US 2/US 81 SKEWED INTERSECTION STUDY

Public Input Meeting #2

Overcoming Barriers — Strengthening Connections

M.P.O. M.P.O. M.P.O.

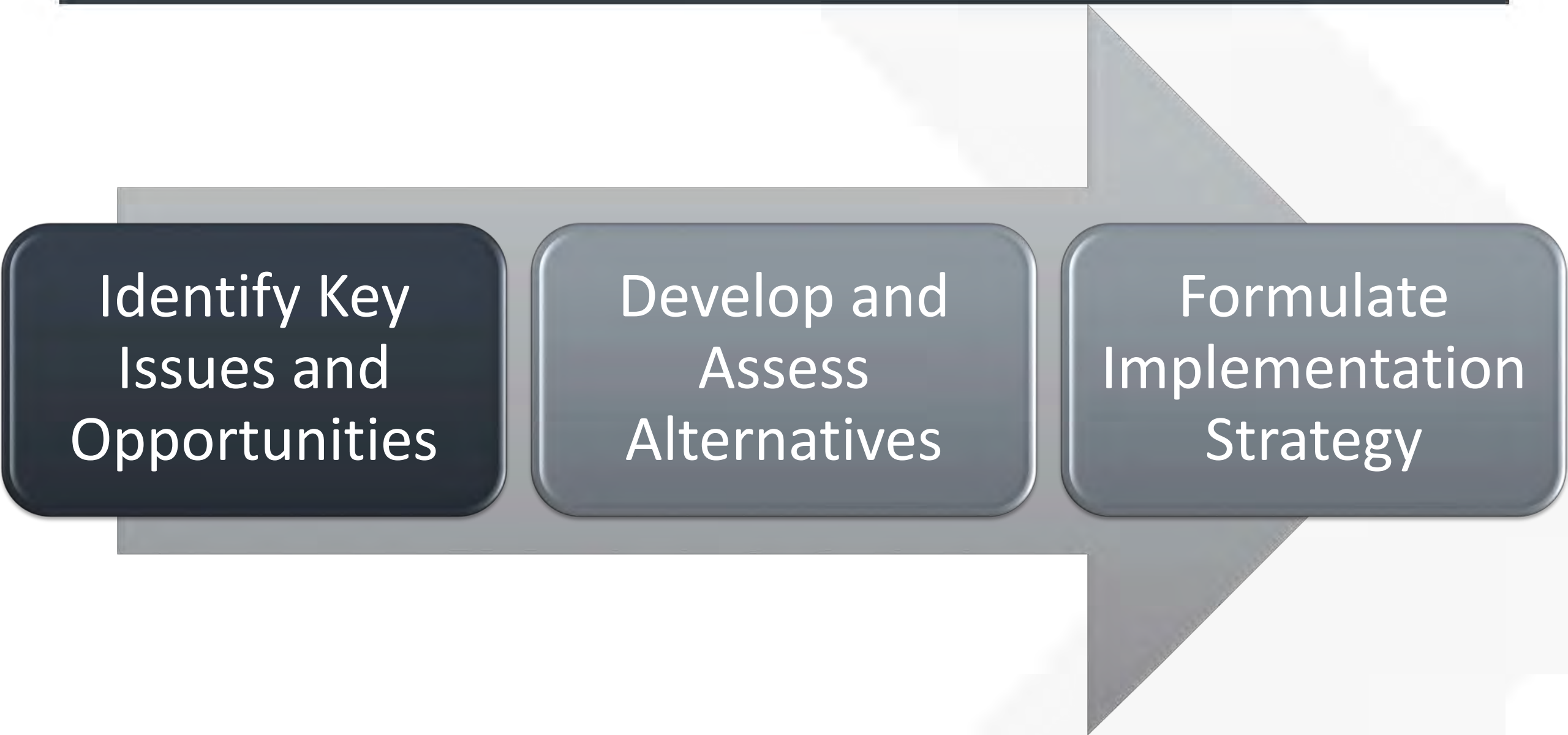
Grand Forks - East Grand Forks Metropolitan Planning Organization

Ensuring Opportunities — Planning One Community

KLJ

ENGINEERING, REIMAGINED

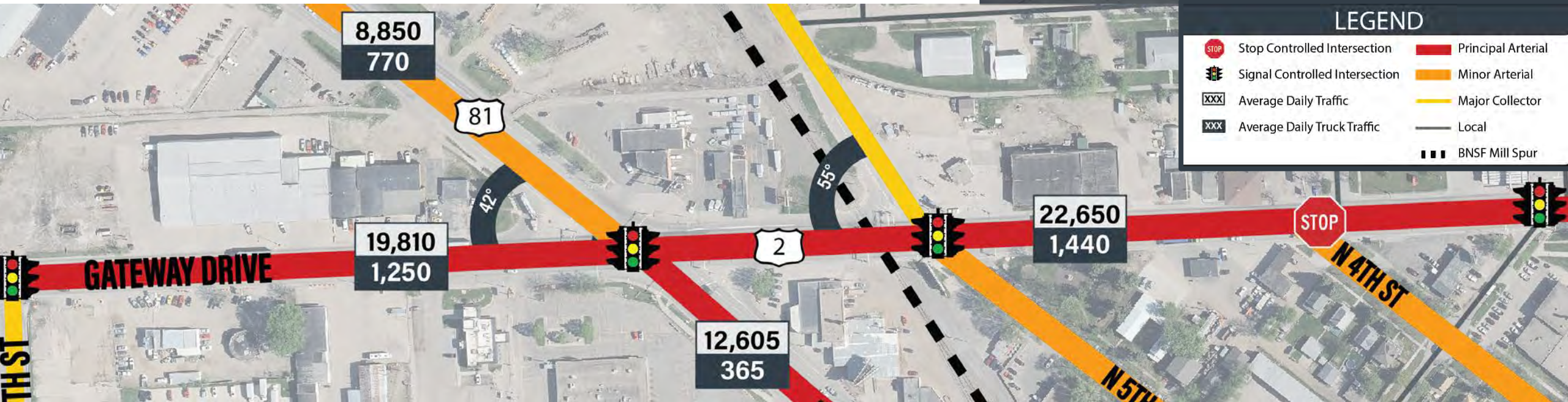
Project Process



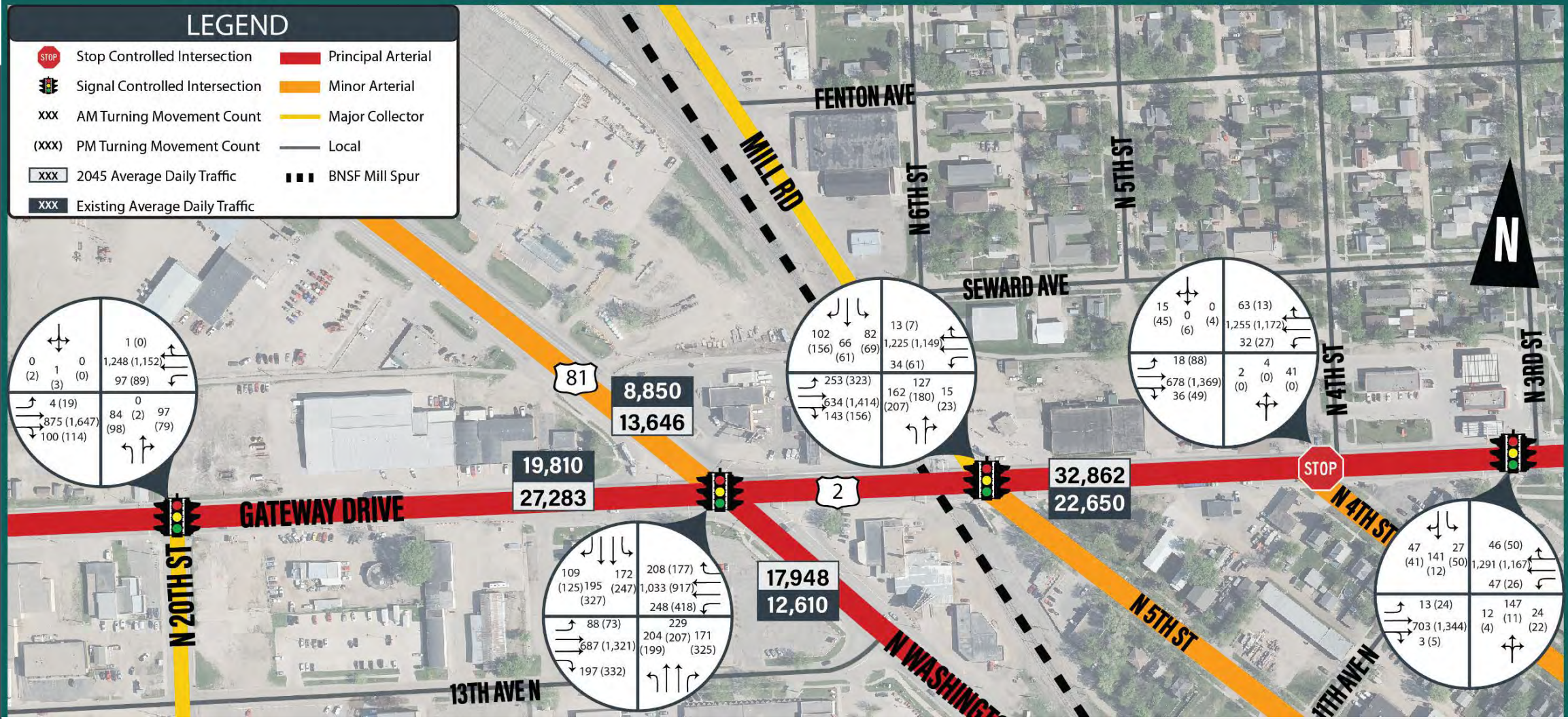
Key Issues Refresher

Traffic

- 19,800 – 22,600 Vehicles Per Day
- 1,200-1,500 trucks per day
  - In 2016, NDSM increased capacity 33%, looking to expand another 22% in 5 years
- Skewed Turning Movements

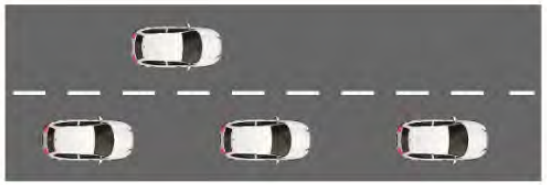
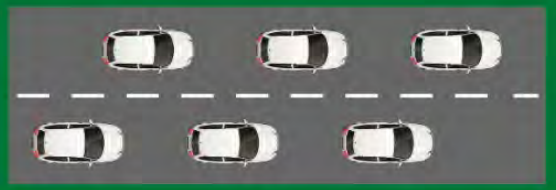


Existing and Future Traffic Volumes

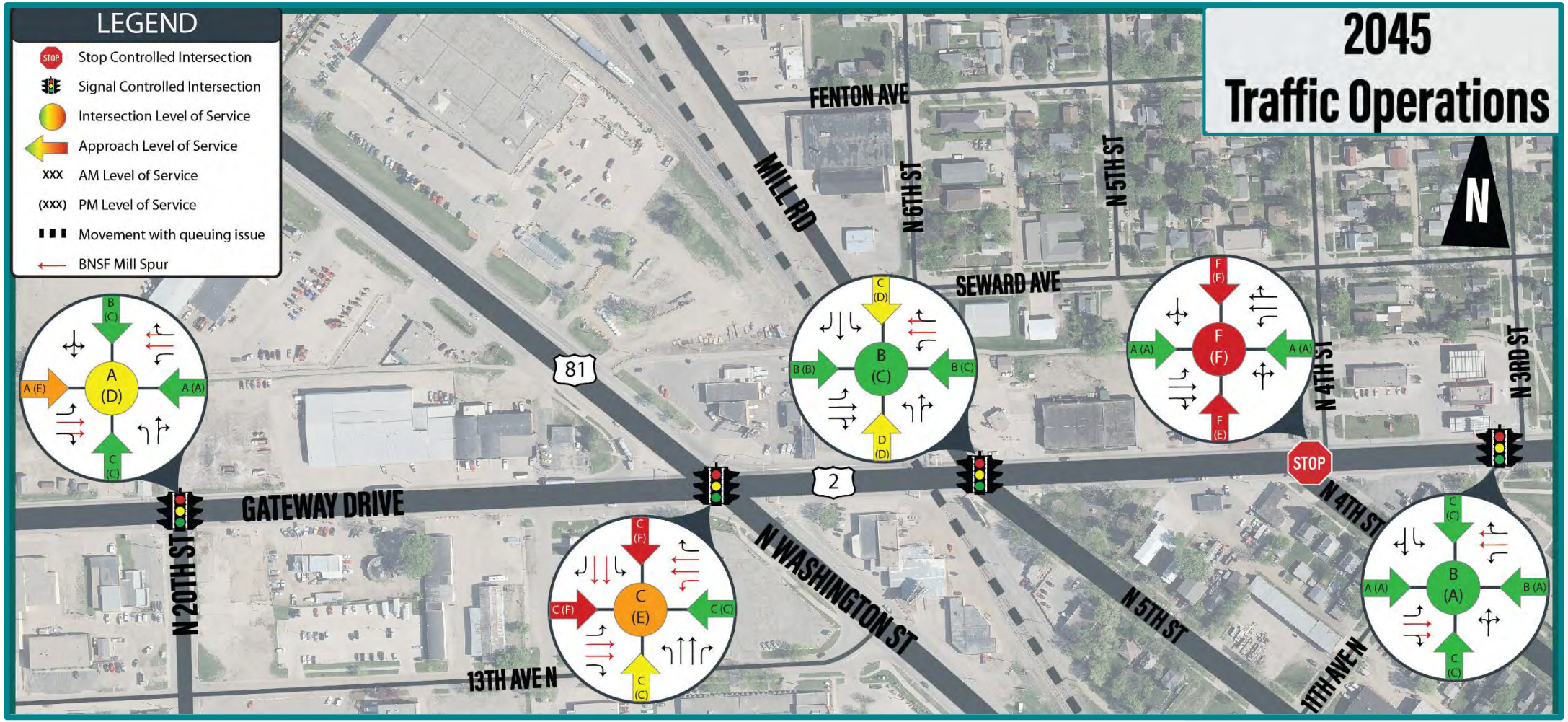


- Projections Show 7,500 – 10,000 More ADT by 2045 on Gateway/US 2
- By Comparison; Historic Traffic Volumes Show Reduced Traffic Volumes over the Past 10 Year

Traffic Operations

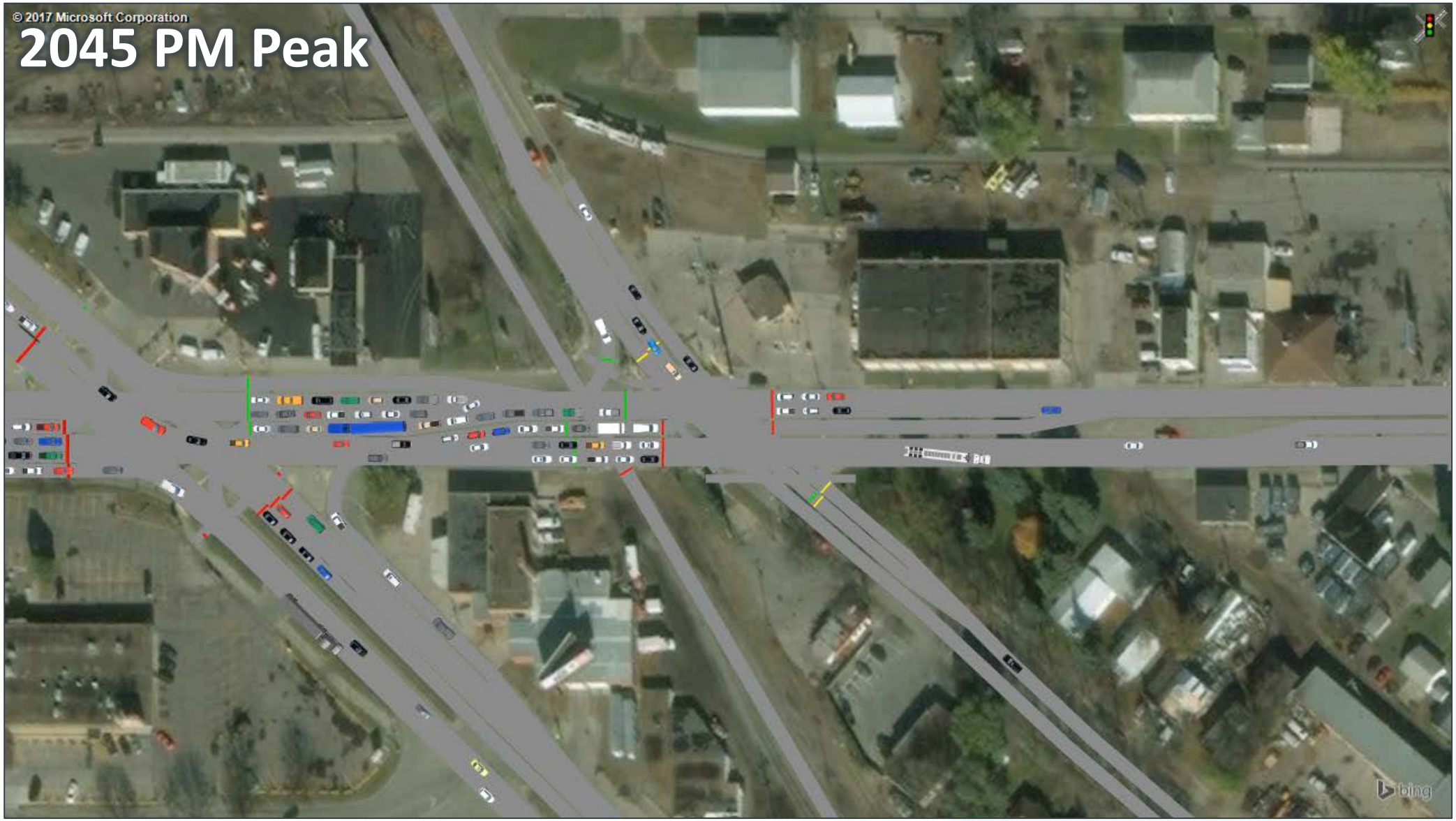
CAPACITY	TRAFFIC FLOW	DESCRIPTION
Under		**LOS A - FREE FLOW** Low volumes and no delays.
		**LOS B - STABLE FLOW** Low volumes and speeds dictated by travel conditions.
		**LOS C - STABLE FLOW** Speeds and maneuverability closely controlled due to higher volumes.
Approaching		**LOS D - RESTRICTED FLOW** Higher density traffic restricts maneuverability and volumes approaching capacity.
At		**LOS E - UNSTABLE FLOW** Low speeds, considerable delays, and volumes at or slightly over capacity.
Over		**LOS F - FORCED FLOW** Very low speeds, volumes exceed capacity, and long delays with stop-and-go traffic.

Intersection Traffic Operations



- LOS acceptable at all intersections today, except N 4^{h} Street.
- Congestion Builds at Washington Street, causing unacceptable LOS in the future
- Queuing an Issue in All Scenarios
- Travel Time a Concern with Trains and Multiple Signals

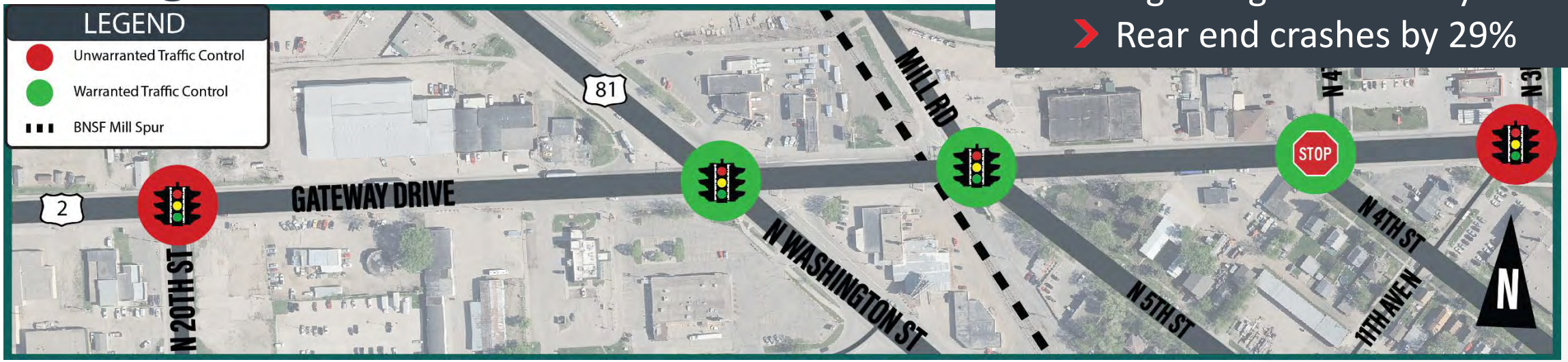
2045 PM Queuing Issues



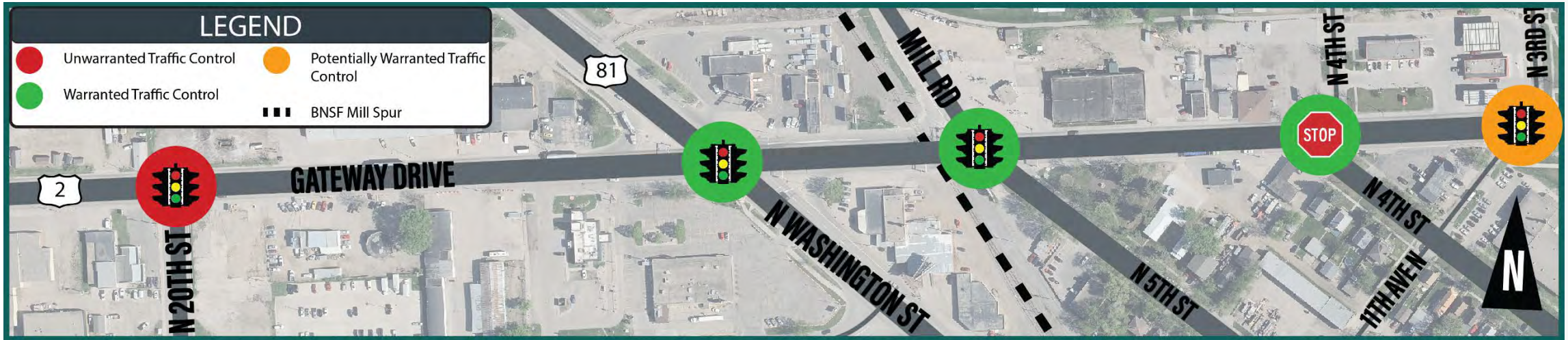
Existing Traffic Control Analysis

- Removal of unwarranted signals reduces
  - All crashes by 24%
  - Injury crashes by 54%
  - Right angle crashes by 24%
  - Rear end crashes by 29%

Existing

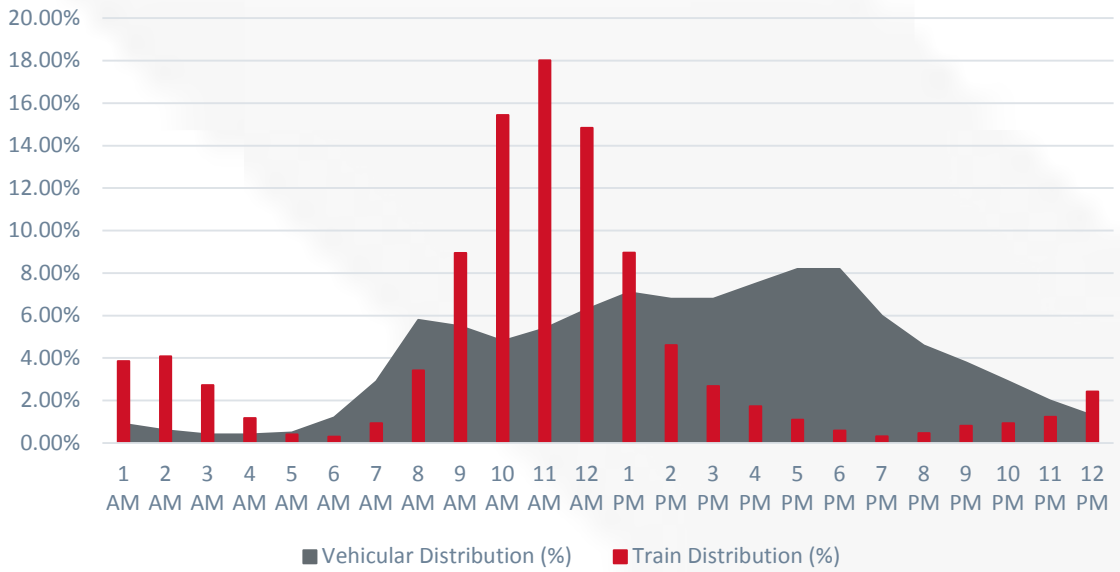


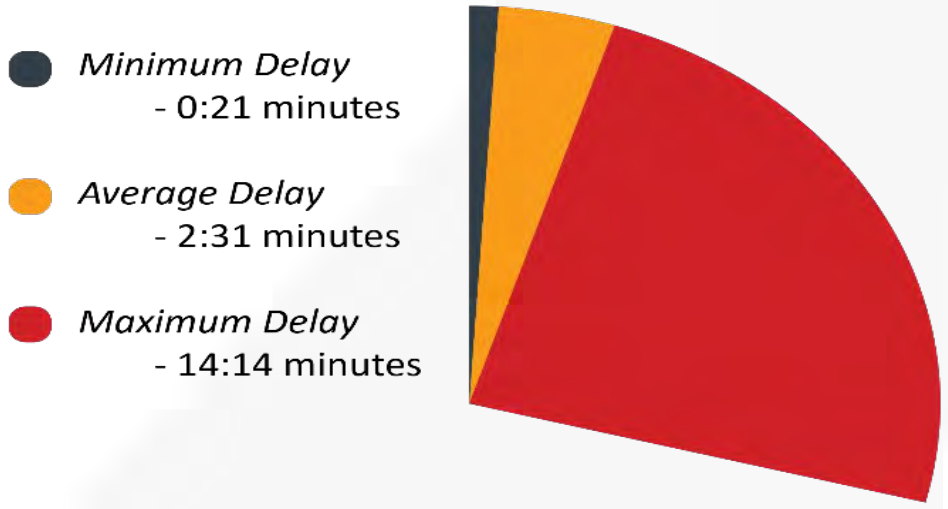
2030 and 2045



Train Blockages

- 4 to 5 blockages per day
  - 10 MPH or Less
- Safety
  - No Crashes Since 1994
  - 7th Highest Predicted Rail Crash Rate in the County





Train Delays

- Delay from One Blockage
  - 4 hours in 2019
  - 7 hours by 2045
- Travel Reliability
  - 2-5x Longer Delays with Train

Unit Trains

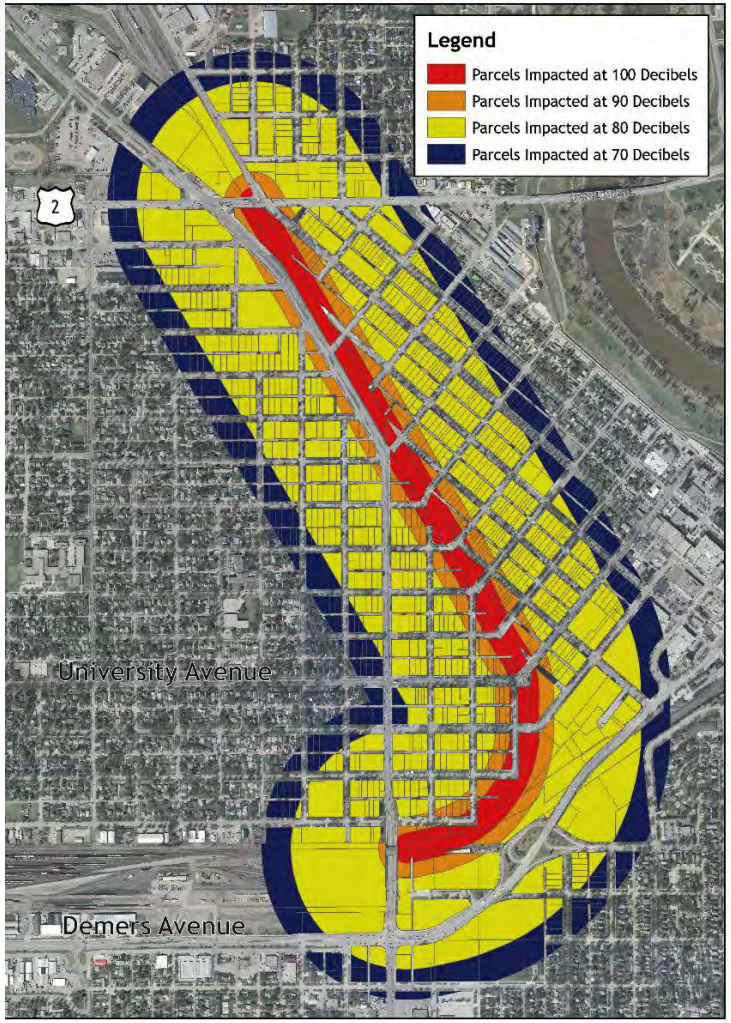
- ND Mill Working to Accommodate Unit Trains
- All crossings will be blocked at the same time.

4x Longer than Current Trains

10-17 Minutes of Delay at Each Mill Spur Crossings

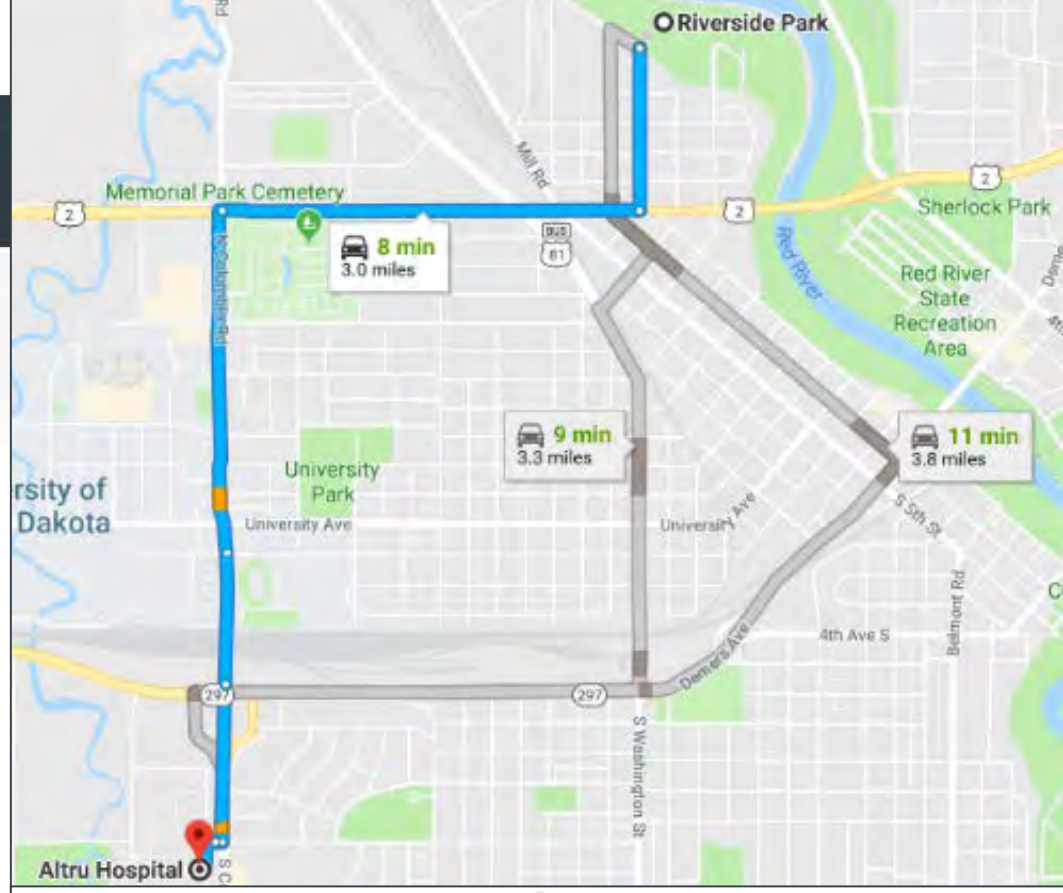
0-4 Blockages per Month

Potential to Occur at Night

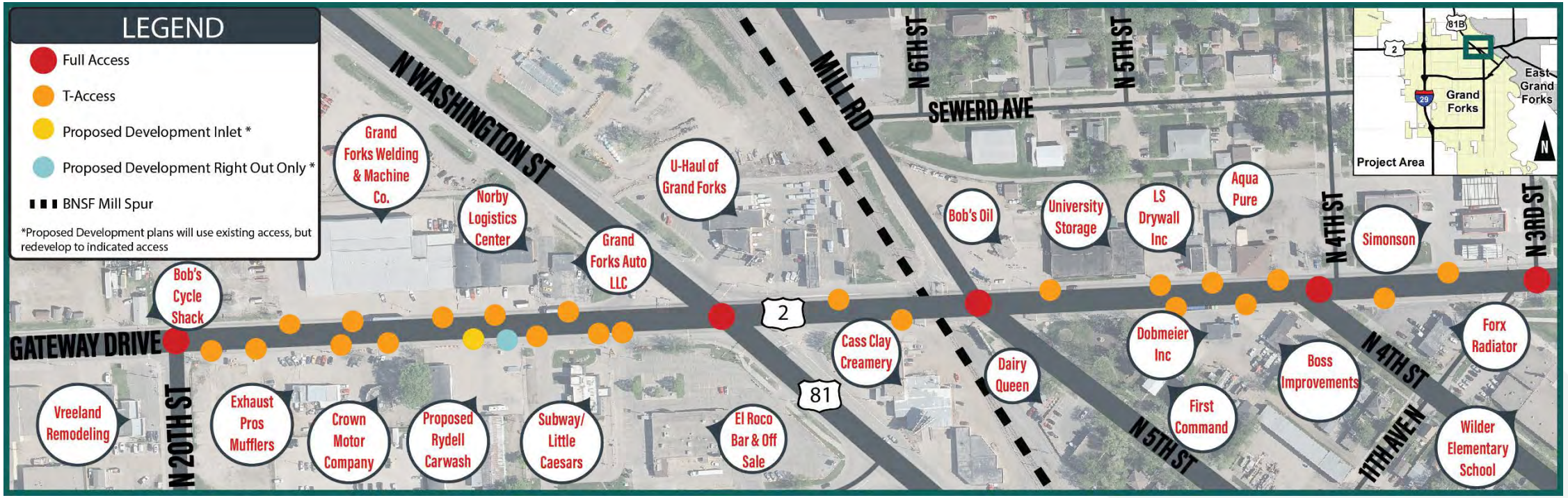


Emergency Responders

- Fire Response Goal to reach every address within four minutes
  - Brain damage in four to six minutes when heart stops
  - Fires can double every 60 seconds
- ND Mill will Work with the City and EMS when a Unit Train Occurs

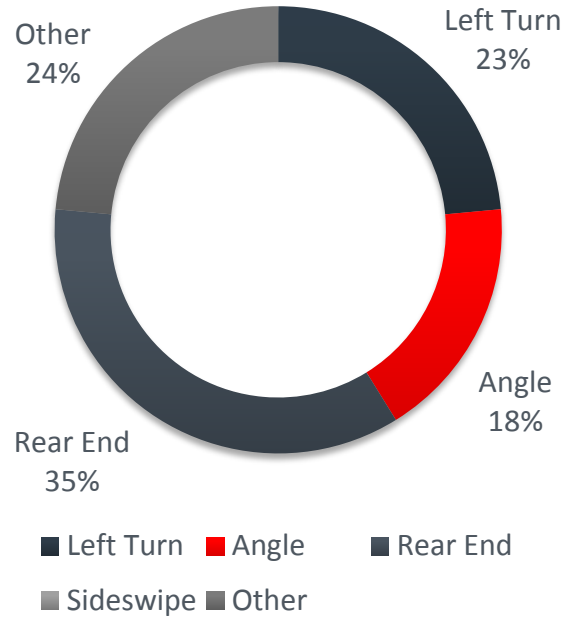


Access Management



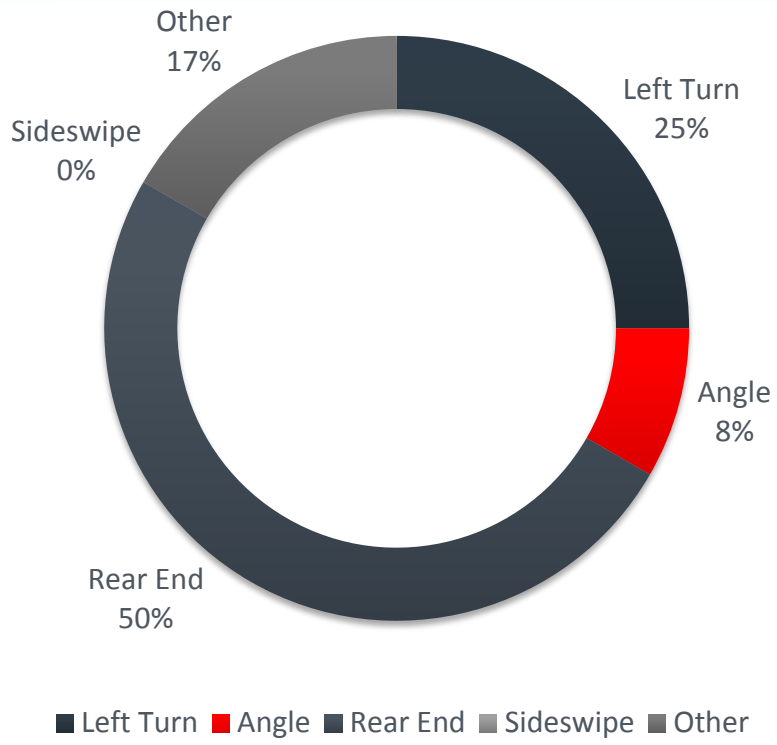
- Unsignalized driveways
  - Increase crash rate by 2%
  - Reduces corridor travel speed by 0.25 MPH
- Desired Access Spacing
  - 660 feet
  - 8 access/mile
- Existing Access Spacing
  - 33 accesses
  - 66 access/mile (8x Standard)

20th Street to Washington Street



- 17 crashes in last five years
- Above critical crash rate
- 41% during AM/PM peak hours
- Long queues and dense access spacings
- Queues block sight lines

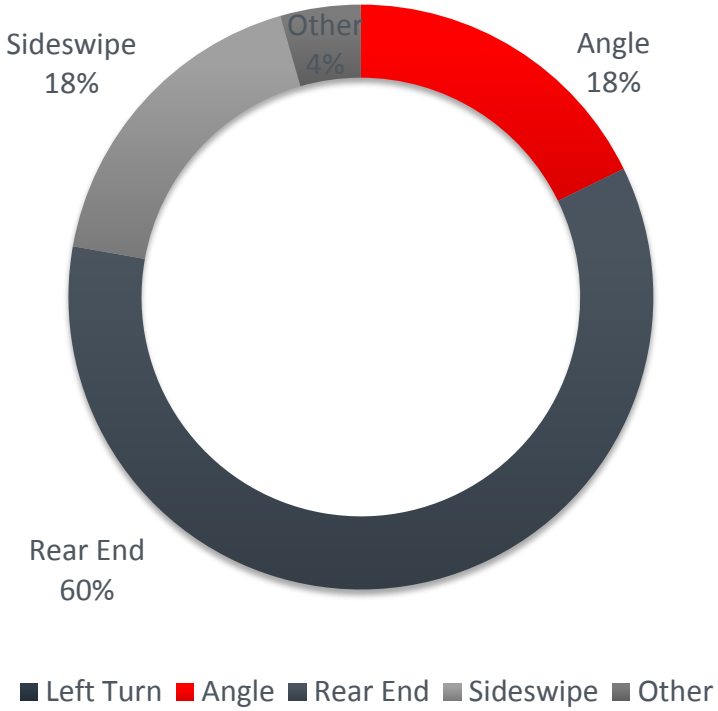
20th Street Intersection



- 12 crashes in last five years
- 33% rear end crashes on east approach
- 25% westbound left-turn crashes (Protected/Permitted)

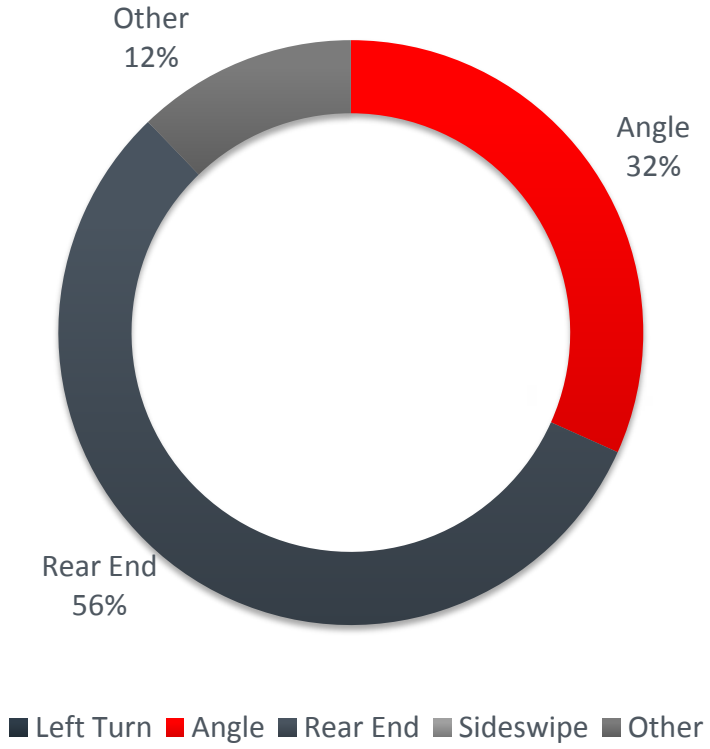
- Unwarranted signal control increases
  - All crashes by 24%
  - Injury crashes by 53%
  - Right angle crashes by 24%
  - Rear end crashes by 29%

US 81/Washington Street Intersection



- 45 crashes in last five years
- 60% rear end crashes
  - 30% during AM or PM peak hour
  - 30% between 11 AM to 1 PM
- 8 crashes involving trucks
- 0 Crashes involving Pedestrians or Bikes

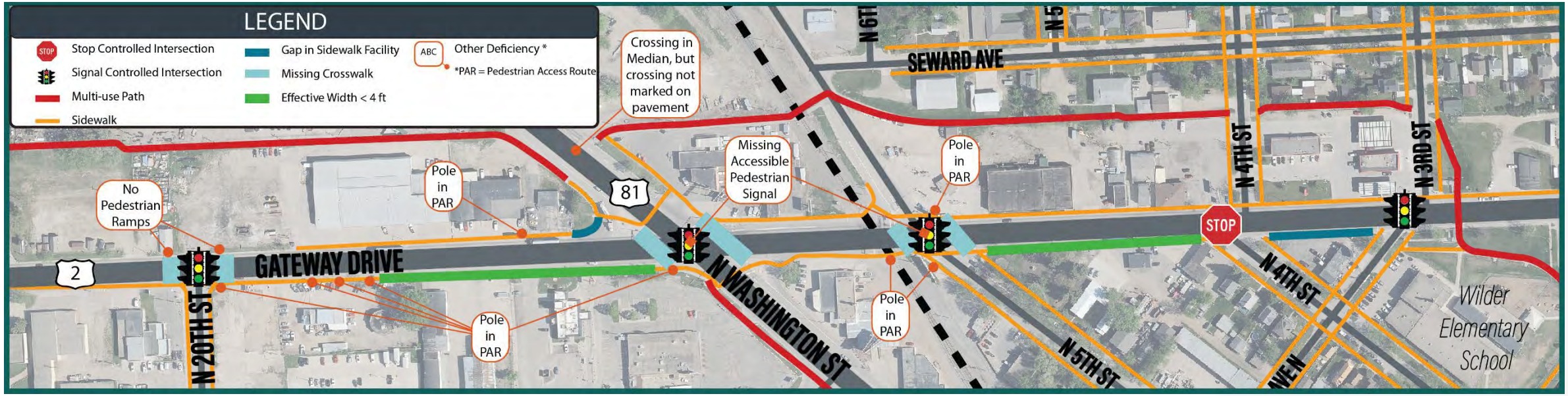
Mill Road/5th Street Intersection



- 41 crashes in last five years
- Above critical crash rate

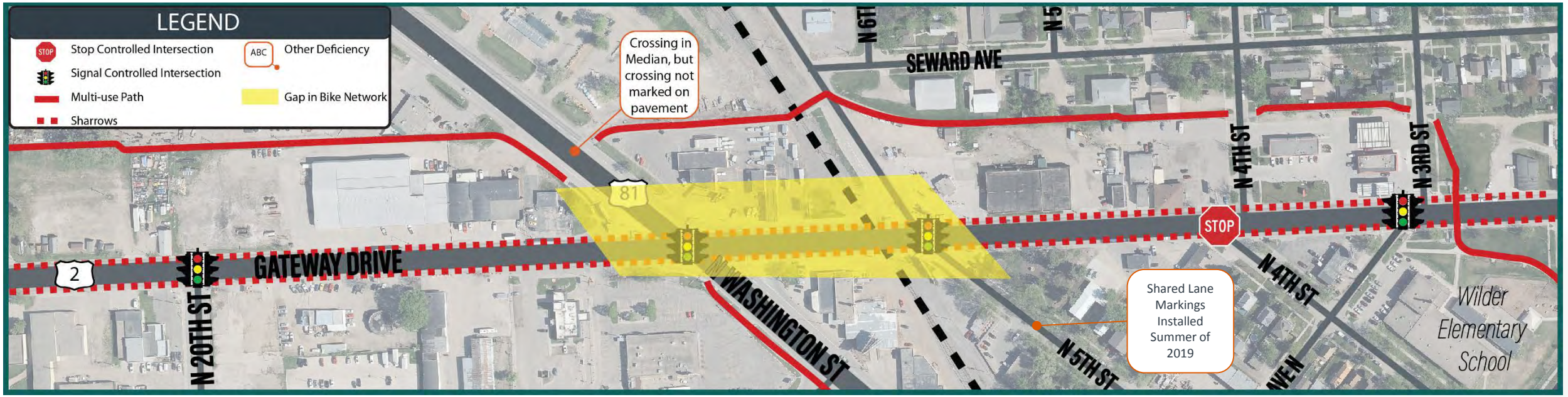
- 50% rear end crashes
  - 65% During AM or PM peak hours
  - 52% occurred on east approach

Pedestrian Network

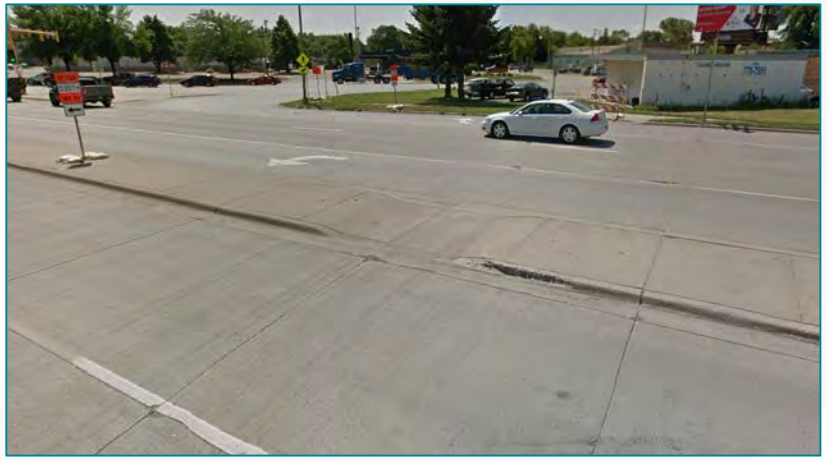


- Only controlled crossing at 3rd Street underpass
- ADA conflicts at crosswalks, utilities and driveways
- Minimal to no buffer

Bicycle Network

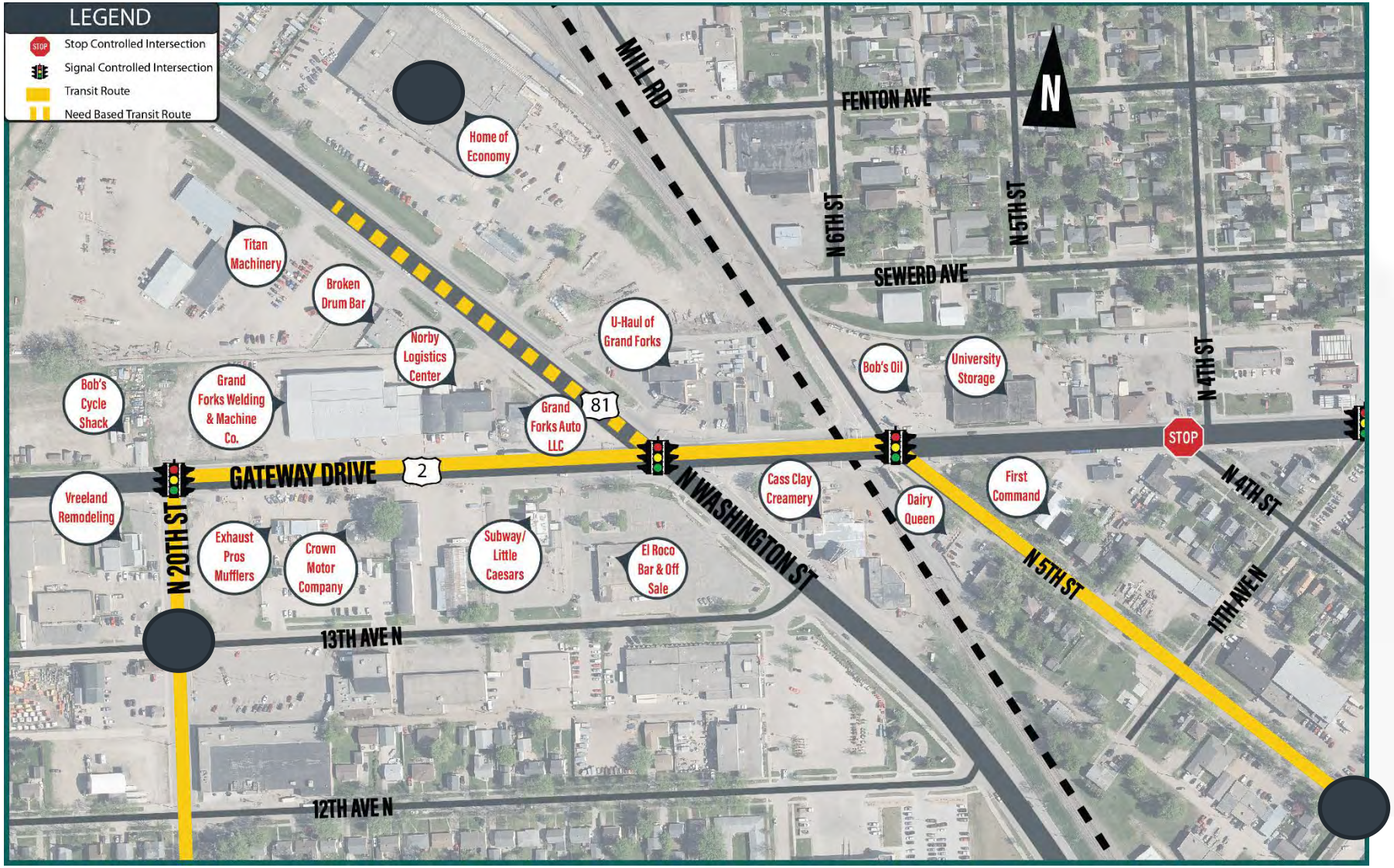


- Connections
  - 3rd Street and Red River Greenway to the east
  - Columbia Road to the west
- No traffic control to cross US 2/Washington Street
- Underpass at 3rd Street
- Bikes allowed on all streets



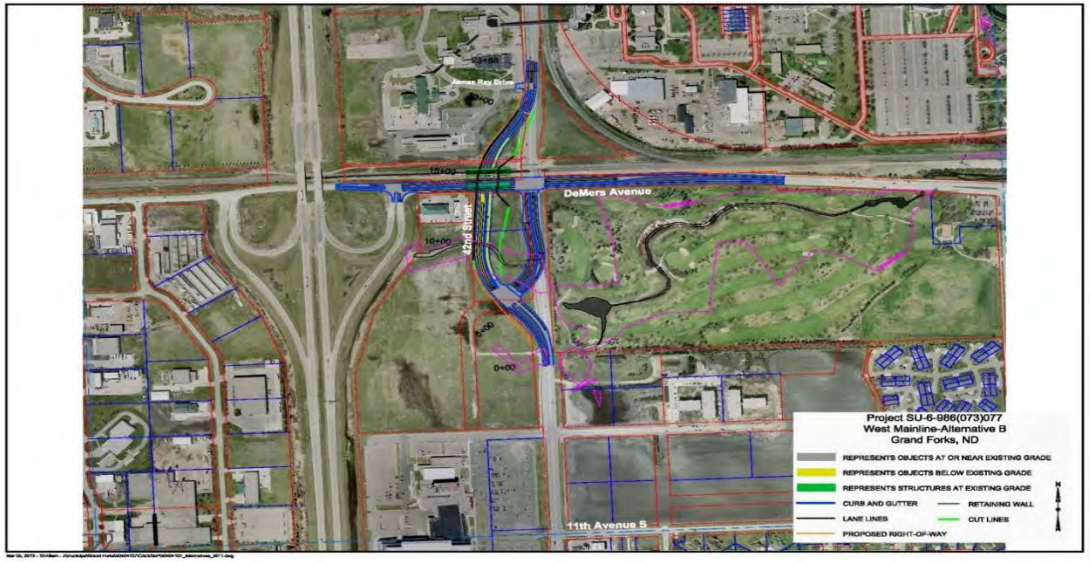
Transit Network

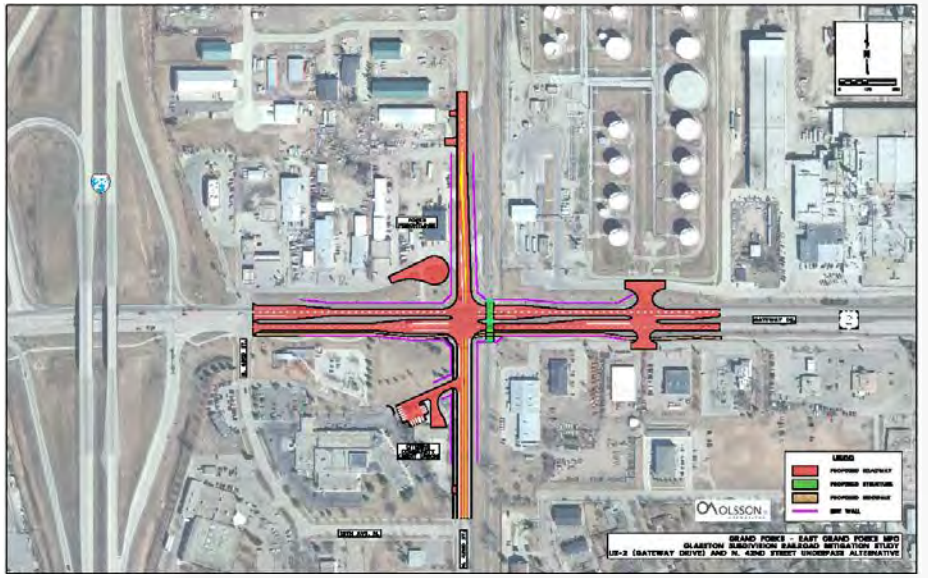
- CAT Route 2
  - Hourly service
- CAT Route 13
  - Night Route
- Stops
  - 5th Street/10th Ave
  - Hugo's on 20th St
  - Home of Economy when scheduled in advance



Funding Availability

- >$150,000,000 in Unfunded Grand Forks Projects
- 42nd Street and DeMers Avenue (~$25-30M)
- Gateway Drive/US 2 and Glasston (~$28M)
- Part of the NHS and Freight System





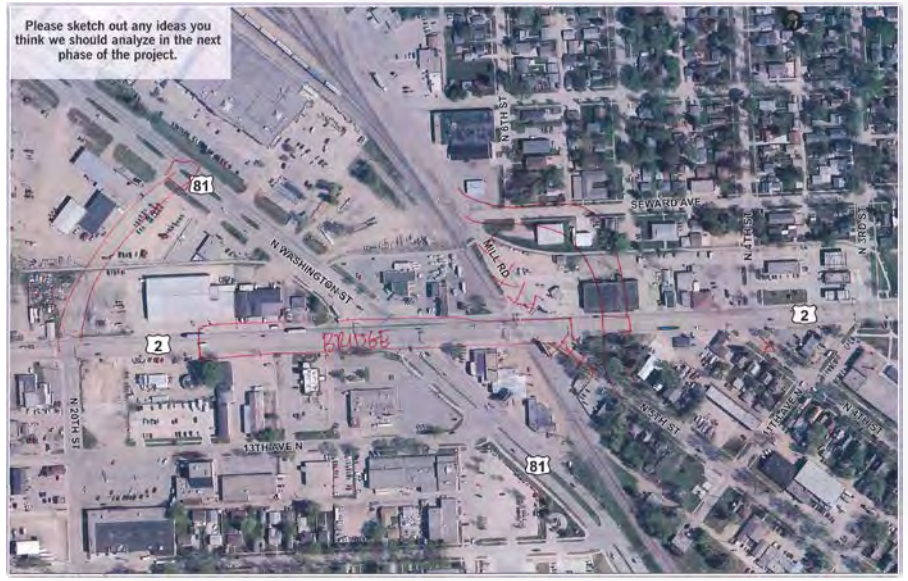
Alternative Development Approach

Public Input Meeting #1

- Held April 11th, 2019
- 12 Attendees
- Only 1 Full Brainstorming Worksheet Filled Out
- Primary Concerns Raised at Meeting;
  - Rail Whistles, Especially with Unit Trains
  - Rail Delays, Especially with Unit Trains
  - Challenging Truck Turning Movements
  - Lack of Good Pedestrian and Bicycle Facilities

Alternative Brainstorming

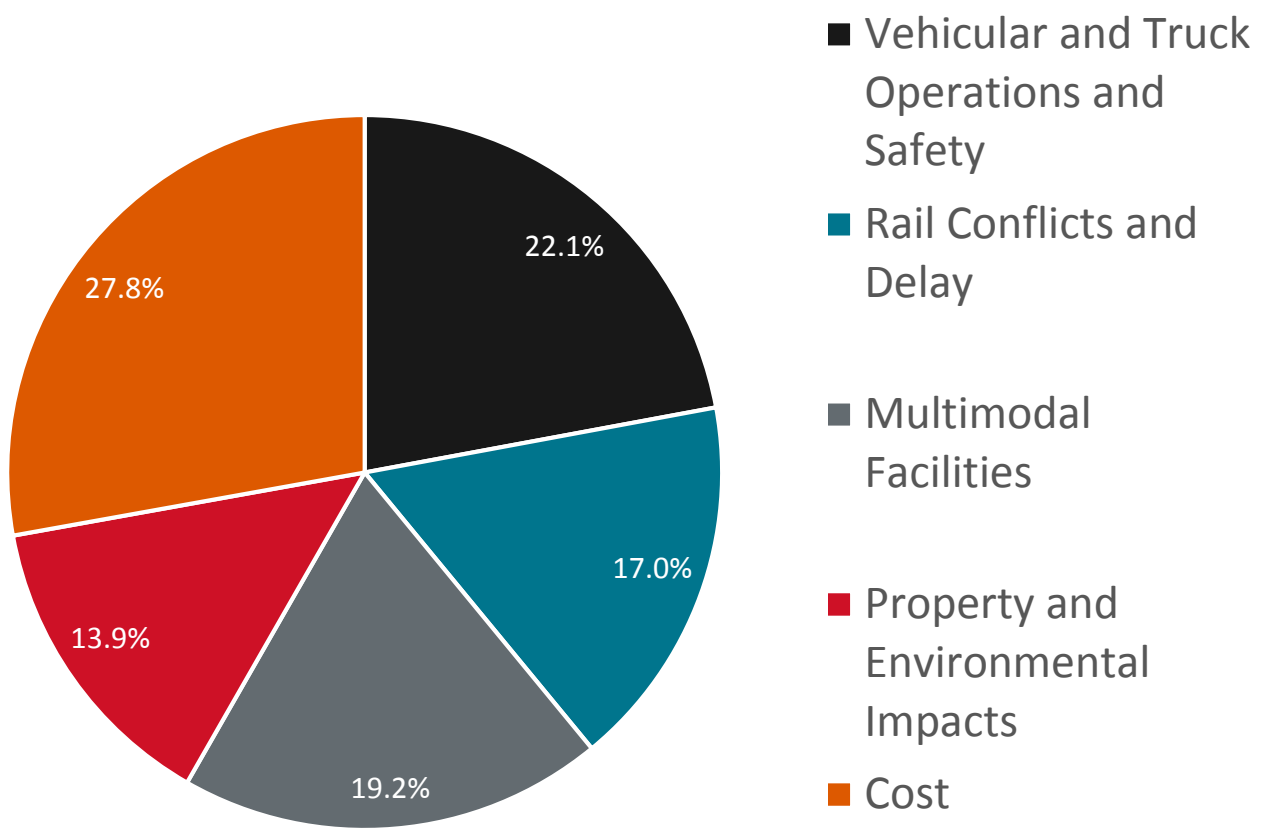
- Steering Committee Brainstorming Guided Alternative Development
- Represented Agencies on Steering Committee Meeting
  - Forks MPO
  - NDDOT Grand Forks District
  - Grand Forks Engineering
  - Grand Forks Planning
  - Wilder Elementary School
  - ND State Mill
  - Local Businesses



Alternative Scoring

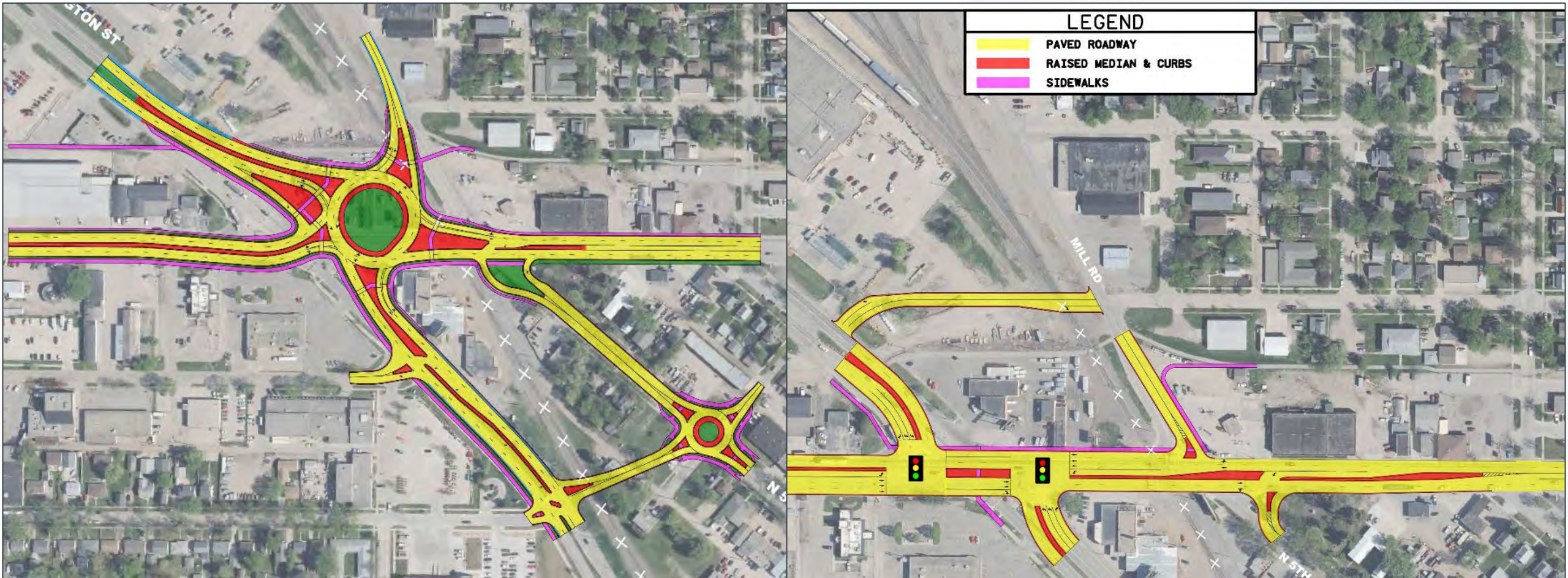
- Scores **ARE** Comparative Summaries
- Scores **ARE NOT** Recommendations

Ranked Evaluation Metrics



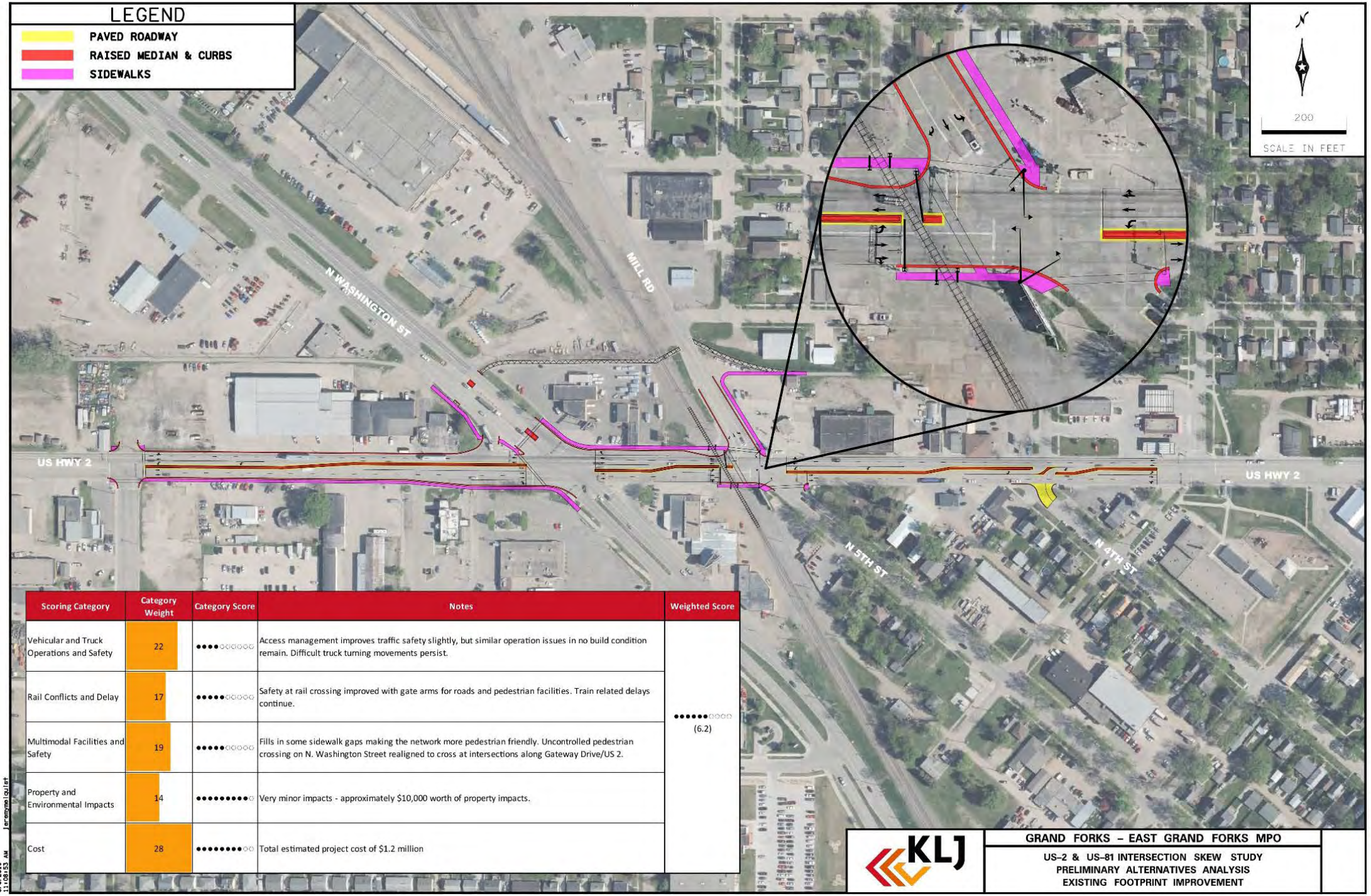
Discarded Alternatives

- Preliminary Analysis and Coordination with Steering Committee Led to Eliminate of Alternatives that Made Conditions Worse



Alternatives with No Changes to the Mill Spur

Alt EF: Existing Footprint Plan



Scoring Category	Category Weight	Category Score	Notes	Weighted Score
Vehicular and Truck Operations and Safety	22	●●●●○○○○○○	Access management improves traffic safety slightly, but similar operation issues in no build condition remain. Difficult truck turning movements persist.	●●●●●●○○○○ (6.2)
Rail Conflicts and Delay	17	●●●●●○○○○○	Safety at rail crossing improved with gate arms for roads and pedestrian facilities. Train related delays continue.	
Multimodal Facilities and Safety	19	●●●●●○○○○○	Fills in some sidewalk gaps making the network more pedestrian friendly. Uncontrolled pedestrian crossing on N. Washington Street realigned to cross at intersections along Gateway Drive/US 2.	
Property and Environmental Impacts	14	●●●●●●●●●○	Very minor impacts - approximately $10,000 worth of property impacts.	
Cost	28	●●●●●●●●○○	Total estimated project cost of $1.2 million	

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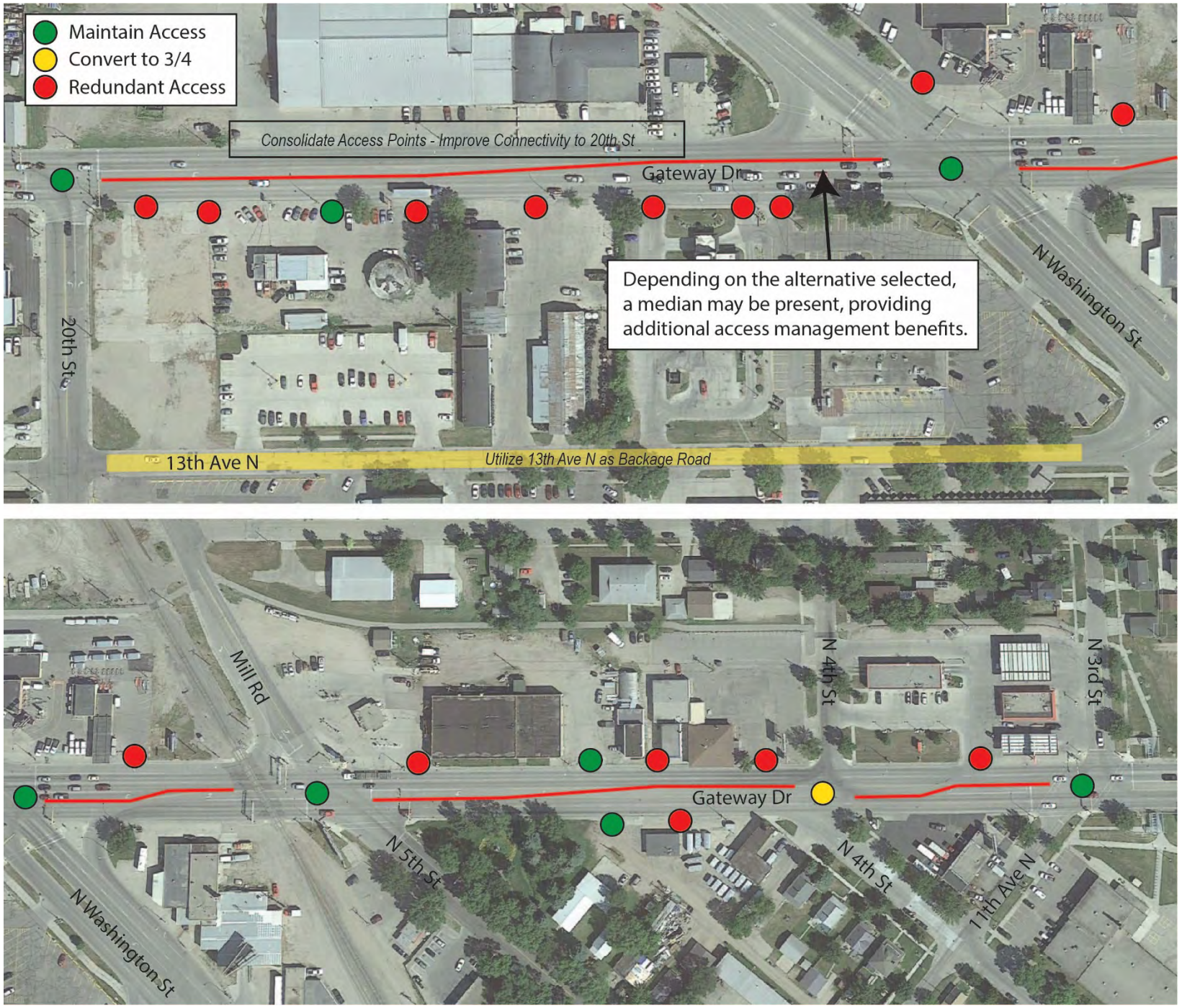
GRAND FORKS – EAST GRAND FORKS MPO

US–2 & US–81 INTERSECTION SKEW STUDY
PRELIMINARY ALTERNATIVES ANALYSIS
EXISTING FOOTPRINT IMPROVEMENT

jeremymeljust
6/6/2019 5:53:11 PM

Optional Access Management

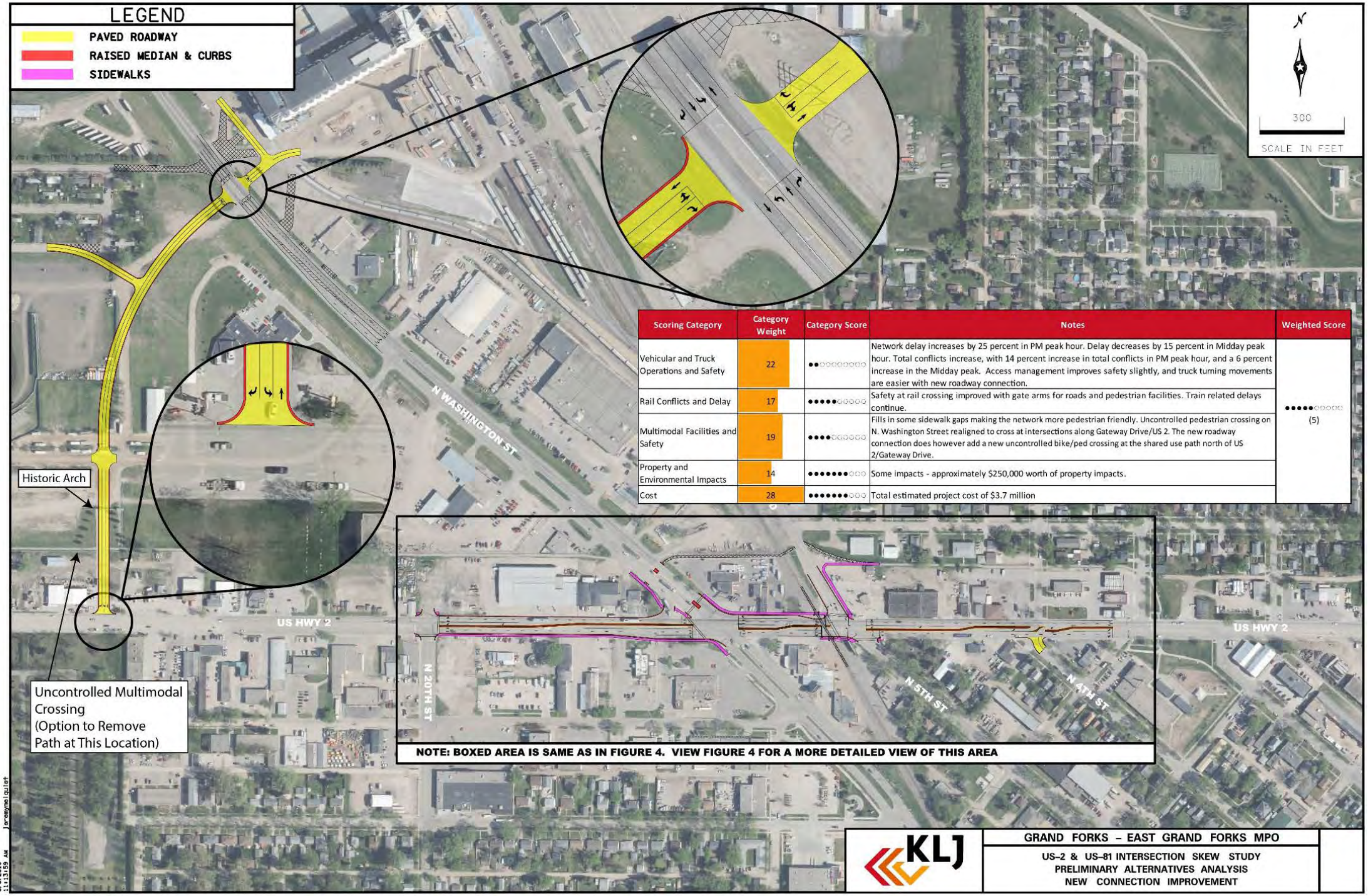


Alt EF: Existing Footprint Improvement Plan

Rankings

Alternative	Category	Category Rank	Overall Rank
EF: Existing Footprint Improvement Plan	Vehicular and Truck Operations and Safety	3	2
	Rail Conflicts and Delay	5	
	Multimodal Facilities and Safety	3	
	Property and Environmental Impacts	1	
	Cost	1	

Alt NRC: New Roadway Connection Improvement Plan



Scoring Category	Category Weight	Category Score	Notes	Weighted Score
Vehicular and Truck Operations and Safety	22	●●○○○○○○○○	Network delay increases by 25 percent in PM peak hour. Delay decreases by 15 percent in Midday peak hour. Total conflicts increase, with 14 percent increase in total conflicts in PM peak hour, and a 6 percent increase in the Midday peak. Access management improves safety slightly, and truck turning movements are easier with new roadway connection.	●●●●●○○○○○ (5)
Rail Conflicts and Delay	17	●●●●●○○○○○	Safety at rail crossing improved with gate arms for roads and pedestrian facilities. Train related delays continue.	
Multimodal Facilities and Safety	19	●●●●○○○○○○	Fills in some sidewalk gaps making the network more pedestrian friendly. Uncontrolled pedestrian crossing on N. Washington Street realigned to cross at intersections along Gateway Drive/US 2. The new roadway connection does however add a new uncontrolled bike/ped crossing at the shared use path north of US 2/Gateway Drive.	
Property and Environmental Impacts	14	●●●●●●●○○○	Some impacts - approximately $250,000 worth of property impacts.	
Cost	28	●●●●●●●○○○	Total estimated project cost of $3.7 million	

GRAND FORKS – EAST GRAND FORKS MPO

US–2 & US–81 INTERSECTION SKEW STUDY
PRELIMINARY ALTERNATIVES ANALYSIS
NEW CONNECTION IMPROVEMENT

6/6/2019 11:13:59 AM Jeremy.Mellief

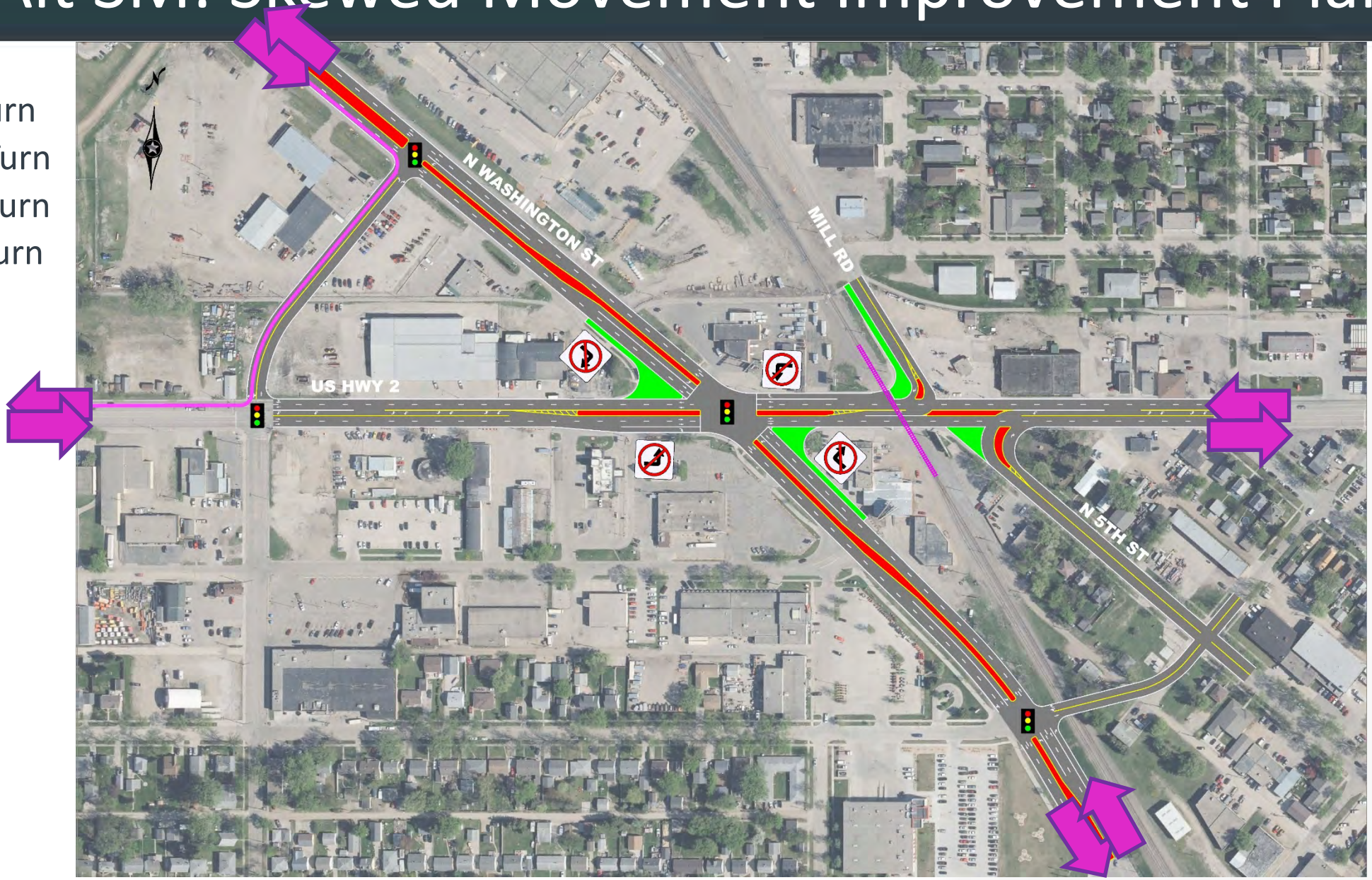
Alt NRC: New Roadway Connection Improvement Plan

Rankings

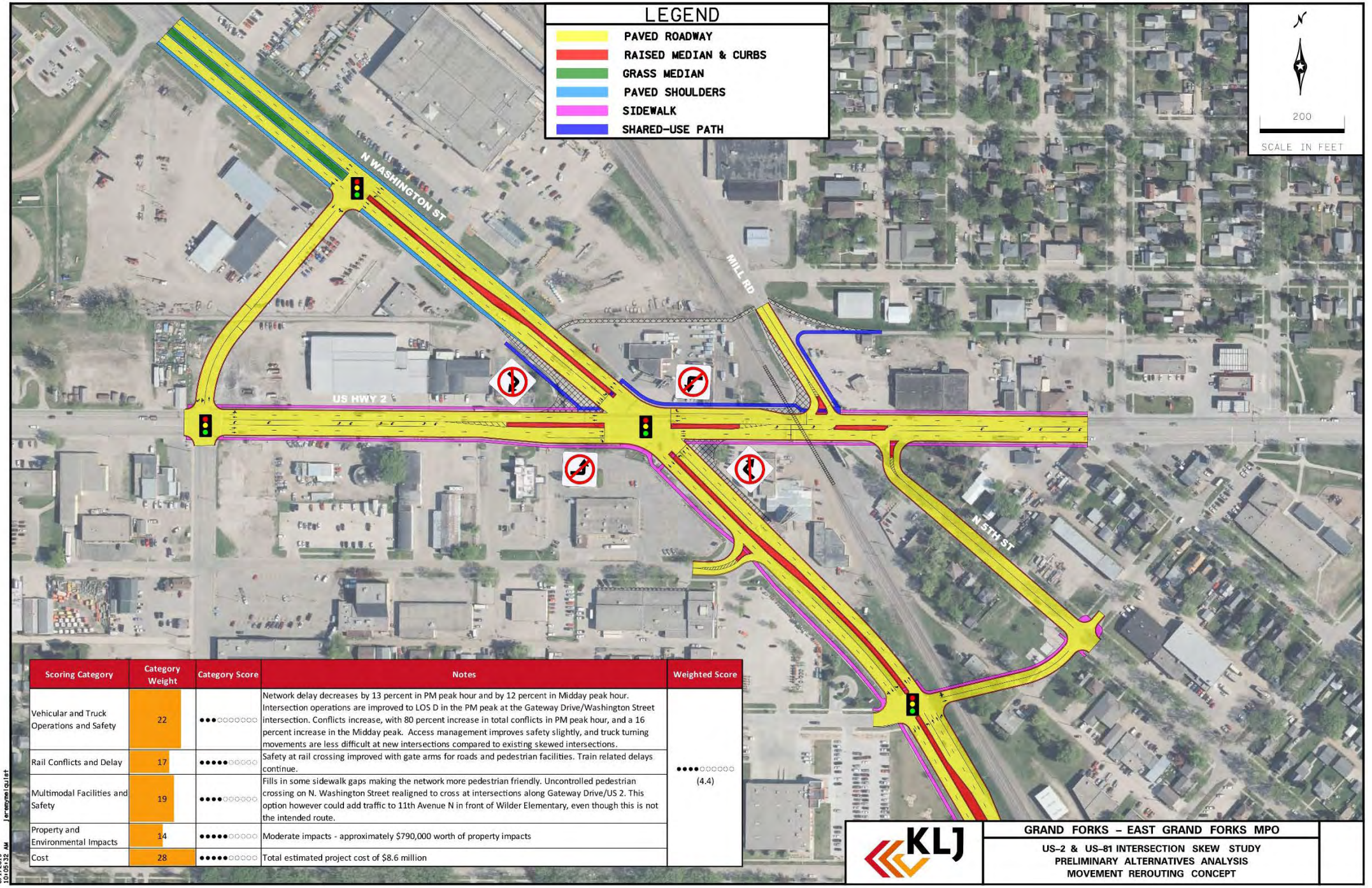
Alternative	Category	Category Rank	Overall Rank
NRC: New Roadway Connection Improvement Plan	Vehicular and Truck Operations and Safety	7	6
	Rail Conflicts and Delay	5	
	Multimodal Facilities and Safety	5	
	Property and Environmental Impacts	3	
	Cost	2	

Alt SM: Skewed Movement Improvement Plan

EB Left Turn
WB Left Turn
NB Right Turn
SB Right Turn



Alt SM: Skewed Movement Improvement Plan



Scoring Category	Category Weight	Category Score	Notes	Weighted Score
Vehicular and Truck Operations and Safety	22	●●●○○○○○○○	Network delay decreases by 13 percent in PM peak hour and by 12 percent in Midday peak hour. Intersection operations are improved to LOS D in the PM peak at the Gateway Drive/Washington Street intersection. Conflicts increase, with 80 percent increase in total conflicts in PM peak hour, and a 16 percent increase in the Midday peak. Access management improves safety slightly, and truck turning movements are less difficult at new intersections compared to existing skewed intersections.	●●●●○○○○○○ (4.4)
Rail Conflicts and Delay	17	●●●●●○○○○○	Safety at rail crossing improved with gate arms for roads and pedestrian facilities. Train related delays continue.	
Multimodal Facilities and Safety	19	●●●●○○○○○○	Fills in some sidewalk gaps making the network more pedestrian friendly. Uncontrolled pedestrian crossing on N. Washington Street realigned to cross at intersections along Gateway Drive/US 2. This option however could add traffic to 11th Avenue N in front of Wilder Elementary, even though this is not the intended route.	
Property and Environmental Impacts	14	●●●●●○○○○○	Moderate impacts - approximately $790,000 worth of property impacts	
Cost	28	●●●●●○○○○○	Total estimated project cost of $8.6 million	

8/1/2019 10:05:32 AM Jeremy.Mailquist

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GRAND FORKS – EAST GRAND FORKS MPO

US-2 & US-81 INTERSECTION SKEW STUDY
PRELIMINARY ALTERNATIVES ANALYSIS
MOVEMENT REROUTING CONCEPT

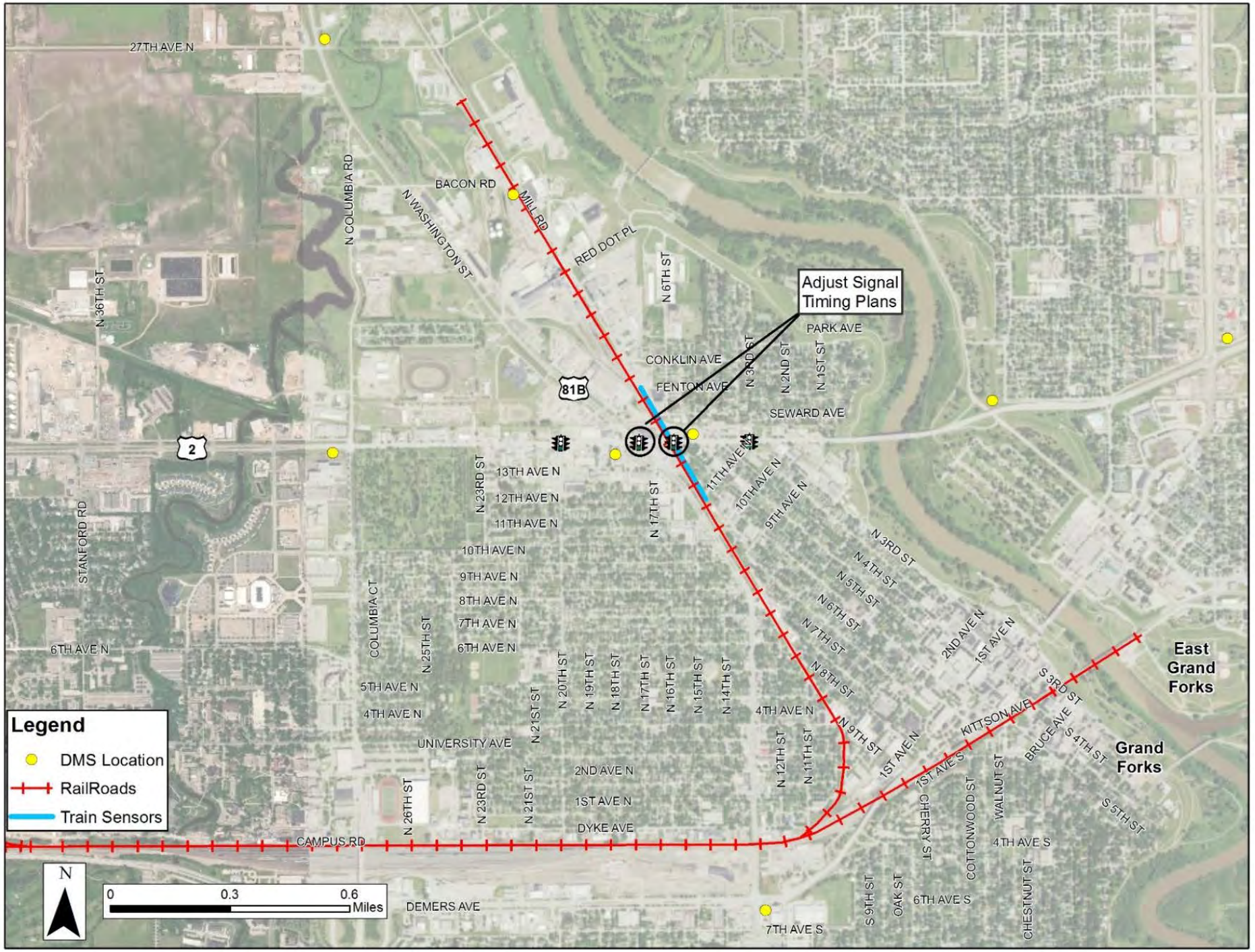
Alt SM: Skewed Movement Improvement Plan

Rankings

Alternative	Category	Category Rank	Overall Rank
SM: Skewed Movement Rerouting Improvement Plan	Vehicular and Truck Operations and Safety	5	7
	Rail Conflicts and Delay	5	
	Multimodal Facilities and Safety	5	
	Property and Environmental Impacts	4	
	Cost	4	

Sub-Option: ITS Routing Solution

Sub-Options: ITS Routing Solution

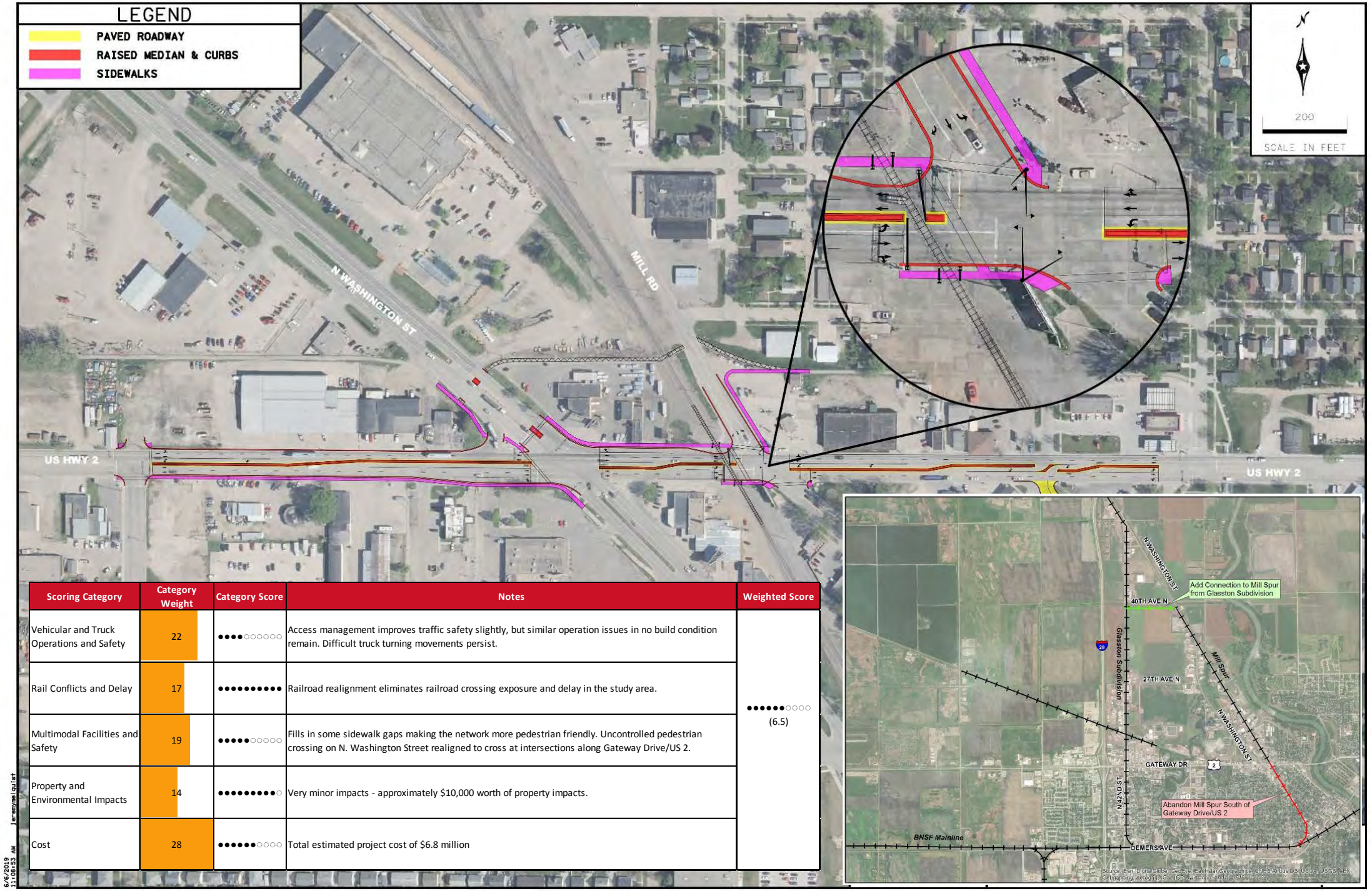


Base Alternatives with Railroad Realignment

Railroad Realignment

- Connect to Glasston Line
- Estimated to be $5.6M
- Past Studies Found Grade Separation Necessary at Gateway/42nd Street/Glasston Line
- Benefits to 8 Other Mill Spur Crossings to Safety and Noise

Alt EF+R: Existing Footprint With Realignment



Scoring Category	Category Weight	Category Score	Notes	Weighted Score
Vehicular and Truck Operations and Safety	22	●●●●○○○○○○	Access management improves traffic safety slightly, but similar operation issues in no build condition remain. Difficult truck turning movements persist.	●●●●●●○○○○ (6.5)
Rail Conflicts and Delay	17	●●●●●●●●●●	Railroad realignment eliminates railroad crossing exposure and delay in the study area.	
Multimodal Facilities and Safety	19	●●●●●○○○○○	Fills in some sidewalk gaps making the network more pedestrian friendly. Uncontrolled pedestrian crossing on N. Washington Street realigned to cross at intersections along Gateway Drive/US 2.	
Property and Environmental Impacts	14	●●●●●●●●●○	Very minor impacts - approximately $10,000 worth of property impacts.	
Cost	28	●●●●●●○○○○	Total estimated project cost of $6.8 million	

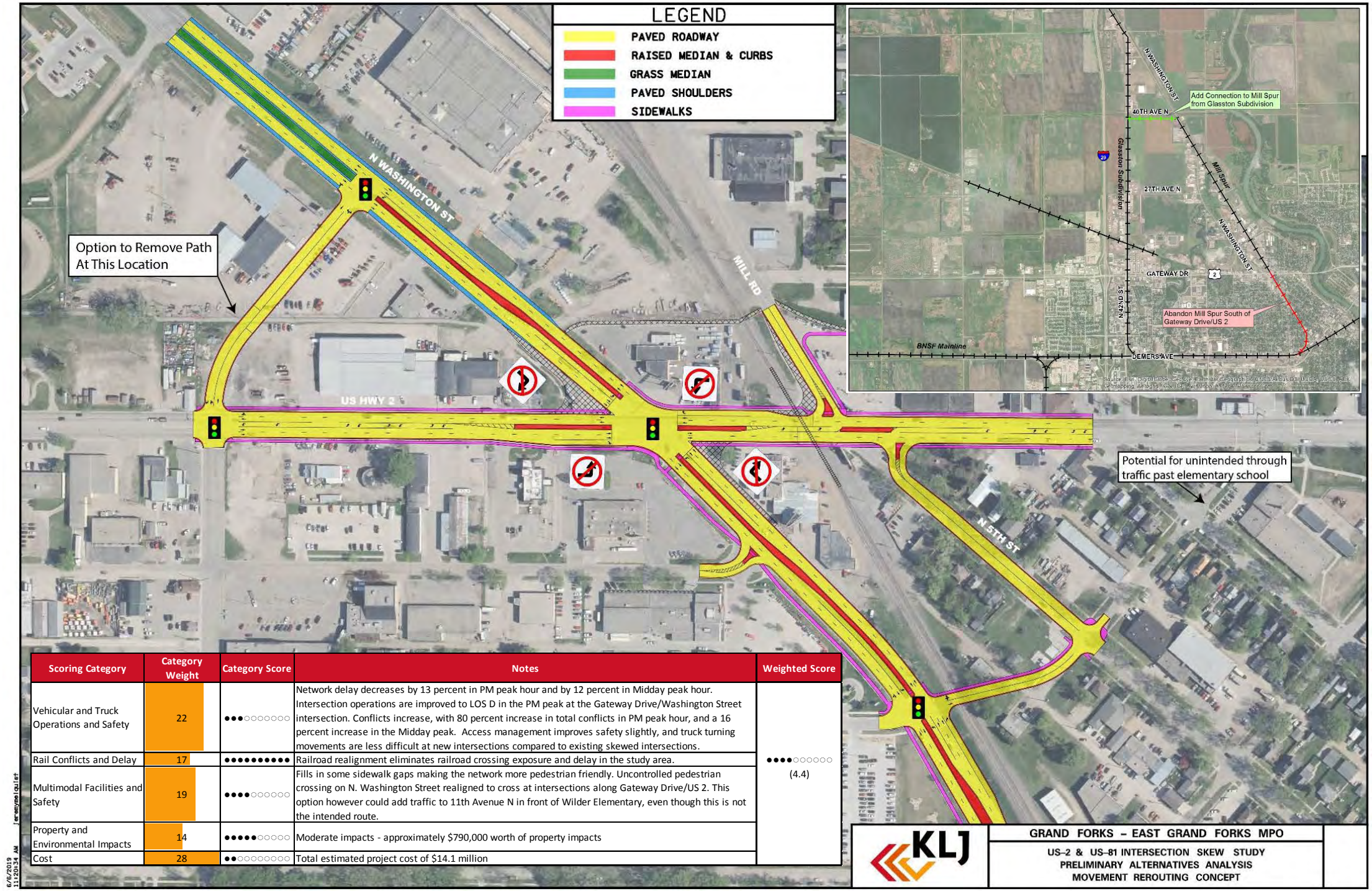
6/6/2019 11:10:53 AM Jennymequist

Alt EF+R: Existing Footprint with Realignment

Rankings

Alternative	Category	Category Rank	Overall Rank
EF+R: Railroad Realignment with Existing Footprint Improvement Plan	Vehicular and Truck Operations and Safety	3	1
	Rail Conflicts and Delay	1	
	Multimodal Facilities and Safety	3	
	Property and Environmental Impacts	1	
	Cost	3	

Alt SM+R: Skewed Movement With Roadway Realignment



Scoring Category	Category Weight	Category Score	Notes	Weighted Score
Vehicular and Truck Operations and Safety	22	●●●○○○○○○○	Network delay decreases by 13 percent in PM peak hour and by 12 percent in Midday peak hour. Intersection operations are improved to LOS D in the PM peak at the Gateway Drive/Washington Street intersection. Conflicts increase, with 80 percent increase in total conflicts in PM peak hour, and a 16 percent increase in the Midday peak. Access management improves safety slightly, and truck turning movements are less difficult at new intersections compared to existing skewed intersections.	●●●●○○○○○○ (4.4)
Rail Conflicts and Delay	17	●●●●●●●●●●	Railroad realignment eliminates railroad crossing exposure and delay in the study area.	
Multimodal Facilities and Safety	19	●●●●○○○○○○	Fills in some sidewalk gaps making the network more pedestrian friendly. Uncontrolled pedestrian crossing on N. Washington Street realigned to cross at intersections along Gateway Drive/US 2. This option however could add traffic to 11th Avenue N in front of Wilder Elementary, even though this is not the intended route.	
Property and Environmental Impacts	14	●●●●●○○○○○	Moderate impacts - approximately $790,000 worth of property impacts	
Cost	28	●●○○○○○○○○	Total estimated project cost of $14.1 million	

KLJ

GRAND FORKS – EAST GRAND FORKS MPO

US-2 & US-81 INTERSECTION SKEW STUDY
PRELIMINARY ALTERNATIVES ANALYSIS
MOVEMENT REROUTING CONCEPT

6/6/2019 11:20:34 AM jeremymolquist

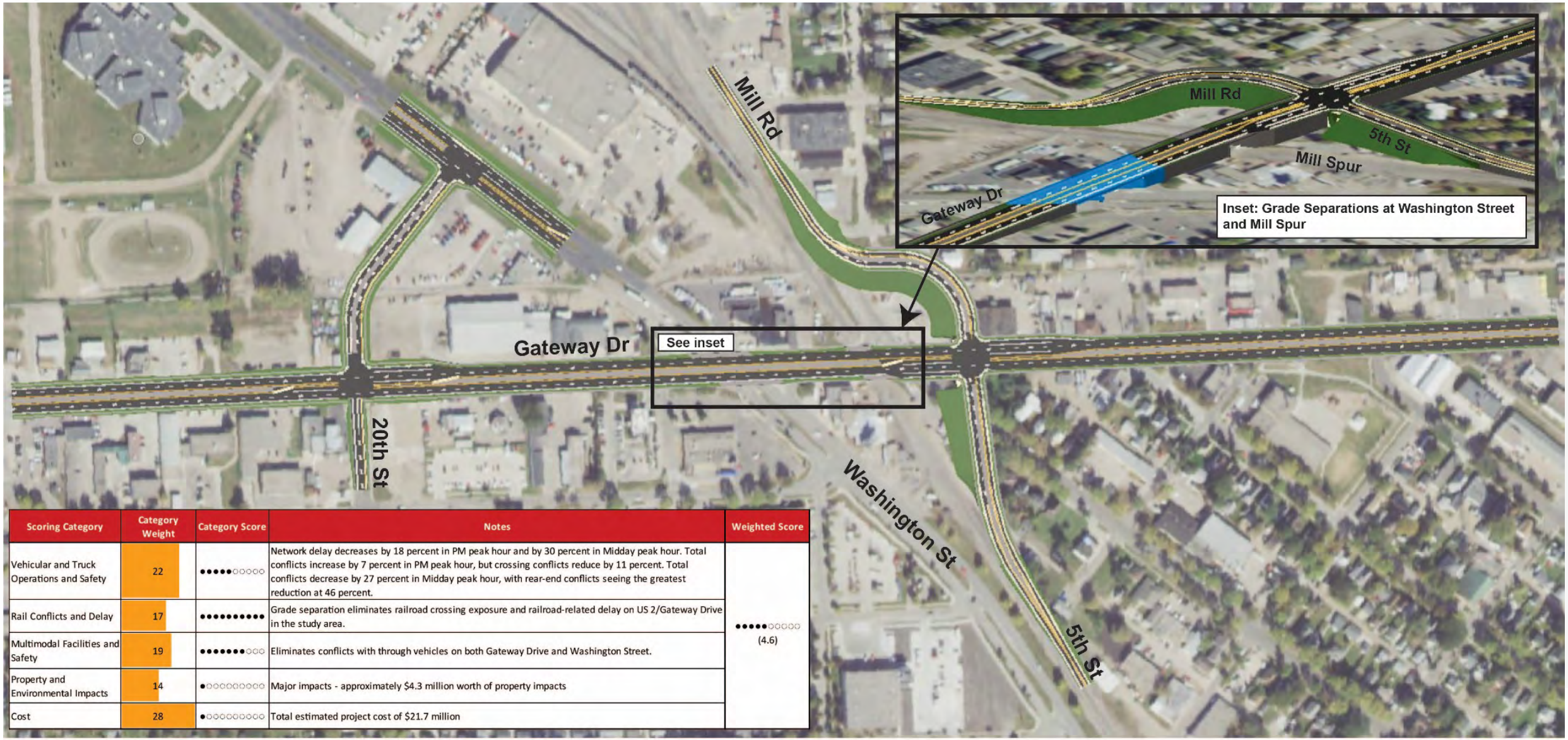
Alt SM+R: Skewed Movement with Roadway Realignment

Rankings

Alternative	Category	Category Rank	Overall Rank
SM+R: Railroad Realignment with Skewed Movement Rerouting Improvement Plan	Vehicular and Truck Operations and Safety	5	5
	Rail Conflicts and Delay	1	
	Multimodal Facilities and Safety	5	
	Property and Environmental Impacts	4	
	Cost	5	

Railroad Grade Separated Alternatives

Alt GS-1: Grade Separation of Washington St and Mill Spur



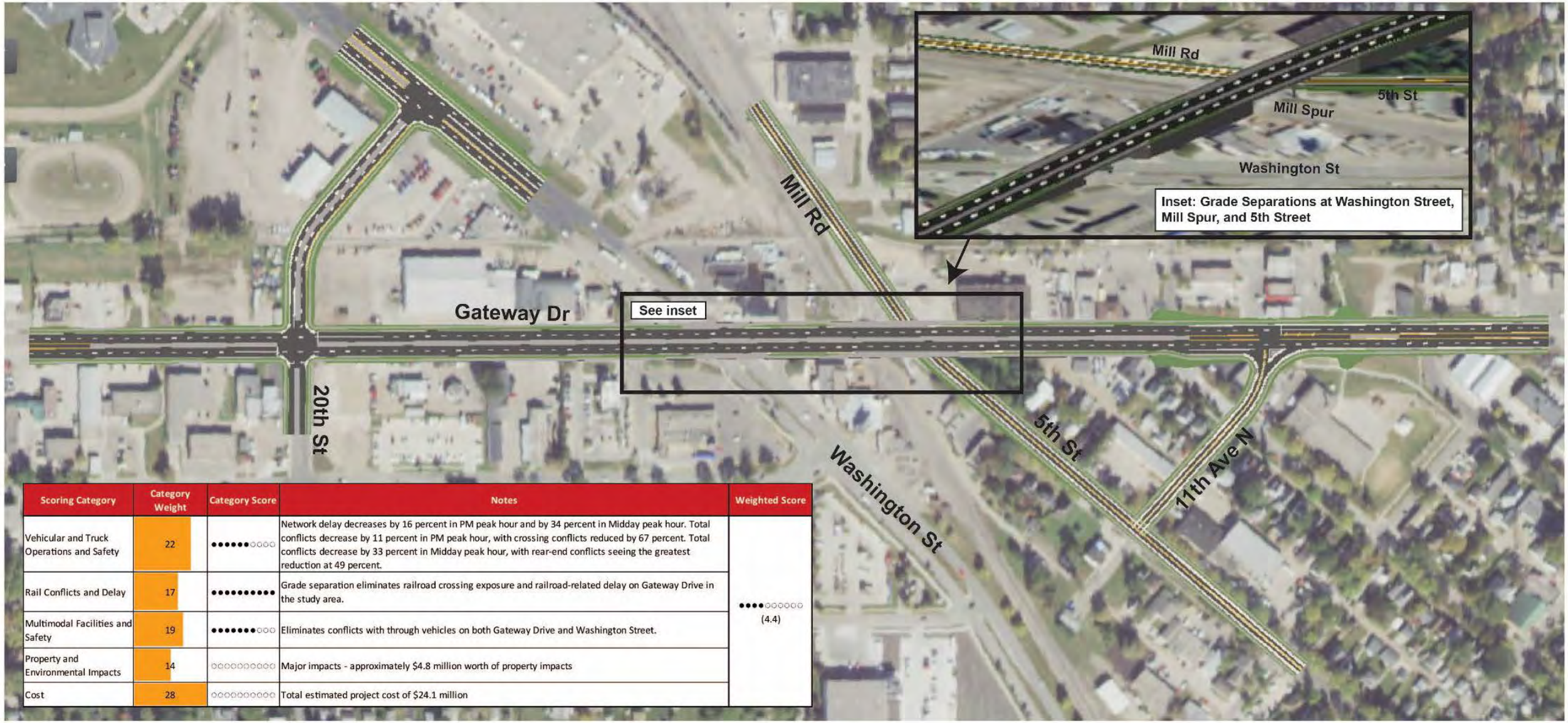
Scoring Category	Category Weight	Category Score	Notes	Weighted Score
Vehicular and Truck Operations and Safety	22	●●●●●○○○○○	Network delay decreases by 18 percent in PM peak hour and by 30 percent in Midday peak hour. Total conflicts increase by 7 percent in PM peak hour, but crossing conflicts reduce by 11 percent. Total conflicts decrease by 27 percent in Midday peak hour, with rear-end conflicts seeing the greatest reduction at 46 percent.	●●●●●○○○○○ (4.6)
Rail Conflicts and Delay	17	●●●●●●●●●●	Grade separation eliminates railroad crossing exposure and railroad-related delay on US 2/Gateway Drive in the study area.	
Multimodal Facilities and Safety	19	●●●●●●●○○○	Eliminates conflicts with through vehicles on both Gateway Drive and Washington Street.	
Property and Environmental Impacts	14	●○○○○○○○○○	Major impacts - approximately $4.3 million worth of property impacts	
Cost	28	●○○○○○○○○○	Total estimated project cost of $21.7 million	

Alt GS-1: Grade Separation of Washington St and Mill Spur

Rankings

Alternative	Category	Category Rank	Overall Rank
GS-1: Grade Separation of US 81/Washington Street and Mill Spur	Vehicular and Truck Operations and Safety	2	3
	Rail Conflicts and Delay	1	
	Multimodal Facilities and Safety	1	
	Property and Environmental Impacts	6	
	Cost	6	

Alt GS-2: Grade Separation of Washington St, Mill Spur and Mill Road

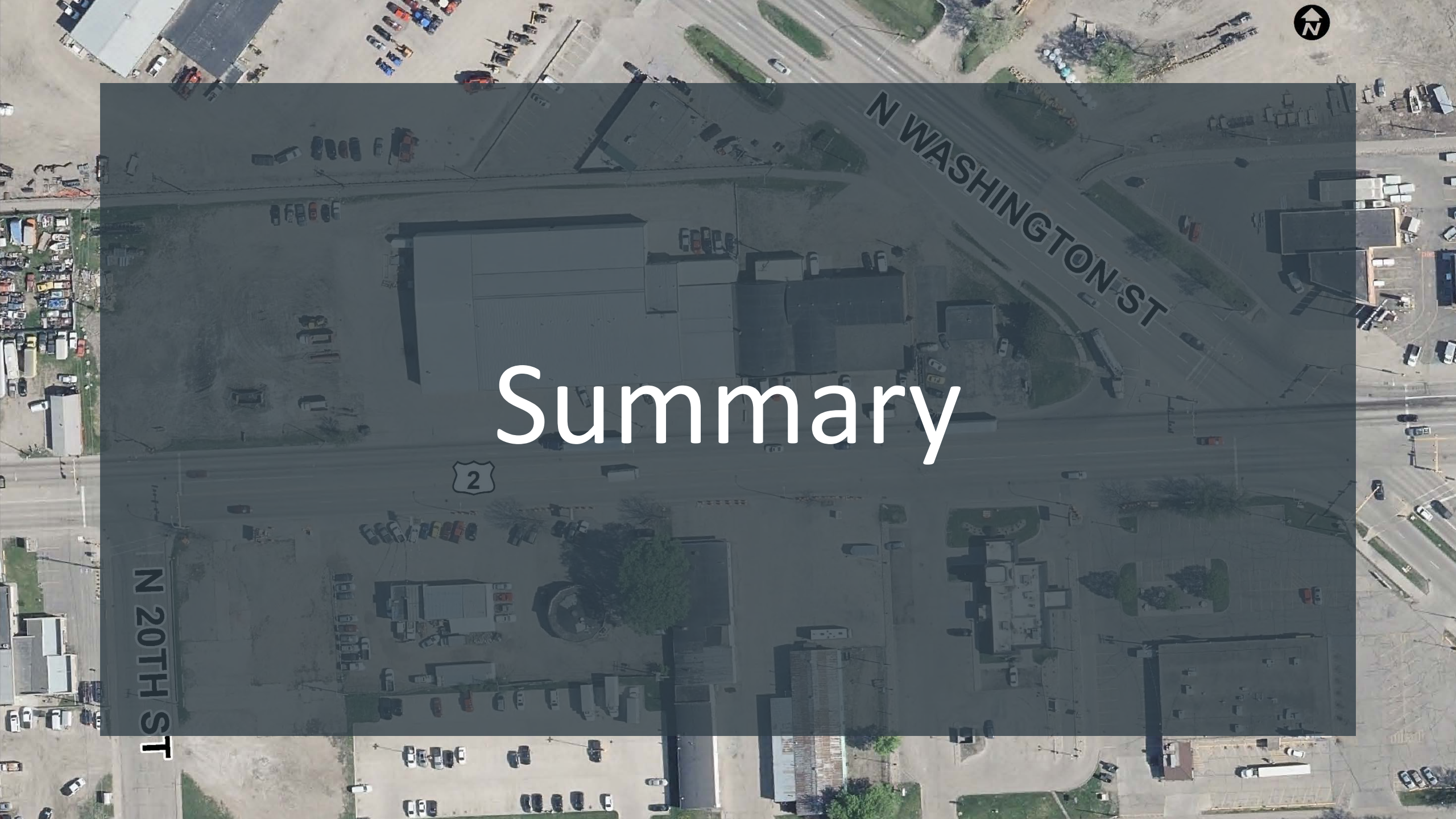


Scoring Category	Category Weight	Category Score	Notes	Weighted Score
Vehicular and Truck Operations and Safety	22	●●●●●●○○○○	Network delay decreases by 16 percent in PM peak hour and by 34 percent in Midday peak hour. Total conflicts decrease by 11 percent in PM peak hour, with crossing conflicts reduced by 67 percent. Total conflicts decrease by 33 percent in Midday peak hour, with rear-end conflicts seeing the greatest reduction at 49 percent.	●●●●○○○○○○ (4.4)
Rail Conflicts and Delay	17	●●●●●●●●●●	Grade separation eliminates railroad crossing exposure and railroad-related delay on Gateway Drive in the study area.	
Multimodal Facilities and Safety	19	●●●●●●●○○○	Eliminates conflicts with through vehicles on both Gateway Drive and Washington Street.	
Property and Environmental Impacts	14	○○○○○○○○○○	Major impacts - approximately $4.8 million worth of property impacts	
Cost	28	○○○○○○○○○○	Total estimated project cost of $24.1 million	

Alt GS-2: Grade Separation of Washington St, Mill Spur and Mill Road

Rankings

Alternative	Category	Category Rank	Overall Rank
GS-2: Grade Separation of US 81/Washington Street, Mill Spur, and Mill Road/5th Street	Vehicular and Truck Operations and Safety	1	4
	Rail Conflicts and Delay	1	
	Multimodal Facilities and Safety	1	
	Property and Environmental Impacts	7	
	Cost	7	



Summary

[redacted]

[redacted]

- Do Nothing
  - Lowest Benefits

[redacted]

- Railroad Realignment
  - 2nd Highest Benefits

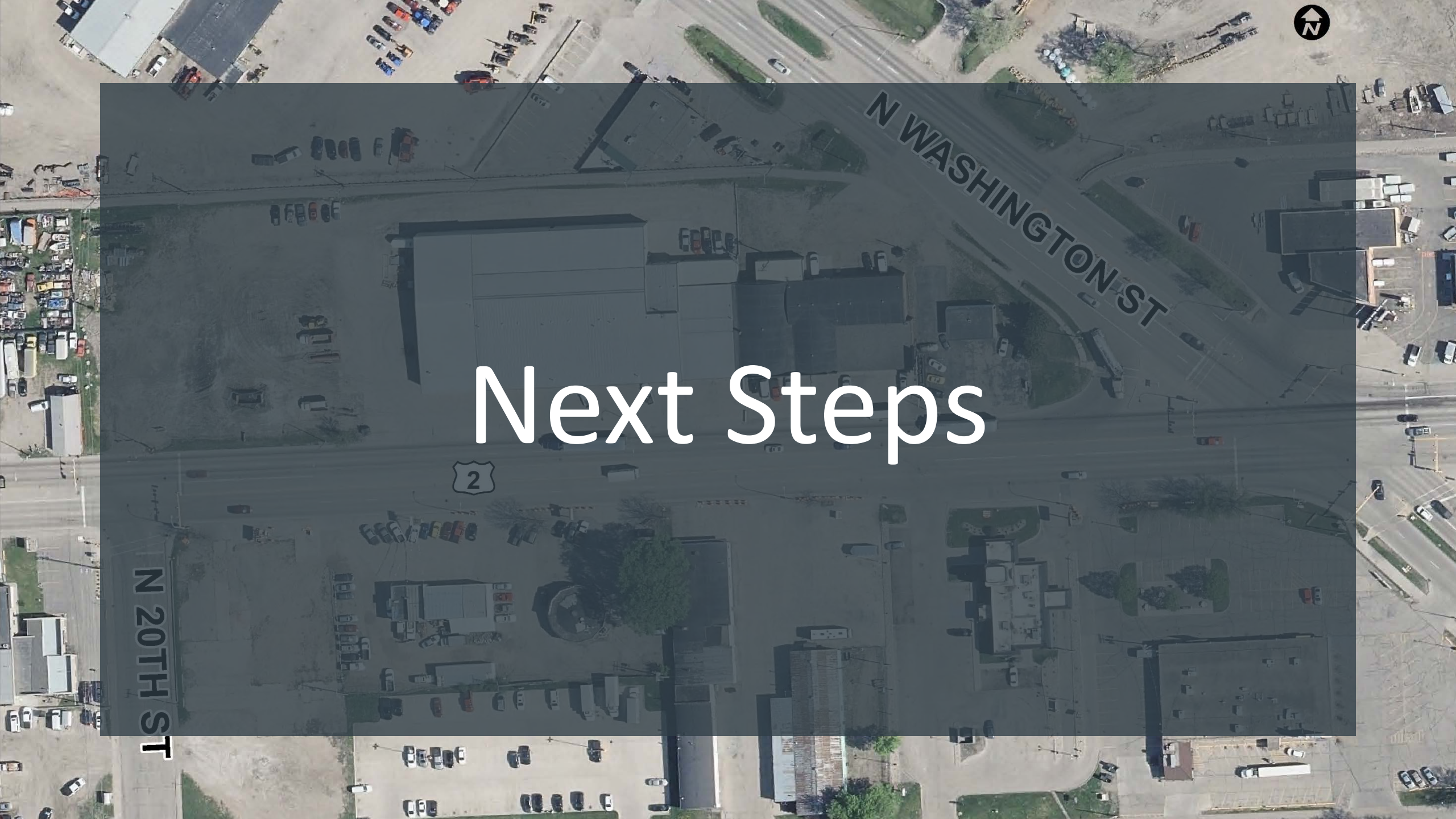
- Grade Separation
  - Highest Benefits

Alternatives Summary – Rankings

Alternative	Category	Category Rank	Overall Rank
EF: Existing Footprint Improvement Plan	Vehicular and Truck Operations and Safety	3	2
	Rail Conflicts and Delay	5	
	Multimodal Facilities and Safety	3	
	Property and Environmental Impacts	1	
	Cost	1	
NRC: New Roadway Connection Improvement Plan	Vehicular and Truck Operations and Safety	7	6
	Rail Conflicts and Delay	5	
	Multimodal Facilities and Safety	5	
	Property and Environmental Impacts	3	
	Cost	2	
SM: Skewed Movement Rerouting Improvement Plan	Vehicular and Truck Operations and Safety	5	7
	Rail Conflicts and Delay	5	
	Multimodal Facilities and Safety	5	
	Property and Environmental Impacts	4	
	Cost	4	
EF+R: Railroad Realignment with Existing Footprint Improvement Plan	Vehicular and Truck Operations and Safety	3	1
	Rail Conflicts and Delay	1	
	Multimodal Facilities and Safety	3	
	Property and Environmental Impacts	1	
	Cost	3	
SM+R: Railroad Realignment with Skewed Movement Rerouting Improvement Plan	Vehicular and Truck Operations and Safety	5	5
	Rail Conflicts and Delay	1	
	Multimodal Facilities and Safety	5	
	Property and Environmental Impacts	4	
	Cost	5	
GS-1: Grade Separation of US 81/Washington Street and Mill Spur	Vehicular and Truck Operations and Safety	2	3
	Rail Conflicts and Delay	1	
	Multimodal Facilities and Safety	1	
	Property and Environmental Impacts	6	
	Cost	6	
GS-2: Grade Separation of US 81/Washington Street, Mill Spur, and Mill Road/5th Street	Vehicular and Truck Operations and Safety	1	4
	Rail Conflicts and Delay	1	
	Multimodal Facilities and Safety	1	
	Property and Environmental Impacts	7	
	Cost	7	

Key Takeaways

1. Eliminating Skewed Turning Movements Comes at a Heavy Cost Either Financially or to Operations
2. It's More Expensive and Impactful to Grade Separate then Realign the Railroad. This Doesn't Account for Benefits at all the Other Crossings Along Mill Spur
3. Traffic Forecasts on Gateway Drive are High and Make Solutions without Added Capacity Challenging. Forecasts should be Monitored.
4. Consolidating Washington with 5th/Mill Spur Isn't Likely Accomplished with Acceptable Operations



Next Steps

Next Steps

Get Your Input!

Develop Implementation Plan and Draft Report

Review Draft Report with Steering Committee

Draft Report Available to the Public

How to Get Involved

- Share Your Ideas at the Meeting!
- Fill Out Scorecard Worksheet
- E-mail: mike.bittner@kljeng.com
- Fill Out Comment Card
- Visit website: https://theforksmpo.com/the-forks-mpo/