Part IV
Congestion Management System

A. Introduction

1. Background

The Congestion Management System (CMS) was one of six management systems introduced with the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1999. ISTEA defines a Congestion Management System as "a systematic process that provides information on transportation system performance and alternative strategies to alleviate congestion and enhance the mobility of persons and goods. A CMS includes methods to monitor and evaluate performance, identify alternative actions, assess and implement cost-effective actions, and evaluate the effectiveness of implemented actions."

2. Causes of Congestion

The Albuquerque Metropolitan Planning Area (AMPA) and its present pattern of development is an example of the typical western American city. It is characterized by low density housing, suburban sprawl, and concentrations of employment. Within the AMPA, employment is increasing at a faster rate than population. Car ownership is growing faster than either population or the number of licensed drivers. Many of these factors were discussed in Part III.

The 1990 Census verified that the Albuquerque Metropolitan Statistical Area had the ninth highest rate of population to vehicles in the nation and the fifth highest in the Southwest. This trend has shown no signs of abating. While 2000 Census data has not yet been released, vehicle registration and housing population to date indicate no change in this trend.

As reported in Part III, the number of Vehicle Miles Traveled (VMT) in the AMPA has increased faster than the population grew. The number of vehicle miles people travel has increased from an average of 12.4 miles per day in 1970 to an average of 21.8 miles per day in 1999. This 76 percent increase can be attributed to various economic and lifestyle factors such as increased car ownership, increased percentage of women in the workforce, more teen driving and sprawling urban development patterns which are not balanced in the distribution of jobs and housing. All of these factors have contributed to the increases of VMT in the Albuquerque area.

The rapid growth on the fringes of the Albuquerque urban area causes several problems that directly affect congestion. The first is high concentrations of housing, which require working people to commute to centers of employment. In addition, there are usually two wage earners per family. The trend has been for each wage earner to have their own vehicle, thus resulting in increased car ownership rates and number of vehicle miles traveled.

The Albuquerque urban area has a number of natural and manmade barriers that also contribute to congestion and transportation problems. These natural barriers are the Rio Grande through the central section of the urban area and the Sandia Mountains to the east. The mountains limit growth and restrict access from Estancia Valley. In addition, there are political barriers that restrict access and development: Sandia Pueblo to the north, and Isleta Pueblo to the south of the AMPA.

Along with these barriers are the manmade barriers to traffic flow in the urban area. The interstates have effectively divided the city into four parts. Land ownership patterns in the Valley leave limited north/south road options, whereas the East Mesa has an established grid pattern. Newer developments have not continued this grid pattern but have adopted the walled community model which is not conducive to mass transit. This has been the major pattern of Westside development.

The Albuquerque area's major expansion occurred during a time of inexpensive gasoline, cheap land, and the American dream of home ownership with "elbow room". The automobile played a central role in a person's life style and social status. This laid the foundation for the congestion we experience today. To avoid future congestion, this region must develop a new approach to growth.

B. CMS Implementation

1. Integration into the Planning Process

Development of the Albuquerque Congestion Management System began with the Congestion Management System Technical Advisory Committee (COMSTAC). The committee published a 1994 work plan that defined the basic parameters of a CMS system and the geographic area. It also suggested performance measures and defined the aspects of the transportation system to be included as part of the CMS evaluation process.

This is the second congestion management report developed for the Albuquerque urbanized area. The first report was the *Albuquerque Congestion Management System: Baseline Conditions Performance Report*, document number TR-128, February 1997. This report was designed to provide a reference base for analyzing congestion trends within the Albuquerque urban area. The report defined a process to identify streets with possible congestion and a method to measure that congestion. The report also established the foundation for storing and processing CMS data within a Geographical Information System (GIS) environment.

In accordance with federal guidance, MRGCOG has committed[15] to the following actions related to the implementation of a CMS:

- The Congestion Management System shall be an integral component of the metropolitan transportation planning and programming process consistent with the congestion management implementation strategy; and

- MRGCOG shall utilize data collected and summarized as part of the CMS to assist in the preparation of the Metropolitan Transportation Plan and assist in evaluation and

[15]Resolution UTPPB R-2001-2, 2/22/01 adopted the CMS as an integrated component of the MTP and TIP.

prioritization of projects and initiatives brought forth through the Transportation Improvement Program and MTP development process; and

- MRGCOG shall collect, and solicit from member governments and agencies, the data necessary for assessing current congestion, evaluating congestion management strategies and monitoring the performance of major projects and CMS initiatives; and

- MRGCOG shall prepare, within the context of the Metropolitan Transportation Plan and the Transportation Improvement Program, an annual transportation system performance evaluation documenting the extent and location of congestion, congestion trends and performance statistics for implemented projects and CMS initiatives.

This work is being done. This section of *Local Motion* is intended to be the annual system evaluation document for 2000.

2. CMS and the MTP Process

The results of the CMS will be used in MRGCOG planning processes. MRGCOG is required to develop a Metropolitan Transportation Plan (MTP) every three years. Projects and initiatives identified in the first ten years of this plan will be used to formulate subsequent TIPs (Transportation Improvement Programs). MRGCOG has begun development of the next MTP, with completion of the process envisioned at the end of this calendar year.

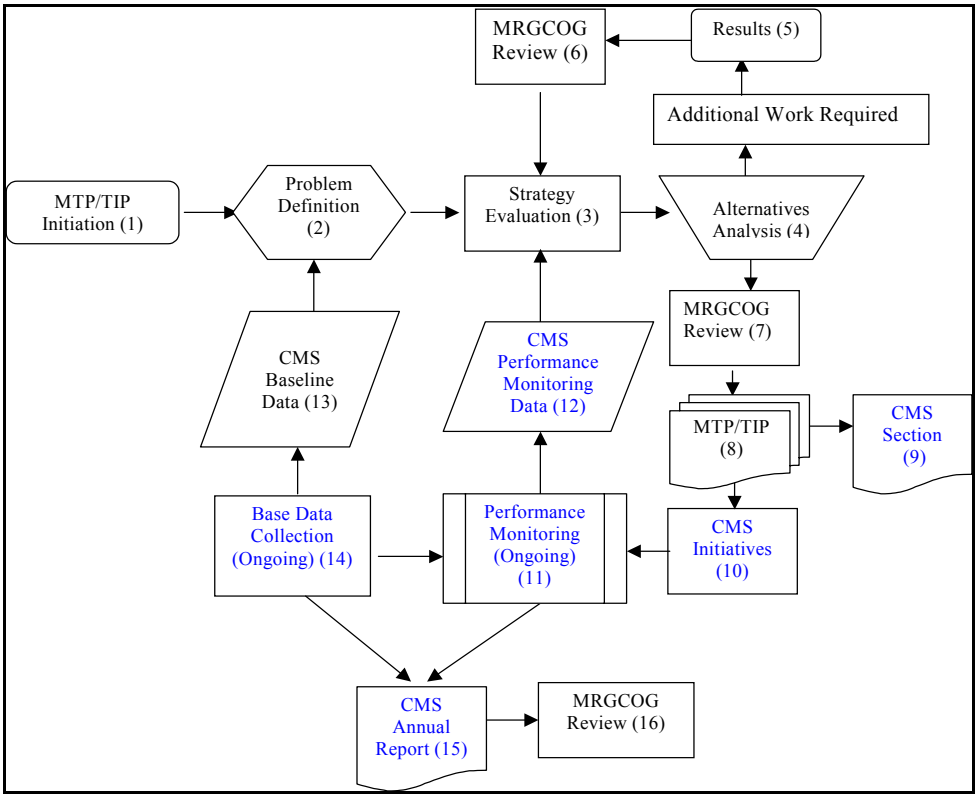
The MTP development process will be rigorous in its consideration and evaluation of strategies. The development process may also involve several iterations of both land use and transportation alternatives. Strategies that may work with one land use or transportation alternative may not be as effective in others. Thus there will be a need to evaluate various approaches with consistent strategies. CMS data will play an important role in the development of transportation alternatives and the evaluation of land use/transportation iterations. Figure IV-1 illustrates how the CMS elements (noted in blue) will be incorporated into development of MRGCOG's MTP and TIP.

One of the first steps in the MTP development process is problem definition/issue identification (1). This portion of the MTP development process incorporates CMS baseline information (13) summarized from ongoing data collection activities (traffic monitoring, travel time, accidents). Once problems have been defined and issues identified, strategies are considered and evaluated (2). Strategy evaluation in this context may include many different ideas (driven in part by the goals and objectives) about how to address the problems or issues related to the entire MTP. It will also include the consideration of strategies to address congestion management. The CMS strategy evaluation process will be informed by the performance monitoring element of the CMS (12).

In order to test the strategies, an alternatives analysis (4) will be performed. This step will involve running the regional travel demand model with different land use and transportation scenarios and will include the modeling of all strategies that can be tested.

For those that cannot be modeled, additional

Figure IV-1
MTP/TIP Development Flow Diagram
(Year One)



feasibility evaluations will be performed.

The alternatives analysis will produce results (5) on strategies and the performance of the transportation and land use combinations. These results will be brought through the MRGCOG process (6) for appropriate review and feedback. The results and feedback will drive the evaluation of additional strategies and alternatives until a satisfactory product is generated. It is likely that several turns through the cycle will be required before this occurs.

It is important to remember that CMS strategies and initiatives introduced and evaluated during this process will also have to be reconciled with other factors that must be considered in the MTP/TIP development process. Some of the other factors that will come into play are:

- Consistency with the MTP's goals and objectives
- Fiscal constraints at the national, state, and local levels
- Level of existing strategy implementation and experience
- Experience in other metropolitan areas
- Implementation time frame
- Congestion relief potential
- Cost-effectiveness
- Implementation feasibility
- Social impacts
- Safety impacts
- Air quality impacts
- Other environmental impacts

Once a satisfactory alternative is developed, it will be packaged with additional information

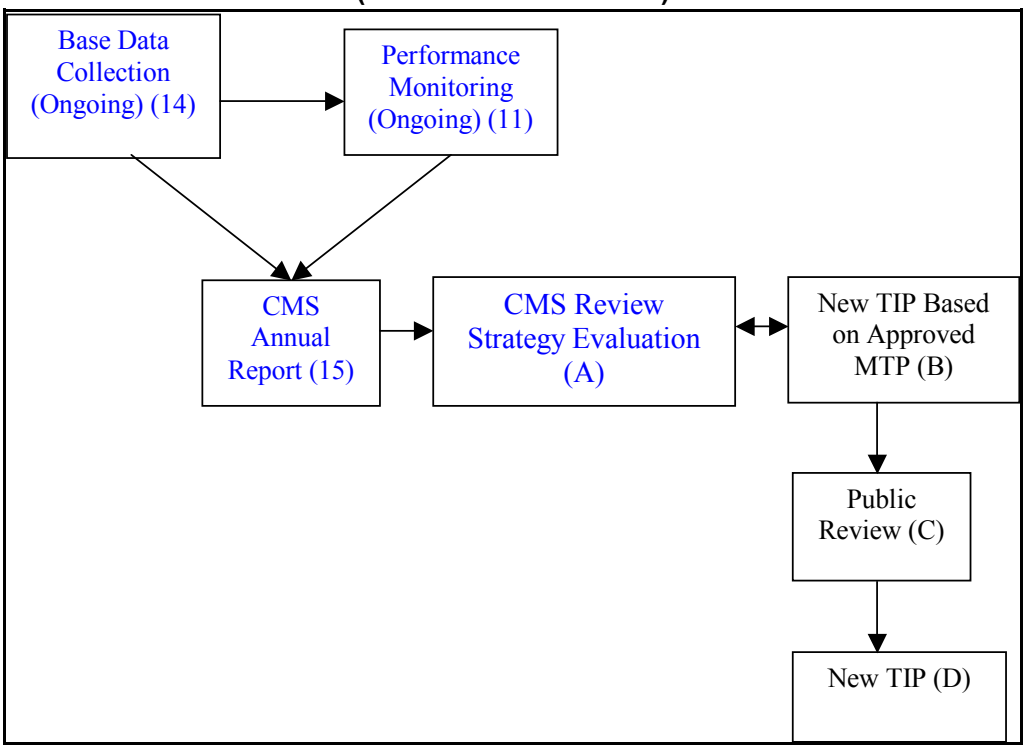
and become the draft MTP/TIP. This will be taken through the MRGCOG transportation committee process for approval (7) of a final MTP/TIP (8). This final document will contain a section describing the surviving CMS initiatives and projects (9). These CMS initiatives and projects (10) will be the subject of ongoing performance monitoring (11) in subsequent years.

In some cases existing data collection efforts will not capture the data necessary to evaluate the performance of an initiative and additional data collection efforts will need to be put in place. New data collection activities will be added to the base data collection effort (14). Both base data collection efforts and performance monitoring will be used to generate this annual report (15).

In the off years (years two and three) the process and the CMS will function differently. Since the year one MTP/TIP development process will define all major initiatives and priorities, (as required by regulation) unanticipated initiatives or consequence are not expected in these years. The major planning activity associated with these years will be updates to the TIP. This process and CMS related activities are illustrated in Figure IV-2 (again, CMS activities are noted in blue).

Since base data collection activities (14) and performance monitoring (11) are ongoing elements of the CMS these activities will continue in the off years. As noted above, these activities will be reported in each annual *Local Motion* (CMS Annual Report – 15). Since each report will include additional data and an evaluation of the performance of CMS

Figure IV-2
MTP/TIP Off Year Process Flow Diagram
(Years Two and Three)



initiatives and strategies (A) this information will inform the TIP process (B) and may result in minor adjustments to MTP projects that are included in the TIP.

Again, major new initiatives are not anticipated in the off years. At the same time it is possible that changes proposed as part of the TIP process may affect CMS initiatives or programs (e.g., changes in funding). Actions of this nature will need to be reviewed in the context of the CMS so that potential implications are understood before revisions to the TIP are formally adopted. This is why there is a double arrow between (A) and (B).

The TIP process will also include appropriate MRGCOG review of CMS initiatives during development. Most of this is anticipated to occur at the technical level since major new policy-based initiatives are not anticipated. If they do occur, appropriate adjustments will be made to the CMS. Once a draft TIP is developed, it will be brought through the MRGCOG process for review and adoption.

3. Identifying Congestion

Traffic congestion is a nebulous thing to define. Everyone knows when they encounter congestion, but there are no nationally agreed upon standards to which to compare local conditions. Congestion for someone living in Los Angeles is different from congestion for somebody living in Albuquerque. As a result, the federal regulation directs that CMS programs be geared to local concerns and perceptions of what constitutes congestion.

For the AMPA, two different measures of congestion have been established. These are volume to capacity ratio and travel delay. For more information about these measures, how they were developed, how data is collected to measure them, and integration into the Geographic Information System (GIS), see MRGCOG's 1997 *Albuquerque Congestion Management System: Baseline Conditions Performance Report*, document number TR-128.

a. Volume to Capacity Ratio

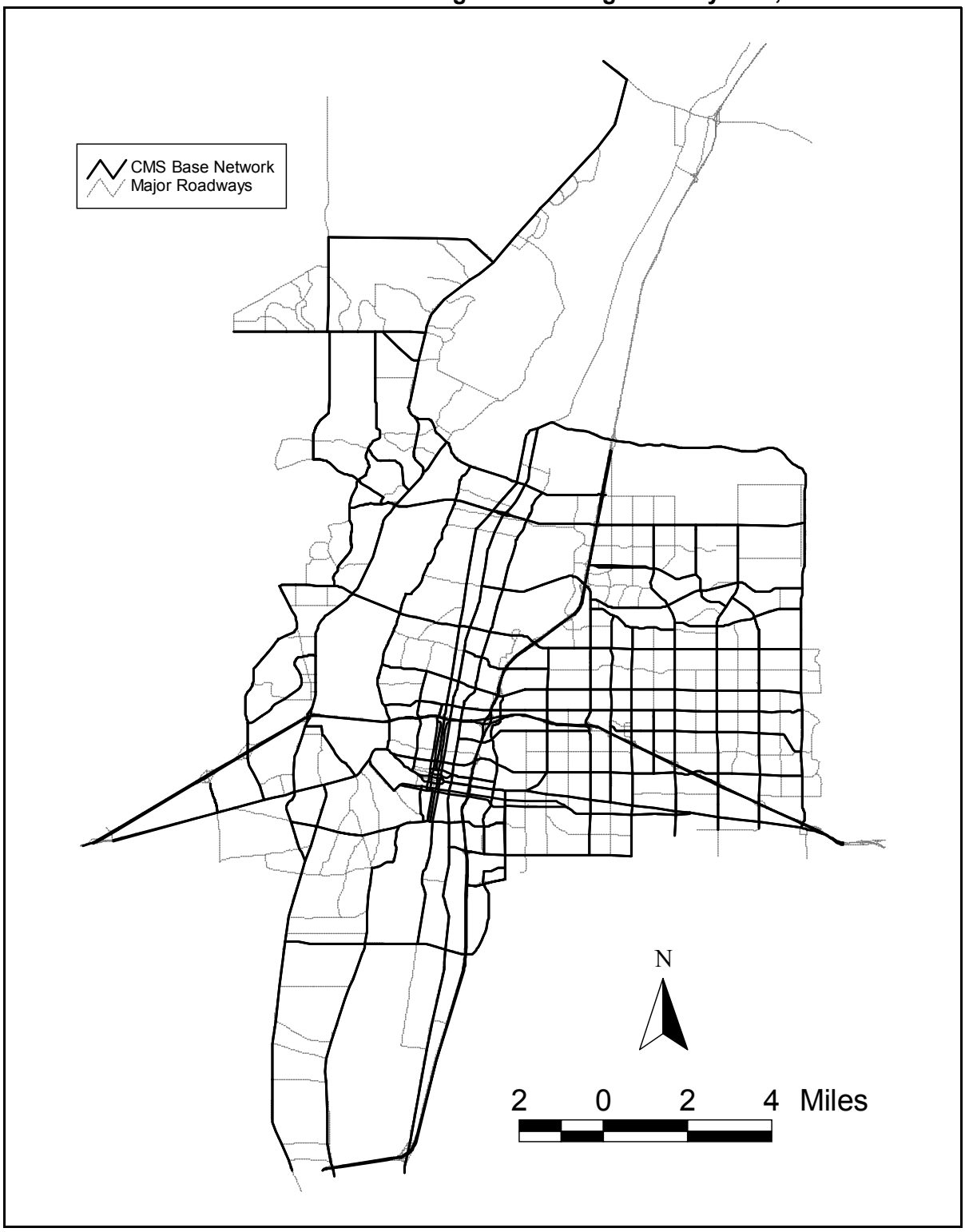
The first measure of congestion uses a ratio of traffic volume to road capacity. A road's carrying capacity varies with its physical characteristics, the types of drivers (commuter/recreational), and its location. There are several methods for defining a roadway's capacity. Most methods are complex and it would not be practical to apply them yearly to an entire street network. A simplified version from the Florida Department of Transportation was used. This capacity is based primarily on traffic light composition and some physical roadway characteristics. The assumption is that traffic lights have the greatest impact on the capacity of most urban area roadways. The carrying capacity is defined at level of service "D," the level of service just before serious congestion occurs.

A baseline CMS network (Map IV-1) was developed that focuses on the principal roadway segments in the region. The baseline CMS network is the reporting network for all the congestion statistics generated for this report.

The V/C ratios are based on the most recent traffic counts available for each roadway segment. The 1997 CMS report uses a single volume to capacity (V/C) ratio of .65. This indicates a point at which roadway segments are experiencing possible traffic congestion.

This point serves to define which links require further analysis. The V/C plots in Map IV-2

Map IV-1
Baseline Network for the Congestion Management System, 2000



and Map IV-3 include two additional CMS ratio brackets. The .85 ratio is commonly used in traffic engineering reports to represent a roadway's most efficient operating level before service begins to degrade. The next level contains roads with a V/C ratio beyond roadway capacity. Even though it is counter intuitive that a road could exceed its capacity, some roads do operate beyond their theoretical capacity. This can be caused by a number of situations, such as geographical limitations. In such a situation, x amount of traffic must go from a to b but is limited to a single option. Because traffic has no other options, the result is a heavily congested roadway carrying traffic beyond its capacity.

b. Travel Delay

The volume to capacity (V/C) ratio is not an all encompassing method for defining congestion. A road may operate just fine with high volumes of traffic. Another congestion index was developed as part of the 1997 CMS report. This index was travel delay in seconds per mile. It is based on actual travel time runs on the CMS network. Here, travel delay is defined in terms of the difference in number of seconds per mile between the actual travel time and the posted speed. To enhance data presentation, four categories of congestion were identified. These categories and their delay/mile function are defined in Table IV-1. The process used for collecting and evaluating travel time data during the past year, and the resulting information about the AMPA's transportation system, are provided in the following section.

C. Congestion Profile

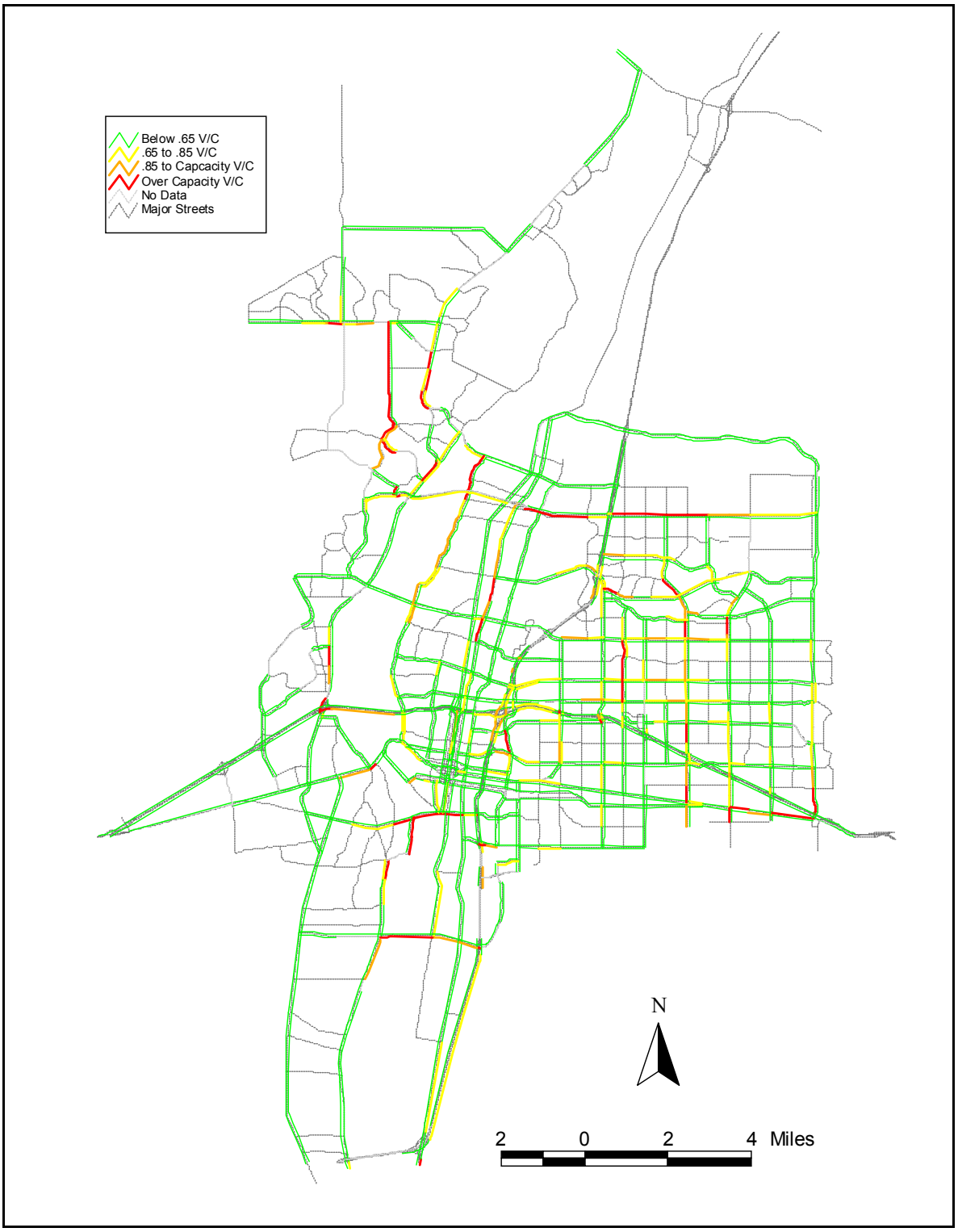
This section of the report provides an analysis of congestion within the Albuquerque Urban Area. By using a combination of elements from the 1997 CMS report, additional congestion indicators, and current travel times, elements and trends of congestion can be identified.

Table IV-1
Travel Delay per Mile Thresholds

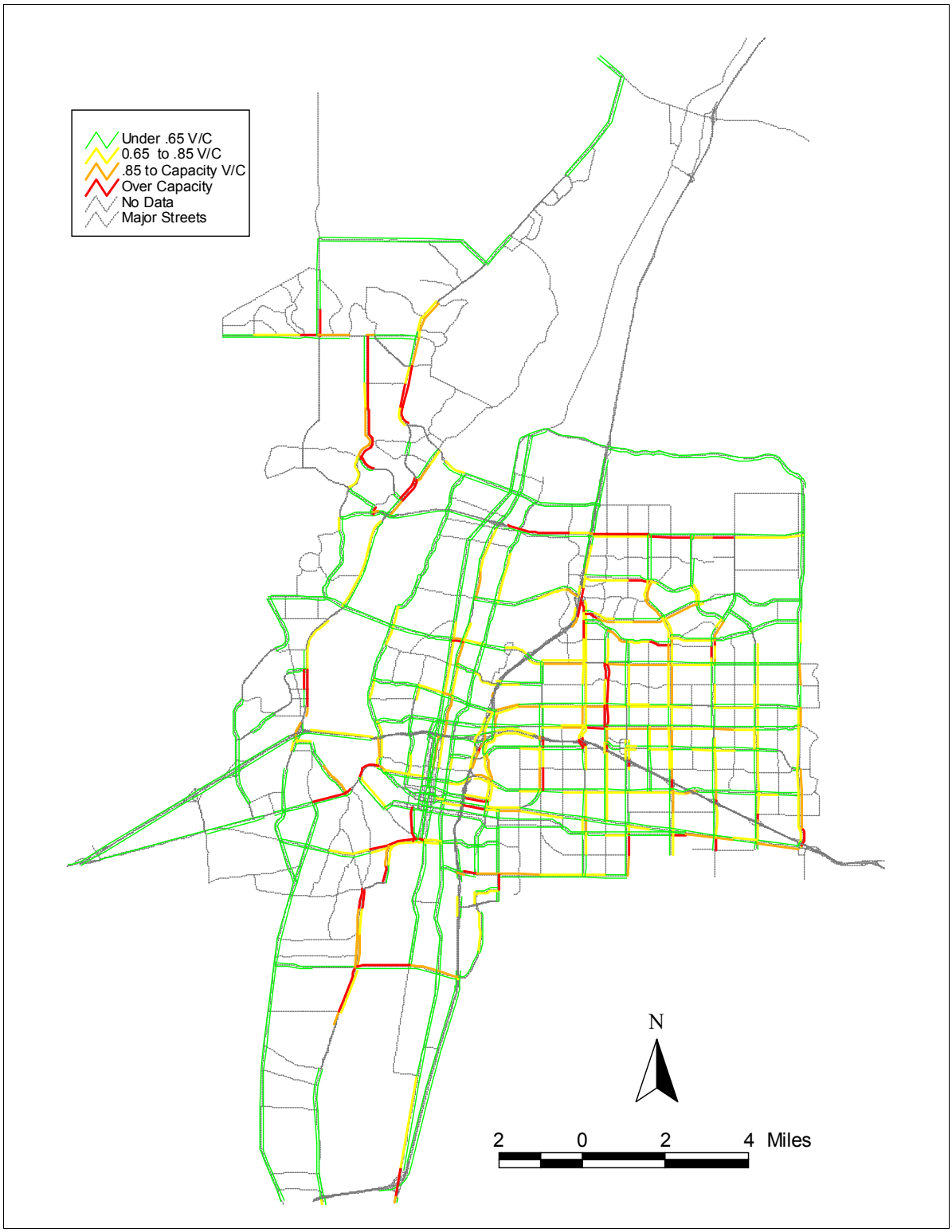
Congestion Level	Delay/Mile
Arterial	
No congestion	less than 40 sec/mi
Beginning Congestion	between 40 to 60 sec/mi
Moderate Congestion	between 60 to 80 sec/mi
Severe Congestion	greater than 80 sec/mi
Freeway Segments	
No Congestion	less than 1 sec/mi
Beginning Congestion	between 1 to 7 sec/mi
Moderate Congestion	between 7 to 14 sec/mi
Severe Congestion	greater than 14 sec/mi

Source: Congestion Management System for the Albuquerque Urban Area Final Report. 1995.

Map IV-2
A.M. Peak Hour Volume to Capacity
based on most recent traffic counts



Map IV-3
P.M. Peak Hour Volume to Capacity
based on most recent traffic counts



1. Methodological Differences, 1995 and 2000

The general structure of the current travel time study was defined in the 1997 CMS report. To enable comparisons with the 1993/1994 Travel Time Study[16], the same straight line and termini road segment run definitions were used. The latest travel time study was conducted following the same general methods used in the 1993/1994 Travel Time Study. Several of the tables produced for the 1997 report were recompiled to match the same base network to assure that the same methodologies were applied to both data sets to obtain comparable statistics.

However, there are some differences between the two travel time surveys. Most of the statistics for the 1997 CMS report were based on a comprehensive travel time report developed as part of a regional travel model update. The 2000 travel time survey was developed specifically to address the issue of congestion. This survey was limited to the Congestion Management Baseline network.

In addition to this difference, the 2000 travel time survey was in essence a development test survey. The 1993/1994 Travel Time Study used stop watches and tape recorders. The 2000 travel time survey tested the use and integration of Global Positioning System (G.P.S.) equipment to record vehicle movement. To produce this report, the G.P.S. data was converted from point data and aggregated to link segment data. That data was then summarized and aggregated to link definitions used in the GIS data base.

The purpose of a CMS travel time survey is to identify and measure traffic congestion, rather than provide an overall profile of the entire system. The GPS units have proven very efficient for gathering travel time information. MRGCOG is considering the possibility of expanding future CMS travel time surveys to include a wider perspective.

2. Average Congested Network Speeds

Tables IV-2 and IV-3 provide information about the peak hour and peak period speed data collected in 1993/1994 and in 2000. At first glance, Table IV-2 indicates a considerable decrease in network speeds from 1993/1994. For some components, this is accurate. The interstate speeds are directly comparable because both the previous travel time and the CMS travel time networks included the entire interstate system within the AMPA. However, speed comparisons on the arterial systems should be viewed with caution because of the differences between sample networks.

An analysis of Table IV-3 indicates that the gap between congestion in the peak hour and congestion in the peak period is widening. That pattern is evident in nearly every functional class and time period.

3. Peak Hour Miles by Congestion Index

Table IV-4 presents the Vehicle Miles Traveled (VMT) data for 1993/1994 and 2000. VMT data is useful for estimating the number of vehicles traveling daily under different levels of congestion. The 1993/1994 information was recompiled to match the base map used for 2000 (Map IV-2). The data in

[16] *1993/1994 Travel Time Study for the Albuquerque Urbanized Area*, MRGCOG, document number TR-123

Table IV-2
Peak Hour & Period Speed vs. Posted Speed by Functional Class
1993/1994 Travel Time Study
(Speed in MPH weighed by VMT)

Functional Classification	Posted Speed	A.M. Peak Speed		P.M. Peak Speed	
		Peak Hour	Peak Period	Peak Hour	Peak Period
Interstate	55.0	57.2	58	55.7	55.8
Principal Arterial	41.1	34.4	35.0	31.5	32.4
Minor Arterial	37.3	32.2	31.8	30.7	30.1

Table IV-3
Peak Hour & Period Speed vs. Posted Speed by Functional Class
2000 CMS Reporting Network
(Speed in MPH weighed by VMT)

Functional Classification	Posted Speed	A.M. Peak Speed		P.M. Peak Speed	
		Peak Hour	Peak Period	Peak Hour	Peak Period
Interstate	56.2	45.6	55	47.9	52.1
Principal Arterial	41.3	33.6	34.2	27.1	32.0
Minor Arterial	36.5	28.8	32.4	27.3	31.2

the table indicates that moderate and severely congested VMT have both increased significantly since 1993/1994, while the uncongested and beginning congestion links experienced relatively little change.

Tables IV-5 and IV-6 show a substantial increase in drivers experiencing congested conditions. All roadways experienced a nearly uniform drop in the uncongested and beginning congestion categories and a rise in the moderate and severe categories from 1993/1994 to 2000.

Severely congested VMT increased for all functional classes. The severely congested portion of the interstate increased in the a.m. by 28.4 percent and by 104.3 percent during the p.m. peak hour. Arterial severe congestion increased by a higher percentage, 84.7 percent in the a.m. and 207.7 percent in the p.m.

A comparison of the miles and lane miles data in the tables shows the physical aspects of congestion. Individual links can experience substantial increases in volume while adjacent links do not show the same degree of increase. For example, the total VMT in severe congestion increased significantly while there was only a light increase in miles with severe congestion on the interstate.

Overall, the number of severely congested miles increased, but not at the rate of VMT growth. Severely congested VMT increased by 124.9 percent between 1993/1994 and 2000 while miles of roadway with severe congestion increased only by 46 percent. This indicates that, while the number of roadway miles with congestion is increasing, the number of vehicle miles in which people experience congestion is increasing more rapidly. National Highway System (NHS) roadways have been identified as

transportation facilities of national significance. The majority of the AMPA roadways on the National Highway System are not experiencing significant congestion problems at this time. However, the NHS system is starting to experience some congestion in the moderate to severe categories in the p.m. peak period.

4. Duration of Congestion

Congestion duration was not included in the original CMS baseline report. However, it has been added here to provide another measure for assessing the impact of congestion on travelers in the AMPA. The duration of congestion is calculated based on 15 minute traffic count data and theoretical roadway capacity at level of service D divided by 4. The consolidated traffic counts program currently stores data in 15 minute intervals for the a.m. and p.m. peak periods. The a.m. peak period begins at 6:00, and the p.m. peak period begins at 3:00. Table IV-7 was developed by counting the number of times the roadway capacity was exceeded in a given 15 minute time period.

More hours of congestion were experienced in the AMPA in 2000 than in 1995. There was a small drop in arterials in the categories Not Exceeding Capacity or Less Than One Hour but significant increases in congestion lasting 1 to 3 plus hours. Several of the roadway segments in the 1995 network with more than one hour of congestion did not repeat their poor performance in 2000. Roadway improvements and new developments account for the shifting congestion duration locations.

Figures IV-3 and IV-4 present the same information distributed within the a.m. and p.m. peak periods. For nearly every 15 minute time period, there is an increase in the number of segments exceeding the 15 minute capacity. The biggest increases occur within the peak hour. In addition, the peak traffic is spread further out on the "tails" of the peak hour when compared to the 1995 data.

5. Combined Congestion Index

Maps IV-4 and IV-5 present the combined congestion peak hour plots. To obtain this data, the elements of three measures of congestion were combined. The three measures were volume to capacity, delay in seconds per mile, and duration of delay. Each measure contributes in a different way to describing congestion. Together they provide a comprehensive picture of congestion in the AMPA in 2000 in the a.m. and p.m. peak periods.

Volume to Capacity Plot - The volume to capacity ratio measures congestion in terms of the actual number of vehicles present on a roadway versus the theoretical capacity of that roadway segment within the peak hour. This measure incorporates all the elements that affect the carrying capacity of a road, such as lane size, access limitations, road grade, and posted speed. The most important element of roadway capacity is its traffic light characteristics. For a detailed description of the methodology used in determining roadway capacity, see the 1997 report *Albuquerque Congestion Management System: Baseline Conditions Performance Report*, document number TR-128.

Delay Flow in Seconds per Mile measures congestion in terms of delay in travel movement. This measure is used as the basis for most of the tables presented in this report.

Table IV-4
Peak Hour Vehicle Miles Traveled by Congestion Index

	1995				2000			
	AM		PM		AM		PM	
	VMT	%	VMT	%	VMT	%	VMT	%
Interstate								
Uncongested	72,057	69.2	84,833	81.5	86,652	83.2	57,038	54.8
Beginning	18,429	17.7	8,095	7.8	0	0	3,295	3.2
Moderate	2,009	1.9	904	0.9	2,551	2.5	22,842	22.0
Severe	11,608	11.2	10,213	9.8	14,901	14.3	20,870	20.0
Principal Arterials								
Uncongested	304,217	83.2	361,799	82.0	317,965	85.3	351,334	78.4
Beginning	30,796	8.4	41,502	9.4	5,672	1.5	18,421	4.1
Moderate	8,319	2.3	12,513	2.8	17,302	4.6	11,332	2.5
Severe	22,145	6.1	25,538	5.8	31,937	8.6	66,777	15.0
Minor Arterials								
Uncongested	119,927	86.8	139,820	85.6	113,546	81.4	126,181	76.5
Beginning	10,629	7.7	15,952	9.8	5,450	4.0	7,746	4.7
Moderate	4,030	2.9	4,432	2.7	4,889	3.5	9,754	5.9
Severe	3,551	2.6	3,054	1.9	15,522	11.1	21,195	12.9

Table IV-5
1993/1994 A.M./P.M. Delay in Miles and Lane Miles

Congestion Category	A.M. Peak Hour				P.M. Peak Hour			
	Miles	%	Lane	%	Miles	%	Lane	%
Interstate								
None	56.1	70.6	152.8	73.2	44.4	55.9	113.4	54.3
Beginning	11.8	14.9	26.3	12.6	16.2	20.3	44.5	21.3
Moderate	4.6	5.8	11.3	5.4	9.9	12.5	25.7	12.3
Severe	6.9	8.7	18.4	8.8	9.0	11.3	25.2	12.1
Interstate Totals	79.4	100.0	208.9	100.0	79.4	100.0	208.9	100.0
Arterials								
None	526.7	83.5	1,054.3	81.5	486.0	77.0	948.5	73.3
Beginning	49.8	7.9	116.4	9.0	75.2	11.9	185.1	14.3
Moderate	17.3	2.7	39.7	3.1	23.1	3.7	56.4	4.4
Severe	37.0	5.9	83.4	6.4	46.5	7.4	103.9	8.0
Arterial Totals	630.8	100.0	1,333.2	100.0	630.8	100.0	1,293.9	100.0

Table IV-6
2000 A.M./P.M. Delay in Miles and Lane Miles

Congestion Category	A.M. Peak Hour				P.M. Peak Hour			
	Miles	%	Lane Miles	%	Miles	%	Lane Miles	%
Interstate								
None	71.0	88.9	182.5	86.9	52.5	65.7	126.6	60.3
Beginning	0	0	0	0	4.3	5.4	9.5	4.5
Moderate	3.9	4.9	12.2	5.8	10.3	12.9	31.7	15.2
Severe	5.0	6.2	15.2	7.2	12.8	16.0	42.1	20.0
Interstate Totals	79.9	100	209.9	100	79.9	100	209.9	99.9
Arterials								
None	564.8	85.7	1153.9	85.8	534.0	81.0	1090.1	81.0
Beginning	14.0	2.1	23.8	1.8	25.2	3.8	50.3	3.7
Moderate	28.6	4.3	55.8	4.1	23.6	3.6	42.3	3.2
Severe	51.4	7.8	112.1	8.3	76.1	11.5	162.8	12.1
Arterial Totals	658.8	99.9	1345.6	100	658.9	99.9	1345.5	100
National Highway								
None	52.3	77.2	132.0	75.2	32.2	47.6	73.0	41.6
Beginning	0	0	0	0	4.3	6.3	9.5	5.4
Moderate	7.2	10.7	18.8	10.7	11.8	17.4	34.6	19.7
Severe	8.2	12.1	24.8	14.1	19.4	28.7	58.5	33.3
Total	67.7	100	175.6	100	67.7	100	175.6	100

Table IV-7
Duration of Congestion on Congested Arterials

Duration	1995		2000		Change	
	Lane Miles	%	Lane Miles	%	Lane Miles	%
Not exceed Capacity	1097.7	86.5%	1090.8	86.4%	- 6.9	-0.6%
Less than one hour	94.6	7.5%	83.9	6.6%	-11.0	-11.6%
One to Two Hours	52.4	4.1%	34.8	2.7%	-17.6	-33.6%
Two to Three Hours	15.0	1.2%	35.5	2.8%	20.5	136.7%
More Than Three Hours	8.8	0.7%	18.2	1.4%	9.4	106.8%

Figure IV-3
A.M. Peak Period
Roadway Segments Exceeding Capacity

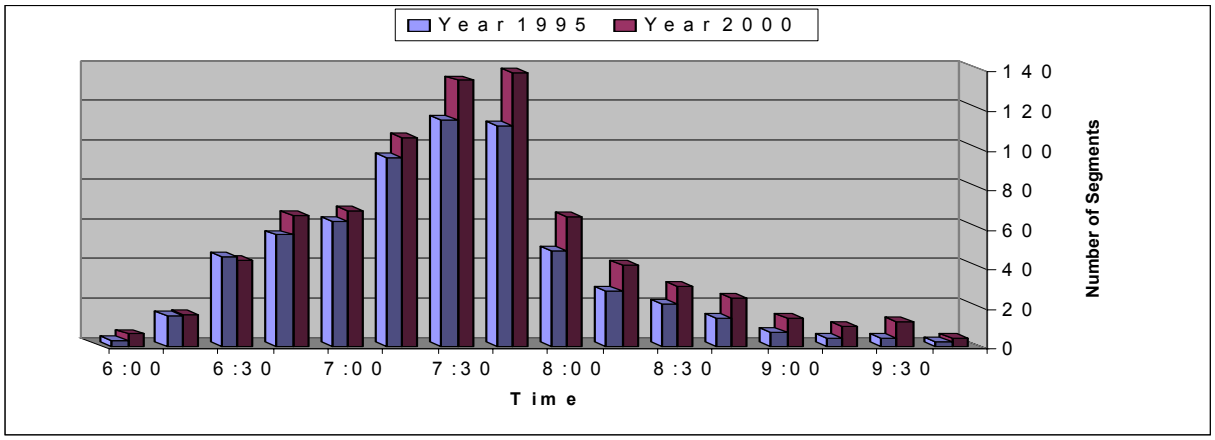
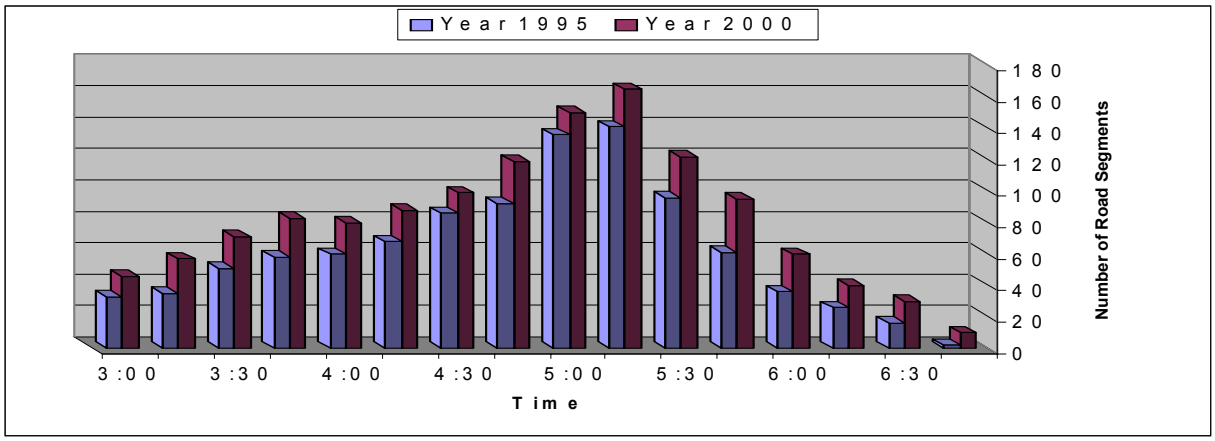


Figure IV-4
P.M. Peak Period
Roadway Segments Exceeding Capacity

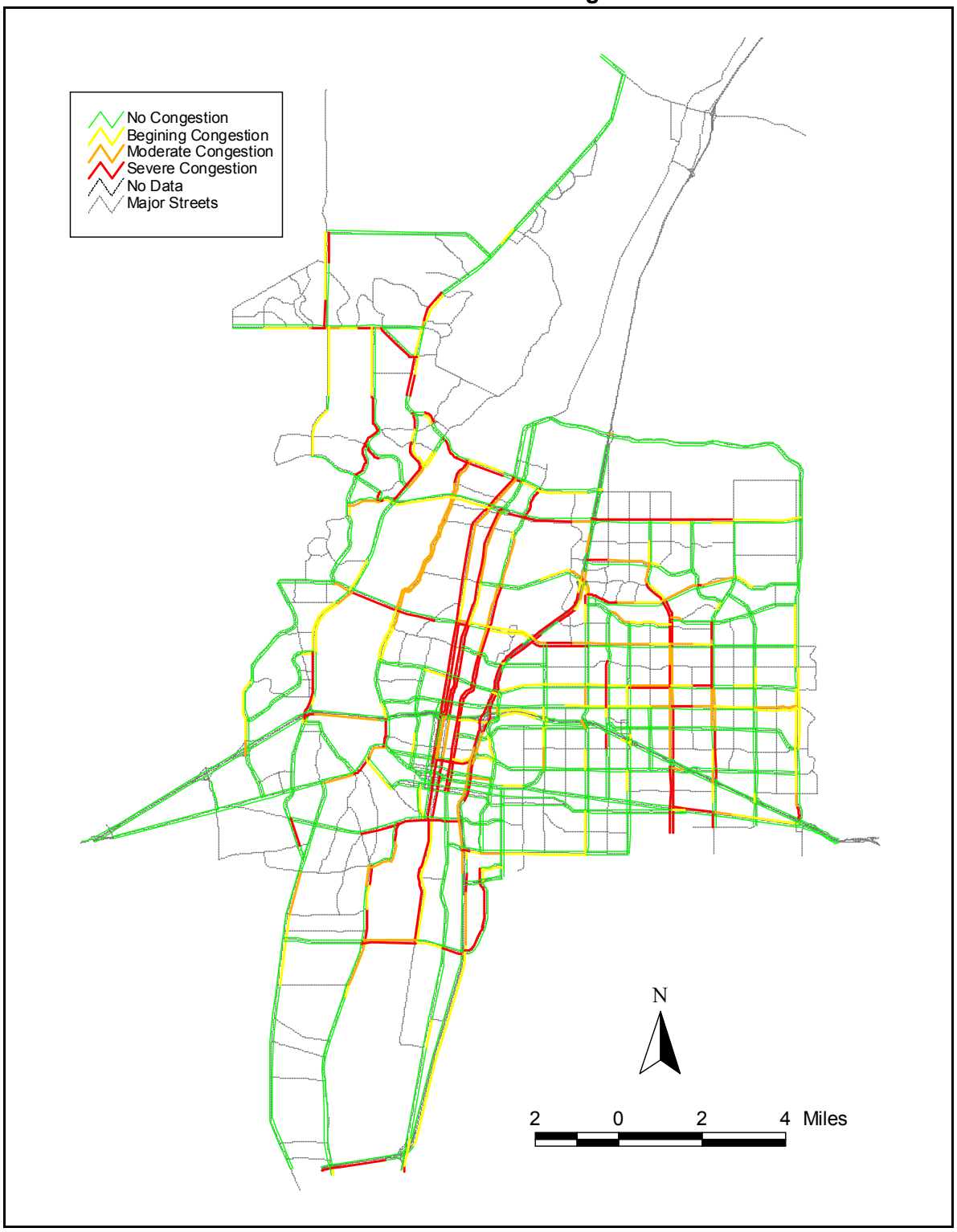


Duration of Delay is another version of the volume to capacity ratio but is more narrowly focused on short time segments. Roadways that are heavily congested on the hour and half hour may not show as being congested on the hourly-based V/C ratio. The duration determination also extends beyond the peak hour.

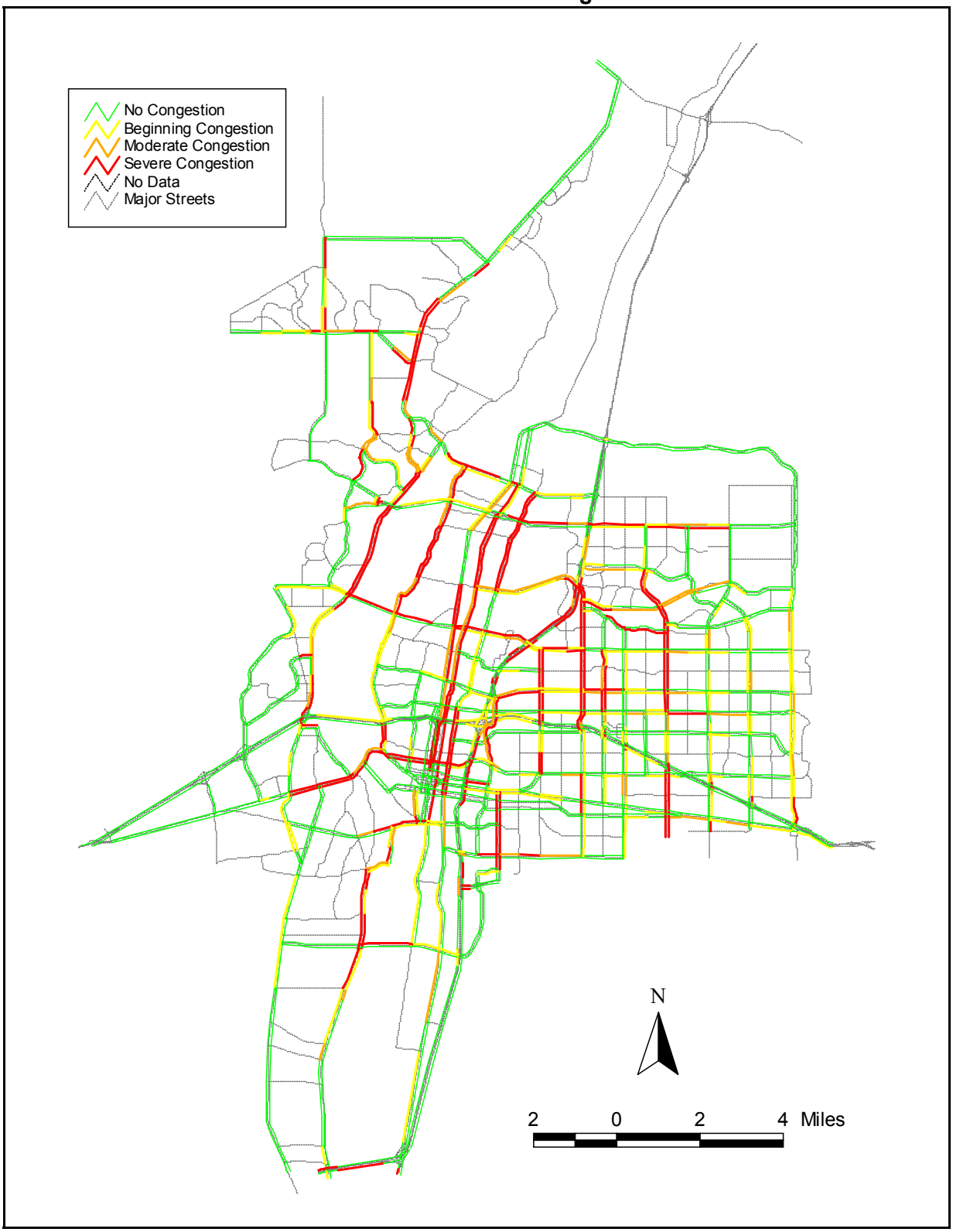
Maps IV-4 and IV-5 present all three elements. By combining these three elements, data anomalies resulting from one method are compensated for by the data provided by the other elements. The level of congestion plotted on a link represents the worst condition of any of the three elements. This provides a better overall perspective.

The maps indicate that all seven river crossings in the AMPA experienced some degree of congestion in 2000. Other heavily congested areas can be found in the Northwest quadrant, the north-south routes throughout the valley, and the entry points into the AMPA along I-25.

Map IV-4
A.M. Peak Period Combined Congestion Index



Map IV-5
P.M. Peak Period Combined Congestion Index



6. Vehicle Occupancy Counts

The 2000 Vehicle Occupancy Rate (VOR) counts used a very small sample. The counts presented in Table IV-8 were gathered using a combination of stationary observed and camera monitoring counts. Counts using either method have produced very consistent results. MRGCOG is investigating data collection strategies that would enable the acquisition of an annual VOR. The present dataset will be used to develop sample size requirements and location lists for subsequent data collection efforts.

Table IV-8
Vehicle Occupancy Counts, 2000

Persons Per Vehicle	1	2	3	4	5+	Vehicles	Est. Persons	V.O.R.
Central Ave. - west of Rio Grande Blvd.								
8:30 - 9:00 Eastbound	410	133	15	9	2	569	771	1.36
9:00 - 9:30 Eastbound	340	111	9	7	3	470	638	1.36
5:00 - 5:30 Eastbound	381	148	20	6	5	560	796	1.42
5:00 - 5:30 Westbound	942	342	37	7	9	1337	1828	1.37
Total 2 way	1323	490	57	13	14	1897	2624	1.38
5:30 - 6:00 Westbound	391	143	19	4	2	559	764	1.37
Wyoming, North of KAFB								
8:00 - 9:00 Southbound	754	73	11	2	0	840	941	1.12
Freeway Counts								
I-40 Test EB AM Louisiana	509	114	5	4	0	632	768	1.22
I-40 AM PH WB San Mateo	1294	244	21	10	3	1572	1906	1.21
I-40 9:00-9:15 Westbound	693	133	13	5	1	845	1025	1.21

7. Crash Data

Incidents, even minor ones, have a significant impact on how traffic flows within an urban area. Nation wide, auto incidents or crashes are the basis for an estimated 57 percent of urban traffic congestion.[17] A study in Houston found that an incident pulled over to the shoulder on a three lane freeway reduced the freeway's carrying capacity by 26 percent. A non-injury crash blocking one lane reduced the freeway's carrying capacity by 50 percent and a major crash blocking two lanes reduced carrying capacity by 79 percent.

The most recent crash data available for the AMPA at the time of publication was for 1995 and 1998. Table IV-9 indicates that, for the Albuquerque area, the crash rate decreased in this period, despite population growth and an increase in VMT and congestion levels. Factors that may account for the decreased crash rate include roadway design improvements, increased law enforcement, and several years of relatively mild weather conditions. However, it is important to note that even though overall crash rates have been reduced, the more heavily congested hours of the day remain the time periods with the highest crash rates.

Table IV-10 shows the seven intersections in the AMPA with the most crashes in 1995 and 1998. Montgomery Boulevard, with 1,067 crashes, and Coors Boulevard, with 725 crashes, were the facilities with intersections with the most crashes during the period from 1995 to 1998. These facilities also registered the highest number of injuries as a result of incidents.

In 1995, there was only one intersection (Coors Boulevard/ Alameda Boulevard) west of the Rio Grande listed as one of the seven intersections with the most crashes. By 1998 this had increased to three intersections (Coors Boulevard/ Paseo del Norte; Coors Boulevard/ Montaño Road; and Coors Boulevard/ Irving Boulevard).

The intersection of Montgomery Boulevard and San Mateo Boulevard had the highest number of crashes and injuries for both 1995 and 1998. The intersection of Montgomery Boulevard and Wyoming Boulevard is also listed in each year as one of the intersections with the most crashes.

Continue Reading Part Four

[17] *1999 Urban Mobility Report*, Texas Transportation Institute.