Nick Batta, Highway Engineer
Office of Urban & Corridor Planning
Feasibility Engineering Section

MEMORANDUM
June 11, 2007

To: James Earl
Office of Project Management

Through: David Butts, Supervisor
Feasibility Engineering Section D A Butts 7/02/07

From: Nick Batta NTB

Re: Mini-Scope of I-65 ATL in Boone County

INTRODUCTION & HISTORY

This memo presents a cost estimate and brief project scope for an added travel lanes/complete pavement replacement project along I-65 in Boone County. The project begins at the I-865 bridge (RP 129+23) and ends at the US 52 bridge (RP 142+05). It encompasses Des Nos. 0200902 and 0200903. A Mini-Scope was written by David Butts on April 28, 2005, for the segment from 1.02 miles south of CR 100E to 0.5 mile north of CR 300N. Its costs were updated by Nick Batta on December 5, 2006. A Mini-Scope was written by Nick Batta on November 8, 2006, for the segment from Lafayette Road to 1.02 miles south of CR 100E. The estimated construction costs from the two Mini-Scopes greatly exceeded the allotted funds; therefore it was decided to segment I-65 and prioritize needs.

Since December 2006, the Feasibility Engineering Section and Office of Project Management have sought input on which segments and interchanges along I-65 were in the most need of improvement. Input came from (but not limited to) FHWA, INDOT Executive Staff, Office of Pavement Engineering, and the Crawfordsville District. Also during this time, funding for the project was increased to $210.3 million in construction year dollars ($182.7 in 2007 dollars).

SEGMENT #1: From I-865 to 0.5 mile north of SR 334

The first segment is approximately 1.38 miles in length and its estimated road construction cost is $17.0 million[1]. The lane drop/addition will occur approximately 450' south of the I-865 bridge (i.e. the south project limit). To the south of the lane drop/addition, a 2.75' lateral through lane shift will be required to transition from the existing 60' median to the proposed 30.5' median. Along with three basic lanes, Segment #1 is to have one auxiliary lane in each direction due to an interchange spacing of 0.9 mile. Each auxiliary lane will be added/dropped at the interchanges and not carried under the interchange crossroad bridges.

The I-865 interchange will retain its current configuration. The expectation is a one-lane on-ramp and two-lane off-ramp (replaces the existing). For the southbound off-ramp, the third lane from the median will be a tapered 'fork' ramp terminal.

The SR 334 interchange will retain its current configuration, with one-lane entrance and exit ramps. Auxiliary turn lanes already exist at both ramp terminals and their traffic capacity will be checked once traffic projections arrive.

[1] All costs shown are for construction, and include factors for environmental mitigation, utilities, drainage structures, maintenance of traffic, noise walls (where appropriate) and a 20% contingency. The values are in 2007 dollars.

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Two bridges cross over I-65 in Segment #1: I-865 and SR 334. There are no mainline bridges. Both bridges have a vertical clearance of at least 16' and will be retained during the project.

SEGMENT #2: From 0.5 mile north of SR 334 to 0.5 mile north of SR 267

The second segment is approximately 3.22 miles in length and its estimated road construction cost is $35.2 million. The typical cross section is to have three basic lanes in each direction divided by a 30.5' flush median.

The SR 267 interchange is to be reconstructed as part of this project. The anticipated work is to rebuild the diamond interchange, adding turn lanes at both ramp terminals. One-lane entrance and exit ramps are expected. The north side of the interchange will tie-into the local road network, either to CR 400E (which is the existing condition) or realigned to the east and tie-into a new road project along the north side of the Anson development (CR 400S). The estimated construction cost for this interchange modification is $11.7 million.

One bridge crosses I-65 in Segment #2: SR 267. It will be replaced as part of the interchange modification described above (cost for replacement is included). There are no mainline bridges.

SEGMENT #3: From 0.5 mile north of SR 267 to 0.5 mile south of CR 100E

The third segment is approximately 3.39 miles in length and its estimated road construction cost is $38.0 million. The typical cross section is to have three basic lanes in each direction divided by a 30.5' flush median.

No interchanges exist in Segment #3.

Twin mainline bridges cross Prairie Creek approximately 0.58 mile south of CR 100E. Both single-span brides are reinforced concrete arches, approximately 30' in out-to-out length, built in 1948 and reconstructed in 1958. They should be replaced as part of this project. The estimated construction cost for bridge replacement is $1.7 million.

SEGMENT #4: From 0.5 mile south of CR 100E to 0.5 mile north of SR 39

The fourth segment is approximately 2.16 miles in length and its estimated road construction cost is $25.2 million. The typical cross section is to have three basic lanes in each direction divided by a 30.5' flush median.

Part of the CR 100E interchange is to be reconstructed as part of this project. The anticipated work will involve the northbound off-ramp only. Although the geometrics of the remaining three ramps may be deficient, funding is not available for a full interchange modification. The northbound off-ramp is to be realigned and its terminal changed from Perry-Worth Rd to CR 100E (estimated length of new ramp construction is 2,500'). This new terminal will create a four-legged intersection with CR 100E and the northbound on-ramp. The exit ramp will be one-lane. Intersection improvements at Perry-Worth Rd/CR 100S and Perry-Worth Rd/CR 100E will be studied since the traffic patterns will change as a result of the ramp realignment. Both intersection improvements will involve realigning legs of the intersection to improve skew. The estimated cost of this minor interchange modification is $1.9 million (including $750,000 for the intersection improvement work).

The SR 39 interchange with retain its current configuration, with one-lane entrance and exit ramps. Auxiliary turn lanes already exist at both ramp terminals and their traffic capacity will be checked once traffic projections arrive.

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Two bridges cross over I-65 in Segment #4: CR 100E and SR 39. There are no mainline bridges. The CR 100E bridge has a vertical clearance over 16' and will not require any work. The SR 39 bridge has a vertical clearance of approximately 15' and will need deck replacement to increase the clearance. The expected bridge cross section is 5-lanes with sidewalks. The anticipated cost of construction for the bridge replacement is $3.0 million.

SEGMENT #5: From 0.5 mile north of SR 39 to 0.8 mile north of SR 32

The fifth segment is approximately 1.54 miles in length and its estimated road construction cost is $19.8 million. From the beginning of this segment to approximately 0.7 mile north of SR 32, the typical cross section is to have three basic lanes in each direction divided by a 30.5' flush median. Segment #5 ends once the inside lanes drop (600' taper), creating a 54.5' depressed median.

The SR 32 interchange will retain its current configuration as it was reconstructed in 2004.

There are two mainline bridges (one in each direction) over an abandoned railroad & Prairie Creek approximately 0.55 mile north of SR 32. The southbound bridge was built in 1949 and the northbound bridge in 1954 (both were rehabilitated in 1996). Each bridge is 374' in total length and contains nine spans (CPCIB & SB). It is anticipated to replace both bridges at a construction cost of $5.4 million. The 1949 Conrail RR bridge over I-65, approximately 0.52 mile north of SR 39, has substandard horizontal & vertical clearances and will require replacement. Its expected construction cost is $11.1 million. Coordination with appropriate railroad officials will be critical for the timeframe of these replacements. The SR 32 bridge over I-65 has a vertical clearance over 16' therefore no work is to be done to it.

SEGMENT #6: From 0.8 mile north of SR 32 to US 52

The sixth segment is approximately 1.13 miles in length and its estimated road construction cost is $11.2 million. The typical cross section is two basic lanes in each direction divided by a 54.5' depressed median. Approximately 0.5 mile of vertical and horizontal alignment of the northbound lanes will be required. A 2.75' lateral through lane shift is required 150' south of the US 52 bridge to transition from a 54.5' to 60' median (i.e. the north project limit, tying into the existing cross section).

Most of the US 52/Lafayette Ave interchange will retain its current configuration. Removal of the southbound off-ramp to Lafayette Ave is recommended (length of ramp removal is approximately 1,650'). The remaining ramps, along with the northbound C/D lane, are to be retained. An Interchange Justification Study will be required since an access point to the Interstate Highway System is being removed. The estimated cost of this minor interchange modification is $200,000.

There are two mainline bridges in this segment. The bridge carrying northbound I-65 over Lafayette Ave will removed (removal costs included in interchange modification described above). There is a mainline bridge which carries all four lanes and the C/D lanes over Prairie Creek approximately 0.47 mile south of US 52. The single-span reinforced concrete arch was built in 1948, reconstructed in 1989, and has an out-to-out length of 51'. This bridge is to be replaced at an estimated construction cost of $1.3 million. One bridge crosses over I-65 in Segment #6, carrying westbound US 52. Its vertical clearance is 16', and therefore no work is proposed to it.

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COST SUMMARY BY SEGMENT (2007 dollars)

Segment #1		
	Road construction	$17.0 million
	Interchange modifications	$0
	Bridge replacements	$0
	Subtotal	*$17.0 million*
Segment #2		
	Road construction	$35.2 million
	Interchange modifications[2]	$11.7 million
	Bridge replacements	$0
	Subtotal	*$46.9 million*
Segment #3		
	Road construction	$38.0 million
	Interchange modifications	$0
	Bridge replacements	$1.7 million
	Subtotal	*$39.7 million*
Segment #4		
	Road construction	$25.2 million
	Interchange modifications	$1.9 million
	Bridge replacements	$3.0 million
	Subtotal	*$30.1 million*
Segment #5		
	Road construction	$19.8 million
	Interchange modifications	$0
	Bridge replacements	$16.5 million
	Subtotal	*$36.3 million*
Segment #6		
	Road construction	$11.2 million
	Interchange modifications	$0.2 million
	Bridge replacements	$1.3 million
	Subtotal	*$12.7 million*
ESTIMATED CONSTRUCTION COST TOTAL		***$182.7 million (2007 dollars)***

[2] Includes cost of bridge replacement

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CONSTRUCTION SEQUENCE

2009

SR 267 over I-65 bridge replacement

In order to begin the added capacity at the south end of the project, the SR 267 bridge needs to be replaced first. This will benefit maintenance of traffic, as the vertical clearance of the existing bridge in the median is too low to direct lanes under.

2010

I-65 added travel lanes from I-865 to 0.5 mile north of SR 267
Conrail RR over I-65 bridge replacement
SR 39 over I-65 bridge replacement

Like the SR 267 bridge, the Conrail RR bridge needs to be replaced before the ATL is constructed around Lebanon. Due to their close proximity, the SR 39 bridge should be replaced concurrently.

2011

I-65 added travel lanes from 0.5 mile north of SR 267 to 0.5 mile south of CR 100E
I-65 over Prairie Creek (south crossing) bridge replacement

2012

I-65 added travel lanes from 0.5 mile south of CR 100E to 0.8 mile north of SR 32
I-65 road reconstruction from 0.8 mile north of SR 32 to US 52
I-65 over abandoned RR bridge replacement
I-65 over Prairie Creek (north crossing) bridge replacement
I-65 interchange modification at Lafayette Ave

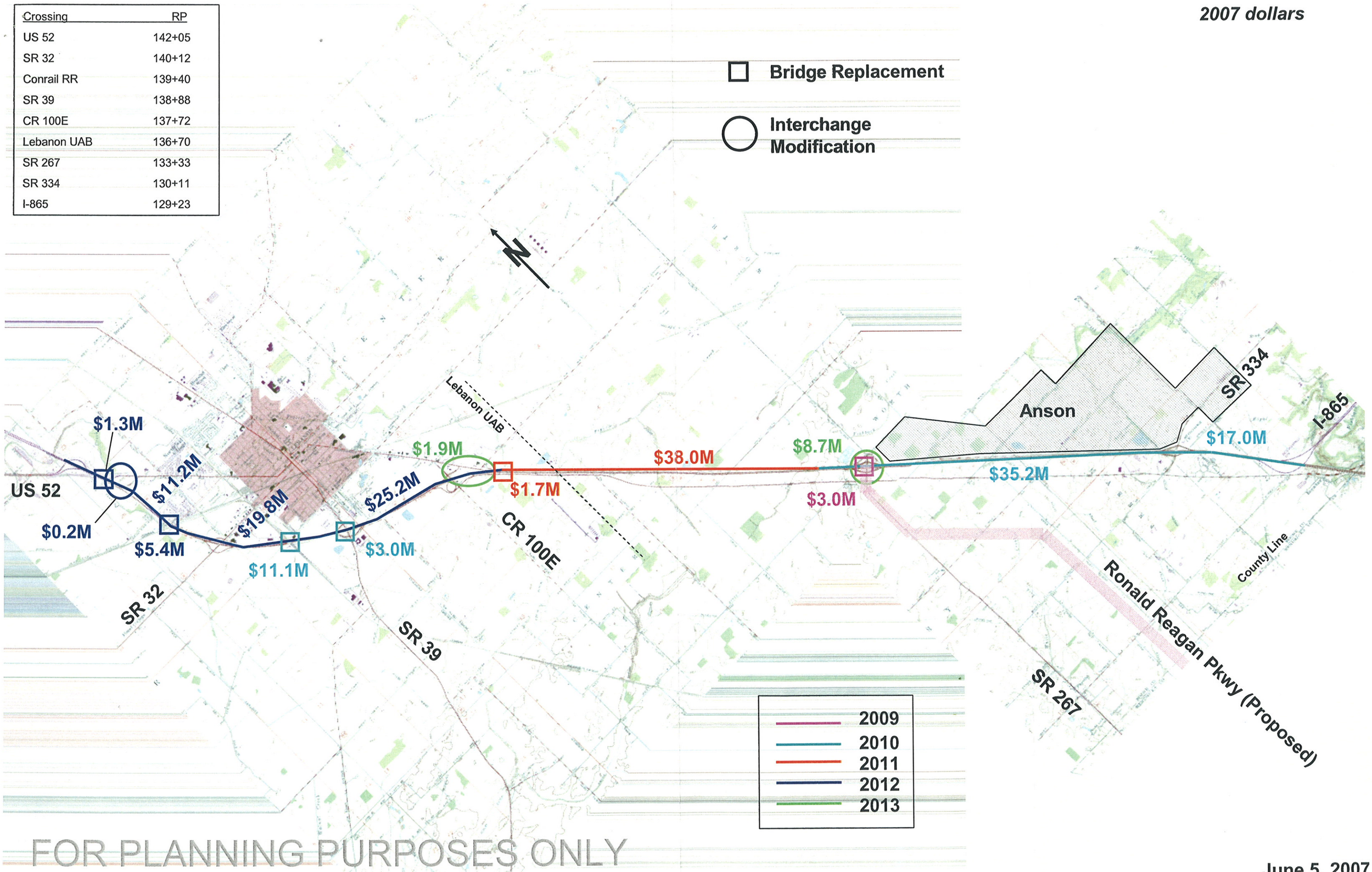
2013

I-65 interchange modification at CR 100E
I-65 interchange modification at SR 267

The final two projects will require R/W, therefore are planned for the last construction year.

2007 dollars

Crossing	RP
US 52	142+05
SR 32	140+12
Conrail RR	139+40
SR 39	138+88
CR 100E	137+72
Lebanon UAB	136+70
SR 267	133+33
SR 334	130+11
I-865	129+23



FOR PLANNING PURPOSES ONLY

June 5, 2007