

# Utah Division Interstate Access Change Request Guidance Document

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## Background

The Federal Highway Administration (FHWA) works with the State highway departments in maintaining the operational flow and mobility of the Interstate system, thereby minimizing congestion. Consistent with our responsibilities, the Utah Division Office is committed to preserving the integrity and safety of the Interstate System through preservation of Interstate access control. Therefore, **FHWA has retained all approval authority to control all access to the Interstate system.** This is necessary to protect the integrity of the Interstate System and the extensive past and future investment associated with it.

The existing Interstate System has been designed and constructed with some capacity and flexibility to accommodate future needs. As land use and travel patterns change within the proximity of the Interstate System it sometimes requires an existing interchange to be modified or new access may be required. When these needs arise, great care must be exercised in the planning and designing of the facility to ensure proposed improvements do not diminish the capacity, operating efficiency and safety of the existing Interstate System. The Interstate System Access Informational Guide (ISAIG) should be utilized in the development, review, and approval of IACRs. The FHWA will provide an electronic copy upon request.

FHWA approval is required when access on the Interstate System is added or modified, and also when breaks in access along the crossroad, extending beyond the ramp terminal 100' in urban areas and 300' in rural areas (FHWA Interstate Design Policy), are requested. This applies to all access changes on the Interstate System regardless of funding sources and oversight. Each entrance or exit point, including "locked gate" and temporary construction access, to the mainline Interstate is considered an access point. When the UDOT considers a new or modified Interstate interchange or permanent locked gate access for transportation purposes is warranted, they will formally seek FHWA approval through the IACR process.

To obtain approval from FHWA to access the Interstate system, a request for access shall be submitted to FHWA through the Utah Department of Transportation (UDOT), in conformance with all applicable laws, guidance, and policies. The Access to the Interstate System document, commonly referred to as the eight policy points and provided in Appendix A, was issued on August 18, 2009, and it includes the requirements for the justification and documentation necessary to substantiate any request submitted to FHWA for approval. The Interstate Access Change Request (IACR) documents UDOT's activities to operate and manage the Interstate system, documents the identified needs and goals, analysis of alternatives and the request for access. Through the review and approval process, the FHWA ensures the request is documented and justified, the initial stated needs and goals are accomplished, and the request is in conformance with the intended purpose of the Interstate System.

## **Modification Requests**

There are several different types of new or modification requests that can impact the Interstate's operation, and they can generally be categorized as temporary, locked gate, or permanent. All three types are identified and addressed in the ISAIG. It should be noted that a modification request is treated the same, whether the project or access is state- or federally-funded.

### **Temporary Interstate Access**

Temporary access approvals require an IACR which briefly addresses the eight points described in the FHWA Policy (see Appendix A) and clearly states the duration of the temporary access or access modification during construction (these are temporary interchanges or temporary ramps). The expectation is the NEPA action for temporary access was completed during project development. Temporary construction access is usually granted only for construction activities within the Interstate right-of-way. The only circumstances that would justify temporary construction access to an adjacent property is when the construction is occurring in an isolated location with no other means of access, the access is for a limited and finite period of time, and there will not be a recurring need. The template for preparation of a temporary IACR is in Appendix B.

### **Locked Gate Interstate Access**

Locked gate access approvals require an IACR which briefly addresses the eight points described in the FHWA Policy (see Appendix A) and identifies the location and purpose of the access and demonstrates safety and operational acceptability for motorists entering and exiting the locked gate. The requirement is the NEPA action for the locked gate must be completed prior to approval of the locked gate access. Since locked-gate accesses are intended only for a few select users, they should be inconspicuous to the general traveling public with limited improvements. Key considerations in the location and design of locked-gate access are sight distance where vehicles will be entering the freeway and acceleration of the entering vehicles. The proposal should also clearly describe to whom access is granted, how the access will be secured, and maintenance responsibilities. The template for preparation of a locked gate IACR is in Appendix B.

### **Permanent Interstate Access**

Permanent Interstate access approval requires NEPA clearance prior to the FHWA approval. It should be a three-step process: a) Methods and Assumptions document b) Draft IACR, and c) IACR including FHWA approval. The three-step process was developed to help the state manage risk and provide flexibility. It is intended to identify fatal flaws and to help ensure the investment in the environmental document is not wasted.

**a) Methods and Assumptions document:**

The Methods and Assumptions document sets the framework for the transportation analysis for the IACR and includes the analysis years, limits of the study, travel demand forecasting, modeling and analysis methodologies, assumed land use and background infrastructure improvements, safety analysis methods, and operational parameters and methods. This will expedite review time and ensure the operations and safety analysis is conducted in accordance with FHWA guidelines found in the ISAIG. The Methods and Assumptions Memorandum template is provided in Appendix C.

**b) Draft Interstate Access Change Request (DIACR):**

Prior to FHWA approval of a NEPA document for public circulation and comment, the UDOT should submit a DIACR (see Appendix D) to FHWA for analysis and determination if the concept is acceptable. FHWA recognizes the detail provided at this time may not be sufficient to address all eight points of the FHWA Policy (outlined in Appendix A). However, there should be sufficient analysis to determine if there is an impact or issue associated with one alternative vs. another depending on the concept of operation and system characteristics (i.e. geometric, operation and other constraints). The DIACR should have sufficient operational analysis to justify the preliminary selection of the preferred alternative.

**c) Interstate Access Change Request (IACR):**

The FHWA shall review and approve the IACR (see Appendix D) submitted by UDOT that addresses in detail all eight points within FHWA policy. The IACR must be accompanied by UDOT's recommendation for approval. This process requires two distinct actions:

1. The first action is the finding of ***engineering and operational acceptability***. This is the more lengthy and time consuming of the two actions; it requires consideration of the eight policy points addressed in detail (see Appendix A). This activity should be conducted concurrently with the NEPA process.
2. The second action is final "approval." This occurs after a NEPA decision has been rendered.
  - i. If a significant change in conditions occurs between the NEPA decision and project construction (e.g., land use, traffic volumes, roadway configuration for design, environmental commitments), the IACR shall be reevaluated for engineering and operational acceptability.
  - ii. If a project has not progressed to construction within 8 years of receiving approval of the IACR, the IACR shall be reevaluated.

The interstate access actions, responsibility for their review, and review schedule are provided in the table below. Note that the FHWA Division is responsible for the approval of all actions but must receive prior concurrence from FHWA Headquarters for actions 4 through 7 below. Also, The FHWA Division retains the authority to consult with any office in FHWA for any study.

<b>Action</b>	<b>Responsibility</b>	<b>Review Schedule</b>
1. Modification to freeway-to- crossroad (service) interchange, e.g., change from diamond to single point urban, doubling lanes for on-ramp with double lane entry to Interstate mainline, adding a loop ramp to existing diamond interchange, etc.	FHWA Division	30-day review upon receipt of request
2. Addition of entrance or exit ramps which complete basic movements at existing interchanges		
3. A new freeway to crossroad (service) interchange in rural and non-TMA areas; (this is a full interchange that provides for all directions of travel).		
4. A new freeway to crossroad (service) interchange in TMA	FHWA Headquarters	60-day review upon receipt of request
5. New partial interchanges or new ramps to/from continuous frontage road (slip ramps) that create a partial interchange. (A partial interchange does not provide for all directions of travel. For this reason, partial interchanges are strongly discouraged.)		
6. Major modification to freeway-to-freeway (system) interchanges, e.g., change from cloverleaf to directional		
7. New freeway-to-freeway (system) interchanges.		

## Operational and Safety Analyses

Changing access onto and off of the Interstate system is a federal action, and thereby requires a NEPA document and IACR. Under certain circumstances, changes to the ramps or street network may impact the Interstate system without changing access onto and off of the Interstate. A NEPA document and an IACR are not required under these circumstances because access was not changed, but an operational and safety analysis may be required by the Division.

The actions listed below, which are adapted from the ISAIG, do not require an IACR but do require an operational and safety analysis.

1. Shift of ramp terminal along the Interstate mainline closer to the cross-street.
2. Addition of lanes to an on-ramp in a TMA.
3. Addition of left-turn and right-turn storage lanes and through travel lanes at existing ramp termini in a TMA if impact to the Interstate is uncertain.

4. Relocation or shifting of the ramp end connection to the cross-street in a TMA when distance to an adjacent, nearby cross-street is reduced.
5. Addition of a single auxiliary lane between two adjacent interchange ramps.
6. Decrease in the length of acceleration and deceleration lanes in a TMA.
7. Improvement of traffic signals if impact to Interstate is uncertain.
8. Implementation of ramp metering
9. Placement of new signing and striping that results in added or decreased capacity on an Interstate on- and off-ramp in a TMA if the impact to the Interstate is uncertain.
10. Changes in access between managed lanes and general purpose lanes.
11. Changes in access on cross streets adjacent to the ramp terminals.

An operational and safety analysis may not be required for the actions above if the FHWA AE determines the mainline operations and safety are unlikely to be negatively impacted by the action. FHWA reserves the right to require an operational and safety analysis for actions not listed above if the AE determines the mainline operations and safety may be impacted or impacts are unknown.

The FHWA Area Engineer should be notified by UDOT early in project development when actions listed above are incorporated into the project. Consult with the FHWA AE to determine the appropriate level of detail for the operational and safety analysis. Existing and future conditions should be evaluated utilizing applicable modeling tools and data for the operational analysis and substantive safety data for the safety analysis.

State- and federally-funded projects shall receive a finding of engineering and operational acceptability from FHWA.

## Reference

23 USC 111(a)

*“All agreements between the Secretary and the State transportation department for the construction of projects on the Interstate System shall contain a clause providing that the State will not add any points of access to, or exit from, the project in addition to those approved by the Secretary in the plans for such project, without the prior approval of the Secretary.”*

23 CFR 1.23, Rights-of-way

23 CFR 625, Design Standards for Highways

Application of Design Standards, Uniform Federal Accessibility Standards, and Bridges [Formerly Federal-Aid Policy Guide Non-Regulatory Supplement NS 23 CFR 625], March 1, 2005

Interstate System Access [Formerly Federal-Aid Policy Guide Non-Regulatory Supplement NS 23 CFR 630C], June 17, 1998

23 CFR 710, Subpart D, Real Property Management

23 CFR 771, Environmental Impact and Related Procedures

23 CFR 752 Non-regulatory Supplement (Safety Rest Areas) October 5, 1992 Federal Register: August 27, 2009 (Volume 74, Number 165, Page 43743-43746)

FHWA Policy Memorandum - Vertical Clearance, Interstate System Coordination of Design Exceptions, August 15, 1997

FHWA Policy Memorandum - Delegation of Authority, Requests for New or Revised Access Points on Completed Interstate Highways, August 19, 1996

FHWA Interstate System Access Informational Guide, August 31, 2010

Utah Division Standard Operating Procedure, December 27, 2010

AASHTO, A Policy on Design Standards – Interstate System, 5<sup>th</sup> Edition, 2005

AASHTO, A Policy on Geometric Design of Highways and Streets, 2011

*UDOT and FHWA Stewardship and Oversight Agreement, July 13, 2006*

*UDOT Design Manual of Instruction, updated February 3, 2011*

## Appendix A – FHWA’s Eight Policy Points

It is in the national interest to preserve and enhance the Interstate System to meet the needs of the 21<sup>st</sup> Century by assuring that it provides the highest level of service in terms of safety and mobility. Full control of access along the Interstate mainline and ramps, along with control of access on the crossroad at interchanges, is critical to providing such service. Therefore, FHWA’s decision to approve new or revised access points to the Interstate System must be supported by substantiated information justifying and documenting that decision. The FHWA’s decision to approve a request is dependent on the proposal satisfying and documenting the requirements below.

The considerations and requirements below are in italics, and a discussion of each requirement’s intent is provided in standard font.

1. *The need being addressed by the request cannot be adequately satisfied by existing interchanges to the Interstate, and/or local roads and streets in the corridor can neither provide the desired access, nor can they be reasonably improved (such as access control along surface streets, improving traffic control, modifying ramp terminals and intersections, adding turn bays or lengthening storage) to satisfactorily accommodate the design-year traffic demands (23 CFR 625.2(a)).*

The intent of this requirement is to demonstrate that an access point is needed for regional traffic needs and not to solve the needs associated with local traffic. While the Interstate facility should not be allowed to become part of the local circulation system, it should be maintained as the main regional facility. Improvements to parallel facilities should be considered in lieu of new access wherever feasible.

Describe the proposed new or revised access and explain the need for the access point. Need must be established by showing: 1) that the design-year traffic demands cannot be accommodated by improvements to the existing roadway network and the existing interchanges/ramps, and 2) that the traffic demanding the new/revised access is regional traffic (longer trips) rather than local traffic circulation. Capacity required for local traffic (shorter trips) is not an adequate need explanation.

2. *The need being addressed by the request cannot be adequately satisfied by reasonable transportation system management (TSM) (such as ramp metering, mass transit, and HOV [high occupancy vehicle] facilities), geometric design, and alternative improvements to the Interstate without the proposed change(s) in access (23 CFR 625.2(a)).*

Improvements within an existing interchange should be considered prior to new access. This point does not mean that ramp metering, mass transit, and HOV facilities are the only TSM alternatives that should be considered. Analysis needs to be provided that addresses the design, safety, and operational considerations of these alternatives.

The proposed change in access also needs to document the consistency of any proposed change with regional, corridor, or system-wide assumptions of special use lanes, transit, or other alternatives to ensure the change in access does not preclude implementation of these TSM alternatives in the future.

3. *An operational and safety analysis has concluded that the proposed change in access does not have a significant adverse impact on the safety and operation of the Interstate facility (which includes mainline lanes, existing, new, or modified ramps, ramp intersections with crossroad) or on the local street network based on both the current and the planned future traffic projections. The analysis shall, particularly in urbanized areas, include at least the first adjacent existing or proposed interchange on either side of the proposed change in access (23 CFR 625.2(a), 655.603(d) and 771.111(f)). The crossroads and the local street network, to at least the first major intersection on either side of the proposed change in access, shall be included in this analysis to the extent necessary to fully evaluate the safety and operational impacts that the proposed change in access may have on the local street network (23 CFR 625.2(a) and 655.603(d)). Requests for a proposed change in access must include a description and assessment of the impacts and ability of the proposed changes to safely and efficiently collect, distribute and accommodate traffic on the Interstate facility, ramps, intersection of ramps with crossroad, and local street network (23 CFR 625.2(a) and 655.603(d)). Each request must also include a conceptual plan of the type and location of the signs proposed to support each design alternative (23 U.S.C. 109(d) and 23 CFR 655.603(d)).*

The operational and safety analysis performed needs to include all elements of the Interstate System, including collector-distributor roads, and provide a comparison of the no-build and build conditions that are anticipated to occur through the design year of the project. The analysis may be extended beyond the minimum requirements outlined above to establish the potential extent and scope of the impacts. Extending the limits of the analysis in urbanized areas where there are closely spaced interchanges may be required. The limit of the analysis area might be different than that of the construction area. The operational analysis limit should be based on logical traffic break within the system. The analysis should demonstrate the engineering and operational acceptability of the proposed change in access. When considering the impacts of various alternatives, priority needs to be given to the performance of the Interstate System within the context of the local planning, environmental, design, safety, and operational conditions. Furthermore, signage is critical to the operations of an interchange and any modification or addition to an access of the Interstate will require appropriate signage to that end, especially for more complex interchange configurations.

The analysis of the operational effects of proposed changes detailed in the IACR should be performed to support the following:

- **Improve the Decision-Making Process** – Operational analyses support the planning / engineering decision-making for complex transportation problems, and promote consistency in comparing alternatives.
- **Assess Scenarios to Identify Robust Concepts** – Operational analysis of future-year conditions is important when long-term improvements are being considered, operational concepts are being discussed, and when traffic and land use patterns are dynamic.
- **Evaluating and Prioritizing Alternatives** – Operational analysis assists in understanding and comparing the impacts of different alternatives. This typically involves the comparison between the no-build conditions with various build alternatives. The impacts are reported as performance measures and should be defined as the difference between the No-Build and Build Alternatives.
- **Present Strategies to General Public and Stakeholders** – Some traffic analysis tools have graphical and animation capabilities which assist in describing the problem, purpose, need, and proposed alternatives.

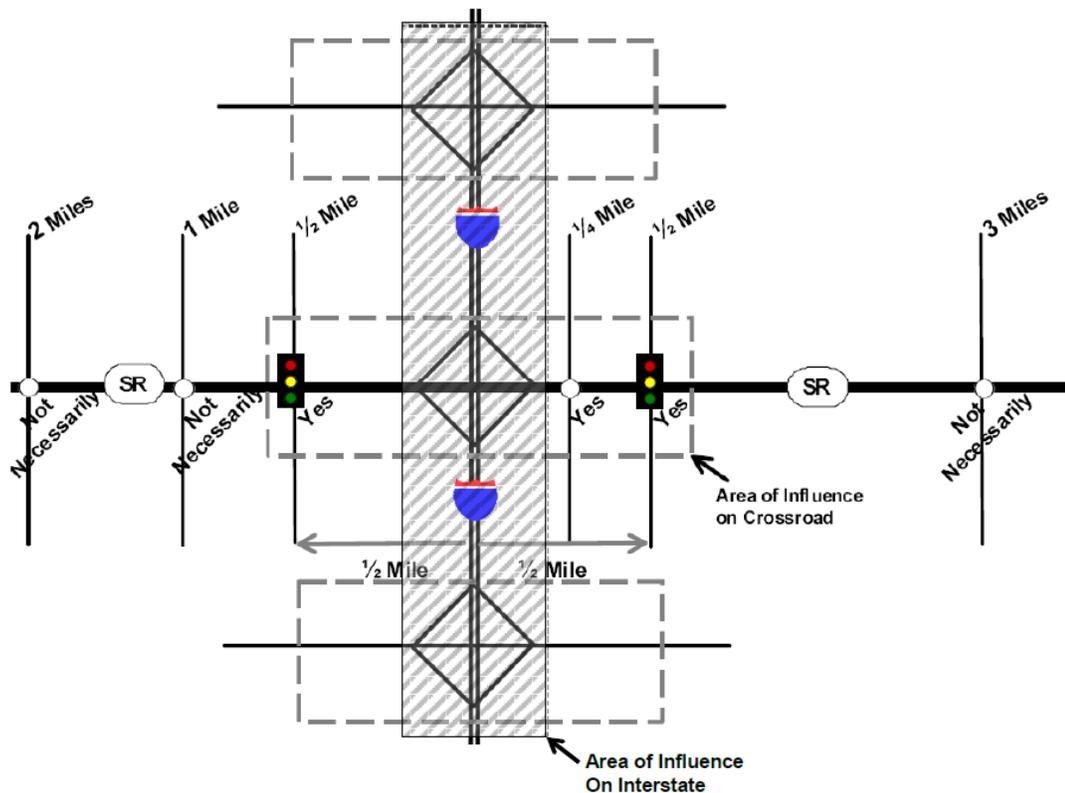
A traffic and operational analysis must be performed that includes an analysis of adjacent segments of the freeway as well as nearby existing and proposed interchanges. The results must demonstrate operational acceptability for the opening year and design year as it relates to following:

- Freeway mainline
- Freeway weaving
- Freeway diverge
- Ramp merge
- Ramp/Crossroad intersection
- Crossroads and other local streets ability to effectively collect and distribute traffic from the new or revised interchange.
- Special use lanes (HOV, HOT Lanes, and associated bypass lanes) where proposed or present

Analysis results should be presented in the request at critical points (e.g., weave, merge, diverge, accident sites, HOV lanes) along the affected section of Interstate (mainline and ramps) and on the surface street system for both the AM and PM peak period. Show new congestion points which would be introduced by the proposal, and congestion points which should be improved or eliminated, any locations at which congestion is compounded, and any surface

street conditions which would affect traffic entering or exiting the Interstate. This should be presented for existing, year of implementation, and design year.

The limits of the analysis on the Interstate shall at a minimum be through the adjacent interchanges on either side of the proposed access. In urban areas it is often necessary to consider the two adjacent interchanges in both directions. Distances to and projected impacts on adjacent interchanges should be provided in the request. The limits of the analyses on the existing or improved surface street system will be the extent of the system necessary to show that the surface street system can safely and adequately handle any new traffic loads resulting from the new/ revised access point. A diagram below demonstrates how an area of influence could be developed.



Source: Adapted from Florida Department of Transportation, *Interchange Handbook*.

Figure 2. Area of Influence

4. *The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" may be considered on a case-by-case basis for applications requiring special access for managed lanes (e.g., transit, HOVs, HOT lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards (23 CFR 625.2(a), 625.4(a)(2), and 655.603(d)).*

All interchanges need to provide for each of the eight basic movements (or four basic movements in the case of a three-legged interchange), except in the most extreme circumstances. Partial interchanges usually have undesirable operational characteristics and violate driver expectancy. If circumstances exist where a partial interchange is considered appropriate as an interim improvement, then commitments need to be included in the request to accommodate the ultimate design. These commitments may include purchasing the right-of-way required during the interim improvements.

Access to special use lanes, transit stations, or park and ride lots that are part of the Interstate System are special cases, and the movements requiring access should be determined on a case-by-case basis.

5. *The proposal considers and is consistent with local and regional land use and transportation plans. Prior to receiving final approval, all requests for new or revised access must be included in an adopted Metropolitan Transportation Plan, in the adopted Statewide or Metropolitan Transportation Improvement Program (STIP or TIP), and the Congestion Management Process within transportation management areas, as appropriate, and as specified in 23 CFR parts 450, and the transportation conformity requirements of 40 CFR parts 51 and 93.*

The Interstate Justification Report needs to include a discussion as to how the proposal is consistent with the transportation planning activities for the area. If the project will be added to the planning process in the future, a discussion needs to be provided that indicates how the project will affect the current plan.

Although FHWA may review a proposed change in access prior to its inclusion in local transportation plans, final approval cannot be given until the project is adopted in the MPO's long-range transportation plan, the MPO's TIP within metropolitan areas and the STIP in rural areas, or within the Congestion Management Process (CMP).

6. *In corridors where the potential exists for future multiple interchange additions, a comprehensive corridor or network study must accompany all requests for new or revised access with recommendations that address all of the proposed and desired access changes within the context of a longer-range system or network plan (23 U.S.C. 109(d), 23 CFR 625.2(a), 655.603(d), and 771.111).*

Sufficient review and coordination needs to be performed to avoid conflicts with other proposed changes in access or corridor improvements. If two or more changes in access are being considered in the same vicinity, then these changes should be analyzed together. The combined effect of the proposed change in access is especially important when several new interchanges are proposed.

The intent of this requirement is to avoid isolated, piecemeal analysis for access change decisions. Where multiple access changes are anticipated in the vicinity, analysis must consider the possible, cumulative effects if all were to be implemented.

7. *When a new or revised access point is due to a new, expanded, or substantial change in current or planned future development or land use, requests must demonstrate appropriate coordination has occurred between the development and any proposed transportation system improvements (23 CFR 625.2(a) and 655.603(d)). The request must describe the commitments agreed upon to assure adequate collection and dispersion of the traffic resulting from the development with the adjoining local street network and Interstate access point (23 CFR 625.2(a) and 655.603(d)).*

Highways should be developed in an orderly and coordinated manner to serve the public. When new development is the driving force behind the need for access, it is expected that the appropriate coordination and analysis is performed to achieve mutual benefits with minimal adverse impact on Interstate travelers. As a condition of approval, certain parts of the local circulation system may be required to be constructed or improved before the new or change in access is opened to traffic. Coordination and cooperation is essential to ensure that when several projects are linked to the approval of a change in access that they are constructed according to an appropriate phasing plan. A commitment of funding or inclusion of projects as part of the planning process prior to final approval of the change in access may be required.

8. *The proposal can be expected to be included as an alternative in the required environmental evaluation, review, and processing. The proposal should include supporting information and current status of the environmental processing (23 CFR 771.111).*

The Policy allows for a two-step approval process. The first step is the determination of engineering and operational acceptability. The final approval can be granted only after the National Environmental Policy Act (NEPA) process is completed. The NEPA process must be followed regardless of the source of funding (including private funding) for the project, since approval of the proposed change in access constitutes a Federal Action. The development of final plans, specifications and engineering, and right-of-way acquisition and construction may be performed only after this final approval is granted.

## Appendix B – Locked Gate and Temporary IACR Template

### Executive Summary

A clear and concise summary should be provided at the beginning of the report explaining how each of the required policy points in Appendix A have been satisfied, along with how the collective assessment of each policy requirement provides the basis for the recommended change in access. It is recommended that a summary of the analysis that was performed, the methods and tools utilized, the assumptions, and the conclusions are included. Information also will include a description of the process followed to analyze different access changes. The request should contain sufficient information, supporting documentation and details commensurate with the type of access requested for FHWA to make a determination without requesting additional items. It is encouraged that relevant information be clearly presented, thereby not requiring an individual to seek out information in other documents. Vicinity maps and other visualization techniques are required.

### Introduction

An introduction to the project should be provided that summarizes the following:

**Background** – This section should identify any supporting information necessary to introduce the project and support the project purpose.

**Purpose** – The project’s purpose and objectives should be identified by highlighting the existing and desired safety, operational and access condition.

**Need** - The need for the access point should be established using factors such as, in the case of temporary construction, accessibility to the construction site and in the case of locked gate, proximity to maintenance or emergency response.

**Methodology** - The method for controlling access to the interstate shall be provided. Permanent locked gates for maintenance or emergency services must be inconspicuous and meet the intended function and placed in a location that has minimum required stopping-sight distance. Temporary accesses must be positively-controlled with a locked gate, not environmental fencing or other similar material, or other suitable method agreeable to the FHWA.

**Project Location** – Include aerial photography of the project area and a map displaying the subject access location. Maps should show distances between the access and key adjacent features that may impact the operations or safety of the access. The subject access location should be identified by milepost.

### Compliance with Policy Point #1

**Compliance with Policy Point #2**

**Compliance with Policy Point #3**

Discuss the analysis of alternatives based on engineering policies and standards, traffic operations, and safety impacts using the evaluation criteria agreed to in coordination with FHWA. This analysis would normally consider, at a minimum, the following:

**Operational Performance** – A qualitative discussion of the operational performance and a map demonstrating the routes of heavy vehicles that will be utilizing the access is required in the request. This should include a comparison of the preferred access point and the access point off of the Interstate.

**Safety** – The effects on the safety of the proposed access should be evaluated. This section should include a qualitative discussion on the safety impacts of the operations to the Interstate system. Figures depicting the signing on the Interstate for entry on and off of the Interstate are required and must meet the current FHWA-approved Utah MUTCD. Also included should be a description of how the access will be controlled, whether it is a locked gate or a temporary access.

**Compliance with Policy Point #4**

**Compliance with Policy Point #5**

**Compliance with Policy Point #6**

**Compliance with Policy Point #7**

**Compliance with Policy Point #8**

Accessing the Interstate is a federal action, thereby requiring a federal NEPA document. For temporary construction access, provide the NEPA document class of action for the construction project and date of approval. Locked gate accesses are not typically associated with a project; therefore, a NEPA document must be prepared for each one.

**Compliance with Engineering Standards**

**Recommendation**

This section will discuss the proposed action and UDOT’s recommendation for approval.

**Notes:**

It is recommended that UDOT coordinate with the respective AE to develop the request prior to submittal. UDOT shall recommend approval upon submittal of the formal request. Approved temporary

access points shall be included in the PS&E or RFP package. If the temporary access point is requested after award, the time and cost savings for the Contractor should be provided in the document. UDOT shall conduct an independent analysis of the Contractor's time and cost savings and ensure that the competitive bidding environment is preserved. UDOT's independent analysis should be included in the request. The Contractor is responsible for all preparation costs, including time and materials to construct the locked gate if the temporary access point is not included in the PS&E or RFP.

## Appendix C – Methods and Assumptions Memorandum

### Interstate Access Change Request Methods and Assumptions Memorandum

The intent of this technical memorandum is to gain endorsement of the methods and assumptions approach to supplement the Interstate Access Change Request. This should be consistent with transportation methods and assumptions for analysis being performed for the project that will be applied within the Interstate Access Change Request process and subsequent documentation. Provided below is an example outline of what should be considered and documented in the assumption document:

#### 1. Introduction and Project Description:

This section identifies all parties involved, the type of interchange proposal, and location. It should also describe what the project entails (figures should demonstrate the study area, construction limits, and traffic area of influence).

#### 2. Problem, Purpose and Needs, Goals and Objectives:

Before embarking on any major analytical effort, it is recommended that the problem, purpose and need be defined. **For example purposes only**, A problem definition may include performance characteristics. For example:

*The existing corridor realizes an average speed of 37 mph during the time period of 5:15 to 5:30 p.m. between two known points, and is accompanied by an average throughput of 1,628 vehicles per hour per lane; this same segment is able to support an average throughput of 2,011 vehicles per hour per lane between 4 to 4:15 p.m. with an average speed of 53 mph.*

By defining the problem, along with these types of operational performance measures, the analyst begins to focus on a top priority issue. This would not be possible with a broad all-encompassing statement that ***the existing facility is congested or access is currently not supported.***

The study goal and objective can then be established to further define the focus of the analysis and the desired future conditions for the facility. **For example purposes only**, a goal and objective statement may emphasize the following:

*It is a goal and objective of this study to identify an alternative which:*

- *Provides for minimum average freeway speeds of 47 mph throughout the peak period between Points A and Point B.*

- *Supports a freeway flow rate of 2,150 passenger cars per hour per lane (pcphpl) throughout the peak period.*
- *Provides for ramp operations which do not generate queues or spillback which impact operations on the freeway or major crossroad.*
- *All parcels are within 2.5 miles of a major arterial, which has the following operational characteristics:*
  - *Arterial operations do not result in phase failure or spillback along the approach defined as the major roadway.*
  - *Operations favor traffic flowing along the major roadway at an average speed of 35 mph.*
  - *Supports continuous arterial flow along the major roadway for a minimum of five signals before a vehicle is required to stop.*
  - *Minimizes delay at all signalized approaches.*

Overall, the study objectives should define why the analysis is needed, what questions the analysis should answer, and what type of information is required to support a more informed decision.

### 3. **Scope:**

This section clearly describes the scope of the project and also lays out the operational and access issues. It is recommended that the problem, purpose and need be defined before embarking on any major analytical effort. The following questions should be answered, as applicable, in describing the project scope:

- What are the project objectives?
- What are the available resources (all partners)?
- What are the project constraints?
- What are the limits of the project (operational / geographic limits)?
- What is the proximity to adjacent interchanges and intersections that have operational / environmental impact to the project?
- How does the study area influence operations at adjacent locations within the transportation network?

- What alternatives / modes are being considered to address the problem?
- What physical elements within the network can be analyzed to support the purpose, goal and objective of the scope?
- Will the operational characteristics of the surrounding area change in the future, and if so, will an understanding of how this relates to the study area warrant analysis?
- What level of quality assurance is planned?
- How will the model selection be evaluated?
- Is there sufficient time allocated to develop, calibrate, and conduct the analysis?
- What degree of precision do the decision makers require?
- Will varying travel demand patterns and land use scenarios be considered to assess how robust and flexible the alternatives are?

Prior to beginning the analysis process, it is recommended that a coordination meeting be held with all interested parties to explicitly refine and verify the problem, purpose, and need; the goals and objectives of the study; and the limits of the operational analysis. The scope of the operational analysis likely will influence the stakeholders to be included in the initial and subsequent meeting.

**4. Project Schedule:**

This section provides an anticipated proposal development and review schedule, and a schedule of production activities consistent with the proposed funding and opening year.

**5. Project Location:**

This section provides a description of the location, and should include both graphic and written description of the location.

**6. Analysis Years:**

This section identifies the base year, opening year, interim year/s (if needed), and design year. The base year is the current year, to quantify the current problem and define the purpose and need. This requires performance data associated with current conditions. This is important regardless of analysis methodology and tools applied. Opening year is the year that the facility is expected to be open for traffic. The design year assessment reflects a 20-year horizon from the anticipated opening date of the project. While a design year may warrant a longer horizon, a minimum design year

based on 20 years is required for the plans, specifications, and engineering for a project as is required by 23 U.S.C. Section 109(b), which states:

*(b) The geometric and construction standards to be adopted for the Interstate System should be those approved by the Secretary in cooperation with the State transportation departments. Such standards, as applied to each actual construction project, should be adequate to enable such project to accommodate the types and volumes of traffic anticipated for such project for the twenty-year period commencing on the date of approval by the Secretary, under section 106 of this title, of the plans, specifications, and estimates for actual construction of such project.*

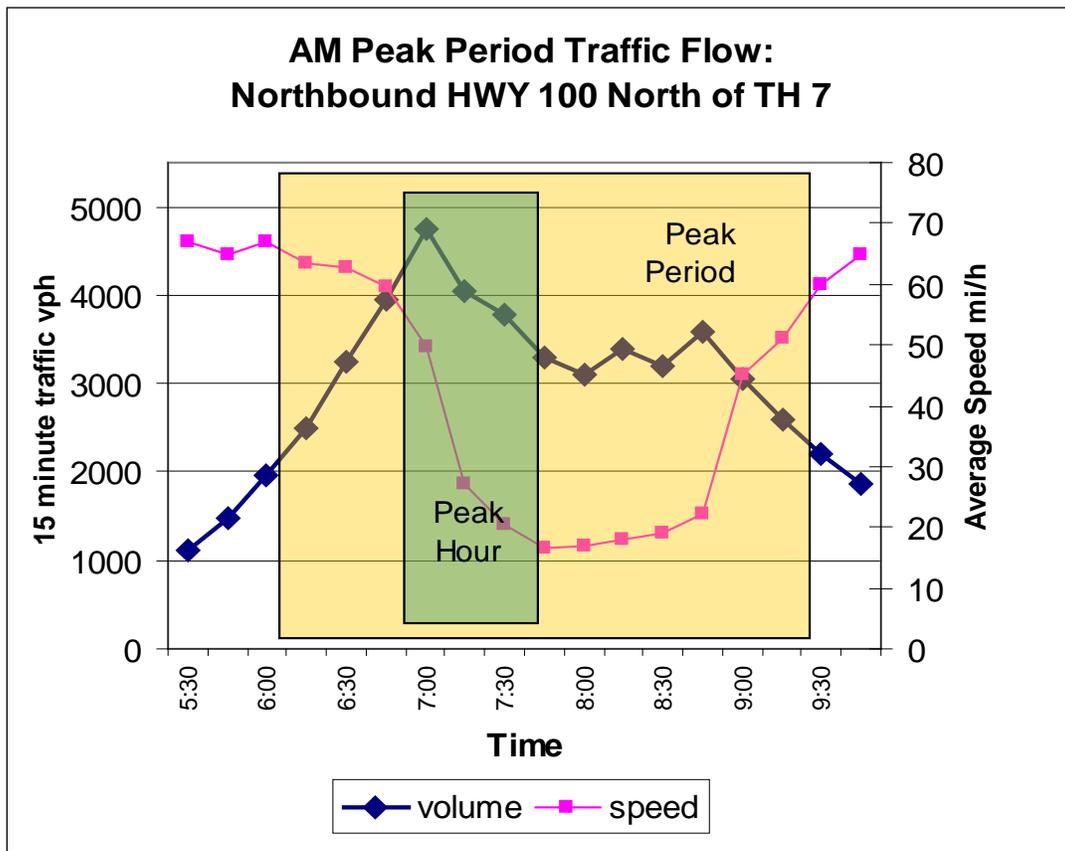
## **7. Analysis Period:**

In addition to the existing and design year, interim years may need to be considered, resulting from phased construction, changes in land use, or other projects within the area of influence.

The 30<sup>th</sup> highest hourly volume (30-HV) in the design year is required as a minimum. Additional periods may be required for times which reflect, for example, typical AM /PM peak conditions or peak conditions as anticipated or defined by the problem, purpose and need of the study. Recognizing that congested conditions may extend beyond a single hour in some cases, the minimum requirement of a 30-HV design year may not be adequate for the operational analysis. In these cases, a multi-period analysis may be needed for some traffic analysis tools that include demand volumes that represent the 30-HV. The analyst should consider this in assessing the traffic forecast demands and in preparing the required data.

For locations and conditions in which a facility is at or near capacity today or in the future, a multi-hour time period would be warranted. Understanding the operational conditions throughout the peak period in particular would provide insights to the length of time in which a corridor is at or near saturation; promote an understanding of the geographic and temporal expanse of congestion due to one or more geometric features within an alternative; and support an ability to quantify multiple operational performance measures.

As depicted in the figure below, while the peak period and peak hour relate to each other, the average speed and traffic flow vary within each, and have different maximums and minimums. Understanding how an alternative supports and recovers from a given traffic demand profile may be as important as understanding how it operates during the peak 15 minutes.



Source: Traffic Analysis Toolbox Volume IV: Guidelines for Applying CORSIM Microsimulation Modeling Software, January 2007, Publication Number FHWA-HOP-07-079.

In summary the study should define the following:

- Existing year
- Opening year
- Interim year (may or may not apply to the project)
- Design year

## 8. Analysis Alternative:

This section should include the following minimum alternatives:

- No-Build
- TSM – This alternative should provide the basis to support Policy Point 2, which states, “*The need being addressed by the request cannot be adequately satisfied by reasonable transportation system management (TSM) (such as ramp metering, mass transit, and HOV [high occupancy vehicle] facilities), geometric design, and alternative improvements to the Interstate without the proposed change(s) in access (23 CFR 625.2(a)).*”
- Alternative Transportation Modes – This includes considering any modal shift of traffic to public transit or special use lanes.
- Build Alternative
- Build Alternative with TSM and Alternative Transportation Modes

Both graphic and written descriptions of the above alternatives should be provided.

## 9. Data Collection:

Based on the different alternatives that have been proposed for the project, identify the types of data for analysis. These data may include:

- Land use – existing and proposed
- Traffic data:
  - i. Geometry (Interstate, ramps, intersections, arterials)
  - ii. Control (signal timing, signs, ramp meters, time of day parking restriction, etc)
- Traffic factors to be collected (PHF, K30, D30, Truck Traffic (T), Recreational Vehicles (RVs))
- Pedestrian, bicycle and transit data as warranted to analyze multi-modal operation
- Access problems, purpose, need, goals, and objectives which may affect the operations and safety of the access.
- Calibration data (capacities, travel times, speed, queues, etc.)

## 10. Travel Demand Forecasting:

This section describes how the future traffic will be forecasted. This section needs to describe and also select the approved models for the area of interest and a comprehensive travel demand forecasting methodology (model to be used, validation and calibration efforts, historical trends analysis, growth rate development, development of future year project traffic, etc.). This activity

should be coordinated with and agreed to by the MPO where applicable and UDOT to promote consistency with multiple studies in the area.

#### **11. Operational Analysis Procedures:**

This section describes how the operational analysis will be done for the project. Details of operational analysis methodology need to include:

- Mainline capacity analysis
- Ramp analysis
- Weave analysis
- Arterial analysis

This section identifies the proper tools for the analysis process based the objectives and goals of the project. The tools could be deterministic (HCS, Synchro, etc), Mesoscopic Simulation (Dynasmart, Paramic, etc), and Microscopic Simulation (CORSIM, Paramic, Vissim, etc). An emphasis on comparing alternatives is encouraged to normalize any inconsistencies between the various analysis tools considered.

#### **12. Safety Analysis:**

The analysis of the safety considerations associated with an Interchange Access Change Request should consider anticipated safety performance supported by substantive safety data when available for any proposed change in access. While this terminology is relatively new, the concepts are not, and are reflected in good practices by many states.

Substantive safety analysis involves the evaluation of the actual performance of a highway or facility as measured by its crash experience (number of crashes per mile per year, with consequences of those crashes as specified by injuries, fatalities, or property damage).

The analysis of safety in the context of an Interchange Access Change Request should address the following elements:

- Establish safety area of influence
- Collect traffic, geometric, and safety data (including design-year volumes)
- Analyze safety data
- Assess existing and future safety conditions under build and no-build scenarios
- Consider possible corrective actions and countermeasures

- Document the current and anticipated safety performance
- Document signing plans for the preferred alternative

**13. Final Report Documentation:**

This section should describe how to document all aspects of the analysis, what will be included in the appendix, and what will be submitted as part of the final report, etc.

The final assumption document should be signed off by the FHWA AE, UDOT, and any other stakeholders as appropriate.

## Appendix D – Interstate Access Change Request (IACR) Template

### Executive Summary

A clear and concise summary should be provided at the beginning of the report explaining how each of the eight required policy points in Appendix A have been satisfied, along with how the collective assessment of each policy requirement provides the basis for the recommended change in access. It is recommended that a summary of the analysis that was performed, the methods and tools utilized, the assumptions, and the conclusions are included. Information also will include a description of the process followed to analyze different access changes and other transportation improvement alternatives considered and selected as the proposed recommendation (such as Interstate System facility, ramps, ramp terminal, crossroad, or local street network).

### Chapter 1: Introduction

An introduction to the project should be provided that summarizes the following:

**Background** – This section should identify any supporting information from previous studies or data acquired to introduce the project and support the project purpose.

**Purpose** – The project’s purpose and objectives should be identified with quantified measures highlighting the existing and desired safety, operational and access condition.

**Need** - The need for improvement should be established using factors such as existing conditions and the conditions anticipated to occur in the analysis years under the No-Build Alternative, or other factors such as the need for system linkage.

**Project Location** – Include aerial photography of the project area and area of influence, a map displaying the subject interchange location, and a brief description of the preliminary area of influence. Maps should be to scale or be schematic drawings showing distances between interchanges, intersections, and other key features. The subject interchange location should be identified by milepost, relationship to adjacent interchanges, and system linkages. Factors used to define the area of influence should be discussed, including interchange spacing, signal locations, anticipated traffic impacts, anticipated land use changes, or proposed transportation improvements.

### Chapter 2: Methodology

This section should summarize the methodology used to develop the Interchange Access Change Request. The discussion should provide sufficient detail for the reader to understand the processes used.

This section should also document the development of the future-year design traffic for each alternative. Information to be contained should include network and project validation, future travel demand projections, and the design traffic projections.

### **Chapter 3: Existing Conditions**

This section should identify the conditions that existed in the project's base year. Text, figures, and tables should be used as appropriate to describe the existing land use, transportation system, demand, performance, and environmental conditions considering the following:

**Demographics** – This section should identify significant population and employment statistics within the project area of influence. Summary for traffic analysis zones for the base year from the selected travel demand forecasting model should be included.

**Existing Land Use** – Existing land use within the project area should be summarized by general land use classifications (residential, commercial, industrial, institutional, recreational, etc.). Major developments within the study area should be identified.

**Existing Roadway Network** – Facilities within the project area of influence should be identified by functional classification, cross section, and access control (e.g., limited or controlled-access). In addition to a discussion, a figure should be provided illustrating each facility within the study area.

**Alternative Travel Modes** – Existing single occupant vehicle (SOV) alternatives related to the project should be identified in this section. These modes may include special use/HOV, park and ride, bus transit, fixed-guide way mass transit, airports, ports, and forms of non-motorized transportation facilities. A figure should be provided illustrating the location of these modes.

**Interchanges** – This section should describe the existing configuration, geometry and other design features of existing interchanges in the area of influence, including identifying any elements that do not meet current design standards. This section should also identify any approved but not yet constructed interchanges, and define their geometry and status. Also, any other interchanges being developed in the area of influence should be identified.

**Existing Data** – This section will discuss existing data source(s) and quality of the data.

**Operational Performance** – This section will summarize the results of the operational analysis including the methodology, assumptions, and conclusions. A comparison of the no-build and multiple build conditions considered should be provided along the Interstate facility and the local roadway network to support the need for the project. Tables and figures should be employed to summarize operational performance.

**Existing Safety Conditions** – This section will summarize an analysis of the safety performance of the existing conditions including existing crash data supporting the need for the project. Any strategies

used to mitigate safety concerns should be discussed. A comparison of the no-build and multiple build conditions considered should be provided along the Interstate facility and the local roadway network to support the need for the project. Tables and figures should be employed to summarize operational performance

**Existing Environmental Constraints** – This section should identify any potential major environmental impact areas or areas of concern that will be addressed during this effort or in subsequent project phases. This analysis is not intended to provide extensive examination of environmental and community impact issues that will be accomplished in the NEPA process.

#### **Chapter 4: Future Condition:**

**Future Land use** – This section should discuss the future land use of the area, and how it affects the operation of the proposed Interstate access. The future / forecasted land use should be consistent with the local land use policy and comprehensive land use plan.

**Forecast Traffic Volume** – This section should provide a base map that displays the future year traffic volume for all locations within the study area.

**Other** – This section can be used to describe any other factors that could affect the design, operation, or safety issues of the proposed facility.

#### **Chapter 5: Interchange Alternatives**

This section will discuss the alternatives considered. A brief narrative regarding location and design elements should be provided for each alternative. At a minimum, the following alternatives will be considered:

- No-Build Alternative.
- Improvements to Alternate Interchanges.
- Transportation System Management Alternative.
- Alternatives Providing a Change in Access.

Each of these alternatives should be identified in independent sections. The proposed modifications and engineering factors including structures, landscaping, schedule, cost, and traffic control devices should be discussed for each alternative considered.

#### **Chapter 6: Compliance with Policy Point #1**

#### **Chapter 7: Compliance with Policy Point #2**

#### **Chapter 8: Compliance with Policy Point #3**

This section will discuss the analysis of alternatives based on engineering policies and standards, traffic operations, and safety impacts using the evaluation criteria agreed to in the coordination meetings with FHWA. This analysis would normally consider, at a minimum, the following:

**Operational Performance** – The documentation of the operational analysis should provide sufficient information for an independent review, if needed, and proper documentation of the process is required depending on the tools used for the analysis. A multi-hour or multi-time period analysis will be anticipated for study areas experiencing or anticipating saturated or congested operating conditions.

**Safety** – The effects on safety (increase or decrease in the type, number, and severity of crashes) of the proposed project should be discussed. This section should also discuss the project's effects on public safety issues such as emergency services and evacuations.

**Evaluation Matrix** – This section will present an analysis of the alternatives using various criteria to assess the impacts and potential consequences for the proposed change in access.

**Chapter 9: Compliance with Policy Point #4**

**Chapter 10: Compliance with Policy Point #5**

**Chapter 11: Compliance with Policy Point #6**

**Chapter 12: Compliance with Policy Point #7**

**Chapter 13: Compliance with Policy Point #8**

**Chapter 14: Compliance with Engineering Standards**

**Chapter 15: Funding Plan**

This plan will identify the specific funding programs or private sources needed to support all of the improvements proposed. Project revenue requirements will be discussed if the project is a toll project.

**Chapter 16: Recommendation**

This section will discuss the preferred alternative selection and any recommendations for further action, such as programming the NEPA or design phases.

**APPENDICES**

Appendices will be used for other supporting documents such as traffic operational analysis documentation. Lane configuration schematic and figures illustrating the existing geometry overlaid with proposed geometry are recommended. These figures should clearly show dimensions for the

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acceleration and deceleration lane spacing, lane transition taper lengths, auxiliary lanes, and interchange spacing (measured from the centerline of grade-separation structures).