



STH 60 Northern Reliever Route Feasibility Study Report

Washington County Public Works
Committee Meeting
September 28, 2016



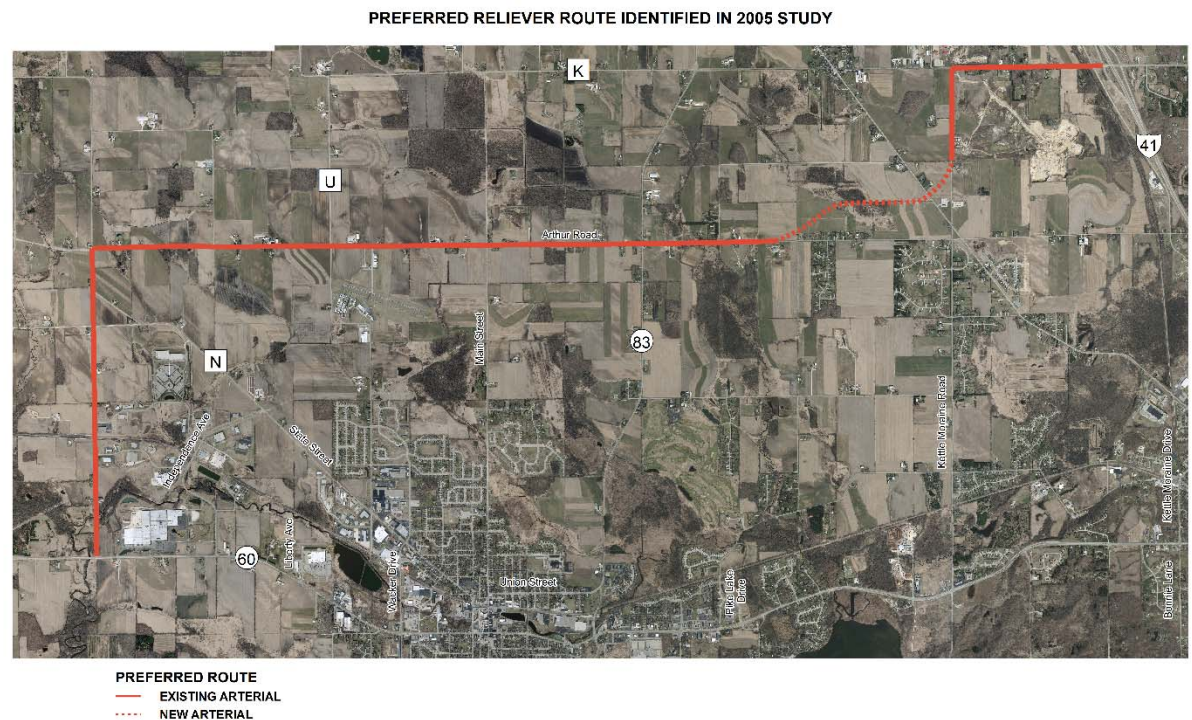
STH 60 Northern Reliever Route Feasibility Study

- Hartford Area Development Corporation (HADC) asked Washington County to consider a reliever route and cited concerns of increasing traffic volume, congestion, and safety problems on STH 60, and in particular, the effect of increasing truck traffic.
- Washington County requested that SEWRPC conduct a feasibility study of a northern reliever route to STH 60 between the western limits of the City of Hartford and IH 41
- The study has identified and evaluated potential STH 60 northern reliever routes and improvements to STH 60
- Conducted in cooperation with concerned and affected local governments, Washington County, and WisDOT.



Update to Study Completed in 2005

- Update to a Washington County study that was completed in 2005.
- 2005 Study considered and evaluated a number of alternative STH 60 northern and southern reliever routes.
- A preferred reliever route was identified (as shown to the right) as part of the 2005 study, but was not implemented.





Study Steps

- Inventory and Problem Identification
- Goal Formulation
- Identification of Alternatives
- Evaluation of Alternatives
- Recommendations



Inventory and Problem Identification

- SEWRPC and County staff met with officials from the City of Hartford, Village of Slinger, Towns of Addison, Hartford, and Polk, and the HADC
 - Identified issues along STH 60
 - Suggested potential northern reliever routes
 - Identified concerns with northern reliever routes



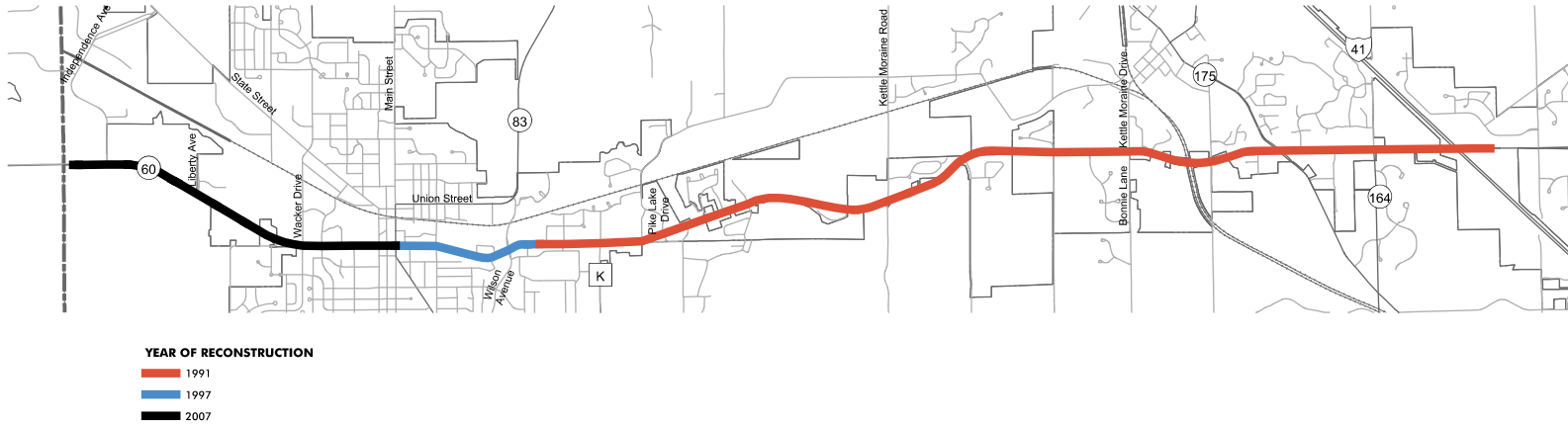
Inventory and Problem Identification

- Pavement History
- Traffic Control
- Current Total and Truck Volume
- Current Traffic Congestion Along STH 60
- Future Total Traffic Volume and Congestion
- Total Vehicular Crashes Along STH 60
- Comparison of Existing Travel Times

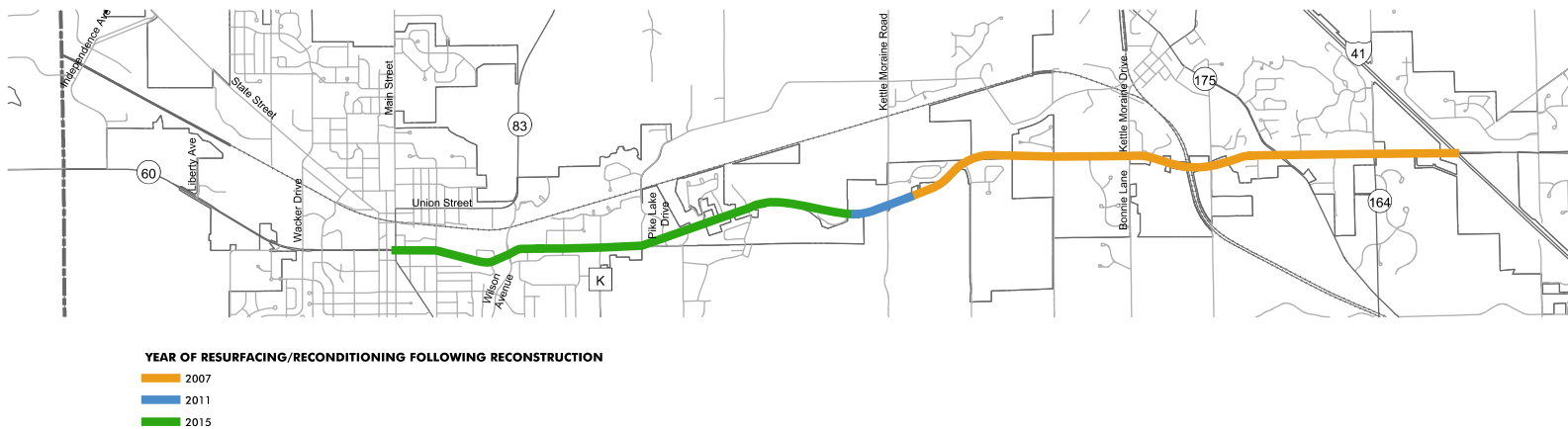


STH 60 Pavement History

DATE OF RECONSTRUCTION OF STH 60 BETWEEN THE WASHINGTON COUNTY LINE AND IH 41



DATE OF RESURFACING OR RECONDITIONING FOLLOWING LATEST RECONSTRUCTION OF STH 60 BETWEEN THE WASHINGTON COUNTY LINE AND IH 41

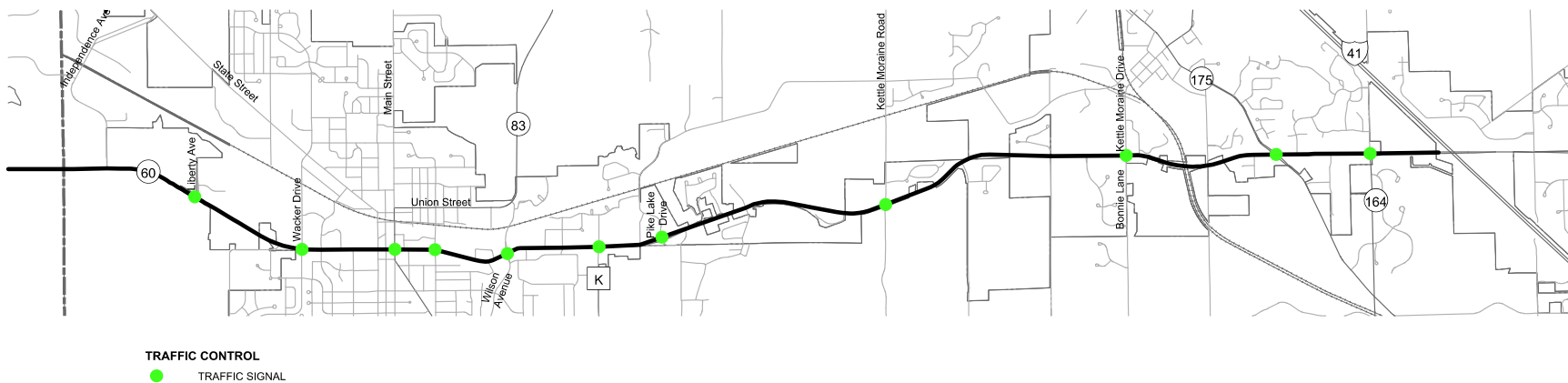




Traffic Control on STH 60

- 11 traffic signals owned and operated by either the City of Hartford or WisDOT
- Traffic Signal Spacing
 - Desired spacing: 1.0 miles or more
 - Acceptable spacing: 0.5 mile or more
 - Liberty Avenue to Pike Lake Drive – 0.4 miles (less than acceptable spacing)
 - Pike Lake Drive to STH 175 – 1.3 miles (meeting desired spacing)
 - STH 175 to STH 164 – 0.6 miles (meeting acceptable spacing)
- There is currently no traffic signal coordination of the signals along STH 60

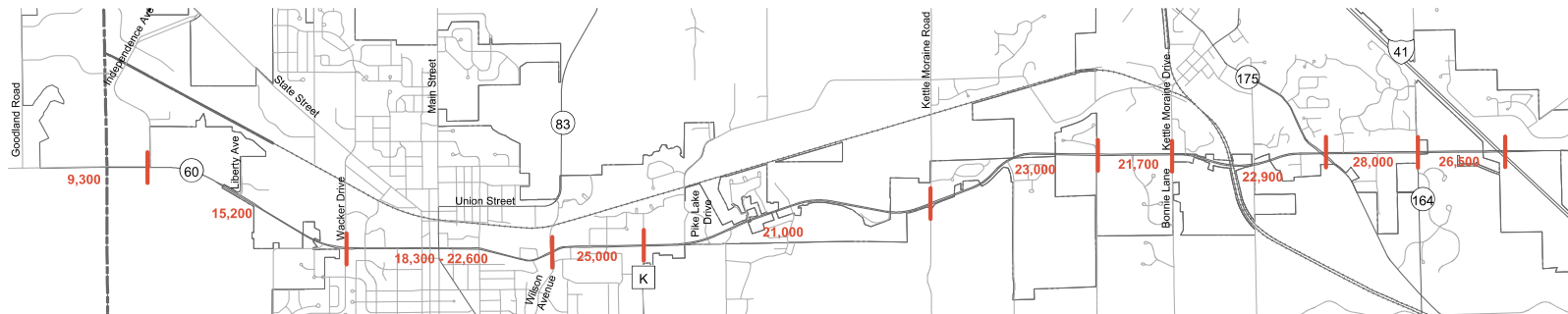
TRAFFIC CONTROL ALONG STH 60





Current Total and Truck Traffic Volume Along STH 60

CURRENT AVERAGE WEEKDAY TOTAL TRAFFIC VOLUME ALONG STH 60



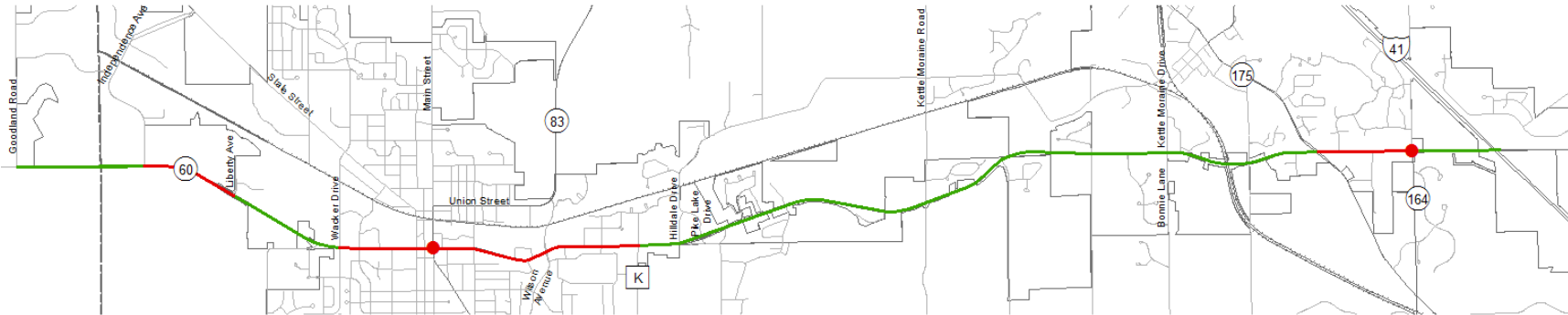
■ Specific Truck Data:

- Truck traffic represents about 9 to 10 percent of total traffic on STH 60.
- Only about 7 percent of trucks traveling on STH 60 are travelling through the Hartford-Slinger area (100 to 200 trucks per weekday).
- Truck information provided by Hartford Area Industries:
 - A survey of seven large companies in the Hartford Industrial Park on the west side of the City of Hartford indicated that they generate about 1,300 truck trips per day
 - 75 to 85 percent of the two largest freight generators in the Hartford Industrial Park travel on STH 60 to/from destinations south of the Hartford area.



Current Traffic Congestion Along STH 60

CURRENT YEAR TRAFFIC CONGESTION ALONG STH 60



FACILITY CONGESTION STATUS

- AVERAGE WEEKDAY TRAFFIC VOLUMES AT OR UNDER DESIGN CAPACITY
- AVERAGE WEEKDAY TRAFFIC VOLUMES EXCEEDING DESIGN CAPACITY AND EXPERIENCING CONGESTION
- PROBLEM INTERSECTIONS IDENTIFIED BY LOCAL OFFICIALS

- When traffic volumes exceeds the design capacity of a roadway, it experiences traffic congestion, typically, during the peak traffic times of an average weekday.
- Congestion can result in slower traffic speeds between controlled intersections and longer delays and queues at controlled intersections.
- During meetings with local officials, two intersections were identified as experiencing congestion, or delay: the intersection of STH 60 and STH 83 and the intersection of STH 60 and STH 164

ESTIMATED STH 60 DESIGN CAPACITY

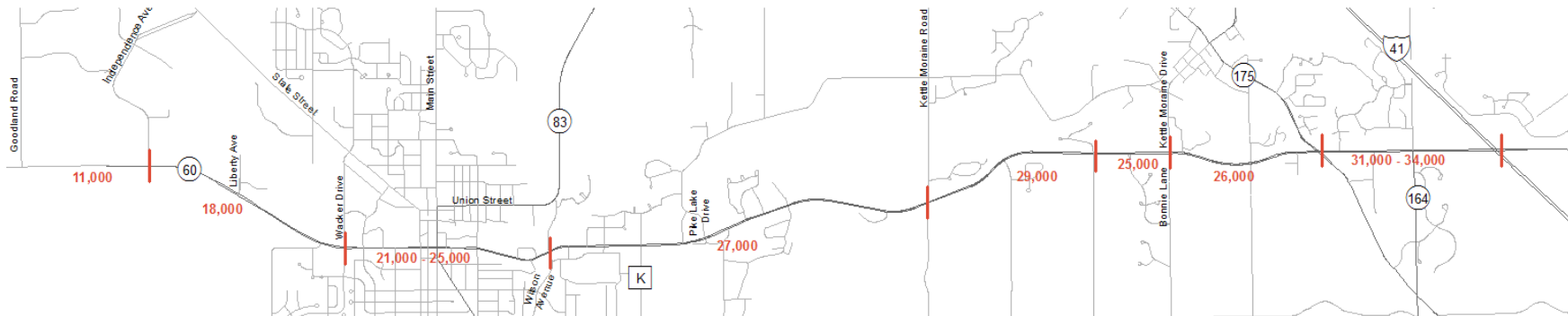
Segment	Facility Type	Design Capacity (Average Weekday Traffic Volume)
Goodland Road to Liberty Avenue	Two-lane	14,000
Liberty Avenue to Wilson Avenue	Four-lane Undivided	18,000
Wilson Avenue to Hilldale Drive	Four-lane with Two-Way Left Turn Lane (TWTL)	21,000
Hilldale Drive to IH 41	Four-Lane Divided/TWTL ^a	27,000

^aWhile portions of this segment have a four-lane TWTL cross-section, development and/or direct access by abutting properties is limited. Therefore a design capacity of 27,000 was assigned to the full segment.

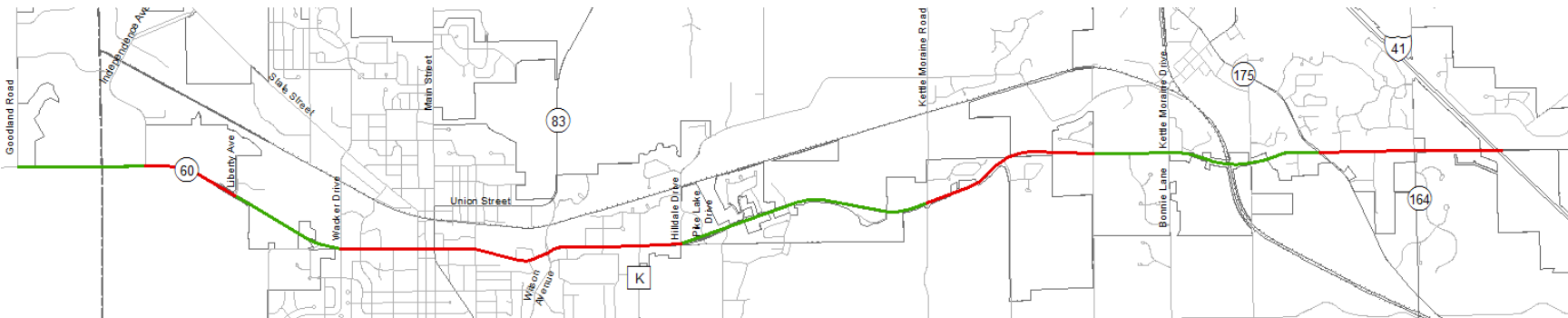


Year 2050 Forecast STH 60 Traffic Volume and Congestion

FORECAST YEAR 2050 AVERAGE WEEKDAY TOTAL TRAFFIC VOLUME ALONG STH 60



FORECAST YEAR 2050 TRAFFIC CONGESTION ALONG STH 60

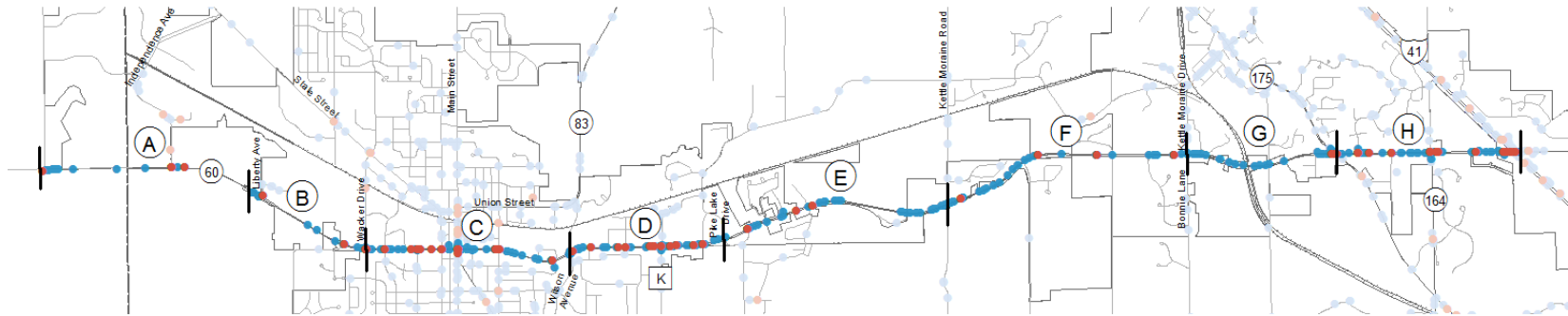


FACILITY CONGESTION STATUS
 — AVERAGE WEEKDAY TRAFFIC VOLUMES AT OR UNDER DESIGN CAPACITY
 — AVERAGE WEEKDAY TRAFFIC VOLUMES EXCEEDING DESIGN CAPACITY AND EXPERIENCING CONGESTION



Vehicular Crashes Along STH 60

TOTAL VEHICULAR CRASHES ALONG STH 60 BETWEEN THE GOODLAND ROAD AND IH 41: 2010-2014



STH 60 BETWEEN WASHINGTON COUNTY LINE AND IH 41

- VEHICULAR CRASHES INVOLVING TRUCKS (67 CRASHES)
- OTHER VEHICULAR CRASHES (625 CRASHES)

OTHER CRASHES IN NORTHERN HARTFORD/SLINGER AREA

- VEHICULAR CRASHES INVOLVING TRUCKS
- OTHER VEHICULAR CRASHES

(A) ROADWAY SEGMENT

NOTES: 1. Truck crashes include incidents where either vehicle involved is a single unit truck, single trailer truck, multi-trailer truck, or non-attached truck.

2. Crashes within 250 feet of STH 60 at intersections with public roadways were included in the crashes identified to be considered with the methodology used by WisDOT for calculating the crash rates of a roadway

- Crash rates on Segments A, C, and H crash rates for all vehicular crashes exceed the State average for their respective roadway types
- On Segments A, E, F, and H crash rates involving a fatality or observed injury exceed the State average for their respective roadway types
- The proportion of truck crashes on Segment C (13 percent) and Segment H (11 percent) exceeds the proportion of trucks traveling on these segments of STH 60 (about 9-10 percent)
- No crashes involving both a truck and a pedestrian and only one crash involving both a truck and a bicyclist from 2010 to 2014

TOTAL VEHICULAR CRASHES (ALL VEHICLES) – 2010 - 2014

SEGMENT	TOTAL		WITH PEDESTRIANS		WITH BICYCLISTS		RESULTING IN FATALITY OR OBSERVED INJURY	
	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE
A	35	125.6	0	0.0	1	3.6	6	21.5
B	36	239.5	0	0.0	0	0.0	2	13.3
C	194	443.0	9	20.6	2	4.6	16	36.5
D	107	284.5	2	5.3	4	10.6	12	31.9
E	60	106.1	1	1.8	1	1.8	13	23.0
F	53	119.5	1	2.3	0	0.0	11	24.8
G	67	123.5	0	0.0	0	0.0	9	16.6
H	140	281.0	0	0.0	0	0.0	25	50.2
TOTAL	692	210.2	13	3.9	8	2.4	94	28.6

CRASHES INVOLVING TRUCKS – 2010 - 2014

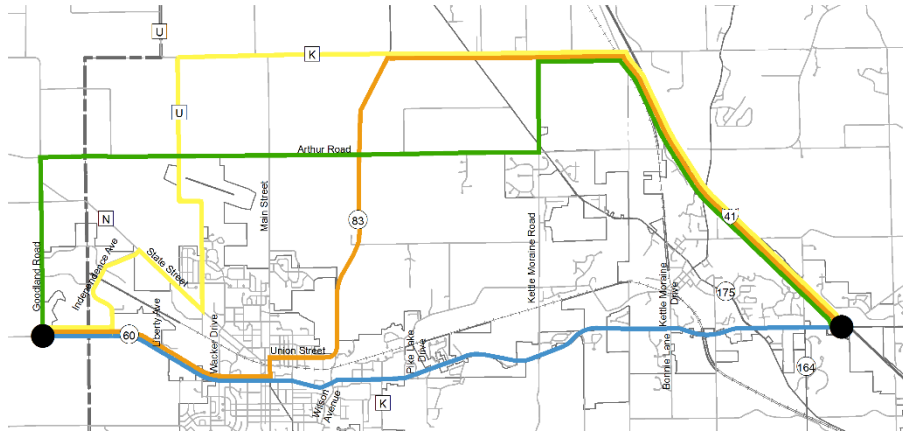
SEGMENT	TOTAL		WITH PEDESTRIANS		WITH BICYCLISTS		RESULTING IN FATALITY OR OBSERVED INJURY	
	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE
A	4	7.4	0	0.0	0	0.0	1	1.8
B	2	4.0	0	0.0	0	0.0	0	0.0
C	25	57.1	0	0.0	1	2.3	2	4.6
D	11	29.2	0	0.0	0	0.0	2	5.3
E	3	5.3	0	0.0	0	0.0	1	1.8
F	4	9.0	0	0.0	0	0.0	0	0.0
G	3	5.5	0	0.0	0	0.0	0	0.0
H	15	30.1	0	0.0	0	0.0	1	2.0
TOTAL	67	20.4	0	0.0	1	0.3	7	2.1

Crash rates are in crashes per 100 million vehicle miles.



Comparison of Existing Travel Times

EXISTING TRAVEL ROUTES FOR NORTHERN HARTFORD RELIEVER ROUTE FEASIBILITY STUDY



AVERAGE TRAVEL TIMES (IN MINUTES) FOR SELECTED EXISTING ROUTES BETWEEN GOODLAND ROAD AND THE IH 41 INTERCHANGE WITH STH 60

Route	Length (Miles)	Direction	Mid Day Travel Times
STH 60 (Blue)	9.2	Eastbound	14
		Westbound	13
Goodland Road/Arthur Road/Kettle Moraine Road/CTH K/IH 41 (Green)	13.5	Eastbound	17
		Westbound	17
STH 60/STH 83/CTH K/IH 41 (Orange)	13.7	Eastbound	16
		Westbound	16
STH 60/Independence Avenue/State Street/CTH U/Turtle Road/CTH K/IH 41 (Yellow)	15.0	Eastbound	19
		Westbound	19

- Travel time is affected by the speed limit of a roadway, the type and frequency of traffic control, and the level of traffic volume and congestion, which can result in reduced speeds and increased delay

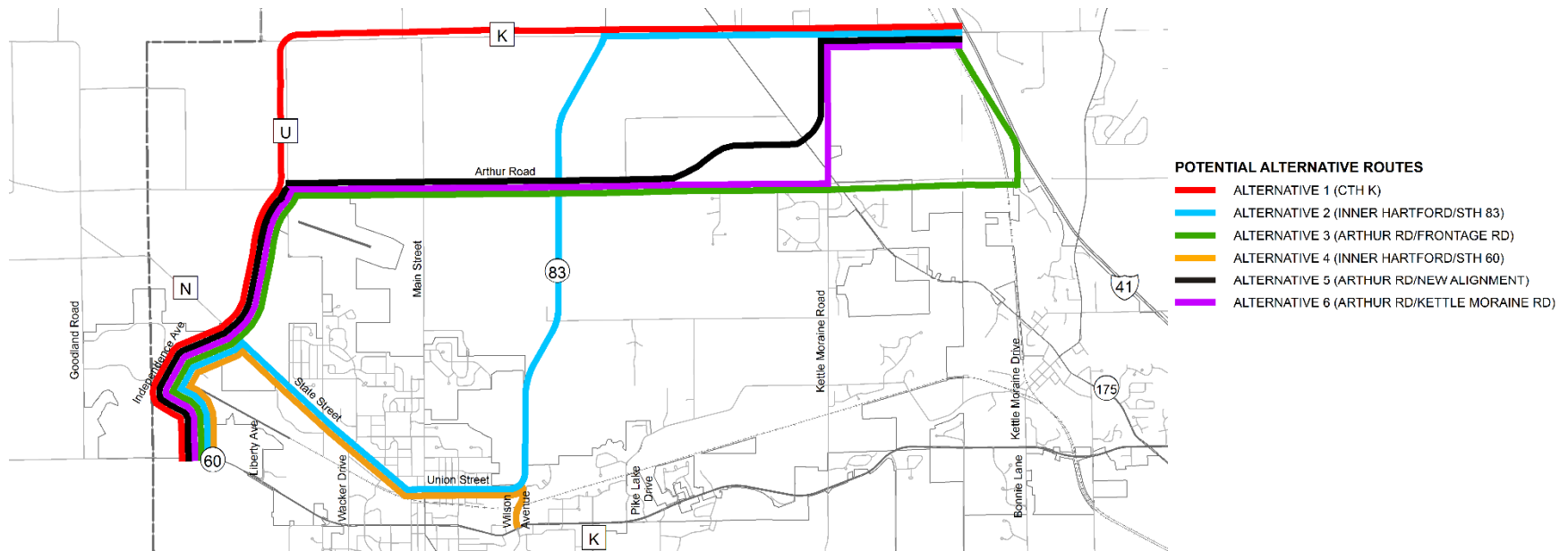


Goal, Objectives, and Criteria

- **Goal:** Enhance the livability and safety of the Hartford and Slinger areas, and thereby encourage continued economic development and expansion
- **Objectives and Criteria:**
 - Provide Alternate Route with Comparable Travel Time to STH 60
 - Ratio of Alternative Route Travel Time to STH 60 Travel Time
 - Reduce STH 60 Traffic Volume and Alleviate STH 60 Traffic Congestion
 - STH 60 Average Weekday Traffic Volume
 - STH 60 Traffic Congestion--Average weekday traffic volume compared to design capacity
 - Potential to divert truck traffic from STH 60
 - Minimize Construction Cost
 - Estimated Construction Cost
 - Minimize Impact of Alternative Route
 - Right-of-way Acquisitions
 - › Number of Residences
 - › Number of Businesses
 - › Acres of Farmland
 - › Total Acres
 - Number of Farms Divided by Alternative Routes
 - Residences Located Along Alternative Route
 - Environmentally Sensitive Lands (Primary and Secondary Environmental Corridor, Isolated Natural Resource Areas, and Wetlands)



Alternatives Identified Prior to Public Meeting



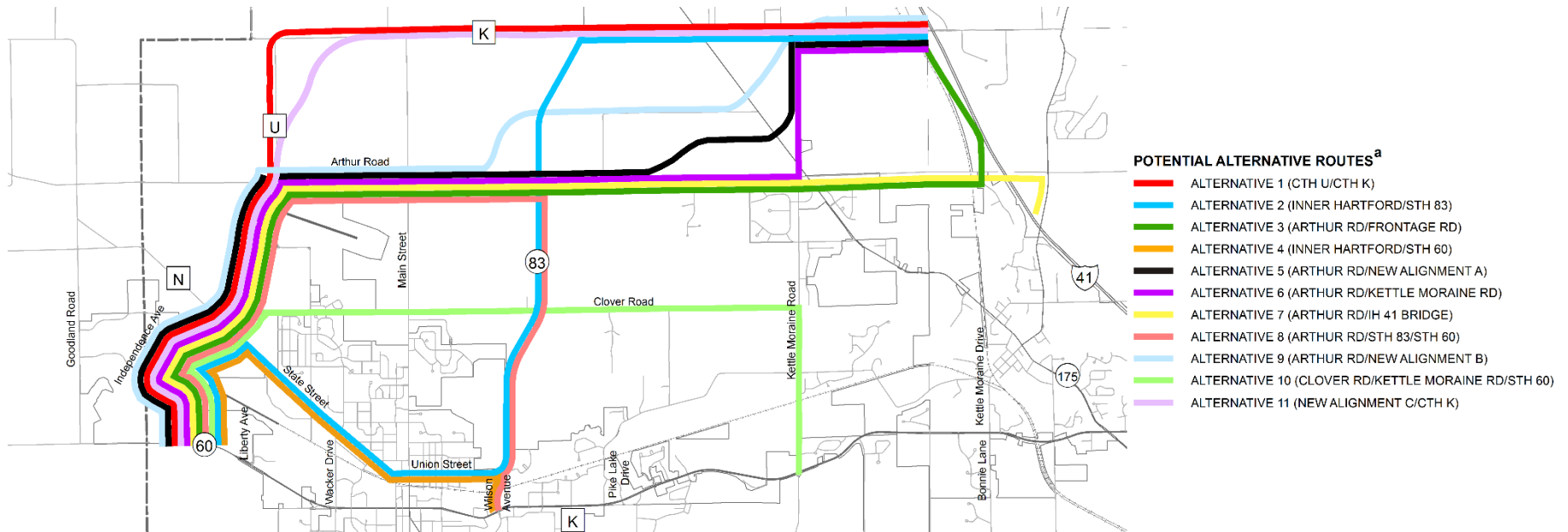


Public Information Meeting

- Public information meeting held on June 29, 2016.
- Over 140 people attended the public information meeting.
- Information on STH 60 and the six alternative reliever routes identified to date were displayed.
- Public was asked to comment on issues related to STH 60 and the six alternative routes identified to date.
- Received 64 written comments at the meeting or mailed/emailed during public comment period ending on July 15, 2016.
 - About 80 percent of the 64 comments were opposed to a STH 60 reliever route
- Based on comments received and discussions with County staff, four alternative routes were added and criteria related to environmentally sensitive lands were added for evaluation of alternative routes.



Alternatives Evaluated



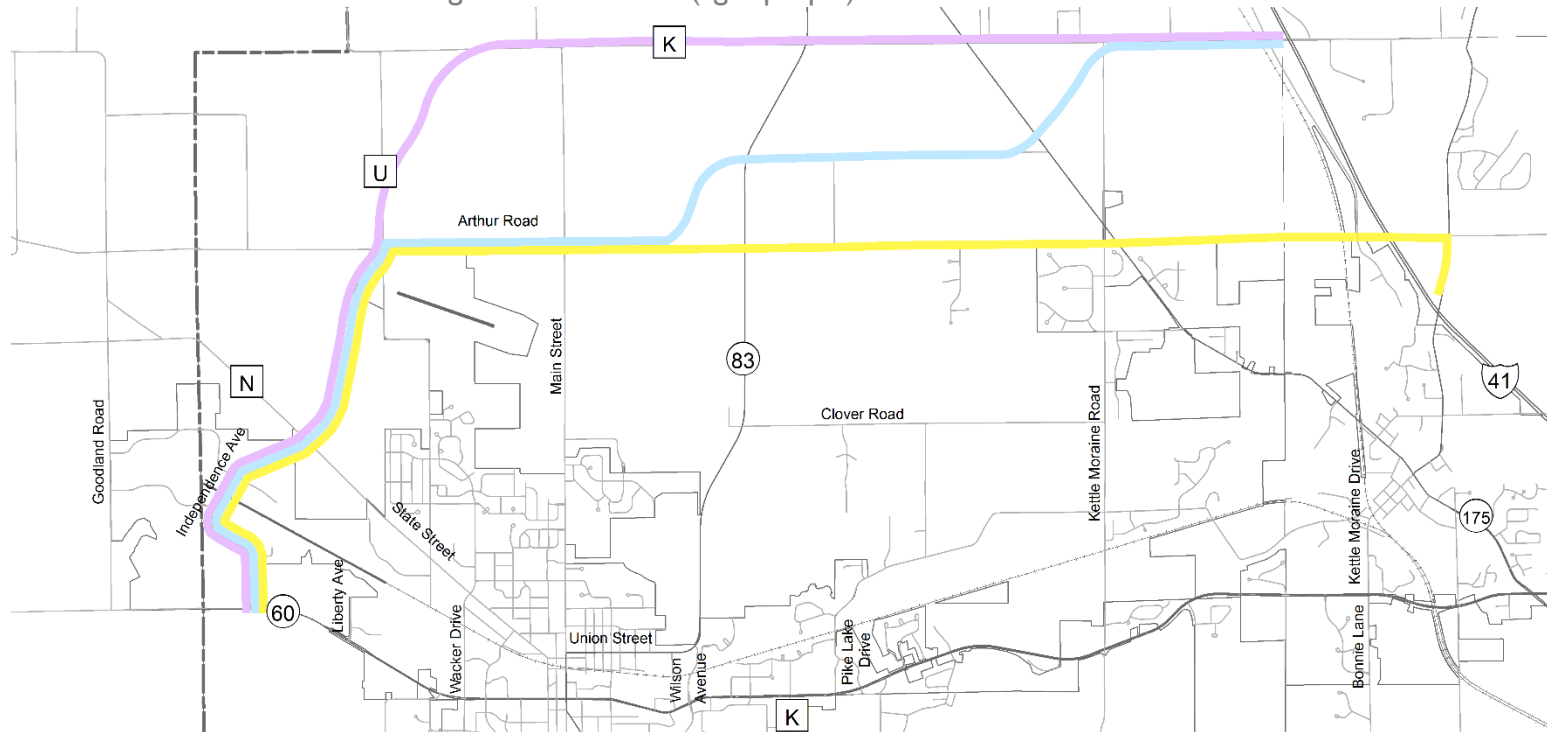
^a Alternatives 7 through 10 were added following the public meeting on June 29, 2016 and were presented to the Washington County Public Works Committee on July 27, 2016. Alternative 11 was added in August 2016, and was presented to the Washington County Public Works Committee on August 24, 2016.

The alignment of Alternative 11, and as well the other alternative routes which include the City of Hartford long-planned extension of Independence Avenue between CTH N and Arthur Road, are consistent with the City of Hartford Airport runway realignment and extension project (from 3,000 to 3,400 feet). The airport's master plan includes a further ultimate extension concept to 5,000 feet, with the extension occurring to the west. This would require the reliever route alignments for an extended Independence Avenue to be relocated about a quarter-mile to the west. In the alternative, to accommodate the ultimate runway extension concept, Main Street between Clover Road and Arthur Road could be relocated about a quarter-mile to the east. This would be addressed in preliminary engineering.



Routes Proposed for Further Consideration

- Alternatives 7 and 9 were proposed by staff for further consideration by the County on July 27, 2016
 - Alternative 7 – Arthur Road/IH 41 Bridge (yellow)
 - Alternative 9 – Arthur Road/New Alignment B (light blue)
- Alternative 11 was proposed by staff for further consideration by the County on August 24, 2016
 - Alternative 11 – New Alignment C/CTH K (light purple)



POTENTIAL ALTERNATIVE ROUTES

- ALTERNATIVE 7 (ARTHUR RD/IH 41 BRIDGE)
- ALTERNATIVE 9 (ARTHUR RD/NEW ALIGNMENT B)
- ALTERNATIVE 11 (NEW ALIGNMENT C/CTH K)



Comparison of Alternative Routes Travel Times to STH 60

Travel Times of Alternative STH 60 Reliever Routes and the Ratio of Travel Time of the Alternative Reliever Routes to STH 60

	Route Length Between STH 60/Goodland Road and STH 60/IH 41	Travel Time Between STH 60/Goodland Road and STH 60/IH 41	Ratio of Travel Time to STH 60
Alternative 1	13.3 miles	15.3 minutes	1.13
Alternative 2	14.8 miles	19.0 minutes	1.41
Alternative 3	14.0 miles	16.9 minutes	1.25
Alternative 4	10.9 miles	16.7 minutes	1.24
Alternative 5	13.1 miles	15.1 minutes	1.12
Alternative 6	13.4 miles	15.8 minutes	1.17
Alternative 7	11.9 miles	14.8 minutes	1.10
Alternative 8	13.8 miles	18.0 minutes	1.33
Alternative 9	12.9 miles	14.8 minutes	1.10
Alternative 10	11.3 miles	14.2 minutes	1.05
Alternative 11	12.9 miles	14.8 minutes	1.10



STH 60 Average Weekday Traffic Volume

Preliminary Projected Change in Year 2050 Forecast Average Weekday Traffic Volume on STH 60 With Implementation of Alternative STH 60 Reliever Routes

	Independence Avenue to Wilson Avenue	Wilson Avenue to STH 175	STH 175 to STH 164
Alternative 1	-2,000 vehicles	-1,500 vehicles	-1,500 vehicles
Alternative 2	0 vehicles	0 vehicles	0 vehicles
Alternative 3	-1,500 vehicles	-1,100 vehicles	-1,100 vehicles
Alternative 4	0 vehicles	0 vehicles	0 vehicles
Alternative 5	-2,000 vehicles	-1,500 vehicles	-1,500 vehicles
Alternative 6	-1,500 vehicles	-1,100 vehicles	-1,100 vehicles
Alternative 7	-3,000 to -3,500 vehicles	-3,500 vehicles	-3,500 vehicles
Alternative 8	-1,500 vehicles	-1,100 vehicles	-1,100 vehicles
Alternative 9	-2,500 vehicles	-2,500 vehicles	-2,500 vehicles
Alternative 10	-3,000 to -3,500 vehicles	-3,500 (East of Kettle Moraine Rd.) +2,000 (West of Kettle Moraine Rd.)	+2,000 vehicles
Alternative 11	-2,500 vehicles	-2,500 vehicles	-2,500 vehicles

The year forecast average weekday traffic volume on STH 60 is 18,000 to 23,000 vehicles between Independence Avenue and Wilson Avenue, 25,000 to 29,000 vehicles between Wilson Avenue and STH 175, and 31,000 to 34,000 between STH 175 to STH 164



Year 2050 Forecast STH 60 Traffic Congestion^a

	Miles of STH 60 Under Congestion	Percent of STH 60 Under Congestion
Alternative 1	4.75	52
Alternative 2	4.75	52
Alternative 3	4.75	52
Alternative 4	4.75	52
Alternative 5	4.75	52
Alternative 6	4.75	52
Alternative 7	3.08	33
Alternative 8	4.75	52
Alternative 9	3.66	40
Alternative 10	5.68	62
Alternative 11	3.66	40

^a About 4.75 miles of the 9.20 miles of STH 60 between Goodland Road and IH 41, or about 52 percent, would be under congestion based on year 2050 average weekday traffic volumes without a STH 60 northern (or southern) reliever route.



Potential to Divert Truck Traffic From STH 60

	Preliminary Projected Change in the Number of Trucks Diverted from STH 60 Through Hartford Downtown on an Average Weekday
Alternative 1	650 trucks
Alternative 2	0 trucks
Alternative 3	500 trucks
Alternative 4	0 trucks
Alternative 5	700 trucks
Alternative 6	500 trucks
Alternative 7	800 trucks
Alternative 8	500 trucks
Alternative 9	1,000 trucks
Alternative 10	1,050 trucks
Alternative 11	1,000 trucks



Estimated Construction Cost

	Estimated Construction Cost ^a	Estimated Right-of-Way Cost	Estimated Total Project Cost
Alternative 1	\$16.2 million	\$1.2 to \$1.7 million	\$17.4 to \$17.9 million
Alternative 2	\$6.0 million	\$2.5 to \$2.8 million	\$8.5 to \$8.8 million
Alternative 3	\$18.5 million	\$1.1 to \$2.1 million	\$19.6 to \$20.6 million
Alternative 4	\$0.7 million	\$1.6 million	\$2.3 million
Alternative 5	\$19.6 million	\$0.8 to \$1.5 million	\$20.5 to \$21.1 million
Alternative 6	\$16.7 million	\$0.8 to \$1.8 million	\$17.5 to \$18.5 million
Alternative 7	\$20.8 million	\$1.4 to \$2.9 million	\$22.2 to \$23.7 million
Alternative 8	\$8.8 million	\$0.3 to \$0.8 million	\$9.2 to \$9.6 million
Alternative 9	\$21.1 million	\$0.6 to \$1.3 million	\$21.8 to \$22.4 million
Alternative 10	\$15.2 million	\$1.2 to \$2.9 million	\$16.4 to \$18.1 million
Alternative 11	\$18.5 million	\$1.2 to \$1.7 million	\$19.7 to \$20.2 million

^a Construction costs include costs for preliminary and final engineering.



Right-of-way Acquisition

	Number of Residences ^a	Number of Businesses ^a	Acres of Farmland	Total Acres
Alternative 1	1 to 3	3 to 4	33.0	38.3
Alternative 2 ^b	21 to 22	3 to 5 (including a church)	2.4	4.5
Alternative 3	2 to 8	1	33.8	42.6
Alternative 4 ^b	18 to 19	2 (including a church)	0.0	1.4
Alternative 5	1 to 6	1	41.7	53.8
Alternative 6	1 to 7	1	33.4	44.0
Alternative 7	4 to 12	1	33.8	43.9
Alternative 8	0 to 3	0	23.9	27.2
Alternative 9	0 to 4	0	52.5	58.2
Alternative 10	4 to 11	0	21.7	42.1
Alternative 11	1 to 3	3 to 4	38.9	43.7

^a The lower end of the range of the acquisition of residences and businesses would be located within the right-of-way of the alternative reliever route, and the upper end of the range includes residences and businesses located within 15 feet of the right-of-way of the alternative route.

^b Assumes aligning State Street with Union Street west of Main Street. Another option would be to align State Street with Union Street east of Main Street, which would potentially reduce the number of residences that would be acquired by one to four residences, eliminate the need to acquire a church, and would add the acquisition of a business.



Number of Farm Fields Divided By Alternative Routes

Alternative 1	5 Fields
Alternative 2	0 Fields
Alternative 3	3 Fields
Alternative 4	0 Fields
Alternative 5	7 Fields
Alternative 6	3 Fields
Alternative 7	3 Fields
Alternative 8	3 Fields
Alternative 9	9 Fields
Alternative 10	2 Fields
Alternative 11	8 Fields



Impacts to Environmentally Sensitive Lands

	Primary Environmental Corridor (Acres)	Secondary Environmental Corridor (Acres)	Isolated Natural Resource Areas (Acres)	Wetlands (Acres)
Alternative 1	0.0	1.9	1.4	2.7
Alternative 2	0.0	0.2	0.1	0.4
Alternative 3	1.7	0.0	0.4	2.1
Alternative 4	0.0	0.0	0.0	0.0
Alternative 5	1.7	4.1	0.4	6.3
Alternative 6	1.7	0.0	0.4	2.1
Alternative 7	1.7	0.0	0.4	2.1
Alternative 8	0.0	0.0	0.4	0.3
Alternative 9	0.0	1.7	0.9	0.9
Alternative 10	10.1	0.0	1.0	10.2
Alternative 11	0	1.8	1.4	2.9



Residences Located Along Alternative Routes

	Number of Residences Located Along an Existing Local Roadway	Number of Residences Located Along an Existing County/State Trunk Highway
Alternative 1	2	47
Alternative 2	66	161
Alternative 3	66	1
Alternative 4	67	91
Alternative 5	27	12
Alternative 6	53	11
Alternative 7	72	2
Alternative 8	21	28
Alternative 9	17	12
Alternative 10	56	1
Alternative 11	1	43



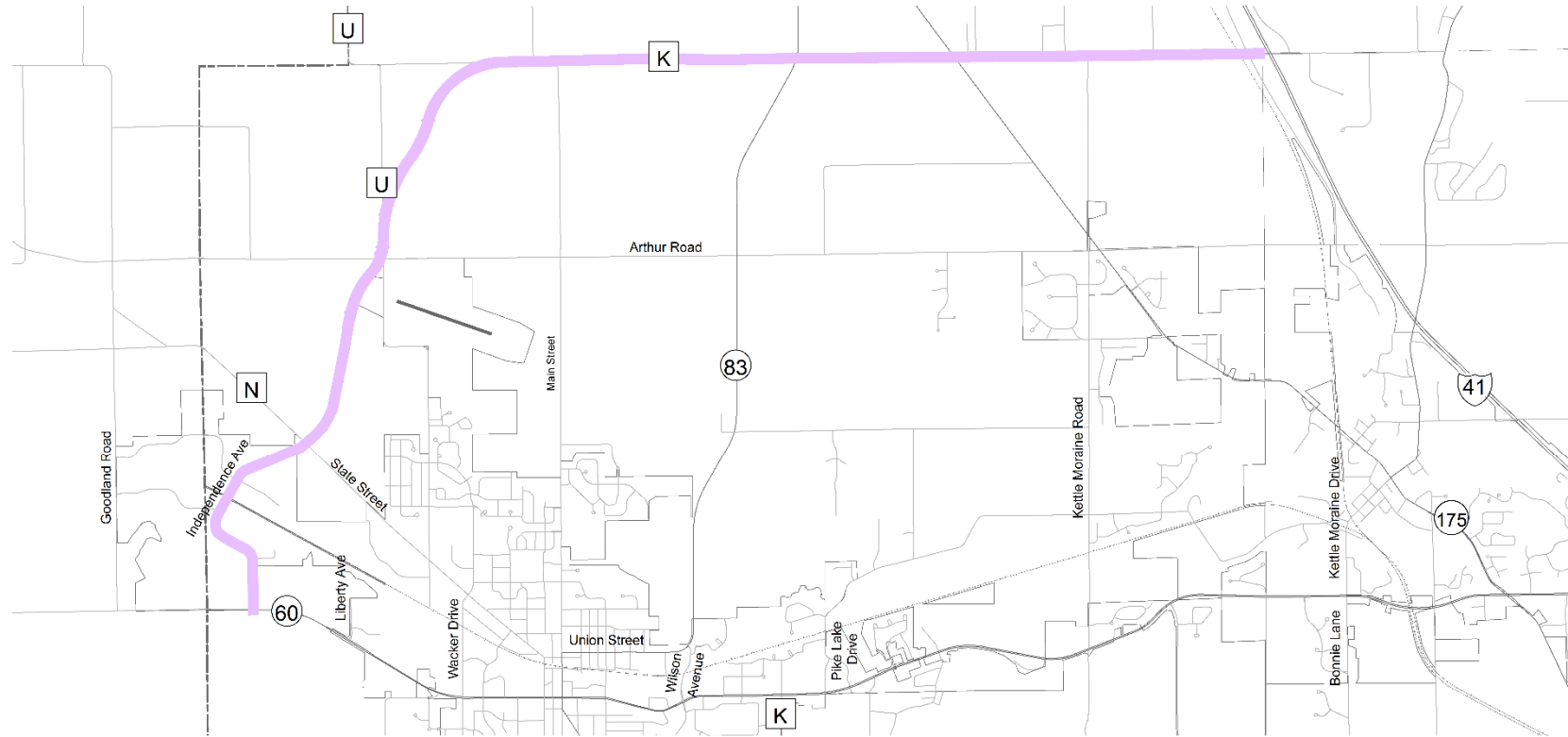
Previous Actions By Public Works Committee

- July 27, 2016 Washington County Public Works Committee Meeting
 - Staff recommended that the Public Works Committee identify Alternatives 7 and 9 as the reliever route alternatives which should receive further study (preliminary engineering)
 - The Public Works Committee determined to not take any action until their next meeting

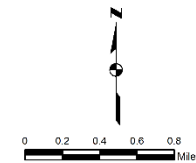
- August 24, 2016 Washington County Public Works Committee Meeting
 - Staff recommended that the Public Works Committee identify Alternative 11 as the reliever route alternative which should receive further study
 - Compared to Alternatives 7 and 9, Alternative 11 would have similar impacts on STH 60 traffic, right-of-way impacts, and construction costs, and would be located primarily on existing county trunk highway
 - The Public Works Committee indicated general agreement with this recommendation, and staff was directed to prepare the study planning report with this recommendation for consideration at the next Public Works Committee meeting



Northern Reliever Route Recommended for Further Study



— STH 60 NORTHERN RELIEVER ROUTE RECOMMENDED FOR FURTHER STUDY





Potential Improvements to STH 60

- Potential traffic flow improvements on STH 60:
 - Coordinate traffic signals
 - 7 traffic signals between Liberty Avenue and Pike Lake Drive
 - 2 traffic signals between STH 175 and STH 164
 - Add right turn lanes on STH 60 at intersection with STH 175
 - Add additional lanes on the northbound and southbound approaches to the intersection of STH 164 and STH 60
 - Add signage to direct trucks travelling to and from the industrial area along CTH N/State Street to utilize Wacker Drive
 - City of Hartford has recently installed such signage along STH 60
- Expected to have limited impact to traffic flow on STH 60 and will not be long term solution