Burns & McDonnell Selected August 2007 to:

- *Complete Location Study and Determine Final Interchange Location for new Interchange to serve BNSF IMF and Logitics Park in SW Johnson County*
- *Complete Environmental Assessment (EA)*
- *Complete Final Break in Interstate Access (BIA)*

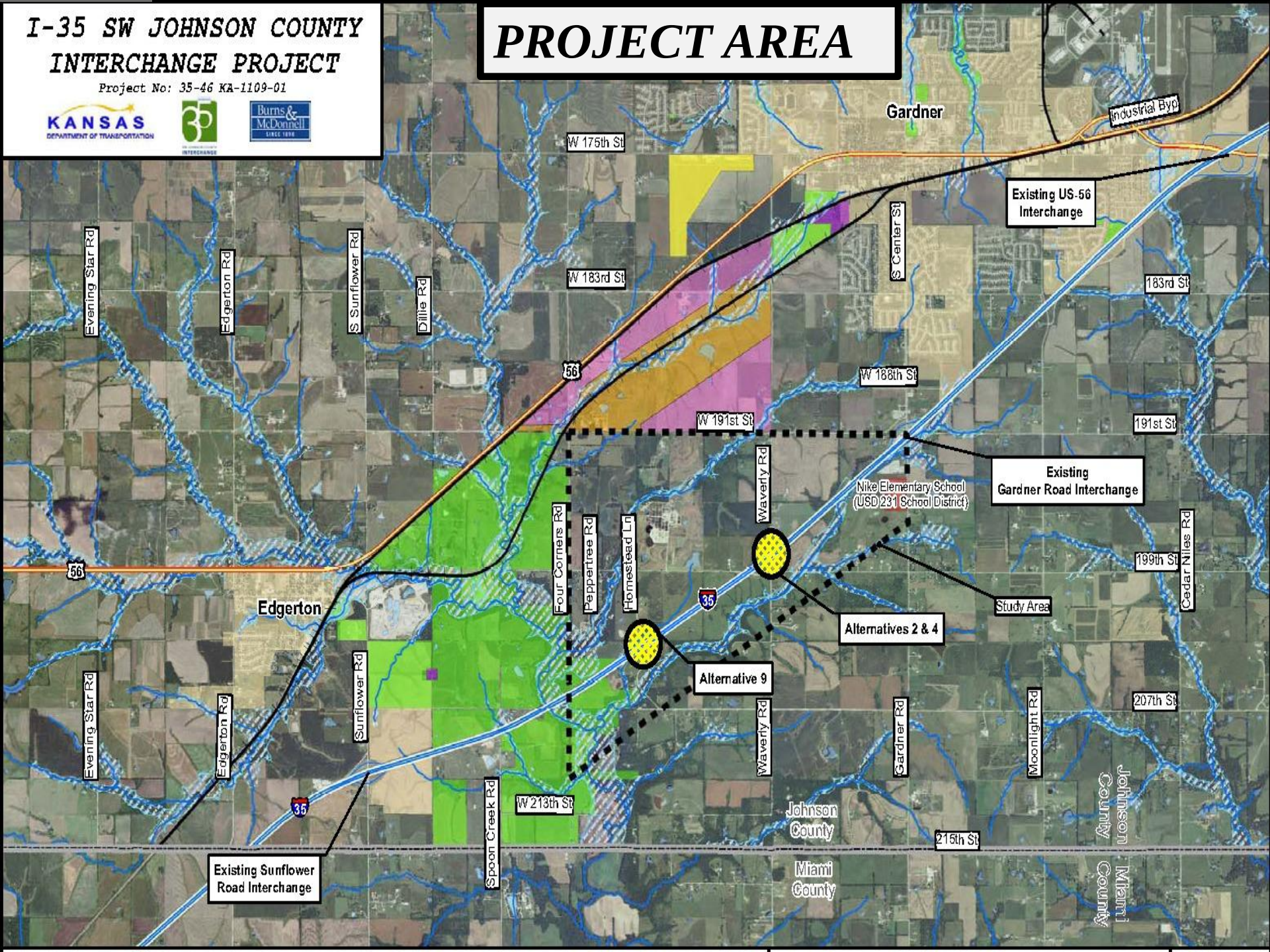
I-35 SW JOHNSON COUNTY INTERCHANGE PROJECT

Project No: 35-46 KA-1109-01

KANSAS DEPARTMENT OF TRANSPORTATION

Burns & McDonnell SINCE 1898

PROJECT AREA



I-35 SW JOHNSON COUNTY INTERCHANGE PROJECT

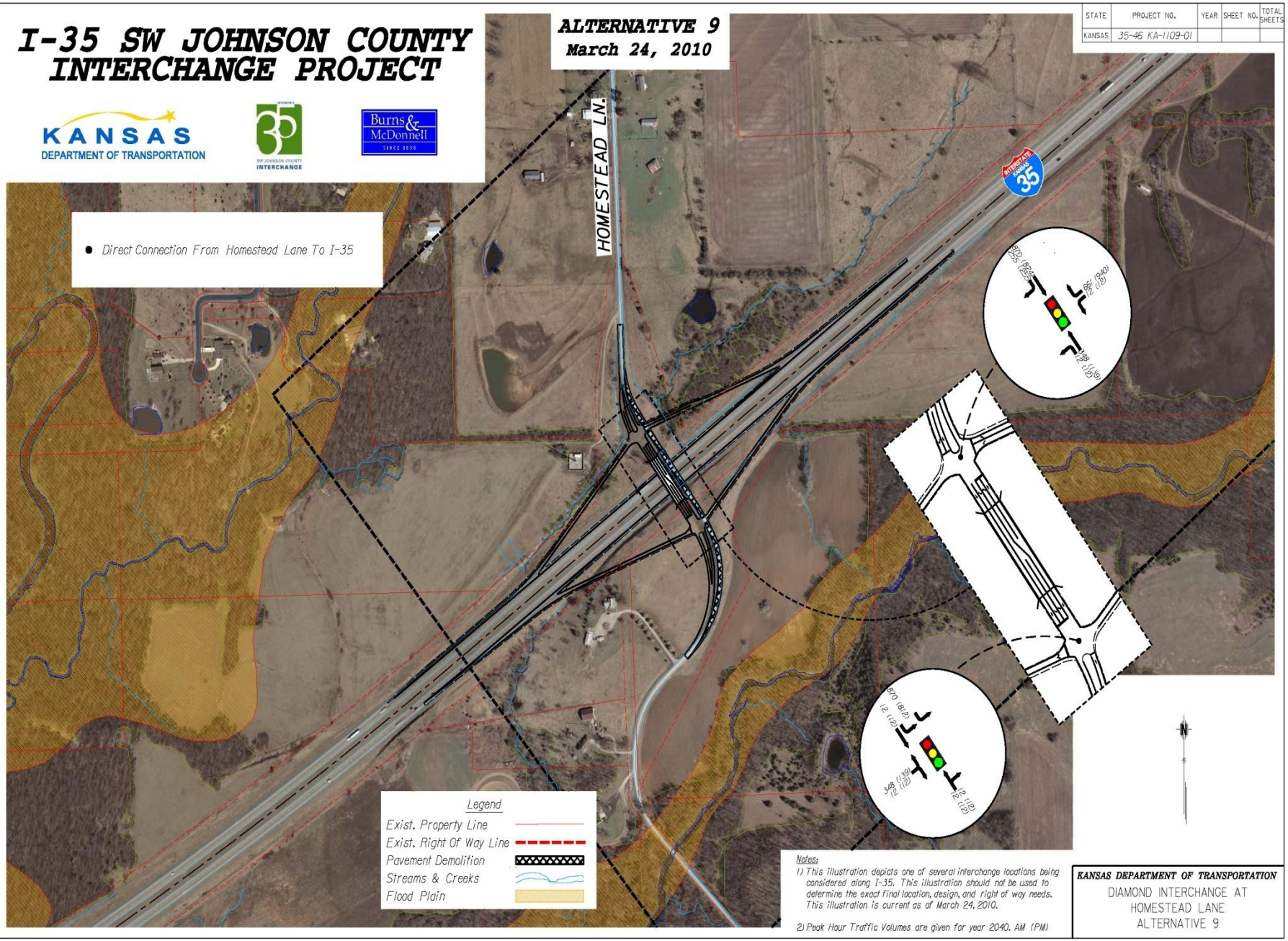
KANSAS DEPARTMENT OF TRANSPORTATION

SW JOHNSON COUNTY INTERCHANGE

Burns & McDonnell SINCE 1898

ALTERNATIVE 9
March 24, 2010

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS	35-46 KA-1109-01			



REFERENCES NOTED	BY	DATE
REFERENCES CHECKED		

Drawn By: $$USERNAME$$ Plotted: $$$$$$YTIME$$$$$$
File: $$$$$$$$$$$$$$DONSPEC$$$$$$$$$$$$$$

Notes:
1) This illustration depicts one of several interchange locations being considered along I-35. This illustration should not be used to determine the exact final location, design, and right of way needs. This illustration is current as of March 24, 2010.

2) Peak Hour Traffic Volumes are given for year 2040. AM (PM)

KANSAS DEPARTMENT OF TRANSPORTATION
DIAMOND INTERCHANGE AT HOMESTEAD LANE
ALTERNATIVE 9

Interstate I-35 Southwest Johnson County

I-35 / Homestead Lane DDI



Interstate I-35 Southwest Johnson County

I-35 / Homestead Lane DDI

Table 3-24: 2030 Gardner IMF Operations plus Induced Development Trip Generation

		AM Peak Hour			PM Peak Hour		
	Daily	in	out	total	in	out	total
IMF							
Trucks	3,121	68	103	171	120	94	214
Bobtails	2,233	49	73	122	86	67	153
Non-Trucks	691	135	135	270	7	14	21
Total	6,045	252	311	563	213	175	388
Logistics Park							
Trucks	2,254	31	38	69	42	34	76
Non-Trucks	8,781	423	38	461	287	353	640
Total	11,035	454	76	530	329	387	716
IMF + Logistics Park							
Trucks	5,375	99	141	240	162	128	290
Bobtails	2,233	49	73	122	86	67	153
Non-Trucks	9,472	558	173	731	294	367	661
Total	17,080	706	387	1,093	542	562	1,104

Design Traffic – 2030 from BNSF EA

- *Three Components*
  - ✓ *BNSF Intermodal Facility (IMF) - Predom Trucks*
  - ✓ *Ancillary Development (7mill Sq Ft) - Mixed*
  - ✓ *Background Traffic (Diversion) – US 56/199th*
- *Distribution from BNSF EA (~85%N/15%S*

Update Traffic to 2040

- *Min 20 year Planning Horizon from Opening*
- *2015 Opening of IMF and Interchange*
- *MARC recent update LRTP to 2040*

Reference to US56 Corridor

- *Assumed interchange at Waverly/199th*
- *Common Intersection – US56/199th/Sunflower*

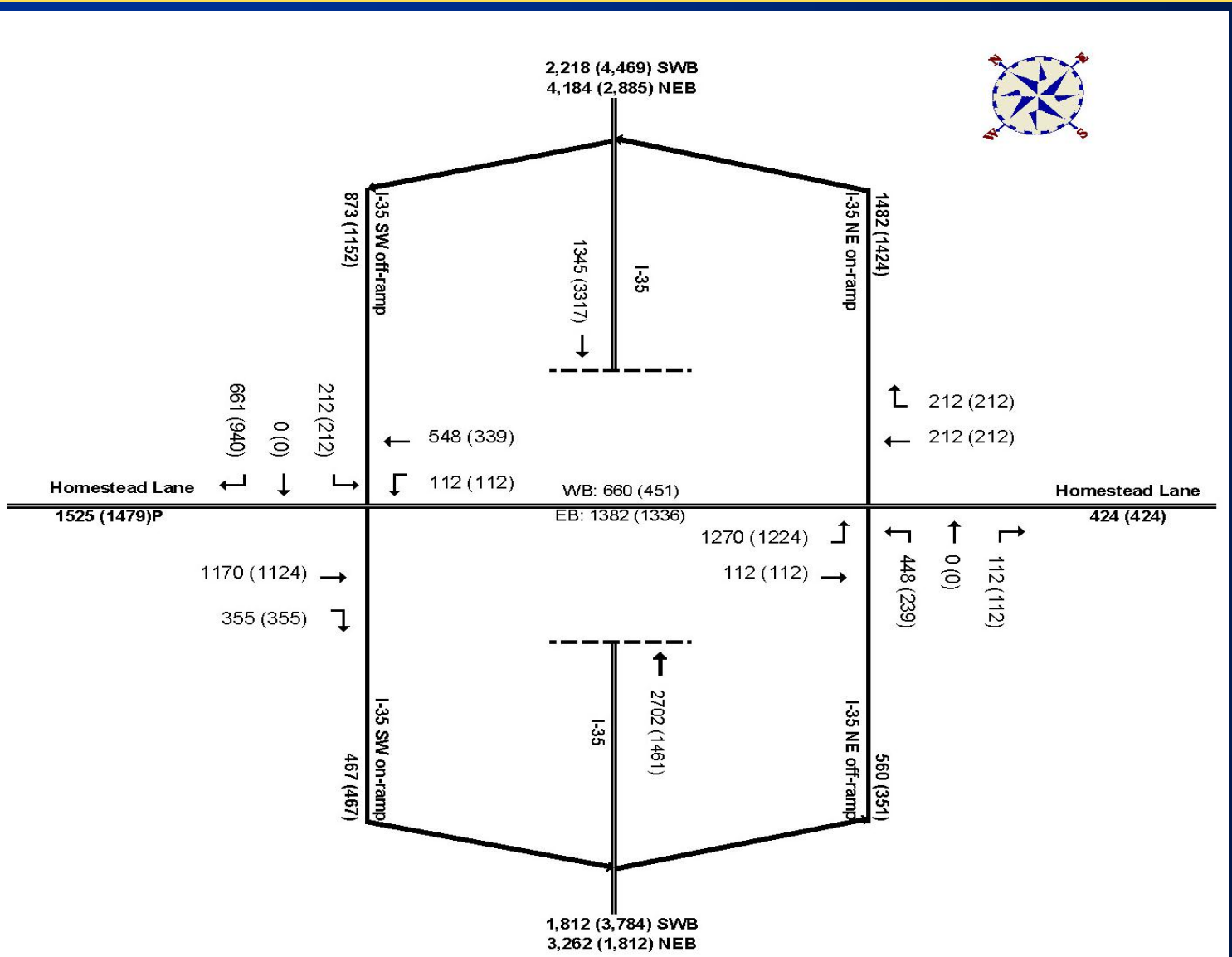
Traffic and Interchange Design Refinement

- *Consider potential development south of I-35*
- *Additional 400 trips at south leg of interchange*
- *ADT Design Volumes*

Homestead Lane north of 199th Street:	16,400 ADT
Homestead Lane south of 199th Street:	33,500 ADT
Homestead Land south of I-35:	5,600 ADT
199th Street east of Homestead Lane:	8,700 ADT
199th Street west of Homestead Lane:	13,500 ADT

Interstate I-35 Southwest Johnson County

I-35 / Homestead Lane DDI

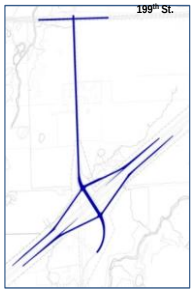


I-35 Homestead Lane Interchange
Project 35-46 KA-1109-02
Conceptual Interchange Designs

August 3, 2010

NOTE:
Estimates include improvements to and including the intersection of 199th Street & Homestead Lane.

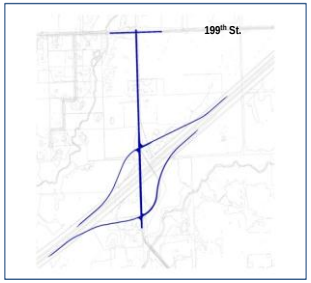
Standard Rural Diamond



- Original BIA conceptual design
- Follows existing grade separation alignment (Normal to I-35)
- No impact to gas transmission line in southeast quadrant
- Minimum right of way impacts compared to other alternatives
- Excessive left-turn volume at south ramp terminal cannot be handled by conventional diamond interchange phasing (LOS E/F at design year 2040). Potential breakdown in traffic operations shortly after opening.
- Queue spill back from south ramp terminal to north ramp terminal
- Construction Cost Estimate - $11,800,000

A

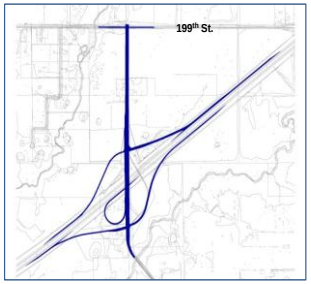
Expanded Diamond Interchange



- Realigns and straightens Homestead Lane but requires longer bridge
- Provides space for potential loop in southwest quadrant for heavy SB to NB left-turn movements
- Potential impact to gas transmission line in southeast quadrant
- Higher right of way impacts than rural diamond
- Excessive left-turn volume at south ramp terminal cannot be handled by conventional diamond interchange phasing (LOS E/F at design year 2040). Potential breakdown in traffic operations shortly after opening.
- Excessively heavy left-turn volume at south ramp terminal
- Construction Cost Estimate - $17,600,000

B

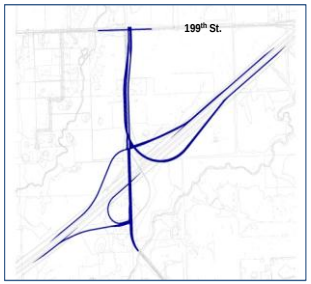
Expanded Diamond Interchange with Loop



- Same basic footprint as Expanded Diamond Interchange
- Loop ramp intended to serve SB to NB 35 truck traffic
- Seven lane bridge required over I-35
- Potential impact to gas transmission line in southeast quadrant
- Requires 5 touch points to the interstate
- Higher right of way impacts than rural diamond
- LOS D under design year 2040 traffic (Limited spare capacity at critical SB to NB movement)
- Unconventional design, operations, and special signing required.
- Construction Cost Estimate - $18,100,000

C

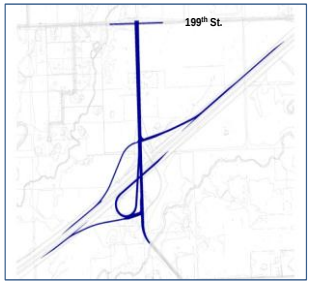
Diamond with Flyover Ramp



- LOS A/B operations under design year 2040 (Ample spare capacity)
- Loop ramp intended to serve Traffic from South of 199th Street
- Flyover intended to serve Traffic from North of 199th Street (Including EB and WB 199th Street)
- Requires 1,600–foot two-lane flyover bridge
- Requires 5 touch points to the interstate
- Minimal acceleration lane length available before the existing 199th Street overpass
- Construction Cost Estimate - $30,500,000

D

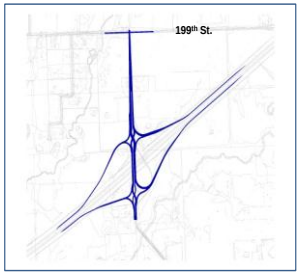
Diamond with Double Lane Loop Ramp



- Unconventional design with minimal available design criteria and operational precedence.
- Least right of way impacts except for standard rural diamond.
- Minimizes impacts to gas transmission line
- Assumed design volume of 1,200 vph matches current 2040 design volume. (no spare capacity). 80% loop capacity reached in 2020 (five years after opening)
- Requires separate bridge for suggested tapered offset to loop
- Construction Cost Estimate - $18,100,000

E

Diverging Diamond Interchange (DDI)

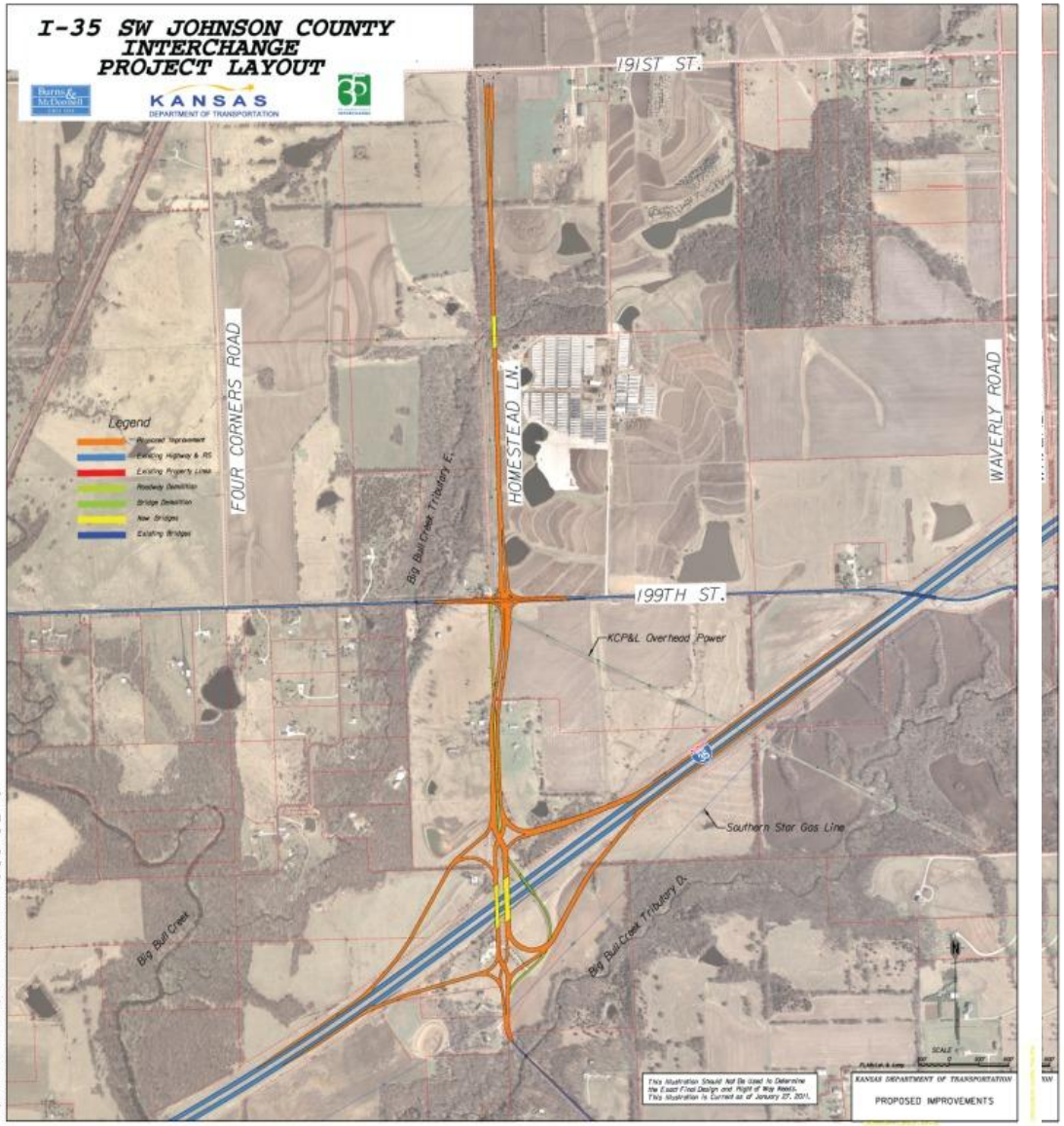


- Unconventional interchange design
- LOS A/B under design year 2040 (Ample spare capacity)
- Free left-turn movement after passing through and across two-phase signal at ramp terminal
- Minimizes impacts to gas and transmission line
- Slightly less right of way impacts in comparison with expanded diamond
- Separate independent bridge structures for northbound and southbound Homestead Lane
- Construction Cost Estimate - $19,100,000

F

Interstate I-35 Southwest Johnson County

I-35 / Homestead Lane DDI



- ✓ *Basis for EA*
- ✓ *Basis for BIA*
- ✓ *Homestead north of 199th and 191st Street byJohnson Cty*
- ✓ *Fall 2011 Letting*

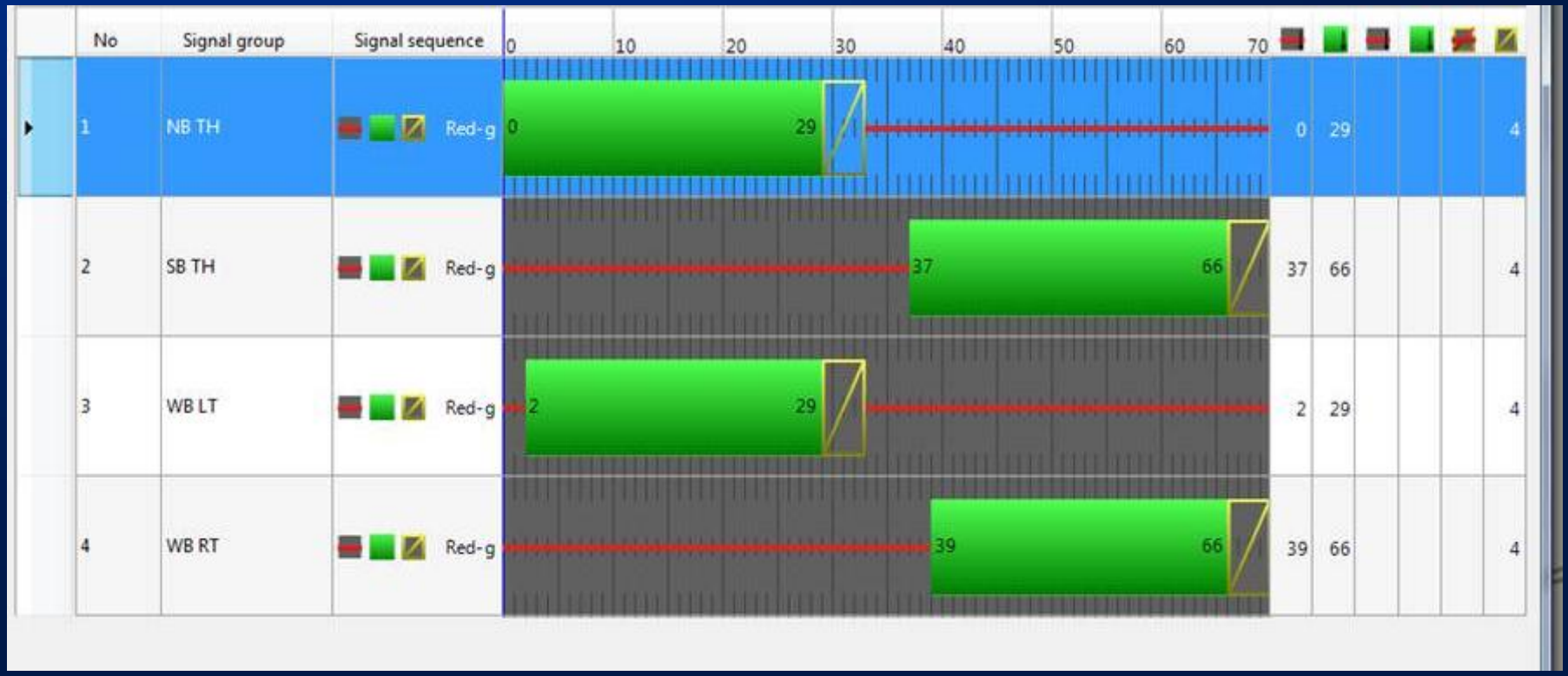
Burns & McDonnell
SINCE 1898

Design Challenges and Features

- *Geometrics for WB-67 (Including Tandem Lefts)*
- *Auxiliary Lanes Designed for Future Widening of I-35 to six lanes*
- *Signalized Off Ramp Movements (Lt & Rt)*
- *Phasing – Dual Controllers (1 per ramp terminal)*

Typical Ramp Terminal Phase Sequence

Extended All-Red Clearance at end of through movement prior to releasing the ramp



Interstate I-35 Southwest Johnson County

I-35 / Homestead Lane DDI



Interstate I-35 Southwest Johnson County

I-35 / Homestead Lane DDI

http://i35swjohnsoncointerchange.ksdot.org/