

Citizens Advisory Team Technical Report Summary

Draft Cumulative and Secondary Impacts

What are cumulative and secondary impacts?

Federal guidance defines cumulative impacts as: "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts are considered direct effects, which are "caused by the action and occur at the same time and place" (40 CFR 1508.8). In more basic terms, cumulative impacts occur where several actions in an area combine to create an impact greater than any one individual activity. Individual cars when added together in one general location leading to a traffic jam is an example. Cumulative impacts. The effects of human activities would accumulate when a second impact occurs at a site or in a region before the environmental system can fully rebound from the effect of the first impact.

Secondary impacts (sometimes referred to as indirect impacts) are "caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Secondary 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 and water and other natural systems, including ecosystems" (40 CFR 1508.8). A simple example is building a new highway interchange at a cross-street can attract the building of a gas station.

The draft technical report follows two principles outlined by the Council of Environmental Quality guidance (1997) in considering secondary and cumulative analyses: (1) focus only on the effects and resources within the context of the proposed action; and (2) present a concise list of issues that have relevance to the anticipated effects of the proposed action or eventual decision.

Why study cumulative and secondary impacts in the Environmental Impact Statement (EIS)?

The Phoenix metropolitan area is growing rapidly and has been since the 1950s. The valley has gone from a small agricultural town to a major metropolitan area over the last 100 years. This rapid growth is expected to continue well into the future. In addition, this growth results in cumulative effects on natural resources in the area, communities, residents, infrastructure and economic conditions. Evaluating cumulative impacts from the proposed action and other activities on various resources provides an understanding of the overall condition of each resource and the proposed action's contribution to effects on the resource. The proposed action may also result in impacts which occur elsewhere or later in time, therefore secondary impacts are evaluated to identify if such effects are occurring.



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What other activities are considered in evaluating cumulative impacts?

The definition of cumulative impacts requires consideration of past, present, and reasonably foreseeable changes that could result in cumulative impacts when combined with the environmental effects of the proposed action. Specifically, activities are evaluated when, in combination with the potential impacts of the proposed action, they could result in significant cumulative impacts. In accordance with precedence set by court cases, reasonably foreseeable changes were limited to projects that are planned and funded. The following types of activities that could result in cumulative impacts were reviewed:

- ► Other highway projects
- Planned mass transit projects in the Study Area
- Major utility projects in the Study Area
- Other general development patterns

Other proposed transportation projects in the proximity to the Study Area include light rail on Interstate 10 (I-10), the I-10 Median Widening project, the SR 801 project, and the I-10 Corridor Improvement Study (Collector-Distributor roads). No major utility projects were identified aside from local distribution system extensions to service existing growth. Examples of on-going development in the Study Area are such residential/commercial projects as the 57-acre Arizona Meadows II, 674-acre Country Place, 160-acre The Sanctuary, 260-acre Windsong and 160-acre Arlington Estates.

What kind of impacts would occur from the proposed action?

Critical resources warranting secondary impact analysis are presented in this section. To address the potential impact severity, classifications in accordance with the FHWA guidance are presented in Table 1.

| Impact Category | Impact Classification | Description | | | |
|------------------------------------------------------------------------------------------------|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| Туре | Neutral, Positive, or Negative | Compares the final condition of a given resource to its existing condition (assumes that the expected impact occurs). Impacts on personal property are considered negative. | | | |
| Severity | Minor, Moderate, or Substantial | Considers the relative contribution of the proposed action to a given impact. | | | |
| Duration | Temporary or Permanent | Permanent is assumed unless otherwise noted. | | | |
| Note: | | | | | |
| Neu = neutral; Pos = positive; Neg = negative; Min = minor; Mod = moderate; Sub = substantial; | | | | | |
| Sec = secondary; Cum = cumulative | | | | | |

| Table 1. | Secondary | Impact | Severity | Classifications |
|----------|------------|--------|----------|-----------------|
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Table 2 functions as a matrix and summarizes the anticipated secondary and cumulative impacts that can be reasonably foreseeable as they relate to the proposed action.

| Resource | Proposed Action Impact | Past, Present and Reasonably | Type of Impact |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------|
| | | Foreseeable | |
| Biological | Habitat loss from direct conversion to transportation use | Habitat loss from urban development | Neg/Mod/Cum/Sec |
| | Habitat isolation and fragmentation | Habitat loss from urban development | Neg/Mod/Cum/Sec |
| | Wildlife population reduction | Vehicle-collisions | Neg/Min/Cum/Sec |
| | Loss of native vegetation | Construction of all types of projects | Neg/Mod/Cum/Sec |
| | Introduction of noxious weeds | | Neu/Min/Cum |
| Water Resources | Increased runoff and flush contaminants from impervious surfaces | Increased impervious runoff and flush contaminants and existing impaired waters | Neg/Min/Cum |
| | Loss and/or alteration of natural drainage features | Loss from urban development | Neg/Min/Cum/Sec |
| | Modification of ground water tables from pumping to drain a depressed facility might eventually impact the water table by removing this water from use | Ground water draw from continued development | Neg/Min/Cum |
| Clean Air | All predictable measures below federal and state standards. Mobile Source Air Toxics (MSATs) may generate adverse effects on nearby residences. | Development related to continued urban growth in the region | Neu/Unknown/Cum |
| Cultural Resources | Disturbance to known historic and pre- historic sites | Permanent loss due to on-going urban growth | Neu/Min/Cum |
| Agricultural Land | Conversion of agricultural lands to a transportation use | Permanent loss due to on-going residential, industrial, and commercial development | Neg/Min/Cum |
| Land Use | Conversion of agricultural lands to a transportation use | On-going residential, industrial, and commercial development | Neg/Min/Cum |
| | Recreational lands | On-going residential, industrial, and commercial development and other transportation and public infrastructure projects | Neg/Min/Cum |
| | Displacements - Residential and business displacements | Other transportation and public infrastructure projects | Neg/Min/Cum |
| | Land use ownership and conversions | On-going residential, industrial, and | Neu/Min/Sec |
| | Community character and cohesion - Alteration to community character and cohesion | commercial development and other transportation and public infrastructure projects | Neg/Min/Cum/Sec |
| | Public service access | Future demands on services as a result of urban growth | Neg/Min/Cum/Sec |

Table 2. Secondary and Cumulative Impacts Summary



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| Resource | Proposed Action Impact | Past, Present and Reasonably Foreseeable | Type of Impact | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-----------------|--|--|--|
| Economic Conditions | Enhanced movement of goods, materials, and services; property value changes | Aggregate past and projected growth in land values and economic activity in Study Area | Pos/Mod/Cum/Sec | | | |
| Note: Neu = neutral; Pos = positive; Neg = negative; Min = minor; Mod = moderate; Sub = substantial; Sec = secondary; Cum = cumulative | | | | | | |

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How do the alternatives differ in cumulative and secondary impacts?

From a cumulative and secondary impacts perspective the action alternatives would have comparable effects. The various activities affecting resources and people in the Study Area and the proposed action can have localized variations at a project level, depending on the specific location of a given effect. However, when viewed cumulatively, a broader view of each resource should be considered and from this perspective, each action alternative has comparable effects.

What if the project was not constructed?

If the South Mountain Freeway were not implemented, the incremental effects contributed *solely* by the proposed action would not occur. However, no action would not preclude other activities from affecting resources in a similar manner. Most cumulative impacts would result from ongoing conversion of land to more intensive human-based development. These effects, such as the permanent loss of cultural resources and the permanent loss of agricultural lands, would occur without the proposed action in place.

What can be done to reduce cumulative or secondary impacts?

Disclosure of secondary and cumulative impacts does not require the project proponent to propose and implement mitigation to address such impacts. Project-specific mitigation as proposed to mitigate direct impacts inherently addresses reductions in such overall impacts. However, the disclosure primarily is for informative purposes. By disclosing these types of impacts, those concerned are provided a mechanism to contact responsible parties either contributing to such impacts or having regulatory authority pertaining to such matters. For example, the Environmental Protection Agency has enacted rules to reduce vehicle emissions at the national and regional levels. Local jurisdictions governing land development have enacted local zoning ordinances to control and regulate development.

Will the proposed action induce additional travel to occur?

To address this question, first it is important to define the phrase, induced travel. It is a phrase used to describe observed traffic volume increases occurring on a new highway after it is opened. The observation is prominent in areas where congestion is already evident (the Phoenix metropolitan area is a prime example).

The proposed action would be constructed where existing traffic congestion has already decreased travel speeds throughout much of the regional freeway system and the major arterial network. To avoid the congestion, over time, some travelers have diverted to alternative routes, changed the time they make their trips, switched to different travel modes, traveled to other



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destinations, or decided not to make a particular trip at all. Because the proposed action would carry substantially more traffic before it would become congested, many of these travelers may switch to the new facility when opened to take advantage of decreased travel times. Some travelers using transit as a choice may also switch and further, some may choose to travel to a different (more distant) destinations (e.g., for shopping) or take a trip that they previously avoided altogether, because it was previously "too much trouble" to make. The behavior driving this switch is often associated with drivers' perception in resulting decreases in the generalized cost of travel, including both travel-time and out-of-pocket costs. However, it is commonly recognized the cause of this 'switch' is more complex; involving various travel behavior responses, evolving individual needs, residential and business location decisions, and changes in regional population and economic growth.

Some induced travel would represent 'new trips'. However, most of the increase in traffic caused by induced travel is expected to come from trips already being made before the proposed action were put into operation (predictable traveler behavior accounted for in the travel demand forecasts conducted for the proposed action). The resulting traffic increase on the South Mountain Freeway is also expected to be largely offset by decreases in traffic volumes on parallel routes and at other times of the day. It is fully expected the net effect on daily vehicle miles of travel in the valley as a result would be minimal. Examples in the valley where this phenomenon has been experienced include the recent openings of the Pima Freeway in Scottsdale and Red Mountain Freeway in Mesa.

The Pima Freeway was open to traffic in 2002 from the Red Mountain Freeway to I-17. The section from the Red Mountain Freeway to Shea Boulevard was open in 1999. Upon openings, a change in traffic volumes were experienced on Hayden and Scottsdale roads (both parallel the Pima Freeway one mile and two miles to the west, respectively). Both are major arterials with cross sections of four to six lanes.

The analysis, conducted by the City of Scottsdale, illustrates a reduction in traffic along both major arterials after the freeway was completed. The traffic reduction on Hayden Road, ranged from 13,900 vehicles per day (vpd) to 48,300 vpd with an average reduction of 31,000 vpd. Scottsdale Road, which is further away from the freeway, experienced a reduction between 2,100 vpd and 13,300 vpd with an average of 10,000 vpd.

The Red Mountain Freeway, from its interchange with the 101L to Gilbert Road was opened to traffic in 2002 and the extension to Higley Road was open in 2003. Upon openings, a change in traffic volumes were experienced on McDowell, McKellips, and Brown roads (all generally parallel the Red Mountain Freeway one, two, and three miles to the south, respectively). All are major arterials with cross sections of four to six lanes.

The analysis, conducted by the City of Mesa, illustrates a reduction in traffic along all three major arterials after the freeway was opened. The traffic reduction on McDowell Road ranged from 6,300 vpd to 9,900 vpd with an average reduction of 8,600 vpd. The traffic reduction on McKellips Road ranged from 2,300 vpd and 33,900 vpd with an average of 19,000 vpd. The traffic on Brown Road ranged from an increase of 300 vpd at the east end and a reduction of 9,700 vpd with an average reduction of 4,500 vpd. The largest reduction is on the west end of the roadway, near Country Club Drive.



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Both examples provide insight to general driver behavior. At the time of opening, both freeways represented to drivers a savings in time and/or cost in travel. Consequently, drivers moved from the arterial network to the freeway system. Over the course of time, it would be expected that some drivers would return to the arterial network as more vehicles traveled on the freeways. For the South Mountain Freeway project, a net reduction on the arterial network is anticipated through the design year 2030 as projected traffic volumes on the arterial network are projected to be less with the proposed action in place than without the proposed action.

For the proposed action, the minimal contribution to overall traffic use by induced travel is expected to have both positive and negative consequences (positive effects on the neighboring roadway network have been previously addressed). Changes in driving behavior leading to the use of the proposed action would be the result of perceived benefits which could include reduced total daily travel time and cost or an increased value associated with a new destination (e.g., a previously 'inaccessible' shopping area with more variety or lower costs).

As a negative consequence, each user of the proposed action would contribute to increased congestion on the freeway. As congestion grows on the new facility, the benefit attributable to potential travel time savings would be expected to decline. Congestion-related impacts (e.g., reduced air quality) would also increase over time. However, it is important to note the overall contribution to projected traffic volumes on the proposed action is anticipated to be minimal (some of which is accounted for in regional traffic models).

It is important to consider that improvements proposed for any type of transportation system (e.g., a new bus route, rail transit line or commuter rail service) would likely lead to changes in travel behavior, which in turn would lead to increased use of the particular system. It is the purpose of 'improvements' made to a given transportation system – to attract new users to the improvement. If this were not a primary goal, the improvement would not be effective nor warranted. For the proposed action, a goal is to attract users of other segments of the regional freeway system and the local arterial network, now and in the future, to the project to optimize, in part, the entire regional transportation system (as outlined in the project's purpose and need). Further, it is important to consider that as improvements are made to all transportation systems, cyclical benefits and impacts would occur. For example, as auto trips are diverted to transit (either due to direct improvements or increased congestion), traffic congestion on parallel highway facilities may lessen, at least temporarily. The resulting reduction in highway traffic congestion may, in turn, attract additional highway trips, similar to an increase in highway capacity.

The Federal Highway Administration's current position relative to induced travel is consistent with the consensus of the transportation planning and travel behavior research community - induced travel is neither more nor less than the cumulative result of individual traveler choices and land development decisions made in response to an improved level of transportation service. Many of the travel choice decisions are accounted for in current travel forecasting models or land use-transportation interaction models.



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Will the proposed action lead to unplanned growth?

Unplanned growth is often termed 'urban sprawl'. Generally, the reference is made in the context of the rapid and uncontrolled urban growth onto previously undeveloped land – usually on the 'outskirts' of an existing urban area. Construction of projects like the proposed action are pointed to as major contributors to urban sprawl. Freeway projects are often cited as making land at the urban fringe more accessible and therefore more attractive for development.

But as with issues surrounding induced growth, the relationship between transportation improvements and land development is complex. Land accessibility in a particular area as a result of a freeway project may make land more attractive for development, but other factors such as utility infrastructure, quality of public services, land acquisition and development costs, economic conditions, and entitlement costs contribute major roles in determining where and how development would occur. And in fact, in many cases, new development being attracted to one part of a metropolitan region often represents development that has been redirected from other parts of the region.

The proposed action would occur in an already quickly urbanizing area (most *noticeably* in the Western Section of the Study Area). As such, the proposed action would not provide new or substantially improved access to a large undeveloped geographic area. The proposed action would occur in an area planned for urban growth as established in local jurisdiction land use planning activities for as much as the last 20 years. If, on the other hand, the proposed action were to be located in a rural area, it may provide access to large tracts of undeveloped land. Some similar types of projects, in fact, in other parts of the country, were developed specifically to promote non-highway economic development. In two such cases, FHWA is monitoring where a substantial highway improvement was completed whose purpose was to promote economic development. In the case of the proposed action, the purpose of the project is not to promote economic development but to respond to a growing need for additional transportation capacity as a result of valley growth occurring now and as projected into the future.

Are the conclusions presented in this summary final?

It is likely findings relative to impacts are subject to change; although, such changes for secondary and cumulative impacts are expected to be minor. The reasons for any future changes will be presented to the public during the Draft EIS and Final EIS stages. Secondary and cumulative impacts relate to reasonably foreseeable actions. Refinement in design features and updated aerial photography, for example, provide insight to changes to project-specific impacts. Typically, project-specific impacts are a small component to the types of impacts described in this summary. As such, it is anticipated the affects would be equal among the alternatives and consequently impacts would be comparatively the same. This assumption would be confirmed if and when such changes were to occur.

As a member of the Citizens Advisory Team, how can you review the entire technical report?

The complete technical report is available for review by making an appointment with Mike Bruder or Mark Hollowell at 602-712-7545.