

## Chapter 2

### Transportation System Characteristics

#### 2.1 JURISDICTIONS AND AFFECTED AGENCIES

The jurisdictions included in this study are the City of Wichita, Sedgwick County, the Metropolitan Area Planning Department (MAPD), Kansas Department of Transportation (KDOT), the Kansas Turnpike Authority (KTA), and Wichita Transit. Each agency within each jurisdiction has numerous sub-agencies that are responsible for activities related to some aspect of the transportation system. The large number of participants makes agency coordination and cooperation even more important, especially during incident management and in other situations where a number of agencies are involved and time is imperative.

The following sections highlight the major transportation related functions conducted by each agency within the metropolitan area.

##### **City of Wichita**

The City of Wichita is the largest population center in Sedgwick County and houses the County's main offices as well as the County's emergency communications center.

The City operates and maintains 344 traffic control signals, 223 of which are currently controlled by a closed loop signal system. More information on this system is provided in Section 2.2.

The City has an OPTICOM signal preemption demonstration project ongoing at four (4) signals on Main Street for Fire Station #1. There is a desire by the fire department to expand the demonstration to include more signals and more fire stations.

The City provides the planning, design, construction, maintenance and operations for the local street network. The City also maintains its own police and fire departments. However, dispatch of these forces is handled by the Sedgwick County Emergency Communications Center.

##### **Sedgwick County**

The County operates police and fire departments for the remaining sections of Sedgwick County not covered by the City's forces. The Emergency Medical Service (EMS) is purely a County department that serves the City and County.

A central dispatch center for the entire county is housed in the County courthouse in downtown Wichita. This center receives all 911 calls coming from Sedgwick County and then dispatches the appropriate agency to the scene. The communications center dispatches the closest responder regardless of jurisdiction.

The county also provides the planning, design, construction, maintenance and operations for the county highway network.

##### **Metropolitan Area Planning Department (MAPD)**

The MAPD is the recognized Metropolitan Planning Organization (MPO) for the metropolitan area. The organization is jointly funded by the City and the County, however it acts as its own

entity. The main function of the MAPD is to project the future conditions and requirements of the transportation system and to create the strategic transportation plan for the entire metropolitan area.

### **Kansas Department of Transportation (KDOT)**

Among other things, KDOT, like most other state DOTs, provides the planning, design, construction, operation, and maintenance for the State-owned roadways in the area, as well as the Interstates and US routes. KDOT also provides complete or partial funding for transportation improvement projects.

### **Kansas Turnpike Authority (KTA)**

The Kansas Turnpike, I-35, runs through the southeast corner of Sedgwick County and through the southeast corner of the City of Wichita. The KTA operates and maintains I-35 from the Oklahoma border to Emporia, including the portion that passes through the Wichita metropolitan area. Funding is provided through tolls collected from the highway users.

### **Wichita Transit**

Wichita Transit operates the public transportation system in the metropolitan area and provides a variety of transportation services including fixed-route bus service, special service for senior citizens and the disabled, rideshare matching, and trolley service in downtown Wichita.

## **2.2 EXISTING TRANSPORTATION NETWORK AND ACTIVITIES**

Initial efforts of this ITS Early Deployment Study have been focused on inventorying and evaluating the existing transportation facilities, infrastructure and operations within the study area. This section provides an overview and summary of the existing transportation system in the Wichita metropolitan area.

### **Existing Highway System**

The existing highway system in the Wichita metropolitan area includes both freeway and arterial facilities operated and maintained by KDOT, the City of Wichita, and Sedgwick County. Figure 2-1 indicates the freeway and arterial system in Sedgwick County. The freeway system includes both interstate and non-interstate facilities.

#### ***Freeways***

The Wichita metropolitan area has an extensive freeway system that includes both radial and beltway-type facilities. The freeway system consists of 480 lane-miles and serves 2.8 million daily vehicle miles traveled in the area.

The major freeway facilities in the Wichita area indicated in Figure 2-1 include:

- I-135 travels north/south to the east of downtown. Its southern terminus is at I-35 (KTA) and continues to the north through Harvey County.
- I-235 is a half belt that travels south, west and north of downtown Wichita. It connects to I-135 to the south and to the north of the City.
- I-35 (KTA) travels through the southeast corner of the City of Wichita and Sedgwick County
- Portions of US 54 (Kelllogg) have been upgraded to freeway. This east/west route bisects the county. The freeway portions include a segment from the west county line to just west of Goddard and a segment from the Wichita Mid-Continent Airport to Hillside Avenue. A new

freeway section between Hillside Avenue and Edgemoor Avenue is currently being constructed and is planned to open in 1999.

- K-96 travels east-west through the county until it combines with US 54 (Kellogg Drive) on the east side of the City.
- K-254 contains a relatively short freeway section from its intersection with I-135 north of the City east to Oliver Avenue.

### ***Arterials***

The Wichita metropolitan area has a limited number of state maintained arterials which are supplemented by the grid network of local arterials. The state maintained arterial system consists of 170 lane-miles and serve 1.6 million daily vehicle miles traveled. The state maintained arterial facilities in the metropolitan area include:

- K-2/K-42 travels to and from its intersection with US 54 (Kellogg Dr.) to the southwest into Sumner County.
- US 81 is a north-south route. It is combined with I-135 for much of its length through the metropolitan area, however it is a separate arterial that runs along Broadway to the south of the City into Sumner County.
- K-15 is a north-south route that runs along the east side of the Arkansas River. It combines with I-135 south of the City.
- K-254 from Oliver Avenue east.
- Portions of US 54 east and west of the City.

The state maintained and local arterials serve major activity centers by linking them to the freeway facilities. State maintained and local arterials also provide a primary means of mobility for trips that are not served by the freeways.

The grid network of arterials within the Wichita metropolitan area often provides an alternate route for the freeway. Diversion of traffic from freeways to selected arterials when freeway facilities are under construction or when there is an incident on the freeway can result in decreased overall delay. However, not all arterials are suitable as alternate routes for freeway traffic. For example, US 54 (Kellogg Dr.) currently exhibits both congestion and high accident rates along its arterial sections, which is a deterrent from suggesting it as an alternate route. An arterial used as an alternate route would preferably run approximately parallel to the freeway, would have adequate access onto and off of the freeway, and would have adequate capacity and operating speeds. Arterial capacity is influenced not only by the number of lanes in each direction but also by the signal timing along the facility. Thus, the capability to vary signal timing plans in response to a large volume of traffic diverting from the freeway significantly enhances the effectiveness of an arterial as an alternative route.

### ***Traffic Signal System***

The City of Wichita operates and maintains 344 traffic control signals, 223 of which are currently controlled by a closed loop signal system. This system consists of Type 170 controllers interconnected to zonal masters via City-owned twisted pair communication cable. The zonal masters are connected to a central microcomputer for monitoring and control purposes. The system has the capability to operate in both time-of-day and traffic responsive mode, although it operates on a time-of-day/day-of-week schedule for most sections. A limited number of locations operate in the traffic responsive mode.

The system has the capability to support multiple timing plans which can be easily changed from the central microcomputer. This feature provides the City of Wichita with the capability to

develop and implement alternate route timing plans to facilitate incident management and diversion strategies. There are plans to expand the system to include all signals within the City of Wichita.

The City has an OPTICOM signal preemption demonstration project currently proceeding at four (4) signals on Main Street for Fire Station #1. There is a desire by the fire department to expand the demonstration to include more signals and additional fire stations.

Figures 2-2 and 2-3 show the locations of the City operated traffic signals and differentiate between those intersections controlled by the closed loop system and those with no system control.

***Railroad Crossings***

There are four (4) railroad agencies operating within the Wichita metropolitan area: Union Pacific, Burlington Northern Santa Fe, Central Kansas Railway, and Kansas Southwestern Railway. All of the agencies operate along tracks that have at grade crossings with the highway system. Figures 2-4 and 2-5 show the railroad crossings throughout the study area. These figures also indicate those crossings where an accident or accidents have occurred between 1992 and 1996.<sup>1</sup> Table 2-1 indicates the number of accidents and the types of accidents that have occurred at area railroad crossings while Table 2-2 shows the number of railway train accidents at individual crossings. A complete listing of accidents is presented in Appendix A.

**Table 2-1 Accident Types at Railroad Crossings**

| <b>Accident Type</b> | <b>Total Accidents</b> |
|----------------------|------------------------|
| Other vehicle*       | 167                    |
| Railway train**      | 58                     |
| Fixed object***      | 44                     |
| Overturned           | 4                      |
| Other object         | 3                      |
| Pedestrian           | 3                      |
| Non-collision        | 1                      |
| Parked vehicle       | 1                      |
| Pedalcycle           | 1                      |

\* This accident type includes rear-end, angle, sideswipe, head on, and backed into

\*\* This accident type refers to a motor vehicle/railway train collision

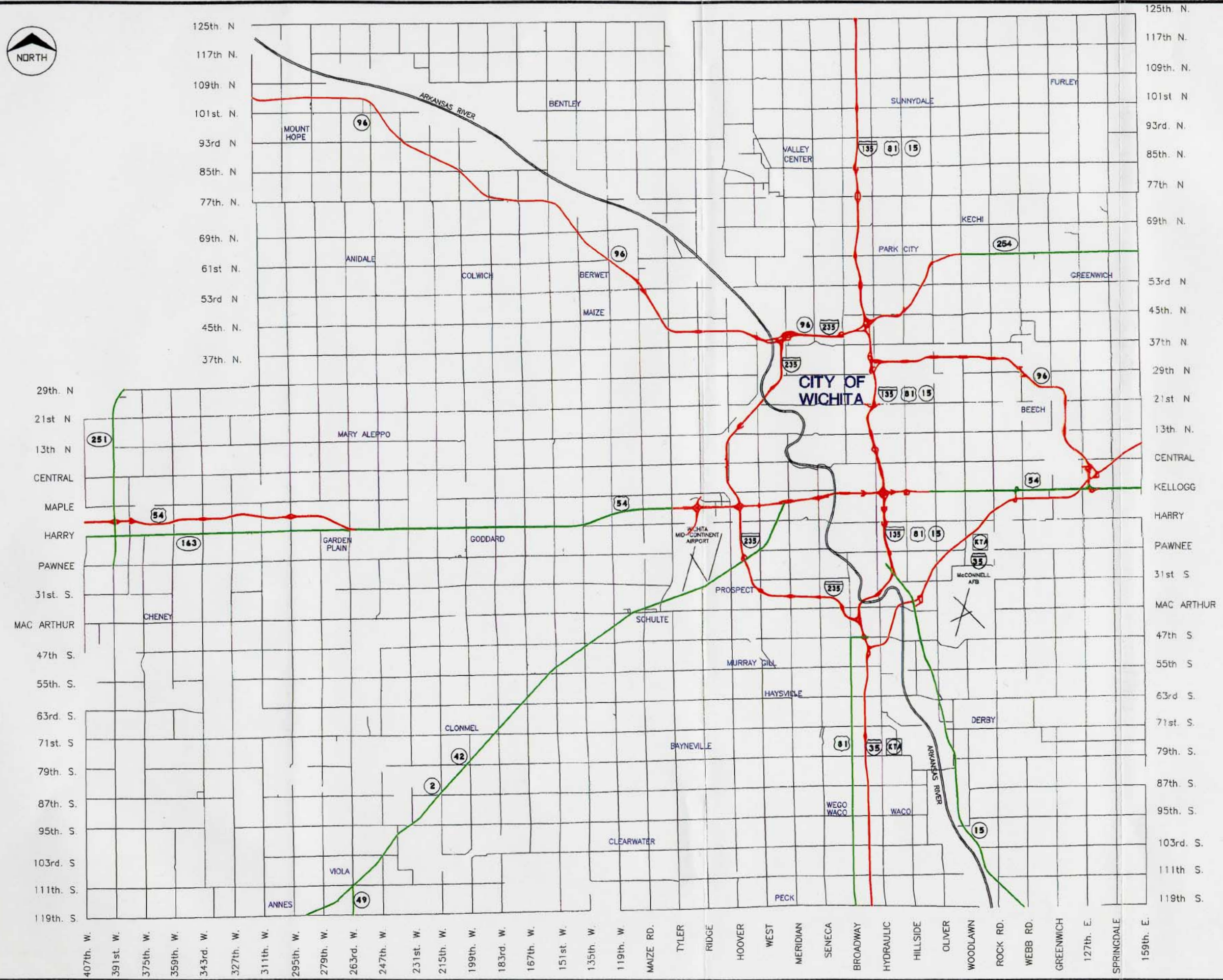
\*\*\* This accident type includes railroad crossing fixtures, curb, guardrail, utility devices, etc.

<sup>1</sup> Accident information along rail lines provided by KDOT





# WICHITA METROPOLITAN AREA ITS EARLY DEPLOYMENT STUDY STRATEGIC DEPLOYMENT PLAN



**LEGEND**

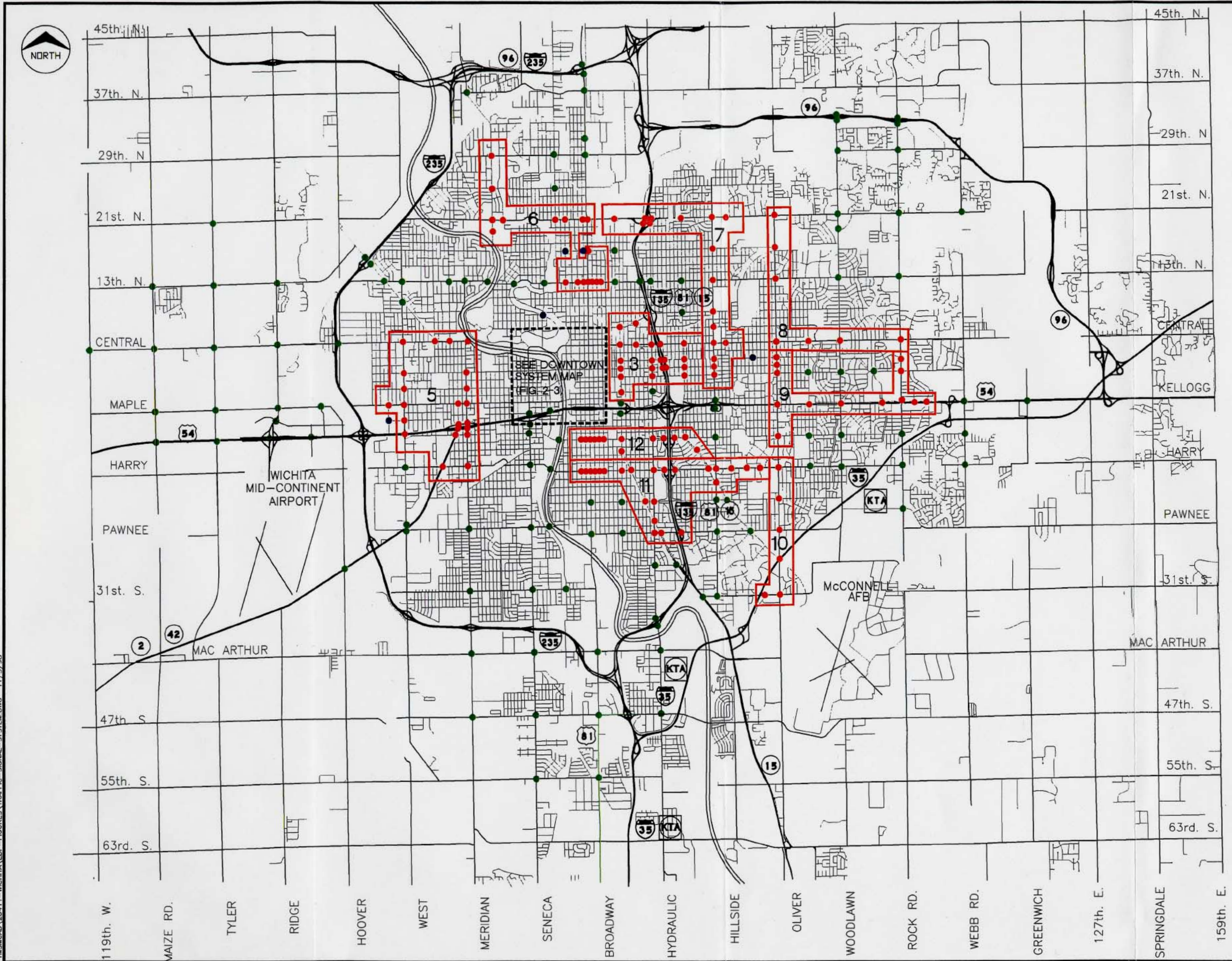
- FREEWAYS
- MAJOR STATE ARTERIALS
- LOCAL ARTERIALS

**FIGURE 2-1  
EXISTING ROADWAY  
NETWORK**

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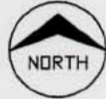
**WICHITA METROPOLITAN AREA  
ITS EARLY DEPLOYMENT STUDY  
STRATEGIC DEPLOYMENT PLAN**

**LEGEND**

- SYSTEM CONTROLLED INTERSECTION
- INDEPENDENTLY CONTROLLED INTERSECTION
- INTERSECTION WITH FLASHER
- SYSTEM ZONE
- 9 ZONE NUMBER

**FIGURE 2-2  
TRAFFIC SIGNAL SYSTEM**





WICHITA METROPOLITAN AREA  
ITS EARLY DEPLOYMENT STUDY  
STRATEGIC DEPLOYMENT PLAN

**LEGEND**

- SYSTEM CONTROLLED INTERSECTION
- INDEPENDENTLY CONTROLLED INTERSECTION
- INTERSECTION WITH FLASHER
- SYSTEM ZONE
- 2 ZONE NUMBER

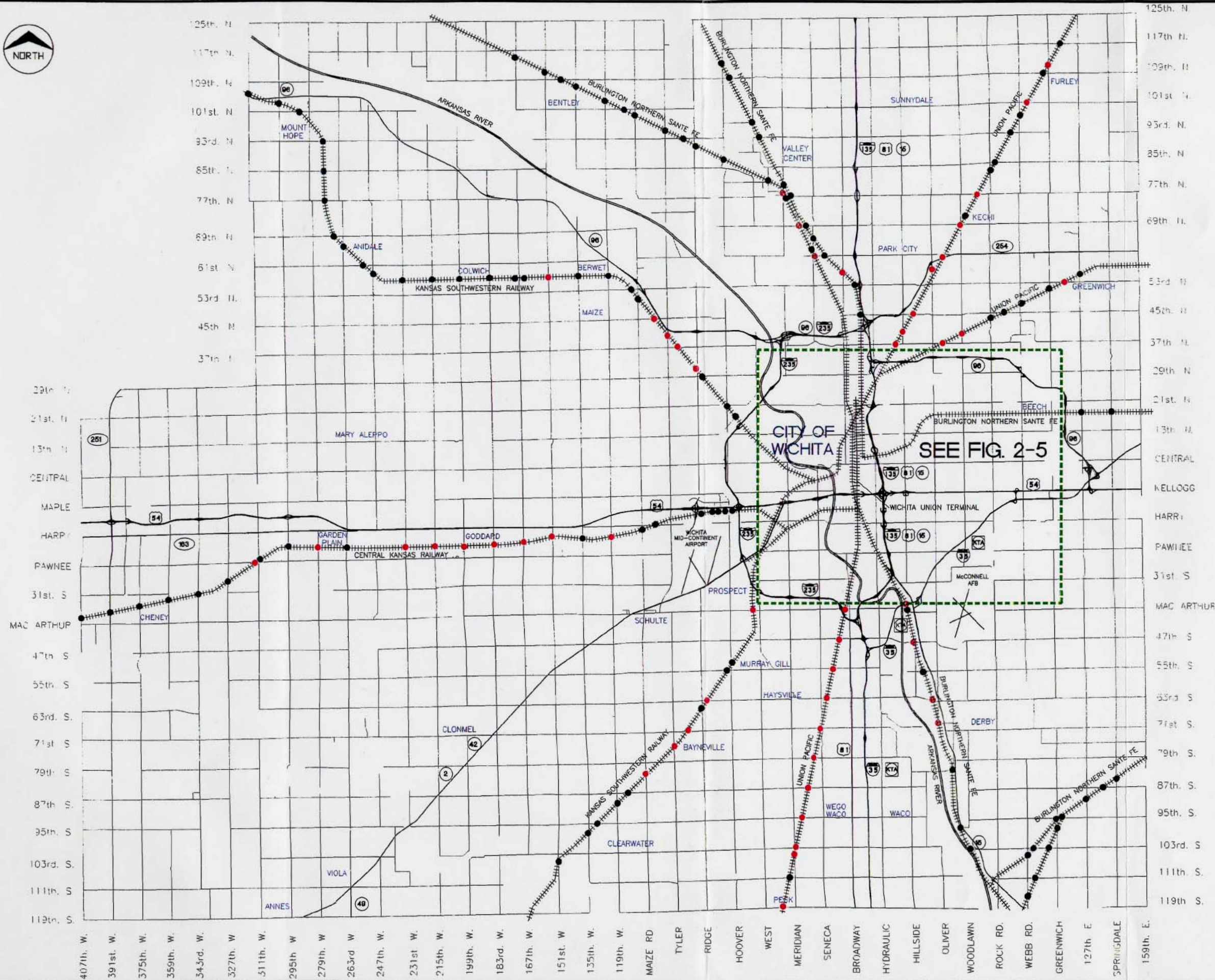
**FIGURE 2-3**  
**DOWNTOWN AREA**  
**TRAFFIC SIGNAL SYSTEM**

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# WICHITA METROPOLITAN AREA ITS EARLY DEPLOYMENT STUDY STRATEGIC DEPLOYMENT PLAN



### LEGEND

- ACCIDENT OCCURRED AT THIS CROSSING, 1992-1996
- RAILWAY CROSSING

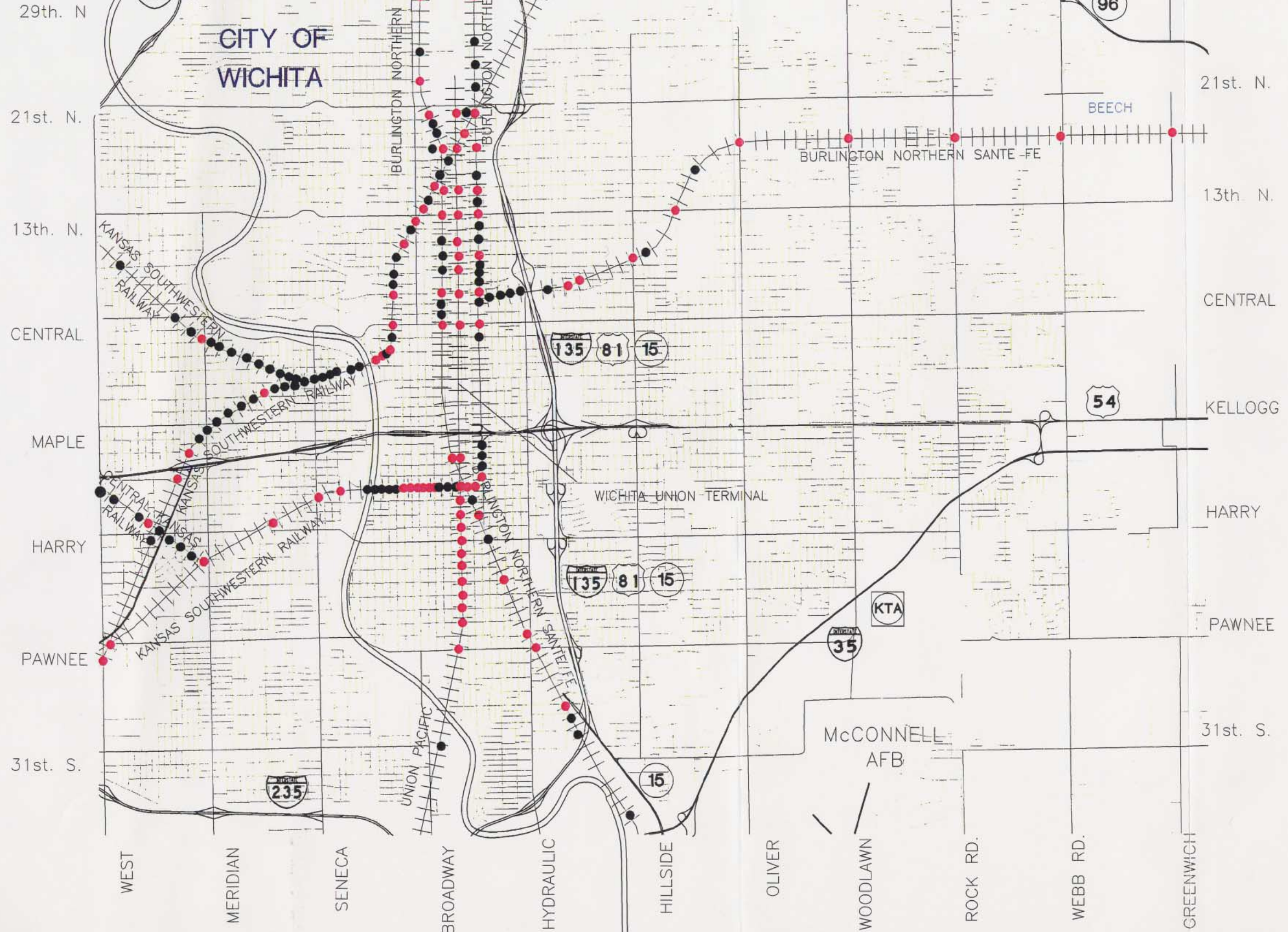
## FIGURE 2-4 EXISTING RAILWAY NETWORK

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**WICHITA METROPOLITAN AREA  
ITS EARLY DEPLOYMENT STUDY  
STRATEGIC DEPLOYMENT PLAN**



**LEGEND**

- ACCIDENT OCCURRED AT THIS CROSSING, 1992-1996
- RAILWAY CROSSING

**FIGURE 2-5  
EXISTING RAILWAY  
NETWORK -  
DOWNTOWN AREA**

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**Table 2-2 Intersections with Railway Train Accidents**

| <b>Intersection (nearest to crossing)</b> |           | <b># of Accidents</b> |
|---|-----------|-----------------------|
| MURDOCK                                   | WICHITA   | 5                     |
| 79 TH S.                                  | SENECA    | 3                     |
| 17 TH N.                                  | MEAD      | 2                     |
| 167 TH W.                                 | KELLOGG   | 2                     |
| MAIN                                      | SANTA FE  | 2                     |
| MURDOCK                                   | MEAD      | 2                     |
| TYLER                                     | 37TH      | 2                     |
| TYLER                                     | 71 ST S.  | 2                     |
| 3 RD N.                                   | WICHITA   | 1                     |
| 18 TH N.                                  | MOSLEY    | 1                     |
| 18 TH N.                                  | SANTA FE  | 1                     |
| 25 TH N.                                  | BROADWAY  | 1                     |
| 29 TH N.                                  | OHIO      | 1                     |
| 33 RD N.                                  | BROADWAY  | 1                     |
| 37 TH N.                                  | BROADWAY  | 1                     |
| 39 TH S.                                  | WEST      | 1                     |
| 53 RD N.                                  | ARKANSAS  | 1                     |
| 61 ST N.                                  | ARMSTRONG | 1                     |
| 61 ST N.                                  | SENECA    | 1                     |
| 69 TH N.                                  | K-15      | 1                     |
| 69 TH N.                                  | WOODLAWN  | 1                     |
| 77 TH W.                                  | WOODLAWN  | 1                     |
| 87 TH S.                                  | SENECA    | 1                     |
| 95 TH S.                                  | MERIDIAN  | 1                     |
| 215 TH W.                                 | KELLOGG   | 1                     |
| 279 TH W.                                 | HARRY     | 1                     |
| ALBERT                                    | QUEEN     | 1                     |
| BAYLEY                                    | MARKET    | 1                     |
| BROADWAY                                  | 15 TH N.  | 1                     |
| CENTRAL                                   | WICHITA   | 1                     |
| MERIDIAN                                  | 111 TH S. | 1                     |
| GREENWICH                                 | 13 TH N.  | 1                     |
| 71 ST S.                                  | RIDGE     | 1                     |
| F612                                      | 95 TH S.  | 1                     |
| KECHI                                     | OLIVER    | 1                     |
| KINKAID                                   | MEAD      | 1                     |
| LINCOLN                                   | MEAD      | 1                     |
| MURDOCK                                   | WACO      | 1                     |
| 199 TH W.                                 | SANTA FE  | 1                     |
| R2194                                     | M07812    | 1                     |

**Table 2-2 Intersections with Railway Train Accidents (continued)**

| Intersection (nearest to crossing) |          | # of Accidents |
|------------------------------------|----------|----------------|
| 63 RD S.                           | K-15     | 1              |
| 151 ST W.                          | 53 RD N. | 1              |
| 85 TH N.                           | RIDGE    | 1              |
| ROCK                               | 13 TH N. | 1              |
| ROCK                               | ROCKHILL | 1              |
| WOODLAWN                           | 39 TH N. | 1              |
| <b>Total</b>                       |          | <b>58</b>      |

Union Pacific Rail and Southern Pacific Rail are currently in the process of merging. A Preliminary Mitigation Plan has been developed by the Surface Transportation Board as a result of the merger review process. This mitigation study identified the daily delay and number of train-vehicle accidents per year. The current (pre-merger) delay caused by Union Pacific trains at major crossings is 97.95 vehicle hours per day. It is estimated that this delay will increase to 290.74 vehicle-hours per day after the merger. Similarly, the pre-merger train-vehicle accident frequency is 1.65 accidents per year while the post-merger accident frequency is estimated to be 1.95 accidents per year.<sup>2</sup>

The mitigation plan identified these and other effects of the merger on the transportation system and proposed mitigation measures to offset those impacts. The mitigation measures will be discussed later in this chapter.

### **Incident Management Activities**

According to the agency interviews and incident management surveys, there is a good level of cooperation among the numerous jurisdictions responsible for incident response and clearance. A Motorist Assistance Patrol (MAP) program is currently sponsored and operated by the Kansas Highway Patrol and KDOT. Two drivers during the peak hours and one driver during the off-peak hours cruise primarily I-235 and I-135. MAP drivers assist stranded motorists by carrying items such as gasoline, water, car jacks, jumper cables and cellular phones.

Sedgwick County operates a central dispatch center for the entire county, including the City of Wichita. This center receives all 911 calls coming from Sedgwick County and then dispatches the appropriate agency to the scene. The communications center dispatches the closest responder regardless of jurisdiction.

Figure 2-6 indicates the locations of the emergency responders in the metro area

### **Public Transit**

Wichita Transit provides a variety of transportation services including fixed-route bus service, special service for senior citizens and the disabled, rideshare matching, and trolley service in downtown Wichita.

Figure 2-7 shows the 17 fixed bus routes. The routes run from a transportation center in downtown Wichita to the outer reaches of the routes. The transportation center allows users to transfer to other routes as necessary. Bus service operates between 6:00am and 6:20pm Monday

<sup>2</sup> The Preliminary Mitigation Plan analyzed Union Pacific/Southern Pacific lines only. The data shown in Tables 2-1 and 2-2 include all rail lines in the study area.

through Friday and 7:20am through 5:20pm on Saturday. During the weekday rush hours, buses leave the center every half hour and hourly all other times.

Wichita Transit works with the Sedgwick County Department on Aging to serve the special needs of seniors in the Wichita metropolitan area. It also provides curb-to-curb service for the disabled. This service utilizes wheelchair lift equipped vans.

Trolleys run in downtown Wichita on announced weekdays, Saturdays and weekend evenings. Individuals may charter a trolley for private use.

Wichita Transit also provides a regional rideshare matching and referral service for Sedgwick and the surrounding counties of Butler and Harvey. People wanting to carpool sign-up and receive a free computer-generated list of potential carpool partners.

Wichita Transit has secured funding for the implementation of an Automatic Vehicle Location (AVL) system in all of their busses and vans. This system will allow Wichita Transit to more effectively manage their operations and to provide real-time transit information to riders and other agencies.

## **System Characteristics**

### ***Traffic volumes***

Existing (1996) freeway average daily traffic (ADT) volumes are shown in Figure 2-8, while the major state arterial ADT volumes are shown in Figure 2-9. The ADT values were provided by KDOT. Figure 2-10 shows the range of ADT values for the local arterials provided by the City.

The highest volumes, not surprisingly, occur around the downtown Wichita area. The Kellogg Expressway and I-135 exhibit the highest ADT values for the freeways, with both facilities handling well over 55,000 vehicles per day through downtown Wichita.

Similarly, the major state arterial volumes increase as they approach the Wichita City limits. Most approach 20,000 vehicles per day as they approach downtown, with the exception of Kellogg to the east. To the west of the K-96 interchange, Kellogg begins to carry 30,000 vehicles per day and over. Higher volumes such as these result in recurring congestion and increased delay.

### ***Recurring Congestion and Congestion Due to Accidents***

Criteria for quantifying congested areas was developed based on past experience with similar project areas and the *Highway Capacity Manual, Special Report 209* by the Transportation Research Board. The criteria for recurring congestion establishes the maximum ADT per lane for freeways at 15,000 vehicles per lane, divided arterials at 10,000 vehicles per lane, and undivided arterials at 7,500 vehicles per lane. Experience has shown that traffic volumes above these levels typically produce periods of recurring congestion. Figure 2-11 shows that by applying this criteria, there is very little recurring congestion in the Wichita metropolitan area. The one section of recurring congestion identified through this process on US 54 (Kellogg Dr.) is currently being reconstructed to be a freeway section. This reconstruction should eliminate the recurring congestion currently experienced along this section of roadway for the time being. The ITS Steering Committee noted that other areas that occasionally experience recurring congestion include the section of Kellogg at the I-235 interchange and many of the off ramps from the freeways.

A similar methodology is used to identify the locations of areas sensitive to incidents. In this case, the effects of accidents on the capacity of the highway network is taken into account. The



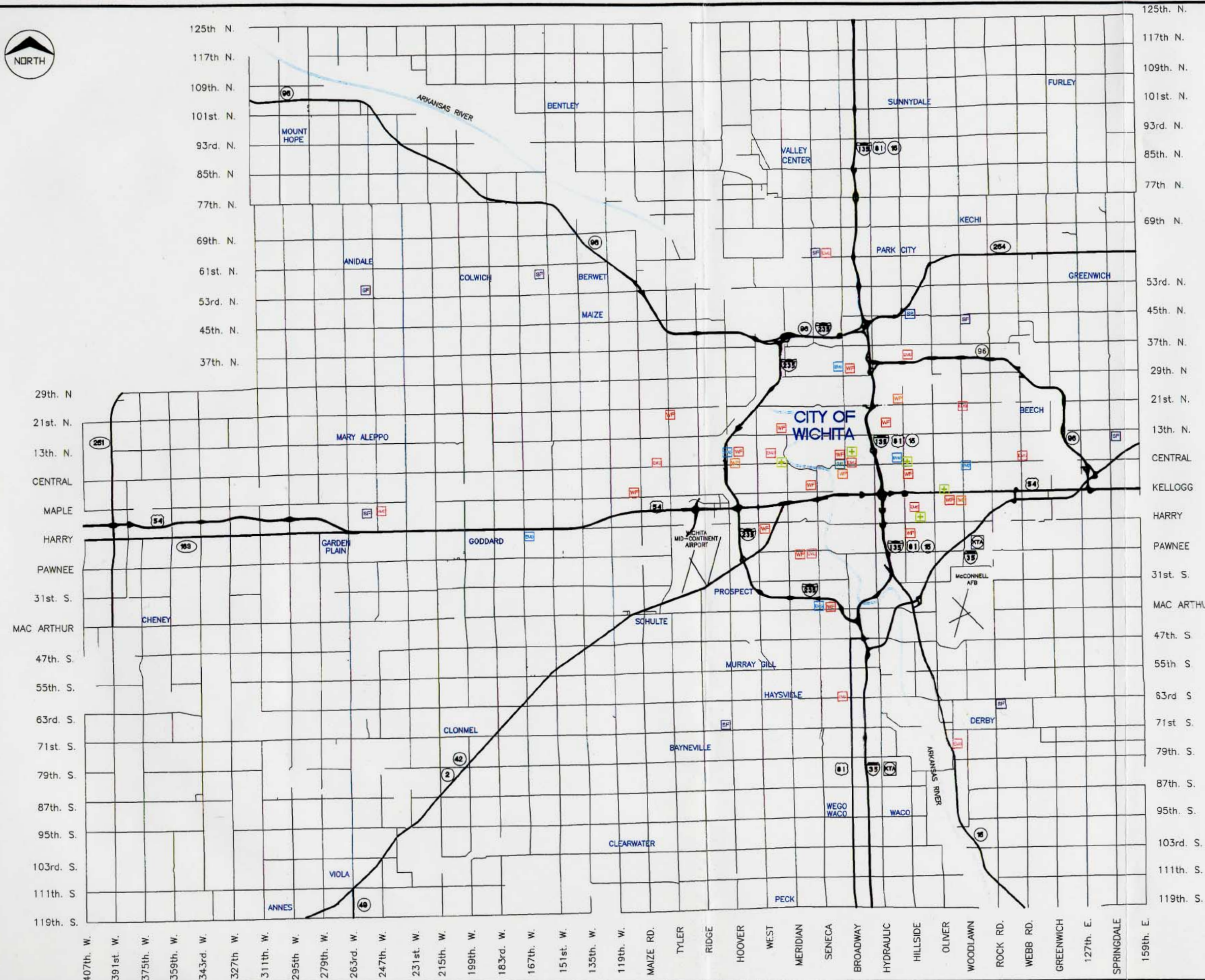
criteria established is a minimum 12,000 ADT/lane with 7 accidents/lane mile for freeways, 8,000 ADT/lane with 11 accidents/lane mile for divided arterials, and 5,000 ADT/lane with 14 accidents/lane mile for undivided arterials. Figure 2-12 shows the areas that are sensitive to disruptions in the traffic flow and may be congested due to those disruptions. The I-235/US 54 (Kellogg Dr.) interchange is an area identified by the Steering Committee and supported by the data that experiences incident related congestion. The I-135 corridor north of US 54 to just south of the K-96 interchange is another major area that is sensitive to disruptions in the traffic flow.

The section highlighted along US 54 (East Kellogg Dr.) on both Figure 2-11 and 2-12 is currently under construction. This construction will upgrade US 54 from its current divided arterial configuration to a freeway, thus eliminating the recurring and incident related congestion currently experienced in this corridor.









The finding that there is very little recurring and limited areas of incident related congestion is backed up by the conclusion of the "1995 Travel Time Survey" produced by the MAPD. It stated that "...travel time is not a major impediment to most drivers, when compared to average commuter times in large US cities... By comparison, the Wichita average commute time has decreased slightly during the past decade from 16.9 minutes in 1980 to 16.6 minutes in 1990."



# WICHITA METROPOLITAN AREA ITS EARLY DEPLOYMENT STUDY STRATEGIC DEPLOYMENT PLAN



### LEGEND

-  HOSPITAL
-  WICHITA FIRE
-  SEDGWICK COUNTY FIRE
-  SEDGWICK COUNTY EMS-INTERIM POST
-  SEDGWICK COUNTY EMS POST
-  WICHITA POLICE
-  STATE POLICE
-  SEDGWICK COUNTY 911 CENTER

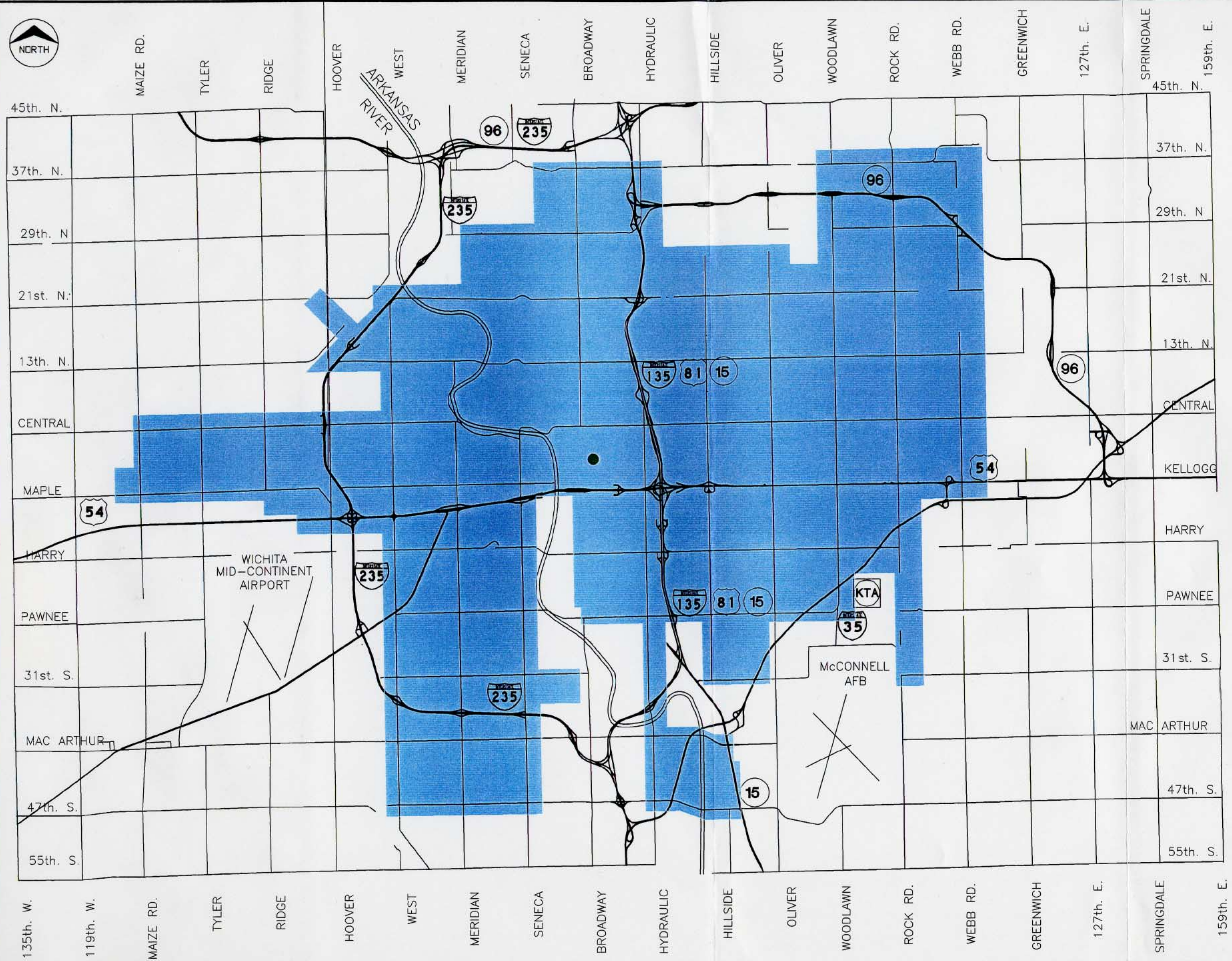
**FIGURE 2-6**  
**FIRE, POLICE, EMS,**  
**HOSPITAL LOCATIONS**

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**WICHITA METROPOLITAN AREA  
ITS EARLY DEPLOYMENT STUDY  
STRATEGIC DEPLOYMENT PLAN**



- LEGEND**
- TRANSIT COVERAGE
  - TRANSIT CENTER

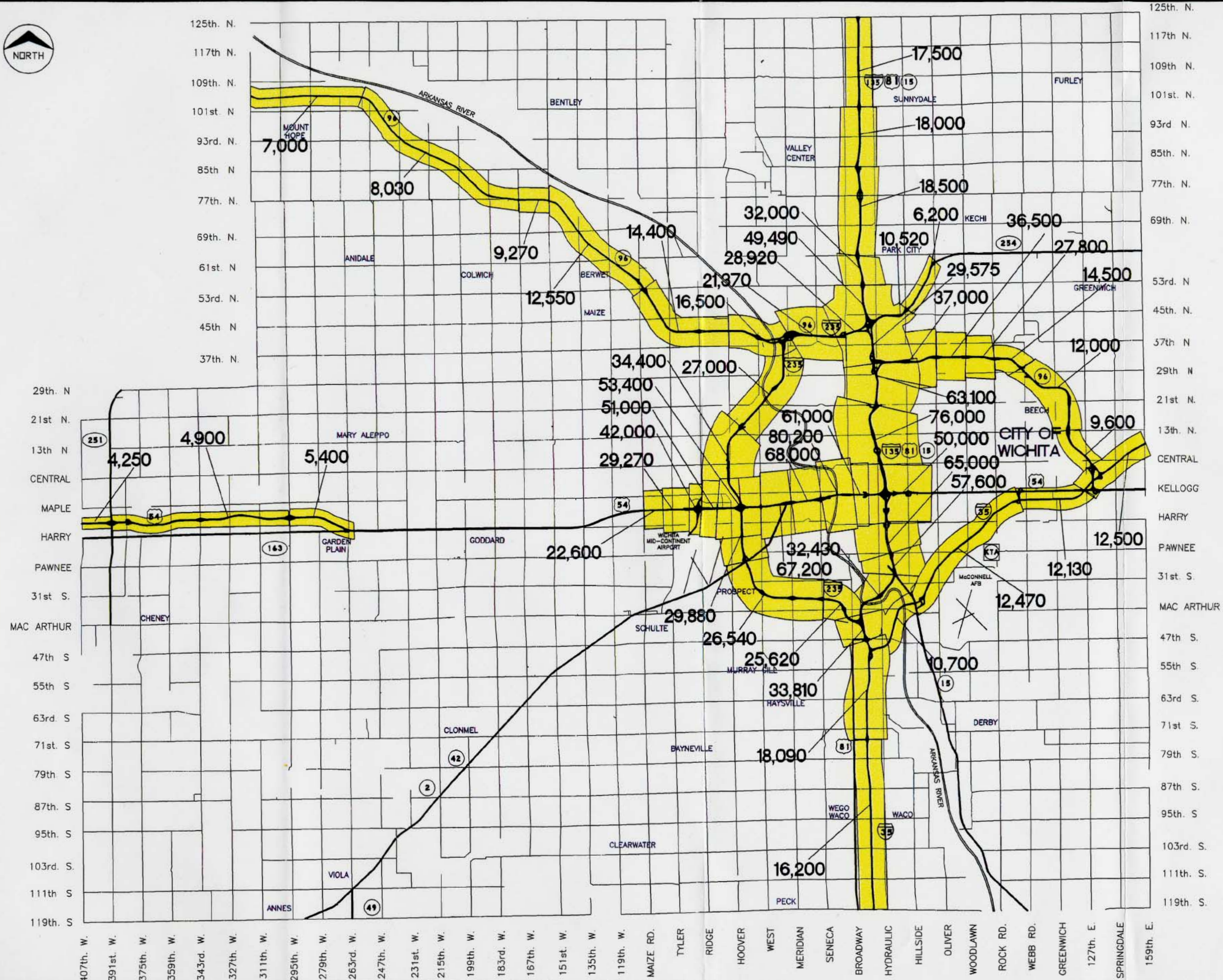
**FIGURE 2-7  
TRANSIT COVERAGE**

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WICHITA METROPOLITAN AREA  
ITS EARLY DEPLOYMENT STUDY  
STRATEGIC DEPLOYMENT PLAN



**LEGEND**

 AVERAGE DAILY TRAFFIC

 9,600

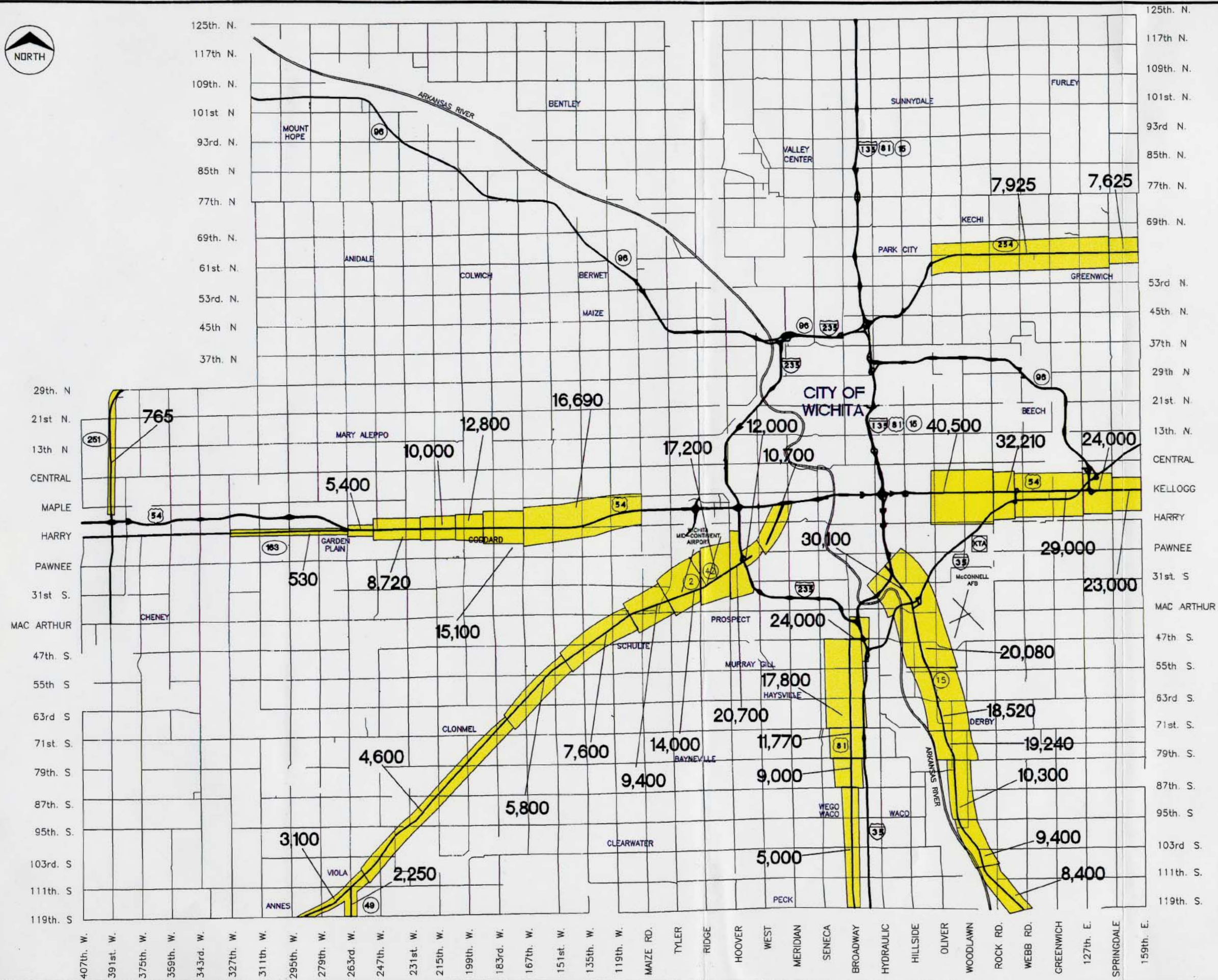
**FIGURE 2-8**  
**EXISTING TRAFFIC VOLUMES**  
**ON FREEWAY FACILITIES**

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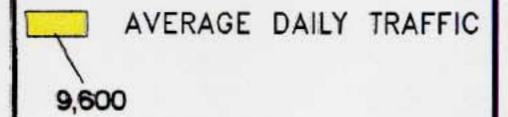




**WICHITA METROPOLITAN AREA  
ITS EARLY DEPLOYMENT STUDY  
STRATEGIC DEPLOYMENT PLAN**



**LEGEND**



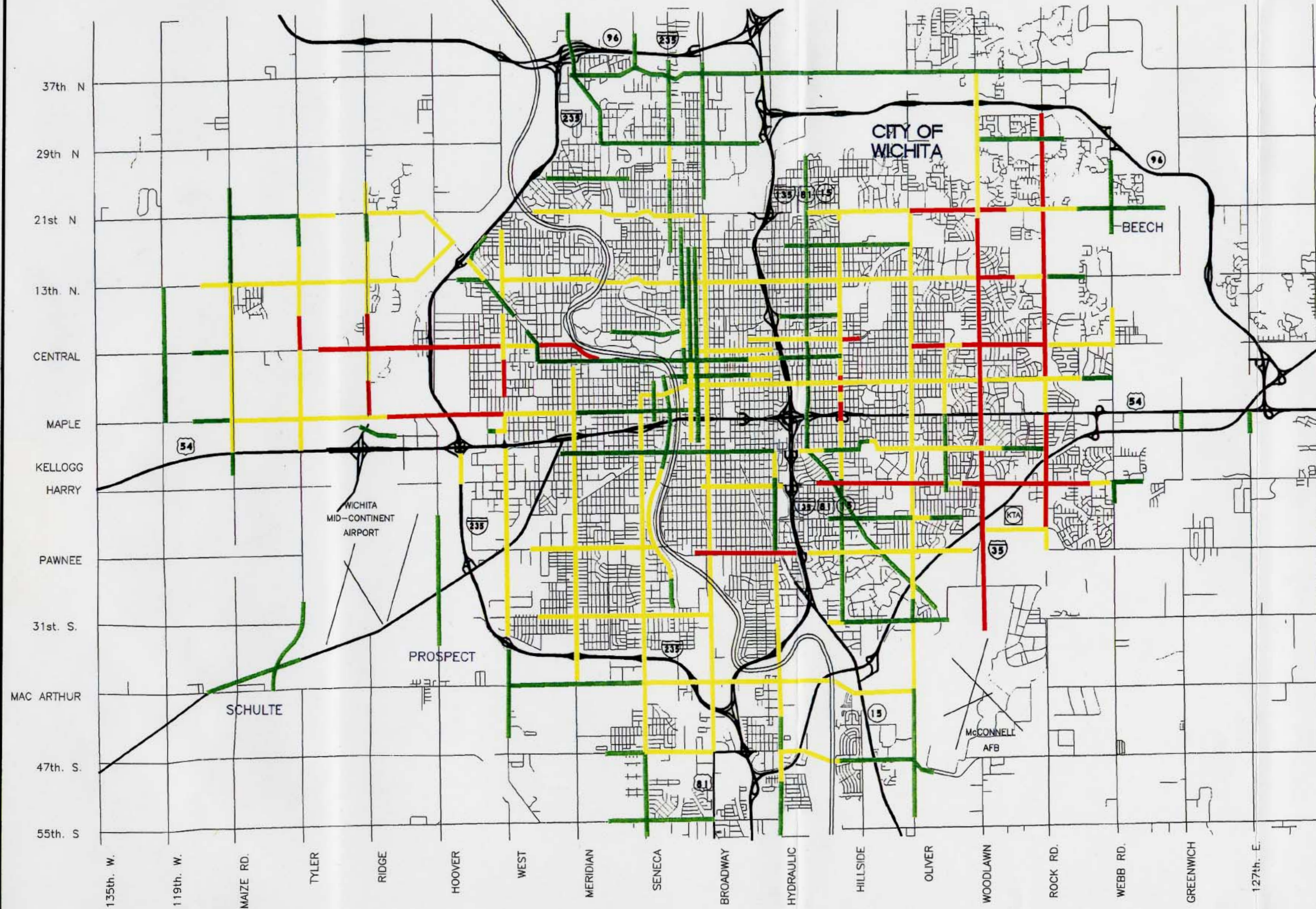
**FIGURE 2-9  
EXISTING TRAFFIC VOLUMES  
ON ARTERIAL FACILITIES**

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WICHITA METROPOLITAN AREA  
ITS EARLY DEPLOYMENT STUDY  
STRATEGIC DEPLOYMENT PLAN



LEGEND

- 5,000-10,000 ADT
- 10,000-20,000 ADT
- 20,000+ ADT

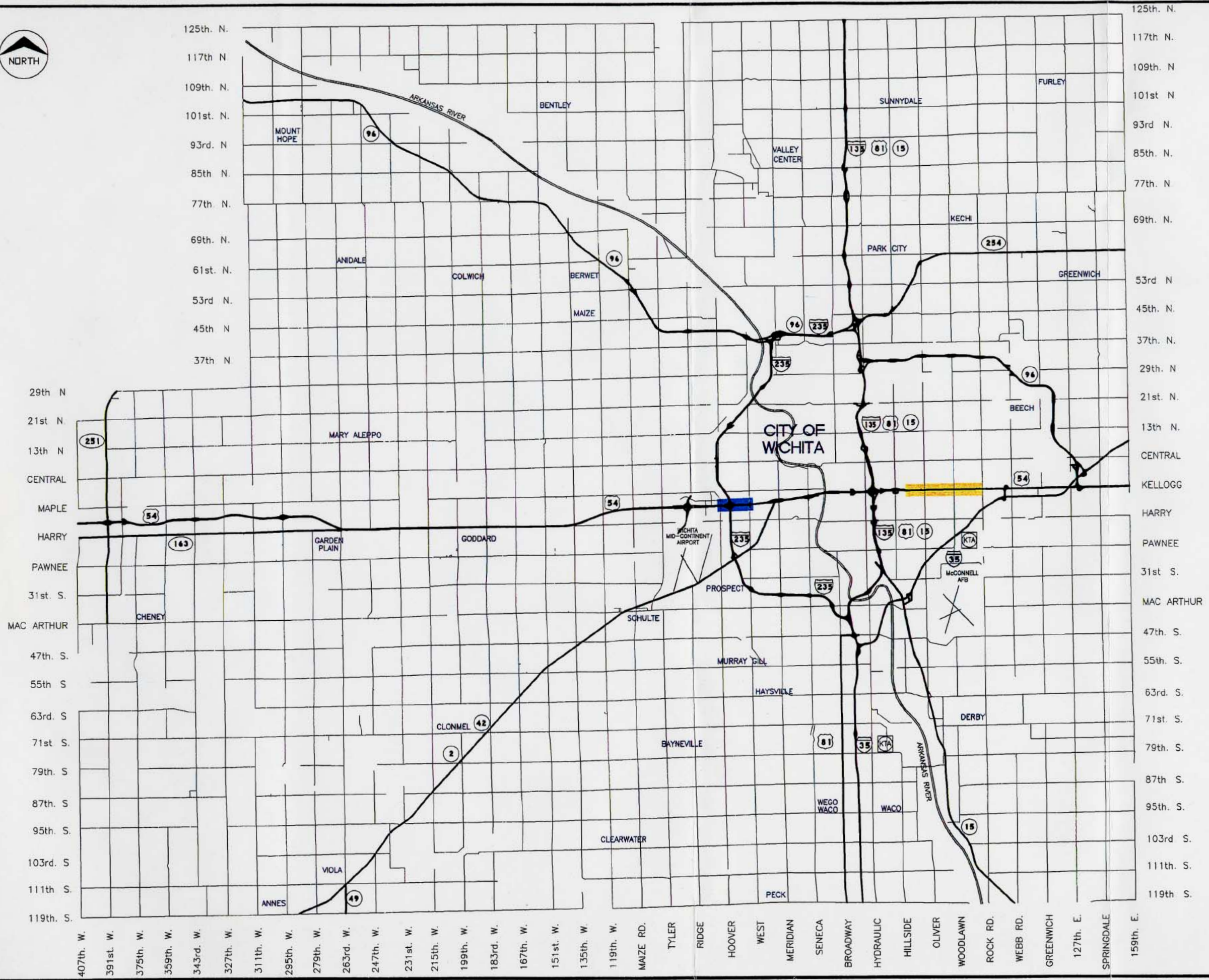
FIGURE 2-10  
EXISTING TRAFFIC  
VOLUMES ON LOCAL  
STREET NETWORK

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WICHITA METROPOLITAN AREA  
ITS EARLY DEPLOYMENT STUDY  
STRATEGIC DEPLOYMENT PLAN



**LEGEND**

- FREEWAYS
- DIVIDED ARTERIALS
- UNDIVIDED ARTERIALS

**FIGURE 2-11**  
**EXISTING RECURRING**  
**CONGESTION AREAS**

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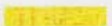





**WICHITA METROPOLITAN AREA  
ITS EARLY DEPLOYMENT STUDY  
STRATEGIC DEPLOYMENT PLAN**



**LEGEND**

-  FREEWAYS
-  DIVIDED ARTERIALS
-  UNDIVIDED ARTERIALS

**FIGURE 2-12  
EXISTING INCIDENT  
RELATED CONGESTION  
AREAS**

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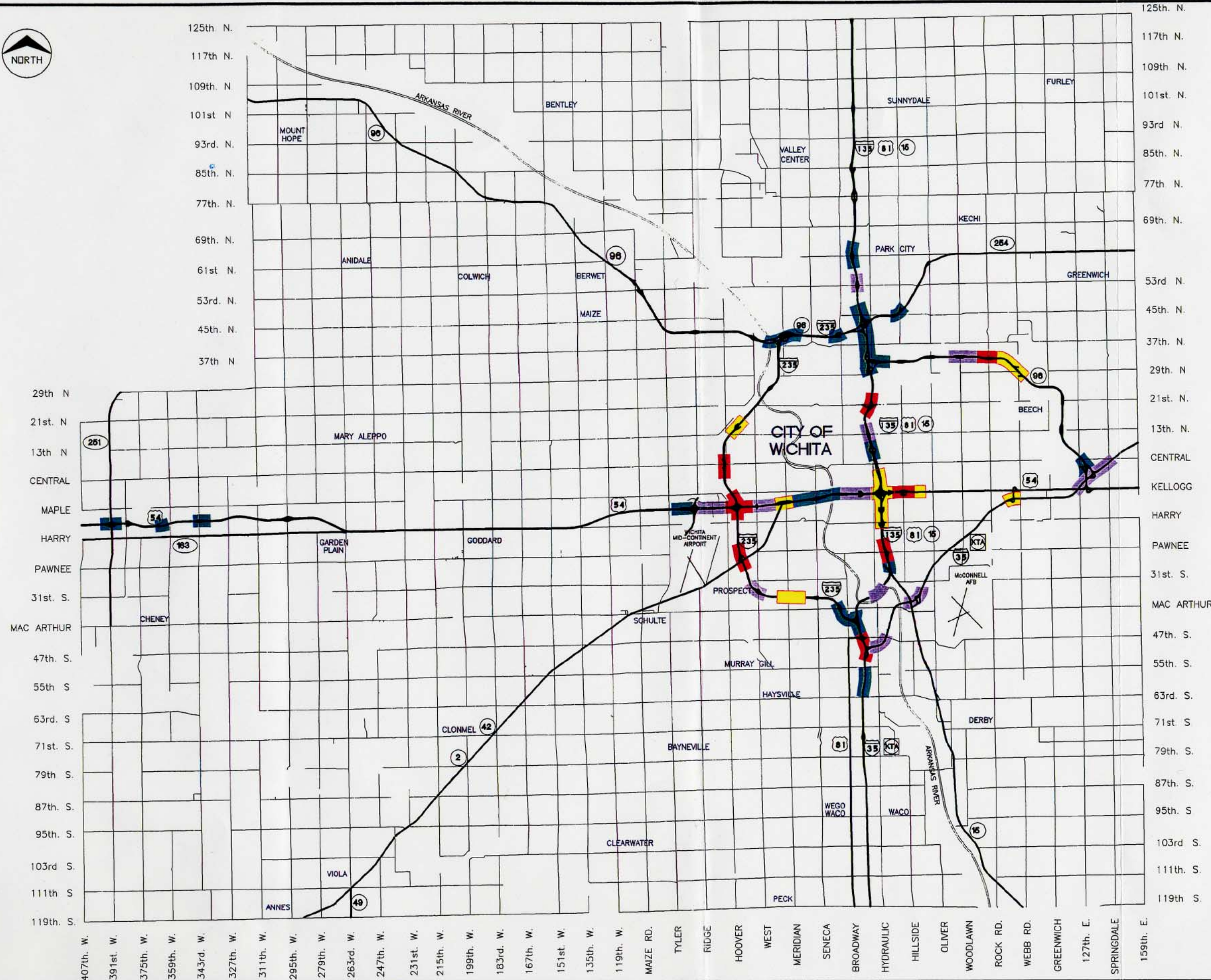
### ***Critical Ranking of Accident Rates***

KDOT uses the actual accident rate and the critical accident rate per section of highway to quantify critical accident areas by what is called a "critical rank". The higher the critical rank, the higher priority is placed on the section of highway. Figure 2-13 indicates the critical ranking on those sections of freeways where the actual accident rate is higher than the critical accident rate as well as showing the severity of the critical ranking. Similarly, Figure 2-14 indicates the critical ranking for sections of the major state arterials where the critical accident rate is higher than the actual accident rate.

Figure 2-15 shows the number of accidents per year (1997) at local arterial intersections. Intersections with less than 7 accidents per year are not included in the figure. The highest number of accidents occurred at the intersection of Topeka and Douglas with 22 accidents in 1997.



**WICHITA METROPOLITAN AREA  
ITS EARLY DEPLOYMENT STUDY  
STRATEGIC DEPLOYMENT PLAN**



**LEGEND**

CRITICAL RANK

- 1-50
- 51-100
- 101-150
- 151+

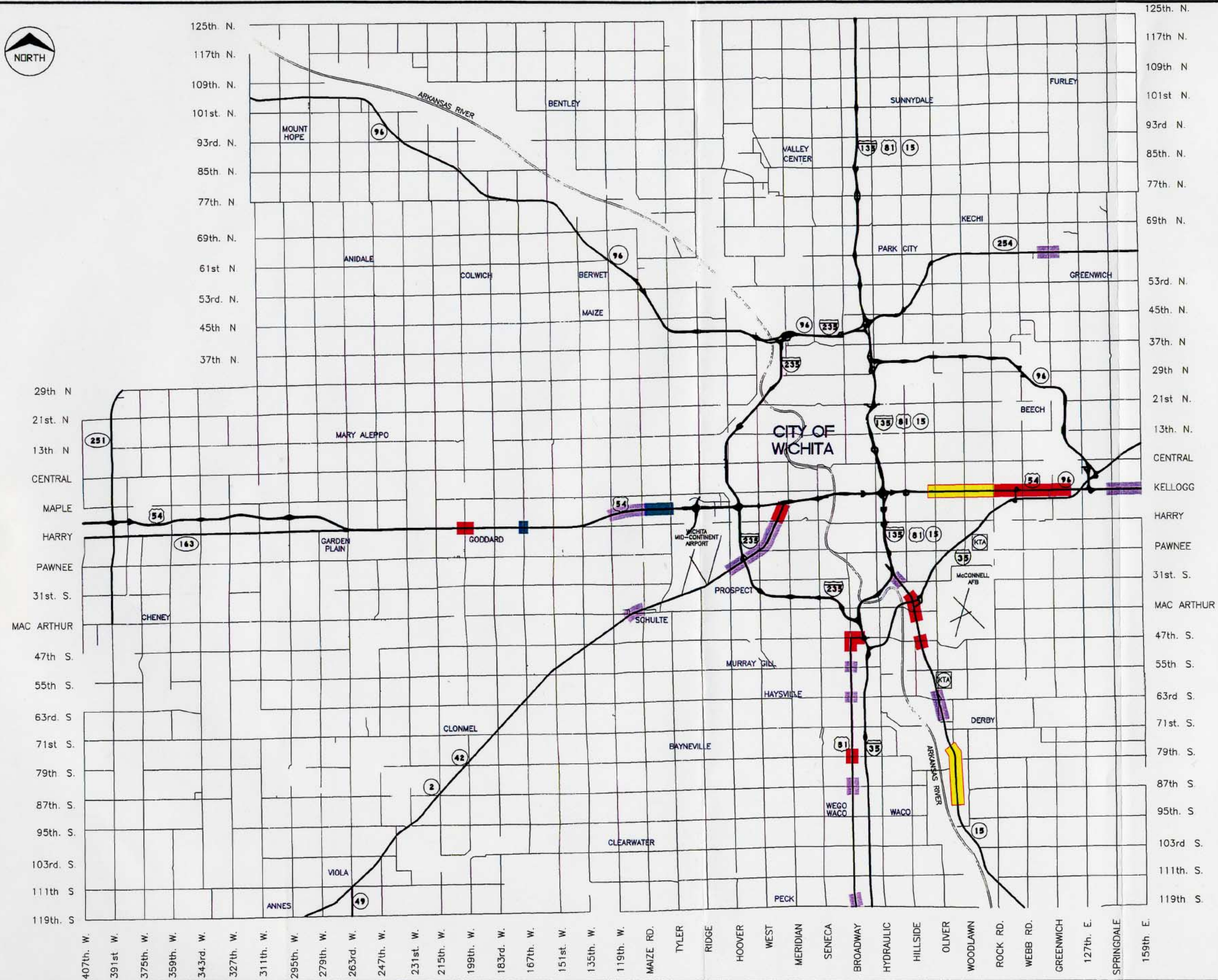
**FIGURE 2-13  
CRITICAL ACCIDENT  
RANKING-FREEWAYS**

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WICHITA METROPOLITAN AREA  
ITS EARLY DEPLOYMENT STUDY  
STRATEGIC DEPLOYMENT PLAN



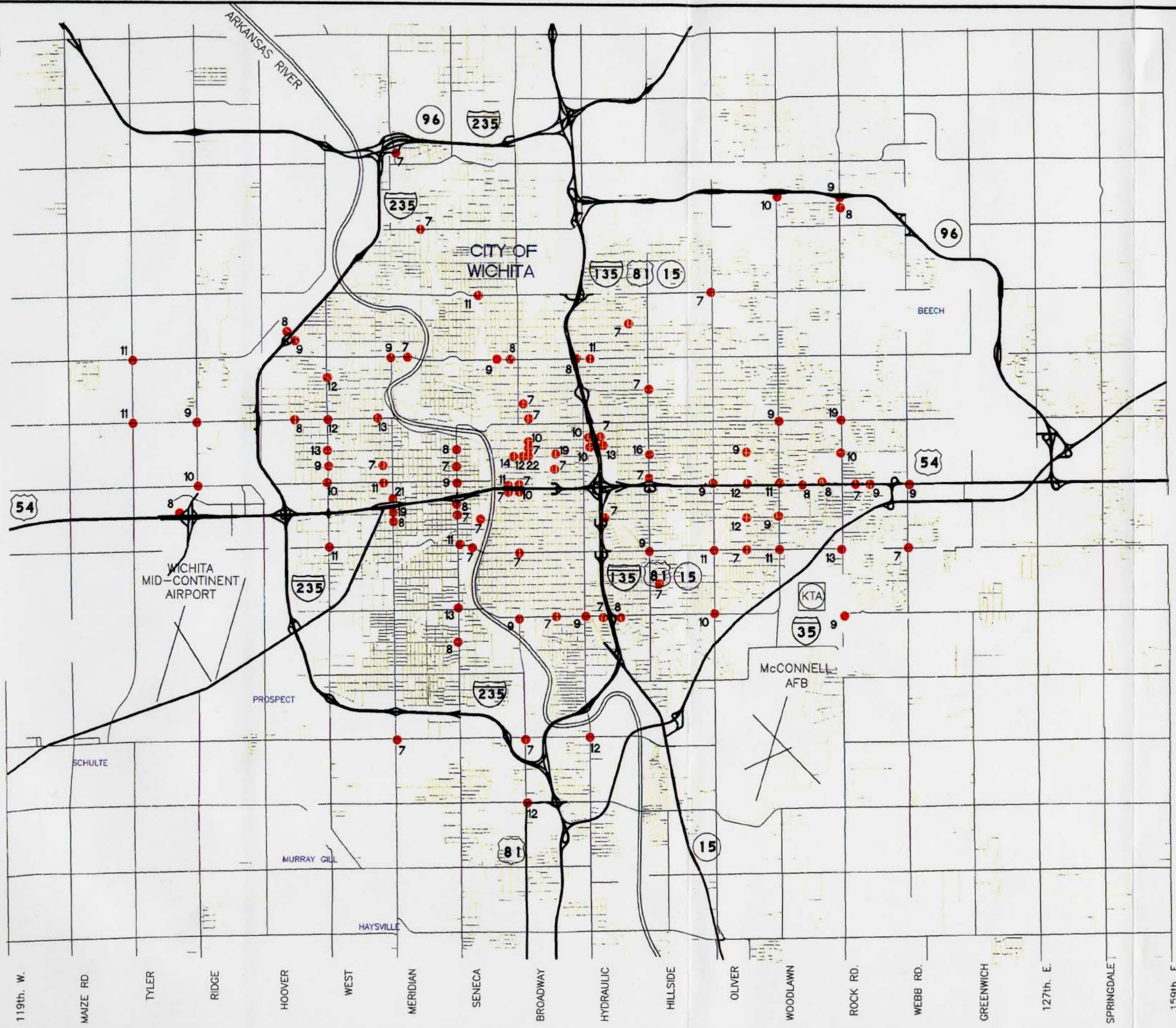
LEGEND

- 1-50
- 51-100
- 101-150
- 151+

FIGURE 2-14  
CRITICAL ACCIDENT  
RANKING-ARTERIALS

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**WICHITA METROPOLITAN AREA  
ITS EARLY DEPLOYMENT STUDY  
STRATEGIC DEPLOYMENT PLAN**

**LEGEND**

-  INTERSECTION WITH ACCIDENTS
-  # OF ACCIDENTS

**FIGURE 2-15  
ACCIDENTS PER YEAR AT  
LOCAL ARTERIALS (1997)**



## 2.3 CURRENT AND PLANNED ITS ACTIVITIES AND PROJECTS

There are a number of activities currently underway or planned in the Wichita metropolitan area that could be classified as ITS projects.

### **Traffic Signal System**

As mentioned in the previous section, the City of Wichita currently operates a closed loop traffic signal system and has plans to expand the system to include all of the signals in the City. The City is also conducting a test project with the OPTICOM signal preemption system. There is a desire by the fire department to expand the demonstration to more signals and fire stations.

### **Incident Management**

Incident Management has been provided in the Wichita area primarily through close working relationships and cooperation among the numerous jurisdictions responsible for incident response and clearance. An Incident Management Plan for the I-135 corridor is being developed as part of the Wichita ITS Early Deployment Study.

### **Public Transit**

Wichita Transit offers the Personalized Public Transit user service through its transportation service for the disabled and the elderly, and the Ride Matching and Reservation user service through its regional rideshare matching and referral service.

Wichita Transit has secured funding for the implementation of AVL systems on all of their buses and vans. This implementation would provide economies of scale for multiple agencies, such as fire and EMS, to participate in the AVL infrastructure installation.

### **Railroad Crossing Safety**

As mentioned in the previous section, a Preliminary Mitigation Plan was developed by the Surface Transportation Board Section of Environmental Analysis in 1997 for the Union Pacific/Southern Pacific Railroad merger. The study stated that the delay caused by Union Pacific trains at major Union Pacific crossings will increase by approximately 193 vehicle hours per day and train vehicle accidents will also increase by about 0.3 accidents per year. The Preliminary Mitigation Plan analyzed the Union Pacific/Southern Pacific lines only, while this study includes all rail lines in the study area.

The study presented two tiers of mitigation measures for the increased train traffic through the metropolitan area. The mandatory Tier 1 measure consists of increasing train speed from 20 to 30 miles per hour. The Tier 2 mitigation measures, which are not mandatory, include, in addition to increasing train speed, a potential grade separation at Pawnee Avenue and Central Avenue. The increase of train speed will mitigate the doubling of the number of trains through Wichita, but it will not positively affect safety.<sup>3</sup>

The following is a summary of the Preliminary Mitigation Plan recommendations:

1. Improve tracks and install a centralized train control system that would allow increased train speeds on the Union Pacific rail line as well as implement a requirement to operate at those increased speeds.
2. Elimination of train crew changes for through trains in Wichita.
3. Installation of a communications system to inform the emergency dispatch center of train locations on the Union Pacific rail line.

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<sup>3</sup> "Wichita/Sedgwick County Railroad Alternatives Analysis", Union Pacific Railroad Company/State of Kansas, 1997.

4. New crossing gates and flashing lights at 16 grade crossings on the Union Pacific rail line in Wichita and Sedgwick County.
5. Fences and guardrails along Mead to separate train right-of-way from motorists.
6. Pedestrian crossing gates at four crossings to enhance elementary school children safety.
7. School safety education program conducted twice a year.
8. Rail safety information for employers, employees, and residents adjacent to the Union Pacific rail line.
9. Train defect detectors to identify potential problems and reduce the risk of derailments.
10. A community advisory panel to establish communications between Union Pacific and local representatives regarding railroad related safety and environmental issues.
11. Quarterly monitoring reports to be submitted to the City and County.

Another study was commissioned by Union Pacific and KDOT to analyze alternative alignments to the west and east as well as improvements to the existing Union Pacific corridor through the metropolitan area. The preferred option through the existing corridor is the least costly method to relieving traffic congestion. It consists of grade separations and closing some less used crossings. To date, no alternative has been selected.

There have been negotiations with Union Pacific Railroad regarding the potential interface of a train location system to the existing 911 system. The desired package would have used advanced train control systems and automated vehicle location technologies to identify train location, length and speed so that routes where a train blocks the path of an emergency vehicle and the anticipated duration of blockage can be identified, thus allowing the 911 dispatcher to reroute the vehicle around the train. There was a concern among the 911 dispatchers as to whether the train notification system would hinder and slow down their dispatching efforts by adding another screen for them to view during an emergency. This issue was resolved with the funds being applied towards grade separation projects. Further evaluation of alternatives for this issue are considered later in this report.

## **2.4 FUTURE TRAFFIC TRENDS**

### **Anticipated ADT**

The MAPD is in the process of finalizing their 2030 traffic projections as of this printing. The 2020 Transportation Plan for the Wichita-Sedgwick County Metropolitan Area was completed by the MAPD in 1994 based on 1990 traffic volumes. The plan identified future transportation problem areas and recommended mitigation measures. However, some roadway segments are currently exhibiting traffic volumes that exceed the MAPD 2020 projections. For these areas, future volumes provided by KDOT based on recent growth trends were used and, while working with the MAPD, engineering and planning judgement was used to determine whether the average between the KDOT and MAPD numbers were more accurate than the straight linear regression numbers provided by KDOT and vice versa.

### **Future Recurring Congestion**

Based on the anticipated 2020 ADT values, areas of future recurring congestion were identified using the same criteria as for the existing ADT values. Figure 2-16 indicates the future recurring congestion areas with the existing traffic geometrics and Figure 2-17 indicates the future recurring congestion areas assuming all of the roadway improvement projects outlined in the 2020 Transportation Plan have been completed. In Figure 2-16, it is assumed that the current Kellogg construction has been completed, thus eliminating, according to the numbers, the recurring congestion that appeared in the area prior to construction.

As shown in Figure 2-16, with an increase in traffic without roadway improvements or ITS implementation, new areas of recurring congestion appear around the Wichita Mid-Continent Airport interchange along US 54 (Kellogg Dr.). Also, as shown in Figure 2-17, if all of the improvements outlined in the 2020 Transportation Plan are completed, recurring congestion is still anticipated to occur along US 54 (Kellogg Dr.) at West St.

### **Future Congestion Due to Accidents**

The areas that will be sensitive to accidents in the future were identified using the 2020 ADT values and the number of accidents per year increased or decreased in proportion with the traffic growth rates per roadway section. The assumption that the number of accidents per roadway section will increase or decrease in direct proportion with the traffic does not account for potential improvements that may occur on the roadway system by the year 2020, but it does provide a conservative estimate of potential future problem areas.

Figure 2-18 indicates the areas sensitive to accidents based on the future volumes with existing roadway geometrics. Figure 2-19 indicates the areas sensitive to accidents based on the future volumes assuming the completion of all of the projects indicated in the 2020 Transportation Plan.





**WICHITA METROPOLITAN AREA  
ITS EARLY DEPLOYMENT STUDY  
STRATEGIC DEPLOYMENT PLAN**



**LEGEND**

- FREEWAYS
- DIVIDED ARTERIALS
- UNDIVIDED ARTERIALS

**FIGURE 2-16  
2020 PROJECTED  
RECURRING  
CONGESTION AREAS WITH  
COMMITTED CONDITIONS**

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**WICHITA METROPOLITAN AREA  
ITS EARLY DEPLOYMENT STUDY  
STRATEGIC DEPLOYMENT PLAN**



**LEGEND**

- FREEWAYS
- DIVIDED ARTERIALS
- UNDIVIDED ARTERIALS

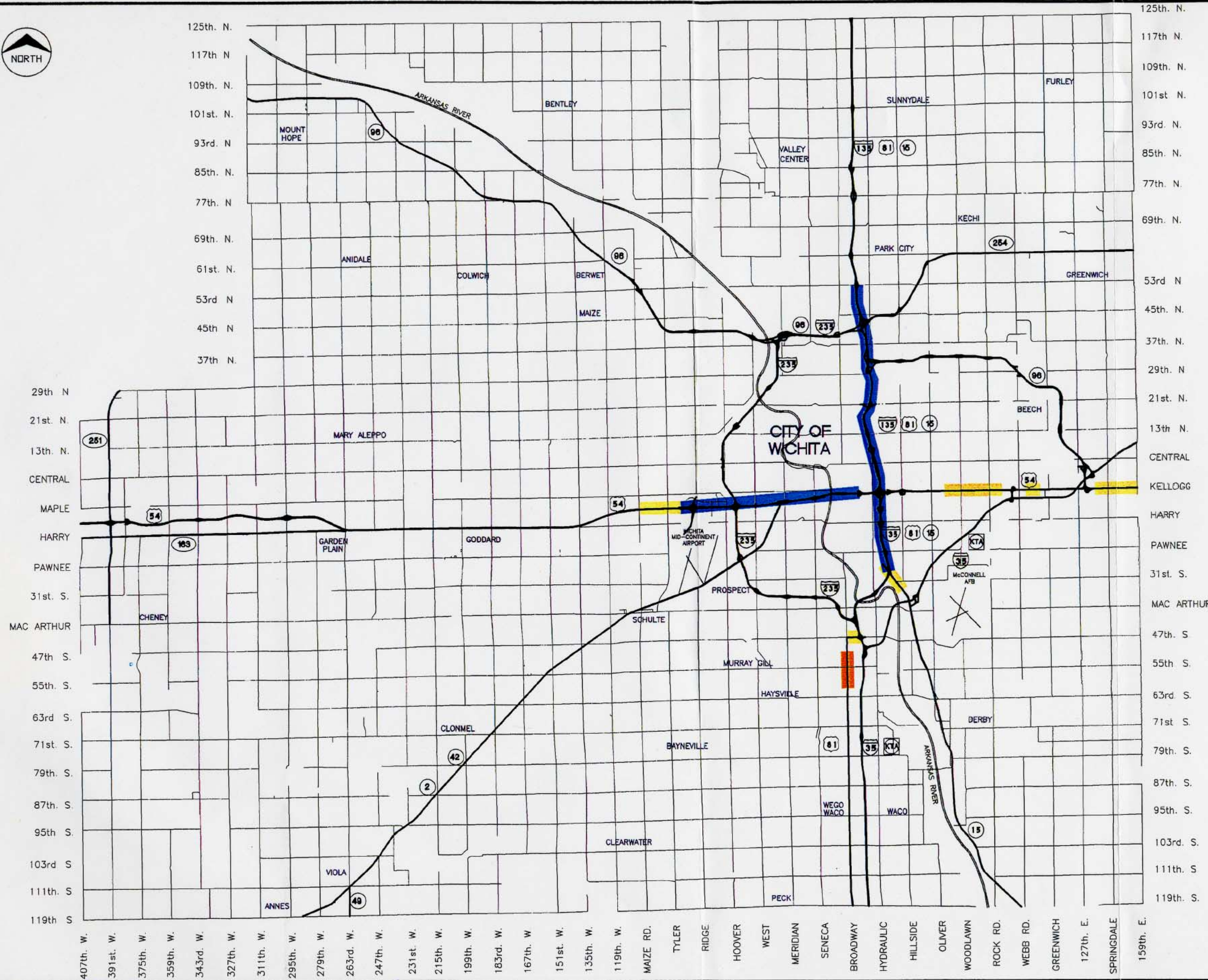
**FIGURE 2-17  
2020 PROJECTED  
RECURRING  
CONGESTION AREAS WITH  
PLANNED CONDITIONS**

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WICHITA METROPOLITAN AREA  
ITS EARLY DEPLOYMENT STUDY  
USER SERVICE PLAN



**LEGEND**

- FREEWAYS
- DIVIDED ARTERIALS
- UNDIVIDED ARTERIALS

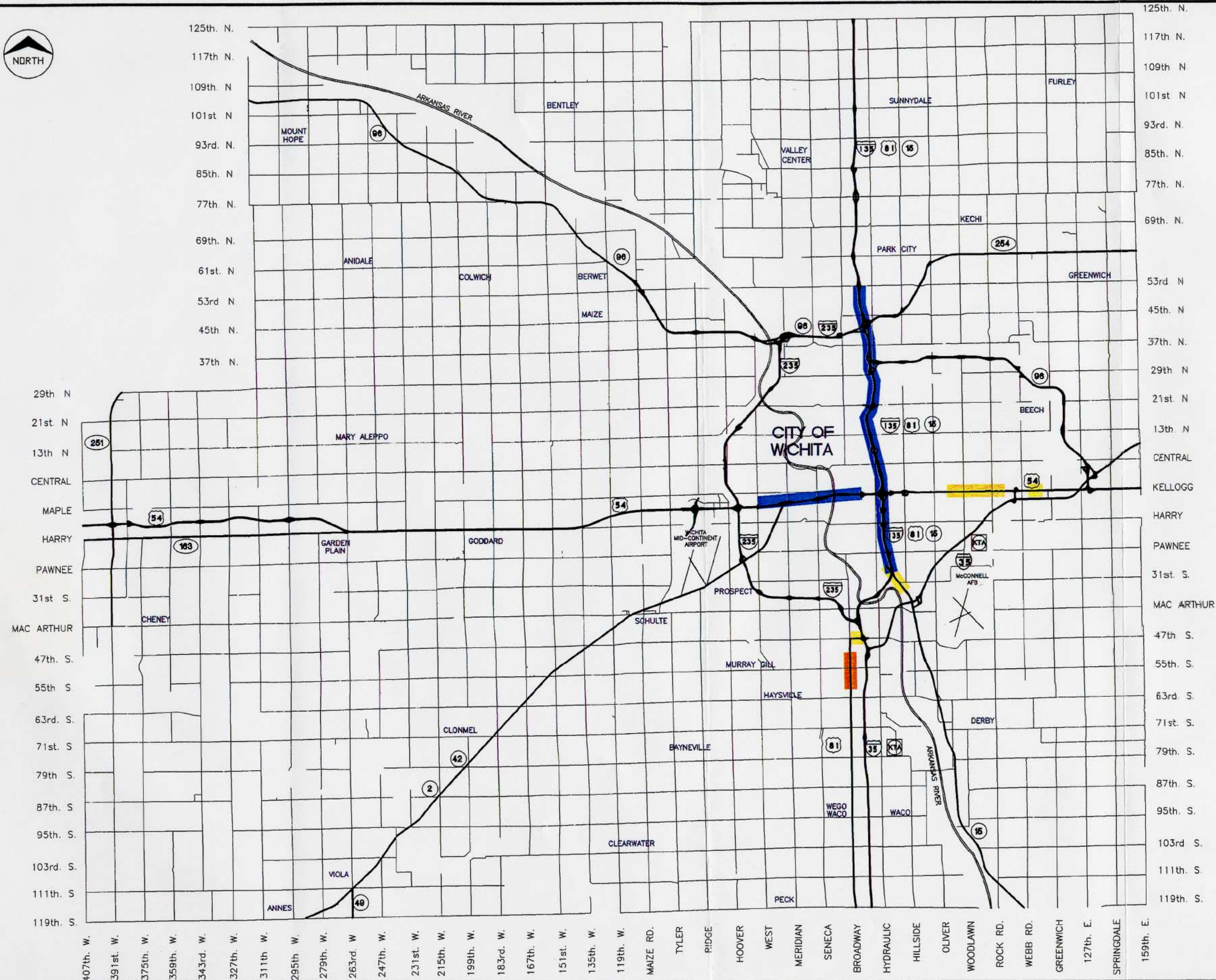
**FIGURE 2-18**  
**2020 PROJECTED**  
**INCIDENT RELATED**  
**CONGESTION AREAS WITH**  
**COMMITTED CONDITIONS**

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**WICHITA METROPOLITAN AREA  
ITS EARLY DEPLOYMENT STUDY  
STRATEGIC DEPLOYMENT PLAN**



- LEGEND**
- FREEWAYS
  - DIVIDED ARTERIALS
  - UNDIVIDED ARTERIALS

**FIGURE 2-19  
2020 PROJECTED  
INCIDENT RELATED  
CONGESTION AREAS WITH  
PLANNED CONDITIONS**

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## **2.5 ISSUES, CONCERNS AND OPPORTUNITIES FOR ITS DEPLOYMENT**

The Wichita metropolitan area encompasses a number of jurisdictions and affected agencies. This may complicate institutional issues by increasing the number of involved jurisdictions and agencies that must be involved in any endeavor that affects the entire area. However, there are a number of activities and organizations in the Wichita metropolitan area that foster interagency communication and cooperation. These activities and organizations can contribute to the successful implementation of the ITS Early Deployment Plan by acting as a source of information and feedback as well as a foundation for enhanced agency communication and cooperation.

### **Incident Management**

As indicated earlier, a majority of the congestion in the Wichita metropolitan area is incident related congestion rather than recurring congestion. I-135 with its elevated structures, substandard shoulders in sections, and the drainage channel in the median is especially impacted by incidents. Therefore, an Incident Management Plan for the I-135 corridor is being developed as part of the ITS Early Deployment Study. The plan will provide basic guidelines for all agencies involved in incident management activities, including contacts for agencies and pre-planned alternate routes. Incident Management has had a significant impact on delay in other metropolitan areas.

The Wichita metropolitan area already has good cooperation and coordination between emergency responders through the Sedgwick County Emergency Communications Center. The center handles all of the emergency dispatching for the entire county, no matter what jurisdiction. Another example of coordination is the Motorist Assistance Patrols (MAP) operated by the Kansas Highway Patrol. MAP's currently cover I-135 and I-235 in the metropolitan area assisting motorists in need as well as providing incident detection to the emergency monitors. Currently, two (2) MAPs operate during the peak hours and one (1) MAP operates during the non-peak hours.

However, even with the good level of cooperation between agencies, there is the potential to realize benefits from enhanced coordination and communication if an interagency plan for all activities at the incident site is implemented. Furthermore, the development of an incident management program would provide agencies with a better understanding of the ramifications of one agency's activities on other agency activities.

### **Traffic Control**

There is a desire within the City DPW to expand the closed loop system to include all signals within the City of Wichita as well as to expand the signal preemption demonstration project. The expansion of the closed loop system would not only decrease travel times, delay and vehicle emissions, it would enhance the incident management efforts by allowing remote timing changes to accommodate the additional traffic volumes created by diverted traffic along alternate routes during an incident. The expansion of the emergency vehicle preemption system will also enhance incident management efforts by decreasing the response time of the emergency responders.

### **Transit**

The implementation of AVL technologies in the transit busses will provide valuable information to the metropolitan area. The information gathered by the busses can provide travel time information not only to the MTA, but also to the City, county, MAPD, KDOT, and any other agency requesting such information. Such a system will also allow the MTA to more effectively manage their operations and to notify their passengers where the bus is and the expected arrival time or of any delays through kiosks, variable message signing at the bus stops, or other interactive method.

## **Railroad Crossing Safety**

The implementation of the mitigation measures outlined in the Preliminary Mitigation Plan for the Union Pacific/Southern Pacific merger will help decrease the vehicle/train conflicts. The removal of at-grade crossings using mitigation funds will also assist in the reduction of accidents and emergency response time.

## **Obstacles To Implementation**

A major concern for the implementation of ITS technologies in the Wichita metropolitan area is to identify funding sources. Any recommendations for deployment of ITS will have to compete for funding with other planned and anticipated transportation improvements. This study will quantify the costs and anticipated benefits of deploying various ITS technologies. This information will allow the ITS Steering Committee and other decision makers to evaluate the cost effectiveness of ITS deployment and guide them in the setting of priorities for transportation improvement funding.

## **Institutionalization of Early Deployment Plan**

It is recommended that the ITS Early Deployment Plan be institutionalized by placing it within the MAPD's Comprehensive Plan for the Wichita metropolitan area. This is recommended not only with the hope that it would then have an advocate and a mechanism for implementation, but also because the document is intended to be a living document, one which will require modification and re-interpretation as local circumstances change and as technology advances and new technologies become appropriate for implementation.