

Chapter 3: Alternatives

The development of alternatives for the New US 31 Project began with a broad examination of potential solutions to the transportation needs of the region. The DEIS (2003) detailed the full analysis process for identifying potential alternatives that would satisfy the Purpose and Need of the project without incurring inordinate environmental impacts. A No-Action alternative was considered as well as three No-Build Alternatives (Travel Demand Management, Transportation System Management, and Mass Transit) and 10 Build Alternatives (Widen US 31 and Alternatives A through I). The Alternative F alignment was identified as the recommended route in the DEIS. In response to comments received following the publication of the DEIS, Alternative F4 was identified as the single preferred alternative. Consequently, this Supplemental DEIS focuses on only one Build Alternative – a revised version of the F4 Alternative, known as the Major Moves Alternative. A description of the original Alternative F4 is contrasted with the Major Moves Alternative throughout this chapter and document.

There have been several changes within the corridor since the publication of the DEIS; therefore, additional updates and analyses of some of the No-Build Alternatives are also provided in this Chapter. Focused reassessments for this SDEIS were performed for the following:

- The consequences of No-Action;
- The applicability of some No-Build Alternatives;
- The functionality of the original F4 Alternative; and
- The functionality of the Major Moves Alternative.

3.1 Alternatives Analysis and Screening Methodology

The alternatives developed for the US 31 Improvement Project were evaluated using a two-phase screening process to determine if they should be carried forward for evaluation in the original DEIS. The first phase of the preliminary screening process analyzed the alternatives with respect to the project's purpose and need. The second phase of the screening process analyzed the environmental impacts of the alternatives that were advanced from Phase 1.

To satisfy the purpose and need for this project, an alternative would have to improve levels of service to a minimally acceptable level (LOS D) and improve safety. Additional consideration was given to consistency with State and regional plans.

3.2 No-Action Alternative

The No-Action Alternative assumes that all of the projects in the current Indianapolis MPO Long Range Transportation Plan would be implemented with the exception of improvements to US 31.

Conclusion: This alternative continues to not meet the project's purpose and need but serves as a baseline when comparing the effectiveness and potential impacts of the other alternatives.

3.3 Updates to Alternatives Screened Out in Phase 1

3.3.1 Travel Demand Management (TDM) Alternatives

Vanpooling/Carpooling: Since the publication of the DEIS, IndyGo has instituted the Central Indiana Commuter Services (CICS) initiative. This group organizes carpooling and vanpooling for commuters

throughout the nine counties of central Indiana (Marion, Hamilton, Boone, Hendricks, Morgan, Johnson, Shelby, Hancock, and Madison) a few locations beyond (i.e. Tipton, Howard, Monroe, and Putnam). Currently, there are approximately 4,000 people utilizing CICS throughout central Indiana and this volume is not significant enough to reduce congestion along the US 31 corridor.

Non-Motorized Facility Enhancements: Recent local roadway upgrades on street parallel to US 31, namely Pennsylvania and Illinois Streets have included sidewalks and/or multi-use trails in their new design. West Carmel Drive and Old Meridian also have sidewalks on both the north and south sides of the street. A strong local effort exists to improve multi-modal transportation on local roads; (see section 4.2) however, several streets within the corridor designated as bike routes are narrow and would not be able to safely accommodate large commuter bicycles volumes without notable large-scale improvements.

Employer-Based Trip Reduction Program: With the addition of Clarion North in 2005, the three hospitals along the corridor (The Heart Center, Clarion North, and St. Vincent's) collectively constitute the largest employer in the area. These facilities already observe non-traditional work schedules for a large majority of their staff, therefore the potential impact of this alternative to provide a notable reduction in peak hour congestion is limited.

Conclusion: Change in TDM Alternatives since the DEIS would not address the purpose and need of this project as "stand alone" alternatives because they would not significantly reduce congestion or improve safety.

3.3.2 Transportation System Management (TSM) Alternatives Updates

Signal Coordination and Timing Updates:

The Indiana Department of Transportation (INDOT) has made several improvements to signal timing since the publication of the DEIS. In 2006, signal timings on US 31 from 96th St to Rangeline Rd were adjusted. The adjustments included modifying the left turn phases so that, at some locations, the left turn phases were initiated prior to the through movements. At other locations, if it provided improved vehicle progression from one signal to the next, the left turn movements were adjusted so that the left turn phases were initiated after the through movement.

Also in 2006, the offsets (the time interval between when the through movement is initiated at a given signal and the signals directly upstream/downstream of that signal) were adjusted at all signals on US 31 between 96th St and Rangeline Rd.

In March of 2008, the signal cycle lengths and splits were adjusted between 96th St and Rangeline Rd. The cycle length is the amount of time it takes for all of the phases to cycle through one time. In other words, if the northbound through phase is initiated, the time it take for that same phase to be initiated the next time was addressed. The split is the amount of time given to each phase, including green, yellow, and all red.

All possible timing improvements have been made in the corridor south of Rangeline Rd. The signals at SR32 and 181st St. were retimed in 2007. Similar signal modifications are planned for Greyhound Pass and 151st St. May 2008. Other signals north of Rangeline Rd. will be re-timed as warranted or per INDOT signal re-timing schedule.

Intersection Improvement Updates:

Some improvements have been made to intersections in the corridor since the DEIS. The Meridian/96th intersection was improved to include the eastbound triple-left from 96th to US 31 north/I-465. In 2002, turn lanes were added at the 136th Street and Rangeline Road intersections. However, these combined

with the improvements made since 2000 on other nearby local street such as Pennsylvania and Illinois, and the additional turn lane scenario analyzed in the DEIS still would not satisfy INDOT standards (LOS D or better) at many of the intersections.

Expanded ITS Application Updates:

In 2006, INDOT was selected by the Federal Highway Administration (FHWA) to participate in the Transportation Technology Innovation and Demonstration Program (TTID) in the Indianapolis area. As a part of the TTID Program, Traffic.com deploys, operates, and maintains vehicle detection sites in and directly adjacent to the Indianapolis Advanced Traffic Management Systems (ATMS) deployment area with this public/private partnership. Traffic.com has installed 10 sites on US 31 within the project limits between I-465 and SR 32 for purposes of providing info to their website.

Conclusion: Changes to the TSM alternatives (signal coordination and timing, intersection improvements, expanded ITS application) do not allow this set of alternatives to address the purpose and need of this project as “stand alone” alternatives because congestion and safety issues remain even with the above system improvements. Further, no other mitigating measures are planned or even possible in many locations.

3.3.3 Mass Transit Alternatives Updates

Two Express Bus routes have been added to IndyGo’s service line since the DEIS – one originating in Fishers and the most recent originating in Carmel. A third route from the south side is planned for 2008 pending the development of local arrangements. The Express Bus routes are a three-year pilot project sponsored by a CMAQ (Congestion Mitigation Air Quality) grant. The selected routes of origin were determined by traffic model findings produced by the Indianapolis MPO and its *Directions* study.

The Carmel route went online on March 17th, 2008. Riders pick up the bus at staggered times throughout the morning peak hours from the Meijer store parking lot at 126th St. The route includes the use of US 31 to Westfield Blvd, to Illinois St., and then to Capitol Ave with rider drop off at a few downtown locations. Return trips are available from downtown locations to the Meijer store during evening peak hours. Ridership on the Carmel route has exceeded the growth trend for the same period as the Fishers route, which has been in service since October of 2007. The Carmel route is currently providing an average of 321 trips/day.

Conclusion: The Mass Transit Alternative continues to not address the purpose and need of this project as a “stand alone” alternative because it would not significantly reduce congestion or improve safety. Further, the Express Bus route only has funding for three years of operation with no grant renewal possible. Once the grant funding is exhausted service will cease unless another funding source can be identified and utilized.

3.3.4 Transportation Management (TM) Alternative Updates

Following the completion of the Preliminary Alternatives Analysis in July, 2002, a Transportation Management (TM) Alternative was developed as a combination of the Travel Demand Management (TDM), Transportation System Management (TSM), and Mass Transit Alternatives.

Conclusion: The collective changes since the DEIS (described above), as well as the forecasted ‘best-case scenarios’ outlined in the original DEIS, do not address the purpose and need of this project because they would not significantly reduce congestion or improve safety.

3.3.5 Phase 2 Screening

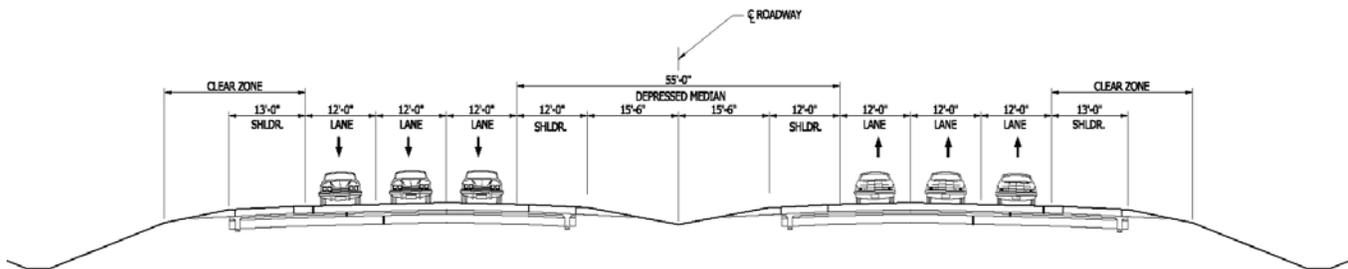
No Alternatives screened out in Phase 2 warrant reevaluation since the associated environmental impacts would only be greater than what was documented in the DEIS due to the increase in development in the local communities.

3.4 Review of Original DEIS F4 Alternative

Following the publication of the DEIS, the 131st Street Interchange and the 146th Street Diamond Interchange were identified as the preferred interchange options based on the findings from the DEIS and comments received from the public. This resulted in initially identifying Alternative F4 as the single preferred alternative.

Alternative F4 is an upgrade of existing US 31 from 96th Street to 216th Street, a distance of 13.1 miles (Appendix A, Sheets 1 to 13). The existing four-lane roadway would be reconstructed as a six-lane freeway with a 55 foot median (dimension includes inside shoulders), 10 new interchanges, and full access control (Figure 3.4-1).

**Figure 3.4-1
Proposed Typical Section**



Alternative F4, as described in the DEIS, would require existing intersections and access points to be converted to interchanges, overpasses, or access closures. The following road closures, some of which may have cul-de-sacs, would include:

- 103rd Street
- 111th Street
- Old Meridian Street
- Circle Drive
- Rangeline Road (F3 and F6)
- Greyhound Pass
- Westfield Boulevard
- 156th Street
- Buena Vista
- Park Street
- 169th Street
- North Glenn Drive
- David Brown Drive
- Blackburn Avenue
- Union Street
- 196th Street
- 202nd Street
- 203rd Street

Below is a brief summary of major elements within Alternative F4 as it was presented in the DEIS.

- System to System Interchange at I-465
- Interchange at 106th Street that would be integrated with the I-465 interchange via braided collector-distributor

- Interchange at 116th Street
- 126th Street underpass
- Interchange at 131st Street
- Interchange at 136th Street
- Rangeline Road underpass
- Interchange at 146th Street
 - Incorporation of exit and entrance ramps to SR 431
 - Connection enhancements between 146th Street and 151st Street, through upgrades of existing roads and new road construction (primarily Greyhound Pass, Western Way, and 146th Street)
 - Overpass at 151st Street, which would cross over mainline US 31
- Interchange at 161st Street
- Interchange at SR 32
- 181st Street overpass
- Interchange at 191st Street
- Interchange at SR 38

3.5 Description of Major Moves Alternative – Preferred Alternative

Based on public and agency comments offered as part of the 45-day comment period and traffic updates due to growth, modifications were made to the F4 Alternative that resulted in the Alternative known as the Major Moves Alternative. These modifications were made in order to address increased traffic in the area, reduce environmental impacts, and accommodate changes to local transportation plans. These changes do not compromise this alternative’s ability to satisfy the project’s purpose and need. The Major Moves Alternative is illustrated in Appendix A, Sheets 1 through 13.

The Major Moves Alternative includes an upgrade of existing US 31 from 96th Street to 216th Street, a distance of 13.1 miles (Appendix A, Sheets 1 to 13). The existing four-lane roadway would be reconstructed as a fully access controlled, six-lane freeway with a 55-foot median (dimensions include inside shoulders, see Figure 3.4-1), nine new interchanges, and one redesigned interchange at I-465. Design elements of the Major Moves Alternative are the same as Alternative F4, described in Section 3.4, with the exception of the following design modifications:

- Addition of “Michigan left” at 96th Street which would require all southbound US 31 left turn traffic to turn right on 96th Street and then make a subsequent u-turn at new intersection on 96th Street in order to travel east bound on 96th Street. The revised travel pattern will allow for acceptable levels of service at the 96th Street intersection.
- Addition of 111th Street overpass which would provide an additional east/west connection between 106th Street and 116th Street for local traffic, additional access for pedestrian and bicycle traffic, and connection to Central Park (Appendix A, Sheet 2).
- Addition of a “slip ramp” at Old Meridian. This north bound off ramp would connect to the existing Old Meridian, Pennsylvania round-about and would serve to alleviate congestion at the 116th Street intersection.
- Addition of 131st St. round-about interchange design (Appendix A, Sheet 4).

- Addition of 136th St. round-about interchange design (Appendix A, Sheet 5).
- Small shift in alignment/skew of 136th Street south of its existing alignment
- 146th Street diamond interchange modified to a split diamond, collector-distributor interchange with 151st Street in response to comments concerning potential economic impacts due to loss/alteration of access to the commercial district and concerns of access for the fire station on 151st Street (Appendix A, Sheet 6).
- Addition of overpass bridge at Greyhound Pass to facilitate traffic circulation within/between the commercial development on either side of US 31.
- Addition of a southbound entrance ramp at 151st St (to US 31 southbound) and a northbound entrance ramp at 146th St. (to US 31 northbound)
- Addition of Union St. bridge at 156th, tying into Western Way.
- Addition of 169th Street underpass which would provide an additional east/west connection between 161st Street and SR 32 for local traffic and additional access for pedestrian and bicycle traffic via the Midland Trace (Appendix A, Sheet 8).

The Major Moves Alternative would require the following road closures, some of which may have cul-de-sacs:

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|--|--------------------------------------|
| • 103rd Street | • North Glenn Drive |
| • Circle Drive (access redirected to Clay Terrace) | • Blackburn Avenue |
| • Westfield Boulevard | • N. Union Street (pavement removed) |
| • 156 th Street | • 196 th Street |
| • Buena Vista (rerouted connector to Farr Hills Rd.) | • 202 nd Street |
| • Park Street | • 203 rd Street |

3.6 Profile Modifications

3.6.1 Profile Overview

In the area between 96th Street and 131st Street the proposed US31 horizontal alignment approximately follows the existing roadway alignment. As of this date, the proposed US 31 profile is either at or below the existing roadway elevation in areas between interchanges and at locations where cross roads will pass over US31. The profile will differ from existing conditions at two interchanges where US31 passes over the cross roads of 106th Street and 116th Street. In comparison, the DEIS US31 F4 alignment passed over three cross roads; 106th Street, 116th Street, and 126th Street. The largest anticipated elevation reduction of approximately 7' is located south of 126th Street. The largest elevation increases of approximately 22' are located at the US31 bridges over 106th Street and 116th Street.

In the area between 131st Street and 216th Street the proposed US31 horizontal alignment approximately follows the existing roadway alignment except in the areas of Range Line Road to 156th Street, the 191st Interchange and the SR 38th interchange. In the area of Range Line Road to 156th Street, the centerline of US 31 starts shifting west,

approximately 200' south of the entrance of Circle Drive to 151st Street. The existing centerline of US 31 is shifted a maximum of 140' in this area. The proposed alignment then follows approximately the existing centerline until approximately 600' south of 169th Street and proceeds to shift west. The alignment shift to the west comes back and ties into the existing US31 alignment approximately 800' south of 196th Street. At the 191st interchange, there are two alternative mainline alignments under review. The first alternative shifts the alignment a maximum of 110 feet west of existing US 31 alignment. The second alternative alignment shifts the alignment a maximum of 50' east of the existing US 31 alignment. The alternatives are under review to evaluate the impacts to various residences and the pond in the southeast quadrant. There is also one more alignment shift to the west in the area of the SR 38 interchange. To avoid taking park property the alignment is shifted approximately 35 feet west of existing alignment.

As of this date, the proposed US31 vertical profile is approximately the same grade or below the existing roadway elevation in areas between interchanges and at locations where cross roads will pass over US31. The profile will differ from existing conditions at two interchanges where US31 passes over the cross roads of 136th Street, SR 38 and where US 31 passes over existing roadways that will remain. US31 crosses over existing roads at Clay Terrace Boulevard, and 169th Street. US31 will also pass over the existing Monon Trail railroad bed. The maximum vertical raise in the profile grade is located just south of Clay Terrace and is approximately 31 feet higher than the existing ground line. The largest anticipated reduction in profile grade is approximately 21', which is located just north of the intersection of Greyhound Pass and US31.

3.6.2 Partially Depressed Freeway Evaluation

Over concerns that the US 31 Improvement Project would have detrimental visual and aesthetic impacts to their community, the City of Carmel requested that a partially depressed freeway be considered for investigation. These concerns were presented in two Carmel/Clay US 31 documents: *Interim Report of Environmental Impact Issues, INDOT US 31 Improvement Project*, dated September 10, 2001, and *The Case for Context Sensitive Design for the US 31 Improvement Project through Hamilton County*, dated Winter 2002. A geotechnical and hydraulic engineering study of a partially depressed freeway was conducted by INDOT and a summary was presented in the DEIS.

The exact profile is still developing based on design considerations, constraints, and coordination with various local agencies and officials. Particular attention is being given to environmental and maintenance consequences related to the depressed options. Any construction scenarios that would require regular pumping are not being considered due to such consequences. Some of the potential design consequences and environmental consequences are outlined below. Concerns center on groundwater depths and associated discharge effects.

Previous studies found stabilized groundwater levels to be very shallow, ranging from 3.0 to 10.8 feet (96 hours following the drilling), as documented in the DEIS. The depth to groundwater from the surface was greatest in the US 31 segment from 146th Street to 151st Street, averaging 9.6 feet. Groundwater levels varied from 3.4 to 6.7 feet between 103rd Street and 131st Street, averaging 4.7 feet.

3.6.2.1 Design Issues and Concerns

General design concerns remain regarding options that would depress the roadway below the water table. Some of these include:

- Proper performance and durability of a highway pavement, stability of side slopes and retaining walls, and construction excavation when groundwater is present.
- Traffic maintenance during construction would be more complex than a standard freeway.
- Increased cost to construct and maintain – introduction of risk to the long-term integrity of pavement and roadside elements and several other maintenance complications.

3.6.2.2 Environmental Issues and Concerns

Drainage and discharge are being carefully explored under the context of the current conditions of Williams Creek, new county and local stormwater ordinances that have arisen out of Rule 13 regulation, and locally lead ongoing watershed planning projects such as the Cool Creek Watershed Management Plan and the Williams Creek Watershed Master Plan recently initiated by Hamilton County Surveyor's Office and the City of Carmel.

Key Environmental Concerns:

- Direct natural resources impacts that would occur as a result of additional drainage outlets and required permitting and mitigation for impacts
- Anticipated cumulative impacts of added stormwater to Williams Creek.
- Effects on nearby private wells and required permitting from regulatory agencies
- Differential settlement due to subsidence from groundwater draw-down may affect nearby office buildings. This would depend on the depth of the foundations, soil type, and behavior.
- Lack of overall noise levels reductions through the corridor as a result of partial depression

3.6.2.3 Recommendation

The Major Moves Alternative will work to depress the roadway as much as possible without creating conditions that require pumping, maintenance and/or added environmental risks. Given the varying depth of the groundwater table, the reasonableness of depressing the roadway throughout the corridor varies by location.

Any subsequent studies to further evaluate groundwater resources, groundwater pressures, and the permeability of subsurface materials will only be conducted if determined necessary as part of the final design phase of the project. Soil borings near the existing and proposed interchanges and near proposed bridges will be drilled to notable depths in order to collect information on soil types and strength, thus further aiding in the understanding of subsurface resources. This will ultimately help the designers in the preliminary design and planning for the type of foundations throughout the project area.