

INITIAL DESIGN CONCEPT REPORT

I-40, Bellemont to Winona
MP 183-214

ADOT Project No. 40 CN 183 H7586 01L
Federal Project No. STP-040-C(BBR)

Ash Fork – Flagstaff Highway
Flagstaff – Holbrook Highway

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Glossary of Acronyms and Abbreviations

AASHTO	American Association of State Highway and Transportation Officials	IDCR	Initial Design Concept Report
AADT	annual average daily traffic	ITS	Intelligent Transportation Systems
AB	aggregate base	LOMR	Letter of Map Revision
ABC	accelerated bridge construction	LOS	level of service
AC	asphaltic concrete	MP	milepost
ADOT	Arizona Department of Transportation	mph	miles per hour
AGFD	Arizona Game and Fish Department	MSE	mechanically stabilized earth
APS	Arizona Public Service	MUTCD	Manual on Uniform Traffic Control Devices
AR-ACFC	asphalt rubber-asphaltic concrete friction course	NB	northbound
AR-OGFC	asphalt rubber-open graded friction course	OP	overpass
ASMS	Arizona Slope Management System	PBTB	permeable bituminous treated base
AT&T	American Telephone and Telegraph	PC/PS	precast/prestressed
AZPDES	Arizona Pollution Discharge Elimination Systems	PHF	peak hour factor
BNSF	Burlington Northern Santa Fe Railroad	PGL	profile grade line
BQAZ	Building A Quality Arizona	PIL	partial interchange lighting
CBC	concrete box culvert	PT	post-tensioned
CCTV	closed circuit television	R	range
cfs	cubic feet per second	RDG	Roadway Design Guidelines
CIL	complete interchange lighting	RHRS	Rock Hazard Rating System
CIP	cast in place	RMP	Resource Management Plan
CLOMR	Conditional Letter of Map Revision	RWIS	roadway weather information system
CMP	corrugated metal pipe	R/W	right-of-way
CNF	Coconino National Forest	SB	southbound
COE	US Army Corps of Engineers	SPMT	self propelled modular transport
DCR	Design Concept Report	SN	structural number
DDHV	directional design hourly volume	SR	State Route
DEA	Draft Environmental Assessment	SSD	stopping sight distance
DMS	dynamic message sign	SWPPP	Storm Water Pollution Prevention Plan
EB	eastbound	TCE	temporary construction easement
FAST	fixed automatic spray technology	TI	traffic interchange
FEMA	Federal Emergency Management Agency	T	township
FHWA	Federal Highway Administration	TNM	traffic noise model
FIRM	flood insurance rate maps	UP	underpass
FIS	Flood Insurance Study	US	United States
FMPO	Flagstaff Metropolitan Planning Organization	USFS	US Forest Service
FS	Forest Service	USGS	US Geological Survey
FUTS	Flagstaff Urban Trail System	VMS	variable message sign
FY	fiscal year	VMT	vehicle miles traveled
HAR	Highway Advisory Radio	vpd	vehicles per day
HW	headwater	WB	westbound
I-17	Interstate 17		
I-40	Interstate 40		
ICO	issues, concerns, and opportunities		

EXECUTIVE SUMMARY

The Arizona Department of Transportation (ADOT), in partnership with the Federal Highway Administration (FHWA), has initiated a design concept study and related environmental studies to evaluate proposed improvements to I-40 in Coconino County, Arizona. ADOT Project No. 40 CN 183 H7586 01L [Federal Project Number STP-040-C(BBR)] consists of a study to prepare the design concept for the addition of capacity to Interstate 40 (I-40) from west of the Bellemont traffic interchange (TI) at milepost (MP) 183 to east of the Winona TI at MP 214. This project is located within the ADOT's Flagstaff District.

The study will provide a long-range implementation strategy that will guide future decisions regarding the interim and ultimate improvements required to modify I-40 to meet the capacity and operational needs of the traveling public over the next 25-30 years. An Environmental Assessment is being developed in concert with this design concept study. Implementation of the study recommendations will depend on funding availability and priorities of roadway construction projects.

The No Build Alternative and Build Alternatives were developed and evaluated for mainline I-40. In addition, alternatives for improvements to several existing traffic interchanges were developed and evaluated, as well as alternative configurations for proposed new interchanges. The recommended mainline alternative is described below, followed by a summary of the recommended interchange alternatives.

The **Recommended Alternative** consists of widening the mainline to three lanes in each direction, spot improvements to address superelevation, vertical stopping sight distance and grade issues, widening and replacing bridges, reconstructing existing interchanges, and constructing four new interchanges. Three lanes in each direction plus auxiliary lanes in several sections are recommended between MP 183.6 and MP 208.4. In general, the recommended widening concept for the addition of a third lane in each direction is inside widening. Outside widening or reconstruction would be used at specific locations where terrain or lane configurations dictate:

- From MP 188–MP 189 (S-curve rockfall containment area): Outside widening is recommended for the eastbound and westbound alignments in this segment, as well as re-profiling of the existing roadways.
- MP 190–MP 193 (Riordan Railroad Crossing): The eastbound and westbound horizontal alignments through this section will be modified to straighten the existing S-curve over the Burlington Northern Santa Fe railroad tracks and improve the superelevation.
- MP 193–MP 194 (Woody Mountain Road): The eastbound and westbound alignments will be re-aligned toward the inside median and lowered to improve the approach grades of the Woody Mountain Road crossing and accommodate the potential new interchange and trail crossing.
- MP 199–MP 200 (Fourth Street rockfall containment area): The eastbound and westbound alignments will be re-aligned toward the median to mitigate the outside rockfall issues.

Existing Traffic Interchanges

- Bellemont TI – The Realigned Diamond with Roundabouts Alternative is recommended.
- Butler TI – A recommended alternative has not been identified; however, it is recommended that the Roundabout, Signalized Diamond, and Double Crossover alternatives be carried forward for further consideration and public comment and the Three Point Urban Alternative be eliminated from further consideration.

- Walnut Canyon TI – Reconstruction of the TI to a standard diamond configuration is recommended with all four diagonal ramps intersecting the re-aligned cross road at reduced skew angles.
- Cosnino TI – The Diamond Alternative is recommended.
- Winona TI – Reconstruction of the interchange in a configuration similar to the existing interchange is recommended. The cross road will be shifted to the east.

Proposed New Traffic Interchanges

- Camp Navajo TI – A new diamond interchange is recommended.
- Woody Mountain TI – The Diamond Interchange with Roundabouts Alternative is recommended.
- Lone Tree TI – A recommended alternative has not been identified; however, it is recommended that the Braided Over and Braided Under I-40 alternatives be carried forward for further consideration and public comment. It is recommended that the Loop alternatives and the Diamond Over I-40 and Diamond Under I-40 alternatives be eliminated from further consideration.
- US 89 TI – A new tight diamond interchange is recommended.

Approximately 155-158 acres of new right-of-way will be required for the project, depending on the recommended alternatives. Coconino National Forest and Kaibab National Forest manage nearly all of the land on both sides of I-40. State Trust Land and privately-owned land comprise most of the land adjacent to the interstate within the City of Flagstaff limits.

The estimated total cost for the design and construction of the overall project is \$629,761,000, excluding the cost of the new right-of-way.

ADOT's 2011-2015 Five-Year Transportation Facilities Construction Program includes only one line item for this segment of I-40 – \$500,000 for a feasibility study in Fiscal Year 2011 for the new Lone Tree TI at MP 197.

Additional reports prepared for this study include:

- Project Scoping Summary (October 2009)
- AASHTO Controlling Design Criteria Report (March 2010)
- Preliminary Traffic Report (March 2010)
- Preliminary Geotechnical Assessment (March 2010)
- Preliminary Drainage Report (May 2010)
- Biological Evaluation (June 2010)
- Cultural Resources Assessment (July 2010)
- Initial Site Assessment (July 2010)
- Agency and Public Information Meeting Summaries (November 2010)
- Preliminary Noise Analysis Technical Report (January 2011)
- Draft Environmental Assessment (March 2011)

Final versions of some of the reports, as well as a wildlife accident reduction report and an implementation plan, will be prepared with the Final Design Concept Report. In partnership with ADOT, the Arizona Game and Fish Department is conducting a three-year wildlife movement study to help identify wildlife-vehicle crash reduction needs.