RM 1431 Diverging Diamond Interchange (DDI)

TexITE Meeting
9/5/2014
Existing Geometry

Source: Google Maps
Existing Geometry

Source: Google Maps
Peak Hour Traffic Volumes

AM (PM) PEAK HOUR VOLUMES
Intersection Images

RM 1431 Looking West

Bridge over IH-35 Looking East

Source: Google Maps
Intersection Images

Source: Google Maps
Key Aspects of the DDI

• No thru movements allowed on the frontage roads through the DDI

• Collector/distributor roads are provided to handle those thru volumes

• Operational efficiency highly dependant on:
  – lane configuration
  – traffic patterns
  – separation between sides
Proposed Geometry
Overhead Guide Signs - EB
Overhead Guide Signs - WB
Signal Configuration - West Side
Signal Configuration - East Side
Signal Phasing

TYPICAL DDI SEQUENCE

OL-J (Ø5+Ø8)
OL-D (Ø4)
OL-I (Ø5+Ø8)
OL-H (Ø5+Ø8)
OL-F (Ø6)
OL-A (Ø2)
OL-C (Ø4, Ø6)
SB IH 35
UNIVERSITY BLVD
BIH 35
RM 1431

Signal Phasing

PROPOSED DDI SEQUENCE

SB IH 35

OL-A, B
(Ø2)

OL-C
(Ø4)

OL-D
(Ø4)

OL-E

OL-H, I
(Ø5 + Ø8)

OL-J
(Ø5 + Ø8)

OL-E, G
(Ø6)

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NB IH 35
Phasing Diagram
Operational Efficiency of the DDI

- Operational efficiency highly dependant on:
  - lane configuration- availability of separate lanes for various movements
  - traffic patterns- High thru volumes on arterial reduce efficiency
  - separation between sides- the more the better
Pedestrian Accommodations
Monitoring and Communications

PTZ Camera

Radio Antennas
Other Projects

• Widening of University Blvd. from 4 to 6 lanes by the City of Round Rock

• Retiming of the signals from IH-35 to Sunrise Road by the City of Round Rock
Estimated Benefits

• Vissim micro simulation for the system -
  – RM 1431/University Blvd. from IH 35 to Sunrise Road

• 70% annual delay reduction for the system

• At IH-35:
  – AM peak hour- LOS E (67.2) to LOS C (23.9)
  – PM peak hour- LOS F (120.5) to LOS D (38.3)

Source: HDR Traffic Study
Recommendations

• Address truck traffic, bicycles and pedestrian traffic early in the design process

• Coordinate closely the roadway design with the traffic signal design

• Develop the TCP during the preliminary design phase
  – The switchover from diamond to DDI operations is the critical phase
Thoughts for the Future

- Consider DDIs instead of typical diamond interchanges as reconstruction projects come up.