CAMBRIDGE SYSTEMATICS

Think Forward

DRAFT Memorandum

TO: Nelson\Nygaard

FROM: Cambridge Systematics

DATE: January 25, 2022

RE: SH-22 Transit Model Runs

To aid in understanding of potential transportation improvements in the WY-22 corridor between US-191 / US-89 in Jackson and SH-390, Cambridge Systematics has conducted several model runs evaluating corridor alternatives. This memorandum summarizes the model run assumptions and results.

Scenario Definitions

The basic alternative definitions are as follows:

- No-build 2035 Condition;
- Shoulder running transit; and
- HOV Lanes.

Each of these alternatives utilizes 2035 household, population, and employment growth forecasts embedded in the Teton County Travel Model. The model was also run for 2016 calibrated base year conditions for comparison to provide context. Because traffic congestion in the corridor is most pronounced during peak summer months, model results represent a summer weekday.

After discussions with representatives of Southern Teton Area Rapid Transit (START), the transit network has been adjusted to reflect transit system improvements that would better support transit in the region and the corridor. These transit improvements include addition of service to the airport and Grand Teton National Park. The forecast year models also increase frequency on existing fixed route bus service by a factor of 3. These transit system improvements are included in all forecast year model runs, including the no-build scenario.

Each scenario has been run under several conditions to better understand the range of possible outcomes in the corridor. These variations include:

- Inclusion and exclusion of a Tribal Trail connector to SH-22; and

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- Inclusion and exclusion of travel demand management (TDM) assumptions intended to reduce single occupancy vehicle trips.

TDM Assumptions

Scenarios that include TDM assume a defined reduction in single occupancy vehicle trips, with the amount of reduction varying by trip purpose and location. Assumed TDM trips have been removed from the removed from the roadways and re-allocated to transit in cases where transit trips are feasible. In cases where transit is not a feasible option, trip reductions are assumed to come from increased non-motorized trips or increased carpooling. TDM reduction assumptions are shown in **Table 1**.

Table 1 TDM Reductions by Purpose and Area

Area	Commute & School	Local Non-commute	Visitor
Downtown	20%	10%	5%
Teton Village	5%	5%	5%
South Park	8%	5%	5%
West Bank	5%	5%	5%
Airport	n/a	n/a	5%
External (Hoback Junction / Teton Pass)	5%	n/a	n/a
External (Grand Teton National Park)	10%	n/a	20%

Model Background and Adjustments

The Teton County Travel model is calibrated to base year 2016 conditions and includes a 2035 forecast year dataset. The model utilizes a cross-classified trip generation model, gravity-based trip distribution model, and logit-based mode choice model. Highway traffic is assigned by time of day using equilibrium traffic assignment and transit trips are assigned for peak and off-peak conditions using TransCAD pathfinder transit assignment method.

In February of 2020 (pre-COVID), a group of Teton County residents conducted an HOV study at the intersection of SH-22 and SH-390. This study produced observed vehicle occupancy rates on a typical winter weekday. While the modeling exercise for this study represents summer conditions, data from the winter study was compared to modeled occupancy rates to determine

reasonableness. This comparison showed a reasonable consistency between the observed and modeled HOV shares.

While the travel volumes are well validated in the SH-22 corridor, modeled travel speeds are not reflective of the observed delay during summertime peak hours. This is common in travel demand models, as operational issues associated with signals, driveways, and other aspects of the corridor are not fully represented in the link-based model. To account for speed differentials under the build scenarios, auto speeds in the forecast year model runs were adjusted to 5 mph. Bus speeds under the HOV and shoulder running transit scenarios were not subject to this speed adjustment, nor were vehicles with more than 1 occupant under the HOV scenario.

A significant number of people who work in Teton County commute from households in adjacent counties, including locations in Idaho across Teton Pass. START provides commuter bus service across Teton Pass, and the travel model includes this bus service. Since this bus service is external to the travel model, ridership over Teton Pass is not sensitive to transit improvements within the model. Post processing adjustments have been made to represent an increase in usage of Teton Pass bus service under the HOV and shoulder running transit scenarios.

Model Results

Scenario testing has been conducted for 17 different scenarios, including one base year (2016) scenario and 16 forecast scenarios. Table 2 and Table 3 summarize model outcomes such as vehicle miles traveled (VMT), transit boardings, highway and transit volumes, and HOV share for each scenario.

As compared to the no-build scenario, shoulder running transit produces an increase in transit riders in the corridor along with a slight decrease in regional VMT and highway volumes in the corridor. HOV scenarios show an increase in transit riders in the corridor as well as an increase in regional VMT and corridor traffic volumes.

Table 2 Summarized Model Results – With Tribal Trail

Scenario	Regional VMT	Regional Transit Trips	Corridor Daily Transit Volume	Corridor Auto Volume	Corridor HOV Share (%)	Corridor Volume of People	Corridor SOV Share	Corridor Pk Hr. Transit Volume	Corridor Pk Hr. Auto Volume
Base Year (2016)	856,000	3,000	540	19,900	34%	29,000	66%	128	4,301
2035 No-Build	1,046,000	5,800	1,400	22,900	30%	33,200	70%	333	4,914
2035 Shoulder Running Transit	1,042,000	6,300	1,600	22,800	32%	33,700	68%	462	4,717
2035 HOV/Bus Lane	1,050,000	6,400	1,800	24,200	33%	36,000	67%	500	4,924
2035 4-Lane Section	1,065,000	5,900	1,600	27,000	35%	40,300	65%	376	5,820
2035 No-Build with TDM	998,000	10,400	1,800 - 2,600	21,600 - 22,400	32%	33,000	68%	576	4,622
2035 Shoulder Running Transit with TDM	994,000	10,700	2,000 - 2,800	21,500 - 22,300	34%	33,500	66%	691	4,447
2035 HOV/Bus Lane with TDM	1,002,000	10,800	2,100 - 3,000	22,800 - 23,700	35%	35,800	65%	736	4,633
2035 4-Lane Section with TDM	1,017,000	10,500	2,000 - 2,900	25,600 - 26,500	37%	40,200	63%	657	5,741

Note: Values have been rounded to acknowledge model uncertainty. Transit ridership in TDM scenarios include a range to demonstrate the uncertainty of TDM reduction assumptions. The Tribal Trail Connector is not included in the base year 2016 scenario.

Table 3 Summarized Model Results – Without Tribal Trail

Scenario	Regional VMT	Regional Transit Trips	Corridor Daily Transit Volume	Corridor Auto Volume	Corridor HOV Share (%)	Corridor Volume of People	Corridor SOV Share	Corridor Pk Hr. Transit Volume	Corridor Pk Hr. Auto Volume
Base Year (2016)	856,000	3,000	540	19,900	34%	29,000	66%	128	4,301
2035 No-Build	1,045,000	5,800	1,300	22,400	31%	32,500	69%	321	4,674
2035 Shoulder Running Transit	1,039,000	6,400	1,700	21,900	32%	32,300	68%	481	4,424
2035 HOV/Bus Lane	1,047,000	6,500	1,800	23,000	33%	34,400	67%	522	4,560
2035 4-Lane Section	1,065,000	5,900	1,500	26,100	35%	39,000	65%	384	6,072
2035 No-Build with TDM	997,000	10,300	1,800 - 2,500	21,100 - 21,800	33%	32,400	67%	553	4,395
2035 Shoulder Running Transit with TDM	991,000	10,700	2,000 - 2,800	20,600 - 21,400	34%	32,100	66%	695	4,197
2035 HOV/Bus Lane with TDM	999,000	10,800	2,100 - 3,000	21,700 - 22,600	34%	34,200	66%	740	4,288
2035 4-Lane Section with TDM	1,016,000	10,500	2,000 - 2,800	24,700 - 25,500	37%	38,800	63%	639	5,503

Note: Values have been rounded to acknowledge model uncertainty. Transit ridership in TDM scenarios include a range to demonstrate the uncertainty of TDM reduction assumptions.