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I-40 Phase I-A/B Corridor Study Executive Summary, Arizona to Albuquerque, Milepost 0 to 150, CN 6101580

Prepared for
New Mexico Department of Transportation

NMDOT

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1. Introduction

This document summarizes the findings and recommendations for the I-40 Phase I-A/B Corridor Study (I-40 Corridor Study) from the Arizona state line at milepost (MP) 0 to the Atrisco Vista Interchange in Albuquerque at MP 150. The I-40 Corridor Study area covers 150 miles of I-40 and adjacent alternate routes as shown in Exhibit 1. I-40 is the primary west-to-east route to and through central New Mexico and is a primary national freight route. I-40 traverses more than 2,500 miles of the United States beginning in the west in Barstow, California, continuing east to Wilmington, North Carolina.

Exhibit 1. I-40 Corridor Study Map

The I-40 Corridor Study documents the process used to identify the preferred alternative for needed improvements to I-40 consistent with the New Mexico Department of Transportation (NMDOT) Location Study Procedures—the NMDOT process for project development from the planning phase through environmental documentation and preliminary design. The NMDOT Location Study Procedures process serves to (1) identify and evaluate the specific problems and conditions within the study area that may require improvements to the existing highway; (2) identify and evaluate improvement options; and (3) identify the preferred alternative.

The NMDOT Location Study Procedures process is consistent with the National Environmental Policy Act (NEPA) of 1966 (as amended), the Federal Highway Administration's (FHWA's) Environmental Impact and Related Procedures (23 CFR 771), and federal statewide planning regulations (23 CFR 450, Subpart B).

The lead agency for the I-40 Corridor Study is the NMDOT, with oversight and funding provided by the FHWA. In addition, the study was coordinated with area tribes and federal, state, and local agencies with jurisdiction and/or responsibility for lands and resources within the study area. The public, key governments, agencies, and organizations were invited to participate in the study process including the Acoma Pueblo, Laguna Pueblo, Navajo Nation, and Zuni Pueblo; the Bureau of Indian Affairs; regional transportation planning organizations, including the Mid-Region Council of Governments and the Northwest Regional Transportation Planning Organization; elected officials; and several federal, state, county, and local government agencies.

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2. Purpose and Need

The purpose of the I-40 Corridor Study is to improve traveler safety, traffic operations and reliability, and the condition of the roadway and associated infrastructure on I-40.

Meeting the above project purpose requires consideration of:

- Expected traffic growth, especially as it relates to forecasted growth in freight transport.
- Accommodating and adapting to changing technologies that may substantially influence how vehicles operate and how traffic is managed (e.g., autonomous vehicles).

The primary factors contributing to the need for improving I-40 are summarized below:

- Geometrics
  - → A total of 48% of the horizontal curves, 6% of the vertical curves, and 73% of interchange access ramps do not meet current interstate highway design requirements. There are many areas, such as bridges, where inside and outside shoulder widths do not meet current design guidelines.
- Infrastructure Condition
  - → There are many undersized drainage structures that need to be addressed to accommodate 50-year and 100-year storm criteria. A long-term solution is needed in the Fort Wingate area near MP 33 due to ongoing flooding that causes closures of both I-40 and parallel alternate route NM 118.
  - → A total of 5 bridges are currently in poor condition.
  - → Based on 2022 data, approximately 37 miles of I-40 mainline pavement are in poor or very poor condition and need to be addressed.
- Future Traffic Growth
  - → Traffic growth, in particular with heavy trucks, may affect future traffic operations. Through most of I-40 in the study area, the existing capacity of 2 lanes is expected to be sufficient to meet a level of service (LOS) C or better through 2050. However, there are spot locations in Gallup and at on-ramps and off-ramps that are expected to degrade below LOS C by 2050 if improvements are not made. LOS D is considered the failure threshold for rural interstate highway and ramp segments located in areas where the population is less than 5,000 as established by the *State Access Management Manual*[1] (SAMM). LOS E is considered the failure threshold for urban interstate highway and ramp segments located in areas where the population is 5,000 people or more per the SAMM. Urban area boundaries in the I-40 study area include Gallup from about MP 13.5 to 29.7, Grants from about MP 78.5 to 85.6, and the eastern edge of Albuquerque near MP 144.5 to 150. While there is some variation between areas identified as rural or urban in the study area, the desired LOS for I-40 from MP 0 to 150 is identified as being LOS C, since the majority of the study area is defined as rural and the majority of trips in the study area, including more than 80% of commercial truck trips and 40% of passenger

[1] NMDOT. 2001. *State Access Management Manual (SAMM), Table 15.C-1*. September 20, 2001.

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vehicle trips, are through trips, meaning they are beginning and ending outside of the I-40 study area. LOS C was identified as being an appropriate target LOS, since the desire is to have similar operating conditions through the I-40 study area from MP 0 to 150.

- Safety
  - → Crashes on I-40 were reviewed from 2016 to 2021 and they have increased since 2016. This increase is most prevalent with crashes involving heavy trucks, which have substantially increased from a low of 34% (177 of 523 crashes) in 2016 to a high of 51% (309 of 600 crashes) in 2021. Fatal and serious injury crash rates on many sections of I-40 in the study area are higher than averages for similar roadways in New Mexico, Arizona, and Texas as shown in Exhibit 2 and Exhibit 3. A high number of crashes involve sideswipes (17%), rear-end collisions (13%), and overturn crashes (14%). These crash types are indicative of spot congestion, lane changes, insufficient ramp merge lengths, and insufficient recovery areas.

Exhibit 2. I-40 Fatal Crash Rates, 2016 through 2021

Freeway Type	Location	Fatality Rate (Fatalities /year/ HMVM)			
		Actual	NM Average [2]	AZ Average [3]	TX Average [4]
Rural	Rural I-40 between MP 0 and 150	*1.76*	1.17	0.13	1.09
	AZ to Gallup MP 0.0 - 16.1	*1.84*			
	Gallup to Thoreau MP 26.3 - 53.0	*2.08*			
	Thoreau to Grants MP 53.0 - 78.9	*1.06*			
	Grants to Laguna MP 85.6 - 114.7	*1.69*			
	Laguna to MP 150 MP 114.7 – 150.0	*1.99*			
Urban[1]	Grants Urban Area MP 78.9 - 85.6	*1.81*	1.10	0.08	0.91
	Gallup Urban Area MP 16.1 - 26.3	*1.19*			

AZ = Arizona, HMVM = hundred-million vehicle-miles, NM = New Mexico, TX = Texas

1 For this analysis, urban areas are defined as the limits between interchanges in Gallup and Grants.

2 NMDOT. 2020. *NMDOT Highway Safety Improvement Program 2020 Annual Report*.

3 Arizona Department of Transportation. 2020. *Highway Safety Improvement Program 2020 Annual Report*.

4 Texas Department of Transportation. 2020. *Highway Safety Improvement Program 2020 Annual Report*.

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Exhibit 3. I-40 Serious Injury Crash Rates, 2016 through 2021

Freeway Type	Location	Serious Injury Rate (Serious Injury/ year/ HMVM)			
		Actual	NM Average [2]	AZ Average [3]	TX Average [4]
Rural	Rural I-40 between MP 0 and 150	*1.79*	1.70	0.32	3.00
	AZ to Gallup MP 0.0 - 16.1	*2.50*			
	Gallup to Thoreau MP 26.3 - 53.0	*1.36*			
	Thoreau to Grants MP 53.0 - 78.9	*1.63*			
	Grants to Laguna MP 85.6 - 114.7	*2.02*			
	Laguna to MP 150 MP 114.7 – 150.0	*1.75*			
Urban[1]	Grants Urban Area MP 78.9 - 85.6	*1.15*	3.83	0.27	3.5
	Gallup Urban Area MP 16.1 - 26.3	*1.10*			

AZ = Arizona, HMVM = hundred-million vehicle-miles, NM = New Mexico, TX = Texas

1 For this analysis, urban areas are defined as the limits between interchanges in Gallup and Grants.

2 NMDOT. 2020. *NMDOT Highway Safety Improvement Program 2020 Annual Report*.

3 Arizona Department of Transportation. 2020. *Highway Safety Improvement Program 2020 Annual Report*.

4 Texas Department of Transportation. 2020. *Highway Safety Improvement Program 2020 Annual Report*.

- **Traffic Operations and Reliability**
  - → The I-40 corridor provides critical national infrastructure for freight traffic and there is minimal existing intelligent transportation system (ITS) infrastructure in the corridor for a facility of this type. Identified deficiencies include limited closed-circuit television monitoring, dynamic messaging signs to broadcast traveler information, and traffic data collection. Expanding the ITS infrastructure would improve operations and safety. Additionally, there is currently no continuous fiber optic/broadband communication network from the Arizona state line to Albuquerque. Expanding the fiber optic network in the study area is needed to support effective ITS.
  - → Construction projects and maintenance activities on I-40 often result in eastbound or westbound traffic being reduced to a single lane through the work zone. Reducing traffic to 1 lane in the eastbound or westbound direction is challenging with existing traffic volumes during peak travel hours and days. During these times, the estimated capacity of 1 lane is often exceeded and backups on I-40 occur. Rear-end crashes account for 13% of crashes in the I-40 study area, but in construction zones, approximately 27% of crashes are rear-end crashes, which is indicative of congestion or long traffic queues.
  - → The rural and remote nature of some parts of the I-40 study area makes it difficult to respond quickly to crashes and weather-related events and restore traffic flow. Moreover, narrow shoulders limit the ability to divert traffic around crashes and incidents. Adjacent local roads and highways provide alternate routes that cover about 113 of the 150 miles of the study area, but adjacent alternate routes are not available in about 37 miles of the study area. On the existing alternate routes there are roadway capacity and other limitations (such as vertical and horizontal bridge clearances for trucks). In most areas, alternate routes are 2-lane roadways with narrow shoulders and posted speeds of 35 to 55 miles per hour. These roadways travel through rural areas, pueblos, and small communities with multiple access points (driveways and adjacent roadways) and have limited connections to and from I-40.

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3. Phase 1-A: Initial Alternatives Screening

A combination of solutions is needed to address the purpose and need. Because of this, the study team considered several initial alternatives including 7 concepts to improve mainline I-40 and 4 operational enhancements. These 11 initial concepts were screened to 2 proposed build alternatives and 4 operational enhancements that were carried forward for detailed analysis.

3.1 I-40 Improvements

Seven I-40 improvement concepts were evaluated using the screening criteria listed below to determine if they could meet identified needs. Based on this assessment, the most favorable alternatives were recommended for further consideration, development, and evaluation in Phase I-B. Concepts that did not meet the screening criteria were not recommended for further consideration.

- Criteria 1: Address Geometric Deficiencies – The ability of an alternative to address identified horizontal and vertical deficiencies and interchange acceleration/deceleration length deficiencies on I-40.
- Criteria 2: Infrastructure Deficiencies – The ability of an alternative to address identified drainage, bridge, and pavement deficiencies on I-40.
- Criteria 3: Improve Safety – The ability of an alternative to improve safety on I-40.
- Criteria 4: Accommodate Future Traffic Growth – The degree to which an alternative could accommodate future traffic growth. To accommodate future traffic growth, it was assumed that an alternative should maintain at least LOS C or better.
- Criteria 5: Improve Traffic Operations and Reliability – The degree to which an alternative could improve traffic operations during construction, maintenance, and incident management, and address ITS needs.

A brief description of the alternative and the screening results are provided in Exhibit 4.

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Exhibit 4. Phase I-A I-40 Improvement Screening Analysis Summary

Alternative	Description	Screening Result
1. Enhanced 2-Lane	▪ 2 lanes would be provided in each direction, inside and outside shoulders widened to 12 feet on both sides to provide space to manage traffic during incidents, maintenance, and construction. Geometric and infrastructure deficiencies would be addressed.	Not Recommended. Would not address spot locations that degrade below LOS C by 2050.
2. Enhanced 2-Lane with Added Lanes	▪ Same as Alternative 1, only a third lane would be built in specific locations to address capacity needs.	Recommended. Similar to Alternative 1 but corrects spot locations that become congested in the future.
3. Enhanced 2-Lane with a Part-Time Shoulder-Running Lane	▪ Same as Alternative 1, only once the wider Enhanced 2- Lane typical section and supporting ITS elements were constructed, sections of I-40 would be regularly operated as a part-time shoulder-running lane in a select area or areas as part of I-40 operations.	Not Recommended. Strategy requires congestion to be severe, recurring, and consistent, which does not occur in the study area. Alternative is not precluded if conditions change.
4. Enhanced 2-Lane with Passing Lane at Consistent Intervals	▪ Same as Alternative 1, only a third lane/passing lane would be built every 5 miles to provide a space for faster moving vehicles to pass.	Not Recommended. Passing lanes may or may not all address spot locations that degrade below LOS C by 2050. Alternative 2 better meets I-40 corridor needs. This alternative is not precluded if conditions change.
5. 3-Lane Alternative	▪ A third lane in each direction would be built for the entire corridor. Geometric and infrastructure deficiencies would be addressed.	Recommended. Widening to three lanes in each direction is not needed in most areas and increases costs and impacts. Though a third lane is not needed in the reasonably foreseeable future, providing a conceptual layout for a 3-lane highway in each direction would ensure that I-40 spot improvements do not preclude the ability to add lanes to specific areas or through the entire 150 miles if needed in the future.
6. Add a Managed Lane in Each Direction	▪ Same as Alternative 5, only the third lane would be a managed lane, which could include a high-occupancy vehicle lane, toll lane, or special-use lanes (such as a freight-only lane).	Not Recommended. Toll and high-occupancy vehicle lanes require severe congestion to provide a travel time advantage; conditions do not meet guidelines for a freight-only lane. This alternative is not precluded if conditions change.
7. Reversible 2-Lane In Median	▪ Same as Alternative 1, only a 12-foot inside shoulder would not be provided and a reversible 2-lane section would be built in the median of I-40.	Not Recommended. This alternative requires a large footprint and would not be an effective traffic management strategy on this section of I-40 since traffic volumes are relatively balanced in each direction. Alternatives 2 or 5 would better meet corridor needs.

In addition to the alternatives described above, the study team considered the following travel demand management strategies that could shift travel by time of day or to a different travel mode to reduce peak-hour and/or daily traffic demand on I-40:

- Commuter rail service
- Enhanced commuter bus service

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These concepts were eliminated from additional consideration because it was found that the benefits they would provide would not meet critical needs identified for I-40 including:

- Addressing geometric, drainage, bridge, and pavement deficiencies
- Improving safety
- Improving traffic operations and reliability

In addition, development and implementation of improved commuter rail or bus services could be developed at any time as stand-alone projects.

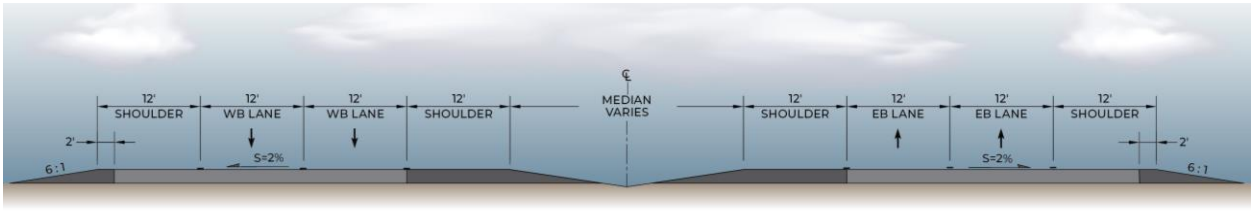
3.2 Alternatives Recommended for Detailed Analysis in Phase I-B

Based on the Phase I-A screening evaluation, the Enhanced 2-Lane with Added Lanes Alternative and the 3-Lane Alternative along with the 4 operational enhancements were advanced for detailed analysis in Phase I-B.

3.2.1 Enhanced 2-Lane with Added Lanes Alternative

This alternative was described in Exhibit 4 and an example typical section is shown below in Exhibit 5.

Exhibit 5. Example I-40 Typical Section: Enhanced 2-Lane with Added Lanes

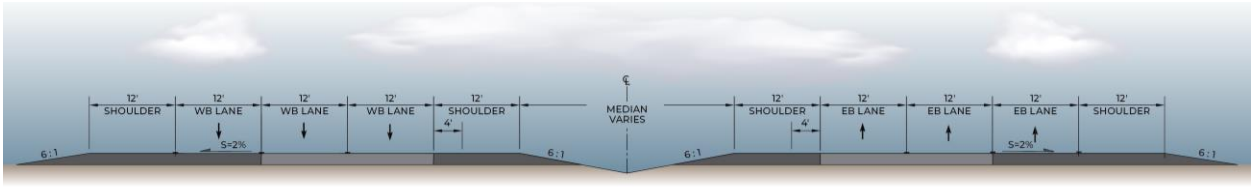


This example shows widening to the inside of I-40. A third lane would be provided in areas where capacity is constrained or where it could benefit safety.

3.2.2 3-Lane Alternative

This alternative is described in Exhibit 4 and is shown below in Exhibit 6.

Exhibit 6. Example I-40 Typical Section: 3-Lane Alternative



This example shows widening to the median; in some areas of the I-40 study area, widening may occur to the outside.

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3.3 Operational Enhancements

Phase I-A included the development of the following 4 operational enhancements that are incorporated as part of both build alternatives for analysis as part of Phase I-B. These operational enhancements would not serve as independent, stand-alone alternatives that could meet the I-40 Corridor Study purpose and need, but would add value to improving operations and reliability on I-40. These operational enhancements are defined and discussed in Section 5.2:

- ITS improvements
- Minimize lane closures during construction and maintenance
- Incident management improvements
- Alternate route improvements

4. Detailed Alternatives Analysis

The criteria used to evaluate the 2 remaining build alternates and the results of the analysis are summarized below:

- Traffic Operations and Future Traffic Growth – Both alternatives are expected to accommodate expected future traffic growth between now and 2050.
- Safety – Both alternatives improve safety by lengthening interchange ramps, correcting curves, and widening shoulders.
- Maintenance of Traffic during Construction – Both alternatives can be built while maintaining 2 lanes on I-40.
- Maintenance of Traffic during Incidents, Maintenance, and Construction Once Built – The Enhanced 2-Lane is a substantial improvement over existing conditions, but the 3-Lane Alternative provides more space and flexibility.
- Right-of-Way Impacts – Impacts are not expected for either alternative, based on conceptual design.
- Environmental Considerations – The 3-Lane Alternative has a larger footprint and more potential effects to cultural and natural resources, but differences are minor.
- Bridge and Drainage Considerations – Both alternatives require widening or replacing bridges, though the 3-Lane Alternative would require more bridge replacements and wider bridges. The 3-Lane Alternative would also require culvert extensions at about 261 locations compared to 47 for the Enhanced 2-Lane with Added Lanes Alternative. Note that each culvert location may have more than 1 culvert.
- Cost – Construction costs for the 3-Lane Alternative are estimated at $31 to $33 million per mile based on 2022 dollars, which is more than the estimated cost of $25 to 27 million per mile for the Enhanced 2-Lane with Added Lanes Alternative. Costs include a 20% contingency and do not include costs for right-of-way acquisition, New Mexico gross receipts tax, project development, interchange ramp extensions, or crossovers. Costs also do not include operational enhancements including improvements to ITS, alternate routes, or incident management. The 3-Lane Alternative will also have higher maintenance costs than the Enhanced 2-Lane with Added Lanes Alternative.

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5. Preferred Alternative

5.1 Preferred Alternative Recommendation

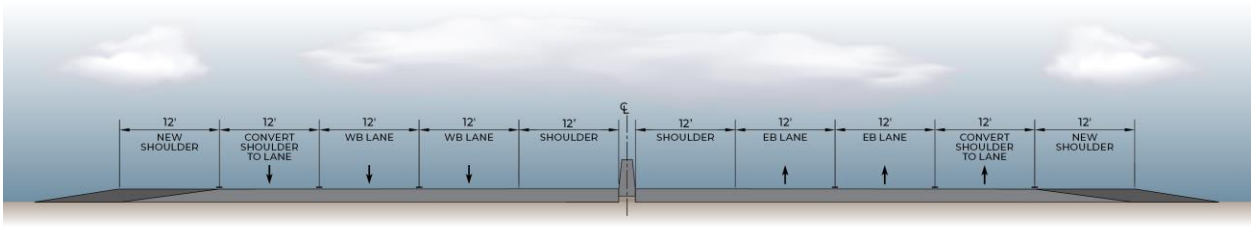
The preferred alternative identified for I-40 from MP 0 to 150 is to construct the Enhanced 2-Lane with Added Lanes Alternative.

Both build alternatives can meet the I-40 corridor needs, and there are no fatal flaws with either build alternative. The 3-Lane Alternative offers better overall operations on I-40 with the addition of a third lane, but it does so at an increased cost when compared to the Enhanced 2-Lane with Added Lanes Alternative. In addition, the 3-Lane Alternative would have a larger footprint, which would result in greater impacts to cultural and natural resources, additional bridges that require replacement or widening, and an increased impact to drainage. The Enhanced 2-Lane with Added Lanes Alternative addresses the purpose and need and does not preclude the eventual construction of a 3-Lane Alternative. Rather, it is future-ready and could be easily expanded to 3 lanes with minimal disruption to traffic if conditions change and 3 lanes are needed. This would allow the NMDOT to make a data-driven decision in the future to expand to 3 lanes in targeted areas to meet needs if conditions warrant.

The Enhanced 2-Lane with Added Lanes Alternative is recommended because it:

- Improves traffic operations and reliability by reducing the main causes of traffic back-ups – construction, maintenance, and incidents.
- Responds to safety and infrastructure needs by addressing pavement condition, interchange ramps that need to be improved, and curves that need to be corrected to meet current roadway design guidelines.
- Meets expected future traffic growth and is “future ready” for easy expansion to 3 lanes by converting one of the shoulders to a lane and adding a new shoulder as shown in Exhibit 7.

Exhibit 7. Example I-40 Typical Section: Expanding the Enhanced 2-Lane Roadway to 3 Lanes



This example shows a typical section where the third lane would be added to the outside of I-40; in some areas, all widening may be done to the median. Many areas of I-40 will continue to have a depressed median; this example shows a location where I-40 would be separated by shoulders and concrete wall barrier.

The Enhanced 2-Lane with Added Lanes Alternative would:

Widen inside and outside shoulders on I-40 to 12 feet on both sides and continue to provide 2 travel lanes in each direction. This would provide space to improve incident management as shown in Exhibit 7 and would allow for 2 lanes to be maintained during construction and maintenance as shown in Exhibit 9.

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Exhibit 8. Incident Response, Existing I-40 Compared to the Wider Enhanced 2-Lane Typical Section

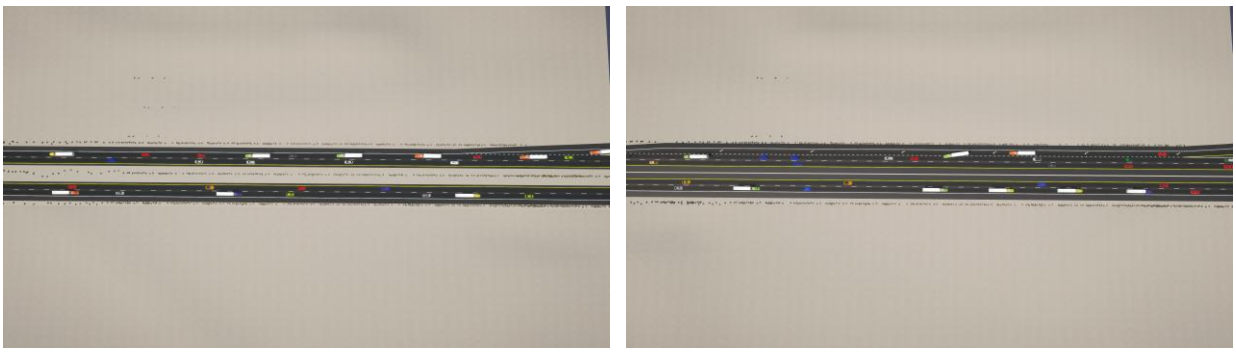
The existing I-40 configuration is shown on the left. The proposed I-40 configuration on the right shows how the wider 12-foot shoulders could be used to get traffic moving if lane closures are needed to respond to incidents.

Exhibit 9. Maintenance, Existing I-40 Compared to the Wider Enhanced 2-Lane Typical Section

The existing I-40 configuration is shown on the left. The proposed I-40 configuration on the right shows how the wider 12-foot shoulders could be used to maintain 2 lanes on I-40 during maintenance activities

- Address bridge, pavement, and drainage deficiencies, which include replacing 5 bridges that are identified as being in poor condition; reconstructing pavement identified as being in poor or very poor condition, and addressing drainage needs that include damaged drainage structures and culverts not meeting hydraulic capacity needs for the 50-year or 100-year design storm.
- Lengthen interchange ramps at 87 locations to address design deficiencies and improve ramp capacity. Exhibit 10 provides an example of potential improvements.

Exhibit 10. Example of a Proposed Ramp Improvement



This graphic shows an example of an existing ramp on the left and an improved ramp that has been extended on the right.

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- Address geometric deficiencies on the I-40 mainline, which includes 70 horizontal curves and 48 vertical curves.
- Build crossovers to accommodate snowplows and emergency vehicles to reverse directions on I-40. The crossovers would also provide a pathway to allow law enforcement to set up a connection for vehicles from one side of I-40 to cross to the other side to keep traffic moving in the event of a crash that requires a closure of 1 direction of I-40. The combination of 12-foot shoulders on both sides of the travel lanes and periodic crossovers would provide flexibility for how I-40 could be managed in cases of lane closures related to incidents, maintenance, or construction.
- Address future I-40 roadway capacity constraints in Gallup by building auxiliary lanes or a third lane for up to 10 miles between interchanges between MP 16 and 26.
- Address I-40 capacity constraints by adding a truck climbing lane on isolated steep grades at 5 locations.

5.2 Operational Enhancements

The preferred alternative also includes the following operational enhancements to address I-40 corridor needs:

- ITS improvements
- Minimize lane closures during construction and maintenance
- Incident management improvements
- Alternate route improvements

5.2.1 ITS Improvements

ITS technologies augment traditional roadway infrastructure by integrating advanced communications technologies to improve transportation operations, efficiency, and reliability. Proposed ITS improvements for I-40 include:

- Data Collection Stations – Upgrade existing data collection systems and add up to 8 additional stations.
- Cameras, Messaging Signs, and Weather Information Systems – NMDOT currently has 9 cameras, 5 messaging signs, and 2 weather information systems that provide real-time information to drivers on I-40. Existing messaging signs would be replaced and additional cameras are proposed. In addition, a variable speed limit advisory sign system is proposed in the Continental Divide area between MP 40 and 55. In this area, variable speed limit advisory signs would be located approximately every 5 miles, where speed reductions may be advised due to weather or other conditions, such as incidents, congestion, or construction.
- Fiber Optic Communications Network – The existing 25-mile fiber optic network located from MP 125 to 150 would be expanded to the entire 150-mile corridor to connect ITS devices and improve information provided to travelers.

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- **District 6 Traffic Management Center** – A Traffic Management Center would be developed in District 6 to enable remote ITS operations and management and to coordinate with key stakeholders such as police, state patrol, and emergency services.
- **Truck Parking Availability System** – The proposed truck parking system would add ITS devices, wireless or wireline communications, and a back-end application to provide information on available truck parking at rest areas near the Arizona state line.

5.2.2 Minimize Lane Closures during Construction and Maintenance

One of the most important findings of the I-40 Corridor Study is that reducing I-40 to a single lane in one direction is problematic during most daytime hours. Roadway construction and maintenance are some of the primary activities the NMDOT conducts in the I-40 study area. As I-40 traffic volumes have increased over time, traditional maintenance of traffic procedures which reduce I-40 to 1 lane are causing traffic congestion and backups. As projects are constructed, it is essential that 2 lanes are provided in each direction. Similarly, for maintenance projects, it is critical that 2 lanes be maintained where feasible.

5.2.3 Incident Management Improvements

Widening roadway shoulders on I-40 will improve the ability of emergency responders to respond to incidents and get traffic moving. Specific incident management recommendations are not provided, since the NMDOT jurisdiction is limited as it pertains to providing incident response. However, I-40 traffic operations and incident response in the study area would benefit from:

- **Establishing incident management as a priority in the I-40 study area and working with the state legislature, the New Mexico Department of Public Safety, the NMDOT, and other law enforcement agencies to improve incident response** – There are multiple ways that incident response could be improved and formalized in the study area, but it would require direction at the legislative level to establish it as a priority and provide funding resources. Reducing incident response times will become more critical as traffic volumes increase on I-40 between now and 2050. In addition, a formal incident response plan will be needed to develop and implement incident management strategies, such as establishing 2-way traffic detours on I-40 or using the proposed wider shoulders for traffic.
- **Push/pull legislation** – Continue to work with the legislature to support push/pull legislation, Currently, New Mexico state law does not provide a provision permitting NMDOT employees to move wrecked vehicles from I-40 and other roadways at the scene of a crash. As such, wrecked vehicles on I-40 are currently moved by tow truck operators under the direction of law enforcement personnel. Providing a provision to permit NMDOT employees to move wrecked vehicles under the direction of law enforcement personnel could improve incident response.

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5.2.4 Alternate Route Improvements

The I-40 Corridor Study included consideration of adjacent frontage roads/alternate routes. Currently, there are about 113 miles of the I-40 study area that have nearby adjacent alternate routes. Those roads are shown on Exhibit 1. Recommendations for these routes include:

- Reconstructing pavement areas where poor pavement is identified, this includes up to 9 miles of roadway.
- Addressing the 5 bridges identified as being in poor condition.
- Consider addressing vertical and horizontal constraints including the concrete box culvert (bridge 6502) that runs under I-40 and carries NM 118 at MP 8.4 and the concrete box culvert (bridge 6307) that runs under I-40 and carries NM 124 at MP 90.58.

6. Public and Stakeholder Coordination

The goals of stakeholder coordination and public involvement for the I-40 Corridor Study were to inform, engage, and involve the public, elected officials, Native American tribes, agencies, and other key stakeholders in the development of alternatives, the selection of a preferred alternative, and development of recommendations.

Exhibit 11 provides an overview of public involvement activities conducted as part of the I-40 Corridor Study. In addition, NMDOT developed and maintained an I-40 Corridor Study website where information was available to the public throughout the duration of the I-40 Corridor Study. The website was visited over 2,500 times.

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Exhibit 11. Summary of Public and Stakeholder Engagement

Stakeholder	Summary
Online Public Meetings	
▪ Meeting 1, November 15, 2022	▪ 56 attendees; 7 people asked questions or made comments at the public meeting, 7 people provided written comments, and 70 people completed an online public survey.
▪ Meeting 2, April 25, 2023	▪ 76 attendees; 15 people asked questions or made comments at the public meeting, 8 people provided written comments, and 34 people submitted comments through an online comment form.
▪ Meeting 3, February 27, 2024	▪ 52 attendees; 21 people asked questions or made comments at the public meeting, 10 people or organizations provided written comments, and 21 people submitted comments through an online comment form.
Tribes and Organizations ▪ Bureau of Indian Affairs ▪ Acoma Pueblo ▪ Laguna Pueblo ▪ Navajo Nation ▪ Zuni Pueblo	▪ Initial meetings occurred in September and October 2022 to provide a study overview, identify contacts and best way to engage tribal staff and members, and discuss I-40 issues and concerns. ▪ Meetings occurred in May, June, and July 2023 to provide an update on study findings and obtain feedback on the alternatives being evaluated. ▪ Meetings occurred in March and April 2024 to discuss study findings and obtain feedback on the preferred alternative and I-40 study area priorities.
Regional Transportation Planning Organizations ▪ Mid-Region Council of Governments ▪ Northwest New Mexico	▪ Initial meetings occurred in September 2022 to provide a study overview, identify contacts and best way to engage staff and members, and discuss I-40 issues and concerns. ▪ Meetings occurred in May and June 2023 to provide an update on study findings and obtain feedback on the alternatives being evaluated. ▪ Meetings occurred in March 2024 to discuss study findings and obtain feedback on the preferred alternative and I-40 study area priorities.
Elected Officials	▪ October 2022 - A written I-40 Corridor Study update was provided. ▪ February 2023 - A written I-40 Corridor Study update was provided. ▪ November 2023 - A presentation was given to the Transportation Infrastructure Revenue Subcommittee on November 13, 2023. ▪ January 2024 - A presentation was given to the New Mexico Transportation Commission at their January 11, 2024, meeting. ▪ March 2024 - I-40 study team members attended the March 21, 2024, New Mexico Transportation Commission meeting.
New Mexico Trucking Association	▪ A survey was conducted in January 2023; 32 people responded.
New Mexico State Patrol	▪ Meetings were held in January 2023 to discuss the I-40 Corridor Study and obtain feedback on issues.

7. Summary of Important Findings

There are several important findings from the I-40 Corridor Study as summarized below:

- **Data Collection** – It is essential that the NMDOT have functional, reliable data collection stations that collect daily traffic volume and vehicle classification information to manage I-40 now and into the future. The NMDOT currently has 4 data collection stations in the study area; however, 3 of these data stations are not currently operational and there are no data stations in the study area currently collecting vehicle classification data. In addition, the historic data collected from the existing data collection stations has been intermittent and unreliable, particularly as it pertains to identifying vehicle classifications. One of the first actions that needs to be advanced in the I-40 study area is to replace the existing data

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collection stations. This will allow for the continuous collection of traffic volume and vehicle classification data that is needed for the NMDOT to better understand current conditions in the study area, seek funding for corridor improvements, and predict and plan for the future.

- Maintaining 2 Lanes during Construction and Maintenance – Reducing I-40 to a single lane in one direction is problematic during most daytime hours. Roadway construction and maintenance are some of the primary activities the NMDOT conducts in the I-40 study area. As I-40 traffic volumes have increased over time, traditional maintenance of traffic procedures that reduce I-40 to 1 lane are causing traffic congestion and backups. As projects are designed and constructed, it is essential that 2 lanes are provided in each direction. Similarly, for maintenance projects, it is critical that 2 lanes be maintained where feasible, or maintenance work is shifted to off-peak travel hours.
- Pavement Condition and Geometric Deficiencies – About 78 miles, or just over half of the corridor needs reconstruction due to failing pavement and/or to correct deficient curves. The remaining (72) miles will need some type of rehabilitation or potential reconstruction over the next 25 years. The NMDOT is doing what they can to keep I-40 operational, but in most cases, they do not have the funding to fully reconstruct the pavement, which is needed in areas where pavement is in very poor condition. The NMDOT assessed pavement in the study area in 2022 (based on 2021 data) and 2023 (based on 2022 data). During this 1-year period, the number of miles of pavement identified as being in poor or very poor condition more than doubled. Mill and inlays are not sufficient for addressing pavement in very poor or poor condition, and they often require closing a lane on I-40 for an extended period, which can cause long backups and delays for drivers. Full pavement reconstruction is needed in areas where pavement conditions are poor or very poor.
- Deficient Ramps – Many crashes in the study area occur at interchanges where traffic merges on and off the highway. There are 87 ramps that do not meet current design criteria and need to be extended. In addition, the operating LOS for at least 25 of these ramps is expected to degrade from an acceptable level of LOS B to LOS D or E, which is below the NMDOT's target threshold of LOS C. Extending the ramps will improve safety and will provide the capacity needed to maintain acceptable traffic operations.
- Bridges – There are 5 bridges on I-40 that are currently in poor condition that likely need to be replaced and another 5 bridges on adjacent frontage roads that are in poor condition. Over the next 25 years, the existing 154 bridges and overpasses will continue to deteriorate and will need maintenance and, in some cases, replacement to keep the roadway operational. Additional funding and a long-term bridge plan are needed to maintain existing bridges in the study area.
- Culverts/Drainage – There are 119 culvert locations that are 60% or more silted and 81 damaged culverts that need repair. In addition, based on a conceptual-level analysis, as many as 336 culvert locations may not have sufficient hydraulic capacity and additional study is needed to determine if hydraulic capacity improvements are warranted. Funding and a long-term plan is needed to address these issues.

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8. Next Steps

Implementing the recommendations from the I-40 Corridor Study will be a long-term effort occurring over many years. The types of projects proposed range from simple maintenance activities that can be completed in a few days to major projects covering multiple miles of I-40 with a construction schedule lasting more than 1 year.

Next steps include working to obtain funding for specific projects and maintenance activities in the I-40 study area from MP 0 to 150. As projects are identified and funded, they will advance into Phase I-C Environmental Documentation, Phase I-D Preliminary Design, and Phase II Final Design.

Additional public outreach will occur in these future phases. Environmental surveys will be conducted as part of Phase I-C. An environmental scoping report was developed as part of the I-40 Corridor Study that includes information on existing conditions, potential impacts of the preferred alternative, and environmental considerations for future projects. This information can be used to identify environmental requirements and level of effort for environmental review.