Revisions, modifications, and corrections after the July 26, 2023 TAC meeting for Slides 41, 42, 46, & 69 are presented in the green text boxes on the slides.

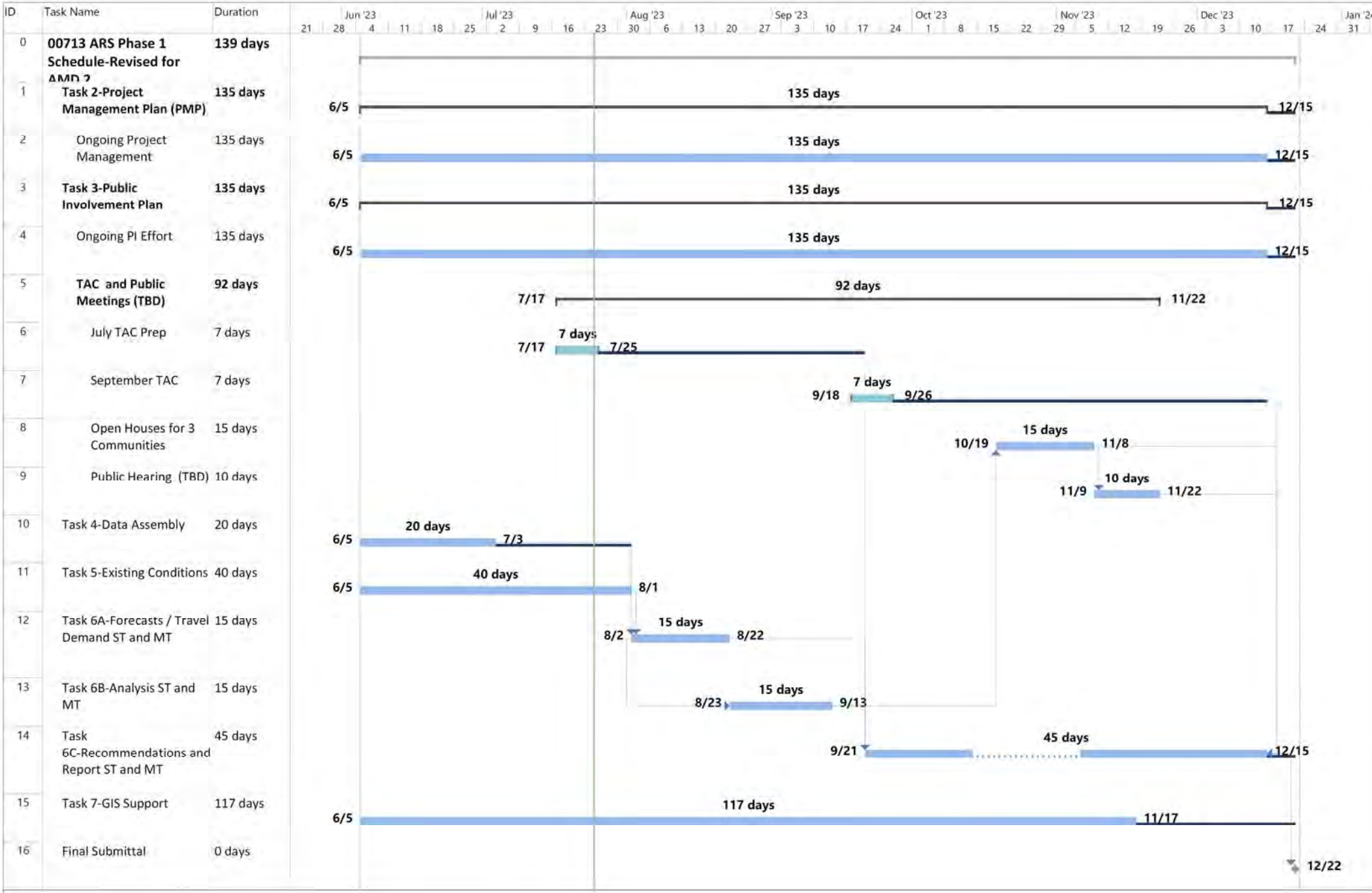
Alaska Department of
Transportation & Public Facilities

Alaska-Richardson-Steese Hwys Corridor Action Plan

TAC Follow-Up Questions from May 16, 2023

Transportation Advisory Committee Meeting

July 26, 2023



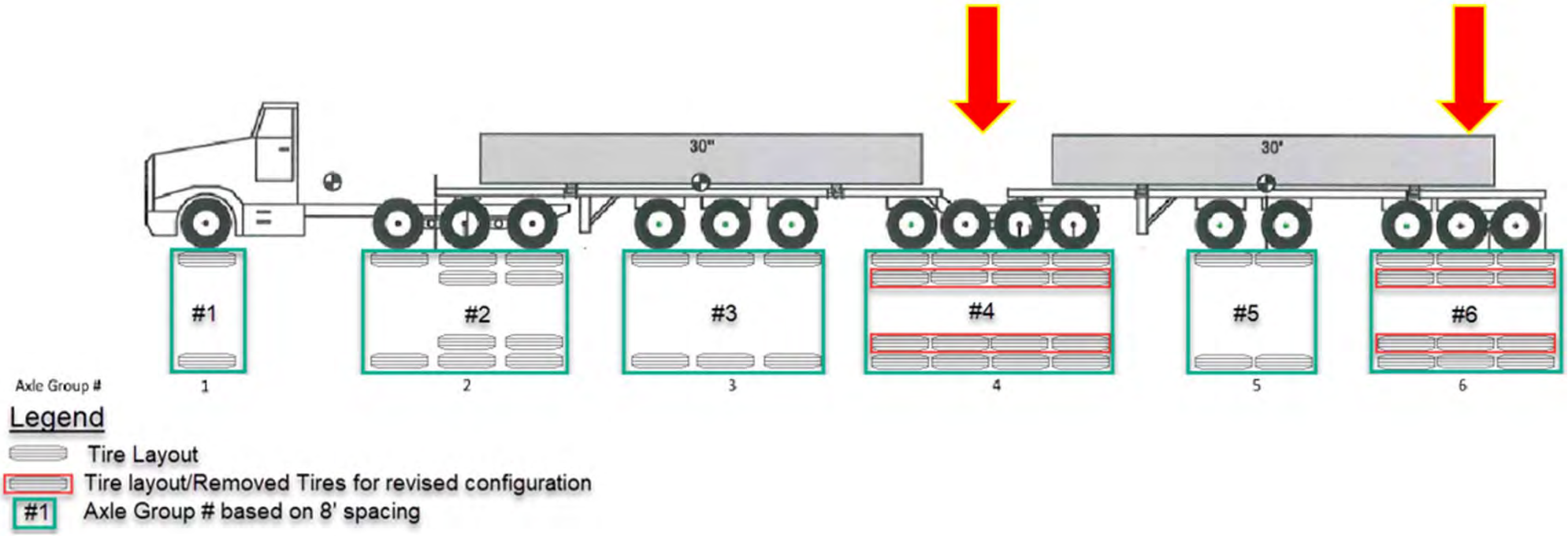
Project: 00713 ARS Phase 1 Sch
Date: Tue 7/25/23

Task	Inactive Task	Manual Summary Rollup	External Milestone	Manual Progress
Split	Inactive Milestone	Manual Summary	Deadline	Slack
Milestone	Inactive Summary	Start-only	Critical	
Summary	Manual Task	Finish-only	Critical Split	
Project Summary	Duration-only	External Tasks	Progress	

Phase 1 Schedule

- Draft Report mid-October
- Community presentations last ½ of October - 1st week of November
- Public Hearing Mid November (if required)
- Final Report Mid-December

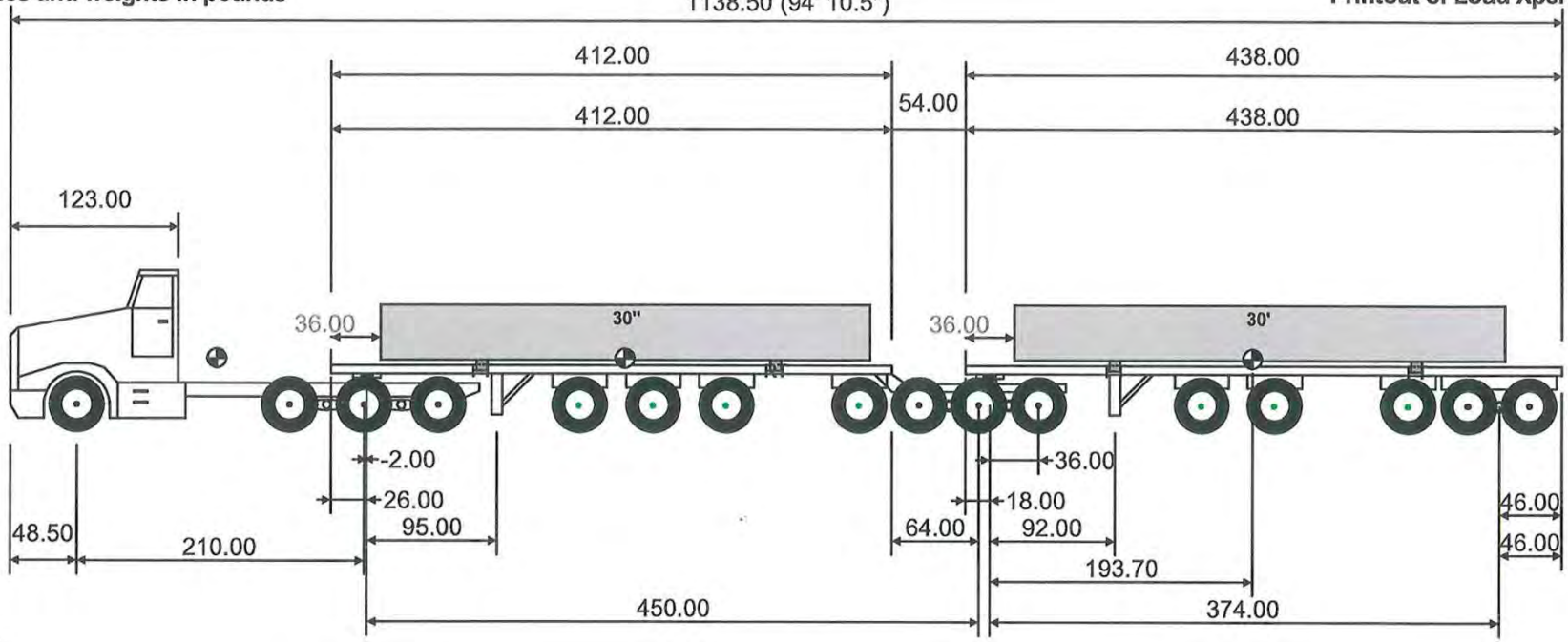
Changes to Axle Groups from Dual Tire to Single Tire



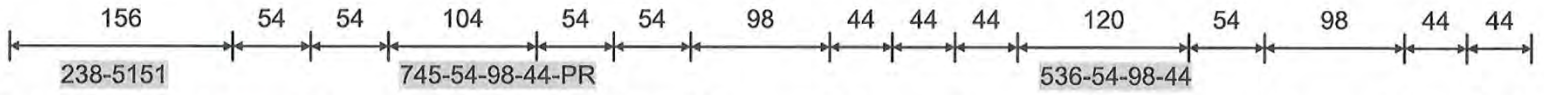
Changes Don't Affect Weights

All lengths in inches and weights in pounds

Printout of Load Xpert software



Inter Axle Spacing (Total =1066)



238-5151 745-54-98-44-PR 536-54-98-44

Axle Loads:	#1 (lb)	#2 (lb)	#3 (lb)	#4 (lb)	#5 (lb)	#6 (lb)	#7 (lb)	#8 (lb)	#9 (lb)	#10 (lb)	#11 (lb)	Total (lb)
Tare:	10271	23700	0	0	0	0	19429	0	0	0	9000	62400
Accessories:	0	0	0	0	0	0	0	0	0	0	0	0
Payload:	-130	13784	9000	9000	9000	9000	15330	9000	9000	9000	10516	102500
Total:	10141	37484	9000	9000	9000	9000	34759	9000	9000	9000	19516	164900
Desired/(GVW)*:	13000	42500	9000	9000	9000	9000	41000	9000	9000	9000	24000	-
GAWR/(GVWR*):	-	-	-	-	-	-	-	-	-	-	-	-

Analysis Modifications

- We were notified of this a few weeks ago.

- We have not had the time to fully understand impacts.
  - Primarily pavement impacts
  - Likely a “negative” impact by concentration of wheel loads

- Analysis presented today does not address the conversion to single tires.

TAC questions after last TAC meeting

- From 3 TAC parties:
- *Don Galligan submitted 1 email question to Shelly Wade (TAC facilitator) on May 26, 2023.*
- *Jackson Fox submitted 1 email question to Shelly Wade on May 30, 2023, also cc'ing Judy Chapman and Don Galligan.*
- *Jenny Campbell and Dave Waldo submitted an email attachment "ASAH comments to Kinney after May16.docx" on May 31, 2023 to Phoebe Bredlie, Shelly Wade, Randy Kinney, and Meg Friedenaur. The attachment had 15 questions.*
- This presentation is an overview. See the **REPORT TO THE TRANSPORTATION ADVISORY COMMITTEE** for details (to be sent to TAC after today's meeting).

Don Galligan

Chena Hot Springs Road Interchange

DG Q1) Chena Hot Springs Road Interchange (*Highlighted by Kinney****)***

"……The bridges over Chena Hot Springs Road on the Steese are load restricted. They actually built the roundabouts at the interchange with gates for heavy loads going to the slope so they could bypass the bridge by driving through the roundabouts and continuing to the on ramp, effectively bypassing the bridges. Will those bridges be able to support the heavier loads? And if not, those roundabout bypasses were designed to have pilot cars open and close the gates ahead of and behind the trucks. This was built like this to accommodate the overweight loads headed from Fairbanks to Prudhoe Bay, occasionally and at night. With these ore trucks going every 15-30 minutes this seems like a huge imposition both to the ore haul trucks and the travelling public to have these gates being opened 2-4 times per hour. If the gates stay open, then people in private autos will use them and not use the roundabouts as they were intended. Please clarify whether those trucks and drive over those load restricted bridges, and if they cannot, what is their plan to get to Fox?"

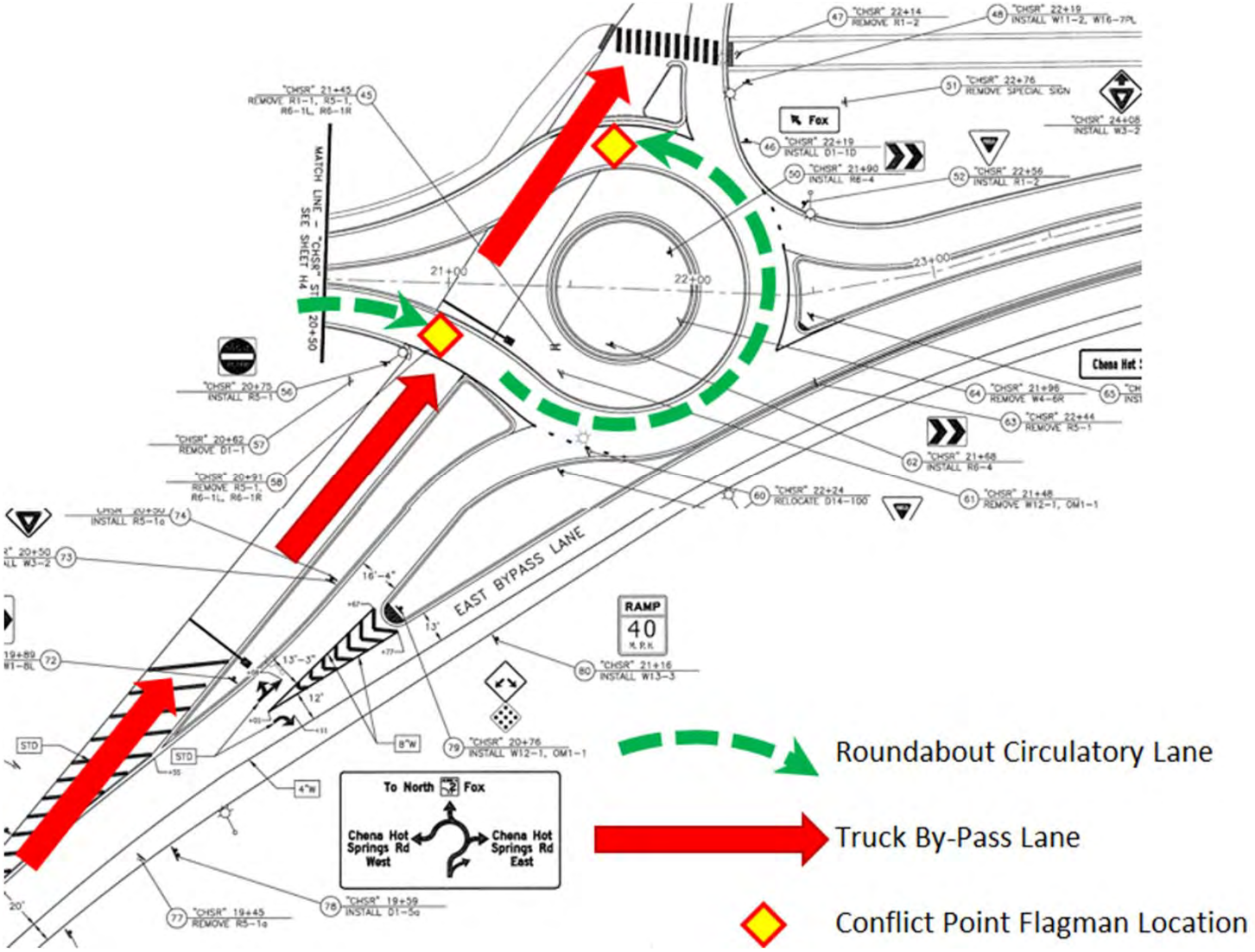
Analysis Summary

- Loaded B-Trains cannot use Bridge 1342, CHENA HOT SPRINGS UNDERCROSSING (Discussed Later).
- They must use Northbound ramps (east side of interchange) with truck lane by-pass if they cannot negotiate the roundabout.
- If using the truck lane, the safe operations during moderate to high traffic conditions would likely require pilot cars and flagmen to stop roundabout traffic for 30 seconds (best case) for each B-Train passage.
- However, models indicate that the B-Train can maneuver through the roundabout (must be field verified, though).

Looking North-East Ramps (Northbound Off-Ramp, nearside; and On-Ramp, far side) By-Pass Lane and Gates

Looking South-East Ramps (Northbound Off-Ramp) By-Pass Lane and Gates

If B-Train Uses By-Pass Lane




Truck Apron

Richardson Highway Chena Floodway Northbound Bridge

- Richardson Highway Bridge 1364, Northbound across Chena Floodway will not support the fully loaded ore hauling B-Trains.
- There is a by-pass roadway over the Chena Floodway floor to allow overweight vehicles to bypass the bridge.
- To access the by-pass, northbound B-Trains must cross over the oncoming southbound lanes on both sides of the bridge to access the ramps onto the by-pass roadway.

Richardson Highway Chena Floodway Northbound Bridge

Note that the stop sign symbols are the general locations that traffic would be stopped, if required by the State.

Jackson Fox

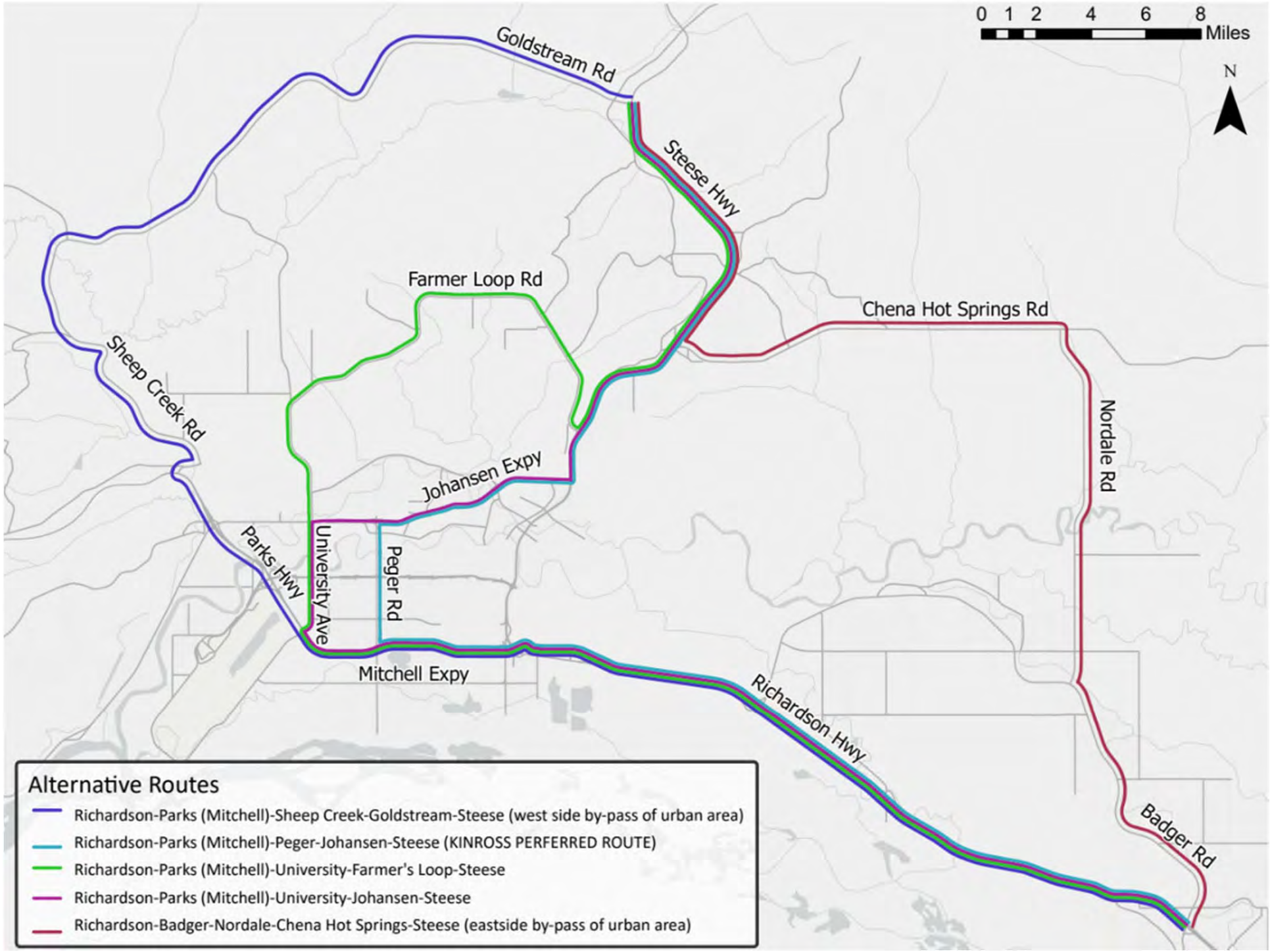
Alternative Truck Routes through Fairbanks

JF Q1- Alternative Truck Routes through Fairbanks (*Highlighted by Kinney****)***

*"….At this time, this just leaves me with one main question/request**:** I would like to see some analysis of the alternate routes through the urban area of Fairbanks and North Pole. I understand there is a route that is preferred by DOT (Richardson/Mitchell-Peger-Johansen-Steese), but there are a number of options for routes through the urban area (possibly even bypassing Fairbanks). I understand for the July TAC meeting we will continue discussing bridges, so to start I will offer up the one unanswered question (Q6) from my last email: "For the urban area I would also like to know the bridge conditions for all potential routes through the area, not just the DOT-preferred route. Examples would include Nordale Road bridges (X3) and Steese Highway bridge over Chena River." With the range of options for routes through the urban area, there are likely different limitations and different impacts, so I would like a thoughtful discussion/analysis on what the best/preferred route might actually be, even if it just confirms the route currently preferred by DOT."*

Routes Considered (North Pole to Steese/Goldstream)

- Richardson-Badger-Nordale-Chena Hot Springs-Steese (eastside by-pass of urban area)
- Richardson-Parks (Mitchell)-Peger-Johansen-Steese (KINROSS PERFERRED ROUTE)
- Richardson-Parks (Mitchell)-University-Johansen-Steese
- Richardson-Parks (Mitchell)-University-Farmer's Loop-Steese
- Richardson-Parks (Mitchell)-Sheep Creek-Goldstream-Steese (west side by-pass of urban area)


0 1 2 4 6 8
Miles
N
Goldstream Rd
Steese Hwy
Farmer Loop Rd
Chena Hot Springs Rd
Sheep Creek Rd
Nordale Rd
Johansen Expy
Parks Hwy
University Ave
Peger Rd
Mitchell Expy
Richardson Hwy
Badger Rd
Alternative Routes
Richardson-Parks (Mitchell)-Sheep Creek-Goldstream-Steese (west side by-pass of urban area)
Richardson-Parks (Mitchell)-Peger-Johansen-Steese (KINROSS PERFERRED ROUTE)
Richardson-Parks (Mitchell)-University-Farmer's Loop-Steese
Richardson-Parks (Mitchell)-University-Johansen-Steese
Richardson-Badger-Nordale-Chena Hot Springs-Steese (eastside by-pass of urban area)

Routes/Roads Not Considered

- Richardson-Steese: This would be the most direct route possible with no out of direction travel, but Bridge 0231, CHENA RIVER (Steese Expressway MP 0.565 to MP 0.677) reportedly will not support B-Train loads (Bridge Design Section).

- All routes that include Cushman Street: Cushman Street bisects the Downtown Central Business District, with heavy pedestrian activity, and short block spacing (increasing intersection queues spillback potential at signals).

- All routes that include College Road: Portions of College Road have high commercial/retail/restaurant development. Unique developments include Tanana Valley Fairgrounds and Farmer's Market.

- Routes that include Van Horn Road, Geist Road, or Airport Way; as these non-controlled access links (driveways and street intersections allowed) are east-west substitute options for the controlled access Parks Highway (Mitchell Expressway) with seemingly no safety or operation advantages.

Criteria

- Bridges on Route (Jackson's original question)
- Planning Consistency
- Functional Classification
- Current Truck Use
- Excessively Poor Pavement Conditions
- Zoning and Land Use Impacts
- Operational Constraints: Maneuverability Through Intersections, At-Grade Railroad Crossings, Terrain
- School Bus Stops

The evaluation area limits for all routes have a common beginning point; the interchange of Richardson Highway and Badger Road; and a common end point; the intersection of Steese Highway and Goldstream Road.

Bridges- Condition and B-Train Loading Capacity

- Bridge Design has evaluated the bridges on the Richardson-Parks (Mitchell)-Peger-Johansen-Steese route.
  - With exception of the Chena Hot Springs Road Bridge, all can support the loaded B-Train operations.
  - Some of these overlap with other routes.
- As noted, the Steese Expressway Bridge 0231 will not support loaded B-Trains.
- If any other routes were advanced, Bridge Design would evaluate condition and capacity.

Richardson-Badger-Nordale-Chena Hot Springs-Steese

5 bridges total

- 1 satisfactory
- 1 unsatisfactory
- 3 unknown

Route (Roads in order of NB B-Train Travel)	Road and Overcrossing Bridge Location (MP to MP)	Bridge Number and Name	B-Train Crossing Feasibility	Notes
Richardson-Badger-Nordale-Chena Hot Springs-Steese	Richardson Highway 350.902 to 350.926	Bridge Points: 1767, BADGER LOOP ROAD UNDERCROSSING	Satisfactory	Not Applicable, B-train to bypass bridge on NB Ramps (NB Rich to NB Badger)
	Nordale Road 0.094 to 0.098	Bridge Points: 7270, CHENA SLOUGH-NORDALE	Unknown	
	Nordale Road 2.341 to 2.374	Bridge Points: 1212, CHENA RIVER	Unknown	
	Nordale Road 3.046 to 3.071	Bridge Points: 1329, LITTLE CHENA RIVER	Unknown	
	Steese Expressway 4.895 to 4.915	Bridge Points: 1342, CHENA HOT SPRINGS UNDERCROSSING	Unsatisfactory	Not Applicable, B-train to bypass bridge on NB Ramps

Richardson-Parks (Mitchell)-Peger-Johansen-Steese

12 bridges total

- 9 satisfactory
- 1 unsatisfactory (CHS must use ramps)
- 2 unknown (not applicable, using ramps not structure)

Richardson-Parks (Mitchell)-Peger-Johansen-Steese (KINROSS PREFERRED)	Richardson Highway 350.902 to 350.926	Bridge Points: 1767, BADGER LOOP ROAD UNDERCROSSING	Satisfactory	
	Richardson Highway 358.543 to 358.567	Bridge Points: 1959, BADGER LOOP ROAD UNDERCROSSING	Satisfactory	
	Richardson Highway 358.838 to 358.848	Bridge Points: 4078, CHANNEL B RICHARDSON HIGHWAY	Satisfactory	
	Richardson NB Off-Ramp 0.417 to 0.450	Bridge Points: 1707, W-W RAMP OC	Satisfactory	
	Parks Highway 323.635 to 323.655	Bridge Points: 1705, CUSHMAN STREET OVERCROSSING	Satisfactory	
	Peger Road 0.523 to 0.571	Bridge Points: 1191, CHENA RIVER	Satisfactory	
	Johansen Expressway 0.977 to 1.019	Bridge Points: 1794, PEGER/GEIST OVERCROSSING	Unknown	Not Applicable, B-train to bypass bridge on EB on Ramp
	Johansen Expressway 1.462 to 1.515	Bridge Points: 1697, GEIST ROAD OVERHEAD	Satisfactory	
	Johansen Expressway 2.869 to 2.889	Bridge Points: 1766, NOYES SLOUGH	Satisfactory	
	Johansen Expressway 2.976 to 3.015	Bridge Points: 1808, COLLEGE ROAD UNDERCROSSING	Satisfactory	
	Steese/Johansen	New-TO BE CONSTRUCTED	Unknown	Not Applicable, B-train to bypass bridge on NB Ramps
	Steese Expressway 4.895 to 4.915	Bridge Points: 1342, CHENA HOT SPRINGS UNDERCROSSING	Unsatisfactory	Not Applicable, B-train to bypass bridge on NB Ramps

Richardson-Parks (Mitchell)-University-Johansen-Steese

13 bridges total

- 9 satisfactory
- 1 unsatisfactory (CHS must use ramps)
- 3 unknown (1 new (University Ave), 1 not applicable, using ramps not structure)

Richardson-Parks (Mitchell)-University-Johansen- Steese	Richardson Highway 350.902 to 350.926	Bridge Points: 1767, BADGER LOOP ROAD UNDERCROSSING	Satisfactory	
	Richardson Highway 358.543 to 358.567	Bridge Points: 1959, BADGER LOOP ROAD UNDERCROSSING	Satisfactory	
	Richardson Highway 358.838 to 358.848	Bridge Points: 4078, CHANNEL B RICHARDSON HIGHWAY	Satisfactory	
	Richardson NB Off-Ramp 0.417 to 0.450	Bridge Points: 1707, W-W RAMP OC	Satisfactory	
	Parks Highway 323.635 to 323.655	Bridge Points: 1705, CUSHMAN STREET OVERCROSSING	Satisfactory	
	University Avenue 4.079 to 4.130	Bridge Points: 0263, CHENA RIVER	Unknown	Recently Constructed
	Johansen Expressway 0.189 to 0.215	Bridge Points: 1793, NOYES SLOUGH (GEIST ROAD)	Unknown	
	Johansen Expressway 0.977 to 1.019	Bridge Points: 1794, PEGER/GEIST OVERCROSSING	Unknown	
	Johansen Expressway 1.462 to 1.515	Bridge Points: 1697, GEIST ROAD OVERHEAD	Satisfactory	
	Johansen Expressway 2.869 to 2.889	Bridge Points: 1766, NOYES SLOUGH	Satisfactory	
	Johansen Expressway 2.976 to 3.015	Bridge Points: 1808, COLLEGE ROAD UNDERCROSSING	Satisfactory	
	Steese/Johansen	New-TO BE CONSTRUCTED	Unknown	Not Applicable, B-train to bypass bridge on NB Ramps
	Steese Expressway 4.895 to 4.915	Bridge Points: 1342, CHENA HOT SPRINGS UNDERCROSSING	Unsatisfactory	Not Applicable, B-train to bypass bridge on NB Ramps

Richardson-Parks (Mitchell)-University-Farmer's Loop-Steese

7 bridges total

- 5 satisfactory
- 1 unsatisfactory (CHS must use ramps)
- 1 unknown (new University Ave Bridge)

Richardson-Parks (Mitchell)-University-Farmer's Loop-Steese	Richardson Highway 350.902 to 350.926	Bridge Points: 1767, BADGER LOOP ROAD UNDERCROSSING	Satisfactory	
	Richardson Highway 358.543 to 358.567	Bridge Points: 1959, BADGER LOOP ROAD UNDERCROSSING	Satisfactory	
	Richardson Highway 358.838 to 358.848	Bridge Points: 4078, CHANNEL B RICHARDSON HIGHWAY	Satisfactory	
	Richardson NB Off-Ramp 0.417 to 0.450	Bridge Points: 1707, W-W RAMP OC	Satisfactory	
	Parks Highway 323.635 to 323.655	Bridge Points: 1705, CUSHMAN STREET OVERCROSSING	Satisfactory	
	University Avenue 4.079 to 4.130	Bridge Points: 0263, CHENA RIVER	Unknown	Recently Constructed
	Steese Expressway 4.895 to 4.915	Bridge Points: 1342, CHENA HOT SPRINGS UNDERCROSSING	Unsatisfactory	Not Applicable, B-train to bypass bridge on NB Ramps

Richardson-Parks (Mitchell)-Sheep Creek-Goldstream-Steese

14 bridges total

- 5 satisfactory
- 9 unknown

Richardson-Parks (Mitchell)-Sheep Creek Rd-Goldsrtream-Steese	Richardson Highway 350.902 to 350.926	Bridge Points: 1767, BADGER LOOP ROAD UNDERCROSSING	Satisfactory	
	Richardson Highway 358.543 to 358.567	Bridge Points: 1959, BADGER LOOP ROAD UNDERCROSSING	Satisfactory	
	Richardson Highway 358.838 to 358.848	Bridge Points: 4078, CHANNEL B RICHARDSON HIGHWAY	Satisfactory	
	Richardson NB Off-Ramp 0.417 to 0.450	Bridge Points: 1707, W-W RAMP OC	Satisfactory	
	Parks Highway 323.635 to 323.655	Bridge Points: 1705, CUSHMAN STREET OVERCROSSING	Satisfactory	
	Parks Highway SB Fairbanks 4.291 to 4.315	Bridge Points: 1244, AIRPORT WAY OC	Unknown	
	Parks Highway SB Fairbanks 4.676 to 4.774	Bridge Points: 1161, CHENA RIVER (PARKS HIGHWAY SB)	Unknown	
	Parks Highway SB Fairbanks, 5.512 to 5.533	Bridge Points: 1878, PARKS/CHENA RIDGE NUMBER 1 (TO NENANA)	Unknown	
	Parks Highway 317.335 to 317.337	Bridge Points: 7272, HAPPY CREEK	Unknown	
	Sheep Creek Road 4.939 to 4.958	Bridge Points: 0357, GOLDSTREAM CREEK	Unknown	
	Goldstream Road 9.148 to 9.168	Bridge Points: 0303, O'CONNER CREEK	Unknown	
	Goldstream Road 5.176 to 5.179	Bridge Points: 7188, BIG ELDORADO CREEK	Unknown	
	Goldstream Road 0.949 to 0.970	Bridge Points: 0478, GOLDSTREAM CREEK	Unknown	
	Goldstream Road 0.613 to 0.623	Bridge Points: 4095, TAPS MP 448.4 CULVERT	Unknown	

Planning Consistency- 2019 FMATS Freight Mobility Plan

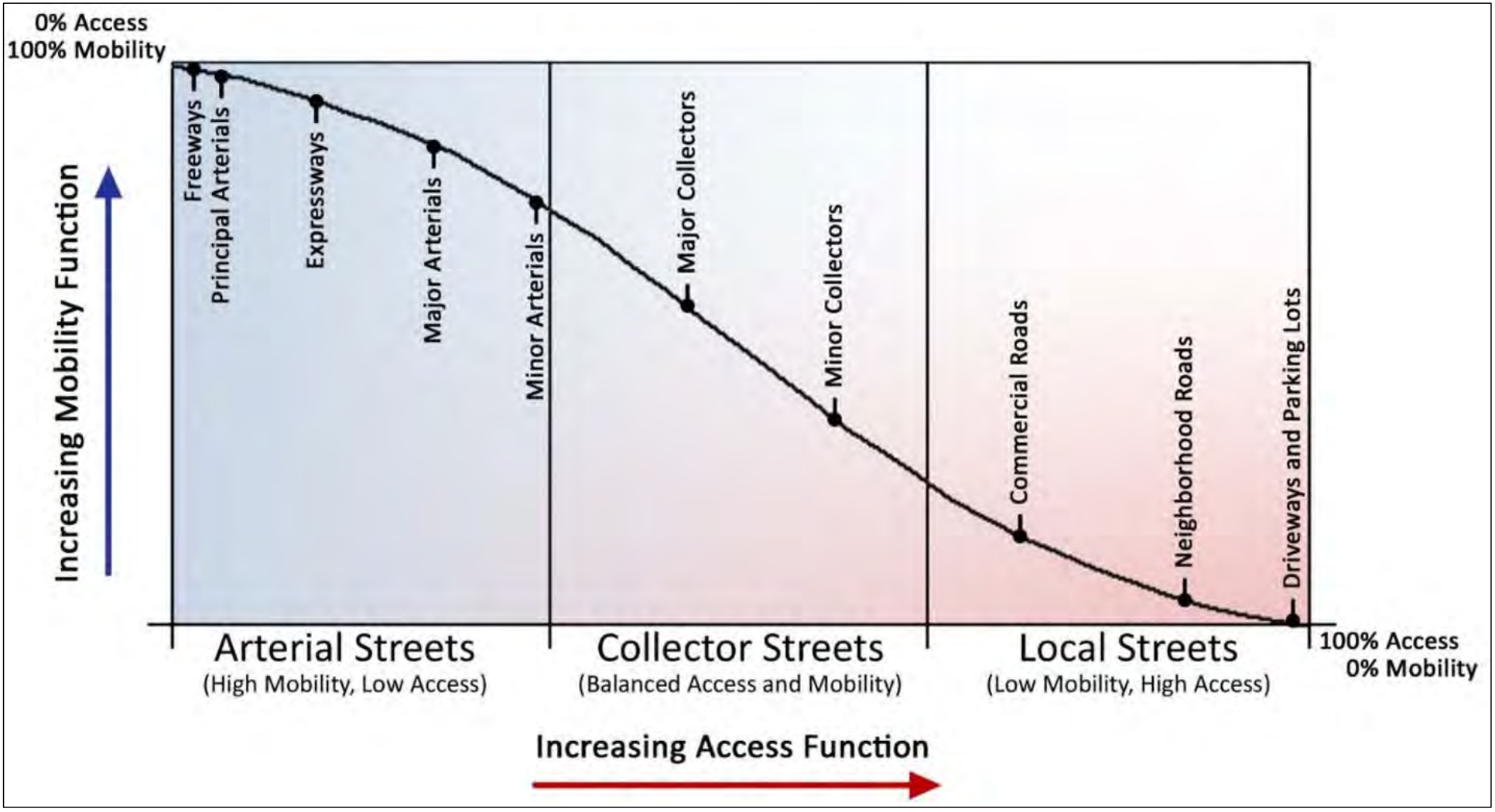
- Plan Designated Truck Routes are:
  - Richardson Highway
  - Steese Highway
  - Van Horn Road
  - Peger Road
  - Airport Way
  - Geist Road
  - Old Richardson Highway
  - Johansen Expressway
  - Parks Highway
  - Mitchell Expressway
  - South Cushman Street

Designated Routes Bold and Green Highlighted

- **Richardson**-Badger-Nordale-Chena Hot Springs-**Steese**
- **Richardson-Parks (Mitchell)-Peger-Johansen-Steese**
- **Richardson-Parks (Mitchell)-**University-**Johansen-Steese**
- **Richardson-Parks (Mitchell)-**University-Farmer's Loop-**Steese**
- **Richardson-Parks (Mitchell)-**Sheep Creek-Goldstream-**Steese**

The Richardson-Parks (Mitchell)-Peger-Johansen-Steese route segments are all designated regional truck routes. Other route alternatives have one or more links that are not regional truck routes.

Functional Classification



Route Functional Class Rating

Rank							
4	Richardson-Badger-Nordale-Chena Hot Springs-Steese	**Segment**	Richardson	Badger	Nordale	Chena Hot Springs	Steese
		Functional Class	Interstate	Minor Arterial	Major Collector	Minor Arterial	Principal Arterial-Other
2	Richardson-Parks (Mitchell)-Peger-Johansen-Steese (KINROSS PREFERRED)	**Segment**	Richardson	Parks (Mitchell)	Peger	Johansen	Steese
		Functional Class	Interstate	Interstate	Minor Arterial	Principal Arterial-Other	Principal Arterial-Other
1	Richardson-Parks (Mitchell)-University-Johansen-Steese	**Segment**	Richardson	Parks (Mitchell)	University	Johansen	Steese
		Functional Class	Interstate	Interstate	Principal Arterial-Other	Principal Arterial-Other	Principal Arterial-Other
3	Richardson-Parks (Mitchell)-University-Farmer's Loop-Steese	**Segment**	Richardson	Parks (Mitchell)	University	Farmer's Loop	Steese
		Functional Class	Interstate	Interstate	Principal Arterial-Other	Minor Arterial	Principal Arterial-Other
5	Richardson-Parks (Mitchell)-Sheep Creek Rd-Goldsrtream-Steese	**Segment**	Richardson	Parks (Mitchell)	Sheep Creek	Goldstream	Steese
		Functional Class	Interstate	Interstate	Major Collector	Major Collector	Principal Arterial-Other

Route has higher mobility segments

Route has lower mobility segments

Current Truck Use

Location	2022 Total AADT	SU AADT	CU AADT	% Trucks (SU and CU)	Additional B-Train	% CU Increase with B-Trains	% Truck with B-Train	Change % Truck (Increase)
Richardson-Parks (Mitchell)-Peger-Johansen-Steese								
Route Segment Arithmetic Averages	*16420*	*753*	*203*	*6%*	*120*	*72%*	*7%*	*0.7%*
Richardson-Badger-Nordale-Chena Hot Springs-Steese								
Route Segment Arithmetic Averages	*3973*	*223*	*35*	*7%*	*120*	*480%*	*11%*	*3.2%*
Richardson-Parks (Mitchell)-University-Johansen-Steese								
Route Segment Arithmetic Averages	*16340*	*679*	*170*	*5%*	*120*	*156%*	*6%*	*0.7%*
Richardson-Parks (Mitchell)-University-Farmer's Loop-Steese								
Route Segment Arithmetic Averages	*11289*	*484*	*116*	*6%*	*120*	*171%*	*7%*	*0.8%*
Richardson-Parks (Mitchell)-Sheep Creek Rd-Goldstream-Steese								
Route Segment Arithmetic Averages	*7440*	*285*	*88*	*5%*	*120*	*187%*	*9%*	*0.9%*

Pavement Conditions

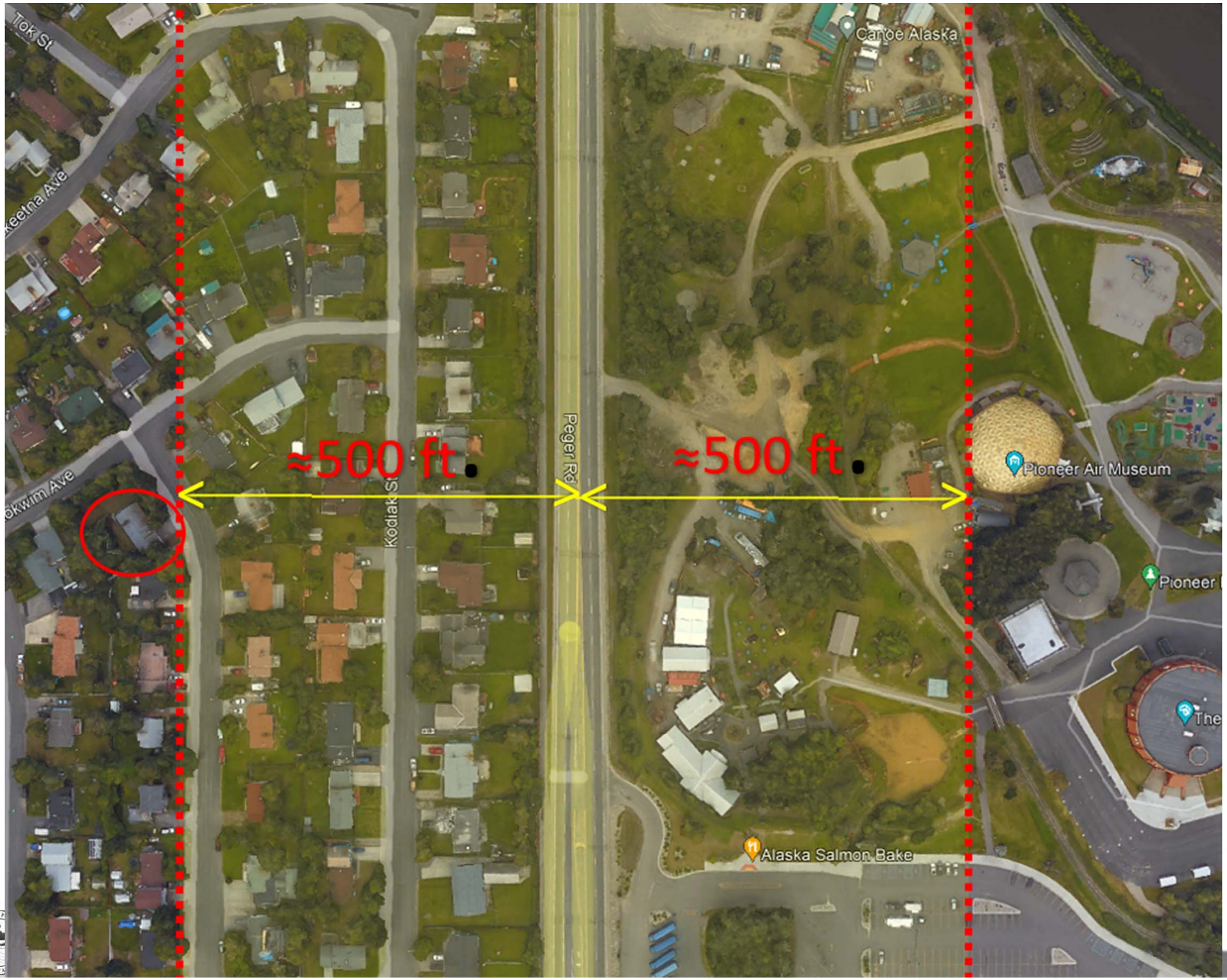
- Richardson Highway, Parks Highway, and Steese Highway segments are common to almost all of the alternative routes and not surveyed (neutral in route selection)
- Peger Road, University Avenue, Johansen Expressway are in generally good condition, and therefore not of concern for those respective routes.
- *Richardson-Badger-**Nordale**-Chena Hot Springs-Steese:*
  - Nordale Road between Little Chena River Bridge and Chena Hot Springs Road- high permafrost subsidence and, or frost heave damage. Extensive repairs in this area.

Pavement Conditions

- ***Richardson-Parks (Mitchell)-Sheep Creek-Goldstream- Steese***
  - Sheep Creek Road and Goldstream Road have sections of pavement undulations caused by permafrost subsidence and, or frost heave, with some spot repairs.
  - Distressed areas do not dominate the roadway, extents, and we characterize the road pavement from the windshield survey as mostly in fair to good condition

Zoning and Land Use

- Use GIS to create a 1,000-foot-wide corridor centered on routes' roadways.
- Collected parcels, parcel values, and buildings within corridor.
- Inventoried zoning, to identify residential impacts.
  - Reporting "strict" residential zoning, where homes will be a part of the land use.
  - Reporting potential residential zone, including General Use, in which dwellings are allow along with other diverse uses.

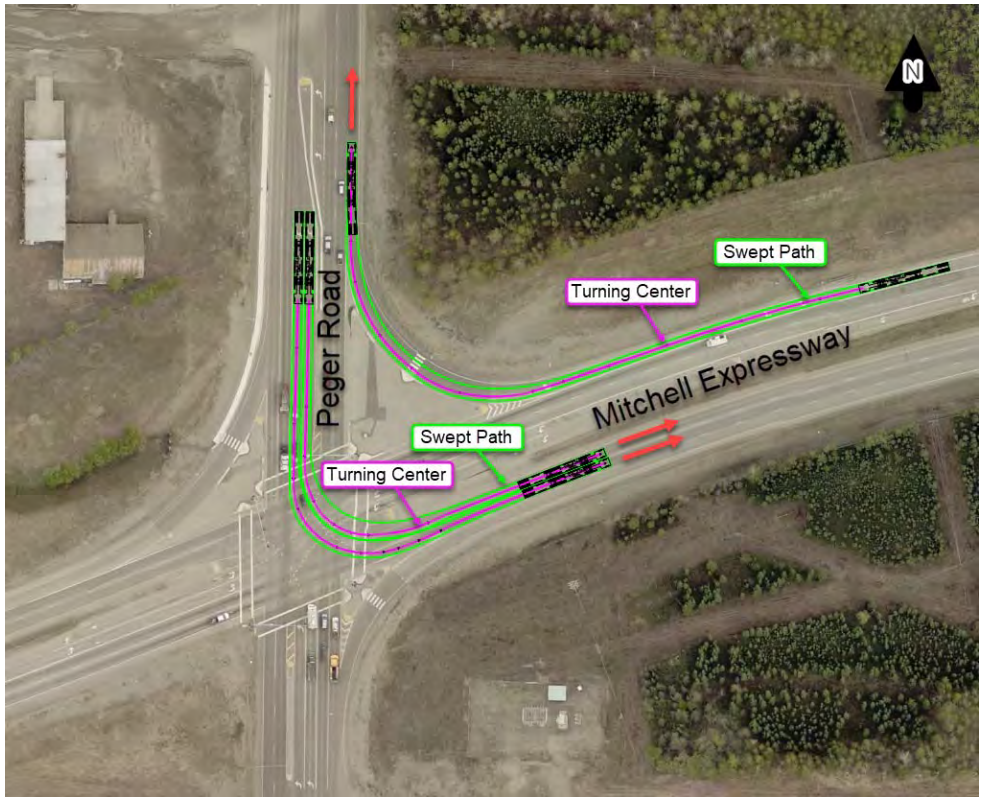

Tok St
Keetna Ave
Kodiak St
Peger Rd
≈500 ft
≈500 ft
Canoe Alaska
Pioneer Air Museum
Alaska Salmon Bake

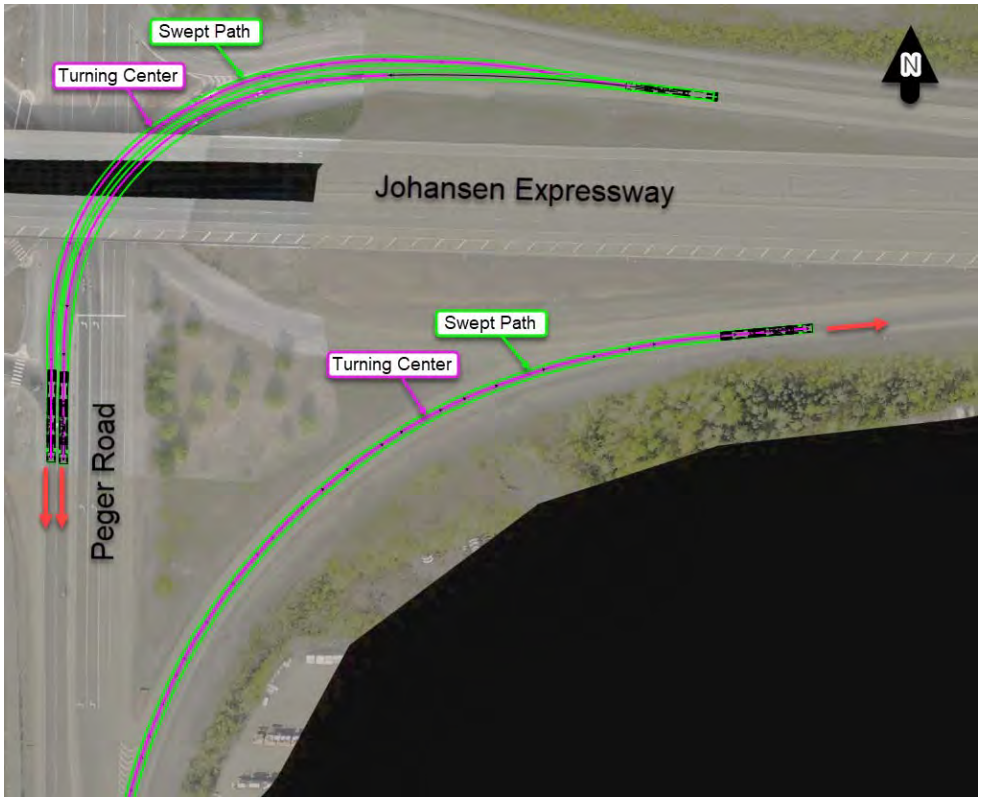
Route	Length (Miles)	1000-foot Corridor, 500 feet each side of Road				
		Parcels	Mean Parcel Value	Buildings	% Potential Residential	% Strict Residential
Richardson-Parks (Mitchell)-Peger-Johansen-Steese	26.6	1265	$ 299,479.42	1269	84.65%	19.74%
Richardson-Badger-Nordale-Chena Hot Springs-Steese	21.2	993	$ 90,463.32	1133	98.31%	28.99%
Richardson-Parks (Mitchell)-University-Johansen-Steese	28.6	1398	$ 339,870.88	1381	78.95%	19.41%
Richardson-Parks (Mitchell)-University-Farmer's Loop-Steese	32.6	1735	$ 296,137.38	1842	86.17%	35.29%
Richardson Highway to Parks (Mitchell) to Sheep Creek Road to Goldstream to Steese	34.1	1339	$ 154,195.84	1328	84.16%	15.04%

Operational Constraints: Intersections; At-Grade Railroad Crossings; Terrain

- Detailed Analysis
  - Richardson-Parks (Mitchell)-Peger-Johansen-Steese
  - Reporting results previously developed
- Sketch-Level Analysis
  - Richardson-Badger-Nordale-Chena Hot Springs-Steese
  - Richardson-Parks (Mitchell)-University-Johansen-Steese
  - Richardson-Parks (Mitchell)-University-Farmer's Loop-Steese
  - Richardson-Parks (Mitchell)-Sheep Creek-Goldstream-Steese

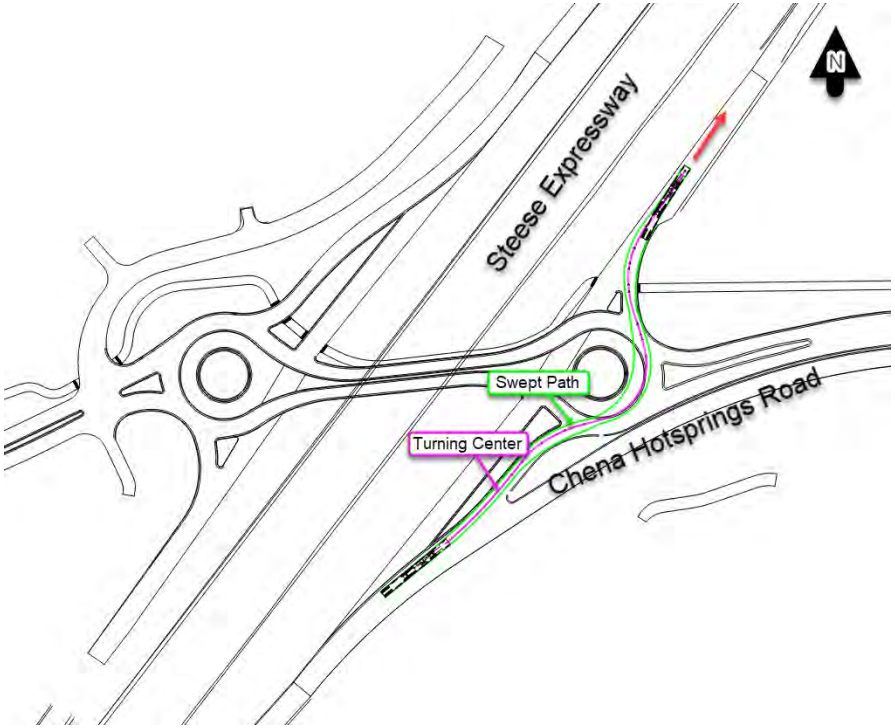
Richardson-Parks (Mitchell)-Peger-Johansen-Steese- Intersections





Left-Turns are under signal control. Right-turns are on ramps or turning lanes, merge or yield.

Richardson-Parks (Mitchell)-Peger-Johansen-Steese- Intersections



Left-Turns are under signal control. Right-turns are on ramps or turning lanes, merge or yield.

Richardson-Parks (Mitchell)-Peger-Johansen-Steese- Railroad Crossings

- B-Train cargo is such that stopping at at-grade railroad crossings are not required.
- If stopped for a train, the additional time to accelerate to normal speeds may delay following vehicles.
- Richardson-Parks (Mitchell)-Peger-Johansen-Steese has no railroad crossings

Added after the July 26 Meeting - *TAC Member Brian Lindamood from the Alaska Railroad stated that any route with at-grade crossings selected by the B-Trains will require diagnostic team evaluations of the crossings because the ARRC considers the B-Train use to be significant changes to current use.*

Richardson-Parks (Mitchell)-Peger-Johansen-Steese- Terrain

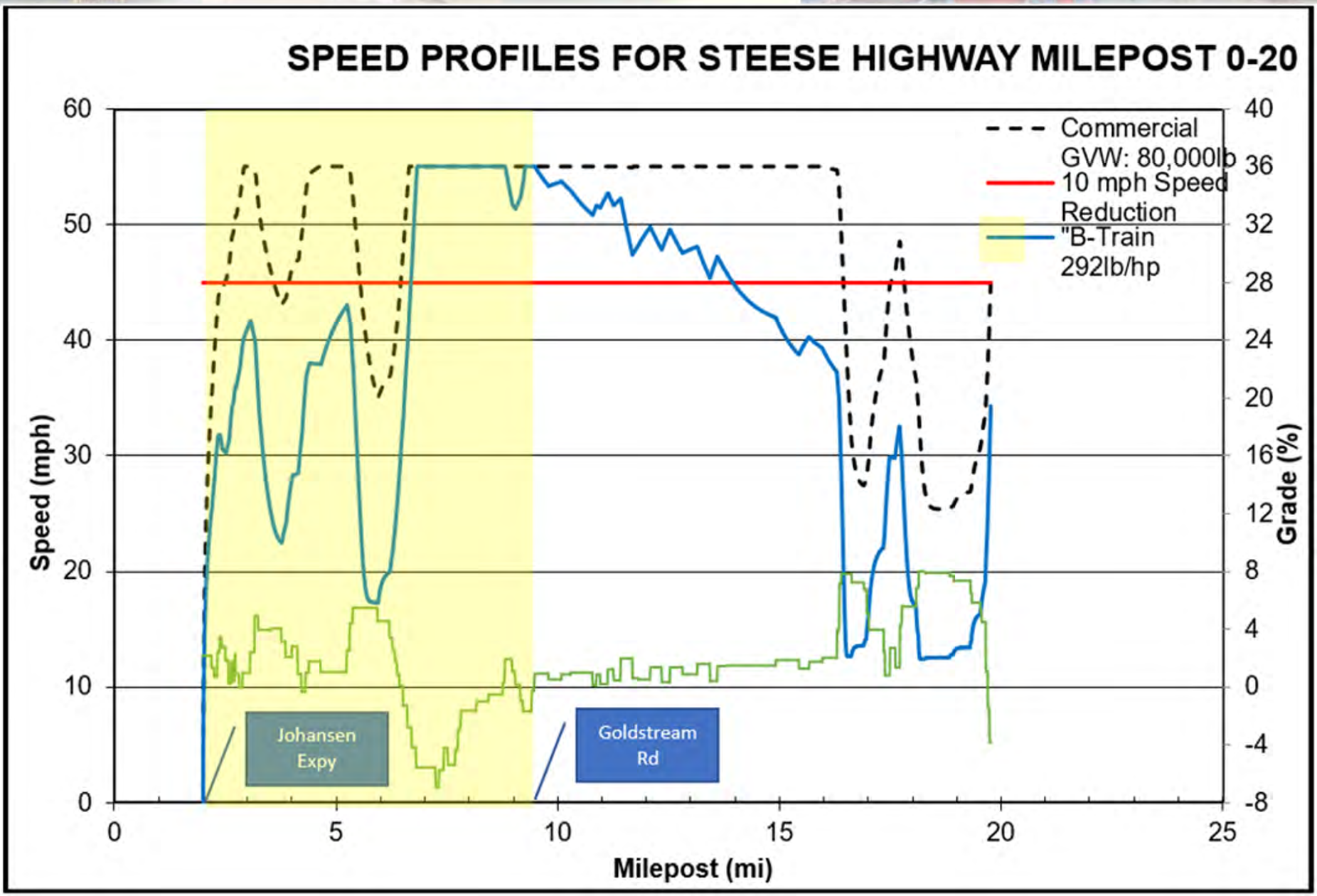
- Richardson Highway, Parks Highway, Peger Road, and Johansen Expressway (except the Northbound to Eastbound On Ramp) are mostly level and will not affect vehicle speeds.
- Steese Expressway between Johansen and Goldstream has significant terrain that affects B-Train speeds.

Added after the July 26 Meeting - *TAC Member Don Galligan from the FNSB stated the Johansen Expy between University and Peger overpass has an uphill grade. This would likely affect B-Train speeds.*

Peger Road / Johansen Expressway Northbound to Eastbound On Ramp

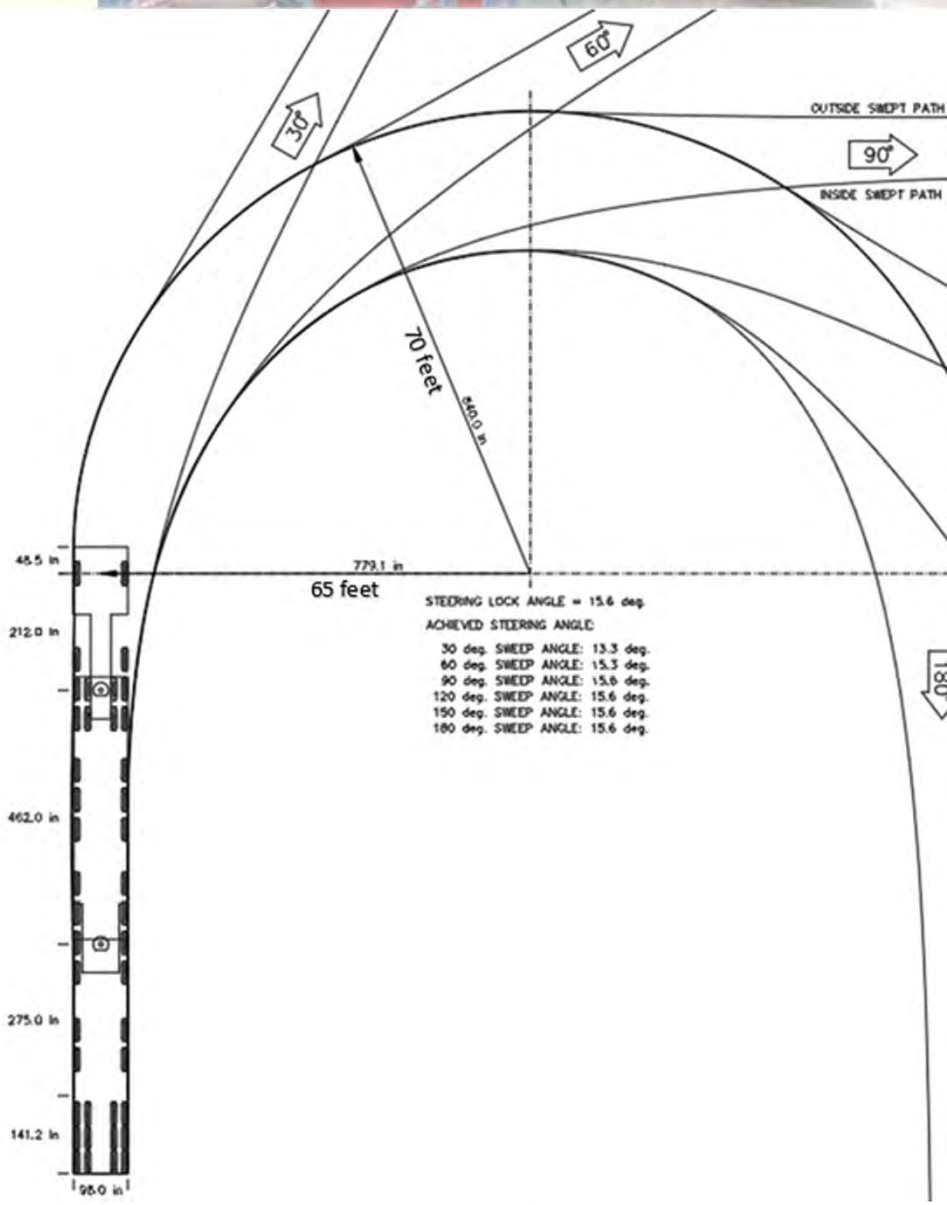
Discussed at May TAC Meeting

Steese Highway
Discussed at March TAC Meeting



Operational Constraints: Intersections; At-Grade Railroad Crossings

- Sketch-Level Analysis
  - Richardson-Badger-Nordale-Chena Hot Springs-Steese
  - Richardson-Parks (Mitchell)-University-Johansen-Steese
  - Richardson-Parks (Mitchell)-University-Farmer's Loop- Steese
  - Richardson-Parks (Mitchell)-Sheep Creek-Goldstream- Steese
- Turning path at 2-lane intersections
- Stop Sign Control
  - Low acceleration, length➔delay
- RR Crossings
- Terrain



Route	Intersections With Likely Encroachment By B-Train Into Adjacent Or Oncoming Lanes	Intersections Under Stop Sign Control	At-Grade Railroad Crossings	Terrain
Richardson-Badger-Nordale-Chena Hot Springs-Steese	Badger/Nordale, Nordale/Chena Hot Springs	Badger/Nordale, Nordale/Chena Hot Springs	None	Rolling: Chena Hot Springs Road
Richardson-Parks (Mitchell)-University-Johansen-Steese	University/Johansen *(potential encroachment into adjacent lane while NBRT)*	None	None	Adverse Grade: Johansen Expy Rolling: Steese Highway
Richardson-Parks (Mitchell)-University-Farmer's Loop-Steese	Farmer's Loop/Steese *(potential encroachment into adjacent lane while SBRT)*	None	University Avenue	Rolling: Farmer's Loop Rolling: Steese
Richardson-Parks (Mitchell)-Sheep Creek-Goldstream-Steese	Parks/Sheep Creek Sheep Creek/ West Tanana Steese/Goldstream *(All likely encroachment into adjacent and oncoming lanes with turns)*	Parks/Sheep Creek Sheep Creek/ West Tanana Steese/Goldstream	Sheep Creek Road	Rolling: Sheep Creek Rolling: Goldstream

Added after the July 26 Meeting - *Johansen Expy between University and Peger overpass has an uphill grade. This would likely affect B-Train speeds.*

School Bus Stops

- No Direct On-Route School Bus Stops
  - Richardson-Parks (Mitchell)-Peger-Johansen-Steese
- Direct On-Route School Bus Stops
  - Richardson-Badger-Nordale-Chena Hot Springs-Steese
  - Richardson-Parks (Mitchell)-University-Johansen-Steese
  - Richardson-Parks (Mitchell)-University-Farmer's Loop-Steese
  - Richardson-Parks (Mitchell)-Sheep Creek-Goldstream-Steese

Conclusions on Jackson's Question

- Based on a qualitative and quantitative criteria, the Kinross preferred route of Richardson-Parks (Mitchell)-Peger-Johansen-Steese seems to have consistently lower or equivalent impacts, higher or equivalent benefits when compared to the other route alternatives.
- Richardson-Parks (Mitchell)-University-Johansen-Steese does well in this analysis but falls short on a couple of criteria.
- The others have significant drawbacks, especially-
  - Richardson-Badger-Nordale-Chena Hot Springs-Steese
  - Richardson-Parks (Mitchell)-Sheep Creek-Goldstream-

Added after the July 26 Meeting – *Jackson requested that we explore an overland route between Nordale/CHS and the mine as an option for east side by-pass route.*

Jenny Campbell and Dave Waldo

Bridge Questions

JCDW Q1- Bridges, Part 1

"Most of the bridges scheduled for replacement along the corridor will not be replaced prior to the Kinross ore haul and will be used for the entirety of the ore haul, with perhaps two being complete prior to its end. ***How will Kinney evaluate bridge safety, damage assessment and enhanced inspection plans prior to replacement?"***

This will be addressed by DOT&PF.

JCDW Q2- Bridges, Part 2

"ADOT/PF bridge section engineer Elmer Marx noted the Kinross ore haul trucks will exceed the inventory rating of 17 bridges along the route. Heavy LCV traffic will increase over 100% along much of the route. ***Will Kinney, or another independent subcontractor, quantify the impacts of 60 heavy LCVs per day exceeding the inventory rating of 17 bridges along the route?"***

This will be addressed by DOT&PF.

Crash Prediction

JCDW Q3- Crash Prediction

"The crash prediction model is generic in term of truck types, i.e. every truck is considered the same, and it certainly doesn't consider a 165,000 pound, 16 axle truck as standard. In fact, Kinney stated that the "effects of tractor-trailers and B-Trains in daily traffic volumes are not fully understood and are not considered in this methodology." ***What will Kinney do to more closely model the actual truck proposed by Kinross and Black Gold to ensure accurate crash predictions?"***

- The Highway Safety Manual (HCM) and companion software, Highway Safety Software (HSS) are the current state of practice for crash prediction.
- In terms of "accuracy" it is the best prediction model available, but still cannot precisely forecast crash occurrence (or severity).
- It is useful in judging relative safety performances of changed conditions (adding B-Trains), and potential treatment alternatives.
- We have conducted a literature survey of research on this matter and will attempt to modify the crash prediction to account for the B-Trains based on research.

Crash Severity

JCDW Q4- Crash Severity Prediction

"Does Kinney plan to model the severity of the anticipated additional ten crashes per year? Does the model predict how the severity of existing crashes might change based on the addition of the B-train trucks?"

The HSS model does not consider the unique attributes of a B-Train. With regards to prediction, we will apply research we find applicable as discussed in the above response, JCDW Q3.

Level of Service: B-Train

JCDW Q5- Level of Service Predictions with B-Trains

"For intersection Level of Service (LOS), the model appears to present a best-case scenario. It seems reasonable to run the range of likely possibilities to truly understand the impact of these trucks in urban areas. ***Will the model be run again assuming some (one, two, three, etc.) of the B-trains get stacked up for one reason or another?"***

- Previous analyses only increase % of Trucks on Route approaches and found delay impacts to be smaller. Ignored the consequences
- This question asks what happens when multiple B-Trains arrive and must be served?

Level of Service: B-Train

- Model assumptions:
  - B-Trains would only use outside lane; following vehicles move to inside lane so that they pass the slower moving B-Trains
  - Loaded B-Train length and slow acceleration dramatically reduces approach saturation flow rate, more B-Trains the larger the impact.
  - Only evaluated loaded B-Trains (NB direction) since SB B-Trains have “normal” performance characteristics.
  - Average hourly arrival rate is 60/24 or 2.5 B-Trains an Hour
  - Arrivals are random, and can be modeled with Poisson Distributions
  - Five states: 0, 1, 2, 3, and 4 B-Trains arrive in the outside lane during a red indication that will need to be served once the signal goes green.

Level of Service: B-Train

- Each intersection and each approach with the loaded B-Train requires evaluation.
- Example results as follows.
- Conclude that this methodology shows poorer performance (note that the evaluation assumes worst case conditions).

Example of Overall Intersection Delay Calculations – Airport Way and Peger Road, 2024 AM Peak

B-Trains at beginning of Green Phase	Probability for Each Cycle	Intersection Delay During Cycle (sec/veh)	Probability x Intersection Delay (sec/veh)
0	91.4122%	27.5	25.14
1	8.2081%	28.4	2.33
2	0.3685%	29.1	0.11
3	0.0110%	29.1	0.00
4	0.0002%	29.1	0.00
Total Overall Intersection Delay (sec/veh) over an AM Hour			**27.6**

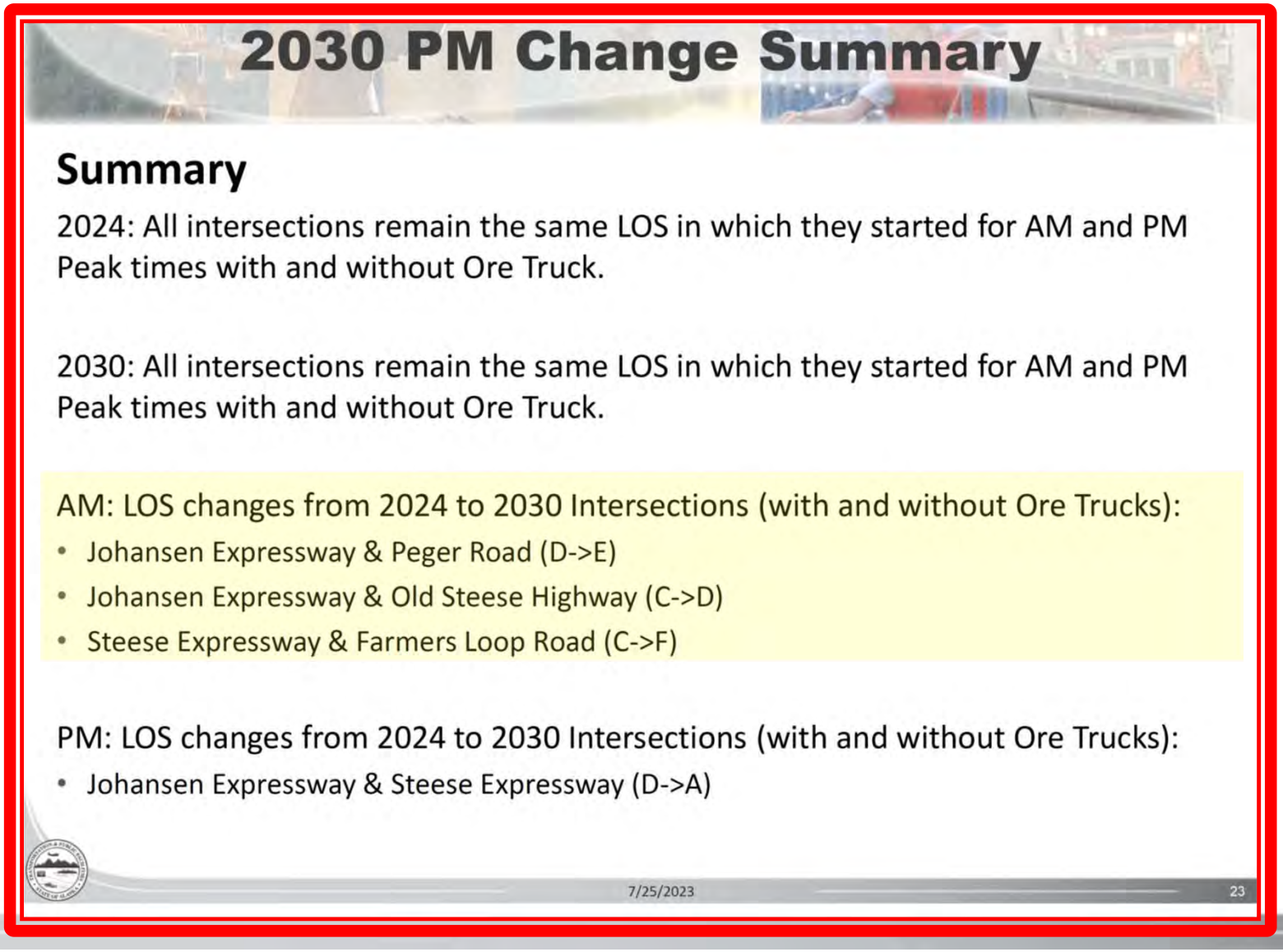
LOS Summary Question

From May TAC Meeting Presentation

JCDW Q6- Level of Service Predictions with B-Trains

"The LOS summary page shows three intersections degrading below acceptable LOS levels.

What recommendations does Kinney anticipate to improve these intersections?"



LOS Summary Question

From May TAC Meeting Presentation

The intersections in this question were reevaluated using Methodology in JCDW Q5.

Johansen Expressway and Old Steese Highway changes from LOS C in 2024 to LOS D in 2030. LOS D is considered acceptable in urban areas. The decline is primarily caused by traffic increase.

Johansen Expressway and Peger Road has long average intersection delays due to the eastbound right-turn movement from Johansen Expressway heading south on Peger Road (high-volume movement during the AM peak). The movement is a channelized right turn and is yield-controlled (does not influence the signal). The eastbound right-turn movement experiences long AM peak delays without the B-trains. The presence of the B-trains minimally increases the delay by about 2 seconds per vehicle. The long delays are not expected to be addressed in the ARS Plan since the eastbound right movement is not controlled by the signal that the B-trains will be using, and the long delays are not a direct result of the B-trains.

Steese Expressway and Farmers Loop Road in 2030 was analyzed under the most recent design proposed by the Steese-Johansen Interchange project. The project team for that project has been notified and they are looking into the design.

Winter Speed Limits

JCDW Q7- Winter Driving Speed Limits Considerations

"Stopping distance on ice/snow – You stated that it is the driver's responsibility to slow down and drive for conditions. ***Will Kinney address this further by recommending winter driving speed limits or other actions to ensure safe road conditions?"***

Alaska Administrative Code addresses driver's responsibility for speed selection:

13 AAC 02.275. Basic rule and maximum limits. *"(a) No person may drive a vehicle at a speed greater than is reasonable and prudent considering the traffic, roadway, and weather conditions."*

The Alaska Driver's License Manual has this entry on the matter of driver's responsibility to slow down as conditions dictate:

"SPEED LIMITATION LAW

…..A person may not drive a vehicle upon a highway at a speed greater than will permit them to stop within the assured clear distance ahead."

Winter Speed Limits

- Speed reduction needed for SSD on ice:

Highway Design Speed	Stopping Sight Distance (SSD) for Design Speed	Safe Speed on Ice for Given SSD
45 MPH	360	28 MPH
50 MPH	425	31 MPH
55 MPH	495	33 MPH
60 MPH	570	36 MPH
65 MPH	645	39 MPH

- Engineering solutions can augment human decisions
- *Variable Speed Limit (VSL)Signs* to adjust for Winter Speeds:
  - Can be static (pre-set) or dynamic (condition dependent).
  - Most likely a dynamic VSL will adjust to the prevailing speed that is being monitored.
  - Proposed for Richardson Hwy; Eielson to Fairbanks.

Winter Speed Limits with VSL

- Study of VSL in British Columbia
  - 34.4% winter crash severity reduction (fatal + injury)
  - B/C ratio of 4.3:1
- Wyoming experience with VSL
  - 50.8% reduction in crash severity (fatal + injury)
  - B/C ratio of 9.05:1

Pavements

JCDW Q8- Pavements

"We look forward to seeing further information on the ESAL calculation results regarding pavement life. ***What recommendations do you anticipate forwarding to DOT to ensure robust enough pavement structure to support the B-Trains?"***

This analyses is ongoing, but we will provide an estimate of additional pavement maintenance efforts that are required because of the B-Trains. The results will be share in the July 26, 2023 TAC meeting (afternoon session).

We will also identify segments that require near term improvement and provide a pavement design recommendation without and with B-Trains so that the impacts can be quantified. (Pending)

School Bus

JCDW Q9- School Bus Stops

"Table 2 in your response to Jackson Fox's questions shows approximately half the school bus stops have inadequate Stopping Sight Distance (SSD) in snow/ice conditions. ***How will this information be factored into your analysis and what are your proposed infrastructure and/or regulatory mitigations for these situations?"***

We've substantially completed the school bus evaluations for all three school districts. The results will be share in the July 26, 2023 TAC meeting (afternoon session).

School Bus

- Potential Engineering Improvements-Rural routes
  - Clearing to Property Lines (Right of Way) to improve winter SSD line of sight
  - Establish permanent stops where signage could be installed
  - Consider turnouts to reduce bus exposure to rear-end collisions
- Potential Operational Improvements- Rural Routes
  - No school children crossing the road to access buses
  - If crossing is necessary, use an aid (e.g. crossing guard) that rides on the bus.
  - Operational improvement require buy-in by transportation companies; may have unforeseen negative consequences

School Bus

- One technology we are evaluating is HAAS Alert which outfits school buses with transponders to warn approaching vehicles with an app of buses locations.
  - GPS and Cellular Network
  - After comparison of heading, location, and other pertinent route data a safe speed, or other data can be presented to an approaching driver.
  - Data transmission from the school bus could be periodically updated or only transmitted with a manual trigger such as flashing lights prior to a school bus stop.
  - Requires buy-in by pupil transportation companies

Driveways / Street Intersections in Crash Prediction Model

JCDW Q10- Driveway and Minor Streets In Crash Prediction Model

"There are hundreds of uncontrolled access points along the route – driveways, small roads, etc. ***Another summary of how these are factored into your crash prediction model and SSD concerns would be helpful."***

We've aggregated driveways and minor intersections along the rural route as a model input for each of the rural analysis segments. (Considered in prediction model)

Stopping sight distance is not a direct input into the analysis segment for the crash prediction model. In selecting the segment design speed, it is implied that stopping sight distance for that design speed is satisfactory.

Driveways / Street Intersections in Crash Prediction Model

- We interpret the “SSD concerns” cited in the question to mean how would snow and ice conditions, in which braking distances are increased for all types of vehicles, affect driveway and minor intersection crashes.
- From the 2013 to 2022 crash data on the corridor we’ve extract and summarize rural driveway and intersection crashes codes as occurring on snow, ice, and slush roadway surfaces.
- From same data, same characteristics we extract the crashes that were coded as occurring on roadway surfaces other than snow, ice, and slush.

Driveways / Street Intersections in Crash Prediction Model

2013 to 2022 Rural Driveway and Intersection Crashes Snow, Ice, Slush Conditions

Rural Highway Segment	Driveway Access	Driveway Access Related	Intersection	Intersection-Related	Grand Total
Alaska Highway	0	1	4	1	6
Richardson Highway	1	2	20	5	28
Steese Expressway/Highway	0	1	16	2	19
Grand Total	1	4	40	8	53

2013 to 2022 Rural Driveway and Intersection Crashes Surfaces Conditions Other than Snow, Ice, Slush

Rural Highway Segment	Driveway Access	Driveway Access Related	Intersection	Intersection-Related	Grand Total
Alaska Highway	1	3	8	0	12
Richardson Highway	1	1	20	2	24
Steese Expressway/Highway	0	1	10	0	11
Grand Total	2	5	38	2	47

B-Train Weigh Station By-Pass

JCDW Q11- B-Train Weigh Stations By-Pass

"In your presentation, you stated that the B-Trains would be required to stop at the state-run weigh stations, thereby ensuring that the trucks are not overloaded. In their November 2022 Driveway Permit TIA to ADOT/PF, Kinross' consultant states that the director of the Division of Measurement Standards and Commercial Vehicle Compliance has given permission for the Manh Choh B-Train trucks to by-pass the state scales in favor of installing their own scales on site, with occasional "ad-hoc inspections" along the route (pp 7-8). ***What is Kinney's response to this allowance and how might this knowledge impact your study and recommendations?"***

Our recommendations will likely be that each B-Train be weighed since they are marginally over allowable GVW, and because during seasonal load restrictions, there appears to be one axle group that exceeds 85% limits. If this can be performed on site and is acceptable to the State then we have no say in the matter. However, this is a policy decision, not an engineering decision.

The concern with requiring the B-Train to use the Tok Station is the left-in and left-out turning maneuvers and elevated crash potential associated with those movements being made with low acceleration rates.

Breakdown Yard in Fox

JCDW Q12- Breakdown Yard in Fox

"Breakdown yard - Does Kinney have any new information from Kinross on the plan to create a breakdown year near the Pedro Monument to avoid driving doubles up around Skoogy curve?"

No. We will ask the Kinross TAC representative for an update at the TAC meeting on July 26, 2023.

Added after the July 26 Meeting – *TAC member Patrick Filbin representing KINROSS stated in the meeting that there will be a yard on Steese Hwy between the weight station and the NOAA driveway (Location to be verified, but closer to NOAA). At the yard, the second trailer of the B-Train will be disconnected. All ore from that yard to Fort Knox will be in single trailer units.*

TAC Member List

JCDW Q13- TAC Member List

ASAH has asked for an accurate list of TAC members on the project website. To date, this still has not been accomplished.

The TAC Member list shown on the website is current as of July 12, 2023. Project website content, including the list of TAC Members, is maintained regularly. The website now indicates the date the website was last updated.

TAC Attendance

JCDW Q14- TAC Attendance

Given the mixed nature of the TAC meetings (in-person and on-line) it was hard to know which TAC members were present. ***Is it possible to take an official role call at the beginning of the meetings rather than just introductions of those who are attending?*** *Knowing who is missing is as important as knowing who is there.*

Roll call is taken by the TAC Facilitator during the Welcome portion of each TAC Meeting/Work Session. Meeting notes document the attendance or absence and method of participation for each TAC entity representative. Meeting notes are shared via the project website within 15 business days following the meeting.