

Kasold Drive Improvement Project

6TH STREET TO BOB BILLINGS PARKWAY



Project Scope



- FAILING PAVEMENT AND BASE (PCI 47)
- MISSING, BROKEN CURBS AND SIDEWALKS
- FULL RECONSTRUCTION NEEDED
- IN CITY'S CIP BUDGET FOR 2016-2017
- INFRASTRUCTURE SALES TAX



Project Team



CITY STAFF

- DAVID CRONIN, PE, CITY ENGINEER
- CHARLES SOULES, PE, PUBLIC WORKS DIRECTOR
- NICK VOSS, PE, PROJECT ENGINEER

CFS ENGINEERS

- AARON GASPERS, PE, PROJECT MANAGER
- KATHERIN STEINBACHER, PE, PUBLIC INVOLVEMENT
- TOM INGRAM, PE, TRAFFIC ENGINEER
- ANDREW ROBERTSON, TRAFFIC ENGINEER



Project Timeline

CONCEPT STUDY (FEBRUARY 2015 TO AUGUST 2015)

- COLLECTING TRAFFIC COUNTS
 - SURVEY CORRIDOR AND UTILITIES
 - PRELIMINARY COST ESTIMATES AND DESIGN CONCEPTS
 - PUBLIC MEETINGS
 - PRESENT OPTIONS TO CITY COMMISSION AND RECEIVE DIRECTION BEFORE PROCEEDING TO DESIGN PHASE
 - DESIGN PHASE (FALL/WINTER 2015)
 - PUBLIC MEETING 50% DESIGN STAGE
 - CONSTRUCTION (SUMMER 2016/2017)
- 

Public/Stakeholder Outreach



PUBLIC MEETINGS

- MAY 27, 2015 NEIGHBORHOOD MEETING AT CHRIST COMMUNITY CHURCH
- JUNE 16, 2015 LIVEWELL HEALTHY BUILD ENVIRONMENT
- JULY 7, 2015 ADJACENT BUSINESS OWNER MEETING AT UNIVERSITY BANK
- JULY 21, 2015 PRESBYTERIAN MANOR MEETING
- JULY 21, 2015 BICYCLE ADVISORY COMMITTEE

SUNSET HILLS NEIGHBORHOOD ASSOCIATION

USD 497 – SCHOOL CROSSING AT HARVARD AND KASOLD

CITY UTILITIES DEPARTMENT

PRIVATE UTILITIES

LAWRENCE FIRE MEDICAL DEPARTMENT

Website

- FACILITATES PUBLIC INFORMATION AND PUBLIC INPUT
- PROVIDES REAL TIME PROGRESS UPDATES THROUGHOUT CONSTRUCTION



***Your voice matters.
Be heard.***

www.kasolddrive.com



Historic Traffic Data



- TRAFFIC RELATIVELY STABLE SINCE 1992
 - ACTUAL GROWTH RATE = APPROX. 0.4%
- GROWTH FACTOR USED FOR PROJECTIONS = 0.5%
 - FULLY DEVELOPED CORRIDOR
 - COVERS CHANGES DUE TO K-10/SLT AND BBP EXTENSION

Comparison of Record KDOT's 24-Hour Traffic Volumes (vehicles per day, VPD)

Segment	1992	1995	1998	2001	2004	2007	2010	2013
Kasold, 6 th -8 th	11,105	12,955	13,370	14,840	15,155	13,645	13,935	13,925
Kasold, 14 th -BBP	13,220	15,265	17,960	15,780	16,640	14,195	14,280	14,735
Harvard, East App.	N/A	2525	3290	3750	4055	3270	2990	3035
Harvard, West App.	N/A	N/A	4500	3660	4105	3855	3745	N/A

Traffic Data



Current Traffic Counts (vehicles per day, VPD)	
Kasold Drive	14,735
Harvard Road	3,035
Kasold & Harvard	17,902
8 th St at Kasold	2,225
Bus/Truck Traffic	< 3%

Projected Traffic Counts 2040 (vehicles per day, VPD)	
Kasold Drive	16,576
Harvard Road	3,414
Kasold & Harvard	20,139
8 th St at Kasold	2,515
Bus/Truck Traffic	< 3%

Peak Traffic Volumes



Peak Hour Traffic Volumes along Kasold, Current
(vehicles per hour, VPH), AM/PM

Segment	NB	SB	Total
6 th – 8 th	518/ 707	531/ 589	1049/ 1296
8 th – Harvard	499/ 526	436/ 531	935/ 1057
Harvard – 13 th	353/ 651	511/ 523	864/ 1174
13 th – 14 th	361/ 654	508/ 526	869/ 1180
14 th – BBP (15 th)	359/ 790	489/ 548	848/ 1338

Peak Hour Traffic Volumes along Kasold, 2040
(vehicles per hour, VPH), AM/PM

Segment	NB	SB	Total
6 th – 8 th	582/ 795	597/ 662	1180/ 1458
8 th – Harvard	561/ 591	490/ 597	1051/ 1189
Harvard – 13 th	397/ 732	574/ 588	972/ 1320
13 th – 14 th	406/ 735	571/ 591	977/ 1327
14 th – BBP (15 th)	403/ 888	550/ 616	954/ 1505

Consideration of Options



- 5 LANE SECTION
- 3 LANE SECTION
- MOUNTABLE MEDIAN
- FULL CENTER TURN LANES
- MEDIAN WITH TURN LANES
- BIKE LANES
- BUFFERED BIKE LANES
- SIDEWALK
- SHARED USE PATH
- TRAFFIC SIGNAL
- SINGLE & DOUBLE LANE ROUNDABOUTS
- STOP SIGN
- RESTRICTED TURNS
- PEDESTRIAN BEACON
- NON-CONTROLLED INTERSECTION
- NO IMPROVEMENTS

Options Modeled & Evaluated

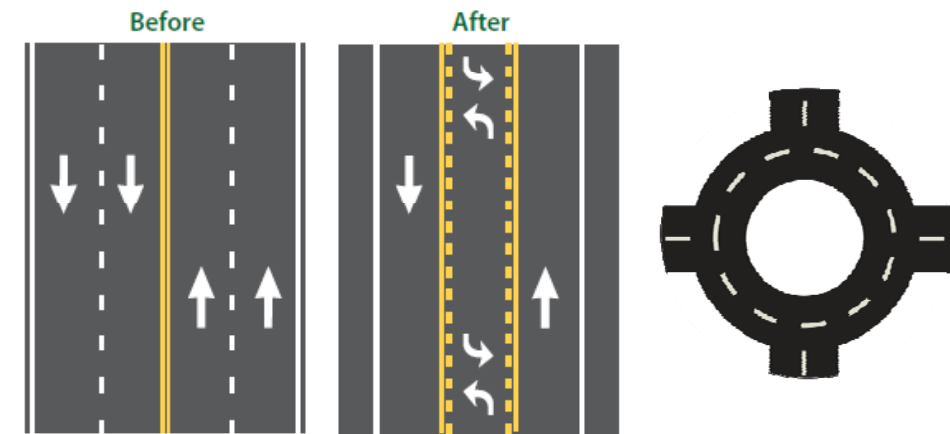


- TYPICAL STREET RECONSTRUCTION OPTION



- 8TH & KASOLD
 - STOP SIGN
 - TRAFFIC SIGNAL
 - ROUNDABOUT *
 - PEDESTRIAN BEACON
 - RESTRICTED TURNS

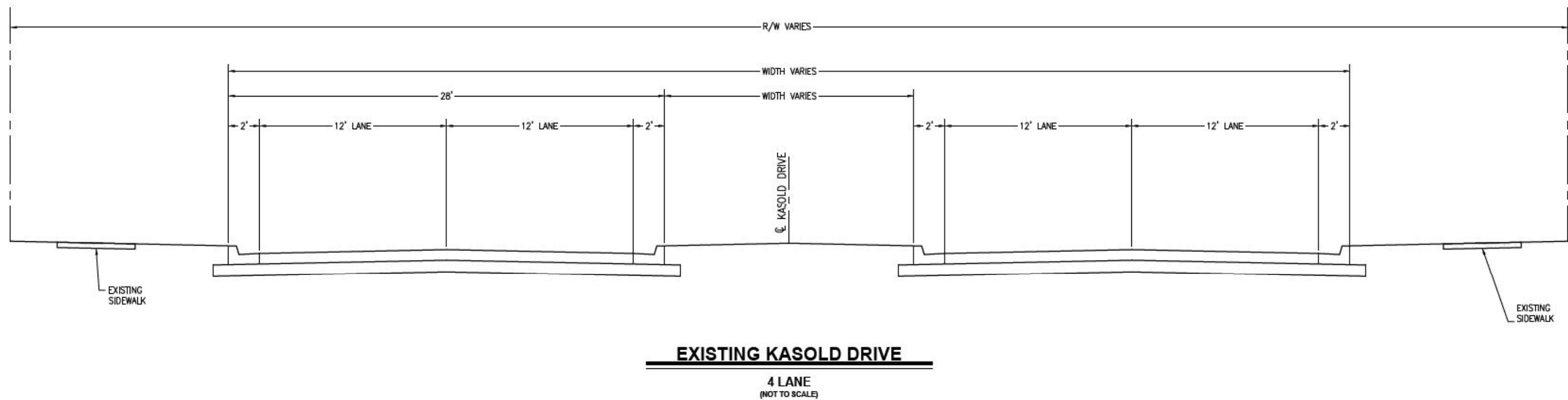
- COMPLETE STREETS OPTION



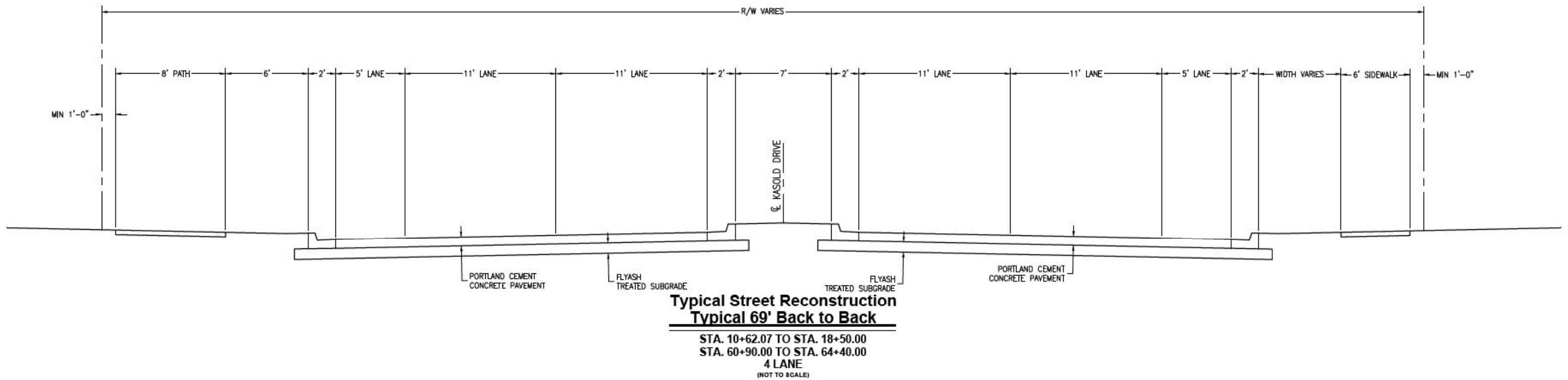
- REPLACEMENT OF WATER DISTRIBUTION SYSTEM
- EXTENSION OF SHARED USE PATH NORTH TO PETERSON

* Roundabout at 8th has been removed from list of options due to right-of-way constraints and results of public input.

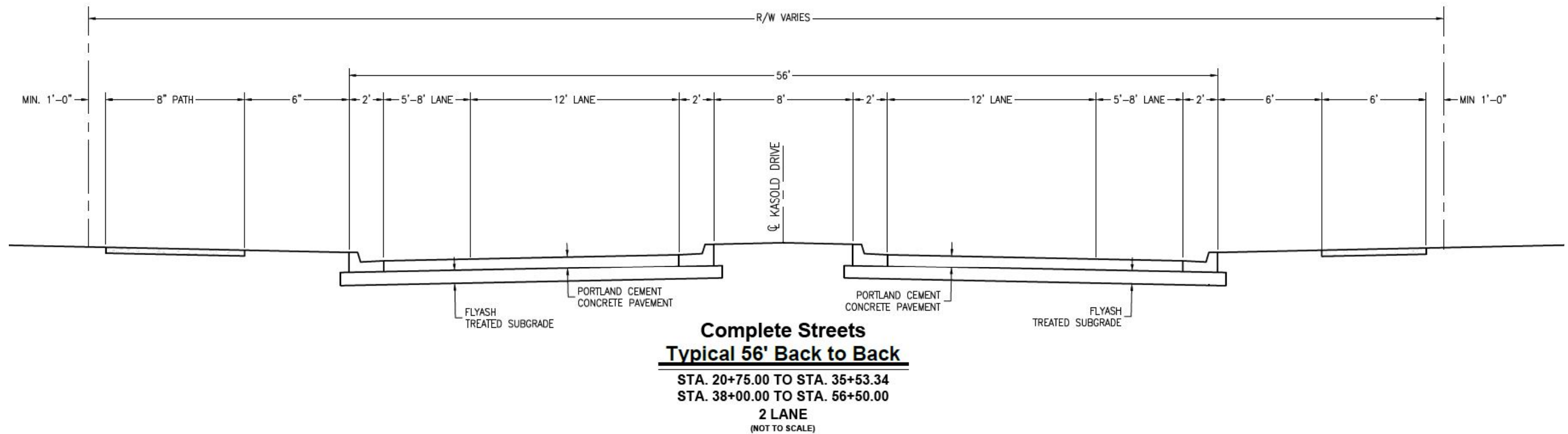
Existing Kasold Drive



Typical Street Reconstruction Option



Complete Streets Option



Evaluation of Options



Number of Traffic Lanes	
Capacity of Single Lane	1,900 VPH
Capacity of Double Lane	3,600 VPH
Peak Hour Kasold, Current	651 VPH
Peak Hour Kasold, 2040	736 VPH

Roundabout or Signal?	
Capacity Single Lane Roundabout	1,250 – 1,600 VPH
Capacity Double Lane Roundabout	2,400 – 3,000 VPH
Peak Hour at Kasold & Harvard, Current	651 VPH
Peak Hour at Kasold & Harvard, 2040	736 VPH

Lane Reconfiguration *	
Lane Reconfiguration Parameters	10,000 – 25,000 VPD
Kasold ADT, Current	14,735 VPD
Kasold ADT, 2040	16,576 VPD

* Lane reconfiguration parameters have been compiled by numerous studies and similar projects performed and constructed over the past two decades.

Synchro Results



Harvard & Kasold, AM/**PM**

Approach	Existing Cond. LOS Delay (sec.)	Roundabout Option LOS Delay (sec.)	Signal Option LOS Delay (sec.)
EB	B/ B	B/ A	B/ B
	13.2/ 12.7	10.1/ 8.1	11.4/ 12.4
WB	B/ B	A/ A	A/ B
	11.2/ 13.8	6.3/ 9.6	9.4/ 15.6
NB	B/ C	A/ B	A/ A
	12.4/ 17.2	8.6/ 9.4	8.4/ 6.9
SB	B/ B	A/ B	A/ B
	13.3/ 14.8	9.2/ 11.7	8.8/ 11.0

Synchro Results



8th & Kasold, AM/**PM**

Approach	Existing Cond. LOS Delay (sec.)	Roundabout Option LOS Delay (sec.)	3-Way Stop Option LOS Delay (sec.)	E-Leg Stop Option LOS Delay (sec.)	Signal Option LOS Delay (sec.)
WB	B/C	A/B	B/C	C/D	A/A
	11.9/ 15.1	8.8/ 12.3	11.9/ 15.1	21.9/ 26.7	6.4/ 6.8
NB	B/C	B/B	B/C	A/A	A/A
	14.3/ 16.6	13.6/ 10.6	14.3/ 16.6	0/ 0	3.9/ 5.5
SB	C/C	B/B	C/C	A/A	A/A
	15.7/ 17.2	11.6/ 11.7	15.7/ 17.2	2.8/ 1.7	5.5 / 6.5

Travel Times



Kasold Drive, 6th Street to Bob Billings Parkway, NB + SB Totals,

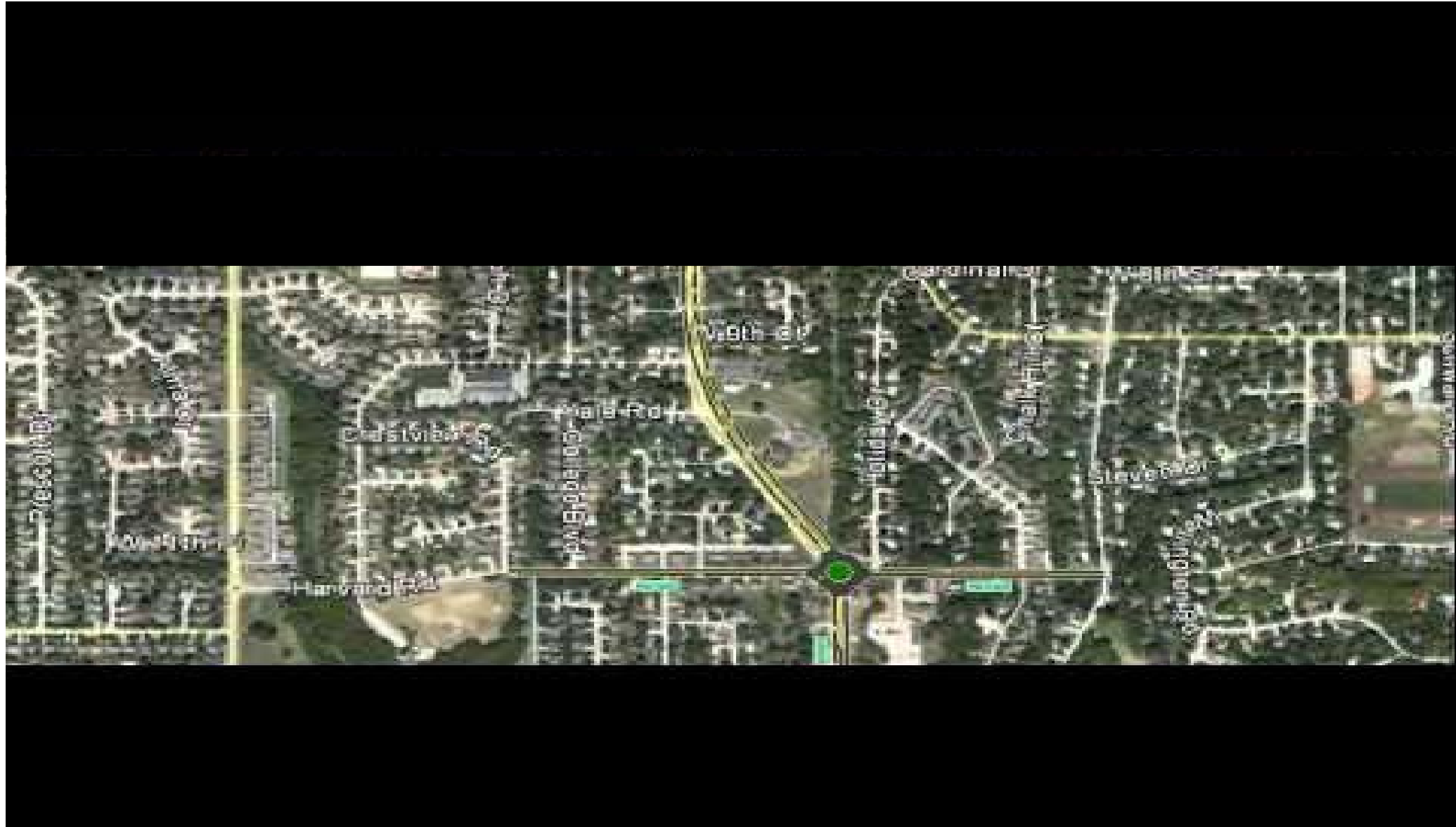
(min.)	Existing Cond.	Typical Street Stop Signs @ 8 th Signal @ Harvard	Typical Street Signal @ 8 th Signal @ Harvard	Complete Streets Stop Signs @ 8 th Roundabout @ Harvard
AM Peak Current	7.1	6.6	6.3	6.6
PM Peak Current	6.8	6.5	6.2	6.5
AM Peak 2040	7.2	7.0	6.5	6.9
PM Peak 2040	7.5	7.1	6.5	6.8

All options studied exhibit decreased travel times when compared to existing conditions.

Synchro Model Typical Street Reconstruction



Synchro Model Complete Streets Option



Lane Reconfiguration Resources



- Knapp, K.K., Welch, T.M. and Witmer, J.A., **Converting Four Lane Undivided Roadways to a Three-Lane Cross Section: Factors to Consider**, ITE Annual Meeting, 1999
- Knapp, Chandler, et al. for the Federal Highway Administration, **Road Diet Informational Guide**, 2014
- Kansas City Missouri Public Works Department, **Road Diet Analysis**, 2015
- Russell & Mandavilli for Kansas State University, **Analysis of a Road Diet Conversion and Alternative Traffic Controls**, 2003
- AARP and the Walkable and Livable Communities Institute, **Road Diets - A Livability Fact Sheet**, 2014
- Burden, D. and Lagerwey, P., **Road Diets: Fixing the Big Roads**, Walkable Communities, Inc., March 1999
- Walkable Streets (August 2003), **Economic Merits of Road Diets and Traffic Calming**
- Safe Routes to School National Center (November 2013), **Safe Routes to School Online Guide**
http://guide.saferoutesinfo.org/engineering/tools_to_reduce_crossing_distances_for_pedestrians.cfm#diet

Similar Lane Reconfiguration Projects

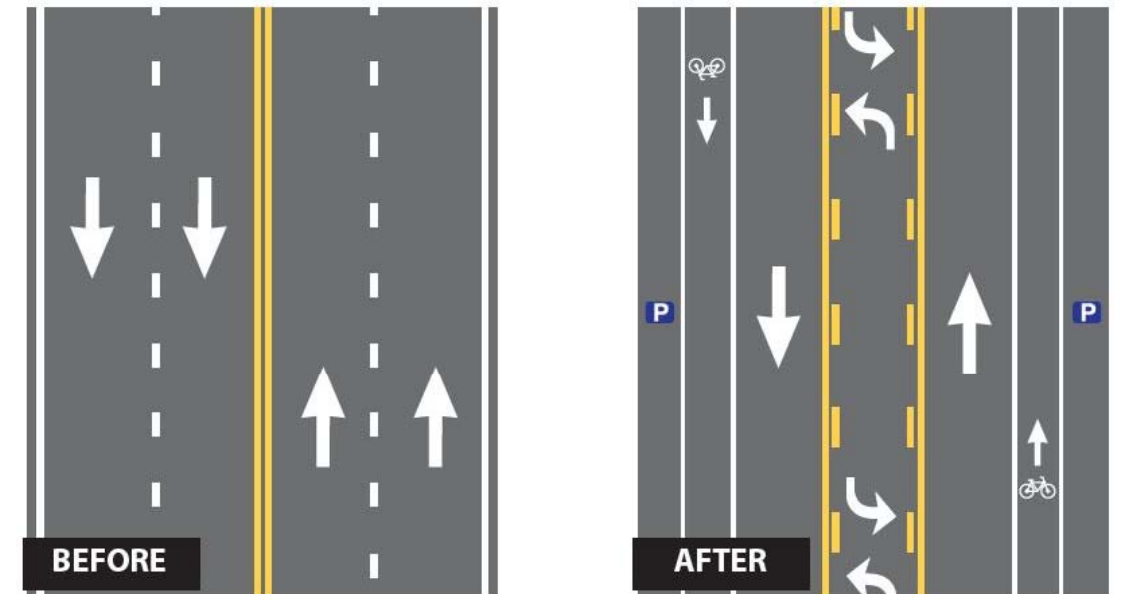


9TH STREET, EAST OF EMERY, LAWRENCE, KS



- ADT = 16,755
- BETTER TRAFFIC FLOW

KANSAS CITY, MO



- CURRENTLY EVALUATING ALL ARTERIALS WITH ADT < 20,000 VPD
- PLAN TO IMPLEMENT LANE RECONFIGURATION AT TIME OF REPAVING

Lane Reconfiguration Case Studies



BURTON STREET, GRAND RAPIDS, MI



- ARTERIAL (ADT = 15,000 VPD)
- SCHOOL & PARK NEARBY
- OPPONENTS WITH CONCERNS OVER CONGESTION, TURNING GAPS
- SLOWER SPEEDS
- LESS CONGESTION
- INCREASED BICYCLE TRAFFIC
- NO APPARENT DIVERSION

LAWYER'S ROAD, RESTON, VA



- ARTERIAL (ADT = 17,000 VPD)
- SPEED LIMIT 40/45
- SUBURBAN AREA
- 70% REDUCTION IN CRASHES
- TRAVEL TIME REMAINED CONSISTENT
- INCREASE IN BICYCLE USE
- 74% AGREED IT WAS AN IMPROVEMENT

Comparison of Options



All options increase level of service, decrease travel time, improve capacity at intersections and improve safety when compared to existing conditions.

TYPICAL STREET RECONSTRUCTION OPTION

- NO REDUCTION IN VEHICLE SPEEDS
- NO ANTICIPATED REDUCTION IN VEHICLE COLLISIONS
- LONGER PEDESTRIAN/SCHOOL CROSSINGS
- NON-BUFFERED BIKE LANES
- 11' DRIVING LANES
- LESS CONCENTRATED TRAFFIC (ADT < SINGLE LANE CAPACITY)
- ADDITIONAL R/W & EASEMENT REQUIREMENTS PROBABLE
- COST TO CITY = \$5.13M
- BUDGET DOES NOT ALLOW FOR EXTENSION OF BICYCLE/PEDESTRIAN FACILITIES NORTH OF 6TH STREET TO PETERSON ROAD

COMPLETE STREETS OPTION

- REDUCTION IN VEHICLE SPEEDS
- ROUNDABOUT AT KASOLD & HARVARD KDOT ESTIMATED AN ANNUAL \$44,108 BENEFIT WITH REDUCTION OF PROPERTY DAMAGE ONLY AND INJURY ACCIDENTS
- REDUCTION IN VEHICLE COLLISIONS BY 40%
REDUCTION IN INJURY COLLISIONS BY 76%
- SHORTER PEDESTRIAN/SCHOOL CROSSINGS
- BUFFERED BIKE LANES
- 12' DRIVING LANES
- MORE CONCENTRATED TRAFFIC (ADT < SINGLE LANE CAPACITY)
- NO ADDITIONAL R/W & EASEMENT REQUIREMENTS LIKELY
- COST TO CITY = \$3.97M
- BUDGET ALLOWS ALLOW FOR EXTENSION OF BICYCLE/PEDESTRIAN FACILITIES NORTH OF 6TH STREET TO PETERSON ROAD

Comparison of Costs



TYPICAL STREET RECONSTRUCTION OPTION *

ESTIMATED CONSTRUCTION COST	<u>\$5.13M</u>
COST TO CITY OF LAWRENCE	\$5.13M

COMPLETE STREETS OPTION *

ESTIMATED CONSTRUCTION COST	\$4.37M
FEDERAL/STATE SAFETY FUNDING	<u>(\$0.40M)</u>
COST TO CITY OF LAWRENCE	\$3.97M



DIFFERENCE IN COST = \$1.16M

SHARED-USE PATH ON KASOLD – 6TH STREET TO PETERSON ROAD - \$250,000

* Does not include property acquisition costs (\$Unknown) or traffic signal at 8th & Kasold (~\$150,000)

Recommendations



Reconstruction with Complete Streets 3-lane option

- REDUCTION IN VEHICLE SPEEDS
- REDUCTION IN VEHICLE COLLISIONS AND INJURY COLLISIONS AT KASOLD AND HARVARD INTERSECTION
- SHORTER PEDESTRIAN/SCHOOL CROSSINGS
- BUFFERED BIKE LANES
- 12' DRIVING LANES
- MORE CONCENTRATED TRAFFIC (ADT < SINGLE LANE CAPACITY)
- CONTEXT SENSITIVE DESIGN FOR RESIDENTIAL AREA
- NO ADDITIONAL R/W & EASEMENT REQUIREMENTS LIKELY
- ELIMINATE ROUNDABOUT OPTION AT 8TH AND KASOLD AND CONTINUE TO EVALUATE OTHER INTERSECTION ALTERNATIVES
- ESTIMATED CONSTRUCTION COST SAVINGS OF \$1,000,000
- ABILITY TO EXTEND BICYCLE/PEDESTRIAN FACILITIES NORTH TO PETERSON