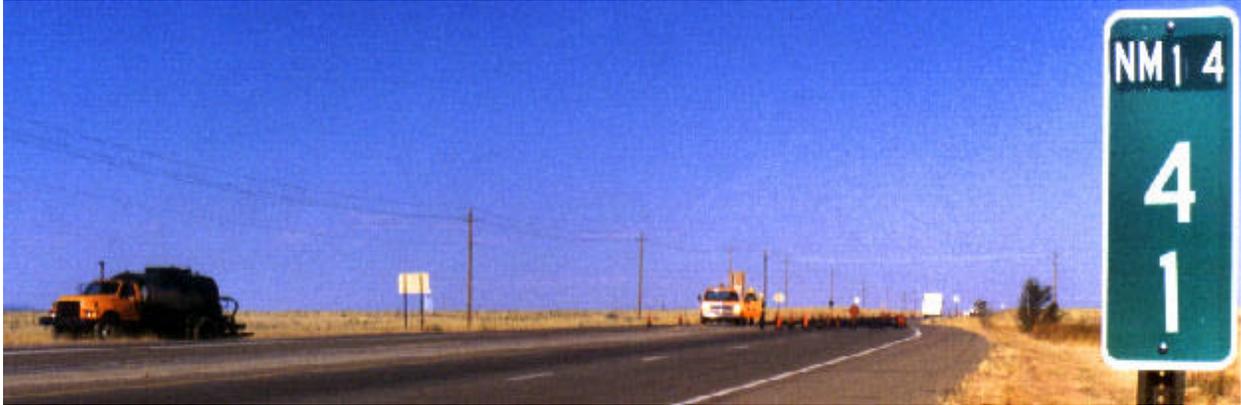


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9.0 Highway Safety Plan



NMSH & TD road crew maintaining the Turquoise Trail

9.1 SAFETY RECORD

The accident data used in this chapter are derived from the NMSH&TD, primarily from their 1996 and 1997 database and from their 1997 New Mexico Traffic Crash Information booklet.

New Mexico highways have significantly higher crash and death rates than the United States national average. The New Mexico crash rate was 2,996 per 100,000 people, while the national rate was 2,513 per 100,000 people. The specific rates for the byway are unavailable, although data on specific crashes are known. Some of the highlights of those data follow.

The Turquoise Trail comprises four New Mexico state highways: NM 14 (46.5 miles), NM 536 (13.6 miles), NM 333 (0.6 miles), and NM 337 (0.5 miles).

9.2 TRAFFIC FLOWS

The traffic flows shown were obtained from the Middle Rio Grande Council of Governments(MRGCOG). The MRGCOG data are available for Bernalillo and Sandoval Counties, but not for Santa Fe County. The traffic on the byway has increased significantly over the past ten year, due primarily to an increase in the local population. Over the past three years, the rate of growth has slowed. Traffic figures for the entire byway are not available; however, the figures that are available cover the most traveled portions of the byway and likely reflect the changes on the byway as a whole. Selected traffic flows follow for 1995 and 1997. The data are for both directions and are an average daily flow for Monday through Thursday.

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	<u>1995</u>	<u>1997</u>
I-40 west of the Turquoise Trail south terminus exit 175	45,000	45,600
I-40 east of the Turquoise Trail south terminus exit 175	28,600	29,700
NM 333 west of the NM 337 and NM 333 intersection	3,900	5,900
NM 333 east of the NM 14 and NM 333 intersection	4,400	5,200
NM 337 south of the NM 337 and NM 333 intersection	6,900	7,300
NM 14 just north of I-40	12,300	12,600
NM 14 just north of Sandia Park	3,200	4,300
NM 14 in Sandoval County	1,100	1,300
NM 536 just west of the intersection of NM 14 and NM 536	2,200	2,700
NM 536 at the top of Sandia Crest	700	800

A flaw exists in the MRGCOG data, if the figures are used to measure tourism flows. The counts are for Mondays through Thursdays. Since weekend travel, the primary tourism time, is not counted the data are skewed. This is illustrated by numbers from alternative sources. For example, a U. S. Forest Service survey indicates that more than 2 million people visited Sandia Crest in 1997 using an average count of 2 people per vehicle. In contrast, the 1997 road data at 800 vehicles per day in both directions indicates less than 300,000 people.

The following Annual Average Daily Traffic (AADT) flows and estimates were obtained from NMSH&TD for Madrid just north of the town at NM 14 mile post 28.8. The item to note is the tremendous growth they expect over the next twenty years.

1996 (Actual)	2000 (estimate)	2010 (estimate)	2020 (estimate)
2,211	2,622	3,840	5,057

AADT flows at NM 14 mile post 38.265 just a few miles north of Cerrillos has already increased dramatically from 2353 in 1990 to 6917 in 1997. The growth has been primarily from people moving into the area and not from tourism.

9.3 ACCIDENTS

The crash rates in Bernalillo, and Santa Fe Counties were over 200 per hundred million vehicle miles which are among the highest rates in the state. Sandoval, a more rural county, had a lower crash rate which was between 101 and 200 per hundred million vehicle miles. Approximately five miles of the byway are located in Sandoval county with the remainder in Bernalillo and Santa Fe counties.

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CRASHES

<u>Highway</u>	<u>1997</u>	<u>1996</u>
NM 14	75	96
NM 333	4	5
NM 337	2	5
NM 536	<u>23</u>	<u>23</u>
TOTAL	104	129

FATALITIES

<u>Highway</u>	<u>1997</u>	<u>1996</u>
NM 14	0	5
NM 333	0	0
NM 337	0	0
NM 536	<u>0</u>	<u>0</u>
TOTAL	0	5

Alcohol was a factor in 7.5% of the crashes in New Mexico in 1997. The rate on the byway appears to be significantly higher.

ALCOHOL AS A CRASH FACTOR

<u>Highway</u>	<u>1997 number</u>	<u>1997 %</u>	<u>1996 number</u>	<u>1996%</u>
NM 14	9	12%	11	11%
NM 333	1	25%	0	0%
NM 337	0	0%	0	0%
NM 536	<u>2</u>	<u>9%</u>	<u>3</u>	<u>13%</u>
TOTAL	12	12%	14	11%

Weather was a significant indicator in crashes on the byway played a significant part of the crash rate.

WEATHER AS A CRASH INDICATOR

<u>Highway</u>	<u>1997 number</u>	<u>1997 %</u>	<u>1996 number</u>	<u>1996%</u>
Rain/wet	12	12%	18	14%
Snow/icy	<u>20</u>	<u>19%</u>	<u>13</u>	<u>10%</u>
TOTAL	32	31%	31	24%

Roadway defects were a minor factor in crashes on the byway, with one crash in 1997 and one in 1996 related to highway defects.

Animal related accidents are a factor in byway crashes. In 1996, game on the road

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Animal related accidents are a factor in byway crashes. In 1996, game on the road was a factor in 6 crashes or 5% of all crashes that year. In 1997, game was not a factor in any crashes.

9.4 MOVING TRAFFIC VIOLATIONS

Moving traffic violation data was not obtained for this plan.

9.5 ROADSIDE CRIME

Roadside crime data was not obtained for this plan.

9.6 WEATHER CONDITIONS

Weather plays a significant role in highway safety on the byway. All of the byway is at altitudes above 5,000 feet and rises to over 10,000 feet in some spots.

9.6.1 Snow and ice

Snow and icy are a significant indicator for accidents. The primary factor listed in the crash data was usually driving too fast for the conditions. Considering the total precipitation for most of the area is less than 13 inches per year with over 300 sunny days, it appears that drivers make mistakes on snowy and icy roads.

Although Interstate 40, the major access road to the byway's southern trailhead, is closed on several occasions due to snowy conditions, no one recalls NM 333, NM 337, or NM 14 being closed due to snow. NM 536 which leads to Sandia Crest and an altitude of more than 10,000 feet is sometimes closed to allow the snow crews to clear the road. Four wheel drive vehicles and chains are commonly used on NM 536 in winter; yet, it is very common for two wheel drive vehicles to be used the day after a major snow storm. Please check with the State Police to check road conditions if in doubt.

9.6.2 Wind

Wind is a significant factor on the byway, especially for high profile vehicles. It is common to have straight line winds exceeding 25 mph with gusts reaching more than 50 mph. In winter, the winds create potentially hazardous conditions with wind-chills easily reaching sub-zero temperatures.

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9.6.3 Rain and flooding

As with snow and icy, rain and wet roads are significant indicator for accidents. Flooding and road closings due to flooding are rare. Due to the landscape and road design and the limited number of bridges and low spots, rain and flooding are not usually a problem.

9.6.4 Fire

Fire conditions are constantly monitored in the region, especially since there was a draught in 1996. The threat of fire was also extremely high in 1999. This heightened sensitivity has put forth resources not previously available to the region. Although there is no written emergency plan in place, the area is fortunate to have a professional staff ready to take action. Local, state and federal government agencies are in constant contact to provide a rapid response to a fire emergency, including fire fighting aircraft stationed at Kirkland Air Force Base in Albuquerque. If you visit the byway during dry conditions, you will likely see the personnel and equipment on the roads ready for action. Based on the conditions, roads could be closed for public safety.

9.7 DISASTER PLAN

There is no written disaster plan for the area; however, the same manpower and equipment used to fight fires is available to respond to most common disasters such as chemical and hazardous material spills, and multi-vehicle crashes. The various agencies meet with each other on a regular basis to discuss contingencies.

9.8 ROADSIDE ASSISTANCE PLAN

There is no formal roadside assistance plan. Cellular phone service covers most of the byway. There are intermittent police patrols by the sheriffs department and state police. There are no local police. The fire departments handle fires and medical problems. Several towing companies cover the area. Emergencies are handled by calling 911.

9.9 ROAD DESIGN FAULTS

The road design can be improved; however, the local community does not believe that typical design improvements will result in a lower crash rate. For example, the road can be widened and straightened, a standard technique, in the northern portion of NM 14. The community believes this will just result in vehicles increasing their speeds.

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Since the human resources are not available to prevent these speeding violations, the community believes the natural curves and limited sight which seem to slow drivers down is a better approach

9.9.1 Road design goals

- Reduce total accidents
- Reduce fatalities and injuries when accidents do occur
- Make driving on the byway a pleasure, rather than a job

9.9.2 Road design objectives

- Maintain a scenic and rural character
- Do not straighten roads if they do not reduce accidents
- Do not widen roads if they do not reduce accidents
- Look at the overall design, including operational changes, that will reduce accidents.
- Do not make hardscape changes to the roadway if operational changes reduce the accident rate to the best national levels
- Do not make hardscape changes, such as guardrails to reduce injuries if operational changes reduce the injury rate per accident to the best national levels.

9.9.3 Road design strategies and projects

- Study the relationship between straight roads, highway speed, and accidents
- Study the relationship between highway turnouts and accidents
- Study the relationship between adding a third lane or a divided highway to reduce accidents
- Study non-invasive methods to minimize accidents
- Add a third lane if that will reduce accidents by allowing fast traffic to pass
- Add a third lane if that will increase traveler satisfaction
- Add road turnouts to allow faster traffic to pass

9.10 MAINTENANCE FAULTS

- Roads are not plowed and sanded to the highest national standards
- Roadsides in the right of way are not clean
- Road shoulders, also used by cyclists, have vegetation and debris
- Illegal signs are not immediately removed
- Sidewalk/bikepath have vegetation growing and damaging them

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9.10.1 Maintenance goals

- Never have a pot hole on the scenic byway
- Never allow a visitor to see trash on the side of the road
- Keep all striping looking clean and sharp.
- Maintain the byway to the highest national standards

9.10.2 Maintenance objectives

- Keep the roadway free of weeds
- Keep the roadway free of debris and trash
- Keep the roadway free of ice and snow
- Keep all signs and traffic controls in good working order

9.10.3 Maintenance strategies and projects

- Obtain funding to increase roadside maintenance
- Obtain funding to enhance snow removal in winter
- Obtain funding to monitor the byway for maintenance problems

9.11 OPERATIONAL FAULTS

There is no mechanism in place to reduce accidents to best national rates. While giving out speeding tickets may reduce speeding, it will also alienate the public which is not good for tourism. Other means, such as sensitivity training and enforcement presence, including the use of technology, may be better alternatives.

There are no written plans in place for disasters. While it is likely that the manpower and equipment will be able to handle most situations, it is difficult for to have an independent review of the risks. There are minimal highway patrols, no road service patrols, and poor communications in the most rural areas.

9.11.1 Operational goals

- Local officials should be prepared for any potential emergency
- Emergency response should be among the best in the country
- Non-emergency road service standards should be among the best in the country
- Enforce laws that will prevent accidents
- Educate the public to prevent accidents

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9.11.2 Operational objectives

- Educate the public to comply with motor vehicle laws
- Enforce motor vehicle laws by enhancing human and technical resources
- Create a written emergency plan
- Create methods for faster response
- Provide communication tools for road travelers
- Provide safety information for road travelers
- Create a partnership of tourism, business and government officials to review safety issues that will affect the visiting public.
- Determine the number of tourist flow vehicles on the byway
- Pass laws that will allow technology to reduce accidents

9.11.3 Operational strategies and projects

- Provide phones every mile for roadside assistance at each mile marker.
- Provide police patrols at least every 30 minutes
- Obtain funding for technology to reduce accidents
- Provide safety patrols by non-police personnel
- Provide road service within 30 minutes
- Increase cellular phone reliability
- Obtain funding to provide written safety information for travelers
- Obtain funding to provide signs for safety information for travelers
- Obtain funding to provide radio safety information for travelers
- Obtain funding to implement an emergency plan including mock emergencies
- Obtain funding to educate the public on emergencies including fires
- Sensitivity training for police to handle tourists
- Sensitivity training for locals that drive on the byway to handle tourists
- Measure traffic on weekends at selected points