Chapter 2: Transportation Challenges in the Region

Transportation planning for the region involves consideration of a number of complex issues. This chapter introduces some of the primary challenges that must be addressed as part of the transportation planning process—for example, rapid population growth in a time of limited transportation funding— while the following chapter presents information on how MRMPO is addressing these by developing strategies for maintaining and improving the transportation network.

A. Rapid Population Growth and Land Development Patterns

The Albuquerque Metropolitan Planning Area (AMPA) has experienced significant growth in recent decades which is expected to continue over the next 25 years. The population quadrupled between 1950 and 2000 to reach 634,000 for an average annual growth rate of 2.7 percent. More recently, the pace of population growth within the AMPA has remained strong, with an average annual growth rate of 3.4 percent between 2000 and 2008. While a dramatic downturn in the economy since 2008 has tempered the pace of growth, the long-range projection indicates that the AMPA will reach one million people by 2025.

Existing Population and Employment

The AMPA represents the vast majority of activity within the greater four-county metropolitan statistical area (MSA), capturing 87 percent of the population and 94 percent of employment. In 2008 there were an estimated 766,500 people living in 324,000 homes in the AMPA. There were an estimated 396,000 jobs, which equated to 1.22 jobs for each home (employment estimates include all jobs covered by unemployment insurance, as well as agricultural jobs, self-employment, and all other "non-covered" jobs).

The time period between 2000 and 2008 was dominated by rapid population growth within the AMPA, which gained approximately 132,000 people and 55,000 homes. Employment growth over that period was modest with an estimated net increase of about 27,000 jobs. Table 2-1 shows how densely settled the incorporated municipalities are within the AMPA and compares changes in density over time.

Table 2-1: Persons per Square Mile, 2000 and 2008

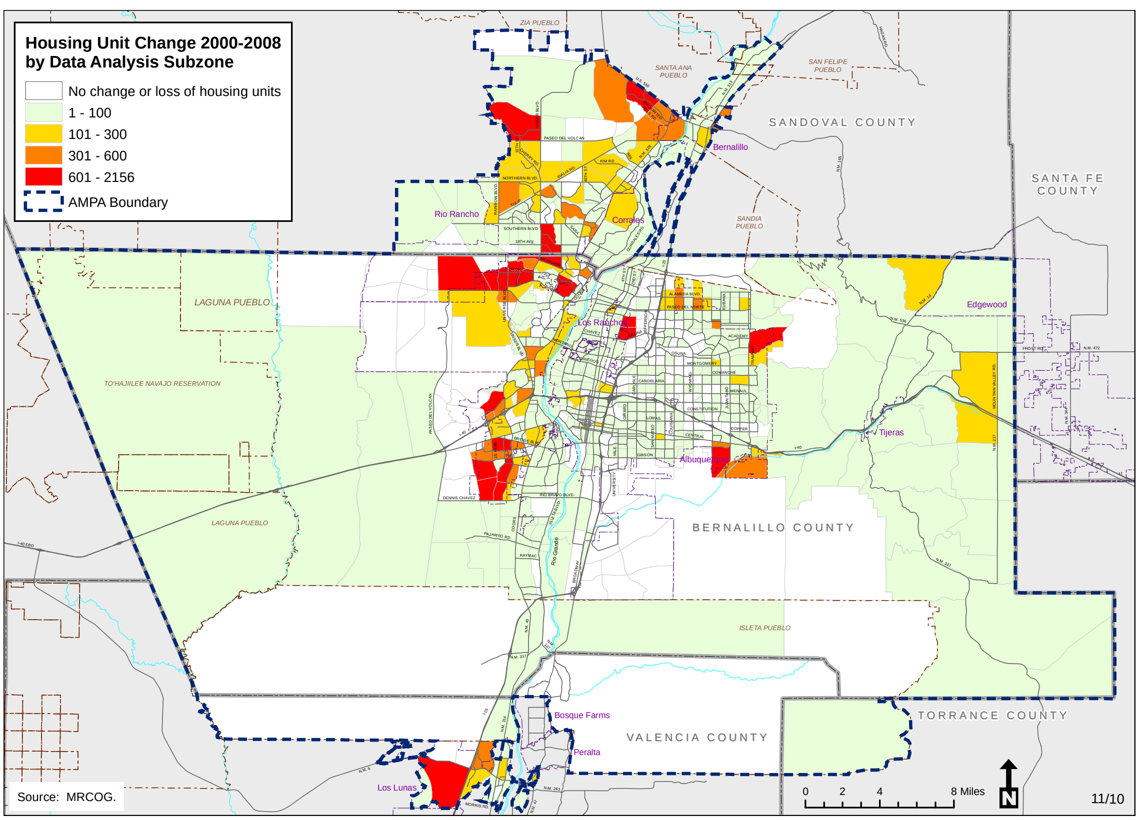
	2000	2008
Bernalillo County	477.71	558.40
City of Albuquerque	2377.16	2826.53
Village of Los Ranchos	1218.20	1296.54
Village of Tijeras	481.03	515.52
Rest of Bernalillo County	104.43	113.38
Sandoval County (pt.)		
City of Rio Rancho	498.22	795.89
Village of Corrales	666.12	811.08
Town of Bernalillo	1269.02	1612.43
Valencia County (pt.)		
Village of Los Lunas	639.52	941.62

** 2000 Population is estimated from 2008 municipal boundaries.*

The AMPA's municipalities have become denser over the last decade, with the City of Rio Rancho seeing the largest increase of 60 percent. The City of Albuquerque remains by far the most densely populated area in the AMPA with more than 2,800 persons per square mile, followed by the Town of Bernalillo and the Village of Los Ranchos.

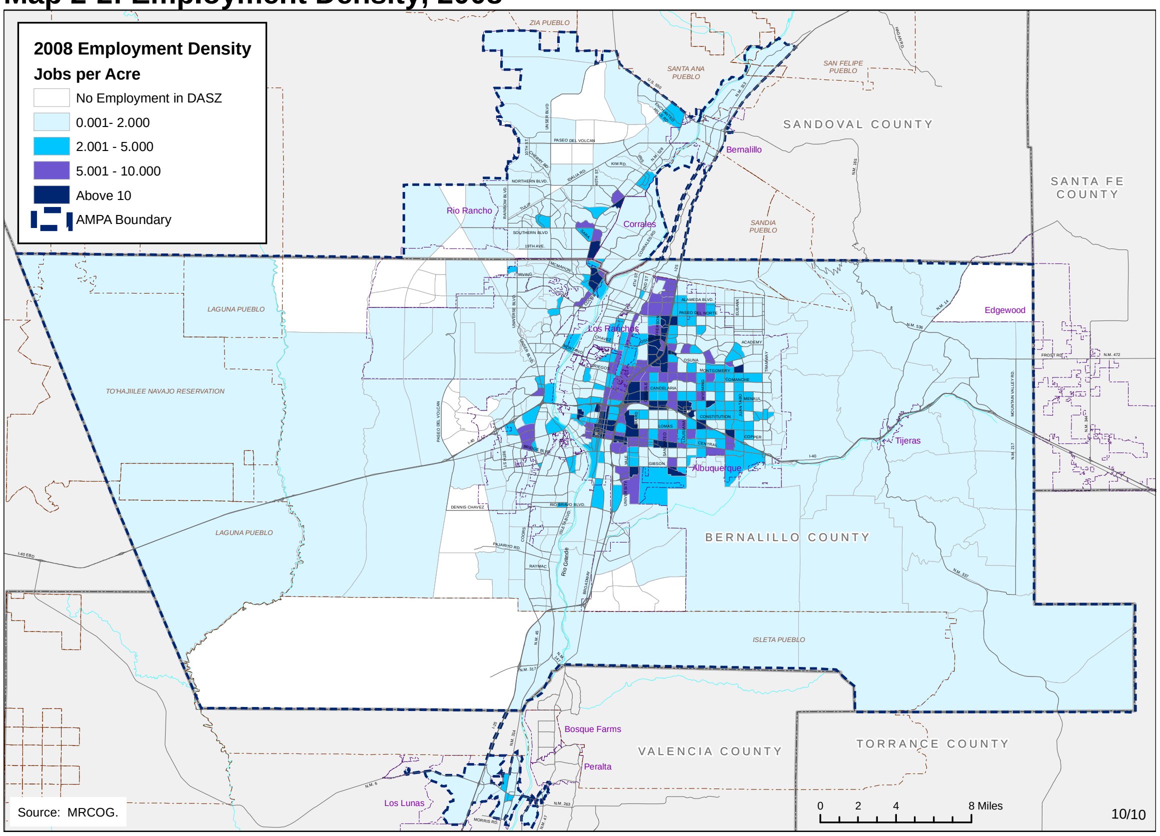
Recent residential growth is characterized by a significant expansion outward as established neighborhoods in the urban core have received far less new development than areas with greater land availability. Map 2-1 illustrates the areas that have seen the greatest residential development between 2000 and 2008.

Map 2-1: Housing Growth, 2000-2008



Map 2-1 emphasizes the magnitude of recent residential growth west of the Rio Grande and to areas north and south of the City of Albuquerque. Albuquerque's northwest and southwest quadrants experienced significant growth by way of several large new subdivisions at the height of the housing boom. Rio Rancho also witnessed a surge of new housing with concentrations in the Cabezon, Enchanted Hills and Northern Meadows subdivisions. In 2005 at the height of its housing boom, Rio Rancho issued a total of 3,700 permits, nearly as many as were issued in the three previous years combined. Los Lunas also saw strong housing construction, particularly in the Huning Ranch subdivision. The 2000 to 2008 timeframe also brought an abundance of housing investment in the core including some higher density and mixed use developments; however, they are not visible in the map simply because the numbers are much lower in comparison to the large lot subdivisions.

Map 2-2: Employment Density, 2008

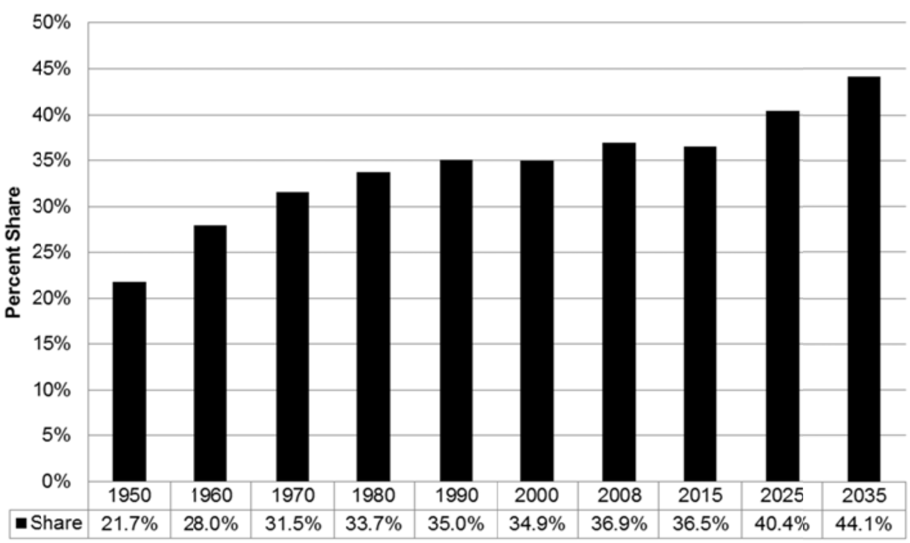


Although there has been job growth throughout the region, Map 2-2 illustrates that specific corridors and centers, primarily within in the City of Albuquerque, continue to hold the highest concentration of jobs in the AMPA. When the picture of housing growth is compared to the distribution of existing jobs, the contrast between the locations of new housing and existing employment sites becomes apparent. One critical transportation issue that results from this growth pattern is the high-volume east-west commute, as residents increasingly locate west of the Rio Grande while the major job concentrations are still primarily east of the river.

Socioeconomic Projections

As the metropolitan hub of the state, the AMPA is projected to increase its share of New Mexico's population from 37 percent today to 44 percent in 2035. At the regional level, one out of every two residents of New Mexico is expected to reside in the Albuquerque Metropolitan Statistical Area (MSA) by 2035.

Figure 2-1: AMPA's Share of the State Population, Historical and Projected



The increasing presence of the metropolitan area within the state of New Mexico is a continuation of a long-term trend that is likely to be exacerbated by the "graying" of the population as the baby boomer generation moves into the 65-plus age cohort. Presently, 11 percent of the population is over the age of 65, but by 2035 seniors will constitute one of every five people in the region. It is expected that an aging population will be increasingly attracted to the amenities and services offered in urban areas, including public transportation, senior living opportunities and healthcare services.

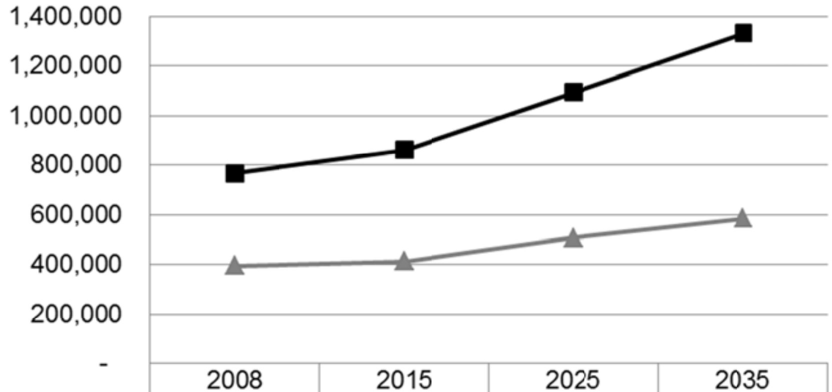
Table 2-2: Population, Housing and Employment, Current and Projected

	2008	2015	2025	2035
Population	767,647	860,957	1,093,490	1,331,139
Housing	323,992	371,743	477,630	586,738
Employment	396,194	414,346	506,717	585,718

The AMPA's population is projected to reach one million by 2025 and 1.3 million by 2035. This growth will require an additional 262,700 homes. In addition, the AMPA is expected to gain nearly 190,000 new jobs, expanding its job base by 48 percent. The majority of new jobs (58 percent) will be related to healthcare, education, and the professional, science and technical services.

The forecast shows that job growth is projected to occur at a slower rate than population growth: 48 percent compared with 75 percent, respectively. The result is a growing gap between people and jobs.

Figure 2-2: AMPA Projected Population and Employment Growth



	2008	2015	2025	2035
Population	766,553	860,957	1,093,490	1,331,139
Employment	396,194	414,346	506,717	585,718

In 2008 there were 2.1 people per job. This number is expected to increase to 2.5 by 2035, which is partially explained by demographics. The over 65 population is the fastest growing segment of the population and is projected to nearly triple by 2035. This is driven by the baby boomer generation, the earliest of whom are just now turning 65 and beginning to enter retirement. As more of the elderly exit the workforce there will be fewer people to step in and replace them. This may eventually present a challenge because, at the same time, there is an increasing dependence on certain goods and services due to an aging population and there will be fewer workers to serve those needs.

Other reasons for the slower pace of job growth pertain directly to the economy. For one, the area's existing job base includes Sandia National Labs, Kirtland Air Force Base and a large government sector. These jobs are considered relatively stable and are not projected to see rapid growth. In addition the professional and technical services and manufacturing sectors among others will likely become more efficient as technological advances increase worker productivity and reduce the demand for labor.

Land Use and Development Patterns

The AMPA is characterized by large expanses of vacant land and rural rangeland—over 70 percent of its total area—presenting the conditions for significant expansion of the urban footprint. This is tempered somewhat by ownership and topological constraints that include Indian reservation land, the Sandia Mountains and the escarpment.

MRMPO developed a land use forecast for 2035 using a small area land use allocation model that considers current development, future development plans and land use policies and constraints. The land use forecast is integral to the production of small area population and employment forecasts and the three are inextricably linked. Table 2-3 shows the different distributions of land uses within the AMPA, both existing and projected.

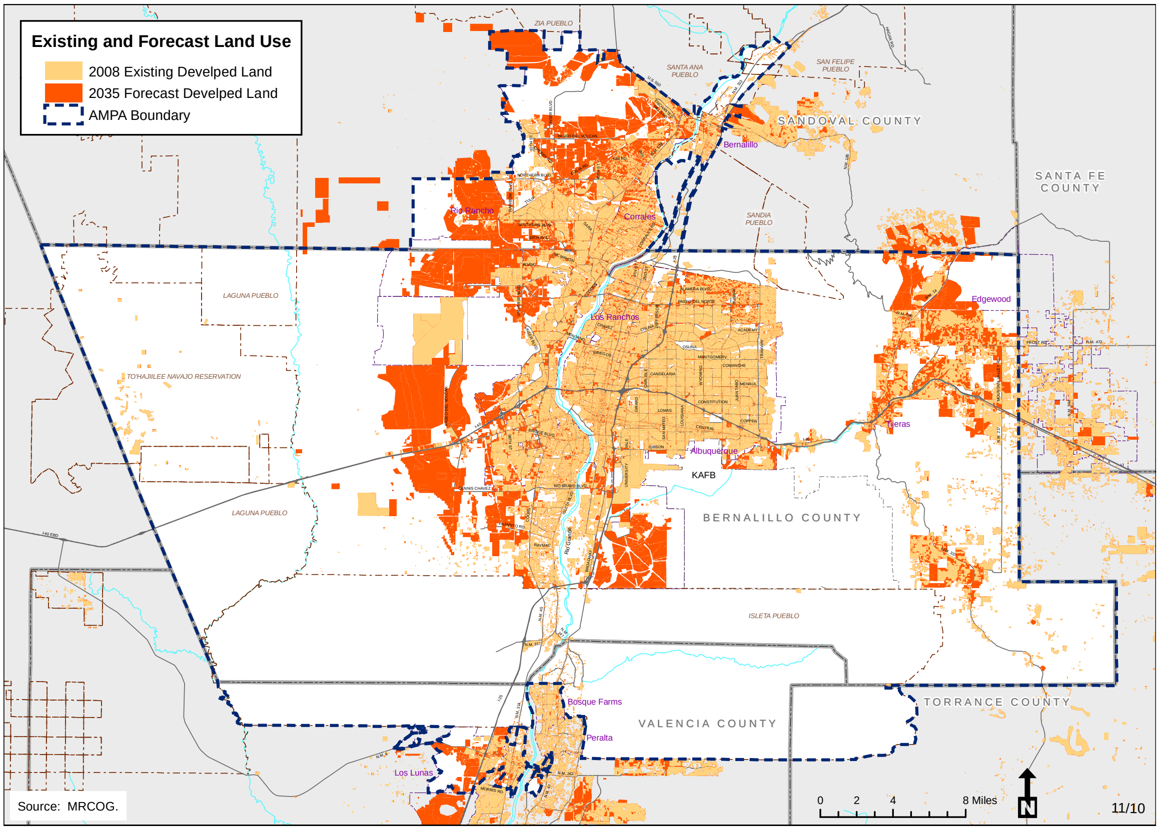
Table 2-3: Developed Land in the AMPA, Current and Projected

	2008		2035	
Land Uses	Acres	Share	Acres	Share
Residential	100,238	11%	186,222	20%
Commercial, Office and Industrial	19,248	2%	27,806	3%
Public Use	7,719	1%	11,388	1%
Vacant, Rangeland and Abandoned	639,469	68%	539,127	58%
Other	170,479	18%	172,610	18%
Total	937,153	100%	937,153	100%

In total, approximately 100,000 acres of currently undeveloped land will be consumed by 2035. Residential uses will occupy an additional 86,000 acres, commercial and other employment uses will add another 8,500 acres, and public uses such as schools, hospitals and public safety buildings will add another 3,600 acres.

The 2035 land use forecast predicts a dramatically larger urban footprint. Map 2-3 shows the metropolitan area's projected expansion between 2008 and 2035. While there is development projected within the established urban area, Map 2-3 shows most of the new growth is projected outward. This development will expand our built area substantially, particularly on the west mesa, in Mesa del Sol, and north and west of Rio Rancho. This development pattern is a product of land availability and cost, existing plans and the magnitude of projected growth.

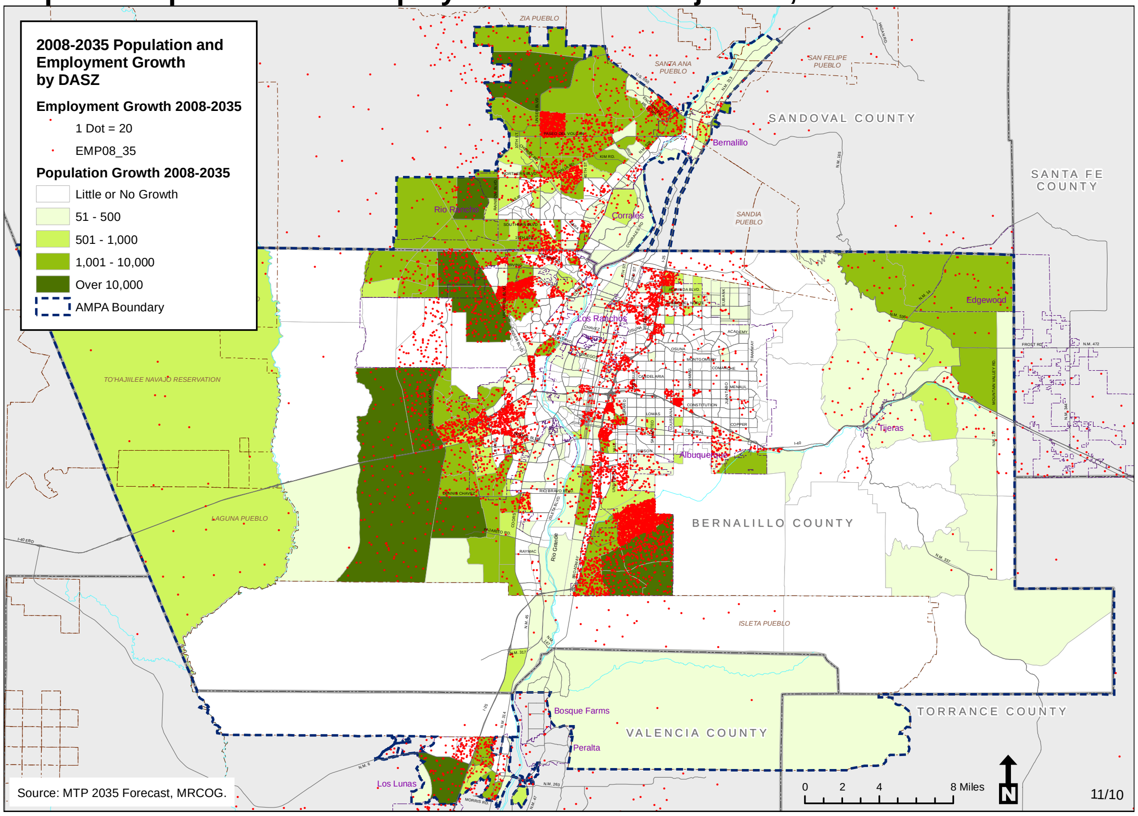
Map 2-3: Existing and Forecast Developed Land Area



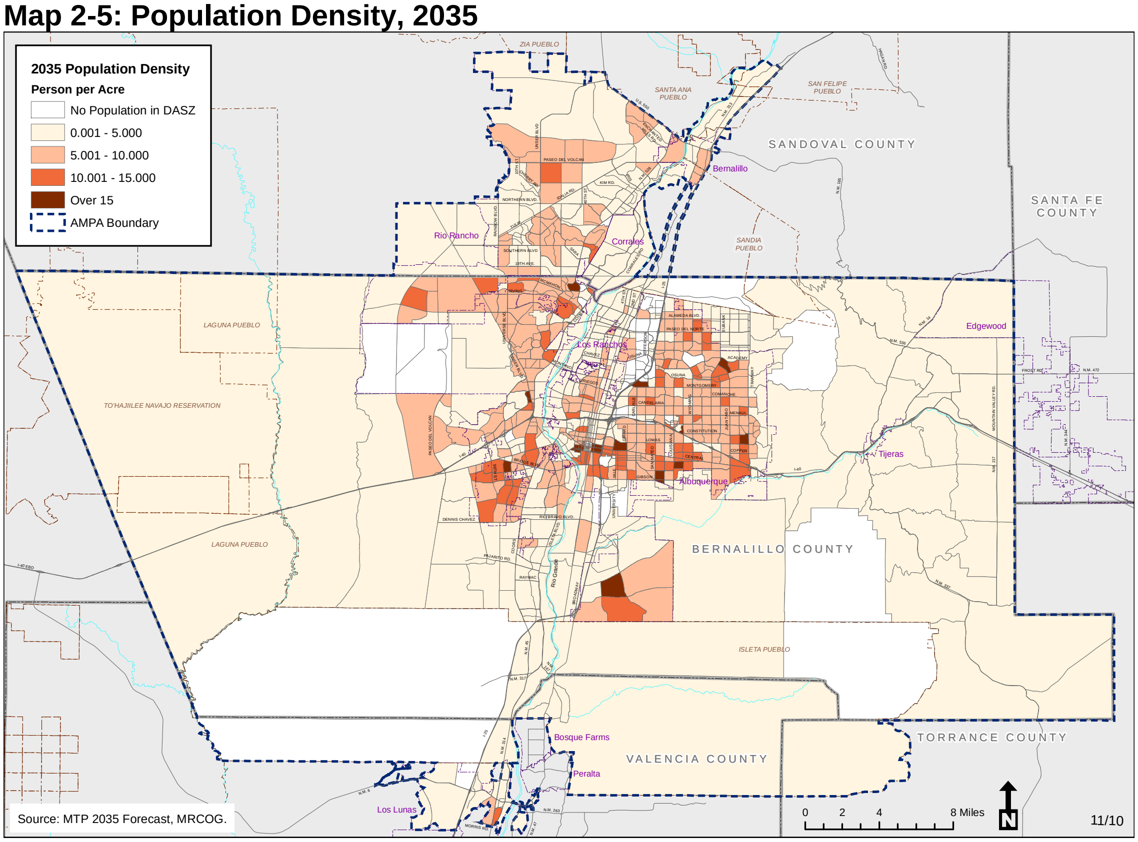
The Impact on Our Commute

The dynamics of land availability and consumption patterns have a dramatic effect on transportation patterns both in terms of volume and congestion. As people locate outward from the urban core to live on the periphery of the AMPA, many population-serving jobs will follow these rooftops. However, job concentrations will remain primarily within urban employment centers and corridors. This means people will be required to travel further to places of employment, which will increase their gas usage and vehicle maintenance costs. And, when the cost of transportation is added to the cost of housing, this development pattern puts a considerable strain on housing affordability. This development pattern is illustrated by the following three maps; Map 2-4 shows where jobs and housing growth are projected to occur and Map 2-5 and Map 2-6 show projected future population and employment densities, respectively.

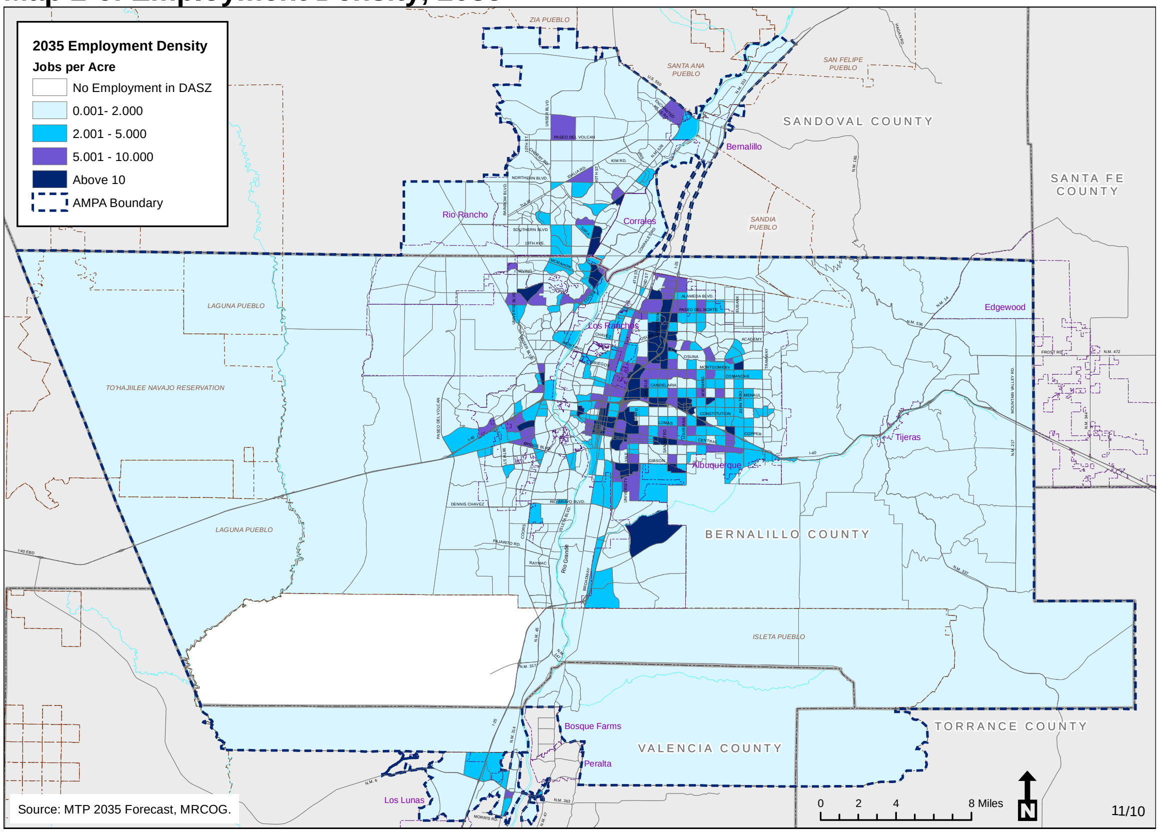
Map 2-4: Population and Employment Growth Projection, 2008-2035



Map 2-5: Population Density, 2035



Map 2-6: Employment Density, 2035



By 2035 the projected level of growth combined with an imbalance between housing and jobs will result directly and indirectly in:

- a doubling of vehicle miles traveled per day from 16 million to 32 million
- a leap in vehicle hours of delay from 400,000 to 1.5 million
- one million daily trips across the Rio Grande (doubled from today)
- a reduction in the labor markets captured for key employment centers
- a compromised quality of life (which is often a key factor when employers are choosing where to locate their businesses)
- higher transportation costs which reduce housing affordability

B. Roadway Conditions

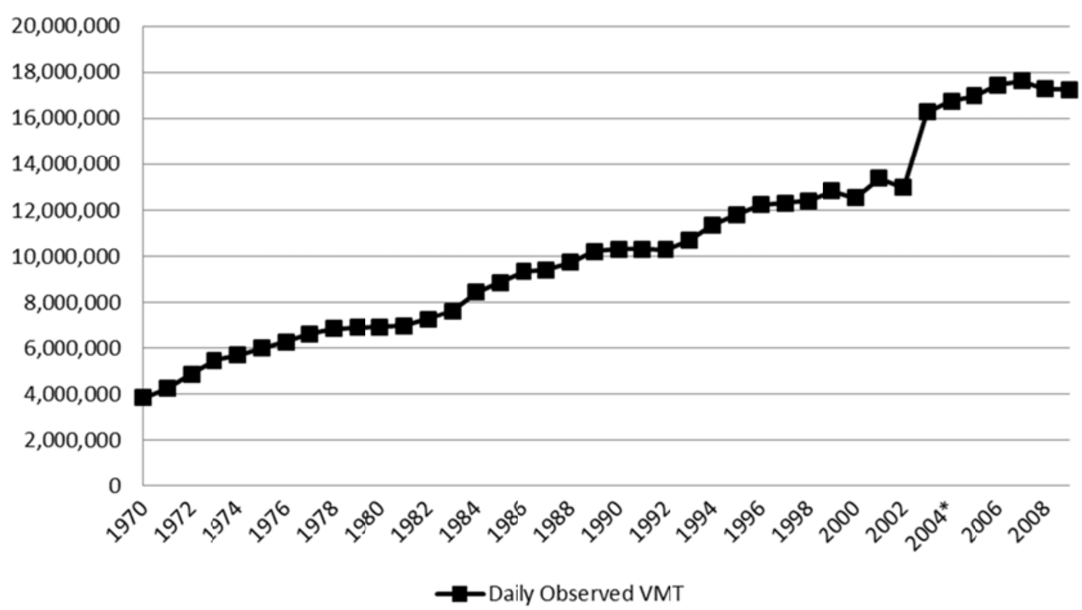
As many drivers know firsthand, the region is already experiencing areas of severe roadway congestion. Future years do not show any sign of reprieve as the area is projected to continue to grow and vehicle miles traveled rates are expected to continue to rise. According to transportation demand model analyses performed by MRMPO, without transportation investments made beyond those programmed in the current TIP (2012-2017), the severity and number of congested roadways will increase substantially by the horizon year 2035, especially for river crossings and on the Westside.

Past and Current Travel

Two sets of data help establish a picture of what current and 2035 roadway conditions in the AMPA will look like: historic data trends based on MRMPO's Traffic Surveillance Program (which provides traffic counts for the region) and baseline travel conditions developed using the regional travel demand model. Traffic counts are done for all federal-aid eligible roadways in the counties of Bernalillo, Torrance, Sandoval and Valencia. Federal-aid eligible roadways include collectors and above and are shown on the Current Roadway Functional Classification map (see Appendix C).

A key performance measure monitored by the Traffic Surveillance Program is vehicle miles traveled, which reflects the amount of vehicle travel on the roadway network. Figure 2-3 shows the historical trend in daily vehicle miles traveled in the AMPA from 1970 to the present. A general increase in the amount of travel is observed with a notable jump occurring in 2004 (attributed to an expansion in the AMPA boundaries to include Los Lunas and Algodones).

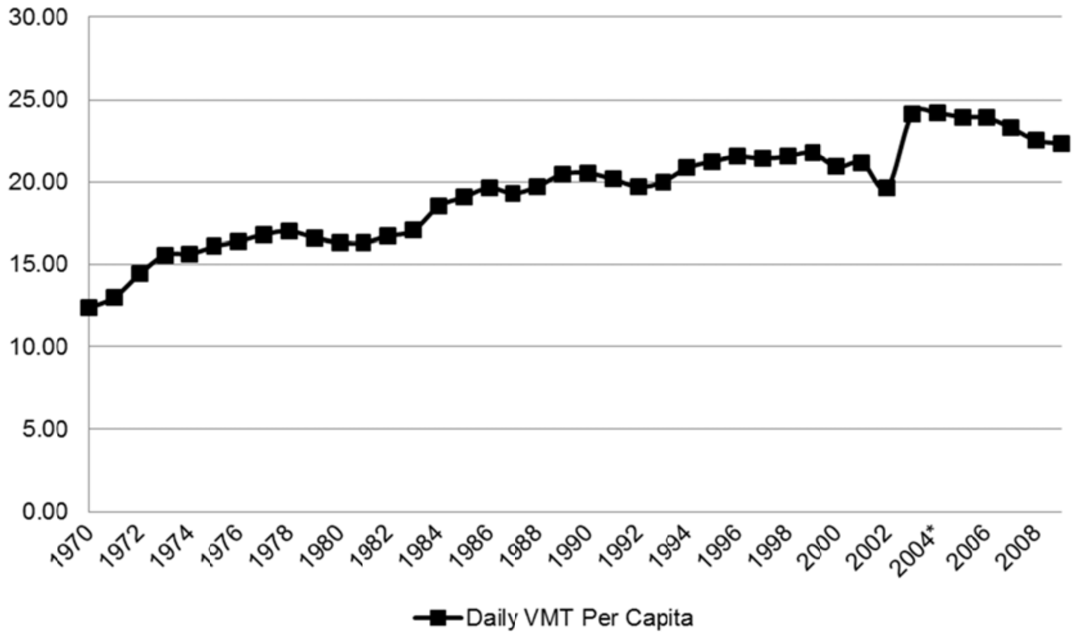
Figure 2-3: Observed Daily Vehicle Miles Traveled in the AMPA, 1970-2009



**AMPA boundary expanded to include Los Lunas and Algodones*

Normalizing vehicle miles traveled data by population gives a measure of vehicle miles traveled *per capita*. Figure 2-4 shows that per capita vehicle miles traveled in the AMPA increased between 1970 and 2009. A significant dip observed in 2000 (associated with the Big-I Reconstruction Project) is followed by a precipitous rise in 2003, then a general stabilization and slight decline to a per capita rate of 22.4 in 2009. Data show that over the past 30 years the overall growth in average vehicle miles traveled per capita continues to climb despite interim peaks and valleys that coincide with events such as national energy price fluctuations and economic forces or local major construction projects.

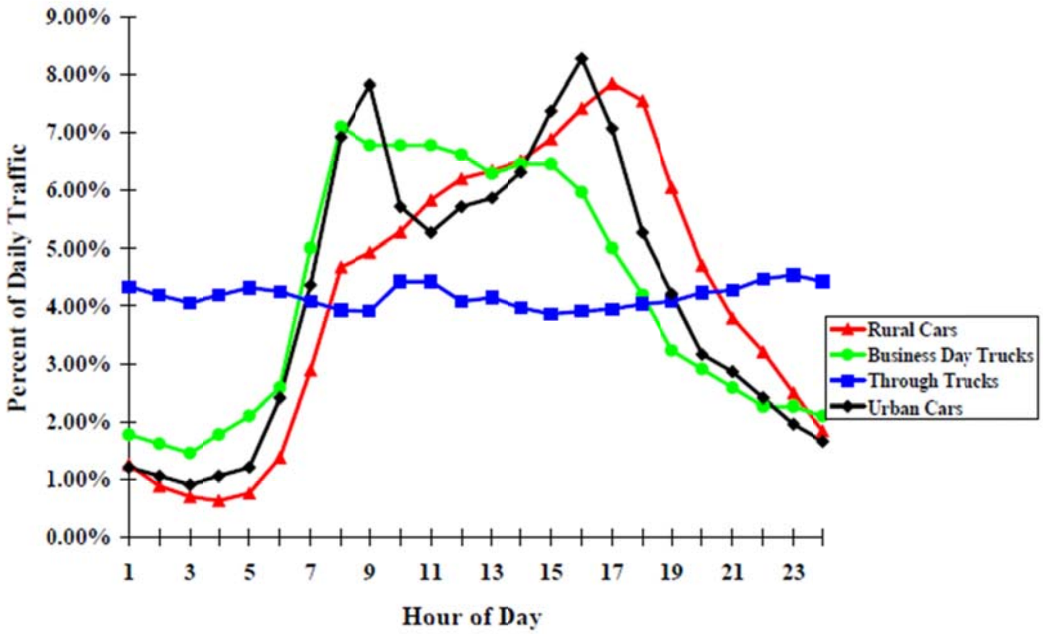
Figure 2-4: Daily Vehicle Miles Traveled Per Capita in the AMPA, 1970-2009



Daily Distribution of VMT

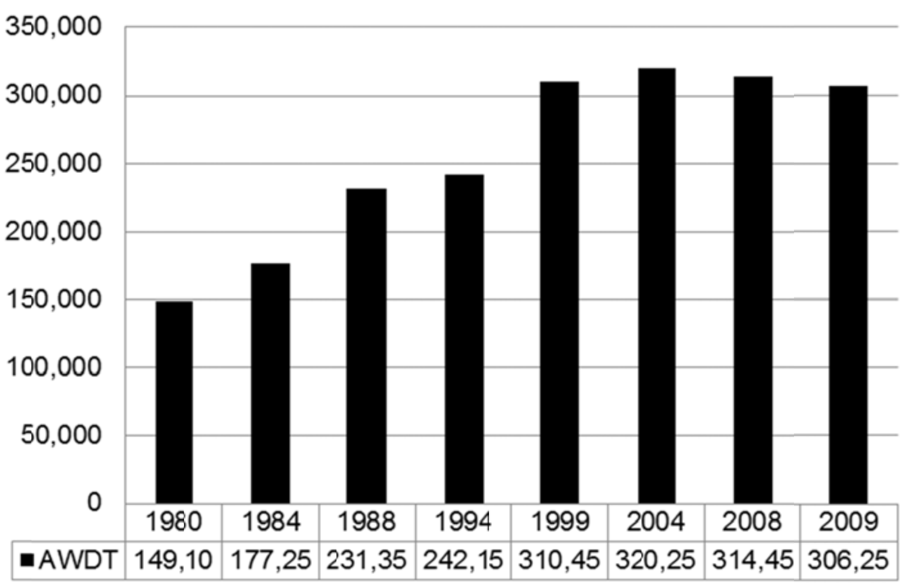
Travel demand, expressed by vehicle type when viewed over time for any given weekday, demonstrates a clear distribution pattern (see Figure 2-5). Within the daily volume there are pronounced peaks for the AM and PM travel periods with a smaller rise in volumes during midday and lunchtime. The AM travel period tends to be dominated by work trips, while PM travel patterns include work trips as well as shopping, recreation, and other non-work related activities. This data can help identify opportunities for travel demand management strategies intended to mitigate peak hour or peak period congestion.

Figure 2-5: Average Daily Distribution of Roadway Volumes/Peak Period Percent of Daily Vehicle Miles Traveled



Source: Traffic Monitoring Guide 2001

Figure 2-6: Historic Average Weekday Daily Traffic (AWDT) Growth at the Big-I, 1980-2009



The Big-I is the nickname given to the intersection of the I-25 and I-40 interstates in the AMPA. Traffic volumes observed passing through this interchange have historically been a common index of travel growth in the AMPA. Figure 2-6 illustrates the observed growth between 1980 and 2009. It is interesting to note the plateau in growth for 2008 and 2009 given the overall linear trend increase of 105 percent between 1980 and 2009. This recent flattening of the growth curve can be observed elsewhere in the Traffic Monitoring Program and has been attributed to the recent economic slow-down.

Future Congestion

In addition to traffic data collection activities, MRMPO maintains a regional travel demand model which forecasts growth and travel demand using a planned transportation network and anticipated socioeconomic information. For the 2035 MTP, model scenarios of the roadway network were developed to represent the base year 2008, the interim years 2015 and 2025, and the planning horizon year of 2035.

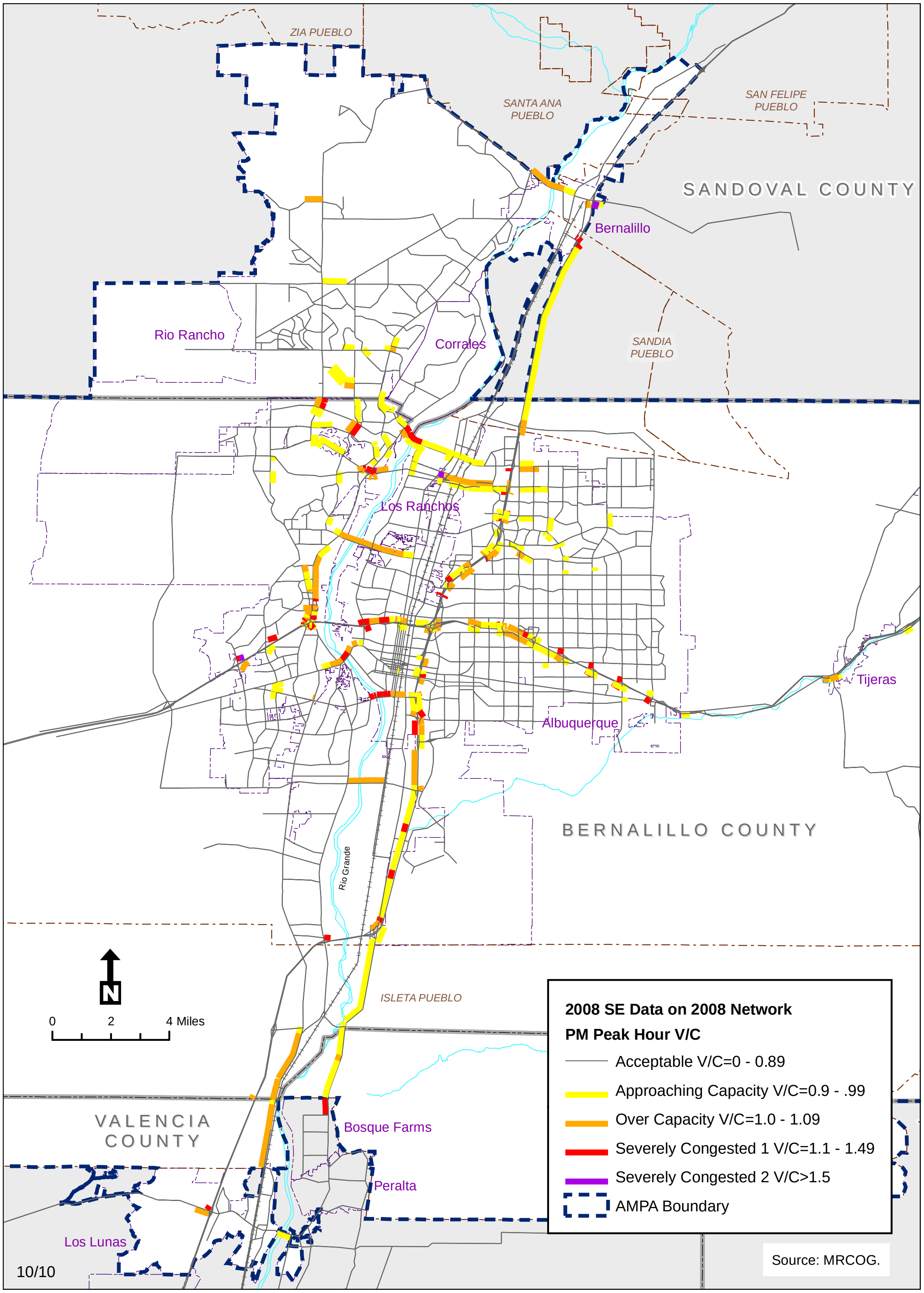
The 2008 base year travel conditions are shown in Map 2-7, which depicts hourly roadway segment volume-to-capacity (V/C) ratios for the entire modeling network. This measure represents the amount of traffic volume on a segment relative to the available capacity. The timeframe for the volume-to-capacity ratios is the PM peak hour, which constitutes the highest volumes and most diverse composition of travel during the day (work-based trips as well as non-work based trips).

The 2008 base year volume-to-capacity map shows that travel conditions in the PM peak hour experience “severe congestion” primarily along river crossings, portions of the interstate mainline and interchanges and at arterial corridors carrying excessive amounts of commuter travel. “Over-Capacity” conditions are also observed at river crossings and portions of the interstate mainline and interchanges, with extensive system degradation shown on arterials. “Approaching Capacity” conditions continue this pattern and extend to other parts of the network.

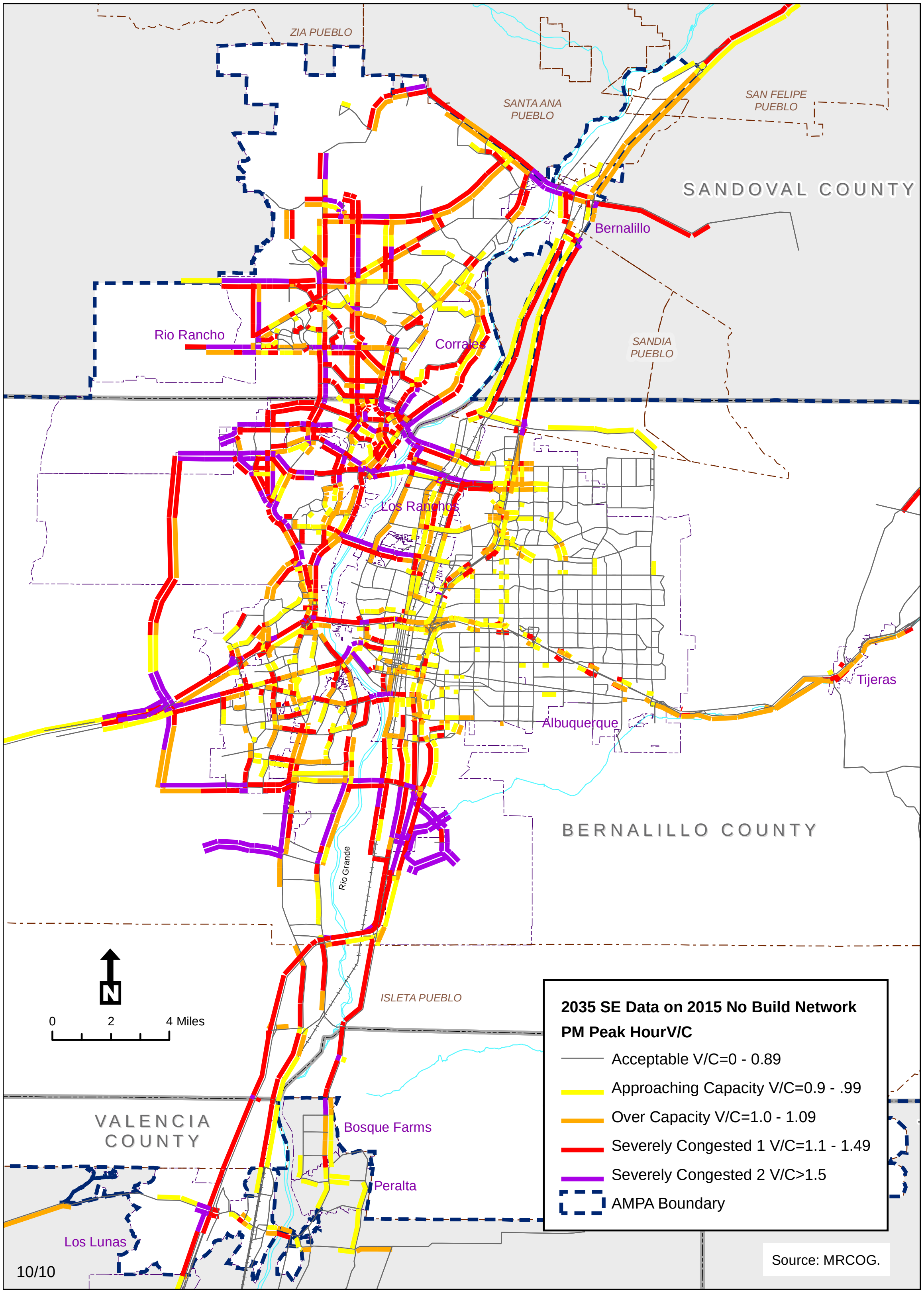
Travel Demand Scenarios

The 2035 planning horizon *no-build* conditions are shown in Map 2-8 which depicts what the transportation system would look like in 2035 if no additional roadway projects were implemented after the 2015 program year. It is represented with 2035 socioeconomic data run on the 2015 “committed” transportation network.

Map 2-7: 2008 Roadway Network Showing Volume to Capacity Conditions at the PM Peak Hour



Map 2-8: 2035 No-build Roadway Network Showing Volume to Capacity Conditions at the PM Peak Hour



The travel conditions associated with the 2035 planning horizon *no-build* scenario are summarized in Table 2-4, with a focus on vehicle miles traveled (VMT), measuring the quantity of travel; vehicle hours of travel (VHT), which indicates the time spent traveling; and vehicle hours of delay (VHD), which measures the time spent traveling below the posted speed. Also included are summaries of the magnitude of vehicle miles traveled under congested/over-capacity conditions for the modeled *no-build* scenario, which represents the quantity of travel demand "unmet" by the available roadway capacity of the system, as well as overall system average speeds.

Table 2-4: Base Year and No-build Roadway Performance Summaries, PM Peak Hour

PM Peak Hour	2008 Base Year	2035 *No-build* (2035 Socioeconomics on 2015 network)
VMT	1,568,108	3,007,466
VHT	42,634	389,762
VHD	8,855	322,691
VMT Over Capacity	99,724	1,365,965
Average Speed	36.8	7.7

Under this scenario the region can expect significant increases in congestion not only at the river crossings, but also on the entire transportation system west of the Rio Grande and along north-south corridors east of the Rio Grande. Anticipated growth in Mesa del Sol south of the airport and east of I-25 are underserved by the inadequate roadway infrastructure of the *no-build* scenario. In Chapter 3, a *build* scenario will be presented along with some strategies to address this congestion. Note that comparable maps and summary statistics for the 2015 and the 2025 scenarios are included in Appendix C.

Freight Movement

Goods mobility is a vital concern to local and national economies. At the national level, transportation is a $1.2 trillion industry, generating eight percent of the nation's jobs. Reliable transportation gives businesses in the AMPA a competitive advantage by providing them the ability to deliver products at lower cost while reaching local, national, and global markets. For consumers in the area, access to these goods raises their standard of living. Within the AMPA, freight can be sorted into two discrete categories: freight moving through the area and local freight movements. The primary mode for carrying freight within the AMPA is via truck.

Through-Freight Movement

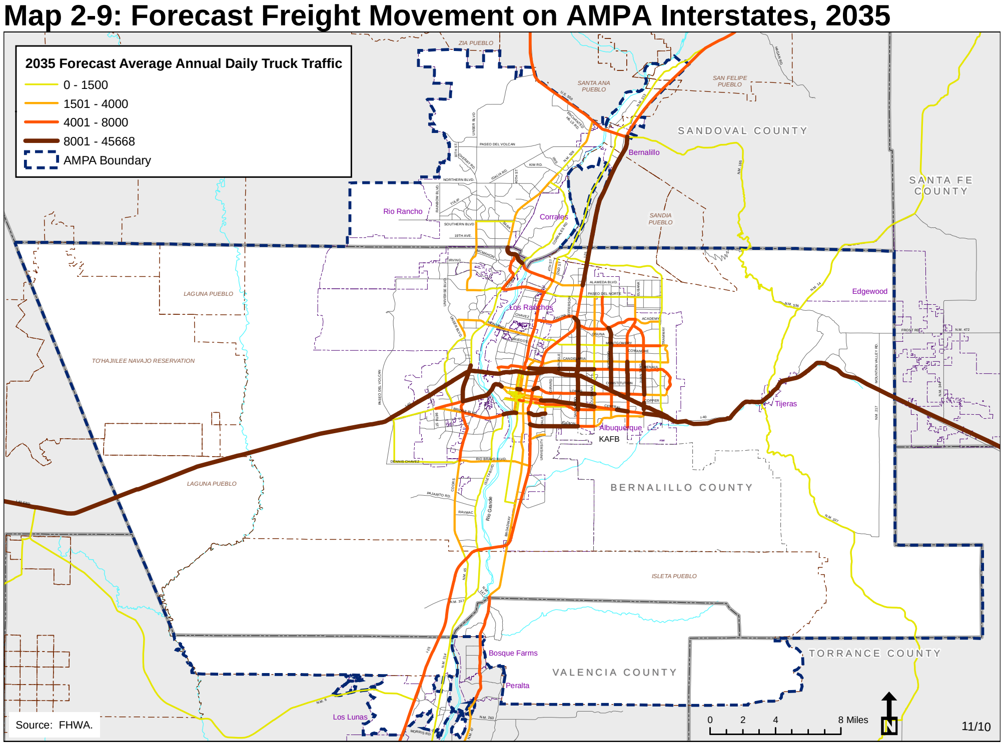
Albuquerque is located at the intersection of the I-40 and I-25 interstate facilities. The two interstates are the only Federal Highway Administration-designated freight routes within the AMPA. I-40 is a major cross-country route, connecting the Port of Long Beach in California to eastern markets. For this reason, preserving and maintaining I-40 is a significant national and regional interest. I-25, on the other hand, carries a much smaller number of trucks.

According to the Federal Highway Administration's Freight Analysis Framework, I-40 at the western AMPA boundary had Annual Average Daily Truck Traffic of 7,548 in 2002. By 2035, that number is projected to increase to 20,063. I-25 at the northern boundary of the AMPA had Annual Average Daily Truck Traffic of 2,766 in 2002, which is forecast to reach 7,163 in 2035. During outreach efforts with local freight stakeholders, long-haul truckers voiced concern that the interstates are not functioning as well as they need to make timely and efficient deliveries. Other observations include the following:

- insufficient rest areas to accommodate the truck traffic using them (with the high usage of existing rest areas comes increased risk of accidents)
- freeway closures due to incidents are increasingly costly to carriers and ultimately consumers
- traffic delays are compounded by the inability of tow vehicles to reach and clear disabled vehicles
- weather events such as snowfall in the Tijeras Canyon result in costly delays

Although the concerns of freight shippers appear to be part of Albuquerque's "growing pains" as an urban area, the situation looks much worse within our planning horizon. According to the Freight Analysis Framework (FAF2) produced by the Federal Highways Administration, truck traffic on I-40 is expected to triple by 2035. This growth will exacerbate the observed problems of insufficient rest areas on the interstate system (see Map 2-9).

Map 2-9: Forecast Freight Movement on AMPA Interstates, 2035



Local Freight Movement

Many major freight companies maintain facilities in Albuquerque, often for the purpose of "breaking" full loads for local delivery and assembling them for outbound trips. UPS operates a fuelling facility in Albuquerque and receives approximately 25 trailers per day at a rail-truck intermodal facility near Second Street and Woodward Street in Albuquerque's South Valley. These trailers are driven to UPS' yard at Comanche and I-25 to be broken or transferred to the interstate system. FedEx maintains separate facilities for FedEx Freight, FedEx Ground and FedEx Air.

Local freight haulers have several concerns about the arterial freight system. Their concerns fall into two categories: 1) Truck restrictions on facilities which make local trips longer and more costly than they need to be and time of day/day of week restrictions which further hamper the movement of goods and compound congestion at critical times, and 2) Weight restrictions on the river crossings at Paseo del Norte Boulevard and Montaño Road mean that shippers must route their fleets across I-40 or Alameda Boulevard to serve high-growth markets on the west side of the Rio Grande.

The lack of truck-accessible bridge crossings means that Alameda Boulevard – the sole arterial bridge crossing between I-40 and US 550 – takes on a disproportionate volume of truck traffic. A further impediment to freight movement on the Westside is the restriction on Unser Boulevard from Ladera Avenue to Rainbow Boulevard. This restriction effectively makes Coors Boulevard the sole north-south arterial for freight movements west of the river. Paseo del Volcan, well west of significant commercial development, functions as an arterial route for through movements to markets in far northwest Albuquerque and Rio Rancho.

Other Freight Challenges

Another locally-adopted policy limits oversize or overweight trucks from moving on weekends or after dark. Such restrictions effectively force the trucks to drive at times when congestion is already at its worst. Another concern regards the widths of roads in the semi-rural North Valley which make deliveries problematic. BNSF is considering the construction of a large-scale intermodal logistics center north of Belen. Though the site under consideration is outside the present boundary of the AMPA, the impact on freight movements in the region may be substantial. Logistics centers such as this one typically cover several thousand acres and host freight and distribution centers for a variety of shippers. Rail facilities are anticipated, with a private commercial airport to follow.

The greatest challenge facing local haulers is a systemic one. The perennial issue of "crossing the river" is even more critical for shippers because of increasing costs. The lack of freight access to the arterial system on the Westside is considered by some shippers to be a "high service cost area" for pick-ups and deliveries.

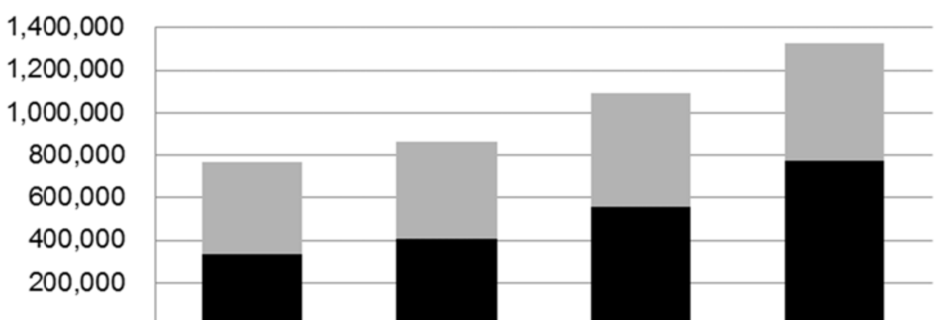
C. Crossing the River

The AMPA is situated in the middle Rio Grande Valley with the urbanized area straddling both sides of the river. The metropolitan area's recent development patterns—in particular the prolific growth west of the river and in the City of Rio Rancho—place a heavy burden on the region's transportation infrastructure. As a result, providing sufficient roadway capacity to maintain acceptable levels of service on bridge crossings has become a challenge. Especially affected is the commute period which is largely dominated by home-based work trips between residential origins and non-residential destinations on either side of the river.

Residential Expansion and Job Centers

The historical growth pattern of residential expansion west of the river is anticipated to continue while most job centers (e.g., the Journal Center, Kirtland Air Force Base and Sandia National Labs, and Downtown) are expected to remain east of the river, exacerbating travel demand across the river. The following two charts show the projected population and employment over time within the AMPA, highlighting the share of each that occurs east and west of the river.

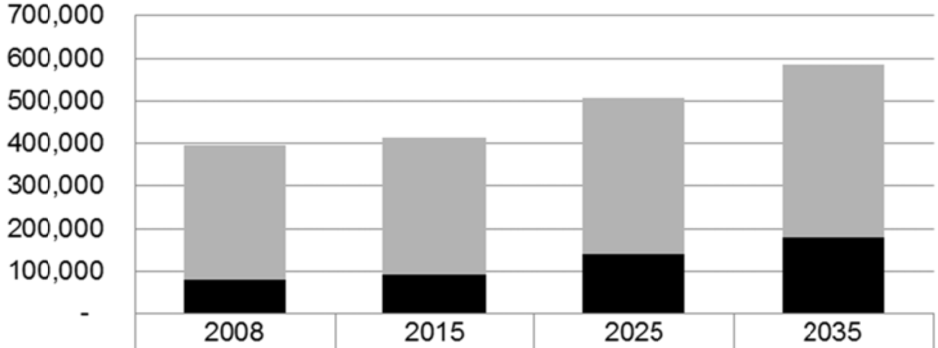
Figure 2-7: Population East and West of the Rio Grande, Current and Projected



	2008	2015	2025	2035
East	432,607	452,301	535,734	556,872
West	334,764	409,522	556,586	772,336

Approximately 44 percent of the AMPA's population today lives west of the river. MRMPO projects that by 2035 the Westside's share will represent 58 percent of the AMPA's population. And, while the Westside is predicted to add a considerable number of jobs throughout the forecast period (99,000), the largest concentration of jobs will remain east of the river.

Figure 2-8: Employment East and West of the Rio Grande, Current and Projected



	2008	2015	2025	2035
East	315,797	323,637	366,306	406,595
West	80,680	90,990	140,775	179,610

The ratio of jobs-to-housing is often used as an indicator of "balance" in an area. The assumption of a healthy balance implies that there are employment opportunities for the workforce, but it also sheds some light on commute patterns; a low ratio means workers are likely to have to drive further for employment. A widely accepted target is 1.5 jobs to every one household. Table 2-5 shows the jobs to housing ratios for the AMPA, east and west of the river.

Table 2-5: Jobs to Housing Balance East and West of the Rio Grande, Current and Projected

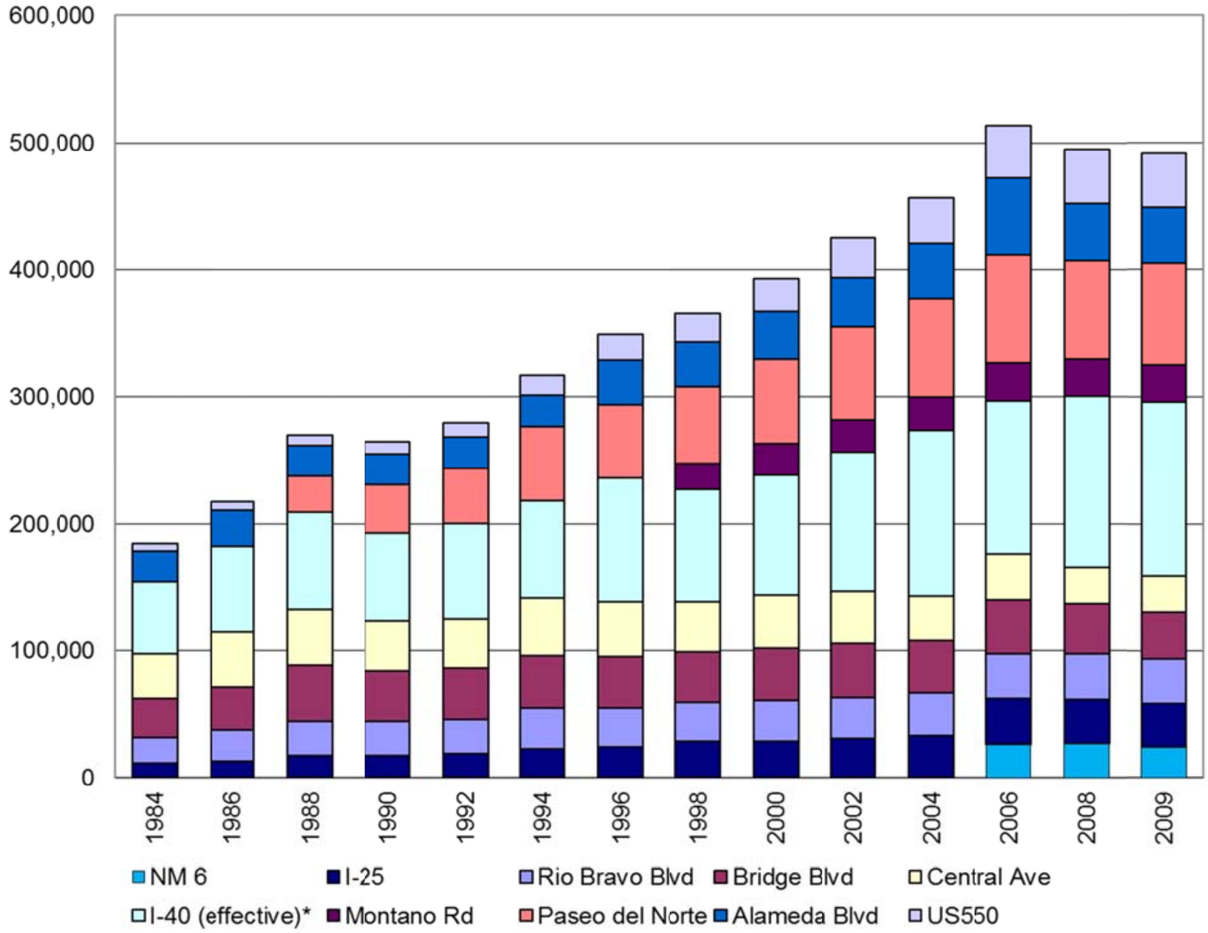
	AMPA Average	West of the River	East of the River
2008	1.22	0.63	1.61
2015	1.11	0.56	1.53
2025	1.06	0.62	1.46
2035	1.00	0.56	1.54

It is clear from these numbers that even with the addition of 99,000 jobs on the Westside, the pace of residential growth does not improve the balance of homes and jobs. The majority of Westside residents will therefore continue to commute to the Eastside for employment. This relationship between housing and jobs will exacerbate existing congestion, particularly on limited capacity river crossings.

River Crossing Travel Demand

There are ten river crossings within the AMPA, each operating at various levels of service during the peak periods of travel. A review of historical average weekday traffic data presented in Figure 2-9 shows that demand has steadily increased over the years. The flattening of this trend in the last two years of recorded data is likely attributed to the economic slowdown. Although this condition is realized in the near term, growth is expected to continue in future year scenarios of the MTP as the regional economy recovers.

Figure 2-9: Growth of Average Weekday Traffic for River Crossings in the AMPA



Source: MRCOG Traffic Monitoring Program

Future Travel Demand

Future travel demand is forecast with the travel demand model, which takes into account socioeconomic data including population and employment projections. Table 2-6 shows the modeled increase in total AMPA river crossing travel demand expected for the analysis year scenarios in the 2035 MTP. Existing river crossings are expected to serve an average of one million daily trips by 2035, essentially doubling the number carried today.

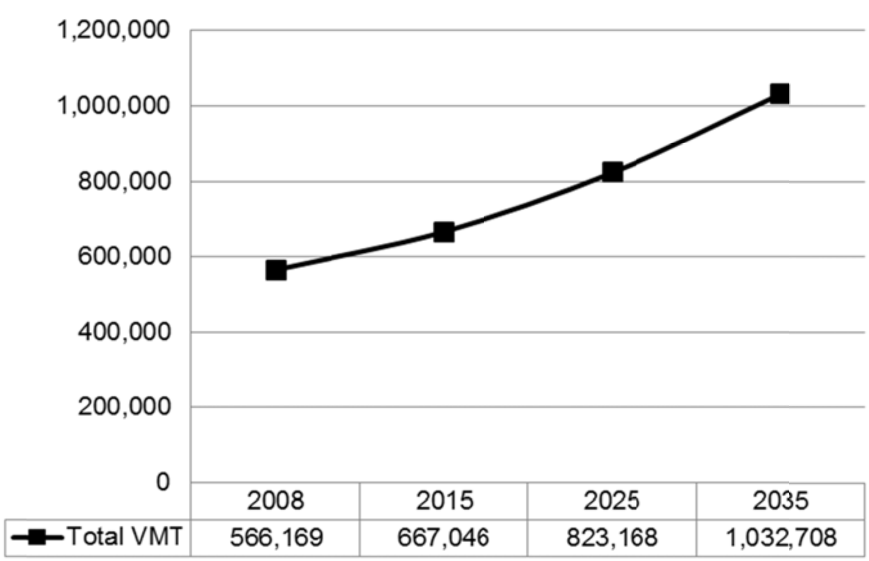
Historically, any proposals for new river crossings within the AMPA have proven to be difficult options for local agencies. Numerous studies have been undertaken to evaluate alternative alignments, yet any recent prospect has been unsuccessful due to factors ranging from required residential relocations, right-of-way expense, environmental impacts to sensitive wetlands and permanent open space, to outright political opposition. Aside from a new river crossing proposed at a location south of Los Lunas (potentially outside of current AMPA boundaries), no additional river crossings or travel lanes are assumed in these future-year river crossing scenarios shown in Table 2-6.

Table 2-6: River Crossings Travel Demand Increase for an Average Weekday

MTP Analysis Year	Daily AMPA River Crossing Demand (Modeled)	Percent Increase over Base Year
2008	566,200	N/A
2015	667,000	**18%**
2025	823,200	**45%**
2035	1,032,700	**82%**

As shown in the Figure 2-10, river crossing travel demand is expected to increase significantly each year over the 2008 base condition, particularly for horizon year 2035 when the increase is expected to reach an astounding 82 percent over the base condition. Without reasonable alternatives to single occupancy vehicle travel, the congestion will soon be unacceptable to many commuters. Indeed, a recent travel survey conducted by MRMPO found that only 27 percent of commuters who reside west of the river and travel east for work were satisfied with the current transportation system, and just over 22 percent of that same group reported they were satisfied with the travel options available to them.

Figure 2-10: River Crossings Travel Demand for an Average Weekday



Preliminary analysis using the region's travel demand model was performed to show the magnitude of shift required from single-occupancy vehicle (SOV) travel mode to transit modes in order to meet the anticipated increase in river crossing demand. For example, in 2035 30 to 35 percent of travelers will need to be travelling via transit or using other non-SOV modes to maintain reasonable vehicle speeds on Paseo del Norte. The other river crossings showed similar results, reinforcing the need for projects that support reliable *people* movement across the river (as opposed to just *vehicle* movement).

Now is the time to begin planning for alternatives such as comprehensive car-pooling programs and exclusive right-of-way for bus rapid transit that would provide much greater efficiencies over auto travel in terms of person carrying capacity, travel time reliability, reduced fuel consumption and improved air quality. Improving travel options and conditions for the river crossings therefore is and will continue to be a major focus of MRMPO's transportation planning efforts. Strategies for maintaining and enhancing mobility across the river are discussed in Chapter 6 Future Directions as well as in Appendix A Compact Land Use Scenario, which provides more detailed explanations of preliminary analyses done by MRMPO that show the impact changes in land use could have on travel demand in the region.

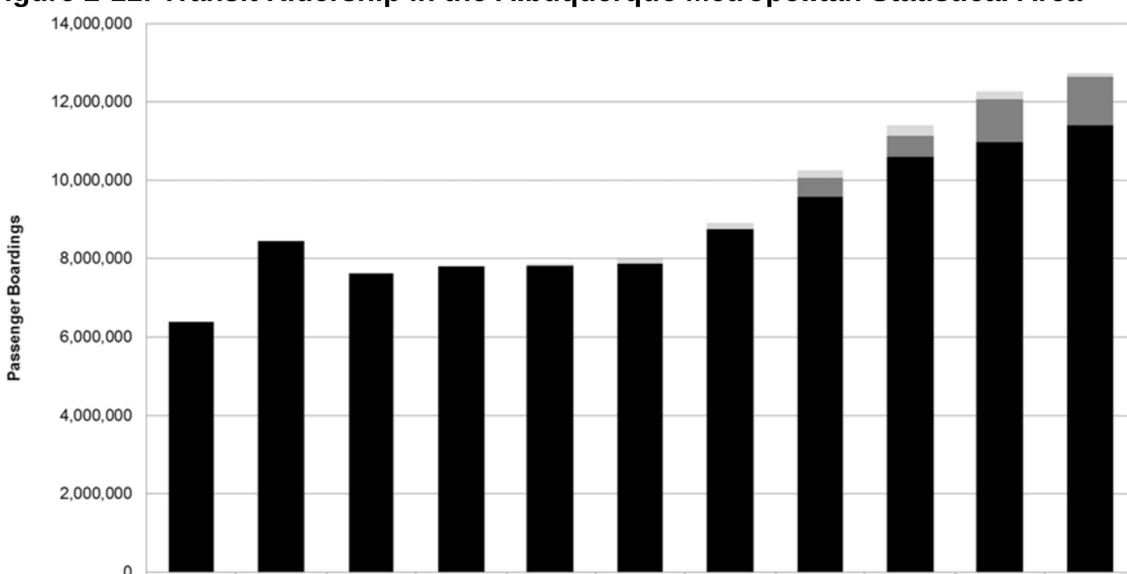
D. Public Transportation Services

In previous decades the Albuquerque metropolitan area had extremely limited bus service and commuter rail did not yet exist. As a result, the regional population was heavily reliant on private vehicles for meeting their transportation needs. Today, more options are available to the traveling public through a range of service providers such as ABQ Ride, New Mexico Rail Runner Express and Rio Metro. There are also Park and Ride facilities and vanpool/carpool services available in the area, demand response service for qualified low income residents to get to a job or job training, and para-transit for persons with physical disabilities.

Accessibility and Public Demand

According to 2008 American Community Survey (ACS) data published by the U.S. Census Bureau, the public transportation commute mode share in Bernalillo County (used as a proxy for the region because it includes a large portion of the AMPA) is approximately two percent compared to a national average of five percent. There are indications, however, that transit ridership in parts of the region is on the rise; the City of Albuquerque's transit provider, ABQ Ride, reported a 56 percent increase in transit ridership between 2000 and 2010 and a 70 percent increase since 2004 (See Figure 2-12). This rise in ridership won Albuquerque recognition as one of the fastest growing public transit markets in the nation. The more recent increase is in part due to the introduction of the Rapid Ride and Rail Runner Express services. Figure 2-11 also shows the 40 percent increase in ridership since the initiation of the Rail Runner Express service.

Figure 2-11: Transit Ridership in the Albuquerque Metropolitan Statistical Area



	99-00	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10
All Other*	6,452	8,065	18,746	21,600	56,070	122,187	167,814	189,086	268,484	197,402	96,700
NM Rail Runner	0	0	0	0	0	0	0	488,118	541,542	1,088,648	1,240,518
ABQ Ride	6,377,327	8,439,507	7,619,093	7,801,883	7,823,498	7,876,527	8,751,698	9,579,900	10,595,445	10,974,390	11,400,737

Source: Data from City of Albuquerque, New Mexico Department of Transportation and Rio Metro compiled by MRMPO

Results from MRMPO's 2010 MTP survey showed that people who reported having more transportation options (i.e., auto, transit, bicycle, and pedestrian options) reported being more satisfied with the transportation network as a whole compared to those who felt they had fewer transportation options. Nevertheless, responding to public demand for transit is fraught with challenges. A major challenge is the magnitude of transit service growth required to effectively serve the region and shift travel patterns. A small decrease in vehicle ridership corresponds to a significant increase in transit service. For instance, to increase transit commuting mode share by two percent in the AMPA requires a very small decrease in overall driving but a *doubling* of transit ridership. Nevertheless, providing additional service beyond current levels is attainable if given the proper regional attention.

While transit service has dramatically improved in the AMPA over the last decade, there is still much room for improvement and there are significant service gaps to fill. Service gaps can be, in part, measured by accessibility to transit. Accessibility is an important metric as it measures the proximity of the population to public transportation services and whether the region is being adequately served with viable transportation options. According to MRMPO transit accessibility analysis, in 2008 only 26 percent of people within the AMPA were living within a quarter mile of transit stops. This quarter-mile distance threshold is generally used by transportation planners as the average "rule of thumb" distance people are willing to walk to reach transit service in the United States. Two service types were analyzed and are shown in Table 3-1. First, all transit stops were assessed to see the percentage of population within an accessible distance of transit. Second, only transit stops with very frequent service were assessed because they represent the "critical" level of service needed in the region. These calculations show considerable need for increased transit service frequency in the region.

Table 2-7: Accessibility of Transit to Populations in the AMPA

Percent of population within ¼ mile of transit service in 2008	26%	Percent of population within ¼ mile of high frequency transit service in 2008	6%
Percent of population within ½ mile of transit service in 2008	72%	Percent of population within ½ mile of high frequency transit service in 2008	21%

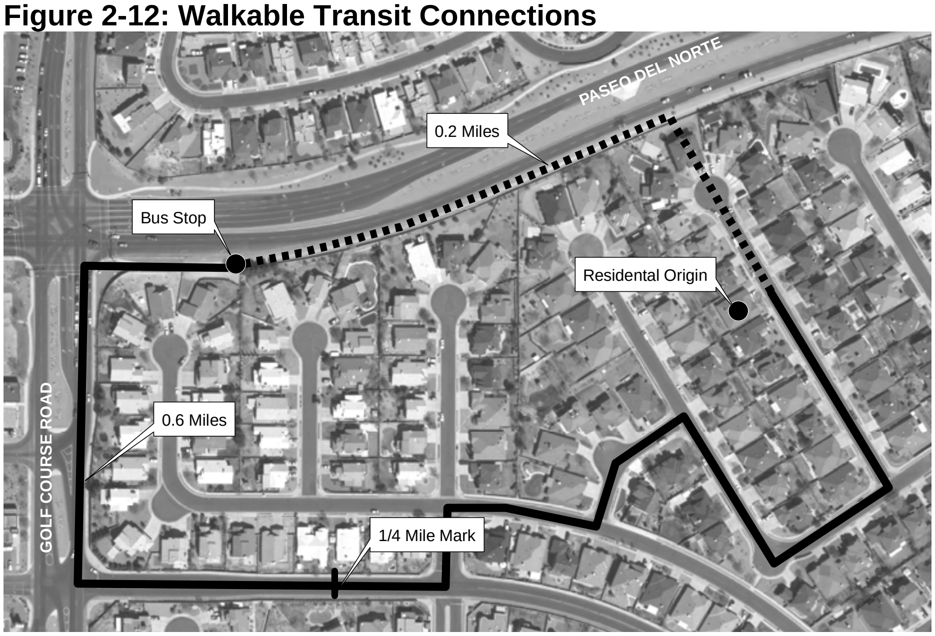
Expanding Services and New Markets

Currently, the AMPA faces the two-fold challenge of needing to simultaneously expand existing services and serve new markets because the fastest growing communities in the AMPA are those with the least extensive transit service. Existing transit service concentrates on balancing broad regional coverage with higher frequency services for low-income communities and activity centers such as popular commercial centers, employment hubs, and the University of New Mexico. Expanding existing service is the most cost-effective approach because the infrastructure already exists; however, providing new transportation options is also essential for tackling regional transportation issues and increasing the transit mode share.

Many of the challenges facing transit, including service expansion to new portions of the AMPA, are created by recent land use and growth patterns. Peripheral housing development and a “drive until you qualify” ethos creates vast disconnected subdivisions of single family detached housing without nearby services. Providing transit service to these communities is difficult due to the lack of street connectivity, their location at the fringes and the existence of arterial roadways designed solely for automobile travel. These types of development patterns result in a very small number of residents who can walk or bike to transit stops in a reasonable amount of time.

Figure 2-12 shows how a disconnected street network can increase a resident’s walk to a bus station from a quarter mile to a half mile. The dashed route, which would be much more direct, is not possible because it lacks a critical connection from the local street to the arterial roadway where the bus stop is located. As a result, the most direct walk is over a half mile long. Providing walkable connections at the head of cul-de-sacs, or providing shorter block lengths within subdivisions, can improve access, but ensuring neighborhoods are designed in such a way is the challenge.

Figure 2-12: Walkable Transit Connections



Transit systems in the region could be better utilized if land was developed and re-developed in more transit-supportive ways. For example, transit services are more successful when they connect higher density developments that include mixed land uses and well-connected streets. Coordinating the location of transit with new or re-development opportunities requires agreements with the local jurisdictions that are responsible for implementing subdivision and zoning regulations.

Roadway Congestion

While transit service is a strategy that addresses congestion, it is at the same time subject to the effects of roadway congestion. Vehicle travel is projected to increase considerably as growth continues. In particular, river crossings and arterials that feed major employment and activity centers (which are also major transit destinations) will likely be the most heavily congested roadways. Few roadways in the AMPA contain transit-specific infrastructure such as dedicated transit lanes or signal prioritization. For transit to become a well-used and reliable means of travel within the AMPA, planning for separate and adequate right-of-ways and investing in transit-related infrastructure must be made a priority to ensure the development of an overall transit system that can reduce travel times and help alleviate congestion.

Personal Travel Habits

Changing personal travel habits is also necessary to increase transit ridership. Moderate commuting times, office parks and retail centers surrounded by more than ample parking, and comparatively minimal investment in transit have created disincentives to policymakers and the public to pursue and use transit. Changing behavior is difficult when a region is used to a primarily auto-oriented lifestyle. However, projected increases in congestion and travel time, as well as rising gas prices, may change regional commuting patterns and encourage new transit users. The issue of transit improvements is not merely one of obstacles, but opportunities. In fact, a major opportunity will be taking advantage of the growing appetite for transit and the recent improvements in service that have had positive results.

E. Pedestrian and Bicycle Systems

The rise of the private automobile as the primary mode of transportation began in the 1950s and corresponded with the creation of new land use and residential patterns that necessitated dramatic changes in roadway infrastructure. In contrast to the "inner-city" suburbs built in the earlier part of the 20th century, the private automobile, cheap gasoline, the new interstate system, and federally subsidized home loans made it possible for Americans to move to previously inaccessible suburbs in large numbers, resulting in significant shifts in living and travel patterns. During this time transportation planning and infrastructure projects focused on accommodating the private automobile. Pedestrian and bicycle modes were not considered and for the most part neither were environmental protection, historic preservation or disability access.

Integrating Bicycle and Pedestrian Transportation

In 1970 when the National Environmental Policy Act (NEPA) was signed into law, planning and decision making for Federally-funded projects, including transportation projects, had to consider protection of the environment. The Americans with Disabilities Act (ADA) was signed into law in 1990, prohibiting discrimination and ensuring access for people with disabilities. Shortly after the passage of the ADA, consideration of pedestrian and bicycle modes of travel were formally established with the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991. ISTEA was followed in 1998 by the Transportation Equity Act for the 21st Century (TEA-21) and in 2005 the Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). These acts acknowledged the importance of intermodal transportation and provided funding for pedestrian and bicycle projects. New Mexico reflected its support of the nationwide recognition of different modes of travel in 2003 when the state's Highway and Transportation Department changed its name to the New Mexico Department of Transportation.

Bicycle and pedestrian travel is far more widely accepted today. New concerns about public health, environmental pollution and dependence on foreign oil have further elevated the importance of these two modes. However, the majority of transportation needs are still met by private automobile travel as is evident by the automobile congestion during peak hour commutes to work and school. Data from the American Community Survey show that of workers 16 years and older, approximately 1.8 percent walked to work and 0.9 percent bicycled to work between 2005 and 2009. Smaller communities tend to have more walk commuters (Town of Bernalillo, Algodones and Tijeras) while the larger City of Albuquerque tends to have more bicycle commuters. Table 2-8 shows the bicycle and walk commuters change in the region over the past decade.

Table 2-8: Percentage of People Commuting to Work by Walking and Bicycling

	Walk Commuters			Bicycle Commuters		
	2000 Census	2005-2009 Five Year Estimate	Difference	2000 Census	2005-2009 Five Year Estimate	Difference
Town of Bernalillo	3.2%	2.8%	-0.4%	0.1%	0.0%	-0.1%
North Valley (Census Designated Place)	2.8%	1.9%	-0.9%	0.1%	0.3%	0.2%
Los Lunas Village	2.8%	0.9%	-1.9%	0.0%	0.0%	
City of Albuquerque	2.7%	2.1%	-0.6%	1.1%	1.2%	0.1%
Corrales Village	2.6%	2.4%	-0.2%	0.2%	0.0%	-0.2%
Bernalillo County	2.5%	1.9%	-0.6%	0.9%	1.1%	0.1%
Pueblo of Sandia	1.8%	2.6%	0.8%	0.2%	0.0%	-0.2%
Placitas	1.6%	0.4%	-1.2%	0.0%	0.0%	
Los Ranchos de Albuquerque	1.6%	4.8%	3.2%	0.0%	0.4%	0.4%
Pueblo of Isleta	1.5%	0.9%	-0.6%	0.0%	0.0%	
Sandoval County	1.4%	1.4%	-0.1%	0.2%	0.3%	0.1%
Valencia County	1.4%	1.0%	-0.3%	0.1%	0.1%	0.0%
South Valley (Census Designated Place)	1.2%	0.5%	-0.8%	0.0%	0.6%	0.6%
Algodones	1.2%	5.4%	4.2%	0.0%	0.0%	
Tijeras Village	0.5%	5.1%	4.5%	0.0%	0.0%	
City of Rio Rancho	0.4%	0.8%	0.4%	0.2%	0.4%	0.2%
AMPA Wide	**2.4%**	**1.8%**	**-0.5%**	**0.8%**	**0.9%**	**0.1%**

Source: U.S. Census (population aged 16 years and older)

Today the main challenge for pedestrian and bicycle transportation planning is effectively incorporating these modes in a car-dominant system. This challenge is multifaceted, requiring changes to land use patterns, policy and spending priorities, infrastructure requirements and public perceptions about walking and bicycling. The following table provides a more specific list of these challenges.

Table 2-9: Challenges for Pedestrian and Bicycle Transportation Planning

Both Pedestrian and Bicycle Challenges	Predominantly Pedestrian Challenges	Predominantly Bicycle Challenges	Challenges due to Geography
Improving connectivity in order to overcome long distances due to segregated land uses and providing facilities that effectively connect to major destinations	Developing areas that invite walking	Providing end of trip facilities	Crossing the Rio Grande River, interstates and any other significant physical barriers
Making walking and bicycling travel times as competitive as possible with the automobile	Developing mixed use areas that have shorter distances between uses	Providing safe routes to accommodate bicyclists of all abilities	Negotiating the elevation gain between the valley, west side escarpment, and the foothills
Retrofitting roadways that previously did not provide space for pedestrian and bicycle facilities			
Changing public perceptions about walking and bicycling and providing education on how to safely and effectively use these two modes for transportation			

Connectivity, Expense and Convenience

The private automobile is best suited for providing transportation where destinations (such as home, work, school, etc.) are separated from each other in low densities. This is because destinations are spread out and parking is plentiful in low-density communities. As a result, driving a car to reach these places usually takes less time than other modes.

Figure 2-13: Examples of Local Road Layouts in Different AMPA Neighborhoods

When land uses are more compact and distances between destinations are shorter, pedestrian and bicycle travel work best (although bicycle travel can also work well for longer distances when there are safe and accessible routes provided).

For the most part, our region has developed in such a way that residential areas are separated from commercial areas and employment centers. The roadway system is organized to support this land use pattern with arterial, collector and local roads. Local roads provide the most comfortable facilities for pedestrian and bicycle traffic due to lower speed and volume of motor vehicles. Unfortunately, many newer developments include local roads that do not connect with other roads and terminate in dead-end facilities (such as cul-de-sacs) in an effort to minimize traffic and maximize privacy for homes. This layout of local roads makes it difficult and less convenient for people living in the neighborhood to walk or bicycle to nearby services or school.

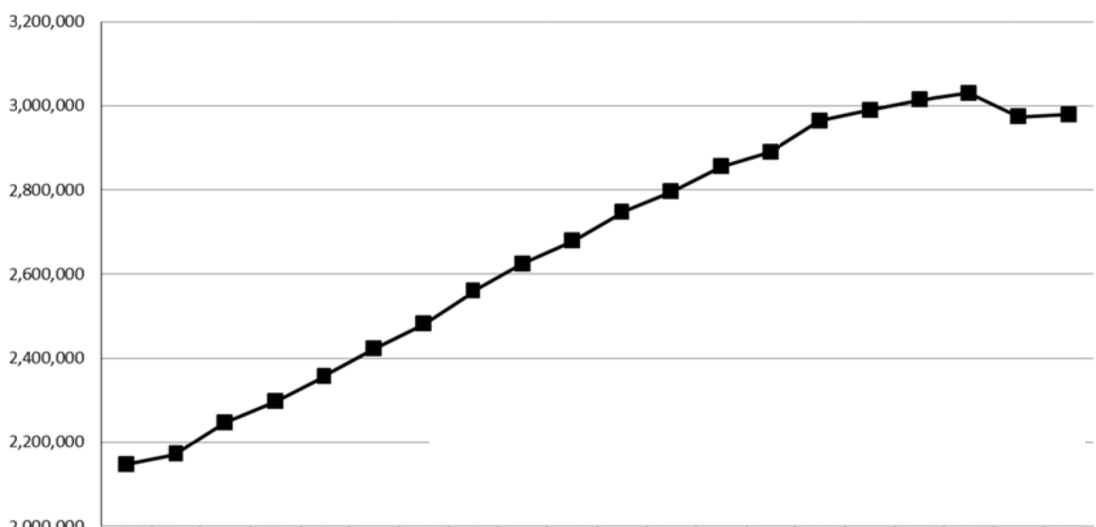
The most efficient and navigable layout for pedestrian and bicycle travel is a grid system which should ideally be designed and built from the development's onset. Older areas in Albuquerque's Eastside are established on a grid system. A good example is Albuquerque's downtown area established prior to 1950 (see Figure 2-13). There is a downside to the Eastside's grid system, however: the major arterials where destinations are located often have insufficient sidewalks and bicycle facilities. In addition, the arterials cross at wide intersections that have high crash rates not only for pedestrians and bicyclists, but also for motor vehicles. Despite the unfriendliness of these arterials to pedestrian and bicycle travel, the grid system provides better access to destinations along these roadways than other street layouts.

Incorporating Alternative Modes

As operating cars become more expensive and less convenient people try other modes. During the gas price spike in 2007 and 2008 vehicle miles traveled per capita dropped (see Figure 2-14) and bus ridership soared. Also city staff had significantly more inquiries for bicycle maps, safety classes and requests for improved facilities during this time period.

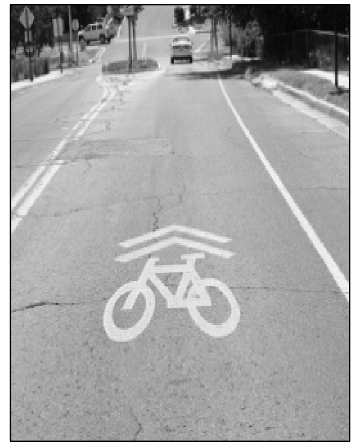
In the future, as driving conditions change and it is no longer relatively cheap and easy for individuals to drive, other modes of transportation must be available and convenient.

Figure 2-14: U.S. Annual Vehicle Miles Traveled (Millions of Miles)



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Annual VMT	2,147	2,172	2,247	2,296	2,357	2,422	2,482	2,560	2,625	2,679	2,746	2,795	2,855	2,889	2,964	2,989	3,014	3,029	2,973	2,979

In areas where parking is limited such as downtown, or during major events like the State Fair, people are more likely to carpool and try alternative modes. Expense and convenience issues are probably best exemplified within the region's university area (and in other college towns around the country). Given space constraints on campuses, it is not practical or economical to provide enough space for everyone attending the school to park a car at the same location. Given that parking at colleges is relatively expensive and inconvenient, and that students are relatively poor and open to new experiences, many students choose to walk, bicycle, take transit or even skateboard for their transportation.



Picture 2-1: Example of Sharrow in Santa Fe, NM

Funding

Funding of bicycle and pedestrian projects has historically been lower than for other modes of transportation. According to the Alliance for Biking and Walking, at the federal level about 1.2 percent of transportation dollars are spent on bicycling and walking. There is growing evidence that greater investment in these modes increases levels of bicycling and walking. In 1997, researchers used the National Bicycling and Walking Study data to investigate the relationship between bicycle commuting and bicycle facilities. They found that each additional mile of bikeway per 100,000 people is associated with a 0.069 percent increase in bicycle commuting. A 2009 follow-up study found that in large cities with populations over 250,000 people, each additional mile of bicycle lanes per square mile is associated with 0.998 percent increase in the percent share of workers commuting by bicycle.[1] For example, in 2000 the City of Albuquerque had 0.31 bicycle lanes per square mile. If this were to increase to 1.31 bicycle lanes per square mile, a significant increase in the density of bicycle infrastructure, an associated one percent increase in the City's bicycle commute to work mode share would be expected. Both studies show a strong correlation between the amount of existing facilities and the share of bicycle commuters.

[1] Nelson, A.C. and D. Allen. If You Build Them, Commuters will Use Them. Transportation Research Record, 1997. and Dill, J. and Carr, T. Bicycle Commuting and Facilities in Major U.S. Cities: If you Build Them, Commuters Will Use Them-Another Look. TRB 2003 Annual Meeting.

Changing Perceptions

A significant challenge to increasing the use of alternative modes such as walking and bicycling is changing people's perceptions, which in large part is accomplished through education efforts. Unfortunately, bicycling and walking often carry the stigma of being less desirable modes of travel whereas automobiles are often considered a sign of social status. In addition, many drivers feel that they have more right to be on the road and resent having to share it with bicyclists or give pedestrians the right-of-way. Moreover, many people choose not to bicycle or walk because they feel these modes of travel are suitable only for the young and fit, or as a result of safety concerns. Public education campaigns can help overcome some of these false perceptions that keep people from choosing bicycle and pedestrian modes of travel.

Safety is a legitimate concern for bicyclists and pedestrians because traveling by these modes means taking on disproportionate risk with every trip, particularly in New Mexico and its urban areas. Ten percent of all trips in the U.S. are by bicycle or foot, yet pedestrians account for more than 13 percent of traffic fatalities. Albuquerque and New Mexico both ranked among the middle third among cities and states for bicycle and pedestrian mode share but were both at the bottom third regarding safety. Table 2-10 shows how Albuquerque compares to other U.S. cities in terms of bicycle and pedestrian safety. As far as both modes are concerned, the city fares worse than the average U.S. city in all three measures for bicycle safety and two out of three measures for pedestrian safety.

Table 2-10: Safety Measures for Bicycle and Pedestrian Travel in Albuquerque, 2005-2007 (compared to 50 largest U.S. Cities)

City	Annual average bicycle fatalities	Bicycle fatalities rate per 10k bicyclists	% of all traffic fatalities that are bicyclists
Albuquerque	3.3	8.5	5.6%
Average (for 50 largest U.S. cities)	2.4	3.3	3.0%
City	**Annual average pedestrian fatalities**	**Pedestrian fatalities rate per 10k pedestrians**	**% of all traffic fatalities that are pedestrians**
Albuquerque	17.7	14.3	29.4%
Average (for 50 largest U.S. cities)	20.1	4.6	26.5%

Source: Alliance for Biking and Walking, 2010 Benchmarking Report

The challenges for pedestrian and bicycle planning are serious, but not insurmountable. Walking and bicycling are worthwhile modes for a wide range of reasons. The most direct impacts are on personal health and expenses. Other benefits include improving the environment, improving traffic congestion, and reducing this country's dependence on foreign oil. For these reasons, improving our transportation network to better include non-motorized modes of travel would benefit individuals and the region as a whole. People who currently use pedestrian and bicycle travel are required to be creative in order to figure out how get around. Likewise, transportation professionals will have to be creative to find ways to accommodate these two modes.

F. Safety

In the United States, motor vehicle crashes are the number one cause of unintentional death for people between the ages of one and 34. According to National Highway Traffic Safety Administration (NHTSA) statistics, an average of 40,000 people die per year from crashes and around 2.5 million are injured. The safety of a transportation system also significantly impacts how accessible services are to the transportation system user. For these reasons, transportation planning in the AMPA should promote safe movement across and within the region.

Whether due to less driving (attributed in large part to the economic recession), better vehicles and facilities, the integration of safety in planning processes, greater public understanding and education, or a combination of these factors, there was a 9.7 percent drop in the number of fatalities and a 5.8 percent drop in the number of injuries nationwide between 2007 and 2008. In 2008, the national fatality rate per 100 million vehicle miles of travel (VMT) fell to a historic low of 1.25, a 13.2 percent drop since 2004.

Locally, there were approximately 84,908 traffic-related crashes that occurred between 2004 and 2008 in the AMPA. Of these crashes, 0.3 percent resulted in fatalities, 30.7 percent resulted in injuries and the remaining crashes resulted in property damage only (see Table 2-11). From 2004 to 2008 the number of crashes in the region declined by almost 19 percent. For more information on key findings for the AMPA region see Appendix E.

Despite this decline in the number of overall crashes, the number of fatal crashes in the region rose by 23 percent in 2008 compared to 2007. In addition, New Mexico's fatality rate of 1.38 per 100 million vehicle miles traveled in 2008 is still above the national average fatality rate of 1.25 per 100 million vehicle miles traveled.

Table 2-11: Crashes in the AMPA, 2004-2008

	2004	2005	2006	2007	2008	2004-2008
Fatal	60	45	49	43	53	**250**
Injury	6,152	5,895	5,366	4,542	4,141	**26,096**
Property Damage	11,646	12,204	12,526	11,903	10,283	**58,562**
Total	**17,858**	**18,144**	**17,941**	**16,488**	**14,477**	**84,908**

Addressing this high fatal crash rate is a critical regional challenge. Other safety challenges in the AMPA include improving major intersections and corridors with high crash rates and reducing alcohol-involved crashes, high pedestrian crash and fatality rates and crashes where young drivers are involved.

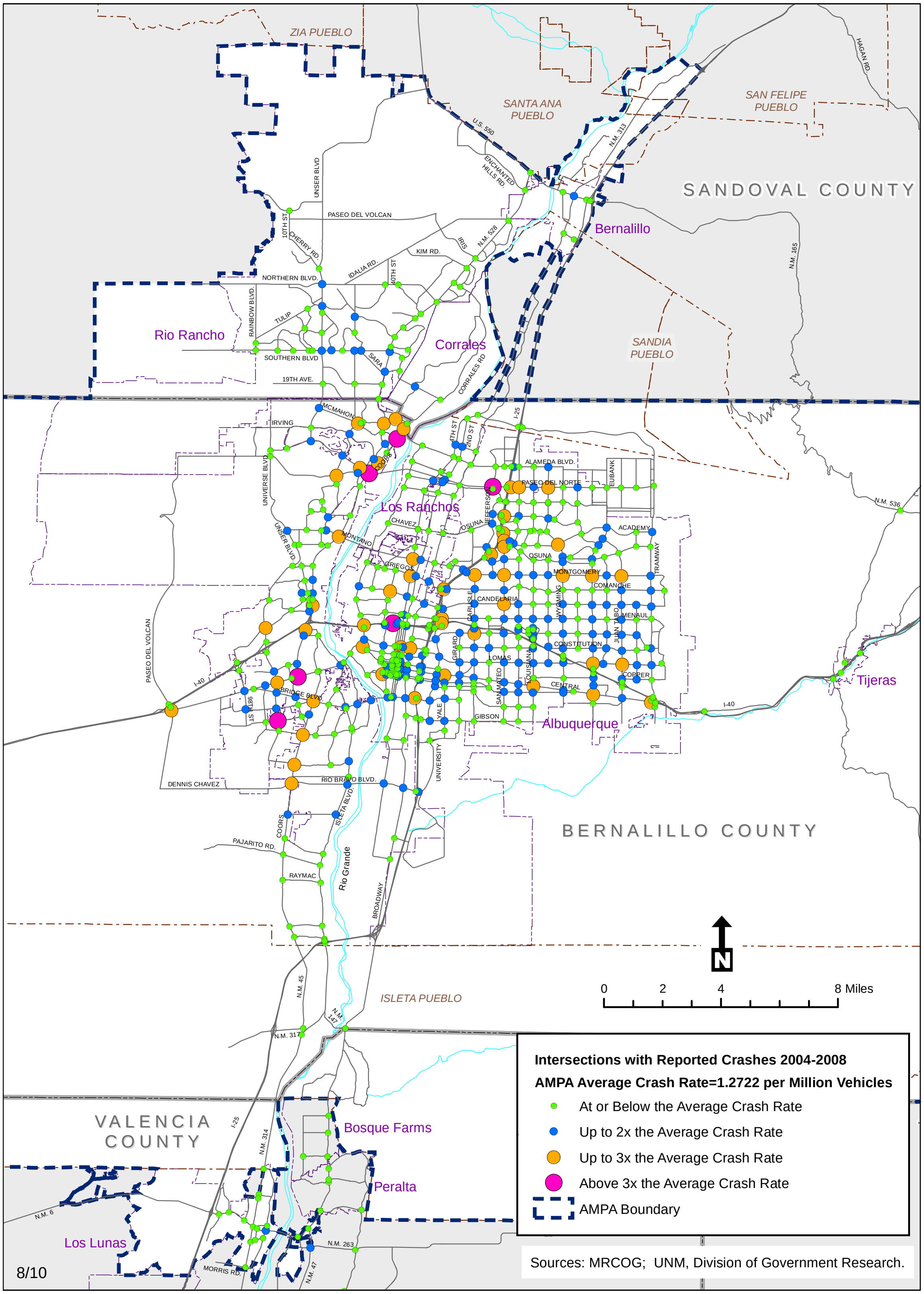
High Crash Rates

In order to provide a better representation of the number of crashes in relationship to the amount of traffic, crash rates were calculated on thoroughfare intersections in the AMPA for the period of 2004 to 2008 by dividing the number of crashes at an intersection by the number of vehicles entering the intersection. These rates are expressed as crashes per million vehicles. Crash rates were also calculated for fatal and injury related crashes, truck, bicycle and pedestrian involved crashes (see the MRCOG *General Crash Report and Trends* for more detailed information). The *General Crash Report and Trends* also includes detailed information and maps on the crash rates for several modes and the location of intersections that have crash rates higher than the AMPA average crash rate. The following are some important findings:

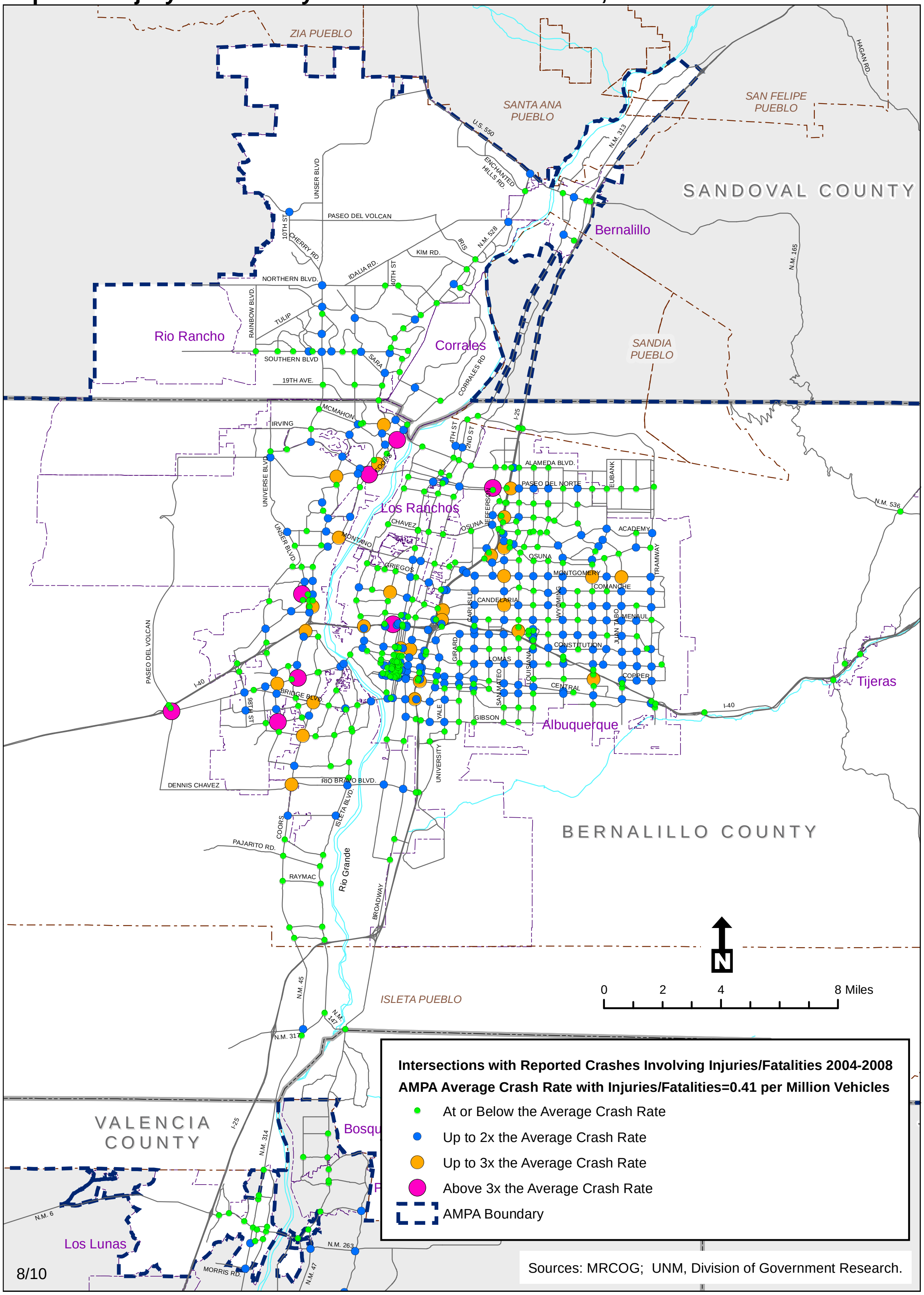
- the intersections with the highest crash rates are primarily concentrated along Coors Boulevard, Paseo Del Norte Boulevard and Central Avenue
- areas with the highest crash rates for bicyclists and pedestrians are around the UNM campus, downtown Albuquerque, and the area in the Northeast Heights bounded by Lomas Boulevard, Indian School Road, Juan Tabo Boulevard and Tramway Boulevard
- intersections that are both in the 'top ten' for crash rates and fatal/injury crash rates include the I-40 South Frontage Road and 6th/8th Interchange, Sage Road and Unser Boulevard, 7 Bar Loop Road and Coors Boulevard, Paseo Del Norte Boulevard and Coors Boulevard, and Central Avenue and Paseo Del Volcan
- one intersection, Gold Avenue and 2nd Street, is included in the top ten for both pedestrian and bicycle involved crashes

Crash rates provide a more accurate picture (than total crash numbers) of the most dangerous intersections for the different modes of traffic in the AMPA area. High crash rates may occur for a variety of reasons. Often they are due to driver inattentiveness and speed. However, other factors include lack of adequate facilities for the more vulnerable non-motorized modes, roadway design that encourages speed, and sight issues or traffic generators (such as high schools or universities) that produce an increased number of young drivers. Further analysis is needed on the location of crashes according to time of day and week, adjacent land use, any patterns in the type of crash by location (e.g. side swipe or hit from behind), and if adequate transportation facilities exist for all modes.

Map 2-10: Crash Rate at AMPA Intersections, 2004-2008

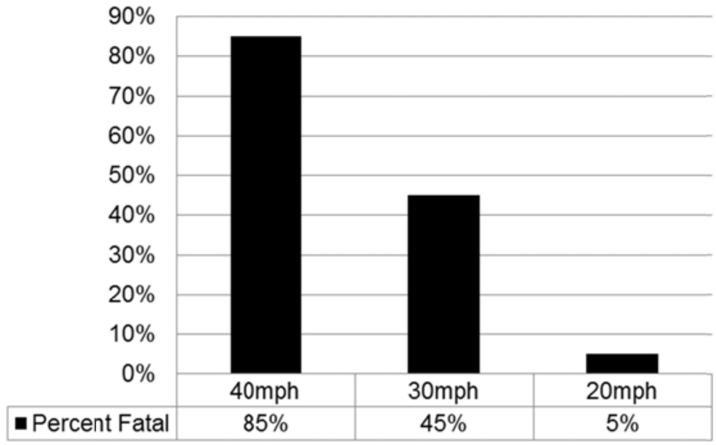


Map 2-11: Injury and Fatality Crash Rates in the AMPA, 2004-2008



Pedestrian and Bicycle Crashes

The pedestrian fatality rate per 100,000 in population for New Mexico remains the seventh highest in the nation, and the bicycle crash rate is the third highest in the nation. And, a particularly alarming statistic for the AMPA is that of all fatal crashes, 24 percent involved a pedestrian. Overall, pedestrian and bicycle crashes occur most frequently along Central Avenue. Although the percentage of injury crashes increased slightly, bicycle safety appears to be faring better, and fatal crashes involving bicyclists have dropped since 2007. A study involving pedestrian fatality rates by vehicle speed concluded that for a pedestrian and motor-vehicle involved crash there is an 85 percent chance that the impact will be fatal to the pedestrian if the speed is 40mph or above. This statistic is compared to a five percent chance of a pedestrian fatality if the speed is at 20mph and below and a 45 percent chance if the speed is between 20 and 30mph (See Figure 2-15).



Contributing Factors

Alcohol Involvement

The involvement of alcohol in crashes is a challenge that continues to afflict the region. According to the National Highway Traffic Safety Administration's Fatality Analysis Reporting System (FARS) database, alcohol-impaired fatalities accounted for 32 percent of all traffic deaths in 2008 nationwide.

- 4.3 percent of all crashes involve alcohol in the AMPA and of these crashes 54 percent resulted in fatal crashes
- Alcohol-involved fatal crashes occur more often on Sunday (30 percent of fatal crashes involving alcohol) and during the last hours of the evening through the early-morning hours.
- During the week alcohol-involved crashes occur most often during late afternoon through the early hours of the morning.
- The highest percentage of alcohol-related crashes involved 20-24 year-old drivers (most of whom are male).

Age and Gender Indicators

According to the National Highway Traffic Safety Administration, motor vehicle crashes are the leading cause of death for U.S. teens, accounting for more than one in three deaths. In 2009, about 3,000 teens in the United States (15–19 years old) were killed and more than 350,000 were treated in emergency departments for injuries suffered in motor vehicle crashes. Following are some age and gender related crash statistics for the AMPA:

- persons 20-24 years old were involved in more fatal crashes than any other age groups
- drivers 20-24 had the highest percentage of pedestrian fatality involvement
- drivers 20-24 had the highest percentage of involvement in cyclist fatalities and injuries
- the proportion of male drivers in fatal crashes was nearly 2.5 times as high as the proportion of female drivers
- male drivers were involved in 63 percent of pedestrian fatalities
- drivers 65 years and older were involved in 7.5 percent of all crashes
- drivers 65 years and older were involved in 14 percent of all fatal crashes and 11 percent of all fatal crashes involving pedestrians

Impending Safety Challenges

Safety challenges that MRMPO and other partners will have to address in the future include the rise in distracted driving related to cell phone use and the increased number of older drivers on the roads (the 65-year and older population are more likely to die or be injured in crashes than the general population). In response distracted driving dangers, the cities of Santa Fe, Las Cruces, and Albuquerque have passed laws restricting cell phone use while driving. On a state level, there is discussion of passing legislation that would address cell phone use; however, no specifics have yet been identified. There has also been discussion at the state level about requiring that seniors renew their licenses more frequently and including a test of physical reaction time. For younger drivers discussion has begun on extending permit duration and increasing penalties for any kind of cell phone use.

The AMPA has significant safety challenges to address that include further analyzing major intersections and corridors with high crash rates, prioritizing the improvement of roadway safety for pedestrians and bicyclists, and increasing education and enforcement around safe driving habits for young drivers. Addressing these challenges requires a variety of strategies aimed at, but not limited to, behavior, design, and enforcement. These strategies are further discussed in Chapter 3.

H. Security

Security planning for transportation in the AMPA takes place under an all-hazards framework, meaning that events ranging from large-scale hazardous materials spills, train derailments, and terrorist threats to emergency weather events are all accounted for in the planning process. MRMPO coordinates with local emergency preparedness committees in order to review the surface transportation system for possible security vulnerabilities and implementable mitigation measures.

Emergency Preparedness

The Albuquerque-Bernalillo County Local Emergency Preparedness Committee (LEPC) focuses on hazardous materials locations and is responsible for monitoring the number and location of the area's hazardous materials permits. A major concern of the LEPC's is the frequent closures of interstate facilities which can force tractor-trailers onto neighborhood streets and result in loads of various substances being parked adjacent to one another, especially as residential neighborhood areas are particularly vulnerable to the distribution of toxic materials. Concern about the closure of interstates potentially creating dangerous conditions has also been voiced by freight carriers.

Inter-governmental coordination for emergency preparedness is addressed through the Federal Executive Board's Emergency Preparedness Committee (FEB-EPC). The FEB-EPC teams include representatives from all federal agencies with offices in New Mexico. Local law-enforcement, fire and other first-response agencies coordinate joint emergency-preparedness related exercises. These can range from exercises conducted entirely on paper, desk-top exercises where incident managers role-play to manage hypothetical situations, to full-scale field tests of emergency procedures, equipment and training. The FEB-EPC also promotes training for Continuity of Operations in the event that a natural or man-made disaster disrupts normal business operations.

Emergency operations personnel at the Albuquerque Emergency Operations Center have noted that not all on-ramps have closable gates to prevent vehicles from entering the interstates in the event of an evacuation. Ideally, the freeway system would be designed to allow inbound freeway lanes to be converted into outbound traffic lanes for an evacuation event. For example, the ramp gates installed along eastbound I-40 prevent freeway access in the event of a closure in Tijeras Canyon.

Finally, Intelligent Transportation Systems (ITS) play a key role in conveying emergency information to the motoring public. Video cameras can monitor freeways during an evacuation event, and Dynamic Message Signs can inform drivers of closures, delays and the appropriate course of action.

I. Air Quality

In the coming decades vehicle miles traveled, population and employment in the region are all expected to increase significantly. By 2035 the total vehicle miles traveled in the AMPA is expected to nearly double from 16.2 million to 31.8 million, population is expected to increase by about two percent per year, and employment is projected to increase by 1.45 percent annually with more than 630,000 persons employed. This growth poses potential challenges for the region's air quality as these three factors contribute to on-road vehicle emissions. These concerns are amplified by the fact that ground level ozone concentrations are expected to exceed pending standards proposed by the U.S. Environmental Protection Agency (EPA). Consequently, the AMPA must look for methods to substantially reduce emissions and improve air quality.

Pollutants in the Region

Air quality is monitored within the AMPA and areas are designated as attainment or nonattainment areas according to whether they meet National Ambient Air Quality Standards (NAAQS) for each pollutant. In Bernalillo County, ground-level ozone, carbon monoxide (CO) and coarse and fine particulate matter (PM) are monitored to ensure compliance with NAAQS.

In the past, the metro area experienced excessive carbon monoxide (CO) emissions, and Bernalillo County developed controls to achieve attainment with the carbon monoxide standard under a Maintenance Plan (the 20-year interval for Bernalillo County began in 1996 and runs through 2016). A Limited Maintenance Plan was proposed and accepted by the local Air Quality Control Board (AQCB) when Bernalillo County demonstrated monitored levels of carbon monoxide at less than 85 percent of the relevant NAAQS. Bernalillo County qualified for this and received local and federal approvals for its Limited Maintenance Plan in 2005-2006. Regional transportation plans, programs and projects must still demonstrate conformity with a Limited Maintenance Plan, but in lieu of the prior regional emissions modeling that had to be performed to determine conformity, MRMPO must verify with the Federal Highway Administration that carbon monoxide levels remain at acceptable levels.

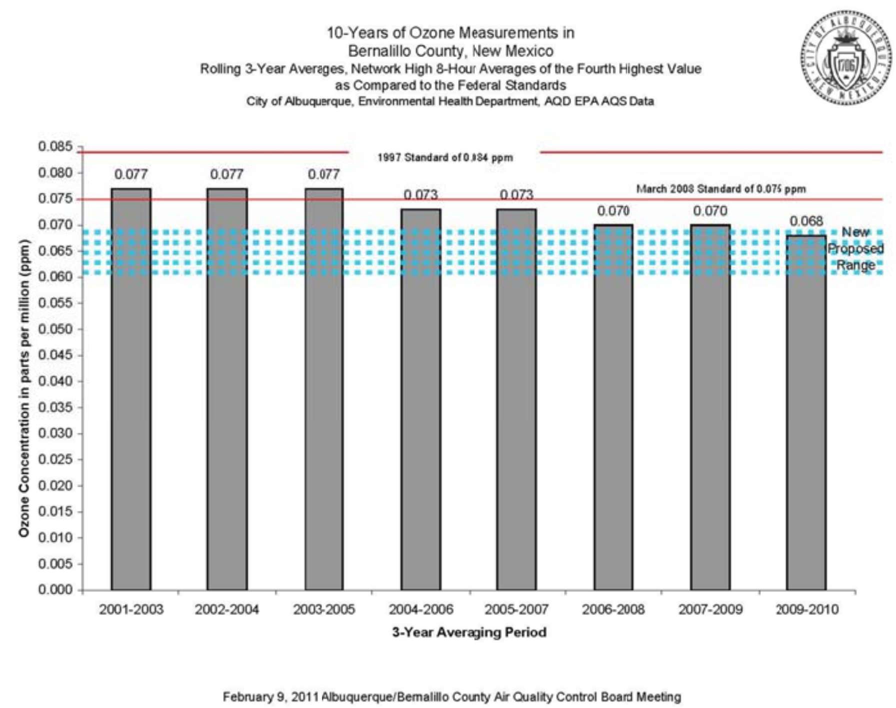
Bernalillo County has taken measures to reduce particulate matter emissions. Through its Fugitive Dust Control Requirements and Surface Disturbance permitting process, Bernalillo County requires that dirt tracked onto paved surfaces be promptly removed and that measures be taken to control dust from operations, such as construction, landscaping and roadwork at all times.

Upcoming Ozone and Transportation Conformity Issues

Another pollutant that is likely to become an issue in the region is ozone. Unlike other pollutants, ozone is not directly emitted but is produced by a complex chemical reaction between two ozone precursors in the presence of sunlight and heat. Principal among the ozone precursors are volatile organic compounds (VOCs) such as raw fuel vapors and oxides of nitrogen (NOx) formed primarily during the combustion of fossil fuels. Therefore, the control of ozone formation is based on regulating emissions of volatile organic compounds and oxides of nitrogen. On-road vehicle emissions are sources of both precursors. Since ozone does not form immediately, and because heat and sunlight are actors in its creation, ozone can form miles away from the original source of its precursors and forms more readily during the hot summer months.

In January 2010, the EPA proposed a more stringent revision to the current ozone NAAQS to ensure that the standard protects public health. The EPA is reconsidering setting revised primary and secondary Ozone Standards in the range of .060 to .070 parts per million, which will more than likely place the AMPA at 100 percent or more of the standard and potentially in nonattainment status. Although the new standards were not confirmed at the time of this writing, potential changes and designations must be made within one year of being published in the Federal Register.

Figure 2-16: Ozone Levels in Bernalillo County as Compared to the National Ambient Air Quality Standards, 2001-2010



Source: City of Albuquerque, Environmental Health Department, Air Quality Division

State Implementation Plan

Upon designation of a nonattainment area, the Federal Clean Air Act requires the preparation of a State Implementation Plan that demonstrates how an area will subsequently meet and maintain established standards. Similarly to CO non-attainment, control measures in the plan must be issued by the Local Board (AQCB). Federally supported transportation plans (such as the MTP), programs and projects in nonattainment areas must conform to the State Implementation Plans for air quality and ensure that they will not cause new, or contribute to existing, air quality problems. This is referred to as conformity determination and requires rigorous analyses to demonstrate compliance with State Implementation Plans. This means that if the AMPA exceeds the ozone standard, it may be more difficult for agencies to utilize federal transportation dollars for general purpose lane additions to the roadway system, there may be additional pressure on transportation agencies to reduce dependency on auto travel, and additional regulatory requirements as stated under Transportation Conformity may be required to reduce the production of ozone.

An area may be re-designated as a maintenance area once it has measured three consecutive years of compliance for that regulated pollutant. Once re-designated to a maintenance area, a maintenance plan once again is required to demonstrate that standards will be met and maintained for the next 20 years (in two 10-year intervals). Transportation plans in designated maintenance areas must conform to State Implementation Plans as well. It should be noted that the control strategies are not allowed to be vacated until the area has met all requirements.

Given the likelihood that the new ozone standards will be officially lowered and that the AMPA could fall into non-attainment status, MRMPO may face the daunting possibility of complying with a new State Implementation Plan for ozone. It is likely this new plan will require aggressive emission reductions strategies that will be more difficult to achieve in light of the significant growth projected for the region. Improving air quality is not only important for steering the region back into compliance with NAAQS, but also for the simple sake of protecting the region's valued clear skies, vistas and clean air.

Climate Change and Greenhouse Gas Emissions

The transportation sector is a major contributor to climate change, an issue which is increasingly considered during the metropolitan transportation planning process. Climate change can be understood as the accumulation of greenhouse gases trapped in the Earth's atmosphere which result in higher average global temperatures than would otherwise be expected. These rising temperatures in turn cause a host of adverse changes to the planet's physical and biological systems.

Greenhouse gases are produced primarily by the burning of fossil fuels. Although it is true that temperatures and climatic patterns naturally vary over time, there is overwhelming agreement within the scientific community that the changing climate is largely caused by greenhouse gases produced by human activities. The issue is no longer whether or not climate change is indeed occurring, but rather, how we can stop contributing to the problem and start mitigating its effects.

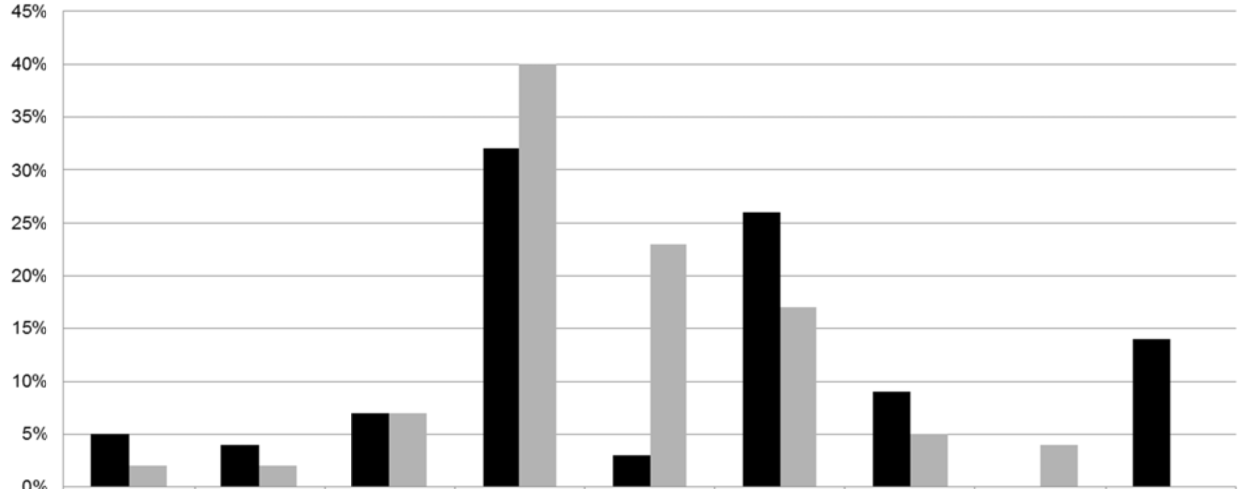
Globally, climate change is expected to produce a number of undesirable changes including a warming of the Earth's surface temperature, sea-level rise, an increase in storm intensities, melting of polar ice, warming and acidification of the oceans, increased occurrences of droughts and floods, reduced water supplies, and a rise in human diseases. It is estimated that the earth's surface temperature may warm 2° to 11°F by the end of this century.

Closer to home, the American West is experiencing change faster than anywhere else in the U.S. and is predicted to have more extreme temperature days which could affect river flow, crops and electricity consumption. According to projections published on the New Mexico Environment Department's website, potential effects of climate change in New Mexico include earlier snowmelt, reduced snow pack, a shorter frost season and significant decreases in soil moisture. Analysis by Tetra Tech for the Natural Resources Defense Council examined the likely effects of climate change on current water demand and found that by 2050, 82 percent of New Mexico counties will be at a moderate to extreme risk of water shortages. This means that climate change will substantially increase the risk that water supplies will not be able to keep pace with demand in most of the state, including the three counties in the AMPA.

As is the case nationally, transportation in New Mexico is one of the sectors that contribute significantly to greenhouse gas emissions. Nationally, the transportation sector contributes approximately 26 percent of total greenhouse gas emissions second only to the electricity sector (32 percent). In New Mexico the transportation sector contributes about 17 percent of greenhouse gas emissions behind electricity (40 percent) and the fossil fuel industry (23 percent). See Figure 2-17 for all contributing sectors.

The relatively low percentage of emissions in New Mexico which are attributable to transportation does not mean climate change considerations can be ignored. In fact, the likely reason transportation emissions are lower in New Mexico compared to national levels is because the state's fossil fuel production industry is significantly large compared to New Mexico's relatively small population (in many states fossil fuel production emissions are negligible). Although the transportation sector accounts for fewer emissions in New Mexico than nationally, New Mexicans actually consume more fuel and produce more transportation-related greenhouse gas emissions per capita than the average American. Additionally, electricity and transportation sector emissions are expected to grow faster than other sectors in the state in the coming years according to the New Mexico Climate Change Advisory Group's 2006 Final Report.

Figure 2-17: Gross Greenhouse Gas Emissions in U.S. and NM by Sector, 2000



	Industrial Processes	Waste	Agriculture	Electricity	Fossil Fuel Industry	Transportation	Residential/Commercial	Non-Fossil Fuel Industry	Industrial Fuel Use
US	5%	4%	7%	32%	3%	26%	9%	0%	14%
NM	2%	2%	7%	40%	23%	17%	5%	4%	0%

Source: New Mexico Climate Change Advisory Group, Final Report December 2006

In response to climate change, transportation decision makers will have to decide how to reduce greenhouse gas emissions and assess their potential effects on transportation infrastructure. For example, the severity of extremely high temperatures can cause structural damage to highways, deteriorate pavement and asphalt, and increase maintenance demands on roads. With a projected significant increase in the number of high temperature days by the end of the century, climate change is likely to cause a series of problems for New Mexico state highways.[2]

Transportation sector greenhouse gas emissions

There are at least six greenhouse gases that contribute to climate change, but carbon dioxide (CO_2), a product of fossil fuel combustion, is by far the main gas produced by human activity. About 85 to 95 percent of all greenhouse gas produced by transportation is CO_2. The main factors that affect how much CO_2 is produced by transportation sources include the fuel efficiency of vehicles, the type of fuel used to power vehicles, and the number of vehicle miles traveled (VMT).[3] The response to these challenges is discussed in Chapter 3 under Transportation Demand Management.

[2] Currently, high temperature days (those at or above 90°F) have a five percent chance of occurring for a given year but are predicted to have a 50 to 100 percent chance of occurring for a given year by the end of the century according to the FHWA(http://www.fhwa.dot.gov/hep/climate/climate_effects/effects03.cfm#sec3_7).

[3] "Operations" is also sometimes included as the fourth factor affecting how much CO_2 is produced by transportation sources. Examples of operations include traffic flow, speed limits, traffic systems management, truck idling, and driver behavior (for example, driving at moderate speeds and slowly accelerating produces less emissions than doing the opposite).

This page intentionally left blank.