



SR 37 Mobility Study Greenfield Avenue at SR 37

Description of Proposed Project

A Traffic Operation Analysis was conducted for the Study area. The purpose of the Traffic Operation Analysis (TOA) was to evaluate traffic operations at the Study intersections. The TOA focused on performing capacity analysis and providing recommendations for the proposed intersection lane configurations. Table 1 shows a summary of existing (2010) capacity analysis for SR 37 and Greenfield Avenue:

Intersection	Traffic Control	Peak	West Leg		East Leg		South Leg		North Leg		Overall	
			LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
SR 37 and Greenfield Avenue	Signal	AM	D	43.3	D	35.1	C	29.5	B	15.6	C	26.0
		PM	F	85.0	E	57.9	D	44.5	C	28.8	D	47.3

Table 2 shows the summary of the capacity analysis for Alternative 1 at SR 37 and Greenfield Avenue after construction of the recommended improvements:

Intersection	Traffic Control	Peak	West Leg		East Leg		South Leg		North Leg		Overall	
			LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
SR 37 NB Ramps and Greenfield Avenue	Roundabout	AM	A	2.4	A	3.6	A	2.4	--	--	A	3.0
		PM	A	3.0	A	4.2	A	3.0	--	--	A	3.5
SR 37 SB Ramps and Greenfield Avenue	Roundabout	AM	A	3.0	A	2.4	--	--	A	3.0	A	2.7
		PM	A	3.6	A	1.8	--	--	A	3.0	A	3.0

Please see the Traffic Operation Analysis (binder labeled Traffic Operation Analysis) to review the Study area results in their entirety.

The two proposed build alternatives were evaluated based on results from the TOA. Results from the TOA were shared with the local stakeholder group during a Stakeholders meeting and afterwards shared with elected officials. During this meeting, the group collectively decided to pursue the alternative which involved reconstructing each of the Study intersections into teardrop roundabout interchanges.



SR 37 Corridor - General

Existing SR 37 is a four lane expressway with four 12-foot travel lanes, four foot inside shoulders, and ten foot outside shoulders. The northbound and southbound travel lanes are separated by a 50 foot open grass median (inside travel lane to inside travel lane). The existing right-of-way along SR 37 varies from mostly 85 feet to 95 feet from centerline on both sides. Many businesses line each side of the SR 37 right-of-way throughout the Study limits. The interchanges proposed in this Study require auxiliary lanes, ramp junctions, and ramp lanes adjacent to SR 37 travel lanes approaching each interchange from each side. Additional right-of-way will be required in many locations adjacent to ramp lanes and junctions. In an effort to minimize the amount of right-of-way required and the impacts to existing businesses, it is proposed that the SR 37 median be enclosed with a center median barrier and the SR 37 travel lanes be shifted in to narrow the width of the roadway through the interchange limits.

A 14.5 foot median is proposed, consisting of six foot inside shoulders and a 2.5 foot median barrier wall. Six foot is the desirable inside shoulder width required using Table 53-6 from the Indiana Design Manual (IDM). See the typical cross sections in this Study for full roadway dimensions. If any, one isolated interchange is constructed, the SR 37 travel lanes would shift back out on the north and south sides of the interchange to match the existing travel lanes and median width. As consecutive interchanges are constructed, it will not be feasible to shift lanes out to the existing median width and back in between most interchanges. If all interchanges were built concurrently, the median would remain enclosed from the south side of 126th Street to the north side of 146th Street, and from the south side of Town and Country Boulevard to the north side of SR 32 / SR 38. As there is sufficient distance between 146th Street and Greenfield Avenue, the travel lanes north of 146th Street could shift out the existing median width even if the 146th Street and Greenfield Avenue interchanges were constructed at the same time or consecutively. Furthermore, because of the layout and surrounding parcels at Greenfield Avenue, it is feasible to maintain the existing open median width through this location even when the proposed interchange is constructed. Where this is cost prohibitive at other locations due to right-of-way and business impacts associated with the wider roadway, it is economically feasible at the Greenfield Avenue Interchange. The travel lanes would shift back into an enclosed median south of Town and Country Boulevard and remain enclosed to north of SR 32 / SR 38, where the lanes would shift back out to meet the existing pavement.

This Study focuses on the interchanges; however the treatment of SR 37 proper, between the interchanges will be affected by each interchange's traffic and proximity to each other. The geometrics developed for this Study are unique to each area between interchanges according to the findings of the Traffic Operations Analysis (TOA) conducted as part of this Study. In each segment between interchanges, in both directions, there will be an entrance ramp junction from one interchange followed by an exit ramp junction to the next interchange. This creates weaving areas between the interchanges, which were analyzed in the TOA. Some weaving areas were acceptable and are recommended. Other weaving areas are not acceptable and have been removed by interconnecting consecutive interchanges with collector distributor lanes. See the TOA for the discussion and results of the weaving analysis conducted between interchanges.



Between 146th Street and Greenfield Avenue

Both northbound and southbound weaving segments are acceptable. The northbound entrance ramp from 146th Street and the northbound exit ramp to Greenfield Avenue will be conventional entrance and exit ramps. The southbound entrance ramp from Greenfield Avenue and the southbound exit ramp to 146th Street will be conventional entrance and exit ramps. There will not be a continuous auxiliary lane between interchanges in both directions.

North of 146th Street, the travel lanes will shift out to transition from the enclosed median to the existing open median. This will eliminate the necessity to reconstruct SR 37, for the sake of enclosing the median, from north of 146th Street to Greenfield Avenue. This area can then be evaluated for replacement based solely on the condition of the pavement at the time of interchange construction, and not out of necessity to construct either interchange.

Between Greenfield Avenue and Town and Country Boulevard

Both northbound and southbound weaving segments are acceptable. The northbound entrance ramp from Greenfield Avenue and the northbound exit ramp to Town and Country Boulevard will be conventional entrance and exit ramps. The southbound entrance ramp from Town and Country Boulevard and the southbound exit ramp to Greenfield Avenue will be conventional entrance and exit ramps. There will be a continuous auxiliary lane between interchanges in both directions.

Between these two interchanges, the travel lanes will need to shift inward to transition from the existing open grass median carried through the Greenfield Avenue interchange, to the proposed enclosed median prior to the Town and Country Boulevard interchange.

Greenfield Avenue

The preferred alternate for this intersection is to construct a “teardrop” roundabout interchange on Greenfield Avenue consisting of two closely spaced roundabouts on either side of SR 37, which are tied together through the middle to function as one unit. Greenfield Avenue will overpass SR 37. SR 37 will be free-flow through this interchange and traffic traveling through on Greenfield Avenue will drive through the roundabouts with a yield condition on the roundabout approach. The current skew of Greenfield Avenue through this interchange will be maintained, as straightening the skew would require the re-alignment of Greenfield Avenue and potential impact two businesses in the southwest quadrant and/or two additional residences in the northeast quadrant.

The layout of the ramps will closely resemble a tight diamond interchange with directional entrance and exit ramps in each quadrant. Beyond the back of the gore area, all four ramps will remain directly adjacent to SR 37 maintaining an approximate 22 foot offset from outside edge of the SR 37 travel lane to the inside edge of the ramp lane(s). This offset allows for the minimum outside mainline shoulder, minimum inside ramp shoulder and the wall in between the mainline and the ramps. This wall is necessary to maintain the elevation difference between the mainline and the ramps as they approach Greenfield Avenue. Exterior walls will also be necessary in the southwest and northwest quadrants to minimize impacts to businesses in



these quadrants (See aerial sheets for estimated wall limits). The residence in the northeast quadrant will be in conflict with the east roundabout and exit ramp, thus will need to be relocated to construct this interchange.

Greenfield Avenue will have two lanes in each direction through the east/west portion of the roundabouts. On both approaches there will be one shared left/through lane, and one shared through/right lane. Both the northbound and southbound exit ramps will exit as one lane and develop into two lanes at the roundabout approach, consisting of one shared left/through lane, one right turn lane. The entrance ramps will both be one lane entrances. For a diagram of the proposed lane configuration see the Traffic Operations Analysis (binder labeled Traffic Operation Analysis).

Two current drive accesses off Greenfield Avenue will need to be removed due to their close proximity to the interchange and the vertical difference of proposed Greenfield Avenue in the area of the drives. One of these drives accesses the Marathon gas station in the southwest quadrant. This business will maintain access to Greenfield Avenue by way of a second existing drive located approximately 150 feet north of the removed drive. The other drive to be removed accesses the Gas America gas station in the northwest quadrant. This business will maintain access to Greenfield Avenue by way of a second existing drive located approximately 150 feet north of the removed drive.

Greenfield Avenue over SR 37 Interchange

The bridge will be designed to meet or exceed the current “AASHTO LRFD Bridge Design Specifications” as supplemented by INDOT design standards. The minimum vertical clearance for roadways crossing over SR 37 is 16’-6”.

The proposed bridge over SR 37 at Greenfield Ave is anticipated to be a two span, 198.5 foot long, prestressed reinforced concrete bulb tee beam structure built with a 38 degree skew to the roadway. The bridge will be a four lane roundabout facility with a clear roadway width of 232’-8” and an out to out coping of 236’-0”. The bridge will be designed to span the four lane SR 37 divided highway with the interior pier placed in the median of SR 37. It is anticipated that the proposed structure will be constructed with integral end bents on piles and a concrete interior wall pier on piles. The structure will also have reinforced concrete approach slabs to provide a smooth transition from the approach roadway to the bridge and to protect the ends of the bridge from settlement and erosion. The proposed bridge will include common height concrete bridge rail with transitions, approach guardrail and end treatments to meet current minimum standards.



Greenfield Avenue Project Development Cost Summary

SR 37 MOBILITY STUDY

Hamilton County, Town of Fishers and City of Noblesville
SR 37 from South of 126th Street to North of SR 32 / SR 38

PROJECT ITEMS:		PROJECT COST (IN YEAR OF EXPENDITURE)
GREENFIELD AVENUE		
Engineering Costs	\$ 3,444,240	
Construction Costs	\$ 24,886,132	
Construction Cost Contingencies	\$ 2,488,613	
Construction Inspection Costs	\$ 3,732,919	
Utility Relocation Cost	\$ 1,080,000	
Land Cost	\$ 2,539,173	
Subtotal Greenfield Avenue Interchange		\$34,726,838

* The Greenfield Avenue Interchange is projected to be constructed in 2024. An inflation factor of 1.469 has been applied to obtain the construction cost shown in this table

**TOTAL
INTERCHANGE
COST: \$34,726,838**

