

I-70 & Kipling Interchange PEL Study

Level 2 Screening



No Action

The No Action alternative is included for comparison of the anticipated traffic operations if no improvements are made to the interchange to the benefits that would result from potential improvements. Under the No Action alternative, several programmed transportation improvements within the study area (with committed funding sources) would be completed, including:

- Kipling Shared Use Path, 32nd Ave to 44th Ave – new detached shared use path on east side of Kipling St
- Kipling Trail, 58th Ave to Ridge Rd – new detached shared use path on west side of Kipling St
- Ridge Rd Bike/Pedestrian Improvements – improved bicycle/pedestrian connection to Gold Line station
- RTD Gold Line Commuter Rail – commuter rail with station at Kipling St and Ridge Rd
- Van Bibber Trail Underpass – new underpass of Kipling St at 56th Pl

Operations and Safety

- Peak hour delay increase experienced at ramp and frontage road intersections.
- Southbound Kipling Street peak hour queues leading to the interchange back up through the 50th Avenue intersection.
- Peak hour queues on the westbound I-70 off ramp extend back to the mainline freeway.
- Increase in accidents expected due to additional congestion as traffic volumes increase.

Multimodal Connections

- Only narrow sidewalk provided directly through the interchange and no bicycle lanes on Kipling Street.

Environmental and Community Impacts

- Limited property impacts.
- Minimal environmental impacts expected with increase in noise and degraded air quality from congestion.
- Increased congestion during peak hours may increase traffic traveling through the surrounding neighborhoods.

Constructability

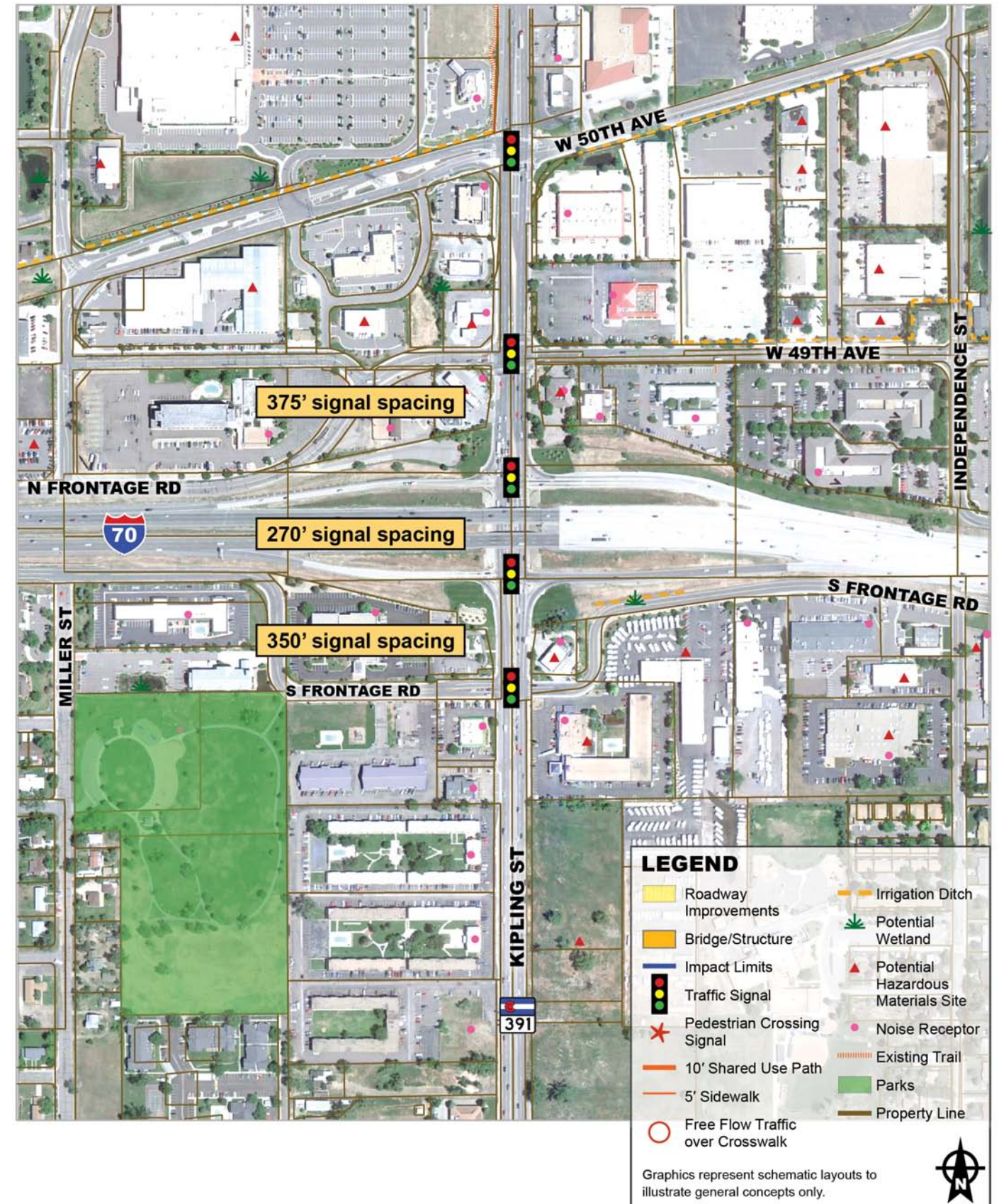
- No construction or right-of-way cost.

Summary of Critical Considerations

Advantages	Disadvantages
<ul style="list-style-type: none"> • No construction or right-of-way costs 	<ul style="list-style-type: none"> • Degraded peak hour vehicular operations • Increased safety issues due to congestion • Substandard multimodal connections

Recommendation:

CARRIED FORWARD
Further analysis required for comparison



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Single Point Urban Interchange (SPUI) Alternative I

This interchange consists of a single signalized intersection on Kipling Street serving all movements to/from the I-70 ramps and the Kipling Street through movements.

The alternative provides a compact layout, eliminates one signal on Kipling Street, and increases signal spacing on Kipling Street.

Operations and Safety

- Westbound I-70 Off Ramp delay reduced by 30% from the No Action alternative in the PM peak hour.
- Peak hour queues on the westbound I-70 off ramp are reduced by almost 75%.
- Greater intersection spacing and directional interchange layout is easy for drivers to negotiate.

Multimodal Connections

- Shared use path and bicycle lanes are provided directly through the interchange.
- The large single intersection may be intimidating for bicyclists and pedestrians to negotiate.

Environmental and Community Impacts

- Minimal environmental impacts expected.
- Interchange estimated to directly impact five properties with partial acquisition (total = 0.2 acres).
- No increase in traffic traveling through the surrounding neighborhoods expected.

Constructability

- Clear-span bridge for I-70 over Kipling Street is required, which creates difficult traffic impacts during construction and limited opportunities to construct in phases.
- Typical construction costs expected with minimal right-of-way costs. (\$ - relative low costs)

Summary of Critical Considerations

Advantages	Disadvantages
<ul style="list-style-type: none"> • Improved vehicular operations • Easy perceived driver expectancy • Direct multimodal connections through interchange • Minor right-of-way impacts • No change to current frontage road access • Typical construction and minimal right-of-way costs 	<ul style="list-style-type: none"> • Pedestrian crossings of high-speed right turns • Relatively difficult construction impacts compared to other alternatives • Limited opportunities to construct in phases

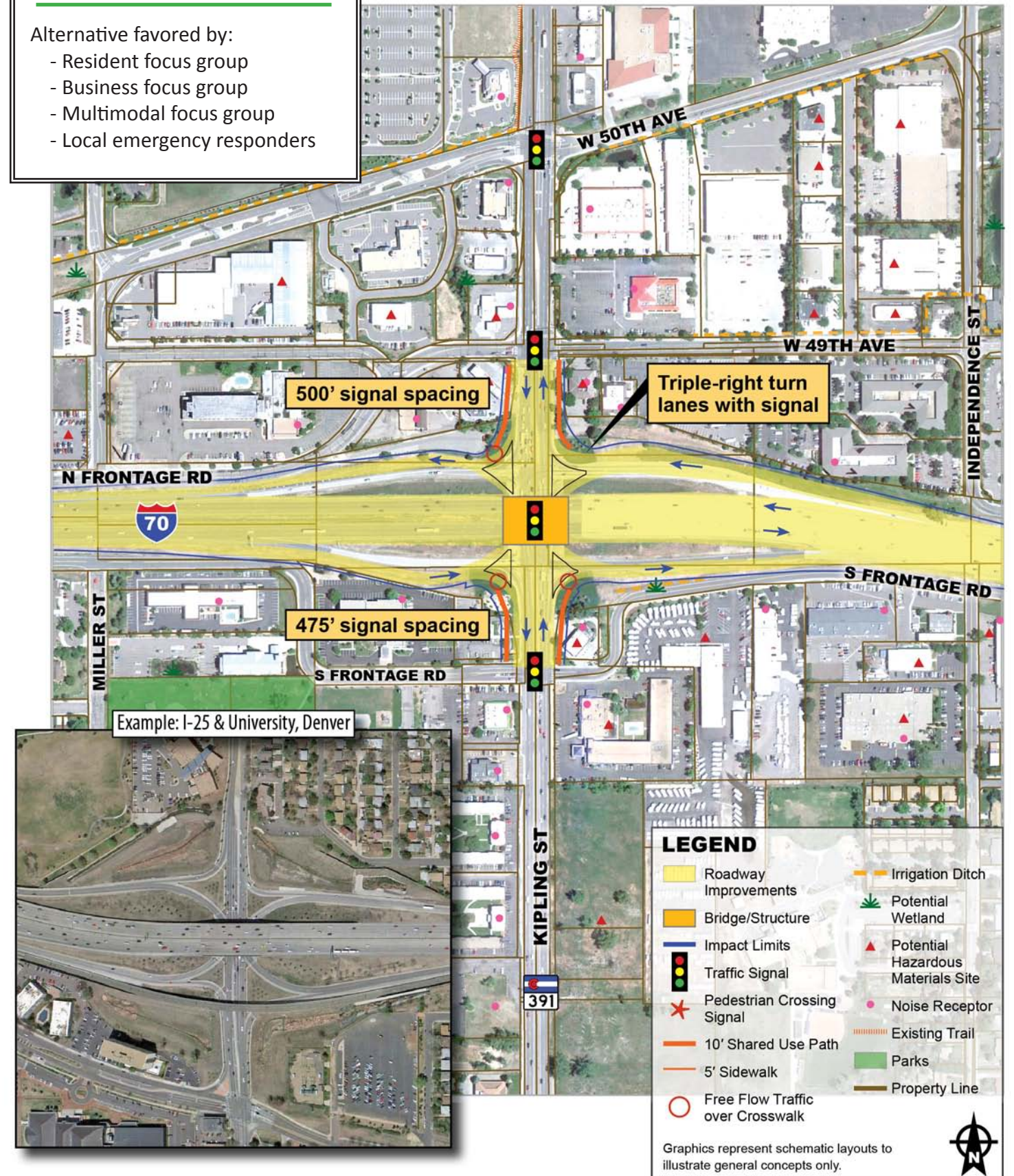
Recommendation:

CARRIED FORWARD

Stakeholder Favorite

Alternative favored by:

- Resident focus group
- Business focus group
- Multimodal focus group
- Local emergency responders



LEGEND

- Roadway Improvements
- Bridge/Structure
- Impact Limits
- Traffic Signal
- Pedestrian Crossing Signal
- 10' Shared Use Path
- 5' Sidewalk
- Free Flow Traffic over Crosswalk
- Irrigation Ditch
- Potential Wetland
- Potential Hazardous Materials Site
- Noise Receptor
- Existing Trail
- Parks
- Property Line

Graphics represent schematic layouts to illustrate general concepts only.



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Partial Cloverleaf with Loops Southwest & Northeast Quadrants Alternative 7

This interchange consists of a loop ramp in the southwest and northeast quadrants providing free-flow operations for the left turn movements from Kipling Street to eastbound and westbound I-70. South Frontage Road is relocated with a traffic signal on Kipling Street south of the interchange with location depending on local land use plans.

The alternative eliminates two traffic signals by removing the left turn movements onto the I-70 ramps and increases signal spacing on Kipling Street.

Operations and Safety

- Westbound I-70 Off Ramp delay reduced by 75% from the No Action alternative in the PM peak hour.
- Peak hour queues on the westbound I-70 off ramp are reduced by almost 70%.
- Greater intersection spacing and typical urban interchange layout is moderately easy for drivers to negotiate.

Multimodal Connections

- Shared use path and bicycle lanes are provided directly through the interchange.
- Shared use path and bicycle lanes cross free-flow loop ramp movements.

Environmental and Community Impacts

- Interchange estimated to directly impact 18 to 20 properties with seven to nine full and 11 partial acquisitions (total = 14.3 to 21.2 acres), depending on South Frontage Road relocation.
- Potential increase in traffic traveling on Independence Street in northeast quadrant expected due to closure of direct access to frontage road.

Constructability

- Relatively easy to construct with areas outside Kipling Street and opportunities to construct in phases.
- Typical construction costs expected with moderate right-of-way costs. (\$\$ - relative moderate costs)

Summary of Critical Considerations

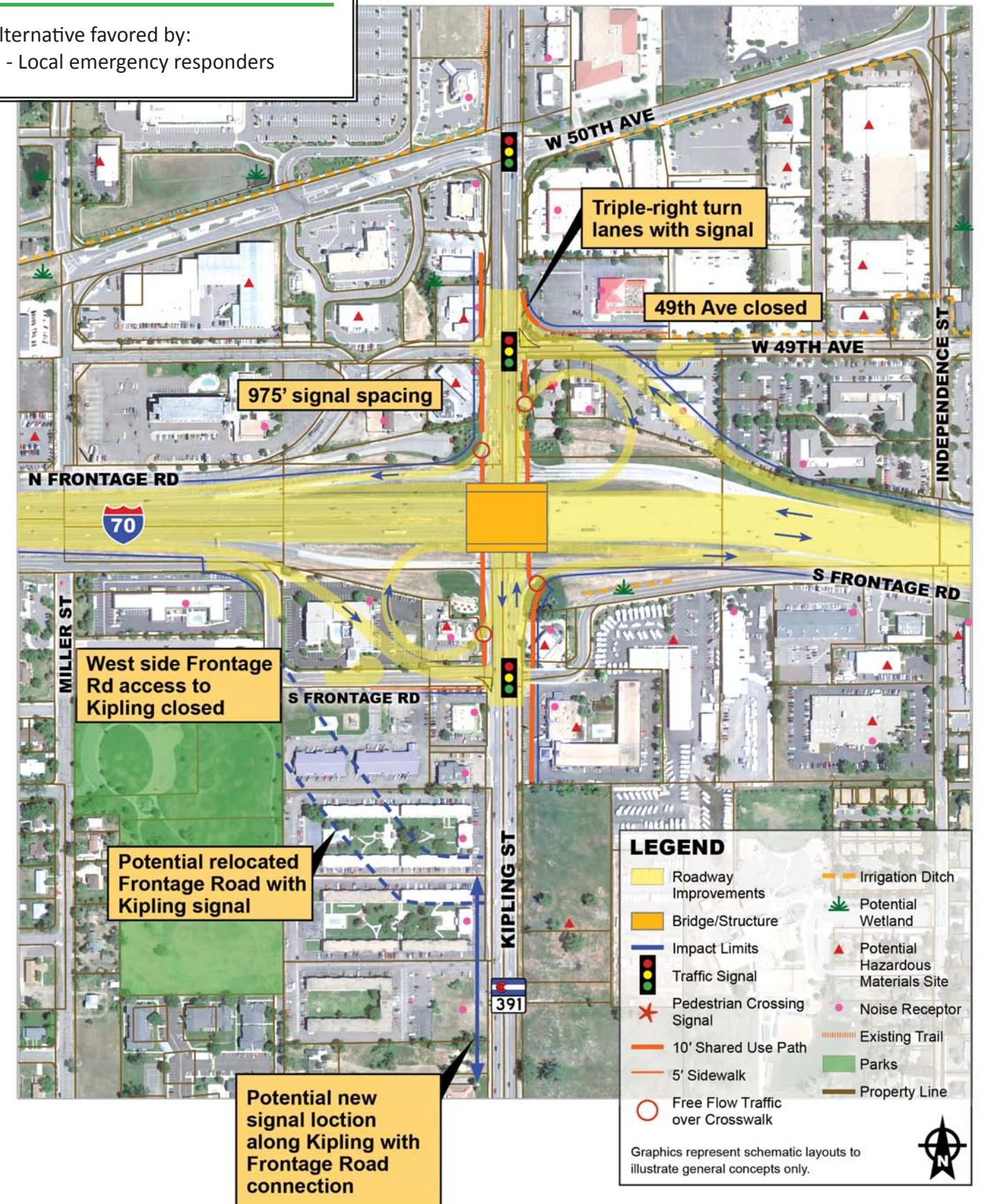
Advantages	Disadvantages
<ul style="list-style-type: none"> • Improved vehicular operations • Moderately easy perceived driver expectancy • Direct multimodal connections through interchange • Opportunities to construct in phases 	<ul style="list-style-type: none"> • Pedestrian crossings of free-flow ramp movements • Frontage road access to northeast quadrant closed • Moderate right-of-way impacts

Recommendation:

CARRIED FORWARD

Stakeholder Preference

Alternative favored by:
- Local emergency responders



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Traditional Diamond Interchange Alternative 12

This interchange consists of two signalized intersections on Kipling Street serving the I-70 ramps with increased spacing between the signals and the existing frontage road intersections are unsignalized and limited to right-in/right-out movements. The South Frontage Road is relocated with a traffic signal on Kipling Street south of the interchange with the location depending on local land use plans.

The alternative provides a eliminates two signals on Kipling Street and increases signal spacing.

Operations and Safety

- Westbound I-70 Off Ramp delay reduced by 45% from the No Action alternative in the PM peak hour.
- Southbound Kipling Street peak hour queues leading to the interchange are reduced by about 75%.
- Peak hour queues on the westbound I-70 off ramp are reduced by about 90%.
- Greater intersection spacing and directional interchange layout is easy for drivers to negotiate.

Multimodal Connections

- Shared use path and bicycle lanes are provided directly through the interchange.
- Pedestrians and bicyclists cross ramp intersections at signals.

Environmental and Community Impacts

- Interchange estimated to directly impact 20 to 22 properties with five to seven full and 15 partial acquisitions (total = 7.3 to 19.8 acres), depending on South Frontage Road relocation.
- Potential increase in traffic traveling on Independence Street in northeast quadrant expected due to limitation of left turns at access to frontage road.

Constructability

- Relatively easy to construct with areas outside Kipling Street and opportunities to construct in phases.
- Typical construction costs expected with moderate right-of-way costs. (\$\$ - relative moderate costs)

Summary of Critical Considerations

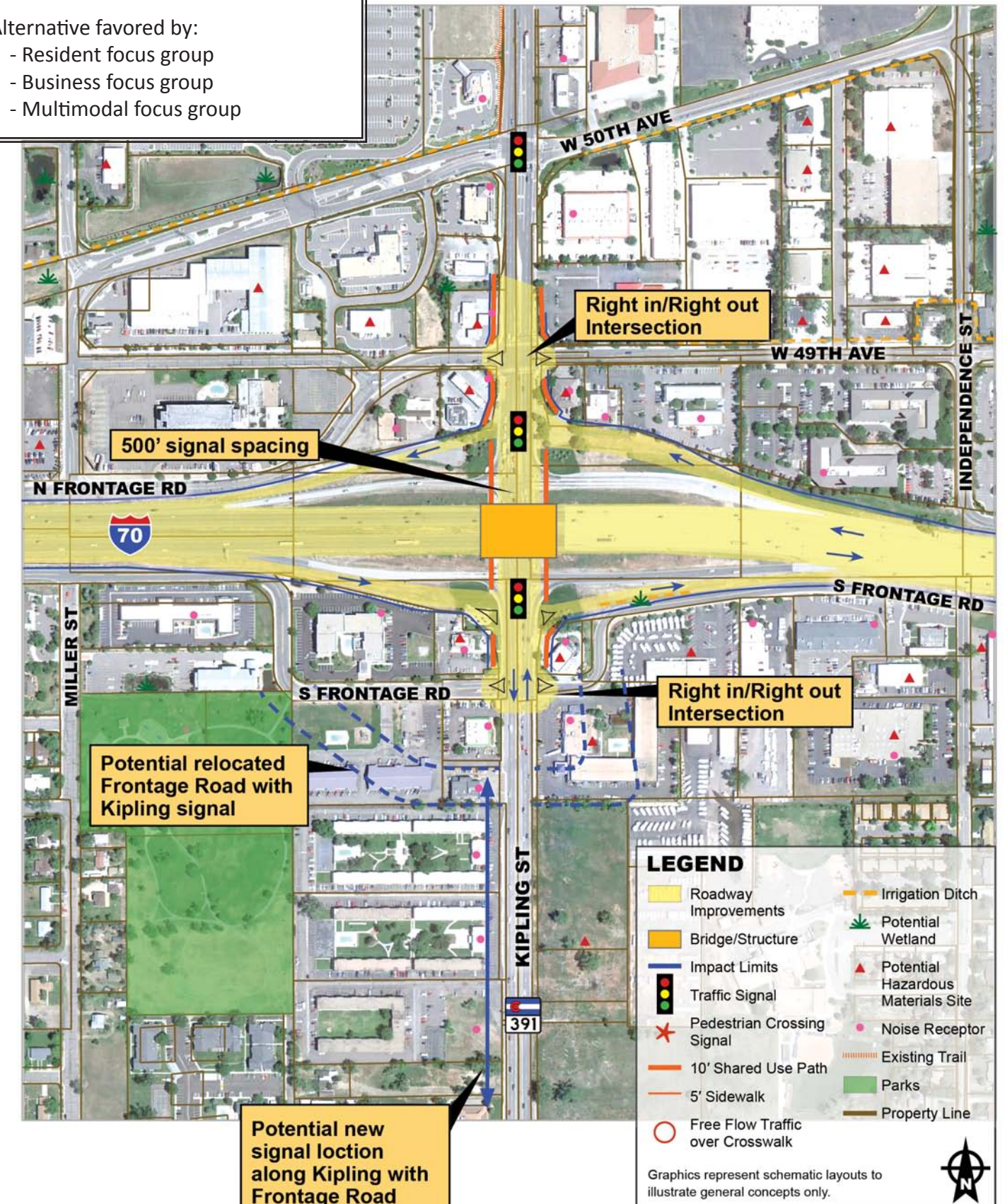
Advantages	Disadvantages
<ul style="list-style-type: none"> • Improved vehicular operations • Easy perceived driver expectancy • Direct multimodal connections through interchange • Opportunities to construct in phases 	<ul style="list-style-type: none"> • Existing frontage road access limited to right-in/right-out movements • Moderate right-of-way impacts with South Frontage Road relocation

Recommendation:

CARRIED FORWARD

Stakeholder Preference

- Alternative favored by:
- Resident focus group
 - Business focus group
 - Multimodal focus group



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Button Hook Ramps Alternative I7

This interchange consists of a loop ramp in the southwest quadrant providing free-flow operations for the left turn movement from southbound Kipling Street to eastbound I-70 and a loop ramp in the northwest quadrant providing access from the westbound off ramp to southbound Kipling Street with direct access to the frontage road in the northwest quadrant.

The alternative eliminates two traffic signals on Kipling Street and provides access between I-70 and the frontage roads.

Operations and Safety

- Westbound I-70 Off Ramp delay reduced by 70% from the No Action alternative in the PM peak hour.
- Southbound Kipling Street peak hour queues leading to the interchange are reduced by 85%.
- Peak hour queues on the westbound I-70 off ramp are reduced by 75%.
- Unusual movements for ramp access to/from Kipling Street is relatively difficult for drivers to negotiate.

Multimodal Connections

- Shared use path and bicycle lanes are provided directly through the interchange.
- Shared use path and bicycle lanes cross free-flow loop ramp movements.

Environmental and Community Impacts

- Interchange estimated to directly impact 18 properties with four full and 14 partial acquisitions (total = 6.2 acres).
- No increase in traffic traveling through neighborhoods expected.

Constructability

- Relatively easy to construct with areas outside Kipling Street and opportunities to construct in phases.
- Typical construction costs expected with moderate right-of-way costs. (\$\$ - relative moderate costs)

Summary of Critical Considerations

Advantages	Disadvantages
<ul style="list-style-type: none"> • Improved vehicular operations • Direct multimodal connections through interchange • Full access between ramps and frontage roads • Opportunities to construct in phases 	<ul style="list-style-type: none"> • Difficult perceived driver expectancy • Pedestrian crossings of free-flow ramp movements • Moderate right-of-way impacts

Recommendation:

CARRIED FORWARD

