

PREPARERS

The following list identifies major contributors in the preparation of the FEIS.

Name	Contribution	Title	Highest Education/Degree		Years/Experience	
<i>Federal Highway Administration</i>						
Jennifer Brown	Senior oversight	Team Leader – Transportation System Performance	MSCE		17	transportation safety and operations
Kenneth Davis*	Senior oversight	Senior Engineering Manager	BS	Civil Engineering	44	highway and transportation projects
Tom Deitering, PE	Senior oversight	Team Lead – Project Delivery	BS	Civil Engineering	16	highway and transportation projects
Mary Frye*	Senior oversight	Environmental Protection Specialist	MA	American History	24	cultural resource compliance, National Park Service park planning, highway and transportation projects
Alan Hansen, PE	Senior oversight	Team Lead – Planning, Environment, Air Quality, and Realty	BS	Civil Engineering	27	highway and transportation projects
Robert Hollis*	Senior oversight	Arizona Division Administrator				
Aryan Lirange, PE	Senior oversight	Senior Urban Engineer	BE	Civil Engineering	19	highway and transportation projects
Lisa Neie	Senior oversight	Civil Rights Specialist	MPA		27	civil rights
Meesa Otani	Senior oversight	Environmental Coordinator	BS	Civil Engineering	5	highway and transportation projects
Layne Patton	Senior oversight	Realty Officer			36	engineering, real estate, transportation, land acquisition
Karla S. Petty	Senior oversight	Arizona Division Administrator	BS	Civil Engineering	26	highway and transportation projects
Ed Stillings	Senior oversight	Senior Transportation Planner	BS	Civil Engineering	25	transportation planning, highway and transportation projects
Steve Thomas*	Senior oversight	Environmental Protection Specialist	AA	Mechanical/Civil Engineering	33	highway and transportation projects
Romare Truely	Senior oversight	Community Planner	MP	Planning	4	transportation planning, freight movement, air quality, tribal transportation
Bill Vachon*	Senior oversight	Senior Transportation Engineer	BS	Civil Engineering	32	highway and transportation projects
Rebecca Yedlin	Senior oversight	Environmental Coordinator	JD	Environmental Law	13	NEPA compliance, environmental planning
<i>Arizona Department of Transportation</i>						
Lisa M. Andersen	Air quality	District Environmental Coordinator	BS	Zoology	22	environmental compliance, air quality
Carmelo Acevedo, PE	Project manager	Senior Project Manager, Urban Project Management	JD	Civil Engineering	37	civil engineer, attorney
Thor Anderson	Strategic oversight	Planning and Environmental Linkages Program Manager			30	environmental planning, hazardous materials
Oliver Antony, PE*	Roadway design	Design Review Engineer	MS	Civil Engineering	53	freeway design
Brock Barnhart	Agency and community oversight	Assistant Communications Director	BA	Business	11	communication, community relations, public involvement
Emily Blinkhorn*	Reviewer	Environmental Planner II, Noise Specialist	BA	Fine Arts	14	NEPA compliance for highway and transportation projects
Misty Dayzie	Cultural sensitivity	Tribal Planner and Coordinator	BS	Business	9	transportation projects, tribal planning and coordination
Dee Bowling	Reviewer	Enhancement Project Manager	BS	Wildlife Biology	24	NEPA compliance for highway and transportation projects
Michael Bruder, PE*	Project manager	Transportation Manager, Valley Project Management	BS	Mining Engineering	27	highway and transportation projects
Matt Burdick	Agency and community oversight	Communications Director	MS	Mass Communications	17	communication in community relations, media relations

\* no longer with organization

PRE	PRE-2 Preparers					
	Name	Contribution	Title	Highest Education/Degree		Years/Experience
	Brent Cain, PE	Senior oversight	Deputy State Engineer	BS	Civil Engineering	26 transportation planning, travel demand modeling, and traffic engineering
	Dennis Crandall	Roadway drainage reviewer	Senior Drainage Engineer	BS	Civil Engineering	31 drainage design, highway projects
	Linda Davis	Cultural resources	Historic Preservation Specialist III/Archaeologist	BA	Anthropology	11 cultural resources
	Mike Dennis*	Air/Noise	Air and Noise Specialist III	BS	Engineering Geology	25 hazardous materials, environmental planning, air quality, noise
	Darlene Dyer*	Reviewer	Environmental Planner III, Biologist	BS	Ecology and Systematic Biology	19 NEPA compliance, biology
	Eddie Edison	Affirmative action	Civil Rights Executive Consultant	BA	Business Administration	26 civil rights enforcement
	Ralph Ellis	NEPA Project Manager	Planning Section Manager	MBA	Business	19 Transportation NEPA compliance
	Pete Eno	Right-of-way	Right-of-Way Coordinator		Surveying (no degree)	51 right-of-way
	Tammy Flaitz	Senior oversight	Transportation Enhancement Program Manager	MS	Geography	27 land use planning, transportation planning
	Fred Garcia*	Air/Noise	Air and Noise Specialist III	AA	Engineering	34 highway development, 18 years of experience in air quality and noise
	Rados Gluscevic	Traffic	Transportation Engineering Specialist	BS	Traffic and Transportation Engineering	13 transportation planning, traffic engineering
	Ed Green	Hazardous materials	Hazardous Materials Coordinator	AA	Business	24 hazardous materials
	Ruth Greenspan, PhD	Cultural resources	Historical Preservation Specialist, Technical Environmental Section Manager	PhD	Anthropology – North American Archaeology	32+ cultural resources management in private, tribal, and state government sectors
	John Halikowski	Senior oversight	Director	BA	Communications	22 senior oversight and policy
	Mark Hollowell*	Reviewer	Environmental Planner III	BS	Business Administration	8 NEPA compliance for highway and transportation projects
	Stephanie Huang, PE	Reviewer	Transportation Engineer I	MS	Environmental Engineering	12 transportation and roadway projects
	Trent Kelso, PE	Senior oversight	Assistant State Engineer, Urban Project Management			
	Dan Lance, PE*	Senior oversight	Deputy State Engineer	BS	Civil Engineering	41 highway and transportation projects
	Larry Langer, PE*	Senior oversight	Assistant State Engineer, Valley Project Management	BS	Civil Engineering	38 highway and transportation projects
	Melissa Maiefski*	Reviewer	Technical Environmental Section Manager	BS	Wildlife and Fisheries Sciences	17 environmental activities related to transportation, including ground work and NEPA compliance
	Mike Manthey, PE*	Traffic design	State Traffic Engineer	BS	Civil Engineering	31 traffic engineering
	Merrisa Marin	Right-of-way	Right-of-way Agent			15 right-of-way coordination
	Velvet Mathew, PE	Reviewer	Transportation Manager	MS	Structural Engineering	13 transportation and highway projects
	Victor Mendez*	Senior oversight	Director	BS/ MBA	Civil Engineering	24 senior oversight and policy
	Paul O’Brien, PE	Strategic oversight	Manager, Environmental Planning Group	BS	Civil Engineering	25
	Reggie Rector	Right-of-way	Right-of-way Engineering Technician			31 real estate, appraisal, right-of-way coordination
	Barney Remington*	Air/Noise	Air and Noise Specialist	BA	Anthropology	7 cultural resources management, environmental compliance, noise and air quality
	Angela Roach, PhD*	Reviewer	Hazardous Materials Specialist	PhD	Geology	7 hazardous materials
	Floyd Roehrich, Jr.	Senior oversight	Deputy Director for Policy	BS	Civil Engineering	29 highway project development
	Robert Samour	Senior oversight	Senior Deputy State Engineer	MPA	Technology	20 construction

\* no longer with organization

Preparers <b>PRE-3</b>						
Name	Contribution	Title	Highest Education/Degree		Years/Experience	
Shannon Scutari*	Strategic oversight	Director of Rail and Sustainability Services	JD/ MBA	Law	9	communications, community partnerships
Timothy Tait	Community oversight and public involvement	Community Relations Manager	MS EdD	Leadership/Crisis Management Organizational Leadership	153	community, media and government relations
Tom Tortice, PE	Traffic	Transportation Engineer I	BS	Civil Engineering	13	traffic engineering
Jennifer Toth, PE	Senior oversight	State Engineer				
Justin White	Biology	Roadside Resources Program Manager	BS	Wildlife Biology	19	NEPA compliance, biology
Nan Wilcox*	Right-of-way	Right-of-way Coordinator	AA	Engineering/ Administration of Justice	27	right-of-way
Pe-Shen Yang, PE	Bridge design	Assistant State Bridge Engineer	PhD	Structural Engineering	28	bridge design, management
<i>U.S. Army Corps of Engineers</i>						
Sallie Diebolt	Cooperating agency oversight	Chief, Arizona Branch	BS	Biology	17	natural resource management
Dana Owsiany, PE*	Cooperating agency oversight	Traffic Engineer	MS	Civil Engineering	20	civil and traffic engineering
Kathleen Tucker	Cooperating agency oversight	ADOT Liaison	MS	Biological Sciences and Environmental Resources	18	landscape architecture, natural resource management
<i>U.S. Bureau of Indian Affairs</i>						
Stacey Begay	Cooperating agency oversight	Highway Engineer				right-of-way
Bryan Bowker	Cooperating agency oversight	Regional Director				senior oversight
Matt Crain	Cooperating agency oversight	Deputy Regional Director				senior oversight
Tamera Dawes	Cooperating agency oversight	Realty Specialist				right-of-way
Beau J. Goldstein	Cooperating agency oversight	Acting Environmental Coordinator				environmental protection
Amy Heuslein	Cooperating agency oversight	Branch Chief, Environmental Quality Services				environmental protection, NEPA compliance
Chip Lewis	Cooperating agency oversight	Environmental Protection Specialist				environmental protection
Cecelia Martinez	Cooperating agency oversight	Superintendent, Pima Agency				senior oversight
Bob Maxwell	Cooperating agency oversight	Transportation Planner				transportation planning
Rodney McVey	Cooperating agency oversight	Deputy Regional Director				senior oversight
Peter B. Overton	Cooperating agency oversight	Agency Environmental Protection Specialist	BS	Agriculture	36	agricultural conservation, environmental protection
David R. Smith	Cooperating agency oversight	Regional Roads Engineer				highway and transportation projects
Jonah Walker	Cooperating agency oversight	Pima Agency, Real Estate Services				right-of-way
Stan Webb	Cooperating agency oversight	Realty Officer				right-of-way
<i>Western Area Power Administration</i>						
Mary Barger*	Cooperating agency oversight	Environmental Planner				cultural resources

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Name	Contribution	Title	Highest Education/Degree		Years/Experience	
Matthew Bilsbarrow	Cooperating agency oversight	Archaeologist			cultural resources	
Danielle Brooks	Cooperating agency oversight	Environmental NEPA			environmental protection, NEPA compliance	
Carla Christelli*	Cooperating agency oversight	Realty Officer			right-of-way	
John Holt*	Cooperating agency oversight	Environmental Technical Manager			environmental protection, NEPA compliance	
Linda Marianito	Cooperating agency oversight	Environmental Division Manager			environmental protection, NEPA compliance	

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Eric Anderson	MPO planning	Transportation Director	MS	Economics	34	transportation, policy projects
Cathy Arthur	Air Quality	MAG Associate	MA	Urban Studies	22	transportation and air quality planning and modeling
Lindy Bauer	Air Quality	Environmental Director	MA	Urban Studies	22	environmental planning
Dean Giles	Air Quality	Air Quality Planning Program Specialist	BA	Geography	24	transportation and air quality planning
Robert Hazlett, PE	MPO planning	Senior Engineer	BS	Civil Engineering	31	transportation, highway projects
Chaun Hill, PE	MPO planning	Senior Engineer	BS	Civil Engineering	33	highway, roadway, and transportation project management
Vladimir Livshits	MPO planning	System Analysis Program Manager	PhD	Transportation Planning and Economics	31	transportation demand modeling, planning
Matt Poppen	Air Quality	Senior Air Quality Policy Manager	MUEP	Masters of Urban and Environmental Planning	15	years of experience in air quality planning
Nathan Pryor	MPO planning	Government Relations Manager	MPA	Public Administration	15	government relations and as public policy analyst
Roger Roy	Traffic volume projections	Decision Support Analyst III	BS	Physics	19	air quality, transportation demand modeling
Mark Schappi, PE*	Traffic analyst	System Analysis Program Manager	MS	Civil Engineering	35	transportation planning, travel demand modeling, highway and transit analysis, truck travel, air quality evaluations
Kelly Taft, APR	MPO planning	Communications Manager	BA	Broadcast Journalism (telecommunications)	32	Accredited in public relations with experience in journalism, communications, public involvement, community relations

Consultant Team

HDR Engineering, Inc.

Angie Barton, EIT*	Noise impacts	Noise Specialist	MS	Civil Engineering	11	transportation planning, noise analysis
Mark Brodbeck, RPA	Technical lead, cultural resources	Cultural Resources Coordinator, Professional Associate	MA	Anthropology	26	cultural resources management
Patricia Brown, PE*	Roadway	Project Manager	BS	Civil Engineering	21	roadway design
Praveen Chanda, PE	Traffic	Transportation Planner	MS	Civil Engineering	10	transportation planning
Faisal Chowdhury, PE	Traffic	Transportation Planner	MS	Civil Engineering	10	transportation planning
Richard Christopher	Legal oversight	Senior Regulatory Specialist	JD	Law		
Jeremy Cook	Socioeconomics	Economist	MA	Economics	12	economics
Elisa Cote, PE*	Drainage	Water Resources Engineer	BS	Civil Engineering	14	drainage
Amelia Edwards, PE*	EIS author	Civil Engineer, Senior Professional Associate	MS	Civil Engineering	24	roadway design, NEPA compliance for highway projects

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Preparers <b>PRE-5</b>						
Name	Contribution	Title	Highest Education/Degree		Years/Experience	
Terry Gruver	Public involvement	Senior Public Involvement Specialist	BS	Business Administration	27	communications and communications strategy
Greta Halle*	Mitigation measures	Senior Environmental Planner	BA/BS	Life Sciences/Psychology	14	NEPA planning
Joel P. Hennings*	Hazardous materials	Hazardous Material Specialist, Environmental Planner	BS	Environmental Science	12	evaluation and management of hazardous materials
Eric Herman*	Biology	Environmental Planner	MS	Environmental Planning	8	biology, GIS review of technical reports, photography
Kelly W. Kading	Hazardous materials	Regional Hazardous Materials Services Manager, Professional Associate	BS	Geology	27	hazardous waste assessment and management
Michael LaBianca, AICP	Technical lead, social conditions	Planner	MEP	Environmental Planning	28	land use planning, environmental, and public outreach projects
Nicholas LaFronz, PE	Technical lead, geotechnical	Senior Geotechnical Program Manager	MSE	Civil Engineering	30	geotechnical engineering
Scott Mars, PE*	Technical lead, water resources, waters of the United States, floodplains, prime and unique farmlands	Project Manager	MS	Water Resources	24	water resources planning, hydrology, water quality, water rights, wetland ecology, soil erosion
Gregg Mitchell, RG	Geotechnical, geology	Geotechnical/Environmental Planner	BS	Environmental Resources	25	engineering, geology, environmental geology, hazardous waste assessment and management
Renee Mulholland	Waters of the United States	Environmental Planner	ME-ERM	Earth and Environmental Resources Management	10	environmental permitting compliance, NEPA compliance
Laura Paty, RLA	Social conditions, document production	Landscape Architect	BS	Design Science in Landscape Architecture and Planning	29	landscape architectural design, site planning, master planning, design guidelines, landscape character analysis
Curt Overcast	Air Quality	Senior Environmental Planner	MS MPA	Environmental Science Public Administration	23	air quality analyst
Carl Petrich*	Lead editor, visual resources	Senior Environmental Planner, Professional Associate	MLA/MBA	Landscape Architecture/Business Administration	36	landscape architecture, environmental and energy planning, business research, technical editing
Susanna Schippers	Editor	Technical Editor	BA	Creative Writing	16	journalism, technical editing, public involvement
Ben Spargo, PE	Project Manager	Project Manager	MS	Civil Engineering	12	transportation planning and engineering
Scott Stapp	Senior oversight	Environmental Section Manager	MS	Biology	36	air quality, hazardous materials, noise, land use, prime and unique farmland, secondary and cumulative impacts, cultural resources, socioeconomics/Title VI/environmental justice
Audrey Unger	Section 4(f) evaluation	Environmental Planner and Biologist	MS	Environmental Planning	8	NEPA compliance, Section 4(f) analysis
Dustin D. Watson*	Technical lead, noise impacts	Environmental Planner/Noise and Air Quality Specialist	MS	Environmental Planning	24	environmental planning
Kurt Watzek	Biological resources	Senior Environmental Planner	MLA	Landscape Architecture	29	environmental planning, NEPA compliance, environmental permitting compliance
Karen Wigglesworth, GISP*	Technical lead, GIS analysis	GIS Manager/SW Regional GIS Coordinator, Professional Associate	BS	Anthropology	28	database management, spatial analysis, oversight of cartographic products
Mark Wollschlager, Attorney*	Senior reviewer	Technical Director – Environmental Review and Permitting	JD	Law	32	environmental review, environmental permitting, NEPA compliance
<i>AMEC Earth &amp; Environmental</i>						
Richard Bansberg, PG	Geotechnical and hazardous materials	Senior Geologist	BA	Earth Sciences	20	environmental assessments, environmental compliance audits, hydrogeologic site characterization studies
Kenneth C. Ferguson, PG	Geotechnical and hazardous materials	Staff Geologist	MS	Geology	11	geotechnical investigations for buildings, characterization of subsidence and subsidence-related phenomena

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PRE	PRE-6    Preparers						
	Name	Contribution	Title	Highest Education/Degree		Years/Experience	
	Lawrence A. Hansen, PhD, PE	Technical lead, geotechnical and hazardous materials	Senior Vice President	PhD	Geotechnical Engineering	30	evaluation of geotechnical conditions; experience in investigation, design, construction, and performance monitoring
	Marcie Martin	Geotechnical and hazardous materials	Environmental Planner	MS	Environmental Management and Industrial Hygiene	15	environmental regulatory compliance biological reviews, Clean Water Act permitting
	Shandra Wagner	Geotechnical and hazardous materials	Environmental Scientist	BS	Geological Engineering	9	soil and groundwater remediation sites
	Ralph E. Weeks, PG	Geotechnical and hazardous materials	Senior Geologist	BS	Geology	40	evaluation of geologic hazards; site selection; hydrogeologic, environmental, environmental, and geotechnical characterization; design development; construction
	<i>AMEC Infrastructure</i>						
	Natalya Hyland, PE	Utilities	Transportation Group Manager	BS	Civil Engineering	29	highway design, transportation projects
	<i>Digital Mapping Associates</i>						
	Sam Lowe	Mapping and aerial photography	Associate of Photogeometric Applications	AA	Civil Engineering	45	mapping and surveying in the transportation industry
	<i>Gila River Cultural Resource Management Program</i>						
	Chris Loendorf, PhD	Cultural resources	Project Manager/Archaeologist	PhD	Anthropology	33	cultural resources management
	Kyle Woodson, PhD	Cultural resources	Director (Acting)	PhD	Anthropology	22	cultural resources management
	<i>Gunn Communications</i>						
	Theresa E. Gunn	Public involvement	Public Involvement Coordinator	MA	Organizational Management	22	designing and implementing public involvement and outreach programs
<i>Jacobs Engineering, Inc.</i>							
Jack Allen	Senior oversight, EIS author	EIS Author, NEPA Strategist	BA	Natural Resource Management	28	NEPA compliance for highway and transportation projects	
Dorothy Bungert	Lead, document design and production	Senior Graphic Designer	BFA	Graphic and Computer Design	33	graphic design management	
Heather L. Honsberger	Public involvement, document production	Senior Public Involvement Specialist	BA/BA	Environmental Studies/ Politics, Philosophy, Law	16	communication of technical information	
<i>Logan Simpson Design Inc.</i>							
Diane Simpson-Colebank, RLA	Technical lead, visual resources	Senior Landscape Architect	MLA	Master Landscape Architect	34	environmental issues, planning, assessments, public involvement, documentation, design	
Patrick Higgins, RLA*	Noise, air, social conditions	Senior Landscape Architect	MPA	Public Administration	41	noise level and air quality assessments, visual assessment, NEPA compliance for highway and transportation projects	
Mark Meyer, RLA*	Visual resources	Senior Environmental Planner	MS	Natural Sciences	30	design and environmental planning including visual resource analysis, natural resource planning, NEPA documentation	

Preparers <b>PRE-7</b>						
Name	Contribution	Title	Highest Education/Degree		Years/Experience	
<i>Southwest Heritage Research</i>						
J. Andrew Darling, PhD	Cultural resources	Principal Investigator	PhD	Anthropology	27	cultural resources management
<i>Traffic Research &amp; Analysis, Inc.</i>						
Robert Medland	Traffic	Vice President	BS	Education	25	traffic data collection
<i>VSI Environmental</i>						
David Pekara	Technical lead, air quality	Project Manager	MBA	Business Administration	24	air quality monitoring and modeling
Dennis Haase	Air quality	Senior Air Quality Specialist	BS	Meteorology	37	air quality assessment
<i>Wilbur Smith &amp; Associates</i>						
Janis Burall	Socioeconomics	Regional Coordinator of GIS Services	BFA	Advertising Art	24	data collection, data conversion, geographic analysis, mapping
Gary Mitchell, AICP	Technical lead, socioeconomics	Director of Urban Planning Services	MA	Urban Planning	24	regional, county, and community planning
Naina Magon, AICP	Socioeconomics	Senior Planner	MA	Urban and Regional Planning	14	comprehensive and land use planning, population and employment forecasting, socioeconomic analyses, transportation planning, parks planning, GIS applications

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ABBREVIATIONS AND ACRONYMS

<b>101L</b>	Loop 101	<b>EIS</b>	environmental impact statement	<b>n.d.</b>	no date
<b>202L</b>	Loop 202	<b>EPA</b>	U.S. Environmental Protection Agency	<b>NEPA</b>	National Environmental Policy Act
<b>303L</b>	Loop 303	<b>EPG</b>	Environmental Planning Group	<b>NHPA</b>	National Historic Preservation Act
<b>A.A.C.</b>	Arizona Administrative Code	<b>ESA</b>	Endangered Species Act	<b>NO<sub>2</sub></b>	nitrogen dioxide
<b>AADT</b>	average annual daily traffic	<b>et al.</b>	and others	<b>NPS</b>	National Park Service
<b>AASHTO</b>	American Association of State Highway and Transportation Officials	<b>FCA</b>	Foothills Community Association	<b>NRCS</b>	Natural Resources Conservation Service
<b>ACHP</b>	Advisory Council on Historic Preservation	<b>FCDMC</b>	Flood Control District of Maricopa County	<b>NRHP</b>	National Register of Historic Places
<b>ADA</b>	Arizona Department of Agriculture	<b>FEIS</b>	Final Environmental Impact Statement	<b>NRSC</b>	Gila River Indian Community Natural Resources Standing Committee
<b>ADEQ</b>	Arizona Department of Environmental Quality	<b>FEMA</b>	Federal Emergency Management Agency	<b>O<sub>3</sub></b>	ozone
<b>ADOT</b>	Arizona Department of Transportation	<b>FHWA</b>	Federal Highway Administration	<b>OH</b>	overhead
<b>ADT</b>	average daily traffic	<b>FO</b>	fiber optic	<b>OHWM</b>	ordinary high water mark
<b>ADWR</b>	Arizona Department of Water Resources	<b>FPPA</b>	Farmland Protection Policy Act	<b>OOE</b>	Gila River Indian Community Office of Enrollment
<b>AGFD</b>	Arizona Game and Fish Department	<b>g</b>	unit of acceleration	<b>P3</b>	public-private partnership
<b>AMA</b>	Active Management Area	<b>GHG</b>	greenhouse gas	<b>PA</b>	programmatic agreement
<b>A.R.S.</b>	Arizona Revised Statutes	<b>gpd</b>	gallons per day	<b>PAD</b>	planned area development
<b>ARS</b>	Avenida Rio Salado	<b>HAP</b>	hazardous air pollutant	<b>PAG</b>	Pima Association of Governments
<b>ASLD</b>	Arizona State Land Department	<b>HEI</b>	Health Effects Institute	<b>PAH</b>	polycyclic aromatic hydrocarbon
<b>ASM</b>	Arizona State Museum	<b>HOV</b>	high-occupancy vehicle	<b>PCD</b>	planned community district
<b>AZ</b>	Arizona	<b>HUD</b>	U.S. Department of Housing and Urban Development	<b>PM</b>	particulate matter
<b>AZPDES</b>	Arizona Pollutant Discharge Elimination System	<b>I-8</b>	Interstate 8	<b>PM<sub>2.5</sub></b>	particulate matter of 2.5 microns or less in diameter
<b>BIA</b>	U.S. Bureau of Indian Affairs	<b>I-10</b>	Interstate 10	<b>PM<sub>10</sub></b>	particulate matter of 10 microns or less in diameter
<b>BLM</b>	Bureau of Land Management	<b>I-17</b>	Interstate 17	<b>POM</b>	polycyclic organic matter
<b>BMP</b>	best management practice	<b>IGA</b>	intergovernmental agreement	<b>ppb</b>	parts per billion
<b>Bulletin #38</b>	National Register Bulletin #38	<b>kV</b>	kilovolt	<b>ppm</b>	parts per million
<b>BWCDD</b>	Buckeye Water Conservation and Drainage District	<b>LESA</b>	Land Evaluation and Site Assessment	<b>Reclamation</b>	Bureau of Reclamation
<b>CAA</b>	Clean Air Act	<b>L<sub>max</sub></b>	maximum noise level	<b>RID</b>	Roosevelt Irrigation District
<b>CCC</b>	Civilian Conservation Corps	<b>LOS</b>	level of service	<b>ROD</b>	record of decision
<b>CEQ</b>	Council on Environmental Quality	<b>L RTP</b>	<i>Long-Range Transportation Plan</i>	<b>RTP</b>	<i>Regional Transportation Plan</i>
<b>C.F.R.</b>	Code of Federal Regulations	<b>LUPZ</b>	Gila River Indian Community Land Use, Planning, and Zoning	<b>R/W</b>	right-of-way
<b>cfs</b>	cubic feet per second	<b>LWCF</b>	Land and Water Conservation Fund	<b>SAFETEA-LU</b>	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
<b>CO</b>	carbon monoxide	<b>LWCFA</b>	Land and Water Conservation Fund Act	<b>SEVRDS</b>	Southeast Valley Regional Drainage System
<b>CO<sub>2</sub></b>	carbon dioxide	<b>MAG</b>	Maricopa Association of Governments	<b>SF</b>	single family
<b>Community</b>	Gila River Indian Community	<b>MAP-21</b>	Moving Ahead for Progress in the 21st Century	<b>SFHA</b>	Special Flood Hazard Area
<b>CPAO</b>	Gila River Indian Community Communications and Public Affairs Office	<b>MBTA</b>	Migratory Bird Treaty Act	<b>SGCN</b>	species of greatest conservation need
<b>CSS</b>	context-sensitive solutions	<b>MCAQD</b>	Maricopa County Air Quality Department	<b>SHPO</b>	State Historic Preservation Office/Officer
<b>CRMP</b>	Gila River Indian Community Cultural Resource Management Program	<b>MCDOT</b>	Maricopa County Department of Transportation	<b>SIP</b>	State Implementation Plan
<b>CWA</b>	Clean Water Act	<b>MF</b>	multifamily	<b>SMCAT</b>	South Mountain Citizens Advisory Team
<b>dBA</b>	A-weighted decibel	<b>µg/m<sup>3</sup></b>	micrograms per cubic meter	<b>SMCL</b>	secondary maximum contaminant level
<b>dBA L<sub>eq</sub></b>	hourly equivalent sound level	<b>mg/L</b>	milligrams per liter	<b>SMPP</b>	Phoenix South Mountain Park/Preserve
<b>DCR</b>	design concept report	<b>MH</b>	manufactured home	<b>SO<sub>2</sub></b>	sulfur dioxide
<b>DEIS</b>	Draft Environmental Impact Statement	<b>mpg</b>	miles per gallon	<b>SR</b>	State Route
<b>DEQ</b>	Gila River Indian Community Department of Environmental Quality	<b>mph</b>	miles per hour	<b>SRP</b>	Salt River Project
<b>DPM</b>	diesel particulate matter	<b>MS4</b>	municipal separate storm sewer system	<b>STB</b>	State Transportation Board
<b>E1</b>	El Alternative	<b>MSATs</b>	mobile source air toxics	<b>SWPPP</b>	Stormwater Pollution Prevention Plan
<b>EA</b>	environmental assessment	<b>NAAQS</b>	National Ambient Air Quality Standards	<b>TCP</b>	traditional cultural property
		<b>NAC</b>	noise abatement criteria	<b>TDM</b>	transportation demand management
		<b>NAP</b>	Noise Abatement Policy		

<b>THPO</b>	Tribal Historic Preservation Officer	<b>US 60</b>	U.S. Route 60	<b>vpd</b>	vehicles per day
<b>TIP</b>	transportation improvement program	<b>USACE</b>	U.S. Army Corps of Engineers	<b>W101</b>	W101 Alternative
<b>Title VI</b>	Title VI of the Civil Rights Act of 1964	<b>U.S.C.</b>	U.S. Code	<b>W55</b>	W55 Alternative
<b>TPC</b>	Transportation Policy Committee	<b>USDOT</b>	U.S. Department of Transportation	<b>W59</b>	W59 Alternative
<b>TSM</b>	transportation system management	<b>USFWS</b>	U.S. Fish and Wildlife Service	<b>W71</b>	W71 Alternative
<b>TTT</b>	Gila River Indian Community Transportation Technical Team	<b>USGS</b>	U.S. Geological Survey	<b>Western</b>	Western Area Power Administration
<b>UG</b>	underground	<b>VAU</b>	Visual Assessment Unit	<b>WQARF</b>	Water Quality Assurance Revolving Fund
<b>UPRR</b>	Union Pacific Railroad	<b>VMT</b>	vehicle miles traveled	<b>WSC</b>	wildlife of special concern
<b>U.S.</b>	United States	<b>VOC</b>	volatile organic compound	<b>WWTP</b>	wastewater treatment plant

## GLOSSARY

<b>accessible</b>	Capable of being reached.
<b>acrolein</b>	One of the seven priority mobile source air toxics designated by the U.S. Environmental Protection Agency. Acrolein can be formed from the breakdown of certain pollutants found in outdoor air, from burning tobacco, or from burning gasoline. Acrolein is highly reactive and remains in the atmosphere for only a brief period of time.
<b>affected environment</b>	Natural resources within the project area that may be changed by the proposed alternatives. These changes might be positive, neutral, or negative in nature to the natural environment.
<b>allottees</b>	The General Allotment Act of 1887 established land trusts for the Gila River Indian Community and individual tribal members. Under the Act, each Tribal member was allotted two 10-acre tracts of land, one for irrigable farm use and one for a home site or grazing purposes. The Act required that the allotted lands be held in trust, established the Bureau of Indian Affairs in the U.S. Department of the Interior, and designated the Bureau of Indian Affairs as the Trustee for allotted lands.
<b>alluvial</b>	Pertaining to or composed of unconsolidated sediments deposited by a stream or running water.
<b>alluvial fan</b>	An outspreading, gently sloping mass of alluvium deposited by a stream, especially in an arid or semiarid region where a stream issues from a narrow canyon onto a plain or valley floor.
<b>alluvium</b>	A general term for deposits made by streams on riverbeds, floodplains, and alluvial fans.
<b>American Indian or Alaskan Native</b>	A person having origins in any of the original peoples of North America and who maintains cultural identification through tribal affiliation or community recognition.
<b>aquatic</b>	Growing or living in or on water.
<b>aquifer</b>	A body of rock or alluvium that is sufficiently permeable to conduct groundwater and yield significant quantities of water to wells and/or springs.
<b>Arizona Department of Environmental Quality (ADEQ)</b>	The State agency responsible for ensuring that the quality of Arizona’s air, land, and water resources meets healthful, regulatory standards.
<b>Arizona Department of Transportation (ADOT)</b>	The State agency responsible, among other things, for state roads and highways.
<b>arterial</b>	A through-road or street.
<b>asbestos-containing material</b>	A material or product that contains more than 1 percent asbestos.
<b>A-scale</b>	A measurement of sound approximating the sensitivity of the human ear to variations in frequencies, used to note the intensity or annoyance level of sounds.
<b>Asian American</b>	A person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands.
<b>assessment viewpoint</b>	General location within a Visual Assessment Unit from which the unit was photographed and evaluated.
<b>at-grade roadway</b>	A roadway element that is approximately level with the immediate surrounding terrain.
<b>automobiles</b>	All vehicles, typically passenger cars, with two axles and four wheels—designed primarily for passenger transportation. Generally, the gross vehicle weight is less than 10,000 pounds.
<b>auxiliary lane</b>	An additional lane on a freeway to connect an on-ramp and an off-ramp.
<b>average travel time</b>	The average time spent by vehicles traveling a highway segment, including control delay, in seconds per vehicle or minutes per vehicle.
<b>background</b>	The landscape distance zone that extends beyond 3 miles from the observer; surfaces and landforms will lose detail distinction. Silhouettes and ridges are conspicuous when skyline is the strongest line.

<b>barrier</b>	A solid wall or earth berm located on a direct line between the roadway and noise receiver location that reduces the noise level at the receiver. Some material that blocks or is intended to block passage, or a natural formation or structure that prevents or hinders movement or action.
<b>bedrock</b>	The solid rock that underlies gravel, soil, or other surficial material, or that is exposed in mountain highlands.
<b>benzene</b>	One of the seven priority mobile source air toxics designated by the U.S. Environmental Protection Agency. It is an important industrial solvent and precursor in the production of drugs, plastics, synthetic rubber, and dyes. Benzene is a natural constituent of crude oil, but it is usually synthesized from other compounds present in petroleum.
<b>bioaccumulation</b>	The accumulation of a substance, such as a toxic chemical, in various tissues of a living organism: for example, the bioaccumulation of mercury in fish.
<b>biotic community</b>	A major regional community of plants and animals over large natural areas. Natural communities are characterized by a distinctive vegetation structure.
<b>Black/African American</b>	A person having origins in any of the black racial groups of Africa.
<b>blasting</b>	The controlled use of explosives to excavate or remove rock.
<b>bosque</b>	A dense thicket of trees; a wooded area or forest.
<b>buffer</b>	An area designed to separate.
<b>1,3-butadiene</b>	One of the seven priority mobile source air toxics designated by the U.S. Environmental Protection Agency. Most butadiene is polymerized to produce synthetic rubber, most commonly used for the production of tires. Small amounts of butadiene are also found in plastics and fuel.
<b>capacity</b>	The maximum number of vehicles that a given section of road or traffic lane can accommodate.
<b>carbon monoxide (CO)</b>	An odorless, colorless gas that is a product of the combustion of hydrocarbons; it interferes with the body’s organs and tissues.
<b>census block</b>	Census blocks are areas bounded on all sides by visible features such as roads, streams, and railroad tracks and by invisible boundaries such as city, town, township, and county limits; property lines; and short, imaginary extensions of roads. Generally, census blocks are small in area—for example, a block bounded by city streets. However, census blocks in remote areas may be large and irregular and may contain many square miles.
<b>characteristic</b>	A distinguishing trait, quality, or property.
<b>chromium</b>	A metal commonly used in plating facilities.
<b>citizens advisory team</b>	A group of volunteers that meets regularly and acts as a sounding board to help the project team understand issues and concerns of their respective communities and to help find a consensus solution for the project.
<b>colluvium</b>	A loose deposit of rock debris accumulated through the action of gravity at the base of a slope.
<b>color</b>	An object’s relative reflectiveness (for example: light, dark) and its hue (for example: red, green).
<b>common point</b>	The break in the Study Area between the Western and Eastern Sections. It is a line perpendicular to the Gila River Indian Community boundary through a point located near Elliot Road and 59th Avenue. All action alternatives share this common point in their alignments.
<b>community</b>	A unified body of individuals; people with common interests living in a particular area. An interacting population of various kinds of individuals (as species) in a common location, or a group of people with a common characteristic or interest living together within a larger area.
<b>Community</b>	Throughout this document, the Gila River Indian Community is referred to as the Community.

<b>community character</b>	A set of parameters that creates a “sense of place” within a community. Factors contributing to community character are physical size, compatible land uses within the community, internal circulation, distinct but common architecture, and cultural activities.	<b>diesel particulate matter (DPM)</b>	One of the seven priority mobile source air toxics designated by the U.S. Environmental Protection Agency. Diesel particulate matter is part of a complex mixture that makes up diesel exhaust. Diesel exhaust is composed of two phases. The gaseous phase is composed of hazardous air pollutants, such as acrolein; benzene; 1,3-butadiene; formaldehyde; naphthalene; and polycyclic aromatic hydrocarbons. The particle phase also has many different types of particles that can be classified by size or composition. Diesel exhaust is emitted from a broad range of diesel engines: the on-road diesel engines of trucks, buses, and cars and the off-road diesel engines that include locomotives, marine vessels, and heavy-duty equipment.
<b>community cohesion</b>	The dynamic within a community that promotes internal neighborhood circulation to and from residences and community facilities, quasi-public facilities, and regularly required activities such as food shopping at local grocery stores.	<b>direct impact</b>	A change in the physical, social, or economic environment that would be caused by the proposed action and would occur at the same time and same place as the action.
<b>congestion</b>	Traffic volume on a road at sufficient densities to become detrimental to its performance; undesirable traffic conditions that exist when traffic on a freeway or street is moving at an average speed of 45 miles per hour or less, and/or the traffic flow is often stop and go.	<b>distinctiveness/vividness</b>	A criterion for measuring visual quality. <i>Distinctiveness</i> is defined by the memorability of the visual impression received from the contrasting landscape elements as they combine to form a striking and distinctive visual pattern. <i>Vividness</i> is assessed according to spatial definition, landmarks, water forms/riparian features, presence of human-made features, topographic relief, skyline character, vegetation, and adjacent landforms and features.
<b>constructive use</b>	A type of use in which a transportation project’s proximity impacts (as opposed to its direct impacts) are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) of the Department of Transportation Act of 1966, as amended, are substantially impaired. Examples include a substantial increase in noise level, impaired aesthetic features or attributes, restriction on access that substantially diminishes the utility of the resource, and other indirect impacts on the resource’s environment or utility.	<b>diversity</b>	The variety of species in a community; this also includes the relative abundance of each species. The number, variety, and intermixing of visual pattern elements.
<b>cooperating agency</b>	Another agency—federal, state, or local—that has jurisdiction by law or special expertise over portions of the project area and that must make a decision on the proposed project.	<b>dry well</b>	An underground structure with stones or gravel inside that is used to collect stormwater runoff to avoid soil erosion. The collected water is dissipated into the ground, where it merges with the local groundwater.
<b>Criterion A of the National Register of Historic Places</b>	Cultural resources associated with events that have made a significant contribution to the broad patterns of our history.	<b>Eastern Section</b>	The portion of the Study Area located east of the common point.
<b>Criterion B of the National Register of Historic Places</b>	Cultural resources associated with the lives of persons significant in our past.	<b>elderly</b>	Those persons age 65 and older; a demographic statistic tracked by the U.S. Census Bureau.
<b>Criterion C of the National Register of Historic Places</b>	Cultural resources embodying the distinctive characteristics of a type, period, or method of construction; or that represent the work of a master; or that possess high artistic values; or that represent a significant and distinguishable entity whose components may lack individual distinction.	<b>elevated roadway</b>	A roadway constructed above the immediate surrounding terrain, either on an embankment or a structure.
<b>Criterion D of the National Register of Historic Places</b>	Cultural resources that have yielded, or may be likely to yield, information important in prehistory or history. Generally, cultural resources eligible for the National Register of Historic Places under Criterion D are not eligible for protection under Section 4(f).	<b>eligible</b>	Refers to properties that meet the National Park Service’s criteria for inclusion in the National Register of Historic Places.
<b>critical habitat</b>	Critical habitat is defined in Section 3(5)(A) of the Endangered Species Act; critical habitat is a specific geographic area(s) essential for the conservation of a threatened or endangered species and that may require special management and protection.	<b>emission</b>	A substance discharged into the air, especially by an internal combustion engine.
<b>cumulative impact</b>	The impact on the environment that results from the incremental impact of the action when added to the other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period.	<b>environmental assessment (EA)</b>	A federally mandated report that includes brief discussions of a project need, alternatives, environmental impacts associated with the alternatives, and a listing of individuals and agencies consulted. An EA is completed to see whether an environmental impact statement is needed.
<b>decibel (dB)</b>	A logarithmic unit indicating the amount of sound energy. The approximate threshold of hearing is 0 dBA (A-weighted decibel), while the approximate threshold of pain is 140 dBA. Most suburban areas have daytime noise levels ranging from 50 dBA to 70 dBA.	<b>environmental impact statement (EIS)</b>	The project documentation prepared in accordance with the National Environmental Policy Act when a project is anticipated to have a significant impact on the environment.
<b>delay per vehicle</b>	The additional travel time experienced by a vehicle with reference to a base travel time (i.e., the free-flow travel time).	<b>ephemeral</b>	Lasting only a short time; present only during a portion of the year; in this document generally refers to watercourses.
<b>demographic</b>	Relating to the vital and social statistics of a population, as in births, deaths, racial or ethnic composition, and related socioeconomic factors.	<b>existing noise levels</b>	The noise resulting from natural and mechanical sources and from other human activity usually present in a particular area; also known as ambient noise level.
<b>density</b>	Number per unit of area.	<b>family</b>	A group of two or more people who reside together and who are related by birth, marriage, or adoption.
<b>design concept report</b>	A study intended to guide future decisions regarding the ultimate improvements to a transportation facility, such as a highway, to meet the capacity, operational, and safety needs of the motoring public.	<b>fault</b>	A fracture or fracture zone in the earth along which there has been movement of the sides relative to one another.
<b>design year</b>	The future year used to determine the probable traffic volume for which a highway and noise abatement are designed.	<b>fauna</b>	The animal population of a particular area.
		<b>Federal Highway Administration (FHWA)</b>	The branch of the U.S. Department of Transportation responsible for administering the Federal-aid Highway Program and the Federal Lands Highway Program. The programs provide financial resources and technical assistance for constructing, preserving, and improving the National Highway System along with other urban and rural roads.



fill	Earth used to create embankments or to raise low-lying areas to bring them to grade.
floodplain	The portion of a stream valley, adjacent to the channel, that is built of sediments deposited during the present regime of the stream and is covered with water when the stream overflows its banks at flood stage.
floodplain encroachment	An action within the limits of the 100-year floodplain.
floodway	That portion of the floodplain in which construction would raise the water level during a 100-year flood by more than 30 centimeters (1 foot).  More generally, 1) a part of the floodplain, otherwise leveed, reserved for emergency diversion of water during floods. A part of the floodplain which, to facilitate the passage of floodwater, is kept clear of encumbrances; 2) the channel of a river or stream and those parts of the floodplains adjoining the channel that are reasonably required to carry and discharge the floodwater or flood flow of any river or stream.
flora	The plant population of a particular area.
foreground	The landscape distance zone that extends up to 0.25 mile from the observer; details can be perceived.
form	The visual mass, bulk, or shape of an object.
formaldehyde	One of the seven priority mobile source air toxics designated by the U.S. Environmental Protection Agency. Formaldehyde is an important chemical used widely by industry to manufacture building materials and numerous household products, such as adding permanent-press qualities to clothing and draperies; as a component of glues and adhesives; and as a preservative in some paints and coating products. Formaldehyde also results from the incomplete combustion of carbon-containing materials such as in forest fires, in automobile exhaust, and in tobacco smoke. It may be present both indoors and outdoors. In the atmosphere, formaldehyde is produced by the action of sunlight and oxygen on atmospheric methane and other hydrocarbons. Small amounts of formaldehyde are produced as a metabolic byproduct in most organisms, including humans.
fracture	A crack, joint, or other break in rock.
fully directional interchange	All traffic movement in the traffic interchange has a dedicated ramp, ensuring free traffic flow in every direction.
geotechnical	Referring to the use of scientific methods and engineering principles to acquire, interpret, and apply knowledge of earth materials for solving engineering problems.
granite	An intrusive igneous rock that is predominantly composed of quartz and feldspar.
granitic	Pertaining to, or composed of, granite.
groundwater	The part of the subsurface water that is in the zone of saturation.
habitat	Place where an animal or plant normally lives, often characterized by a dominant plant form or physical characteristic.
Hispanic/Latino	Of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.
Holocene	An epoch of the Quaternary period from the end of the Pleistocene, approximately 10,000 years ago, to present time.
household impact	A social unit consisting of those living together in the same dwelling. A direct or indirect consequence of the construction or operation of a proposed alternative, including the No-Action Alternative, on the environment in the Study Area; can be negative, positive, or neutral.
income	Total amount of all and any wages, bonuses, and/or tips an individual receives in a given year.
independent utility	The ability of the proposed action to function as proposed, independent of other planned transportation-related projects in the region.

indirect impact	Changes that are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect impacts may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on air, water, and other natural systems, including ecosystems.
intactness	A criterion for measuring visual quality. The integrity of visual order in the natural and human-made environment and the extent to which the landscape is free from visual encroachment of human-made elements.
intermittent	A stream that flows at only certain times of the year (not continuously) because of the balance between water losses from evaporation and seepage and actual streamflow.  Refers to the territory over which authority is exercised.
jurisdiction	Passed by Congress in 1965, the Act established the Land and Water Conservation Fund, a matching assistance program providing grants paying half the acquisition and development cost of outdoor recreation sites and facilities. Section 6(f) of the Act prohibits the conversion of property acquired or developed with these grants to a nonrecreational purpose without the approval of the U.S. Department of the Interior's National Park Service. A condition of conversion is that replacement lands of equal value, location, and usefulness are provided. This means that where conversions of Section 6(f) lands are proposed for highway projects, replacement lands are required.
Land and Water Conservation Fund Act (LWCFA) and Section 6(f)	
last resort housing	On most projects, an adequate supply of housing would be available for sale or rent, and the benefits provided would be sufficient to enable relocation to comparable housing. However, there may be projects in certain locations where the supply of available housing is insufficient to provide the necessary housing for those persons being displaced. When a housing shortage occurs, the Arizona Department of Transportation would solve the problem by the administrative process called Housing of Last Resort (see Appendix 4-1 for more information).
lateral	A type of irrigation feature branching from a canal. Can be a lined or unlined ditch or pipe.
L <sub>eq</sub>	The equivalent steady-state, A-weighted sound level which, in a stated period, would contain the same acoustical energy as the time-varying sound levels during the same period. The average noise level over a period.
L <sub>eq1h</sub>	The L <sub>eq</sub> for 1 hour.
leukemogen	A substance tending to induce the development of leukemia.
level of service (LOS)	The operating performance of an intersection or roadway segment can be described using the term <i>level of service</i> . Level of service is a qualitative description of operation based on the degree of delay and maneuverability.
light trucks	All vehicles with two axles and four wheels, designed primarily for transportation of passengers and cargo. Generally, the gross vehicle weight is equal to or less than 6,000 pounds.
line	The edge of an object or a part of an object—the linear transitional demarcation between objects and between colors and textures.
listed species	Any species of fish, wildlife, or plant that has been determined to be endangered or threatened under Section 4 of the Endangered Species Act.
logical termini	Rational end points for a transportation project and for a review of environmental impacts.
long-term impact	Change that will be significant beyond 2035, which is the design year for the proposed South Mountain Freeway project.
low-income	Populations in households with an income at or below the U.S. Department of Health and Human Services poverty guidelines.

<b>major viewpoint</b>	A location from which the landscape is viewed where the view of distinct landforms/landmarks attracts attention away from the foreground area.	<b>National Register of Historic Places (NRHP)</b>	The nation’s official list of cultural resources worthy of preservation. Authorized under the National Historic Preservation Act of 1966, the National Register of Historic Places is part of a program to coordinate and support public and private efforts to identify, evaluate, and protect historic and archaeological resources. Properties listed in the National Register of Historic Places include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, engineering, and culture.
<b>metamorphic rock</b>	Any rock derived from preexisting rocks by mineralogical, chemical, and/or structural change in response to marked changes in temperature, pressure, shearing stress, and chemical environment.	<b>National Trail</b>	The backbone of the Phoenix South Mountain Park/Preserve trail system, stretching from the Pima Canyon Trailhead in the east to the San Juan Lookout in the west. Nearly every other trail in the park joins the National Trail at some point.
<b>methodology</b>	A particular procedure or set of procedures.	<b>native</b>	An indigenous plant or animal.
<b>micron</b>	A metric unit of length equal to one millionth of a meter.	<b>Native Hawaiian/Other Pacific Islander</b>	A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
<b>migration</b>	To move from one country, place, or locality to another.	<b>nonattainment areas</b>	Areas that have failed to meet the National Ambient Air Quality Standards.
<b>minority populations</b>	People who identify themselves as Hispanic or Latino, Black or African American, American Indian or Alaskan Native, Asian, Native Hawaiian or other Pacific Islander, some other race, or more than one race.	<b>nonpoint source</b>	Pertains to the discharge of pollutants into waters or air where the pollutant sources come from an area rather than a single source that can be pinpointed.
<b>mitigation</b>	<p>An action taken to reduce or eliminate an adverse impact stemming from construction, operation, or maintenance of a proposed action alternative. Mitigation could reduce the magnitude and extent of an impact from a level of significance to a level of insignificance. Mitigation includes:</p> <p><i>Avoiding</i> the impact altogether by not taking a certain action or parts of an action.</p> <p><i>Minimizing</i> impacts by limiting the degree of magnitude of the action and its implementation.</p> <p><i>Rectifying</i> the impact by repairing, rehabilitating, or restoring the affected environment.</p> <p><i>Reducing</i> or eliminating the impact over time by preservation and maintenance operations during the life of the action.</p> <p><i>Compensating</i> for the impact by replacing or providing substitute resources or environments.</p>	<b>occupancy</b>	Housing unit inhabited as of April 1, 2000 (when the 2000 Census was taken).
<b>mobile source air toxics (MSATs)</b>	The seven priority mobile source air toxics—acrolein; benzene; 1,3-butadiene; formaldehyde; naphthalene; polycyclic organic matter; and diesel particulate matter.	<b>off-road</b>	Nonroad vehicles: aircraft, trains, boats, farm equipment, recreation, and construction equipment.
<b>multidisciplinary process</b>	A method using numerous professions or experts working together to solve a problem.	<b>on-road</b>	Cars, motorcycles, buses, light-duty trucks, and heavy-duty trucks.
<b>naphthalene</b>	One of the seven priority mobile source air toxics designated by the U.S. Environmental Protection Agency. Naphthalene is a white, crystalline, volatile solid that converts directly to a gas without an intermediate liquid phase at room temperature so that it exists as a gas in the atmosphere. Naphthalene is produced from petroleum refining and coal tar distillation. Naphthalene is released to the air from the burning of coal and oil and from mothballs. Naphthalene is a component of tobacco smoke and vehicle exhaust. Its vapors are highly irritating to the eyes.	<b>overpass</b>	A grade separation where the freeway passes over the cross street or rail line.
<b>National Ambient Air Quality Standards (NAAQS)</b>	Standards set by the U.S. Environmental Protection Agency to protect public health and welfare. These standards are set for pollutant concentrations that states, cities, and towns must meet by specified deadlines.	<b>ozone (O<sub>3</sub>)</b>	A form of oxygen and a criteria pollutant that can develop when oxides of nitrogen, volatile organic compounds, and sunlight interact in the lower atmosphere. Ozone is a powerful oxidizing agent, and is thus biologically corrosive
<b>National Environmental Policy Act (NEPA)</b>	The federal law, enacted in 1970, that established a national policy for the environment and requires federal agencies to become aware of the environmental ramifications of their proposed actions, to fully disclose to the public proposed federal actions, to provide a mechanism for public input to federal decision making, and to prepare environmental impact statements for every major action that would significantly affect the quality of the human environment.	<b>peak hour</b>	The single morning or evening hour during which the maximum traffic volume occurs.
<b>National Historic Preservation Act (NHPA)</b>	The primary federal law pertaining to the protection of cultural resources.	<b>pediment</b>	A broad, gently sloping erosion surface or plain of low relief, typically developed by running water, found in arid or semiarid regions at the base of abrupt and receding mountain fronts; it is underlain by bedrock that may be at the surface but is more often mantled with a thin veneer of alluvium derived from upland regions.
<b>National Park Service (NPS)</b>	An agency within the U.S. Department of the Interior, the NPS preserves the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of current and future generations. The NPS is responsible for the administration of the National Register of Historic Places. Under Section 6(f) of the Land and Water Conservation Fund Act, the NPS reviews land conversions for transportation projects that require replacement land.	<b>perched groundwater</b>	Unconfined groundwater separated from the underlying main body of groundwater by unsaturated rock or alluvium.
		<b>perennial</b>	Present throughout the year.
		<b>physiographic province</b>	A region of which all parts are similar in geologic structure and climate, and which has had a unified geomorphic history; its relief features differ significantly from those of adjacent regions.
		<b>piedmont</b>	Lying or formed at the base of a mountain or mountain range.
		<b>PM<sub>2.5</sub></b>	Particulate matter of 2.5 microns or less in diameter.
		<b>PM<sub>10</sub></b>	Particulate matter of 10 microns or less in diameter.
		<b>point source</b>	Stationary source of emissions, such as manufacturing facilities, factories, petroleum refineries, and dry cleaners.
		<b>polycyclic organic matter (POM)</b>	One of the seven priority mobile source air toxics designated by the U.S. Environmental Protection Agency. POM is a broad class of over 100 organic compounds existing as either gases or particles in the atmosphere, depending on chemical structure, temperature, and pressure. POM is produced by incomplete combustion of fossil fuels and vegetable matter and is generally present in the atmosphere in particulate form. Vehicle exhaust is one of many sources of POM.
		<b>population</b>	All the organisms living in a given area; a group of individuals.

<b>precursors</b>	Pollutants that contribute to the formation of other pollutants.
<b>prime farmland</b>	Land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion.
<b>prior rights</b>	As used in this document, <i>prior rights</i> refer to a situation involving a utility company that has facilities located on private easements that are later acquired or encompassed by the State’s right-of-way. In this situation, the utility is given a choice of relocating its conflicting facilities onto a public right-of-way or of acquiring a new easement and relocating onto it. Either would be at the Arizona Department of Transportation’s expense.
<b>project sponsor</b>	An individual, agency, or group who lends support to the project by advocacy and/or financial means.
<b>proximity impacts</b>	Indirect impacts so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired. Proximity impacts are in regard to noise, air, and water pollution; wildlife and habitat; aesthetic values; and/or other relevant impacts.
<b>prudent and feasible</b>	This concept is essential to the Section 4(f) process. It refers to how practical an alternative is in its attempt to avoid the use of a Section 4(f) resource. The term <i>feasible</i> refers to whether a project can be built using current construction methods, technologies, and practices. The term <i>prudent</i> refers to how reasonable and responsible the alternative is. The Arizona Department of Transportation is obligated to choose an avoidance alternative only if it is prudent and feasible.
<b>public use</b>	Public use entails access for more than a select group of the public at any time during normal hours of operation.
<b>publicly owned</b>	Property that is owned and/or operated by a public entity. If a governmental body has a proprietary interest in the land (such as fee ownership or drainage easements), it can still be considered publicly owned.
<b>Quaternary</b>	The second period of the Cenozoic era, following the Tertiary period. It began 2 or 3 million years ago and extends to the present.
<b>reasonable alternatives</b>	Feasible recourses for a proposed action.
<b>receiver</b>	The location at which noise levels are measured, modeled, and analyzed. Receivers of interest are typically residences, schools, parks, or other noise-sensitive land uses.
<b>receiving water</b>	Watercourse or water body that would receive discharges from a source(s).
<b>recharge</b>	The process involved in the addition of water to the zone of saturation; also, the amount of water added.
<b>return period</b>	A return period, or recurrence interval, is an estimate of the interval of time between events such as an earthquake, flood, or river discharge of a certain intensity or size. It is a statistical measurement denoting the average recurrence interval over an extended period, and is usually required for risk analysis.
<b>right-of-way (R/W)</b>	Publicly owned land used or intended to be used for transportation and other purposes.
<b>riparian</b>	An aquatic or terrestrial ecosystem associated with bodies of water, such as streams, lakes, or wetlands, or dependent on the existence of perennial, intermittent, or ephemeral surface or subsurface water drainage. Riparian areas are usually characterized by dense vegetation and abundance and diversity of wildlife.
<b>rolling profile</b>	A roadway that follows the land contour and is not flat. Slight crests and sags in roadway help avoid concentrated stormwater drainage and assist in making travel interesting for drivers, thus improving safety. Such a road profile helps to cost-effectively balance the import and export of fill material and minimize the amount of land that must be acquired.

<b>scale</b>	The apparent size relationship between a landscape component and its surroundings. See <i>indirect impact</i> .
<b>secondary impact</b>	Under Section 106 of the National Historic Preservation Act of 1966, federal agencies are required to identify and evaluate cultural resources and consider the impact of undertakings they fund, license, permit, or assist on historic properties eligible for inclusion in the National Register of Historic Places. The federal agencies must allow the State Historic Preservation Office and the Advisory Council on Historic Preservation the opportunity to comment on these undertakings.
<b>Section 106 of the National Historic Preservation Act</b>	A later amendment to the U.S. Department of Transportation Act of 1966 stipulating that the Federal Highway Administration and other departments of transportation using federal funds cannot approve the use of land from a significant publicly owned public park, recreation area, wildlife or waterfowl refuge, or any significant cultural resource unless there is no prudent and feasible alternative to the use of that land and unless the action includes all possible planning to minimize harm to the property resulting from its use.
<b>Section 4(f)</b>	A solid, fragmental material transported by wind, water, or ice; chemically precipitated from solution or secreted by organisms; and that forms in layers in loose, unconsolidated form.
<b>sediment</b>	A traffic interchange connecting a freeway facility and a cross street—it typically features traffic signals to regulate traffic flow.
<b>service traffic interchange</b>	The time, place, and circumstances in which something occurs or develops.
<b>setting</b>	Any construction or natural barrier that, when located between the roadway and the receiver, will provide an excess reduction in road noise.
<b>shielding</b>	Change that will not be significant beyond the planning horizon of the design year (2035).
<b>short-term impact</b>	Single-family, detached house.
<b>single-family residence</b>	Of, relating to, or involving a combination of social and economic factors.
<b>socioeconomic</b>	A chemical product used to dissolve or disperse other substances.
<b>solvent</b>	Sound-pressure level measured, for use in transportation noise analysis, through use of A-weighted frequency.
<b>sound level (or noise level)</b>	The rate of movement of vehicular traffic measured in miles per hour (mph).
<b>speed</b>	The State Historic Preservation Officer is appointed by the governor to head the State Historic Preservation Office. The agency provides project review and oversees compliance with Section 106 of the National Historic Preservation Act. The U.S. Department of Transportation generally uses the Section 106 process as a method for determining National Register of Historic Places eligibility and by which a cultural resource’s significance is determined for a federal undertaking under Section 4(f).
<b>State Historic Preservation Office/Officer (SHPO)</b>	The document prepared by the Arizona Department of Environmental Quality detailing for the U.S. Environmental Protection Agency the actions the State of Arizona will take to attain compliance with the National Ambient Air Quality Standards.
<b>State Implementation Plan (SIP)</b>	Boundary of area being evaluated for the South Mountain Freeway Environmental Impact Statement/Section 4(f) Evaluation.
<b>Study Area</b>	Sinking or downward settling of the earth’s surface, not restricted in rate, magnitude, or area involved. Subsidence may be caused by natural geologic processes, such as solution, compaction, or withdrawal of fluid lava from beneath a solid crust; or by human activity, such as subsurface mining or the pumping of oil or groundwater.
<b>subsidence</b>	For any given species, defined as habitat that contains the components (i.e., food, cover, and nesting/breeding sites) required for the survival and reproduction of a species.
<b>suitable habitat</b>	



<b>system linkage</b>	Improving access to various points throughout the region by connecting or “linking” two or more transportation facilities.
<b>system traffic interchange</b>	A traffic interchange connecting two or more freeway facilities and allowing for uninterrupted traffic flow as motorists move from one facility to another.
<b>tetrachloroethene</b>	A solvent commonly used in dry cleaning; can become a groundwater contaminant.
<b>texture</b>	An object’s apparent surface coarseness or roughness.
<b>threatened species</b>	Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
<b>transportation demand management (TDM)</b>	A general term for strategies that encourage more efficient use of existing transportation resources.
<b>transportation system management (TSM)</b>	Fundamental traffic engineering actions taken to improve the operation of the highway system to help reduce congestion.
<b>trichloroethene</b>	A solvent primarily used in metal degreasing and cleaning operations; can become a groundwater contaminant.
<b>ultimate configuration</b>	The ultimate lane configuration of the proposed action includes three general purpose lanes and one high-occupancy vehicle lane in each direction, for an eight-lane, divided, access-controlled freeway.
<b>unique farmland</b>	Land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, fruits, and vegetables.
<b>unity</b>	A criterion for measuring visual quality. The degree to which visual resources join together to form a single, coherent, harmonious visual pattern. It refers to compositional harmony—intercompatibility between the landscape elements, or an organized balance. Unity can be measured by two factors: the degree of contrast between human-made elements and their setting in the landscape and the unity of the overall landscape. The rating for the degree of contrast between human-made elements and their setting in the landscape is based on a rating of the visual compatibility, scale contrast, and spatial dominance of the elements.
<b>upland</b>	Ground elevated above drainage features, wetlands, and rivers that could be banks, hills, and slopes. Land that is generally dry.
<b>U.S. Census Bureau</b>	Part of the U.S. Department of Commerce, the government department responsible for collecting statistics about the nation, its people, and its economy.
<b>U.S. Department of Transportation (USDOT)</b>	The agency responsible for transportation issues in the federal government. It consists of many agencies providing transportation services to the public, including the Federal Highway Administration and the Federal Aviation Administration.
<b>use</b>	A “use” of a Section 4(f) resource, as defined in 23 Code of Federal Regulations § 774.17, occurs 1) when land is permanently incorporated into a transportation facility, 2) when there is a temporary occupancy of land that is adverse in terms of the statute’s preservationist purpose, or 3) when there is a constructive use of land. A constructive use of a Section 4(f) resource occurs when the transportation project does not incorporate land from the Section 4(f) resource, but the project’s proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired.
<b>utility</b>	An entity that transmits or distributes communication, cable television, electricity, light, heat, gas, petroleum products, water, sewer, waste, or any other similar commodity that directly or indirectly serves the public. For this document, a railroad is considered a utility.

<b>veneer</b>	A thin layer of a deposit covering another layer.
<b>Visual Assessment Units</b>	Subdivisions of the landscape defined in terms of landform, vegetation, land use, length, and special features in the foreground, middleground, and background. In particular, such units are defined by observable changes in the primary biotic community as marked by vegetation, changes in land use and visual character, and changes in viewpoint (on- or off-corridor), as well as the presence of special features in the landscape.
<b>visual character</b>	The order and composition of the elements of form, line, color, and texture that form the visual landscape.
<b>visual impact</b>	The degree of change in visual resources and viewer response to those changes.
<b>visual quality</b>	The measure of the visual elements of distinctiveness, intactness, and unity as it relates to the formation of a distinct landscape.
<b>visual/viewer sensitivity</b>	The relative measure of viewer response to changes in the visual landscape.
<b>Water Quality Assurance Revolving Fund (WQARF)</b>	Created under the Environmental Quality Act of 1986 to support hazardous substance cleanup efforts in the state of Arizona. The program is administered by the Arizona Department of Environmental Quality. It has a federal counterpart, the Comprehensive Environmental Response Compensation and Liability Act (CERCLA).
<b>watershed</b>	That part of a landform from which stormwater runoff flows to a single point.
<b>Western Section wetlands</b>	The portion of the Study Area located west of the common point. The U.S. Army Corps of Engineers defines wetlands as areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, under normal conditions, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, and similar areas, and are subject to protection under Executive Order 11990 and Section 404 of the Clean Water Act, as amended.
<b>White</b>	A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.
<b>wildlife of special concern in Arizona</b>	Species whose occurrence in Arizona is or may be in jeopardy, or with known or perceived threats on population declines, as described by the Arizona Game and Fish Department’s listing of wildlife of special concern in Arizona.
<b>xeroriparian</b>	Dense areas of vegetation that border dry desert washes.
<b>Symbols</b>	
°	Degree.
>	Greater than.
≥	Greater than or equal to.
<	Less than.
≤	Less than or equal to.
%	Percent.
μ	Micro.
±	Plus or minus (approximate value).
§	Section (in legal references). Plural is denoted by §§.
<xxxx>	Brackets set off Web site addresses or e-mail addresses from the surrounding text.



BIBLIOGRAPHY AND REFERENCES

ADOT Technical Reports and Predecisional Reports and Memorandums

Technical reports—with the exception of the cultural resources and Section 4(f) technical reports (because of the sensitive information they contain)—are available on the project Web site at <azdot.gov/southmountainfreeway>. If reviewing a hard copy, the technical reports are also included on the compact disc placed in the envelope on the back cover of Volume I. Technical reports, predecisional reports, and memorandums can be made available for review by appointment at ADOT Environmental Planning Group,1611 W. Jackson St., Phoenix, AZ 85007 [(602) 712-7767]. Special requests for portions of the cultural resources and Section 4(f) reports will be considered by ADOT on a case-by-case basis.

Final Environmental Impact Statement  
Technical Reports and Addenda

- Air Quality Report
- Biological Evaluation
- Cost Estimate Report
- Economic Impacts Report
- Energy Report
- Floodplains Report
- Geotechnical Report
- Initial Site Assessment
- Jurisdictional Waters Report
- Land Use Report
- Noise Report
- Prime and Unique Farmland Report
- Secondary and Cumulative Impacts Report
- Section 4(f) and Section 6(f) Report
- Social Conditions Report
- Title VI and Environmental Justice Report
- Traffic Overview
- Utilities Report
- Visual Resources Report
- Water Resources Report

These reports were updated for the Final Environmental Impact Statement.

Predecisional Reports and Memos

- South Mountain Transportation Corridor Study, Purpose and Need Technical Memorandum Traffic Analysis (2001)
- Alternatives Development and Screening Process Memorandum (2002)
- Scoping Summary Report (2002)
- South Mountain Corridor Study Issues Assessment (2002)
- South Mountain Transportation Corridor – Purpose and Need Technical Memorandum (2002)
- Alternatives Screening Report (2003)
- SR 202L/SR 101L Direct Connection Alternatives Screening Report (2003)
- SR 202L/SR 101L Direct Connection Alternatives along 99th Avenue and ¼ Mile East Memorandum (2004)
- Traffic Report (2007)
- Tunnel Concept Preliminary Estimate of Costs Memorandum. March 2005 (2009)
- Renaming of Alternatives for the Draft EIS Memorandum (2006)
- W101 Options Screening Memorandum (2006)
- Business Issues Relating to Access Change Memorandum (2006)
- W101 Alternative, Partial Reconstruction or Full Reconstruction of the Existing System Interchange Memorandum (2006)
- System Interchange Ramp Capacity Memo (2006)
- System Interchange Mainline Through Capacity Memorandum (2006)
- Phoenix South Mountain Park/Preserve and Traditional Cultural Property Avoidance, Ridge Bridge – Tunnel Analysis Memorandum (2009)
- E1 Alternative – Profile Variations along Pecos Road Memorandum (2009)
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