Treasure Valley High Capacity Transit Study

Traffic Issues Evaluation

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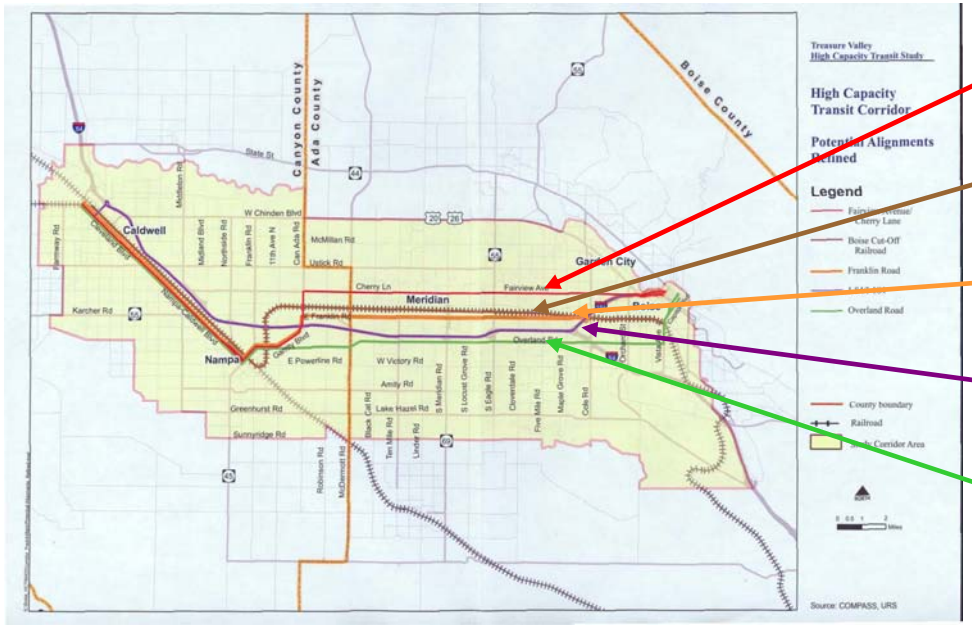
KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

Presentation Outline

- Objectives of Traffic Evaluation
- Review of Evaluation Methodology
- Summary of Findings
  - *Arterial Alignments*
  - *Boise Cutoff Alignment*
  - *I-84/I-184 Alignment*
- Questions

Objectives of Traffic Evaluation

- Identify existing traffic context for each alignment
- Review future transportation improvements and traffic projections
- Assess potential traffic issues related to implementing HCT along the five potential alignments



Fairview Ave/Cherry Ln

Boise Cutoff Railroad

Franklin Road

I-84/I-184

Overland Road

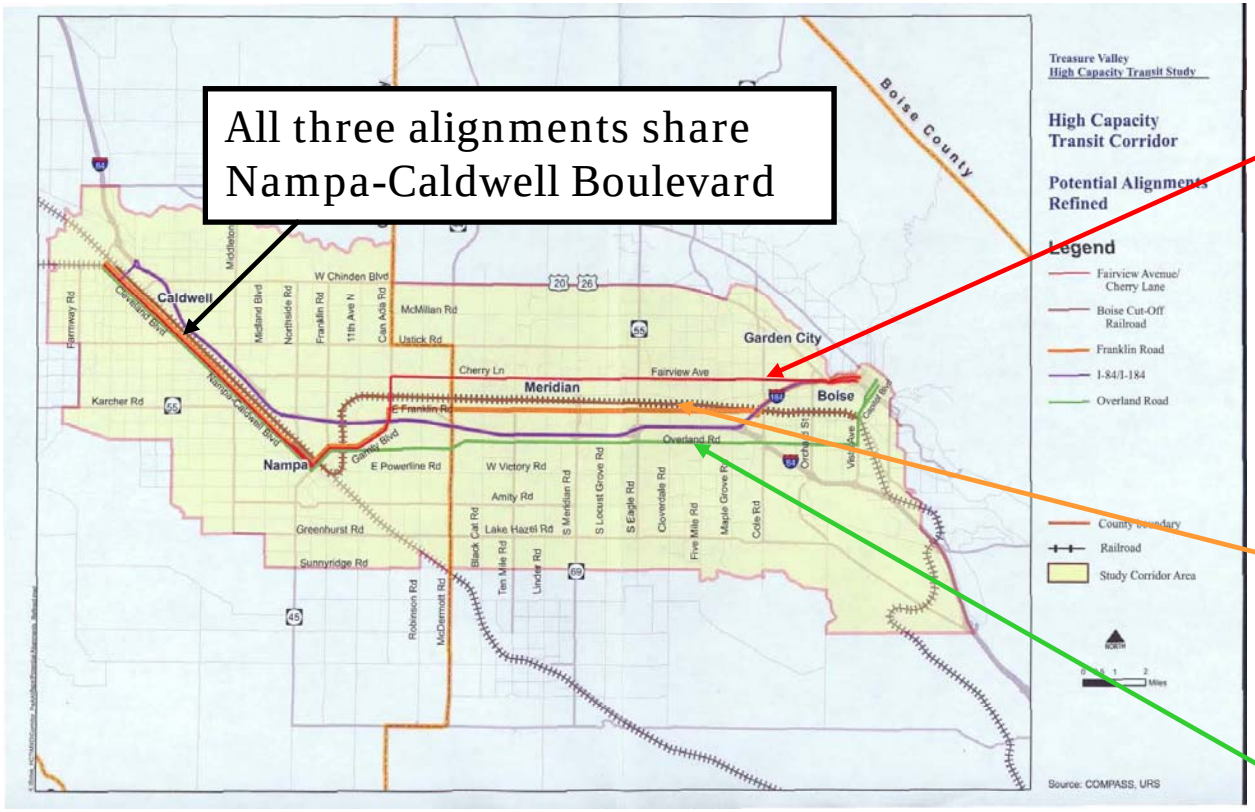
Evaluation Methodology

- Arterials
  - *Traffic operational issues*
    - Future Capacity
    - Impact of Signals
    - Impact of Driveways
  - *Identification of priority treatments*
  - *Unique station location issues*

- Boise Cut-off
  - *Existing and future arterial traffic crossing issues*
    - Capacity impacts to arterial crossings
    - Conflicts with adjacent intersections
  - *Potential crossing improvement needs*

- I-84/I-184
  - *Potential traffic operation issues with bus access to stations*

Arterial Alignments



Fairview Ave/Cherry Ln

Franklin Road

Overland Road

Arterial Alignments – Fairview Avenue

- General traffic capacity
  - *Boise - Meridian: will reach capacity of 7 lanes*
  - *Meridian – Nampa: will need 5-7 lanes depending on the section*
  - *Mixed-traffic alternative will be impacted by significant intersection delays.*
- Access density will be a significant issue for exclusive transit lanes
  - *Business impacts: high driveway density.*
  - *Signal capacity impacts: much more left-turn and u-turns (double or triple lefts at signals may be needed)*
- Special issues
  - *Fairview/Eagle: possible CFI*

Seven-Lane Section on Fairview Ave

Driveways on Fairview

Arterial Alignments – Overland Road

- General traffic capacity
  - *Boise - Meridian: will reach capacity of 7 lanes*
  - *Meridian – Nampa: will need 5 lanes (still needs alignment west of Ten Mile determined)*
  - *Mixed traffic alternative will be significantly affected by*
- Access density will be a significant issue for exclusive transit lanes
  - *Business impacts: same high density as Fairview Ave.*
  - *Signal capacity impacts: much more left-turn and u-turns (double and triple lefts at signals may be needed)*
- Special issues
  - *Overland/Cole: intersection on structure*

Seven-Lane Section on Overland Road

Overland Road/Cole Road intersection

Arterial Alignments – Franklin Road

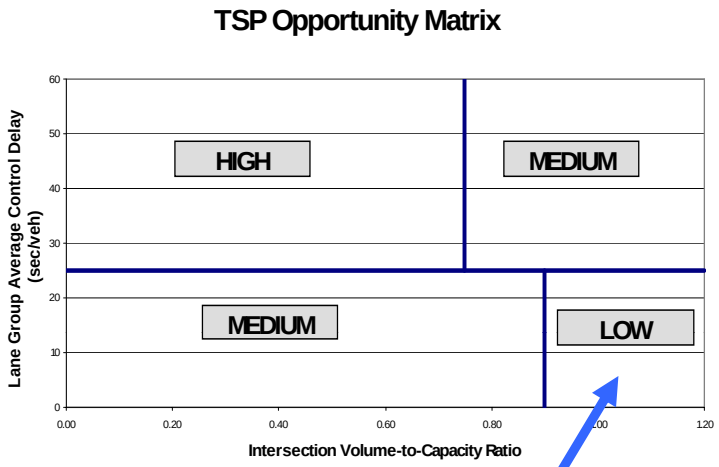
- General traffic capacity
  - *Boise - Meridian: will reach capacity of 7 lanes*
  - *Meridian – Nampa: will need also need 7 lanes on some sections*
- Access density will be a significant issue for exclusive transit lanes
  - *Business impacts: only 60% of the driveways on Fairview and Overland.*
  - *Signal capacity impacts: less left-turn and u-turn impacts.*
- Special issues
  - *Connection to I-184*
  - *Close proximity to Boise Cutoff RR*

Arterial Alignments – Stations

- Pedestrians crossing to stations
  - *Can have a significant impact at signals*
- Park and rides generate traffic
- Parking coordination and pedestrian connections with adjacent development
  - *Illegal parking can cause issues*
  - *Development designs near stations may need to be modified.*

Arterial Alignments – Priority Treatments

- Transit pre-emption for LRT
  - *Could impact signal capacity 10%-30%*
- Transit signal priority (not preemption)
  - *Early green or green extension*
  - *Only when vehicle is behind schedule*
  - *Typically 10-15 seconds of green time moved four times per hour.*
  - ***MINIMAL IMPACT TO CAPACITY (<10% on opposing movements)***
  - *General Benefits:*
    - 5-10% travel time reduction is typical
    - Reliability improvement
  - *Potential Issues*
    - Limited peak benefit at near-capacity intersections
    - Does not work well in congested conditions with mixed traffic service (without bypass lanes)
    - Impact on signal operation – some controllers may require special programming.



High V/C Ratios: Less Use of Priority

Case Study – SH 7/55th Street AM Peak Hour Boulder County, Colorado

- Average bus delay in peak direction is nearly twice the non-peak

- Adjusted green times by reducing opposing left-turn and side street phases and increasing transit phase
  - *Increased WB through by 17 seconds*
  - *Increased EB through by 12 seconds*

- Impacts at individual intersections are nominal

Case Study – SH 7/55th Street AM Peak Hour Average Hourly Impacts Due to TSP

Transit Directions Slightly Improve

	Eastbound Approach		Westbound Approach	
	V/C	Delay	V/C	Delay
Without TSP	0.20	14.3	0.79	28.3
With TSP	0.20	13.4	0.76	25.8
Change	0	(0.9)	(0.03)	(2.5)

Transit Directions Slightly Improve

	Northbound Approach		Southbound Approach	
	V/C	Delay	V/C	Delay
Without TSP	0.79	41.5	0.26	30.5
With TSP	0.85	51.8	0.28	32.4
Change	+0.06	+10.3	+0.02	+1.9

	Intersection	
	V/C	Delay
Without TSP	0.69	28.5
With TSP	0.71	29.2
Change	+0.02	+0.7

Case Study – SH 7/55th Street AM Peak Hour Boulder County, Colorado

- Transit benefits are additive

- Maximum benefit gained when TSP strategies are applied to the majority of study intersections

Trip Savings Per Bus: 30 min travel time

Direction	Bus Delay Savings per Trip		
	AM (sec/bus)	Off-Peak (sec/bus)	PM (sec/bus)
Outbound	54.3	77.9	143.4
Inbound	169.1	68.1	100.1

Arterial Alignments – Priority Issues

- Impact to north-south arterials approximately 5-10%. Overall intersection impacts <5%
- Limited peak benefit at large high-volume intersections
- Would require bypass lanes for use in mixed-flow.
- Impact on signal operation – some controllers may require special programming.

Arterial Alignments – Priority Treatments

- Queue By-Pass Lanes (Mixed-Flow)
  - *Can use right-turn lanes that are not congested*
  - *May have to be long to get bus out of queue traffic prior to the signal*

Transit Bypass in Portland OR

Transit Bypass in Boulder, CO

Arterial Alignments - Findings

- Removal of existing or future travel lanes would have substantial impacts
- Delays at major intersections will be significant
- Even if transit lanes are added, signals will be impacted by removing left-turn access to driveways.
- Each alignment has some locations with special challenges.
- Franklin Road alignment has less impacts due to less commercial development
- Transit priority won't have significant impacts on signals but also may not result in significant transit improvement

Boise Cut-off – Preliminary Findings

- Capacity impact to adjacent signals
  - *Queue clear outs and gates down*
  - *Curtis, Hartman, Liberty, Cole, Milwaukee, Benjamin, Maple Grove*
  - *Approximately a 10%-30% impact on closely spaced signals (15 min headways)*

Cole Road Crossing Adjacent to Franklin Signal

- North-south delay from crossings
  - *Minimal overall delay impacts: much less than signals*
  - *Eagle Road: congestion across tracks may require grade separation*

Eagle Road Un-Gated Crossing

Boise Cut-off – Summary

- Traffic impacts are generally low at crossing locations
- Some adjacent signals will experience significant impacts due to pre-emption clear-out
- Identified needs
  - *Gates at crossings*
  - *Coordination with adjacent signals*
  - *Capacity & geometric improvements to some major intersections such as Cole Road and Milwaukee Street*
  - *Possible grade separation studied at some locations such as Eagle Road*

I-84/I-184 – Express Bus

- No significant impact to traffic capacity
- Bus access to stations is the primary issue
  - *Bus likely required to be in outside lane*
  - *Waiting in queues on ramps*
  - *Delay getting through traffic signals at ramp/arterial intersection*
    Merging delay at congested locations
- Identified needs
  - *Modifications on ramps and ramp signals to provide exclusive bus lanes may be needed*
  - *Technology such as ramp metering*

Eagle Road Double Lane Exit

Garrity Blvd Double Lane Exit

Overall Summary

- The arterial alignments have the greatest impact on traffic capacity and access to businesses
  - *Franklin Road generally has the lowest impact*

- The Boise cutoff would require improvements at signals near the track and possibly grade separation at crossings of congested arterials such as Eagle Road.

- The I-84 express bus alternative will experience significant delay getting to and from stations. Improvements to interchanges may be required to improve transit travel time.