

# Kasold Drive Improvement Project

6<sup>TH</sup> STREET TO BOB BILLINGS PARKWAY

---



City of Lawrence

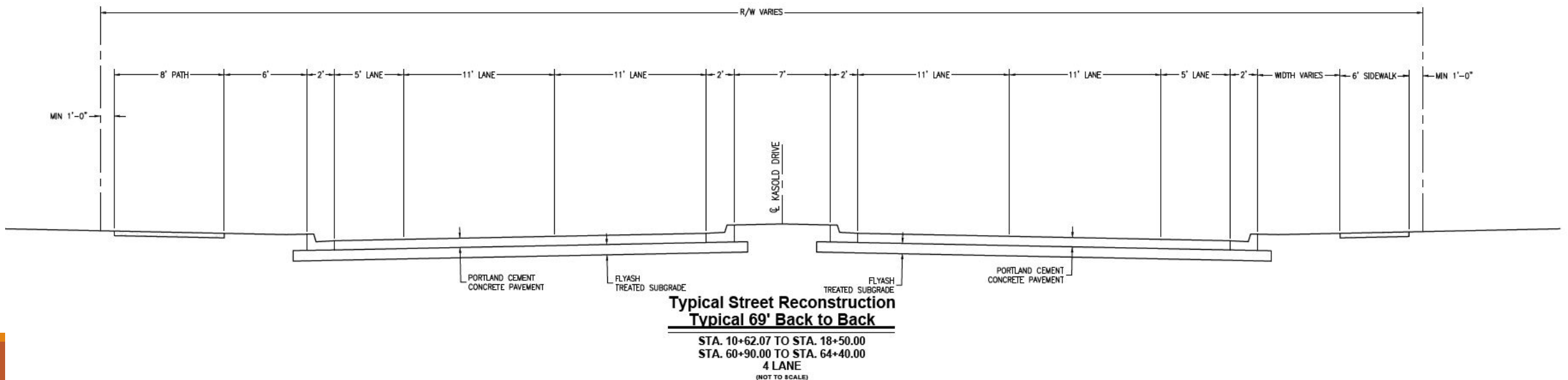
# Project Scope/Concept Study

- Failing pavement and base (PCI 43.8)
- Full Reconstruction needed – base failures, missing curb
- Add sidewalk and bicycle lanes
- CIP 2017 Budget - Infrastructure sales tax
- Concept Study - Feb. 2015 - 2016



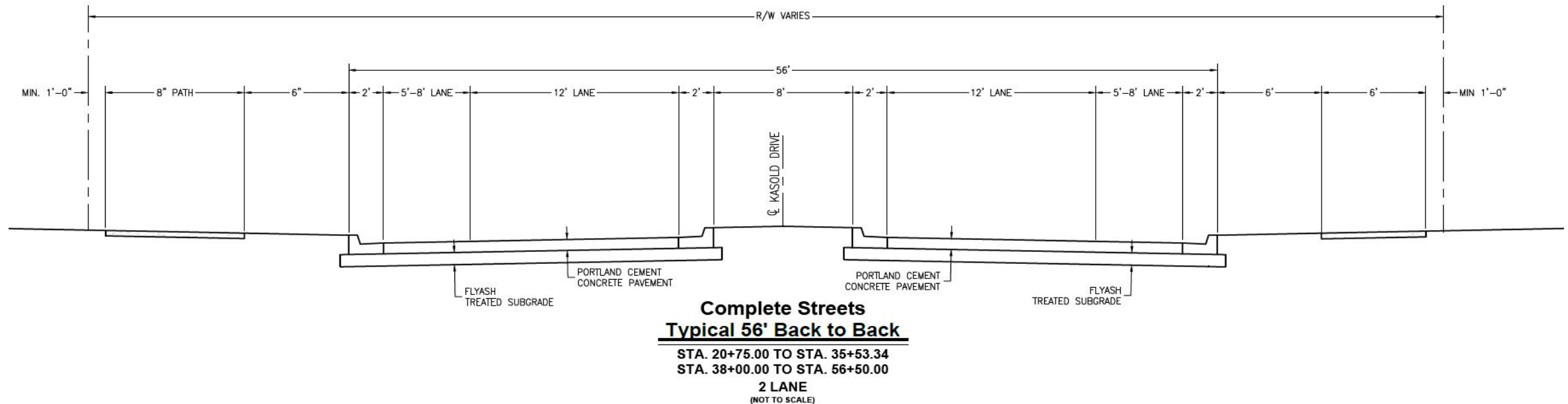
# Option 1- Typical Street Reconstruction

- 2 lanes in each direction – 11 ft
- Median with turn lanes
- 5 Ft. Bicycle lanes
- 6 Ft. Sidewalk and 8 Ft. Shared Use Path
- Traffic signal @ Harvard



# Option 2 - Complete Street Reconstruction

- 1 lane in each direction (W. 9<sup>th</sup> Ct. to 14<sup>th</sup> Street)
- 2 lanes each direction at signal approaches (6<sup>th</sup> to W. 9<sup>th</sup> Ct. & 14<sup>th</sup> to 15<sup>th</sup>)
- Median With Turn Lanes
- 5 Ft Bike Lane with 3 Ft Buffer
- 8 Ft Shared Use path & 6 Ft Sidewalk
- Roundabout at Harvard







Sheet  
reference  
number:  
**1**

Sheet 1 of 4

Street, Storm & Waterline Improvements

Kasold Drive Improvements  
Lawrence, KS  
Kasold Drive and Hargrave Road  
Options 1 & 2

Designed by  
CFS ENGINEERS  
cfe.com

In the Complete Streets Option  
the 5 lane section is maintained  
between BBP and 14 Street





Prepared by:	Reviewed by:
Designed by:	Checked by:
Drawn by:	Approved by:
Field notes:	Final notes:

**Kasold Drive Improvements**  
Lawrence, KS

**Kasold Drive and Hazard Road**  
Options 1 & 2

Street, Storm & Waterline Improvements

Sheet reference number:  
**4**  
Sheet 4 of 4

In the Complete Streets Option  
The 5 lane section is maintained  
Between W. 6<sup>th</sup> St and W. 9<sup>th</sup> Ct.

Capacity

- Capacity of a roadway corridor is limited by the traffic flow/ control at intersections.
- Both options can accommodate projected traffic volumes
- Both options will maintain the Arterial Street and Truck Delivery Route Designations
- Both options will be safer than the existing roadway

Number of Traffic Lanes	
Capacity of Single Lane	1,900 VPH
Capacity of Double Lane	3,800 VPH
Peak Hour Kasold, Current	651 VPH
Peak Hour Kasold, 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

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

# Case Studies – Lane Reconfiguration



## 9<sup>th</sup> Street, East Of Emery, Lawrence, KS



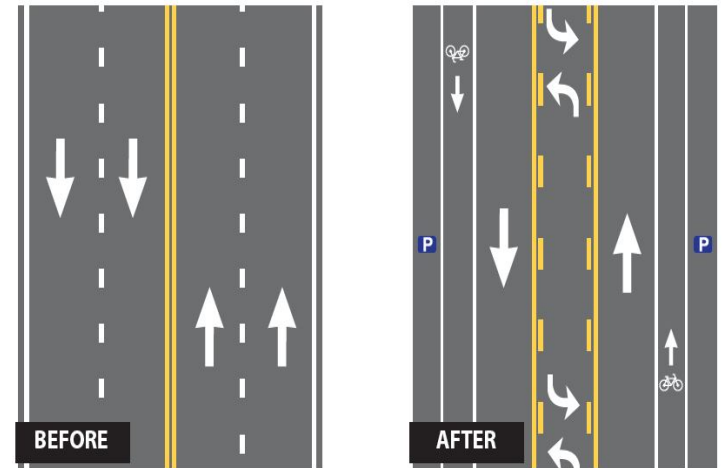
- ADT = 16,755 VPD
- Better traffic flow
- Safer turning movements and bicycle lanes

9<sup>th</sup> & Miss. PM Peak hour  
2011 - 1553 vph on 9th St.  
2015 - 1579 vph on 9th St.

9<sup>th</sup> & Maine PM Peak hour  
2011 - 1494 vph on 9th St.  
2015 - 1553 vph on 9th St.

9<sup>th</sup> & Emery PM Peak hour  
2011 - 1553 vph on 9th St.  
2015 - 1454 vph on 9th St.

## Arterials in Kansas City, MO



- Currently evaluating all arterials with ADT < 20,000 VPD
- Plan to implement lane reconfiguration at time of repaving



# Case Studies – Lane Reconfiguration



## Mission Road in Kansas City, KS and Prairie Village, KS



- **ADT's: 15,000 – 25,000 VPD**
- **Kansas City, KS:**  
**from 43<sup>rd</sup> Street to Belrose Manor**
- **Prairie Village:**  
**from 71<sup>st</sup> Street to 75<sup>th</sup> Street**  
**VERY similar to Kasold corridor**
- **Various cities are planning additional lane reconfiguration improvements along the Mission Road corridor**

# Case Studies – Lane Reconfiguration



## 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
- 74% Agreed It Was An Improvement
- 70% Reduction In Crashes
- Travel Time Remained Consistent
- Increase In Bicycle Use

# Case Studies – Lane Reconfiguration for Speed Reduction



- **Luten Avenue in Staten Island, New York**
  - Road Diet Near School
  - RESULTS: The **percentage of vehicles exceeding the speed limit decreased by 34 percent** along southbound Luten Avenue and **decreased by 21 percent** in the northbound direction.
- **US 75 in Sioux County, Iowa – Road Diet**

Percent of vehicles traveling more than 5 mph over the speed limit	BEFORE	AFTER
	43 percent	13 percent



# FHWA / KDOT – Road Reconfiguration Review

---

- FHWA has ongoing initiative to review road reconfiguration projects
- Worked with FHWA Staff and consultant to review Kasold Concept Plans and Traffic Study
- FHWA concurred with the feasibility for the ‘Complete Streets’ alternative
- KDOT also reviewed and has agreed to fund a single lane Roundabout at Kasold and Harvard.
- KDOT’s funding is Federal Safety Fund dollars and canNOT be re-allocated to other State needs

# Benefits of Lane Reconfiguration

---

- Reduced Conflict Points
- Improved Sight Lines
- Less Difficult Crossing Maneuvers
- Lower and More Uniform Speeds
- Traffic Demands Still Met
- Improved Conditions for Others
- Supports Local Business
- Lower Construction Costs
- Less pavement to Maintain
- Less Storm Water Infrastructure and Runoff
- Less Roadway for snow removal and street sweeping



# Accident Data Changing a 4 way STOP to Roundabout

---

**Wakarusa & Inverness (Completed in Jan. 2015) - 26% decrease in crashes and 100% decrease in injury crashes**

2.7 crashes per year before (8 total in 3 years prior) - 1 injury crashes

2.0 crashes per year after (3 total in 1.5 years after) - 0 injury crashes

**19th & Barker (Completed in 2004) - 25% decrease in crashes and 75% decrease in injury crashes**

4.0 crashes per year before (12 total in 3 years prior) – 4 injury crashes

3.0 crashes per year after (9 total in 3.0 years after) – 1 injury crashes

City of Lawrence currently has 20 roundabout controlled intersections and 92 signal controlled intersections



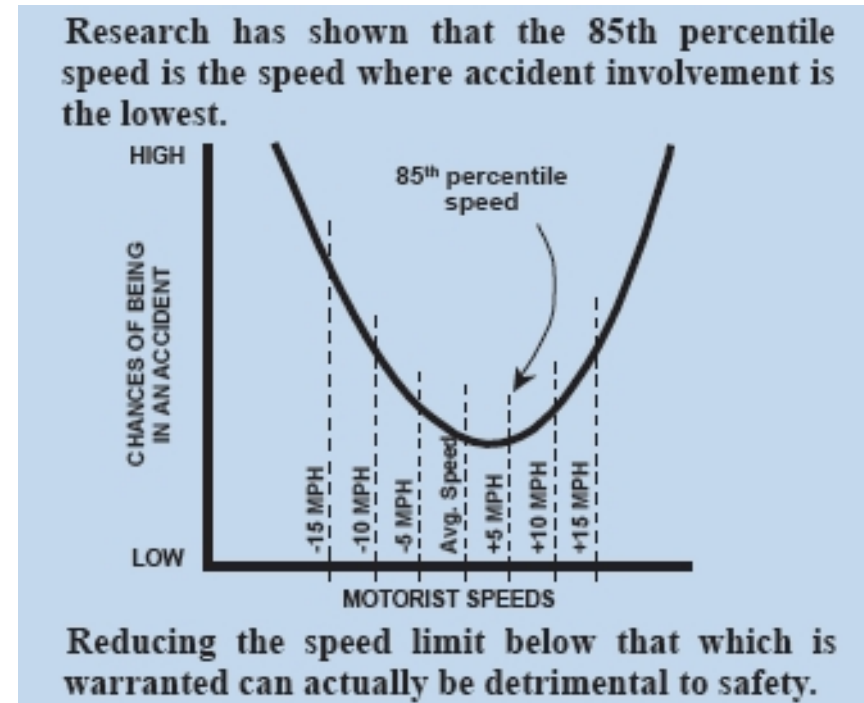
# Maintenance Costs

- A traffic signal has an estimated annual operational cost of \$8000 per year, including electrical costs and maintenance of equipment.
- A roundabout has an estimated annual maintenance cost of \$1000 per year, including lighting, irrigation, and maintenance of landscaping.
- Pavement life is expected to be 30+ years. Over the life of the pavement minor maintenance will be needed such as crack sealing and minor patching. There is approximately 20% less pavement between the two options.
- 20% less pavement will also take less time for snow removal and will have less storm water runoff

# SPEED

- Definition: The 85<sup>th</sup> percentile speed is the speed 85% of the traffic drives at or below, with 15% exceeding.
- The 85<sup>th</sup> percentile speed is the safest speed and recommended to be used to establish speed limits in accordance with the Manual on Uniform Traffic Control Devices.
- For every five miles per hour you drive over or under the 85<sup>th</sup> percentile speed your chances of being involved in a crash increase.
- Physically controlling the speed with Narrow lanes or traffic calming is more efficient than enforcement and is 24/7

Location	Speed Limit	85 <sup>th</sup> Percentile Speed
Kasold between 13 <sup>th</sup> & 14 <sup>th</sup>	35 mph	<b>43 mph</b>
Kasold at 10 <sup>th</sup> Street	30 mph	<b>41 mph</b>
Kasold between 8 <sup>th</sup> & 10 <sup>th</sup>	30 mph	<b>37 mph</b>
27 <sup>th</sup> St & Kasold Dr crosswalk	40 mph	<b>52 mph</b>



# What can \$1 million fund?



31 residential blocks of mill and overlay



67 blocks of Micro-surfacing and patching



25,000 LF of C&G  
(Approx. 21 blocks both sides)



Harvard Road



## Sidewalks

Kasold 6 <sup>th</sup> to Peterson (5 <sup>th</sup> Ter to Tomahawk Dr)	\$250K
Sidewalk on one side of all SRTS	\$230K
Repair 650 of the 3760 non ADA compliant ramps	\$520K
Sidewalk on all Arterials*	\$330K



## Other Projects



East 15<sup>th</sup> -  
Maple to Brook



Wakarusa/Overland  
Intersection



Kasold – 22<sup>nd</sup> to Clinton



# Comparison of Costs

## TYPICAL STREET RECONSTRUCTION OPTION \*

ESTIMATED ROAD CONSTRUCTION	\$5.40M
ESTIMATED WATERLINE CONSTRUCTION	\$0.57M
CONCEPT DESIGN COSTS	\$0.13M
ESTIMATED FINAL DESIGN & CA	\$0.45M
<b>TOTAL COST TO CITY OF LAWRENCE</b>	<b>\$6.55M</b>

## COMPLETE STREETS OPTION \*

ESTIMATED ROAD CONSTRUCTION	\$4.64M
ESTIMATED WATERLINE CONSTRUCTION	\$0.57M
CONCEPT DESIGN COSTS	\$0.13M
ESTIMATED FINAL DESIGN & CA	\$0.45M
FEDERAL/STATE SAFETY FUNDING	(\$0.475M)
<b>TOTAL COST TO CITY OF LAWRENCE</b>	<b>\$5.32M</b>

**DIFFERENCE IN COST = \$1,230,000**

SHARED-USE PATH ON KASOLD – 6<sup>TH</sup> STREET TO PETERSON ROAD ~ \$250,000

\* Does not include property acquisition costs, assumes traffic signal at 8<sup>th</sup> Street

# Comparison of Options

	Typical Street Reconstruction	Complete Streets
<b>Speed</b>	Minimal reduction in overall speeds	Road Diets reduce the aggressive/top-end speeders and overall speed of a corridor
<b>Effect on collisions</b>	No anticipated reduction	<u>Road Diets</u> <ul style="list-style-type: none"> <li>• Create less conflict points.</li> <li>• Reduction in vehicle collisions by 40 percent.</li> <li>• Reduction in injury collisions by 76 percent.</li> </ul> <u>Roundabouts</u> <ul style="list-style-type: none"> <li>• Create less conflict points</li> <li>• 76 percent reduction in injury crashes</li> <li>• 90 percent reduction in fatal and incapacitating injuries</li> </ul>
<b>Bicycle Lanes</b>	5 ft bicycle lanes	Buffered 5 ft bicycle lane (8 ft total); improves safety for bicyclists by creating more space between vehicle lane and bicycle lane
<b>Pedestrian Crossings</b>	No change in distance to cross roadway	Shorter distance to cross roadway; improves safety for pedestrians/students
<b>Lane capacity</b>	Accommodates future traffic demands	Accommodates future traffic demands
<b>Driving lane width</b>	11 ft	12 ft
<b>Intersection control</b>	Traffic Signal	Roundabout
<b>Harvard &amp; Kasold</b>	Level of service A-B	Level of Service A-B
<b>R/W &amp; Easements</b>	Additional R/W or Easement needed	Not likely
<b>Construction Cost</b>	\$5.4 million	\$4.64 million

# Recommended Options

---



## Complete Streets Option

### ✓ Increase in Safety

- Reduction in Vehicle Speeds
- Reduction In Vehicle Collisions And Injury Collisions at Kasold & Harvard
- Shorter Pedestrian/School Crossings
- Buffered Bike Lanes Provide Improved Safety for Bicyclists
- Extension of Bicycle/Pedestrian Facilities North To Peterson

### ✓ Context Sensitive Design For Residential Area

- Improved livability and “feel” of the neighborhood

### ✓ Lower Costs

- Additional R/W & Easement Requirements are UNLIKELY
- Estimated Construction Cost Savings to the City Of \$1,230,000
- Roundabout Requires Less Maintenance and Operational Costs Compared to a Traffic Signal

## Traffic Signal at 8<sup>th</sup> & Kasold

- ✓ Increased Safety
- ✓ Better Traffic Flow