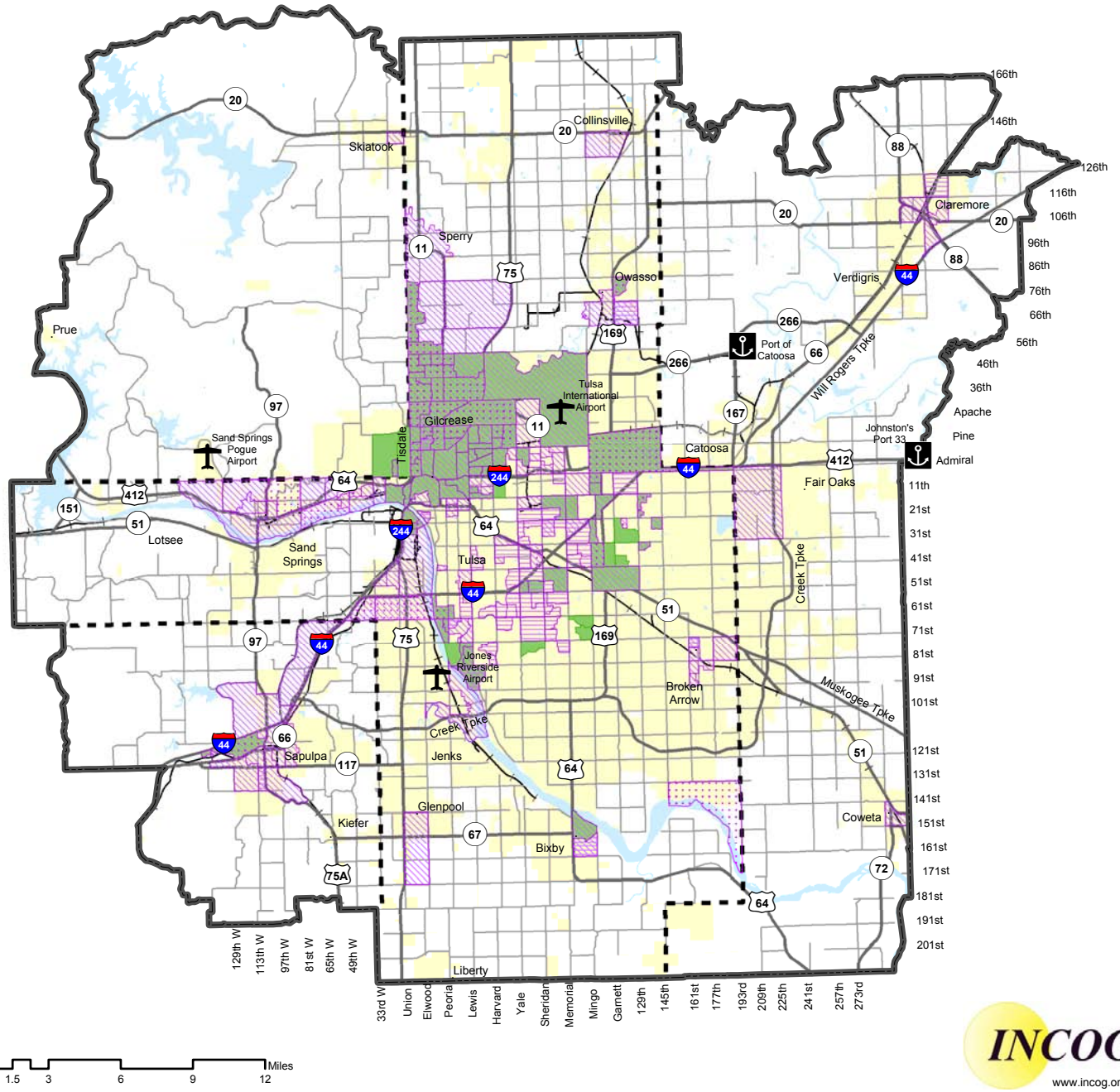
The maps on Pages 109, 111 and 113 show the TMA's greatest concentration of SSG populations in relation to TMA roadway (*Social Environment and Planned Roadways)*, transit (*Social Environment and Planned Public Transportation)* and multimodal (*Social Environment and Planned Trails & Bikeways)* routes.

Because roadway plans typically have a greater physical impact on communities than do plans for transit and bike/pedestrian facilities, *Table 19* examines the list of 2030 planned roadways in relation to identified SSA neighborhoods.

Similar studies were conducted for neighborhoods affected by the planned public transportation system and the planned bicycle/pedestrian system. Results from that examination showed areas with high concentrations of minority and/or low-income households are well-served by the proposed improvements and that particular consideration should be given to those areas when specific projects are implemented.

In addition to looking at the geographical impacts of the proposed improvements, a broad analysis was conducted

Socially Sensitive Areas



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- Minorities and Hispanics
- Youth
- Elderly
- Low-Moderate Income

- Highways
- Arterials
- Rail
- County Boundary
- Transportation Management Area
- Corporate Limits

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Map Scale - 1:410,000

Location Map

of the mean travel time for SSA residents relative to residents of the overall TMA. Mean Commute Time for the Tulsa TMA was computed based on Census data for 2000 and compared with the SSAs for the same year. The TMA mean commute was 23 minutes when compared with the SSA commute time, which was 22 minutes. With the improvements proposed by 2030, the average speed for the entire network increases 2.4%, and therefore it is expected that the mean travel time for SSA residents will be proportional to that of TMA residents overall.

MINORITY AND LOW-INCOME

For the purposes of this LRTP and in conformance with the Executive Order, minority and low-income populations are defined as follows:

Minority *refers to persons who are Black (having origins in any of the black racial group of Africa or African American); Hispanic (of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race); Asian American (having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands); or Native American Indian and Alaskan (having origins in any of the original people of North America maintaining cultural identification through tribal affiliation or community recognition). The US Census separates Hawaiian (including people of the Pacific Islands) from Asian American.*

Many SSAs are lacking sidewalks that allow pedestrians linkages to bus stops and other destinations.

Low-income *refers to household income at or below the Community Development Block Grant (CDBG) thresholds. As of 2000, the CDBG threshold was $19,350, 50% of the area median income ($39,260) in the Tulsa Transportation Management Area.*

Year 2000 US Census data were used to obtain minority population information, and CDBG threshold was used to identify people at low-income levels in the TMA. The total minority population in the TMA for the year 2000 was approximately 19.5% of the general population, while the low-income segment represented nearly 11% of the general population. Although the US Census data give a demographic profile of the study area, further research was carried out to identify low-income populations and to gain a better awareness or "sense of place" within those communities. This research included insight from area planning officials and comments submitted by neighborhood and civic organization representatives, as well as the general public.

Census data indicate a range of socioeconomic and demographic characteristics within the TMA. Statistically, most of the neighborhoods situated on the northern and western fringes of Downtown Tulsa were found to have the greatest concentrations of minority populations and households with incomes below the national poverty level.

ELDERLY AND YOUTH

In addition to examining proposed impacts of roadway, transit, and trail projects on minority and low-income populations, areas having high concentrations of elderly and youth were also studied in order to identify possible needs for new or improved facilities. Elderly is defined as TMA residents age 65 and older. According to the 2000 US Census, 81,489 persons (11.6% of the general population) in the TMA are over age 65. Most of this group is situated within the east and southeast sections of Tulsa's corporate limits.

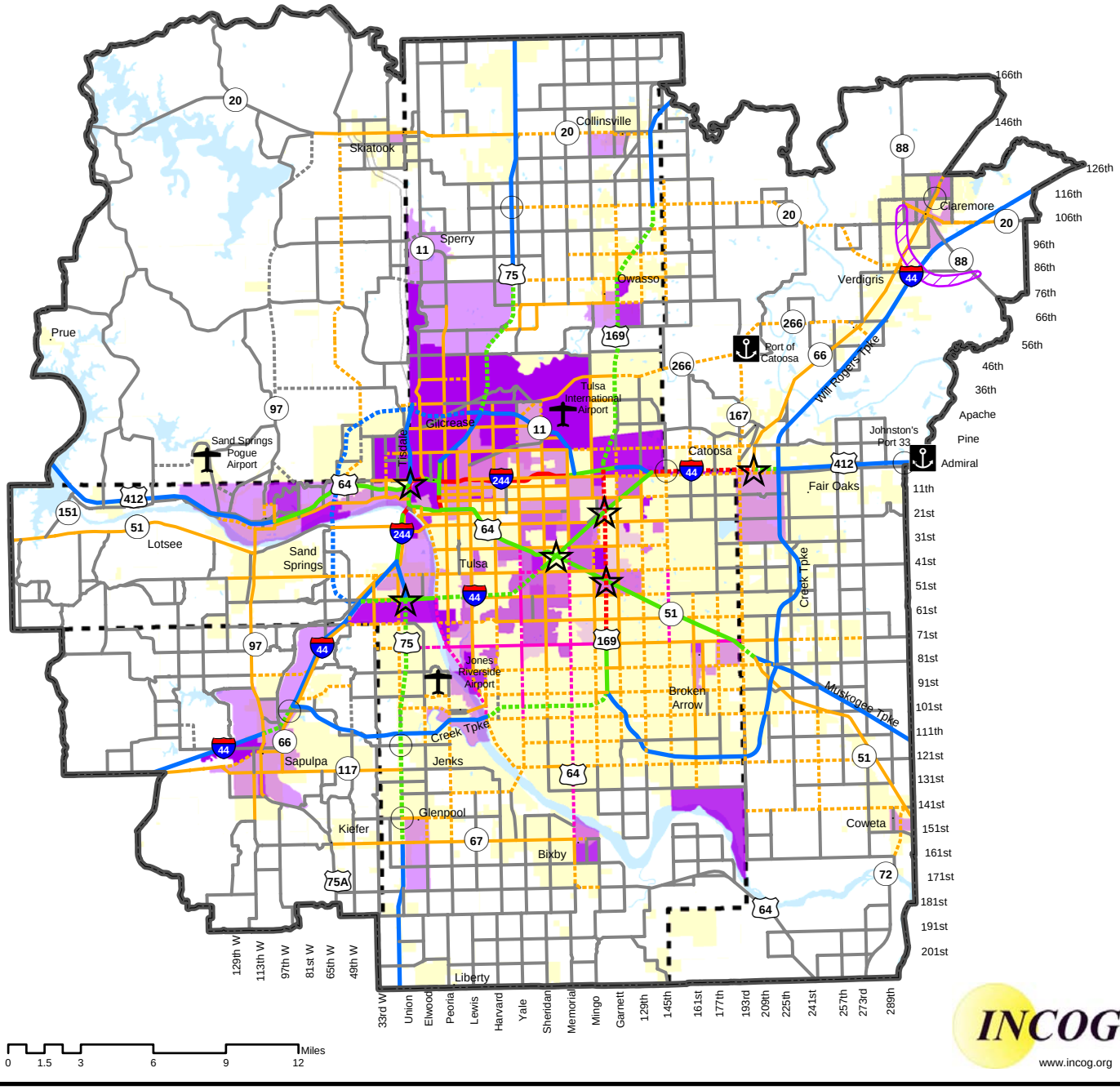
The youth demographic is often overlooked in the transportation-planning process. A key indicator of youth possibly lacking adequate transportation is the number of single-parent female-headed households with children under 18. According to 2000 US Census counts, there are over 30,000 single-parent, female-headed households in the TMA, and this group represents nearly 11% of the total population.

Persons in this category, according to most statistics, live in low-income areas with little or no means of reliable transportation. Therefore, access to transportation facilities, such as transit routes and on-street bikeways, is vital and creates a dual benefit that serves not only the parent, who may need transportation to commute to work, but also the youth, who relies on safe transportation to school or community centers. The *Socially Sensitive Areas* map identifies the greatest concentration of these 2 groups within the TMA.

TABLE 19
List of Roadway Projects Impacting Socially Sensitive Areas

PROJECT NAME	PROJECT DESCRIPTION
I-44	Arkansas River to Sheridan Rd.
I-44 (east)	SH-66 to Creek Turnpike
I-44/Turner Turnpike	SH-97 to Creek Turnpike
I-44 (west)	I-244 to US-75
SH-20	US-75 to US-169
SH-72	SH-51 to 161st St. South
US-169	I-244 to 71st St. South
US-169	I-244 to SH-20 (116th St. North)
US-169	91st St. South to Memorial Drive
US-75	I-44 to SH-67 (151st St. South)
US-75	SH-11 (Gilcrease Expressway) to 86th St. North
Gilcrease Expressway	I-44 to Lewis Ave.
11th St. South	129th East Ave. to 145th East Ave.
12th St.	SH-97 to Adams Rd.
31st St. South	Garnett Rd. to 145th East Ave.
36th St. North	Cincinnati Ave. to Osage Dr.
49th West Ave.	61st St. South to I-44
61st St. South	Riverside Drive to Harvard Ave.
61st St. South	US-75 to 49th W Ave.
76th St. North	US-169 to 129th East Ave.
81st St. South	Lewis Ave. to SH-51
91st St. South	Delaware Ave. to 193rd East Ave.
145th East Ave.	I-44 to 41st St. South
177th East Ave.	51st St. South to 101st St. South
193rd East Ave.	I-44 to 121st St. South
Admiral Place	Garnett Rd. to 129th E Ave.
Garnett Rd.	11th St. South to Pine St.
Memorial Drive	I-44 to 151st St. South
Peoria Ave.	61st St. South to Riverside Drive
Pine St.	SH-11/Gilcrease Exp. to SH-66
Pine St.	25th West Ave. to Union Ave.
Port Road Extension	SH-11 to Sheridan Rd.
Riverside Drive	101st St. South to 121st St. South
Riverside Drive	I-44 to 101st St. South
Riverside Drive (Scenic Parkway)	Houston to I-44
Sheridan Rd.	Apache St. to 36th St. North (Port Road)
Union Ave.	51st St. South to 91st St. South
Yale Ave.	Pine St. to Apache St.

Social Environment and Planned Roadways



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Destination 2030

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Note - The Socially Sensitive Area Factors include: Youth, Elderly, Low Income, Minorities, and Hispanic.

- 1 Factor
- 2 Factors
- 3 Factors
- 4 Factors
- 5 Factors

- Expressway 8-lane, Existing
- Expressway 8-lane, Planned
- Expressway 6-lane, Existing
- Expressway 6-lane, Planned
- Expressway 4-lane, Existing
- Expressway 4-lane, Planned
- Arterial 6-lane, Existing
- Arterial 6-lane, Planned
- Arterial 4-lane, Existing
- Arterial 4-lane, Planned
- Arterial 2-lane, Existing
- Arterial 2-lane, Planned

Interchange Reconstruction

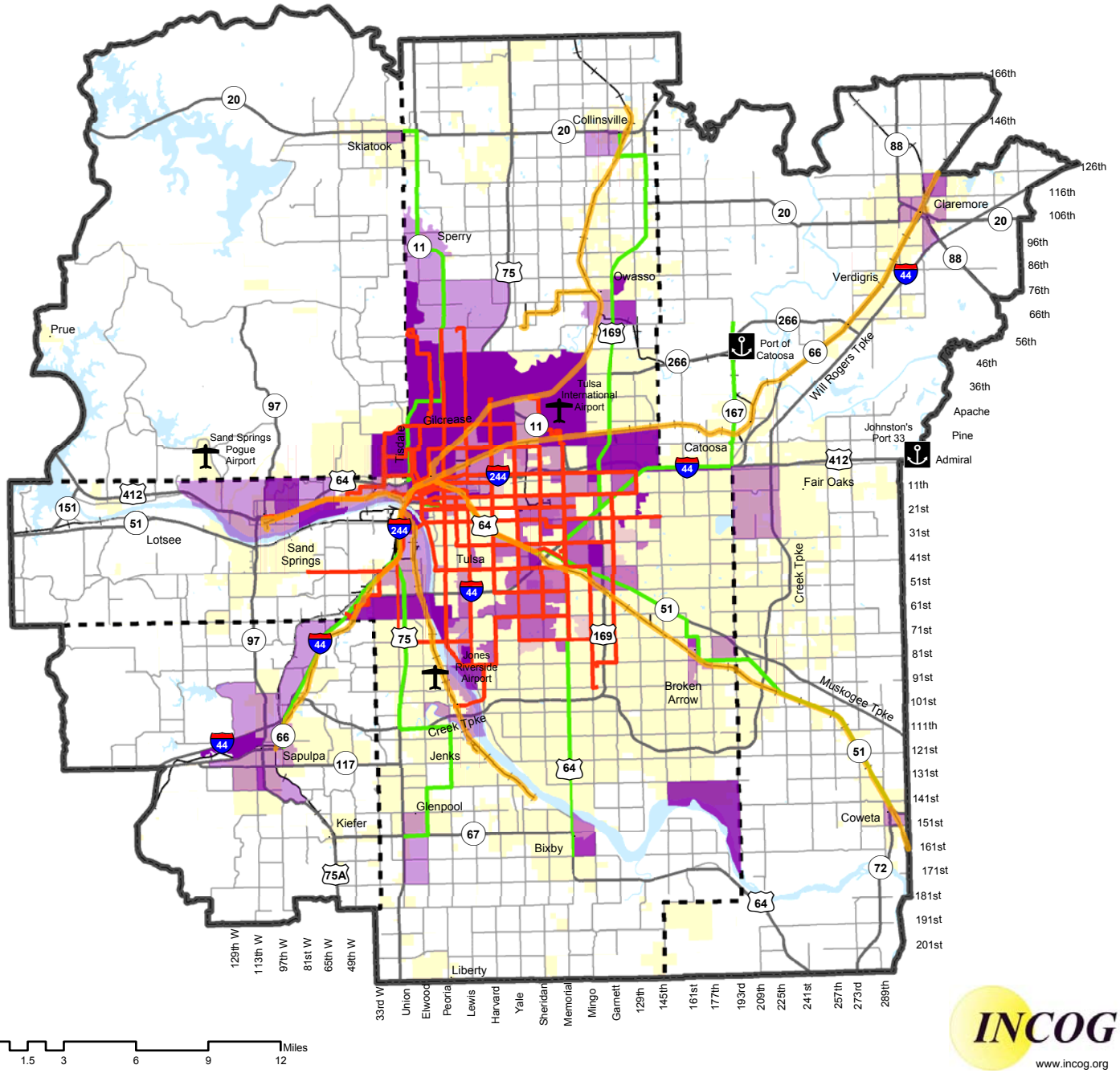
- Expressway
- Grade-Separated
- County Boundary
- Corporate Limits
- Transportation Management Area
- ODOT SH-88 Study Area

N W E S

Map Scale - 1:410,000

Location Map

Social Environment and Planned Public Transportation



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Note - The Socially Sensitive Area Factors include: Youth, Elderly, Low Income, Minorities, and Hispanic.

- 1 Factor
- 2 Factors
- 3 Factors
- 4 Factors
- 5 Factors
- Urban Routes
- Suburban Routes
- Commuter Corridor Study Areas

- Highways
- Arterials
- Rail
- County Boundary
- Corporate Limits
- Transportation Management Area

N W E S

Map Scale - 1:410,000

Location Map

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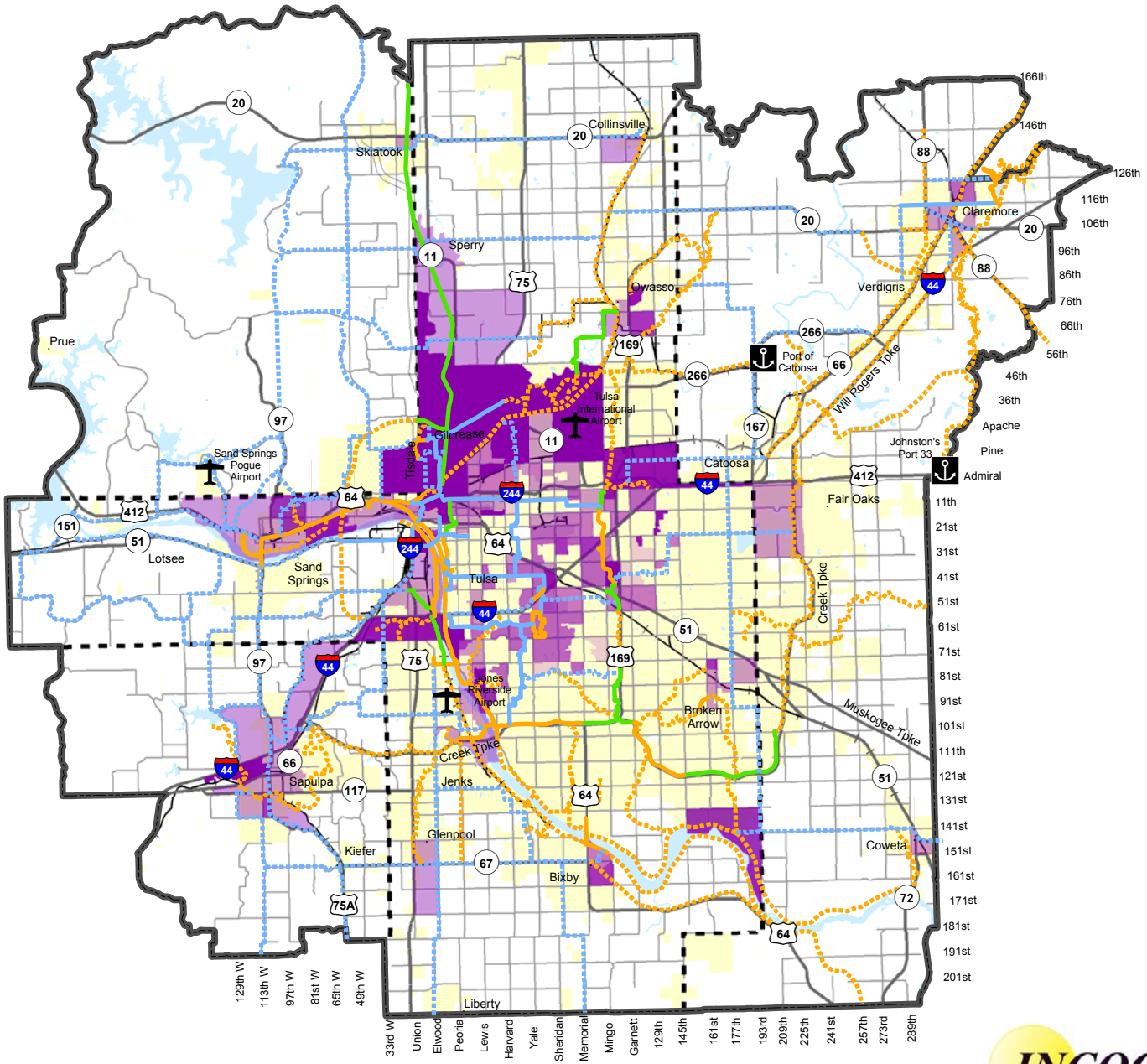
Social Environment and Planned Trails & Bikeways



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Destination 2030

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Note - The Socially Sensitive Area Factors include; Youth, Elderly, Low Income, Minorities, and Hispanic.

- 1 Factor
- 2 Factors
- 3 Factors
- 4 Factors
- 5 Factors

- Existing Bikeway
- Proposed Bikeway
- Existing Trail
- Proposed Trail
- Funded

- Highways
- Arterials
- Rail
- County Boundary
- Corporate Limits
- Transportation Management Area

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Map Scale - 1:410,000

Location Map

Recommendations

The maps and tables in this section provide only a snapshot of impacted neighborhoods. Further analysis would be needed to determine the degree of impact these projects would have on SSAs with regards to potential displacement/ relocation, affordable housing, noise levels, local commute times and availability of public transportation, access to bike/pedestrian facilities, and potential for separating/ bisecting minority and/or low-income neighborhoods.

The primary purpose then for the figures and table noted in this chapter is to suggest, with respect to certain projects in the LRTP that directly and indirectly affect SSGs, efforts should be undertaken by implementing agencies to ensure these areas have ample opportunity for public participation in the physical planning phases. In doing so, a set of recommendations are proposed for transportation project sponsors and INCOG with respect to implementing the LRTP.

For the following recommendations, *transportation project sponsors should:*

OUTREACH

- Send newsletters, outreach materials, and/or surveys for major projects to residents in Socially Sensitive Areas (SSA) as appropriate
- Hold outreach events and community group meetings at convenient times and locations for residents
- Inform neighborhood planners of various transportation-related projects occurring in SSAs

ROADWAYS

- Identify projects with potential noise pollution issues
- Coordinate with city and neighborhood planners to minimize impediments, such as noise, or physical barriers that may separate communities
- Ensure that roadway projects do not detract from an SSA residents' quality of life
- Enhance the accessibility and mobility of residents living in minority and/or low-income areas by constructing sidewalks that serve as linkages between bus stops and other points of interest

For the following recommendations, *INCOG should*:

PUBLIC TRANSIT

- Evaluate the Public Transit Plan for the TMA , in coordination with MTTA, to
  - Ensure transit serves SSAs
  - Develop the planned system, which would provide more hours of operation and allow transit users to commute to employment centers in a more timely fashion

TRAILS AND BIKEWAYS

- Review current land-use development policies for the general area
- Advocate adherence to sidewalk policies for new developments
- Provide schools in SSAs with bicycle and pedestrian safety information
- Continue to advance the planned trails and on-street bikeways, particularly in SSAs where transportation options may be limited

NATURAL ENVIRONMENT

Environmentally Sensitive Areas

The natural environment is an important consideration in transportation planning. It is the purpose of this section to provide information that may expedite and enhance the planning, permitting, and implementation process for planned projects where environmental issues must be considered.

For the purpose of this section, various environmental considerations specific to the TMA were selected based on the data that was available for analysis on a regional basis:

- Lakes, ponds, or other water bodies
- Impaired Streams (including a ¼ mile buffer)
- 100 year Floodplain
- McClellan-Kerr Navigation System (including bordering property owned by the Army Corps of Engineers)
- Bald Eagle Habitat and Nesting Areas (including a 1 mile buffer)
- Arkansas River Least Tern Preserve
- Parks (including a ¼ mile buffer)
- Skiatook Wildlife Management Area
- Oil and Gas Wells
- Prime Farmland

These considerations were mapped, combined to create an index of environmentally sensitive areas, and compared with planned transportation improvements for roadways (*Natural Environment Areas and Planned Roadways* map, Page 121), public transportation (*Natural Environment and Planned Planned Transportation* map, Page 123), and bicycle/pedestrian facilities (*Natural Environment and Planned Trails & Bikeways* map, Page 125). Areas showing clusters of multiple considerations adjacent to planned projects were termed Environmentally Sensitive Areas (ESA). These areas were considered in relation to planned roadway, bicycle/pedestrian, and public transportation improvements.

Effects on ESAs by bicycle/pedestrian facilities and public transportation improvements were mitigated during the planning process. However, these projects will still require permitting and interagency cooperation during implementation. Planned roadway improvements were determined to have the greatest potential impact on ESAs. These improvements, listed in *Table 20*, will require more rigorous environmental reviews and cooperative strategies between federal, state, tribal and local agencies. It is recommended that all parties involved in any aspect of planned projects in ESAs engage the various state, tribal and federal permitting agencies early in the development of the transportation improvement. INCOG will monitor the ESAs and project proposals to ensure the early and continuous involvement of all affected agencies.

As part of its long-term planning process, INCOG strives to ensure the preservation of historical archeological sites, as identified by the Oklahoma Archeological Survey (OAS) and in cooperation with the State Historic Preservation Office of the Oklahoma Historical Society. These sites range from prehistoric occupations dating back some 9,000 years to historic manifestations of the 1930s and 1940s. According to OAS, there are over 1,650 prehistoric and historic archeological sites in the Tulsa TMA (184 in Creek County, 714 in Osage County, 330 in Rogers County, 170 in Tulsa County, and 253 in Wagoner County).

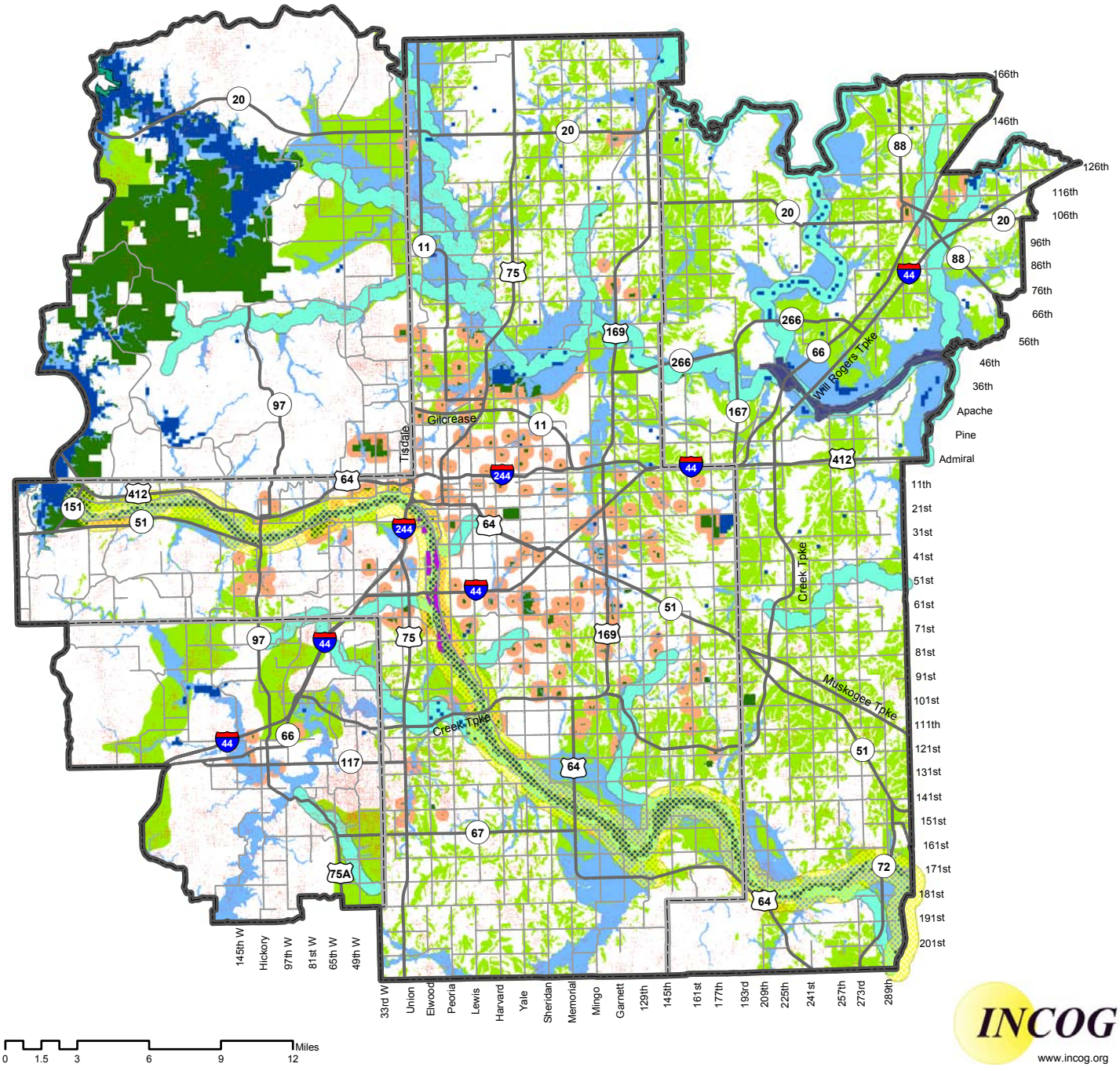
Although many of these sites fall some distance from the metropolitan areas, they remain as key features that will continue to have a bearing on the long-term directional growth patterns of the TMA. It is worth noting, however, that contrary to widely held perceptions, archeological sites can and do survive in urban environments, according to OAS. Therefore, comprehensive cultural resource studies should be undertaken with all transportation infrastructure improvements.

Air Quality Considerations

The 3 primary pollutants, Volatile Organic Compounds (Hydrocarbons), Carbon Monoxide (CO) and Nitrogen Oxides (NOx) were estimated using the federally approved Mobile 6 model for the region. The present-plus-committed roadway network and the proposed 2030 roadway network were modeled to calculate Vehicle Miles of Travel (VMT) and the average speed. The resulting estimates for these pollutants are shown in *Table 21*.

The mobile model factors for the year 2030 allows for significant reduction in mobile emissions due to newer fleets and stricter standards for automobiles. These estimates assume the national defaults for the mix of vehicles will apply to the Tulsa TMA. Therefore, based on the Mobile 6 emissions model, the transportation system will contribute less to air pollution in 2030 than it did in 2000, the base year for the LRTP.

Environmentally Sensitive Areas



Transportation Management Area
County Boundary
Highways
Arterials

Lake or Pond

Oil and Gas Wells
wells

Bald Eagle Habit and Nesting Area
1/2 Mile Buffer Zone

Impaired Streams
1/4 mile buffer zone

Other Sensitive Areas
Arkansas River Least Tern Preserve
Skiatook Wildlife Management Area
McClellan-Kerr Navigation System

Floodplains
100 year Floodplain

Parkland
Park
1/4 mile buffer

Prime Farmland
Prime Farmland

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Map Scale - 1:410,000

Location Map

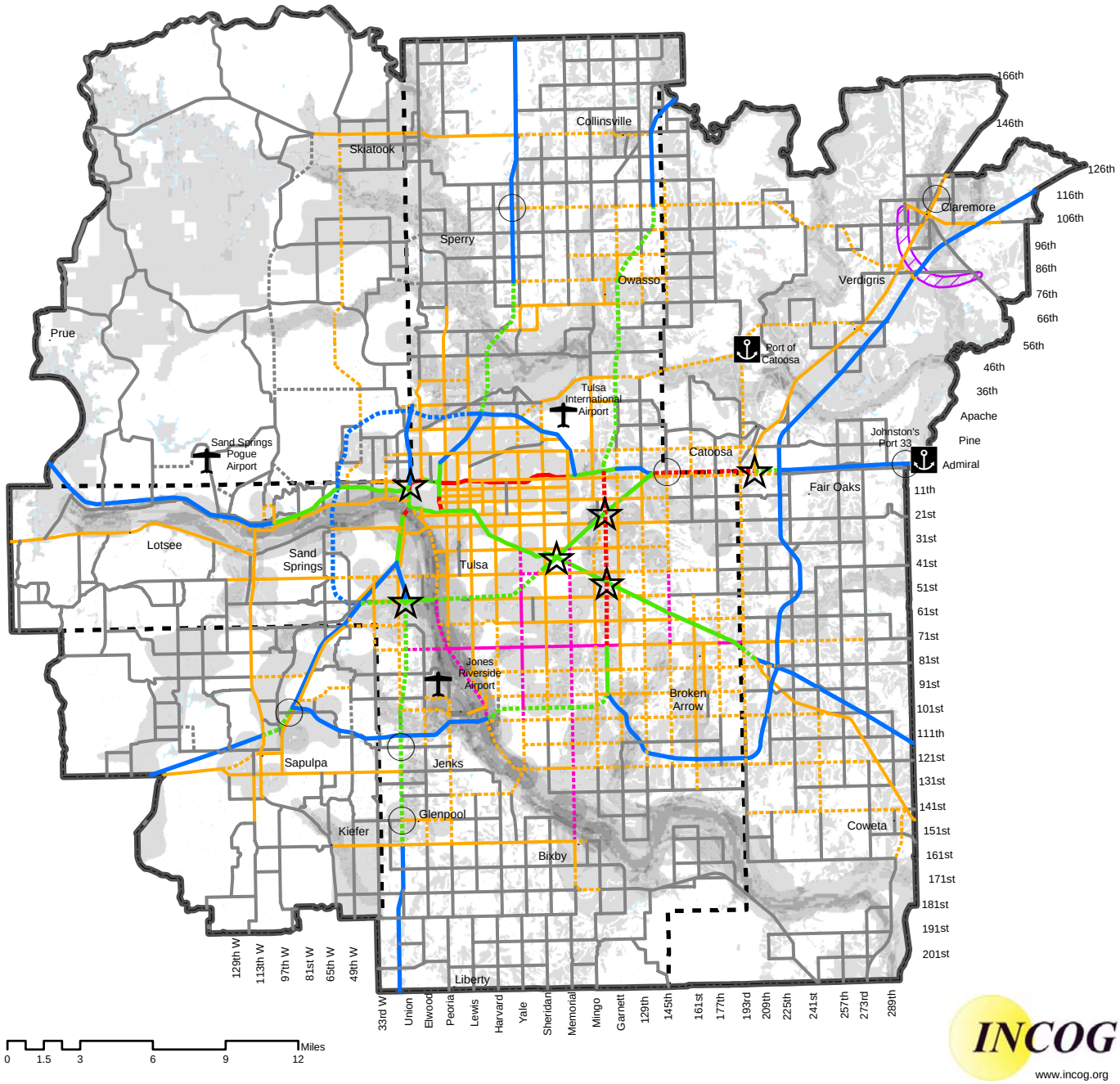
TABLE 20
List of Roadway Projects Impacting Environmentally Sensitive Areas (ESAs)

PROJECT NAME	PROJECT DESCRIPTION
I-44	Arkansas River to Sheridan Rd.
SH-97/Wilson Rd.	2nd St. to Morrow Rd.
Gilcrease Expressway	I-44 to Lewis Ave.
41st St. South	Riverside Drive to 33rd West Ave. (incl. River bridge)
61st St. South	Riverside Drive to Harvard Ave.
71st St. South	US-75 to Arkansas River
91st St. South	Elwood Ave. to Peoria Ave./Elm St.
101st St. South	Riverside Drive to SH-51
Harvard Ave.	91st St. South to 101st St. South
Lewis Ave.	81st St. South to 91st St. South
Memorial Drive	I-44 to 151st St. South
Peoria Ave.	61st St. South to Riverside Drive
Riverside Drive	101st St. South to 121st St. South
Riverside Drive	I-44 to 101st St. South
Riverside Drive (Scenic Parkway)	Houston to I-44
Yale Ave. / Yale Place	121st - 131st St. South (incl. River bridge)

TABLE 21
Three Primary Pollutants from Mobile Sources - 2000 and 2030

POLLUTANT	2000	2030	CHANGE IN TONS	CHANGE IN PERCENT
HC in Tons/Day	28.5	6.1	-22.4	-78.60%
NOx in Tons/Day	62.3	7.1	-55.2	-88.60%
CO in Tons/Day	344.9	133.7	-211.2	-61.20%

Natural Environment and Planned Roadways



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- Expressway 8-lane, Existing
- Expressway 8-lane, Planned
- Expressway 6-lane, Existing
- Expressway 6-lane, Planned
- Expressway 4-lane, Existing
- Expressway 4-lane, Planned
- Arterial 6-lane, Existing
- Arterial 6-lane, Planned
- Arterial 4-lane, Existing
- Arterial 4-lane, Planned
- Arterial 2-lane, Existing
- Arterial 2-lane, Planned
- County Boundary
- Transportation Management Area

- 1 Factor
- 2 Factors
- 3 Factors
- 4 Factors
- 5 Factors
- 6 Factors
- 7 Factors
- 8 Factors

- Expressway
- Grade-Separated
- ODOT SH-88 Study Area

The various environmental considerations specific to the Tulsa TMA were selected based on the data that was available for analysis on a regional basis and include:

- Lakes, ponds, or other water bodies
- Impaired Streams (including a ¼ mile buffer)
- 100 year Floodplain
- McClellan-Kerr Navigation System (including bordering property owned by the Army Corps of Engineers)
- Bald Eagle Habitat and Nesting Area (including a 1 mile buffer)
- Arkansas River Least Tern Preserve
- Parks (including ¼ mile buffer)
- Skiatook Wildlife Management Area
- Oil and Gas Wells
- Prime Farmland

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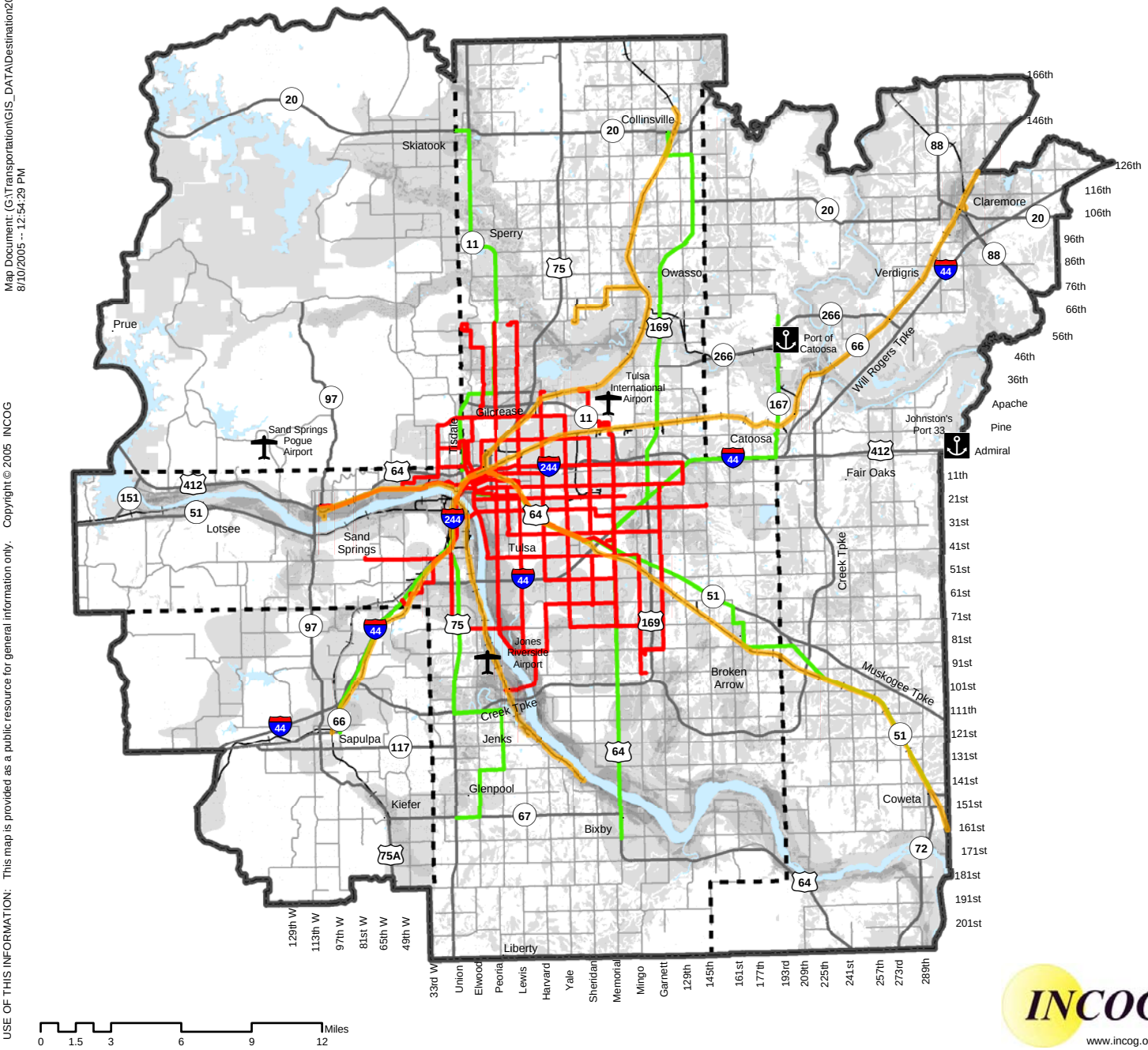
Map Scale - 1:410,000

Location Map

Natural Environment and Planned Public Transportation



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- MTTA_UrbanRoutes
- MTTA_SuburbanRoutes
- Corridor Study Areas
- Highways
- Arterials
- Rail
- County Boundary
- Transportation Management Area

- 1 Factor
- 2 Factors
- 3 Factors
- 4 Factors
- 5 Factors
- 6 Factors
- 7 Factors
- 8 Factors

The various environmental considerations specific to the Tulsa TMA were selected based on the data that was available for analysis on a regional basis and include:

- Lakes, ponds, or other water bodies
- Impaired Streams (including a ¼ mile buffer)
- 100 year Floodplain
- McClellan-Kerr Navigation System (including bordering property owned by the Army Corps of Engineers)
- Bald Eagle Habitat and Nesting Area (including a 1 mile buffer)
- Arkansas River Least Tern Preserve
- Parks (including ¼ mile buffer)
- Skiatook Wildlife Management Area
- Oil and Gas Wells
- Prime Farmland

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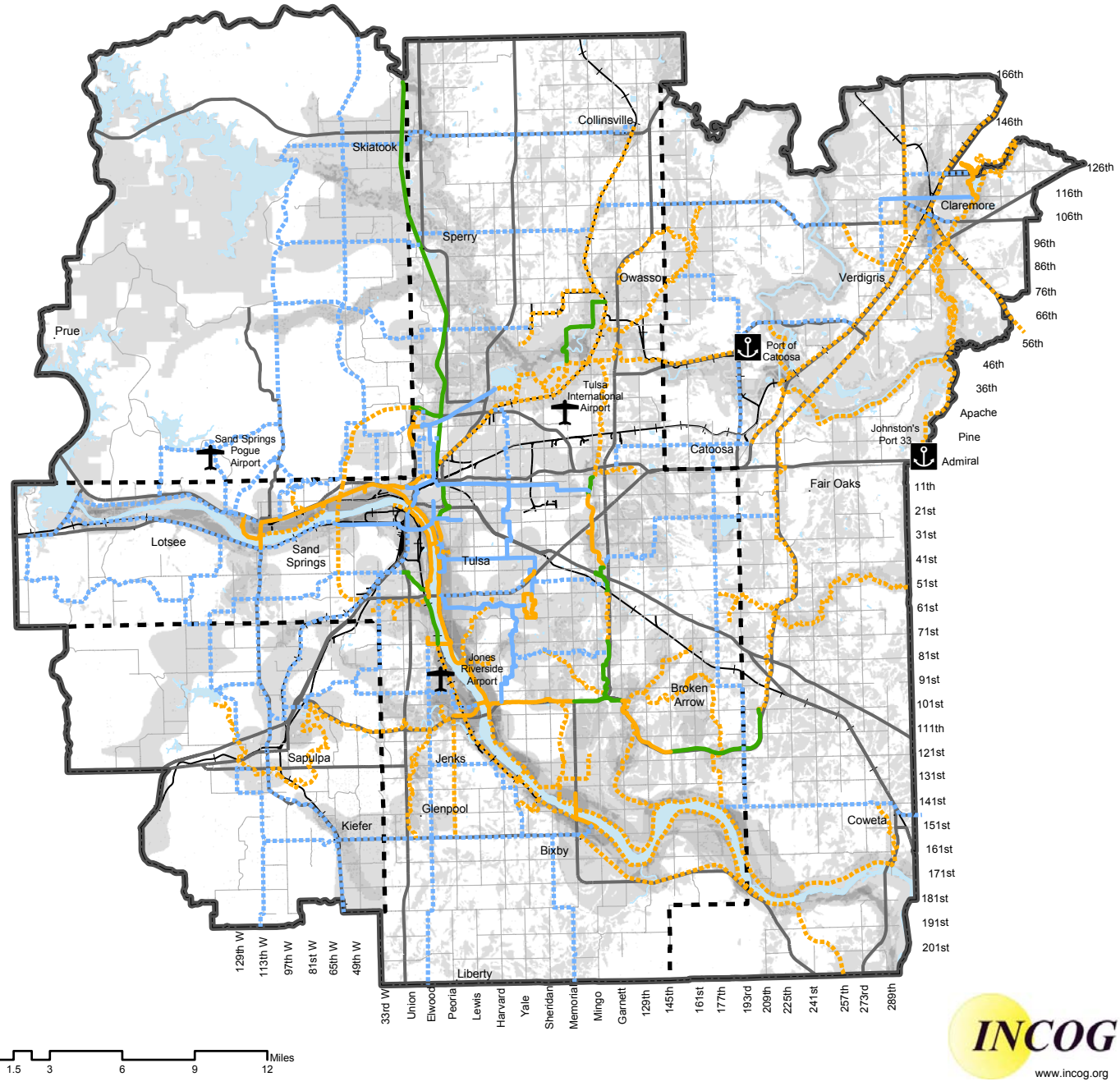
Map Scale - 1:410,000

Location Map

Natural Environment and Planned Trails and Bikeways



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Destination 2030

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- Existing Bikeway
- Proposed Bikeway
- Existing Trail
- Proposed Trail
- Funded
- Highways
- Arterials
- Rail
- County Boundary
- Transportation Management Area

- 1 Factor
- 2 Factors
- 3 Factors
- 4 Factors
- 5 Factors
- 6 Factors
- 7 Factors
- 8 Factors

The various environmental considerations specific to the Tulsa TMA were selected based on the data that was available for analysis on a regional basis and include:

- Lakes, ponds, or other water bodies
- Impaired Streams (including a ¼ mile buffer)
- 100 year Floodplain
- McClellan-Kerr Navigation System (including bordering property owned by the Army Corps of Engineers)
- Bald Eagle Habitat and Nesting Area (including a 1 mile buffer)
- Arkansas River Least Tern Preserve
- Parks (including ¼ mile buffer)
- Skiatook Wildlife Management Area
- Oil and Gas Wells
- Prime Farmland

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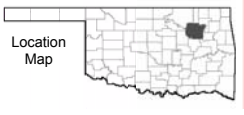
Map Scale - 1:410,000



FINANCIAL CONSIDERATIONS

The *Destination 2030* Long Range Transportation Plan (LRTP) is financially constrained. This fiscal constraint implies revenue will be available to build the planned improvements as well as fund the maintenance and asset management of the existing system.

Cost Considerations

This plan utilized costs that were currently available as well as the latest assumptions with regard to right-of-way, utility relocation, and all reconstruction-related recommendations. The local cities and counties improvement estimates were included in order to supplement the urban arterial cost estimates provided by the Oklahoma Department of Transportation (ODOT).

Capacity improvement projects on state highways and arterials were revised to reflect 2005 dollars and were used to supplement other information. Maintenance costs are based on ODOT-supplied information for state and city projects under consideration. For transit estimates, the New System Design plan was used to update the public transportation costs. Bicycle/pedestrian system costs were estimated based on the Trails Master Plan document and adjusted for inflation, as well as on-going project estimates.

Financial adjustments were made based on the need and severity of roadway conditions and the necessary reconstruction of highways and interchanges. As a result, construction and capital costs require a significantly higher percentage than operating and maintenance costs. As shown in *Table 22*, approximately 74% of the total roadway costs reflect capital costs alone. Public Transportation improvements accounts for 19% of the total estimated cost, and Bicycle/Pedestrian costs are slightly above 2% of the total estimated expenditure.

TABLE 22
Cost and Revenue Estimates

FACILITY/SOURCE	OPERATING AND MAINTENANCE COSTS	CONSTRUCTION AND CAPITAL COSTS	TOTAL COSTS	PERCENT OF TOTAL
Expressways	$75,864,000	$616,875,000	$692,739,000	18.75%
Turnpikes	$13,728,000	$40,000,000	$53,728,000	1.45%
Arterials	$572,975,000	$1,165,300,000	$1,738,275,000	47.06%
Highway Interchanges	$0	$250,000,000	$250,000,000	6.77%
Intersection, Bridge & Signal Improvements	$0	$80,000,000	$80,000,000	2.17%
Rehabilitation of Expressways	$74,200,000	$0	$74,200,000	2.01%
Subtotal	$736,767,000	$2,152,175,000	$2,888,942,000	78.21%
Percent	26%	74%	100%	
Public Transportation	$602,750,335	$114,046,750	$716,797,085	19.41%
Bicycle/Pedestrian Links	$18,000,000	$70,036,510	$88,036,510	2.38%
Total	$1,357,517,335	$2,336,258,260	$3,693,775,595	100.00%
Percent	37%	63%	100%	

REVENUE SOURCE	ESTIMATED REVENUE
Local	$1,023,213,277
ODOT (State/Federal)	$1,644,873,438
Federal/Urbanized Area	$262,500,000
OTA	$53,728,000
Dedicated Transit/City/Federal	$716,797,085
TOTAL	**$3,701,111,800**

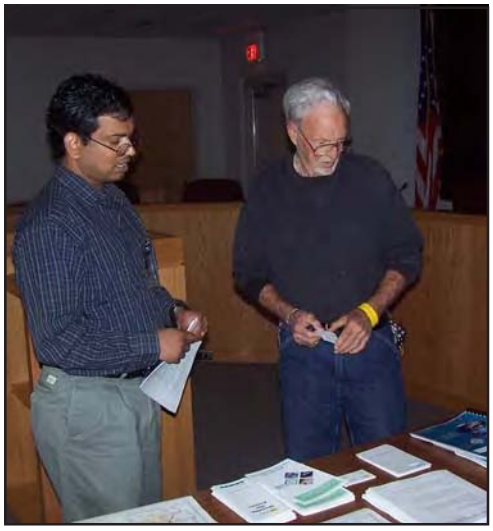
Revenue Estimates

The revenue was estimated using the most recent available information from local, state and federal agencies and organizations that have historically provided funding for TMA improvements. Specifically, urbanized area revenue estimates, city bond and sales tax monies, ODOT roadway project spending, and enhancement project funds were used. The revenue available for the transit and turnpike portions of spending is assumed to come from respective entities through dedicated monies.

Local resources (cities and counties) are estimated to provide 27% of the total revenue. About 20% of the total is estimated for implementation of the Public Transportation system plan, which is contingent upon that revenue stream. *Table 22* illustrates the total cost and revenue estimate.

CORRIDOR STUDIES

In the course of developing the LRTP, several areas or corridors were delineated for further study. Due to the complexity of issues affecting these corridors and the difficulty in identifying a single or relatively straight-forward solution addressing the projected travel demand, they were selected for more detailed study that is not feasible at the broad regional level at which the LRTP is developed. These corridors are I-44 from I-244 to Riverside Drive, US-75 from SH-11 to 86th Street North, US-169 from 71st Street South to SH-20, US-64/SH-51 (Broken Arrow Expressway) from downtown Tulsa to Broken Arrow, Riverside Drive from Denver Avenue to the Creek Turnpike, Yale Avenue from US-64/SH-51 (Broken Arrow Expressway) to 71st Street South, and Memorial Drive from I-44 to SH-67. These corridors are shown on the *Corridor Study Area* map, Page 129.



During the draft review meeting in Jenks, an area landowner discusses aspects of the plan with an INCOG staff member.

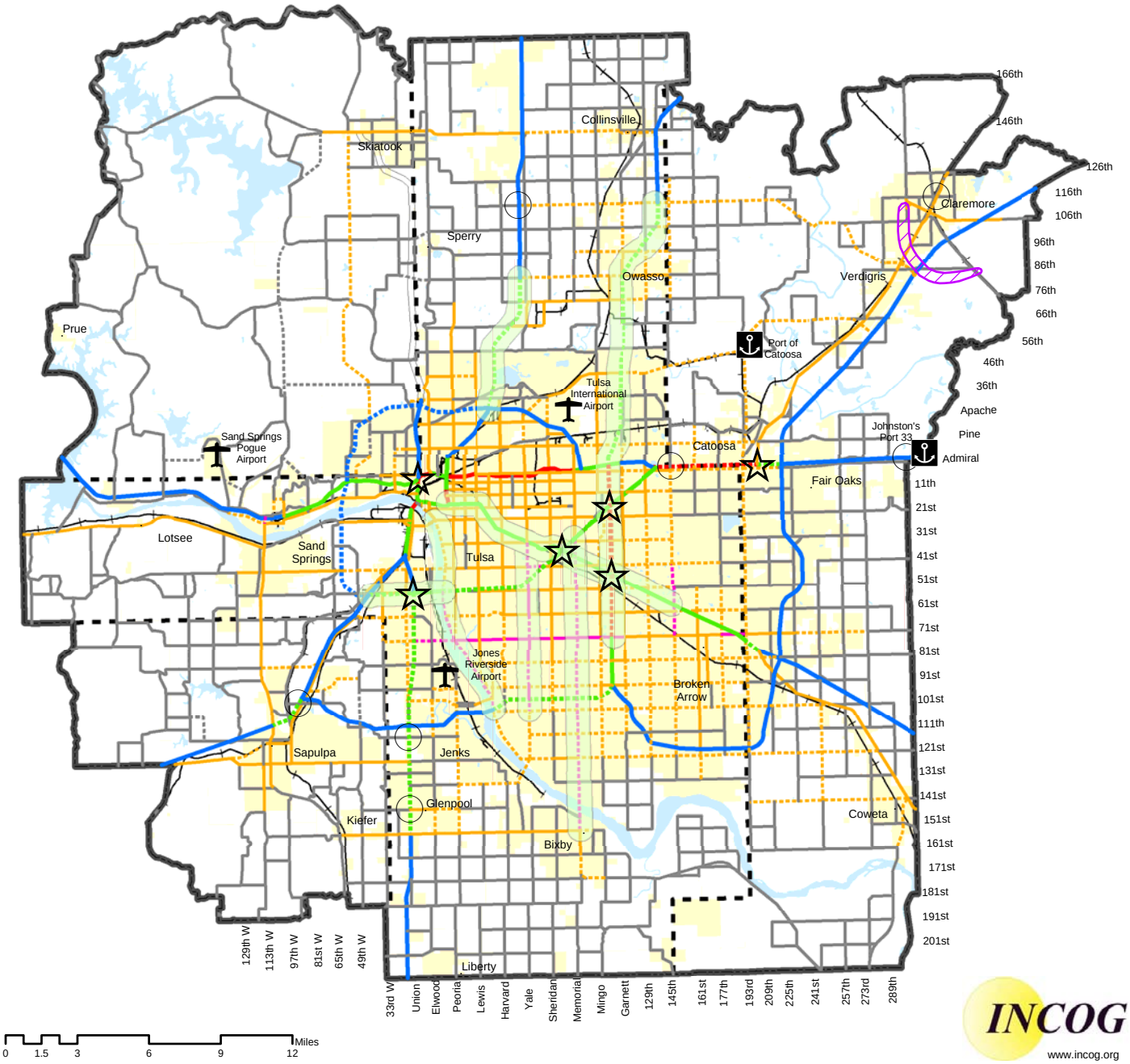
In addition to those study corridors, several commuter corridors have been identified in the Public Transportation Element. These commuter corridors were selected for their potential development for alternative modes of transportation including dedicated High-Occupancy Vehicle lanes or High-Occupancy Toll lanes on the expressways, Bus Rapid Transit, or some form of passenger rail. Based on direction from the TMA Technical Advisory Committee and Transportation Policy Committee, INCOG will conduct an assessment of the study corridors and the commuter corridors to determine the highest priority for evaluation and implementation.

PUBLIC REVIEW AND COMMENT SUMMARY

For the development of the LRTP, INCOG conducted a continuous, extensive, and at times intensive, public education and involvement process. Since September 2002, INCOG held 5 major public outreach events, 4 newsletters were published in English and Spanish, 4 public opinion surveys were conducted, a vision retreat was held for key stakeholders from throughout the region, a contact database of over 1,500 individuals and organizations was created and maintained, numerous presentations were given to various civic and business organizations, and a dedicated web page with all related information, documents, and results was maintained. Throughout the process of developing the LRTP, guidance was provided by the TMA Technical Advisory Committee and Transportation Policy Committee during monthly meetings. Those meetings were open to the public, and all agendas and attachments were available via the web page or upon request. Through these efforts schedules, data, documents, decisions, and results were distributed to the public and the views, values, and priorities of the region were incorporated in the LRTP.

The entire body of public involvement for this LRTP is included in the *Supporting Documents,* and a summary of the public input up to the draft plan phase is included in the Introduction. *Table 23* is a summaryof the comments received on the draft plan and INCOG's responses.

Corridor Study Areas



Map Document: (G:\Transportation\GIS_DATA\Destination2030\D2030_Corridor_LP.mxd)
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USE OF THIS INFORMATION: This map is provided as a public resource for general information only.

INCOG
www.incog.org

- Expressway 8-lane, Existing
- Expressway 8-lane, Planned
- Expressway 6-lane, Existing
- Expressway 6-lane, Planned
- Expressway 4-lane, Existing
- Expressway 4-lane, Planned
- Arterial 6-lane, Existing
- Arterial 6-lane, Planned
- Arterial 4-lane, Existing
- Arterial 4-lane, Planned
- Arterial 2-lane, Existing
- Arterial 2-lane, Planned

- Corridor Study Areas

Interchange Reconstruction

- Expressway
- Grade-Separated

- Proposed Corridor Beyond 2030
- Rail
- County Boundary
- Corporate Limits
- Transportation Management Area
- ODOT SH-88 Study Area

N
W E
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Map Scale - 1:410,000

Location Map

TABLE 23

Draft Review - Public Comments and Responses

May 2, 2005 - Broken Arrow City Hall	
Comments included questions on when the county-line Arkansas River Bridge would be built and requests for the widening of Lynn Lane to allow better access to schools and industrial properties, as well as better traffic flow in heavily traveled areas. A respondent also suggested the intersection at Lynn Lane and 51st St. should be 5 lanes due to "very heavy traffic."	The projected travel demand by 2030 did not justify a bridge crossing of the Arkansas River at 193rd East Ave. (County Line Road.) Lynn Lane is planned as a 4-lane arterial from 51st St. South to 101st St. South. Also, the intersections of arterials are generally engineered to provide greater capacity (additional lanes) to reduce congestion.
May 2, 2005 – Glenpool City Hall	
Glenpool City Council members had comments following a presentation during their May 2 meeting. Council members wanted to know why Glenpool was the "only community" in the TMA without a 6-lane highway and nominated US 75 for realignment and expansion. They also encouraged widening Peoria and Elwood to SH-67 and 141st to Peoria/Lewis Avenue.	Based on a review of the transportation model, the financial estimates over the life of the plan, and the functional plans developed by ODOT it was determined to be appropriate to extend the widening of US-75 to 6-lanes from 121st St. South to SH-67(151st St. South). The plan recommends Peoria Ave as a 4-lane arterial from 91st St. South to SH-67, Elwood as a 4-lane arterial from 141st St. South to SH-67 and 141st St. as a 4-lane arterial from US-75 to Peoria Ave.
May 3, 2005 – Transit Focus Meeting (Denver Avenue Station)	
One respondent suggested special fuel rates for public transportation to cut costs and allow more buses to be available, as well as creating connections to Claremore and Catoosa. Another asked that city councilors' names and addresses be published and distributed to bus patrons so they can personally contact them with their thoughts on bus funding and service. One respondent thought transfers should be available at more locations. The price of bus passes was deemed too high by one respondent, who mentioned San Antonio's $20 bus pass. Four respondents noted the bus system was doing "good work with low funding." One of these also remarked the buses were clean and accessible, and that drivers were "almost always" courteous and punctual.	Several recommendations in the Public Transportation chapter are aimed at the issues of reducing costs, increasing efficiency and increasing funding. Connections to all communities in the TMA are included in the plan. The remaining comments, being oriented to current operational issues, were transmitted to MTTA.
Most comments centered on adding or modifying specific bus routes, adding additional express routes, and extending service to evenings and Sundays. Respondents also repeatedly mentioned shortening wait times and re-scheduling so transfers can be made despite small fluctuations in arrival and departure times.	Greater efficiency and expanded service in terms of operational hours and geographic area were specifically addressed in several of the recommendations in the Public Transportation chapter. The key factor in providing greater service is obtaining a dedicated source of funding, which is the plan's number one recommendation.
May 4, 2005 – Rudisill Public Library	
The only comment suggested contacting churches and YMCAs for future meeting coordination and locations.	A comprehensive review was conducted of the public outreach efforts during the development of *Destination 2030.* A formal amendment to the adopted *Public Involvement Process* is proposed for consideration by the TAC and TPC. Involving churches and YMCAs is included in the proposed amendment.

May 5, 2005 – Freight Focus Meeting (Port of Catoosa)	
One respondent said a study should be done to determine how full container importers have functioned since the closing of the rail intermodal facility, and what can be done in the future.	A recommendation in the Freight Movement chapter has been added to conduct such a study.
A respondent associated with the Johnstons Port 33 said he was disappointed that the TMA does not include the northern part of Wagoner County west of the McClellan-Kerr Waterway where Johnstons Port 33 is planning to expand operations. He also noted that the LRTP does not mention that SH-412P carries in excess of 2 million tons of materials by truck each year.	The TAC and TPC will consider expanding the TMA to include additional area in Wagoner and Rogers Counties after adoption the of *Destination 2030.* Although the plan does not specifically identify the volume of truck traffic on SH-412P, the construction of a grade-separated interchange with US-412 is planned due to the high volume of freight movement.
May 9, 2005 – Owasso Old Central Building	
INCOG received comments verbally regarding the importance of US-169 expansion for the City Owasso. Other improvements cited at the open house included, SH-20, 86th Street North west of US-169 as near-term projects needed, and as a long-term project, the widening of 116th Street N.	Improvements to US-169, SH-20, 86th St. North, and 116th St. North are all recommended in the plan. All improvements in the plan are needed by 2030, based on projected travel demand. Prioritization of highway improvements is a cooperative process between INCOG, ODOT, and the respective counties and cities. In the past, US-169 has been a high priority for improvement.
May 10, 2005 – Skiatook City Hall	
One respondent commented that Lake Road in Skiatook should be 4 lanes.	Based on the projected travel demand and financial feasibility this suggested improvement is not included in the plan. This will be reconsidered in the update of the Long Range Transportation Plan for 2035.
May 11, 2005 – Roadway Focus Meeting (Martin Regional Library)	
One respondent asked when the trail system northward from 11th and Mingo is expected to be completed. He also asked if it will be bicycle and pedestrian friendly and whether there were plans to connect it to River Trails.	The next section of the Mingo trail from 11th St. to Mingo Road near Admiral has recently been funded. Ultimately, the Mingo Trail will extend to Mohawk Park. The Mingo Trail will connect to the River Trails via the Creek Turnpike Trail and numerous on-street bike routes.
One respondent stated that North & South Memorial from the Airport, South to East 27th Street, served as a "gateway street" and "front door" to Tulsa. She said the road should be resurfaced, a fifth lane should be added, and the center median should be removed.	This segment of Memorial currently is 4-lanes. The plan recommends the number of lanes for through-traffic, therefore many of the 4-lane arterials could be 5-lanes. Since this suggestion cannot be specifically addressed in the context of a long range plan, it was forwarded to the City of Tulsa Public Works Department for their consideration.
Two respondents asked for copies of the display posters used during the meeting to relay transportation facts to attendees. One would like to use these facts in an upcoming newsletter to her homeowners association.	Copies were sent to both respondents.
May 14 – Bike/Pedestrian Focus Meeting (Hicks Park)	
One respondent asked if 56th Street North is to be widened and the bridge replaced. He also suggested distributing statistics from studies documenting the economic, crime reduction, and quality-of-life impacts trails can provide.	The Bicycle-Pedestrian chapter recommends an on-street bikeway on 66th St. North from the Cherokee Industrial Park to Osage County and beyond. A brochure of facts and figures for trails is being considered as an implementation component of the plan.

May 16 – Sapulpa City Hall	
The Sapulpa City Council made numerous comments after a presentation to them during their May 16 meeting. Council members emphatically encouraged an eastbound ramp off I-44 at Hilton Road. They said the project would further encourage commercial/economic activity along the SH 66 corridor from Hilton Road south into town.	The suggestion to add the ramp was analyzed in the transportation model and the financial projections. Based on that analysis it was determined to be appropriate to include it as a recommendation for a grade-separated interchange.
Emailed responses	
One email respondent stated the LRTP should focus less on vehicle use and more on mass transit and land-use issues. He specified interest in 24/7 bus operation, HOV and light rail implementation, and land-use policies that encourage mass transit over personal vehicle use.	Several recommendations in various chapters of the plan give greater consideration to alternative modes of transportation, greater intergration of transportation and land use planning throughout the region, specific consideration of alternative modes in future development, and the projection of 20% of the anticipated revenue dedicated to public transportation improvements and operations, while transit will only account for approximately 1% of the total travel in the TMA. Further, the plan has identified specific corridors in the region for more detailed analysis of alternatives such as HOV/HOT lanes, bus-rapid transit, or passenger rail.
A second email comment requested removing the word "private" from the Roadways recommendation supporting funding a Major Investment Study for a highway from Tulsa to Wichita, Kansas, and continuing to I-70 near Hayes, Kansas.	The reference limiting funding to private sources was deleted.
Another respondent suggested 3' striped shoulders be added to all new roads, widening projects, and road-repair projects for major roads as an economical and safer alternative for bicyclists. He also noted that while the Tulsa Trails System provides a nice recreation opportunity, further expansion should focus on connecting commuters from home to work through a series of off-street and on-street corridors. In addition, he noted a media campaign should be launched stressing share-the-road laws and the benefits of bicycle commuting.	The plan includes specific roadway cross sections that include 14-feet outside lanes on all arterials specifically for consideration of bicycle transportation. The plan recommends a number of trails and bikeways that will be the core routes for the regional system. Those routes were identifed in the development of the Trails Master Plan primarily for transportation purposes. The implementation of the trails and bikeways in the region has focused on these core routes. The suggestion to implement a media campaign to educate drivers about bicycle commuting was included in the Bicycle-Pedestrian chapter.

TABLE 24

Final Plan Review - Public Comments and Responses

Environmental Agency Review	
Bureau of Land Management stated no BLM interest will be affected by the LRTP.	No response required.
Oklahoma Water Resources Board noted that flood plain permits and considerations were required because the City of Tulsa and most surrounding communities administer floodplain management regulations.	The acquisition of permits is a project-level decision that we cannot reasonably address on the broad regional level.
FEMA stated that for communities that participate in the National Flood Insurance Program, local administrators should be contacted to determine whether permits are needed	Local administrators will be contacted on a project specific basis.
Army Corps of Engineers noted that prior to any implementation, project specific information related to projects should be submitted to the Army Corps of Engineers for review and/or permitting	No response required.
Oklahoma Archeaological Survey noted that there are hundreds of historical and cultural sites in and adjacent to the urban area and that a comprehensive review of potential sites should be undertaken at the initiation of any of the specific projects identified in the plan.	The Plan Effectiveness Chapter 6 has been revised to include this consideration.
The Oklahoma Conservation Commission stated they hadno comments at this time but appreciated the opportunity to review the LRTP during the environmental review	No response required.
July 28 - Public Hearing	
Asked for more information on the I-44 as it relates to 51st Street, and also making Lewis to Harvard one way	Making 51st Street a one-way frontage road eastbound from Lewis to Harvard is a component of the project to reconstruct and widen I-44 from Yale to the Arkansas River. The plan includes the one-way concept and the transportation model does not show any adverse impact on the arterial streets. However, the model does not analyze the impact on the residential streets. ODOT is reviewing the issue and will present information at a public meeting in September.
Stated opposition to the bridge at Yale	The modeling data and process have been extensively reviewed and the need for a bridge by 2030 to relieve the Memorial bridge and the 96th Street bridge is valid.
State Rep. Fred Perry stated that he had received multiple comments in his office about the bridge at Yale and asked about the possibility of publicly funding the project	The modeling data and process have been extensively reviewed and the need for a bridge by 2030 to relieve the Memorial bridge and the 96th Street bridge is valid. Most of the improvements recommended in the plan are anticipated to be publicly funded and there is no requirement for either publicly or privately funding any particular project.
Stated that he had some ideas for restructuring the MTTA public transportation system and asked for an opportunity to further discuss his plan with MTTA and FHWA representatives	After the Public Hearing, Mr. Guy met with MTTA and FHWA representatives and presented his information for their review. No materials or information were transmitted or presented to INCOG.

Roadways and Bridges	
Stated specific traffic signal and signage changes to improve congestion management	A significant component of the congestion management system is the improvement of the signals as well as coordinating the signals in corridors, particularly across jurisdictional boundaries.
Asked what homes will be affected by the widening of Wilson Avenue in Sand Springs	The acquisition of right-of-way is a project-level decision that we cannot reasonably address on the broad regional level.
Commented he was not in favor of making 51st a one-way street.	This is an impact of the planned widening of I-44 from Yale Avenue to the Arkansas River. This concern has been communicated to the Oklahoma Department of Transportation for their review.
Mayor Commented that Glenpool is in full support of the Plan, especially expanding Hwy 75 to 6 lanes from 151st and the grade separated exchange at 141st.	No response required.
Commented that widening projects should be considered before major development, and that more widening should be done on specific streets to relieve congestion and encourage new businesses. Also commented that seeing specific target dates for projects would be helpful.	In the City of Tulsa and the unincorporated portions of Tulsa County, the anticipated right-of-way is preserved as much as possible in the land development process. Specific project implementation is prioritized by the respective communities. With over 1,300 lane-miles of recommended improvements, it would be nearly impossible to reasonably prioritize those improvements.
Comments include: designating the Creek Turnpike I-644, and support of Gilcrease Drive as a freeway, grid-based transit system, and rail system from Tulsa to Broken Arrow. Also supports park-and-ride facilities and bike lanes and trails.	INCOG supports designating the turnpikes with a numerical designation. The plan includes the entire Gilcrease from US-75 west and south to I-44 as an expressway/parkway. The Public Transportation chapter includes recommendations that address the planned fixed-route transit system, passenger rail feasibility studies and the implementation of more park-and-ride locations.
Encouraged expansion of Highway 266 to a four-lane divided highway to better handle increased traffic	That expansion is included in the Plan.
Extend 111th Street South from Yale to Riverside	Based on the projected travel demand by 2030 this improvement is not warranted. However it will be considered again within the next 5 years in the update of the plan for 2035
Said the expansion of the highway to the Port would help traffic situation	That expansion is included in the Plan.
Expressed concern over placement of the bridge at Yale and having it built/operated by a private entity. He wrote that the bridge project should be acceptable to all parties involved.	The modeling data and process have been extensively reviewed and the need for a bridge by 2030 to relieve the Memorial bridge and the 96th Street bridge is valid.
Recommended the intersection at 71st Street and Union Avenue be redesigned and the new design be constructed now while 71st Street is closed to traffic.	Although the Plan does recommend improving 71st and Union, it is up to the respective governments to prioritize the implementation of those improvements. The reconstruction of 71st and US-75 is an ODOT responsibility whereas the 71st and Union intersection is the responsibility of the City of Tulsa. Tulsa has not identified that improvement as an immediate priority.
Stated Figure 14, in addition to the cross-sections, should include more details on the spacing of intersections, street furniture, light poles, etc., and that expressways and busier arterials include pedestrian underpasses and overpasses. Also asked what the plan is for Houston between Riverside and 12th and for Riverside between Houston and Southwest Blvd.	Figure 14 is not intended to specify designs of the roadways but rather to indicate right-of-way requirements for consideration in the environmental clearance once the project is initiated.

Roadways and Bridges (Continued)	
Stated that the Gilcrease Expressway has proven to be a waste of money and that, in the future, INCOG should prioritize and fund projects on a regional basis and not allow community/county funding to dictate the projects that are completed.	All of the recommendations are generated from a regional analysis of the transportation system. Funding availability is a consideration in the financial constraint analysis that is conducted after the proposed improvements are identified. The Gilcrease Expressway/Parkway is a necessary component addressing regional travel demand and although there is some funding identified from local sources, approximately 80% of the funding is from federal sources.
Two people sent emails siting objections to bridge at Yale and widening of Yale to Creek Turnpike	The modeling data and process have been extensively reviewed and the need for a bridge by 2030 to relieve the Memorial bridge and the 96th Street bridge is valid. Further, even without the bridge, Yale will need to be widened from the Creek Turnpike to 111th Street South.
Nineteen People sent written comments explaining their objections to the bridge at Yale	The modeling data and process have been extensively reviewed and the need for a bridge by 2030 to relieve the Memorial bridge and the 96th Street bridge is valid.
The Homeowners for Fair Zoning and South Tulsa Citizens Coalition expressed opposition to the bridge at Yale.	The modeling data and process have been extensively reviewed and the need for a bridge by 2030 to relieve the Memorial bridge and the 96th Street bridge is valid.
Supports moving the bridge at Yale to 121st and Delaware in the Plan. He also wondered why Riverside was changed from 6 lanes in the 2020 Plan to 4 lanes in the 2025 Plan. Lastly, he said he didn't feel public outreach has been properly conducted, especially concerning the Yale Bridge.	The long range Plan analyzes the transportation system of the region as a whole and in comparing the alternatives of the location of the terminus of the Yale bridge there was little difference in the resulting traffic volumes on the various affected roadways. Therefore, the final location of the terminus of the bridge is an engineering level decision beyond the scope of the Plan. Riverside Drive was recommended as a six-lane facility in previous plans due to the projected travel demand primarily to the Central Business District. In developing the 2025 plan the projected travel demand did not warrant the expense of 6-laning Riverside Drive, so it was retained as a 4-lane facility. The public outreach for the 2030 plan has been the most extensive for any long range transportation plan conducted by INCOG. The entire public involvement process has been documented and is available for review at the INCOG offices.
Objects to the bridge at Yale and widening of Yale Ave.	The modeling data and process have been extensively reviewed and the need for a bridge by 2030 to relieve the Memorial bridge and the 96th Street bridge is valid. Further, even without the bridge, Yale will need to be widened from the Creek Turnpike to 111th Street South.
Objects to the bridge at Yale and widening of Yale south of 91st Street	The modeling data and process have been extensively reviewed and the need for a bridge by 2030 to relieve the Memorial bridge and the 96th Street bridge is valid.
Supports the bridge at Yale	No response required.
Objects to widening Yale	Even without the planned bridge across the Arkansas River the projected travel demand warrants the widening of Yale south of the Creek Turnpike.
Objects to widening Yale for 101st to 111th Street South due to potential removal of Oak trees.	Based on the projected travel demand by 2030 this improvement is warranted. The issue of potentially removing Oak trees is a project-level analysis the we cannot reasonably address on the broad regional level.
Objects to widening Yale south of 101st Street South	Based on the projected travel demand by 2030, this improvement is warranted.
Supportive of bridge at 57th W. Ave.	No response required.

Public Transportation	
MTTA suggested revising the public transportation chapter to reflect the most current data from MTTA.	Revision were made as noted
Is encouraged by the recommendation to improve the coordination of land use and transit planning.	No response required.
Said he believes the plan did not focus enough on rail options and gave specific ideas for implementing a light rail system	Although there is significant interest in passenger rail service throughout the region, there was limited support for funding passenger rail, which tends to be a rather expensive system to initiate and maintain. Therefore, the plan does not include specific passenger rail implementation, but it does identify corridors that should be studied to determine the feasibility of passenger rail service.
Stated a higher percentage of proposed bus routes (currently 55%) should be provided to SSAs, since SSGs rely more on public transportation	Federal regulations require that recommended improvements do not disproportionately impact or benefit any particular population or segment of the region. The analysis conducted in the Public Transportation element concluded that the SSAs and SSGs are not disproportionately impacted or benefited by the proposed improvements when compared to the overall TMA.
Said there should be greater emphasis on funding for public transportation and that the Scenic Parkway for River Parks should retain the current character	The public transportation element of the Plan comprises approximately 20% of the total cost of the recommended improvements, both capital costs as well as operating and maintenance costs. Without a dedicated source of funding for public transportation, it is difficult to plan for expansion of the system with certainty.
Bicycle/Pedestrian	
Commented that greater focus should be given to trails that may alleviate congestion, and that more emphasis should be given to those trails that would reach heavily populated areas and may thus have a larger effect on commuting. He also thought the Fry Creek and Riverside (dual tread) projects should be moved up in priority.	The Plan gives greater priority and emphasis to trails that maximize the transportation options for residents. The Fry Creek trail connecting Tulsa and Bixby and the dual trail on the River Parks system are both in the first tier of priorities.
Extend the 71st Street Trail from Elwood west for 2 miles.	Staff will analyze this proposal, solicit public input, and amend the plan if necessary.
General Comments	
Person said he supports the Plan as it was approved	No response required.
In an detailed letter, it was suggested that the LRTP change focus from congestion management to tackle issues including land-use, alternative transportation, sense of community/place, and others. He also stated he believes the 41st Street bridge should be removed from the LRTP until final plans for the Arkansas River are completed.	The plan was drafted based on the values and priorities of the residents of the region. Throughout the public involvement process the greatest concerns were safety, efficiency of the system, and reasonable financial investment and management. Greater and better coordination with land development is a significant recommendation of the plan. Finally, based on the transportation model, the addition of the 41st bridge provides an alternative to the I-44 bridge for local travel and improves the connectivity between west Tulsa and mid-town.

DESTINATION 2030 PLAN EVALUATION

The *Destination 2030* LRTP embodies the vision of the TMA for a sound regional transportation system. The LRTP provides accessibility, environmental integrity, economic opportunity, and financial feasibility as well as enhances overall safety, efficiency, and total management of the existing transportation system. Included in the LRTP are numerous roadway capacity improvements corresponding to the region's continual growth and urbanization, completion and implementation of the regional Trails Master Plan, improved transit commuter corridors, and other measures augmenting the transportation system. These enhancements and the region's commitment to sustaining the environment will further stimulate the TMA's quality of life.

It is critical that the recommendations of the LRTP are pursued to the most reasonable extent possible. To that end, the LRTP evaluation establishes the following measures to evaluate the goals, objectives and the actions proposed in the plan.

- **Conduct an annual evaluation of the actions identified under each of the LRTP elements -** The actions proposed under the Roadways, Public Transportation, Bicycle/Pedestrian and the Freight Movement elements are specific and often relate to a collaborative process among various agencies. A structured review between plan periods (approximately 1½ to 2½ years after adoption of the LRTP) with identified stakeholders to advance the issue and the proposed action is also necessary. This review will enhance and strengthen the planning process.

- **Conduct technical and policy reviews –** A review of specific actions related to Transportation Demand Management (TDM), Transportation System Management (TSM) and Intelligent Transportation System planning, Transit funding, Trails Master Plan implementation, and freight movement improvements will be necessary as part of the above review. Public input and building public-private partnerships in these areas will be necessary at key milestones.

- **Effectively communicate during LRTP implementation –** Policymakers should be informed and further actions should be sought as needed. Relaying timely information to the transportation system users is also necessary. Immediately upon adoption of the LRTP, INCOG, in cooperation with relevant agencies and users groups as appropriate, should conduct an analysis of planned improvements and develop a list of the priority unfunded improvements.

- **Develop technical measures that exemplify the planning process and the transportation facilities in general** - Examples include regional trail user counts, investments in safety or air quality improvements, average travel speeds on expressways and primary arterials, and total transit users.

- **Scrutinize planning assumptions as a means of achieving necessary plan evaluation -** The growth rate of employment and population near- and mid-term should be evaluated to determine if actual growth rates are consistent with the forecasts. Other evaluation criteria should include vehicle data, trip-related information, and cost and revenue assumptions, as more current data becomes available.

- **Measure customer access and accountability to the LRTP -** These can be measured from regional policymakers' evaluation of the planning process and their input into the process. Identified stakeholders can be surveyed to determine their involvement in the LRTP and to identify any deficiencies in the process