AGENDA ITEM SUMMARY

MEETING DATE: September 10, 2020 (RFTA Board Meeting)

AGENDA ITEM TITLE: Integrated Mobility Study (IMS), Phase 1 – Report Out

STAFF RESPONSIBLE: David Pesnichak, EOTC Regional Transportation Administrator

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The purpose of this memo and presentation are to report out the results from Phase 1 of the Integrated Mobility System (IMS) study, which was jointly funded in 2020 by the EOTC and RFTA. No action is requested at this time.

This Phase 1 Study is the next step in the development of the IMS, which was created by the 31-member Community Forum Task Force on Transportation and Mobility that met between June 2016 and August 2017. This Task Force concluded with a report in 2017 called the Upper Valley Mobility Report that was unanimously adopted by the Task Force members.

Fehr & Peers is currently under contract to complete the Phase 1 analysis this year. To date, final reports for each of the tasks have been completed and those results are ready to be communicated out to RFTA and the EOTC officials. For the EOTC, the results from this Phase 1 study and the anticipated upcoming Phase 2 will inform future projects and expenditures.

The following components of the analysis are a part of Phase 1, as identified in the scope of work. Each component is analyzed in a stand along memorandum from Fehr & Peers, which are attached.

1. Review and Refinement of existing Strategies - Refine the five principle strategies outlined in the IMS. This task would also add more definition so that the parameters of each of the systems can be roughly identified and modeled for how effective the IMS could be at improving mobility and managing traffic congestion (see next task).

2. Perform a High-Level Effectiveness Analysis of the IMS - The consultant will evaluate the potential effectiveness of the Integrated Mobility System using off-the shelf tools, travel elasticities, and similar analytical techniques. The purpose of this analysis is not an exhaustive study of traffic implications or detailed GHG analysis, but a general picture of the potential reduction in VMT, GHG emissions, and reduced SOV vehicle travel.

3. Identify an Implementation Framework – While the IMS provides a robust approach to managing vehicle travel in the upper valley, some elements are more complex and could take more time to implement than others. This framework would help identify a potential “pilot project” that brings together two-to-three of the IMS strategies that could be simpler to get off the ground but would still have enough synergistic benefits to reduce demand for SOV travel. This task would involve some additional analysis of how to combine different strategies along with working with EOTC staff to understand which strategies might be the easiest to implement (from a practical and political standpoint). This task was originally proposed as an in-person workshop, however, due to COVID-19 this component of the original scope will not be able to be completed as planned.

The components of the Integrated Mobility System (IMS) – Upper Valley Mobility Report

Staff from the EOTC, City of Aspen, Pitkin County, Town of Snowmass Village, and RFTA along with representatives from the Community Forum Task Force on Transportation and Mobility participated in several reviews leading up to this point.

With the IMS Phase 1 of the study wrapping up Staff has been looking ahead to Phase 2 in 2021, which is expected to dive deeper into modeling and socio-economic impacts. More specifically, Phase 2 (not yet fully funded) is anticipated to: 1) complete a more detailed greenhouse gas and travel analysis identifying which trips are most likely to be affected, 2) develop performance measures and evaluation framework, 3) develop an equity impact analysis, and 4) look at potential impacts from autonomous vehicles.

To this end, Staff applied for and was awarded $30,000 from the CDOT Multi-Modal Options Fund (MMOF) toward the anticipated $60,000 cost for Phase 2. These funds were awarded at the maximum level of 50% of the project cost. In addition, RFTA has provided a tentative commitment letter in the amount of $10,000 towards the Phase 2 study. The EOTC will review funding allocation in the amount of $20,000 for Phase 2 in October.

Some notable overall takeaways from the Phase 1 reports include:

- Interdependency. While individual measures can have limited impacts on reductions to congestion and greenhouse gas emissions, their effectiveness can be multiplied when implemented as a system.

- No ‘Silver Bullet’. All of the strategies analyzed have a degree of effectiveness; however, there is no ‘silver bullet’. When moving forward with congestion mitigation and limiting greenhouse gas emissions, small incremental steps that build on one another are expected to have the greatest overall impact.

Specific takeaways on the 5 tenants from the Phase 1 reports include:

- HOV Lane Enforcement Important, but Not as a Stand Alone Measure. It was identified that HOV lane enforcement on Highway 82 would have “no VMT / GHG emission benefit as a stand-alone strategy”.

This said HOV lane enforcement is an important and integral component to other strategies that can reduce VMT and greenhouse gas emissions.

- Ride Hailing Could Result in Short-Term Reductions, but Ride Sharing is More Impactful Long-Term. It is anticipated that ride hailing could have limited effect short-term, with the greatest impacts among visitors. Meanwhile ride sharing could have a positive benefit both short and long-term, particularly among commuters, by providing more travel choices and better access to the transit system (and thus less reliance on car travel).

- BRT Enhancements Could Have Positive Impacts Alone while Multiplying Benefits for Other Strategies. For any congestion or greenhouse gas emissions reduction strategy to be impactful, an effective and competitive alternative to a private vehicle must be in place. As a result, enhancing BRT service could have a strong multiplier effect. However, BRT improvements alone will have limited potential congestion and greenhouse gas reductions.

- Congestion Reduction Measures Could Have the Strongest Impacts but are also Notably Difficult to Implement. Congestion Reduction Measures, including congestion and parking pricing, could have strong impacts on reducing VMT and greenhouse gas emissions. Any reductions are dependent on a strong and effective alternative mode, however. In addition, dynamic congestion pricing could be very difficult to implement politically, would require significant coordination with CDOT, may require legislative changes, and could have notable equity impacts that would need to be mitigated.

Attachments:

- Presentation – RFTA Board, September 10, 2020

- 2017 Upper Valley Mobility Report

- Final Report – Task 1, Dated April 6, 2020

- Final Report – Task 2, Dated June 16, 2020

- Final Report – Task 3, Dated July 28, 2020

Integrated Mobility System (IMS)

Upper Valley Mobility Report

Phase 1 Analysis – Report Out

Integrated Mobility System (IMS) Phase 1 Analysis Report Out

Background:

- IMS Developed by 31-member Community Task Force on Transportation and Mobility
- IMS Outlined by Task Force in Upper Valley Mobility Report (2017)
- EOTC and RFTA jointly funded IMS Phase 1 Analysis in 2020
- Fehr & Peers Under Contract w/ Pitkin County for Phase 1 Analysis

Purpose of Presentation: Report out results from Phase 1 Analysis

Phase 1 Analysis Scope:

- Refine 5 Identified Strategies for Modeling
- Perform High-Level Analysis of Impacts on: 1) VMT, 2) GHG Emissions, 3) SOV Travel
- Identify Implementation Framework

Integrated Mobility System (IMS) Phase 1 Analysis Report Out

Fehr & Peers Team:

- Ann Bowers, Chris Breiland, and Marissa Milam

Local Review Team:

- EOTC: David Pesnichak
- RFTA: Dan Blankenship, David Johnson
- Pitkin County: Brian Pettet
- City of Aspen: John Kreuger, Mitch Osur
- Town of Snowmass Village: David Peckler
- CDOT: Andrew Knapp

Task Force on Transportation and Mobility / Aspen Institute:

- John Bennett, Bill Kane, Cristal Logan, Evan Zislis

September
2020

Integrated Mobility Study (IMS)

Implementation Framework

EOTC RFTA THE ASPEN INSTITUTE FEHR PEERS

Upper Valley Mobility Report

Effectiveness Summary

Ranking	Strategy	Long Term Effectiveness GHG emission reduction
1	***Congestion Reduction Measures***	17,600 metric tons/year
2	***Ride Sharing***	3,800 metric tons/year
3	***Phased BRT Enhancements***	800 metric tons/year
4	***HOV Lane Enforcement***	No VMT/GHG emission benefit as a stand-alone strategy.
5	***Ride Hailing***	No VMT/GHG emission benefit as a stand-alone strategy.

Main Takeaways

Interdependency of strategies:

Individual measures can have limited impacts on reductions to congestion and greenhouse gas emissions, their effectiveness can be multiplied when implemented as a system.

No Silver Bullet:

When moving forward with congestion mitigation and limiting greenhouse gas emissions, small incremental steps that build on one another are expected to have the greatest overall impact.

Short Term 0-5 Years

Short Term Implementation

- HOV lane enforcement on State Highway (SH) 82
- Increase parking prices and expand hours of pricing in downtown Aspen
- Begin speed and reliability improvements along BRT route
- Implement pilot ridesharing app for commuters

Medium Term 3-10 Years

Medium Term Implementation

- Implement ride hailing service in Aspen/Snowmass Area
- Expand the City of Aspen's carsharing program, and begin fleet electrification
- Expand the Aspen Downtowner's service and fleet
- Construct new Park & Ride in the Carbondale/El Jebel/Basalt area, and begin a new peak period BRT service to Snowmass

Long Term
11+ Years

Long Term Implementation

- Implement dynamic road pricing on SH 82

Integrated Mobility System (IMS) Phase 1 Analysis Report Out

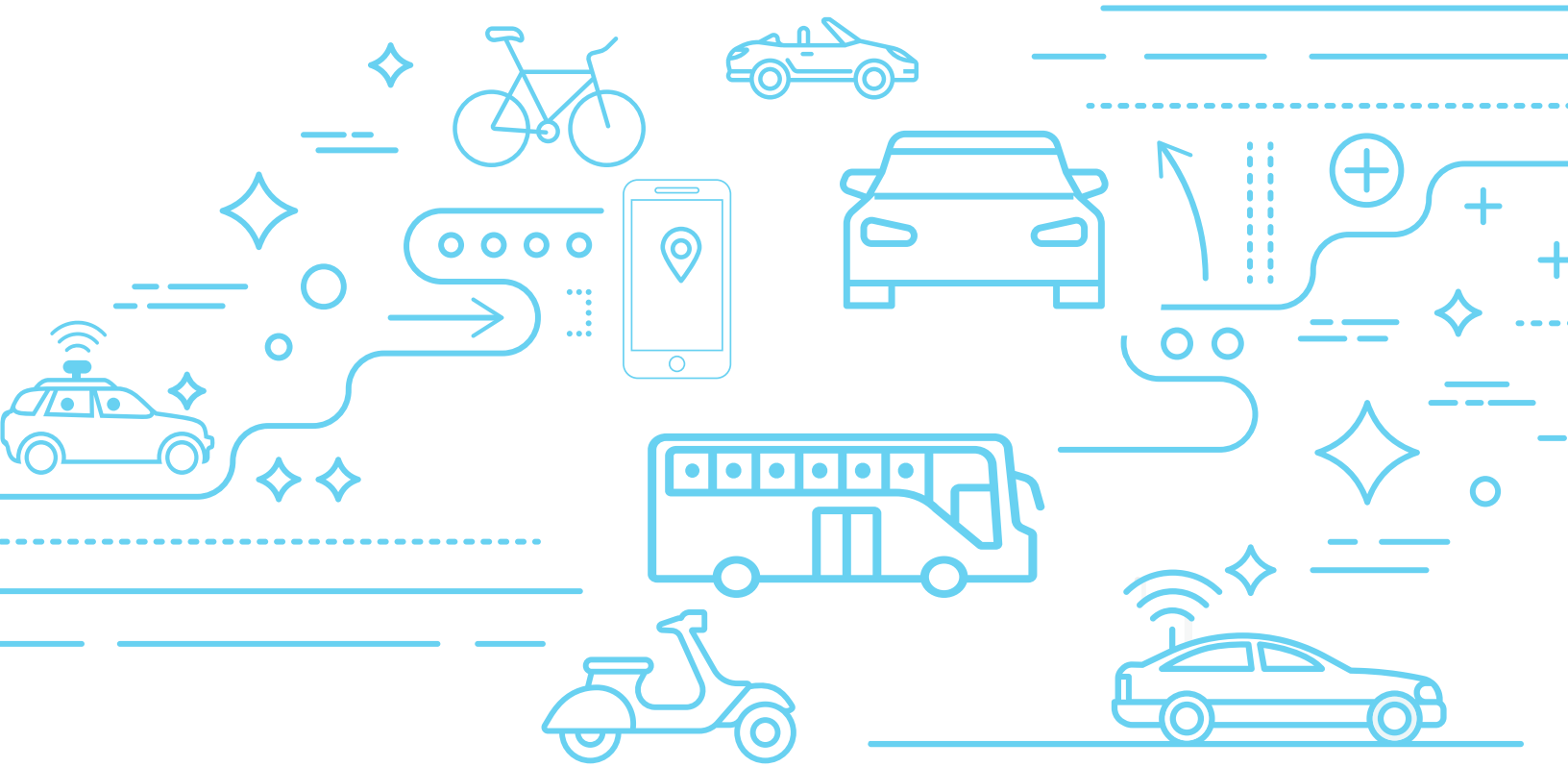
Report Out Schedule:

- RFTA Board — Thursday Sept 10
- TOSV Council — Monday Sept 14
- COA Council — Monday Sept 21
- BOCC — Tuesday Sept 22

Next Steps:

- 2021 - Phase 2 Analysis
- Scope: Detailed Modeling and Socio-Economic Impacts
  - GHG Emissions and Travel Analysis (which trips most impacted)
  - Performance Measures and Evaluation Framework
  - Equity Impact Analysis
  - Impacts from Autonomous Vehicles

Questions



Community Forum Task Force on Transportation and Mobility

Upper Valley Mobility Report

September 2017

THE ASPEN INSTITUTE
community programs

Community Forum Task Force on Transportation and Mobility

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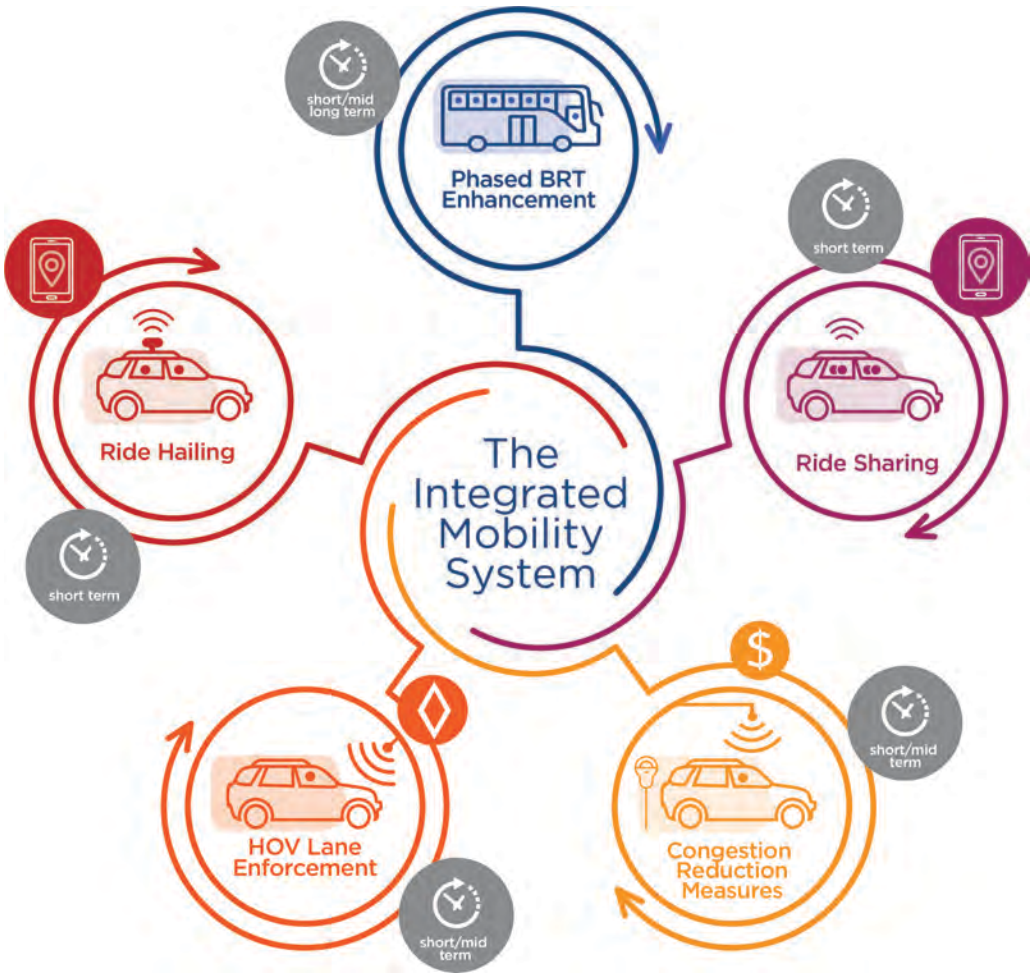
Summary and Conclusions

Working under the auspices of the Aspen Institute, the 31 members of the Community Forum Task Force on Transportation and Mobility met from June 2016 through August 2017. Its goal was to create a values-based vision for transportation and mobility in the upper Roaring Fork Valley for the year 2035 that would address traffic congestion as well as the mobility needs of our residents, commuters and visitors. (See "What is the Problem?" on p. 6 and "Core Values" on p. 8.) Task force members sought solutions that would meet the established goal and be both politically achievable and financially viable.

When the Community Forum Task Force began its work in June 2016, many members expected that it would focus on one or more large-scale, capital-intensive transportation solutions. Instead, what emerged was a balanced "integrated mobility system" of programmatic solutions that could be experimented with and phased in over time. To address the challenge of *induced traffic* (see p. 7), this integrated system employs a balance of both carrots and sticks. Its complementary measures could be implemented as budgets permit over short, mid, and long-term time frames.

Recommendation:

In its final meeting, the task force recommended unanimously that work begin immediately to plan an integrated mobility system that includes the following five elements (see below). The individual components of this system are interdependent. Some measures specifically reduce traffic congestion; others increase mobility for the public. Some are capital and cost intensive, while others would contribute revenue, making the system more affordable. (To promote social equity, the task force recommends that 100% of any revenues raised be reinvested to reduce the cost of transit and alternative mobility measures – or even make them free – for those who use them.) These five elements lend themselves to experimentation, they are flexible, and they are reversible.



The Integrated Mobility System (from short to long-term):

1. Ride Sharing (short-term)
2. Ride Hailing (short-term)
3. Congestion Reduction Measures (short and mid-term), which include dynamic road pricing and dynamic parking pricing
4. HOV-Lane Enforcement (short and mid-term)
5. Phased BRT Enhancement (short, mid and long-term), which may not necessarily cross the Marolt Open Space. Could include enhanced service to Snowmass Village.

Additional measures supported by the task force's matrix analysis:

- Transit-Oriented Affordable Housing (mid and long-term)
- Airport/Transit Connectivity, especially low-cost options (short and mid-term)
- Snowmass Connection Enhancements (short and mid-term)

(Please see the *Summary of Mobility & Transportation Options* that begins on p. 9 for a discussion of all the above measures.)

A Single Planning Entity:

The task force recommends strongly that the three upper valley governments identify a single entity to coordinate and facilitate regional mobility planning among governments, the private sector and the community. Over time, this coordination should expand in scope to include the full region.

Observations:

- Free-flowing traffic is not a reasonable expectation unless congestion reduction measures are sufficient to reduce current traffic and mitigate future induced traffic.
- The U.S. is undergoing a transition away from a car-centric culture. Millennials are buying fewer cars than previous generations, and parking demand is expected to drop.
- Regional and local land use decisions profoundly affect mobility challenges and traffic congestion.
- A grassroots advocacy organization for an integrated mobility system is essential.
- The community should seek public/private partnerships to help implement it.
- The integrated mobility system adopted should leverage existing approvals and plans (e.g., the Entrance to Aspen Record of Decision, Aspen Area Community Plan, etc.).
- We should improve mobility incrementally and continuously.
- Specific elements of the integrated mobility system will affect different people and different geographies in varying ways. We should consider carefully which user group is affected by each element of the system and plan accordingly.
- We should engage innovators and entrepreneurs from all sectors to help create the mobility system we envision.

The Community Forum Task Force recommends that the package of mobility experiments now being planned by the City of Aspen should be used by Aspen, Pitkin County and Snowmass Village to help demonstrate and explore elements of this integrated mobility system.

What Success Will Look Like:

If we fully implement the integrated mobility system, we will make upper valley travel substantially easier while remaining true to our most important community values. Commuters would spend more time with their families or on the job; visitors would gain a greatly improved vacation experience; and residents would enjoy an enhanced quality of life.

Introduction

What is the Problem?

Traffic congestion is a defining problem for residents, commuters and visitors in the upper Roaring Fork Valley. Traffic jams detract from our community's livability and waste valuable time that could otherwise be used for productive work, recreation, or visiting with friends and families. Commuters lose countless hours per year in stalled traffic, and Aspen residents cite downtown auto congestion as one of their biggest concerns. Businesses find it increasingly difficult to hire the employees needed to maintain our status as a world-class resort. Auto congestion clogs our streets and highway, creates noise and aggravation, and adds carbon and other pollution to our air.

Traffic congestion hurts our community in three broad ways: reducing economic productivity for local workers and businesses; damaging the visitor experience; and lowering the quality of life for everyone. Snarled traffic does not reflect well on our community, which prides itself on responsible urban planning and sincere concern for the environment. RFTA, while doing an excellent job at carrying over five million passengers per year, is operating at capacity for much of the year, and its future growth faces possible limits from both budgetary challenges as well as the reality that about 1,000 daily bus trips already enter and leave Aspen in peak season.

Our current challenges will only grow. The state demographer's office projects that, by 2035, Pitkin County's resident population will grow by 25% and the Roaring Fork Valley's population will grow by roughly 50% to a total of 70,000 people. Visitor growth could be comparable – and all these increases will further stress an already challenging traffic problem.

The Community Forum Task Force recognizes that we cannot build our way out of traffic congestion by simply adding more highway or transit capacity. A more sustainable and effective long-term solution must be found.

The Work of the Transportation & Mobility Task Force

In 2016, the Aspen Institute convened a group of 31 community leaders to develop a values-based vision for where we, as a community, want to be in 20 years (by 2035) with respect to transportation and mobility in our upper valley (Basalt to Aspen/Snowmass). The group met for 15 months: from June 2016 through August 2017. Through its research and meetings with local and national transportation experts, the Community Forum Task Force reviewed the rapid changes taking place in demographics, technology, culture, mobility preferences, autonomous and electric vehicles, ride hailing and sharing, carpooling, transportation demand management, and the wide array of available mobility options, both new and old.

Early on, task force members identified nine core values by which to evaluate transportation and mobility options. These ranged from community values like environmental quality and community character to operating system values, such as financial feasibility and effectiveness at reducing traffic congestion. The task force then identified a dozen transportation and mobility options representing diverse approaches to solving the traffic and congestion issues facing our community, and it then developed a matrix by which to review each option in terms of its compatibility with the core values.

The Principle of Induced Traffic

Early on, task force members identified induced traffic as a critical principle that must be addressed by any transportation/mobility system adopted in our valley.

In growing areas, when automobile congestion is reduced by increasing mobility alternatives and/or highway capacity, new traffic is generated and highways normally return to their previous level of automobile congestion. This reality has been demonstrated repeatedly in growing towns and cities around the U.S. and the world, as well as here in our valley. The phenomenon has two primary causes, both rooted in human behavior:

(A) **Latent Demand**. When perceived auto congestion is reduced during peak hours, many people will use a highway more often, shift their travel back to peak hours, or switch from transit to driving, thus increasing congestion again. This is a specific application of the economic concept of "induced demand." That is, when the supply of a good increases, more of the good is consumed.

(B) **Land Use Effects**. A perceived shorter commute to a desired work or recreation destination spurs residential and commercial real estate development in more distant areas. In short, a new or expanded highway can turn land previously perceived to be distant in terms of commuting time into prime real estate development property. Since traffic engineers estimate that each new unit of housing can typically generate 10 new one-way auto trips per day, 100 units of new housing can result in 1,000 additional daily car trips on local roads and highways. The effects of new residential and commercial development on traffic congestion are often dramatic.

For more information on induced traffic:

Building Bigger Roads Makes Traffic Worse
Wired 2014
https://www.wired.com/2014/06/wuwt-traffic-induced-demand/

Increasing Highway Capacity Unlikely to Relieve Traffic Congestion
University of California-Davis 2015
http://www.dot.ca.gov/research/researchreports/reports/2015/10-12-2015-NCST_Brief_InducedTravel_CS6_v3.pdf

Generated Traffic and Induced Travel
Victoria Transport Policy Institute 2017
http://www.vtpi.org/gentraf.pdf

Regional Challenges, Regional Solutions

From the start, the task force recognized that regional problems demand regional solutions and that the upper valley neither can, nor should, solve the valley's transportation challenges on its own. Task force members, who themselves live in different regions of the Roaring Fork Valley, discussed this reality at length. At the same time, the members believed that the upper valley mobility problem was a good place to start, and it hoped that its work would spark a broader and much needed regional conversation about mobility throughout the Roaring Fork Valley and beyond. In addition, since a significant percentage of mid-valley traffic moves to or from Aspen/Snowmass, upper valley solutions can help with some of the issues elsewhere.

Core Values Underlying Our Upper Valley Transportation System

Essential Community Values

➢ **Community Character**
- Preserves livability
- Fewer cars/less traffic
- Decreases urbanization
- Reflects limits to growth
- Compatible with affordable housing and transit oriented development
- Tranquility … community peace and harmony
- Promotes thriving community
- Fun and cool
- Aesthetically pleasing

➢ **Environmental Quality**
- Reduces carbon emissions and other pollution

Operating System Values

➢ **Traffic & Congestion Reduction**
- Reduces long term traffic and congestion
- Fewer single occupant vehicles

➢ **Social Equity**
- Affordable to users
- Valley-wide benefits
- Works for both residents and visitors
- Positive shared experience
- Builds community

➢ **Convenience and Comfort**
- Frequent
- Fast
- Reliable travel times
- Easier commute
- Seamless and integrated
- Multiple modes and cross-modal ease
- Connects mountains and tourist centers

➢ **Adaptable to the Future**

Minimum System Requirements

➢ **Safety**
- Human safety
- Cyber security

➢ **Financial Viability**
- Cost effective
- Data informed
- Cost and funding mechanisms acceptable to community

➢ **Capacity to Move People and/or Reduce Travel Demand**
- Adaptable to different travel demands
- Sufficient capacity and scale to make a difference

Our 2035 vision for upper valley transportation is an integrated system that incorporates all of the above values and creates a spectrum of innovative mobility options for our residents, commuters and visitors.

Summary of Transportation & Mobility Options

As presented by invited experts and discussed by the task force

Ride Sharing Systems

Ride Hailing Systems

Enhanced Bus Rapid Transit

HOV Lane Enforcement

Dynamic Road Pricing

Parking Strategies

Snowmass Village Connection Enhancements

Airport/Transit Connectivity

Transit-Oriented Affordable Housing

Light Rail Transit

Mountain-to-Mountain Connection

Increased Highway Capacity for Vehicles

Ride Sharing Systems

An app-based ride sharing system could allow travelers to share automobile rides in two ways:

A. First and Last Mile Service: Moving riders between homes and transit stations, as well as between final transit stations and workplaces, recreation areas or other destinations.

B. Valley Trunk Line Service: Moving riders along RFTA's valley trunk line route between origin communities and destinations in the Aspen/Snowmass area.

This could be (1) a peer-to-peer app-based system matching private vehicle drivers with passengers, (2) a for-hire app-based "microtransit" service such as Chariot, Lyft Line, UberPool, etc., or (3) a "casual carpool" system requiring minimal third-party management. In the first two cases, the cost of a ride could be paid through the app – no cash need be exchanged. For security, drivers might be prescreened during registration (See "issues"). Both drivers and riders could be user-rated through the app.

The system could be optimized with a wide array of mobility resources, such as bike sharing, "kiss and ride" stations, employer incentives and pedestrian improvements. To alleviate first-mile challenges, WE-cycle, our local bike share provider, could be expanded to reach more riders throughout the valley.

Features & Advantages:

- Could increase valley mobility without adding new cars to the highway or requiring RFTA to buy more buses.
- Simplicity of "one click" mobility. A ride sharing app could identify and reserve seats on private vehicles already en route up or down the valley.
- Ridesharing along the valley's trunk line corridor could increase.
- More efficient use of thousands of existing private vehicles in our valley.
- Could build sense of community in valley.
- Could attract riders currently unwilling to ride public buses.
- Cheaper and easier than capital intensive alternatives such as LRT or enhanced BRT.
- Ride sharing concepts are now being tried in different parts of country.
- Target audiences can be reached through social media campaigns.

Issues & Challenges:

- Because of the principle of induced traffic, ride sharing is unlikely, by itself, to reduce traffic congestion on Highway 82.
- Would enough riders use the system to significantly increase mobility?
- Is driver screening actually needed? If so, what level of screening would drivers undergo and how would it be managed?
- An app-based system would need to use either an existing app (e.g., Transit App) or a new one created for our valley. Building on an existing app would be preferable.
- Could riders be picked up at RFTA stations without impacting bus operations?

Cost Implications:

- Relatively low up-front capital cost compared to some other options. Would not require substantial construction and equipment.
- A for-hire provider (Lyft Line, UberPool, etc.) might require a public subsidy for riders.

Ride Hailing Systems

Ride hailing systems include app-based services like Uber, Lyft, the Aspen Downtowner, and taxis that offer on-demand rides. They tend to be organized public or private services, rather than peer-to-peer citizen-based systems. Like ride sharing, ride hailing could function in either of two ways:

A. First and Last Mile Service: Moving riders between homes and transit stations, as well as between final transit stations and workplaces, recreation areas or other destinations.

B. Valley Trunk Line Service: Moving riders along RFTA's valley trunk line route between origin communities and destinations in the Aspen/Snowmass area.

A ride could be summoned through an app, and its cost could be bundled with that of a RFTA bus ticket so that only a single transit purchase (or click) would be needed.

Features & Advantages:

- Simplicity of "one-click" mobility.
- Relatively low cost as an option to develop.
- First and last mile service could make it easier to use RFTA's trunk line buses moving up and down valley.
- Concept now being tried by for-hire services in different parts of country.
- Target audiences could be reached through social media campaigns.
- Some existing transportation funding by governments, nonprofits and schools might be redirected to more efficient uses.

Issues & Challenges:

- Because of the principle of induced traffic, ride sharing is unlikely, by itself, to reduce traffic congestion on Highway 82.
- A for-hire system (UberPool, etc.) might require a public subsidy for riders.
- Some locations have limited cell service and GPS mapping for apps is not always reliable.
- Ride hailing companies (Uber, Lyft, etc.) would need to increase service levels in the valley.

Cost Implications:

- Relatively low up-front capital cost compared to some other options. Would not require substantial construction and equipment.
- By potentially boosting ridership on RFTA's trunk line buses, first and last mile service might increase RFTA's need to buy more buses and incur additional operating expenses.

Enhanced Bus Rapid Transit (BRT)

Enhanced BRT could consolidate existing BRT, express, local, and skier-shuttle riders at 10, 20, and 30-minute frequencies, depending on time of day. Electric or Compressed Natural Gas (CNG) buses could be part of enhanced BRT service operating between the Brush Creek BRT Station and Rubey Park. In the future, autonomous electric buses might provide benefits similar to LRT at lower cost.

Features & Advantages:

- Could feel more like LRT: quiet and comfortable.
- Could reduce overall bus congestion in Aspen by as many as 100 bus trips per day.
- Electric buses are much quieter than CNG or diesel buses, although if the system started off with CNG buses, this noise reduction benefit would be lost.
- Could be phased more easily than LRT: electric buses and other enhancements could be introduced as funding becomes available. Initially, up-valley passengers might not have to transfer to electric buses at the Brush Creek Intercept Lot.
- If the Modified Direct Alignment across the Marolt Open Space were used, this would save an average of two minutes per trip and improve emergency access in and out of Aspen.
- City buses would remain as in-town shuttles, but in the future they might become small autonomous transit vehicles.
- New transit stop at 7th Street. New end-of-line station might be created at Main and Galena.
- Could include Snowmass Village Connection Enhancements
- Future autonomous electric buses might safely travel within a few inches of one another, although digital security would become extremely important.
- Over time, BRT could build ridership and eventually lead to light rail.

Issues & Challenges:

- Because of the principle of induced traffic, enhanced BRT is unlikely, by itself, to reduce traffic congestion on Highway 82.
- While Aspen residents voted to allow light rail across the Marolt Open Space, a new vote would be required for bus lanes there. A new highway across Marolt would be politically difficult.
- By requiring passengers to transfer to/from buses at the Brush Creek BRT Station, the BRT option may not be as convenient as existing one-seat ride services for commuters and skiers, and it might incur a “transfer penalty” in ridership. (A future all-electric valley bus system would resolve this issue.)
- If the Modified Direct Alignment across Marolt was not constructed with its two-minute time savings, nothing might offset an electric bus “transfer penalty” at Brush Creek, which could result in a loss of ridership.
- Electric buses likely require in-route charging stations and auxiliary heat in the winter.
- Electric buses have higher capital costs, and RFTA is currently challenged just to replace its diesel and CNG buses. Initially, some buses might have to remain diesel or CNG.

Cost Implications:

- Significant capital cost ($159 million – $200 million, 2016 dollars), but lower than LRT.
- Possibly reduced operating costs compared with today’s BRT, Local, Express, and Skier Shuttle bus services.
- Deployment of charging infrastructure could be expensive.

High Occupancy Vehicle (HOV) Lane Enforcement

The Highway 82 Basalt to Buttermilk Record of Decision (ROD) included HOV lanes as a Transportation Demand Management (TDM) measure introduced with the Basalt/Buttermilk four-lane highway project (1996-2004). HOV restrictions were designed to increase carpooling and allow more efficient transit operations. Also, the right lane's reduced congestion should decrease travel time for car pools and transit users. Vehicles carrying two or more passengers may use the HOV lanes during rush hours.

The Colorado Department of Transportation (CDOT) initially conducted a robust public relations campaign to inform the traveling public about the SH 82 HOV program. Early on, the Colorado State Patrol (CSP) enforced the HOV lanes, and motorist compliance was high. Pitkin County courts, however, were reluctant to fine motorists who challenged tickets in court. Subsequently, enforcement dropped off, and tickets are no longer issued.

The lack of enforcement of existing HOV restrictions is negating the benefits of the HOV lanes. Efforts are needed to secure judicial support, provide outreach, and fully enforce HOV laws.

Features & Advantages:

- Previous analyses estimate that full HOV compliance could reduce weekday traffic by over 2,500 vehicles per day.
- Provides for safer, more efficient transit operations.
- Reduces parking demand due to decreased vehicle trips.
- Could reduce auto emissions and pollution.
- Existing technology can count the number of riders in a car and reduce enforcement costs.
- Enforcement might also be subcontracted out to reduce the load on local resources.
- Enforcement would reward and encourage carpooling/ride sharing.
- Visible enforcement of HOV restrictions would also reduce speeding on Highway 82. This could address the perceived "advantage" of single-passenger private vehicles speeding illegally.
- Enforcement might "calm" Highway 82, shift attitudes and reduce stress and accidents.
- Could create a "rules of the road" education and communication opportunity.

Issues & Challenges:

- Because of the principle of induced traffic, existing HOV restrictions might not, by themselves, reduce traffic congestion on Highway 82, but they might potentially, if tightened (e.g., three passengers).
- May be difficult to secure judicial support for enforcement of HOV laws.
- Additional enforcement efforts by the CSP and Pitkin County Sheriff would require additional law enforcement resources. These might be provided by new enforcement revenues.
- Would require partnerships with CDOT, Colorado State Patrol and local governments.
- Might require a change of local law enforcement philosophy.
- Would work best if the HOV lanes came all the way into Aspen.

Cost Implications:

- Costs of additional law enforcement resources and whether new revenues would offset them.
- Costs for a robust public outreach campaign to explain the HOV restriction, and why it is in place.

Dynamic Road Pricing

For Aspen, dynamic pricing might include an electronic toll on traffic entering Aspen that could vary depending on levels of congestion and purpose of trip. To avoid the toll, motorists could park at the Brush Creek lot and take a free bus into Aspen or qualify for an exemption to the toll (car pool, etc.).

Road pricing is one of the few options that has demonstrated its ability to actually reduce traffic congestion. Trip pricing could depend on different factors, such as time of day, number of passengers, level of congestion, and environmental impact. For example, travel might be free for car pools, working parents with children in Aspen preschools, or those working in essential services. While pricing sounds like a "stick," it could seed many "carrots" by funding transportation options that reduce the need for a private vehicle. Dynamic pricing could make travel to Aspen significantly quicker and easier than today, and by reducing travel time would allow for higher productivity for those who are paid by the hour.

For Aspen, dynamic pricing might include an electronic toll on traffic entering Aspen that could vary depending on levels of congestion and purpose of trip. To avoid the toll, motorists could park at the Brush Creek lot and take a free bus into Aspen or qualify for an exemption to the toll (car pool, etc.).

Features & Advantages:

- May be the most reliable tool available to reduce or eliminate traffic jams both on Highway 82 and in downtown Aspen. Roadway capacity freed up by road pricing is less likely to be filled by induced-traffic than other mobility options.
- Aspen and Snowmass bound commuters and visitors could reduce or eliminate time lost sitting in traffic jams.
- Professionals who charge by the hour, such as electricians and plumbers, could benefit from a significant increase in billable hours that would greatly exceed the cost of any toll.
- Could significantly improve the visitor experience and stimulate the local economy.
- If properly designed, could enhance social equity. (Versus the current traffic jams, in which everyone loses.)
- Toll revenues could be used to fund RFTA buses and other mobility options. Ideally, RFTA buses would become less expensive (possibly even free), along with future driverless shuttle services, etc.
- Would reduce carbon emissions and other forms of air pollution. Would support the City of Aspen's Canary Initiative.
- Both automobile drivers and transit users could benefit in a potential "win/win."

Issues & Challenges:

- Federal and state rules would control the development of this program.
- A substantial public outreach effort would be necessary to build community support.
- Without social equity measures (e.g., enhanced and/or free alternative mobility options), this might be considered a regressive tax.
- Safeguards would be needed to mitigate traffic diversion to McLain Flats Road.
- Tolling facility should be close to Aspen to avoid charging for airport travel.
- This plan must offer travelers an excellent value proposition in exchange for road pricing.
- Implementation would require strong political will at all levels of government.

Cost Implications:

- Would generate substantial new revenue to reinvest in existing and new mobility alternatives.
- An initial investment would be required to fund the capital cost of tolling facilities (overhead detection) and the program startup costs.

Parking Strategies

Integrate parking into a larger, innovative mobility system through a combination of measures that might include the following:

- **Dynamic pricing**, which varies parking prices to respond to traffic congestion, parking availability and location, and special events.
- **Centralized valet services**, which could increase utilization of public and private parking spaces and garages. (For some, this might reduce the need for circling around the block.)
- **Zoning code changes** to discourage car use in residential/commercial developments.
- **Employer Carrot-Sticks**: Employers would limit parking and offer alternative transit options to employees instead of parking spaces. If parking were made more of a responsibility, neighborhoods might stop being "storage lots."
- **Other City of Aspen ideas** for parking innovations are currently under study.

Because individual actions taken by Aspen, Snowmass and Pitkin County often affect the other jurisdictions, parking strategies should be considered and coordinated on a regional basis.

Features & Advantages:

- Each strategy or combination of strategies could be tested, modified, and refined over time.
- Parking strategies could be designed to park more cars outside town to reduce the number of cars downtown.
- Roadway capacity freed up by dynamic parking pricing is less likely to be filled by induced-traffic than other mobility options. This could complement dynamic road pricing.
- New revenues could be directed toward subsidizing transit passes and other alternative mobility modes.

Issues & Challenges:

- Unless parking strategies include significant new dynamic pricing, the principle of induced traffic would likely prevent this option from reducing traffic congestion on Highway 82.
- User acceptability.
- To be fair, a dynamic pricing plan would need to include social equity measures for commuting workers (e.g., enhanced and/or free alternative mobility options).
- Would not affect those with free parking spaces in downtown Aspen.
- Simply reducing parking places could adversely affect stores and restaurants.
- May prompt arguments about whether parking is a right or a privilege.

Cost Implications:

- Little capital cost.
- Modest operating costs.
- Dynamic pricing might generate new revenue to reinvest in other mobility alternatives.

Snowmass Village Connection Enhancements

More direct transit links to Snowmass Village on Brush Creek of Owl Creek roads (e.g., LRT or BRT) could be part of the larger mobility enhancement program.

The successes of the free skier shuttle and the evening direct service between Snowmass Village and Aspen demonstrate the potential to move travelers from private automobiles to transit "trunk line" service, which could be aligned with the existing BRT service as a first step. Future steps could include dedicated direct bus service in the peak periods. These services, combined with the possibilities of direct, aerial Mountain-to-Mountain connections, could integrate the ski areas of Snowmass, Buttermilk, Highlands, and Aspen within one operating system.

Features & Advantages:

- Connects the two upper valley communities and tourist bed bases.
- Expands on highly successful winter operations.
- Uses existing infrastructure.
- Focuses on tourism and employee mobility.
- Has significant carrying capacity.
- A scenic Owl Creek transit route might enhance the visitor experience.

Issues & Challenges:

- Because of the principle of induced traffic, this option is unlikely, by itself, to reduce traffic congestion on Highway 82.
- Labor intensive.
- Owl Creek would require costly improvements to accommodate transit.
- If transit ran on Owl Creek, the existing system using Brush Creek as a transfer station would lose some efficiencies.
- Owl Creek is challenging, particularly in winter.

Cost Implications:

- Relatively low capital costs, depending on system chosen.
- High operating cost, which could strain existing resources.

Airport/Transit Connectivity

Although the current airport bus station and Highway 82 pedestrian underpass serve the airport terminal, transit ride-share to/from the airport is only about 3%, although a good portion of the remaining 97% doesn't necessarily drive a car the rest of the way. Based on current airport planning, this is not expected to change, even though enplanements are projected to increase significantly over the next 20 years. Options for stronger transit access to the airport:

- Using the existing BRT station on Highway 82, stopping buses at the terminal doors, or creating a designated airport transit shuttle. Options that use the BRT station would require some type of weather-protected connection to the terminal doors (e.g., covered and/or moving walkway).
- For a fee, hotel shuttles might be given the right to use bus lanes to and from the airport.
- More passengers might be intercepted outside the airport and transported via special transit.
- Empty hotel shuttles might "scoop up" passengers at bus stops.
- Visitors' luggage might be transported directly to and from hotels for them (as in Switzerland).

Features & Advantages:

- Studies show that visitors would rather use transit than rent a vehicle.
- Additional transit ride-share from the airport would:
    - Reduce traffic growth facilitated by an expansion of rental cars.
    - Provide an opportunity for visitors to begin their Aspen experience on transit.
    - Decrease rental vehicles in Aspen and Snowmass Village.
    - Potentially increase visitors' use of transit in town.
    - Provide savings on lodge and hotel shuttle costs.

Issues & Challenges:

- Because of the principle of induced traffic, this option is unlikely, by itself, to reduce traffic congestion on Highway 82.
- It's unclear who is responsible for costs and planning for airport transit amenities.
- Bringing BRT to the terminal door would add significant travel time to the BRT system. This problem would be eliminated if airline passengers boarded a bus at the existing BRT station.
- Some lodges and hotels prefer to capture their guests at the terminal and provide transportation to control and enhance their Aspen experience.
- Some transit vehicles are not set up to take luggage.
- Loading luggage adds time to transit trips.
- Data on the mix of transportation modes is unavailable.

Cost Implications:

- Costs associated with developing transit access to terminal door.
- Loss of airport revenues from fewer vehicle rentals.

Transit-Oriented Affordable Housing (TOAH)

The concept of transit-oriented affordable housing (TOAH) has been pursued for many years in the upper Roaring Fork Valley. Over the decades, over 2,800 affordable housing units have been created in the upper valley to retain our sense of community, house our local workforce, and reduce the need for commuting on Highway 82. Fortunately, over half of Aspen's population lives today in deed restricted affordable housing. Unfortunately, over 60% of the town's workforce must still commute to town each day, significantly exacerbating traffic congestion. Job generation inside Aspen's roundabout has outpaced the creation of affordable housing, locking in the need for many to commute.

One option for reducing travel demand is to redouble local efforts to locate affordable housing close to work or transit — and to do so in all local jurisdictions. For example, RFTA has located park and ride lots and transit stops close to Basalt, El Jebel and Carbondale neighborhoods. Each might offer affordable housing opportunities to help reduce travel demand on our highway.

Features & Advantages:

- TOAH works best when people can walk directly to work, eliminating the need to drive.
- TOAH can build community while reducing peak-hour travel needs.
- City and county governments are continually evaluating potential sites. Park and ride lots themselves could be used for affordable housing built over the parking lot, thus becoming a "live and ride." Likewise, organizations located on campuses could be encouraged to build housing over parking lots and other land near their facilities.
- Many Aspen and Snowmass businesses are unable to hire sufficient employees during winter and summer seasons.
- Non-commuting employees enjoy more family time and arrive at jobs less stressed out.
- Affordable housing near work or transit increases social equity.

Issues & Challenges:

- Because of the proven principle of induced traffic, this option is unlikely, by itself, to reduce traffic congestion on Highway 82. Local experience bears this out.
- Even when it's located near workplaces, new housing can still increase the number of cars on local roads, although at a lower rate than non-transit-oriented housing.
- Finding new upper valley housing sites has been a notorious problem for many years.
- New housing projects often provoke resistance from neighbors.
- New housing inevitably increases other community costs for things like schools, early education and daycare, hospitals, social services, police and other emergency responders, etc.
- While affordable housing and growth control have historically enjoyed support from many of the same upper valley voters, the goals of creating new housing and retaining our small-town quality of life are now beginning to conflict. Housing often generates significant opposition.
- Transit Oriented Affordable Housing is most effective in destination communities, but the easy sites for housing are often outside urban growth boundaries.

Cost Implications:

- Affordable housing is expensive. Projects require significant local-government subsidy, private sector investment, and/or compromising of local zoning requirements.
- Funding strategies include affordable housing taxes, tax incentives, land use requirements and fees, private initiatives, public/private partnerships, and federal/state programs.

Light Rail Transit (LRT)

Light Rail Transit (LRT) is contemplated as the final phase for transit in the Entrance to Aspen Record of Decision (ROD). The Elected Officials Transportation Committee (EOTC) of Pitkin County, Aspen and Snowmass recently commissioned a study to update the LRT alternative from Aspen to the Brush Creek parking lot/transit station. As currently designed, LRT would run from the Brush Creek lot to either Rubey Park or a new proposed station at Galena Street and Main Street. In the Galena and Main option, local buses would run from Rubey Park, and small autonomous transit vehicles would connect Rubey Park to the Galena & Main station.

Features & Advantages:

- Studies show LRT to be a more enjoyable transit experience than buses. LRT might enhance the visitor/commuter experience.
- Voters have approved LRT across the Marolt Open Space, and LRT is the preferred alternative in the Record of Decision for the Entrance to Aspen Environmental Impact Statement (EIS).
- Provides an opportunity for a future down-valley commuter rail connection.
- Has substantial passenger carrying capacity.
- Reduces more buses in downtown Aspen and across Castle Creek Bridge than BRT.
- By requiring fewer drivers than BRT, LRT would reduce RFTA's hiring challenge.
- Onboard Charging Systems (OBS) represent a major breakthrough in LRT power technology, allowing a rail vehicle to operate without overhead wires. Instead, rail vehicles would run off of batteries and charge at stations using inductive charging.

Issues & Challenges:

- Because of the principle of induced traffic, LRT is unlikely, by itself, to reduce traffic congestion on Highway 82.
- Requires construction of the Modified Direct alignment across Marolt Open Space via the existing transportation easement with a direct connection to 7th and Main Street.
- By requiring passengers to transfer to/from buses at Brush Creek BRT Station, the BRT option may not be as convenient as existing one-seat ride services for commuters and skiers, and it might incur a "transfer penalty" in ridership.
- Very high capital and operating cost for which federal funding is unlikely.
- Although quiet, some might consider LRT out of scale with Aspen.
- Projected to have about the same ridership as the BRT option.
- Potential impacts to vehicle movements at at-grade intersections.
- LRT is an inflexible investment – but one with great longevity.

Cost Implications:

- Based on the recent EOTC study, LRT costs would range from $428 million to $528 million.
- High capital cost exceeds currently available budgets and revenue streams.
- LRT construction is more disruptive than BRT and complicated to phase. This could negatively impact financing options.
- Operating and maintenance costs are double those of the BRT option.

Mountain-to-Mountain Connection

Aerial intermountain gondola connections between Aspen and Snowmass have been discussed for half a century. They offer the potential both to significantly improve the skier experience and to alleviate some winter peak-hour roadway travel demand. Potential connections include:

A. A Highlands-Buttermilk gondola connecting the bases of Buttermilk and Highlands with a stop at the top of Buttermilk.

B. A gondola connection from Highlands to Aspen Mountain.

C. A gondola from Buttermilk to the summit of Elk Camp at Snowmass, designed to address stringent environmental criteria.

A system of intermountain gondolas connecting Aspen, Snowmass, Buttermilk and Highlands as a single skiable mountain complex could improve the Aspen-Snowmass winter experience and represent a major resort enhancement. Snowmass/Aspen visitors and valley skiers could all benefit.

Features & Advantages:

- During winter months, a mountain-to-mountain system could reduce peak-hour travel by taking skiers off the road and potentially reducing pressure on Highway 82, Brush Creek Road, Maroon Creek Road, Owl Creek Road and the entrance to Aspen roundabout.
- A mountain to mountain connection would likely reduce demand for upper-valley RFTA buses, possibly freeing up resources.
- It could help parents avoid many Ski Club and other mountain drop-off trips for children.
- Enhancing the winter resort experience would help protect Aspen's appeal and competitive position as a world class winter resort destination. A gondola connection might also be a major attraction for non-skiers (like Chamonix's Aiguille du Midi cable car ride).

Issues & Challenges:

- Because of the principle of induced traffic, this option by itself is unlikely to reduce traffic congestion on Highway 82, unless it were combined with a substantial auto-disincentive.
- Would require U.S. Forest Service approval and likely require support from all upper valley governments.
- Some neighbors might object to gondolas in their view plane.
- Environmental objections might be raised to a Buttermilk-Snowmass gondola, even if no access road were constructed.
- A gondola interconnection is not in the County's master plan.
- It would not directly connect areas with large bed bases.

Cost Implications:

- A mountain to mountain interconnect system might be paid for with private investment.
- Opposition could exist to a public investment that might serve only skiers, although connections and integration with public transit might merit a public/private partnership or coordinated investment in some form.

Increased Highway Capacity for Vehicles

(unrestricted four-lane into Aspen)

[Note: Unlike the previous options, this one was not suggested by any outside experts consulted by the Community Forum Task Force or by any task force member. It is included here simply because it has been debated for so many decades in the upper valley.]

Traffic congestion exists on the two-lane portion on Highway 82 between Aspen's four-lane Main Street and the four-lane highway from down valley to Buttermilk. To increase highway capacity, this option would add lanes without enforced restrictions (e.g., HOV or Bus). The option was rejected in the past, in part because it would increase traffic congestion, noise, and air pollution in downtown Aspen. (Note that Aspen's PM-10 pollution has subsided since the 1990's, and Aspen now meets federal air quality standards.)

Features & Advantages:

- Would reduce highway congestion in the short term.
- Would allow safer operations and reduce accidents by eliminating the S-curves.
- Could utilize the "preferred alignment" transportation easement across the Marolt Open Space.
- Would be adaptable to tolling to generate revenues and manage travel demand.
- Might improve emergency access in and out of Aspen in the short term.
- May accommodate rubber–tired transit solutions.

Issues & Challenges:

- Because of the principle of induced traffic, increased highway capacity (without dynamic road pricing) would not reduce long term traffic congestion on Highway 82. This has been demonstrated in other cities.
- Would immediately increase traffic congestion and noise in downtown Aspen.
- Would increase carbon emissions and other forms of air pollution in Aspen.
- Would place rubber-tired transit in mixed traffic, which would slow transit.
- Would require a City of Aspen public vote to cross the Marolt Open Space.
- Would violate the Aspen Area Community Plan and the Canary Initiative.
- Would require the Environmental Impact Statement process to be reopened because it is not currently approved in the Aspen Record of Decision*.

Cost Implications:

- Estimated cost is over $100 million.
- In the short term, reduced travel times might provide savings to motorists and to businesses dependent on the movement of goods and services. In the long term, traffic congestion would resume.
- Increased traffic congestion, noise and air pollution in downtown Aspen might reduce Aspen's quality of life and resort appeal, harming the economy.
- Environmental Impact Statement required by the National Environmental Policy Act.

Other Options Not Studied for This Report

Over past decades, many mobility options have been considered for the Entrance to Aspen. Examples include a large intercept parking facility located close to Aspen (under the Marolt open space) and the so-called "split shot" in which traffic entering Aspen would cross the Marolt open space, while departing traffic would follow the existing S-curves. While the Marolt intercept lot idea was advocated by one of its members, the task force did not study either of these options, noting that both had been rejected in the environment impact review that was part of the Aspen Record of Decision.

Community Forum Task Force on Transportation and Mobility

ADDENDUM

1. Community Forum Task Force members
2. Expert speakers and links to their presentations
3. Options matrix and scoring system
4. Options scoring results

THE ASPEN INSTITUTE
community programs

Community Forum Task Force on Transportation and Mobility

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Community Task Force Members

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community programs

Task Force Members

John Bennett, Co-Chair
Former Mayor of Aspen

As former Cradle to Career Director for the Aspen Community Foundation, John Bennett oversaw the Aspen to Parachute Cradle to Career Initiative, which is aimed at increasing youth success across western Colorado. After more than two decades as a business CEO, Bennett moved to the public sector, serving four terms as Aspen's mayor and overseeing a $40 million budget that produced a surplus each year he was in office. He later served as VP of the Aspen Institute, co-founder of the Cordoba Initiative, and president of For The Forest, an environmental stewardship organization. He's a graduate of Yale University.

Rose Abello
Director, Snowmass Tourism

Rose Abello was named Tourism Director for Snowmass Tourism in September 2014. She first moved to the Roaring Fork Valley in 1997 and served as director of communications for Aspen Skiing Company. She has spent more than 25 years marketing travel and tourism.

Pam Alexander
Aspen citizen

Formerly based in San Francisco, Alexander founded a technology-focused public relations firm which was acquired by WPP. Clients included Hewlett Packard, WebMD, EarthLink and the TED conference. She serves on the board of the Aspen Valley Ski Club, the Aspen Valley Hospital Foundation and the Aspen Art Museum, and is a former board member of the Aspen Community Foundation.

Markey Butler
Mayor, Town of Snowmass Village

Markey Butler is the first woman to be elected Mayor of Snowmass Village in its 37-year history. Butler is also the executive director of Hospice of the Valley.

Ward Hauenstein
Aspen citizen, City Councilman

Ward moved to Aspen in the fall of 1976. He is an enthusiastic bicyclist both mountain and road. In the winter he enjoys XC skate and classic, AT, and Alpine skiing. He is active in the Aspen Chapel and has been politically involved in local Aspen issues. He was elected to the Aspen City Council in May 2017.

Bill Kane, Co-Chair
Advisory Principal, Design Workshop

Bill is a 42 year resident of the Valley. He served as Planning Director for Aspen and Pitkin County from 1974-78. He authored the Aspen/Pitkin County growth management plan and oversaw the rezoning of Aspen and much of Pitkin County. He also was a Principal at Design Workshop. Aspen and served as VP in charge of Planning and Development for Aspen Skiing Co. from 1995-2005. He currently resides in Basalt and is a commissioner on the Colorado Parks and wildlife Commission. He is also on the Board of Great Outdoors Colorado and Aspen Valley Land Trust. Bill is an advisory principal at Design Workshop.

Nina Eisenstat
Aspen Marketing and Communications

Nina Eisenstat provides marketing and strategic communications consulting services to businesses, professional services firms, public institutions, and non-profit organizations. She is serving her third term as an elected member of the Aspen Chamber Resort Association's board of directors and sits on its marketing advisory and public affairs committees. She was a six-year member of the board of directors of the Buddy Program, president of its first national council, and a member of its community relations and development committees.

Brent Gardner Smith
Executive Director, Aspen Journalism

Brent Gardner-Smith is founder, editor and executive director of Aspen Journalism, a local nonprofit investigative journalism organization. Brent has over 30 years of experience in journalism, broadcasting and public affairs and has worked at the Aspen Daily News, The Aspen Times, Aspen Public Radio and Aspen Skiing Company. He has a master's degree in journalism from the University Of Missouri School Of Journalism.

Tom Heald
Asst. Superintendent, Aspen School District

With long family ties to western Colorado (family homesteads on American Flats near Silverton and Dallas Divide near Telluride), Tom and his family have lived in the Roaring Fork Valley for 25 years, with equal stays in Carbondale, Silt, Glenwood and now Aspen. As assistant superintendent for the Aspen School District, Tom has a sphere of influence in constructing meaningful activities for students and staff to thrive as learners, while his greatest joy is being outside with his wife, sons, and dogs to climb, raft, ski, ride and wrestle with gravity.

Task Force Members

David Houggy
President, Aspen Science Center Board of Directors

David joined the Buddy Program team as new Executive Director in 2012, bringing a wealth of experience in business development and strategic planning. He is a founding member of the Advisory Board of Mentor Colorado, an organization founded to promote and advocate for mentoring throughout Colorado. He is also President and a member of the Board of Directors of the Aspen Science Center, dedicated to bringing STEM programming to the youth of the Roaring Fork Valley.

David Hyman
Former Owner, High Mountain Taxi

David worked for many years in the transportation industry as the owner of High Mountain Transportation, a taxi, shuttle and delivery company. He has served on several transportation committees and study groups over the years, and has a keen interest in transportation issues.

Michael Kinsley
Facilitator and Strategic Planner

Michael was a county commissioner from 1975-85, the period in which Pitkin County transitioned to progressive policies. So he can talk about Aspen's good ol' days ad nauseum. Since '83, he has worked for Rocky Mountain Institute on sustainable communities and campuses, plus designing and facilitating many RMI corporate workshops and charrettes. Now that he's part-time with RMI, he provides mediation, facilitation and strategic planning services valley wide. And he's a painter.

John Krueger
Director of Transportation, City of Aspen

John has worked for the City of Aspen for over 20 years. He started in the Parks department as the Trails Supervisor managing and building trails in the Aspen area. He worked closely with CDOT to build the trail along Highway 82, the underpasses at the golf course, Truscott and Buttermilk. As Director of Transportation, John coordinates with CDOT, RFTA, the EOTC, Pitkin County, Snowmass, and Glenwood Springs on planning and valley wide transportation projects and issues. He is also responsible for the management of the local transit system, car share program, the Downtowner, employer outreach and various Transportation Demand Management programs.

Melony Lewis
Aspen citizen

Melony has worked with various organizations nationally and locally, primarily focusing on the environment and education. She currently serves on the board of Vanguard Chapter of the Aspen Institute, Aspen Country Day School and Aspen Center for Environmental Studies. Her employment experience has included public relations and marketing, medical employment recruiting and placement, guiding cycling tours throughout Europe, and executive language coaching.

Cristal Logan
Vice President, Aspen Institute

Cristal Logan is Vice President, Aspen and Director of Community Programs at the Aspen Institute. During her 18 year tenure at the Institute, Cristal has expanded the number of community events to over 70 days of programming per year including lectures, seminars for teens, and discussion series year round. A fourth generation resident of the Roaring Fork Valley, Cristal served as one of the inaugural members of the Aspen Community Foundation Spring Board, and is Vice Chairman of the Board of the Aspen Chamber Resort Association.

Mirte Mallory
Founder & Executive Director, WE-Cycle

An Aspen native, Mirte is the Co-Founder and Executive Director of WE-cycle, the Roaring Fork Valley's bike transit service. WE-cycle features 190 bikes at 43 stations between Aspen, Basalt, Willits, and El Jebel and is designed to serve as the first/last mile connection to RFTA and for short, quick, point-to-point trips. Mirte is the former Chair of the Pitkin County Planning & Zoning Commission and the Curator of the BERKO Photo Collection.

Tom Melberg
Real Estate Broker, Sotheby's

Tom moved to Aspen, Colorado on June 1, 1975 and never looked back. He got his real estate license in 1978 and has found the work to be the best job one could have. Tom is envied by his fellow colleagues by how he is consistently one of the top producing real estate brokers in the Aspen area while balancing his joy and commitment to skiing, golf, yoga, fly fishing, hiking, hockey, bird hunting and meditation. Tom is forever grateful for making his move to Aspen and living the dream with his wife, Lindy, for the past 28 years and their now three grown children, Ella, Wylie and Maggie.

Task Force Members

Michael Miracle
Director, Community Engagement, Aspen Skiing Company

Michael Miracle is the director of community engagement at Aspen Skiing Company. In that role, Michael is tasked with deepening ASC's connection to communities throughout the Roaring Fork Valley. That work could involve digging in on specific issues such as housing and transportation, or simply listening to and responding to community members concerns. Prior to joining ASC, Michael edited Aspen Sojourner magazine for a decade. His previous job in publishing was at Skiing magazine, where he worked for seven years, first as an assistant editor, then associate editor, and finally senior editor.

Maria Morrow
Attorney and Principal, Oates, Knezevich, & Gardenschwartz, P.C.

Maria Morrow is an 18-year Aspen resident, and has practiced law locally with OKGKM since her move from Chicago, where she began her legal career. After an impressive beginning as a federal court law clerk followed by practice as a litigator at the 100-year-old firm Kirkland & Ellis LLP, Maria moved to Aspen and joined Oates, Knezevich, & Gardenswartz, P.C. She became a shareholder of this 34 year-old firm in 2007. Maria specializes in real estate transactions, business transactions, contracts, litigation, homeowners' associations, and employment matters.

George Newman
Member, Board of County Commissioners, Pitkin County

George is on the Board of County Commissioners for District 5, and has been a Pitkin County resident since 1974. He holds a BS in Economics and an MA in Public Administration. He has a desire to protect the natural environment while maintaining a commitment to citizen involvement. He was a founding member and director of both Leadership Aspen (now Roaring Fork Leadership) and the Emma Caucus.

Steve Skadron
Mayor of Aspen

Steve Skadron is in his second term as Mayor of Aspen. Prior to becoming mayor, Skadron served as an Aspen City Council member for six years. Before that, he spent four years on the city Planning and Zoning Commission.

Greg Rucks
Transportation Principal, Rocky Mountain Institute

Greg Rucks is a principal in RMI's Transportation Practice and is currently managing a multi-year partnership with the Austin community to develop and implement technology and world-class solutions for transforming mobility. With an eye on replicability, Greg is also helping scale solutions from Austin to other global cities, starting with Denver. Since joining RMI in December 2010, Greg led a commercialization effort focused on lightweight-vehicle design and development that has since been funded by the Department of Energy.

Sheri Sanzone
Owner and Founder of Bluegreen
Landscape Architect and Urban Planner

Sheri is a landscape architect, planner and urban designer and founder of Bluegreen, a leading edge and environmentally responsible design studio based in Aspen. A former board chairperson of the Aspen-Pitkin County Housing Authority and Roaring Fork Leadership, Sheri also served on the US Green Building Council Colorado Chapter board. Before founding and nurturing Bluegreen, Sheri was Principal-in-Charge of Design Workshop's Aspen office.

Zoë Brown
Senior Associate
The Aspen Institute

Zoë served as an excellent manager of logistics for the Community Forum. While she was not an official task force member, she served as a key member of the team who worked tirelessly on this project.

John Sarpa
President, Sarpa Development

John has been a major real estate figure in Aspen and the Roaring Fork Valley since 1985. He co-chaired the citizens group that master planned and re-developed the Aspen Meadows, home of the Aspen Institute, Aspen Music Festival and School and the Aspen Center for Physics. He is currently the Vice Chairman of the Aspen Valley Hospital Foundation, a board member of the Valley Health Alliance and Chairman of the Aspen Institute Community Forum.

Task Force Members

Ralph Trapani

Program Director, Parsons Transportation Group

Mr. Ralph J. Trapani, P.E. is an award-winning engineer with over 40 years of transportation engineering experience. He is a Program Director with Parsons Transportation Group. He serves on the board of directors for CLEER (Clean Energy Economy for The Region). He spent 28 years with the Colorado DOT, serving as the I-70 Glenwood Canyon project manager for 12 years, and the State Highway 82 corridor manager for 10 years. He lives in Glenwood Springs, Colorado with his 16 year old son Lucca. He enjoys telemark skiing at Highlands, motorsports and cycling.

Barry Crook

Assistant City Manager
City of Aspen

Barry Crook, is one of two Assistant City Managers for Aspen. He oversees affordable housing planning/development, the Transportation Department, the Parking and Downtown Services Department, the City Council's Top Ten Goals effort and the city's customer service/continuous improvement efforts. Mr. Crook has over 30 years of experience working in state and local government in both the budget/finance and quality/customer service areas.

Katie Viola

Partner, Kissane Viola Design

Katie Viola is partner at Kissane Viola Design in Aspen, Colorado. She and her husband Paul have been living in Aspen for 16 years. Katie and Paul relocated from NYC where they were design directors for a wide variety of print publications and websites. Currently Kissane Viola Design specializes in brand development, art direction and graphic design, with many national and local clients. Kissane Viola Design is located in downtown Aspen. Katie is on the board of the Aspen Education Foundation and her son John is a proud student of Aspen Middle School.

Community Forum Task Force on Transportation and Mobility

2

Expert Speakers

with links to presentations

THE ASPEN INSTITUTE
community programs

EXPERT SPEAKERS

Session 1, December 13 and 14, 2016

Jim Charlier, President, Charlier Associates

Wheeler Opera House and taskforce meeting

Charlier is a well-known transportation and land-use planner based in Boulder. He's worked extensively in Aspen, in the Western US and in resort communities. Charlier discussed the influence of economics, demographics, settlement patterns, and technology on transportation systems and mobility, as well as the changing behavior and expectations in both public and private transportation.

LINK: **https://www.aspeninstitute.org/events/community-forum-reimagining-mobility-roaring-fork-valley/**

Session 2, March 9 and 10, 2017

Ann Bowers and Chris Breiland, Fehr & Peers

Doerr-Hosier Center and taskforce meeting

Bowers and Breiland, who have worked on transportation in the Roaring Fork Valley for years, discussed practical new ways to reduce demand for transportation systems, while increasing convenience; emerging technologies that affect design, safety, and efficiency of all travel modes; how lifestyle and behavioral trends influence transportation systems; and how big data helps us better understand travel patterns. Bowers' expertise includes the most advanced, state-of-the-practice transportation analysis techniques, and Breiland is an expert in complex multimodal corridor analysis.

LINK: **https://www.aspeninstitute.org/events/community-forum-transportation-mobility-reimagining-transportation-mobility-upper-roaring-fork-valley-session-2/**

EXPERT SPEAKERS

Session 3, May 24 and 25, 2017

Tony Dutzik, senior policy analyst, Frontier Group

Doerr-Hosier Center and taskforce meeting

Frontier Group is a public policy think tank focusing on the intersection of transportation, energy, and the climate. Dutzik discussed innovative mobility technologies and services—what they are and what they do; case studies in US cities where these technologies and services have been applied; and the opportunities and challenges that innovative mobility solutions present.

LINK: **https://www.aspeninstitute.org/events/community-forum-transportation-mobility-reimagining-transportation-mobility-upper-roaring-fork-valley-session-3/**

Session 4, June 6, 2017

Greg Rucks, Rocky Mountain Institute's transportation practice

Wheeler Opera House and taskforce meeting

Rucks addressed the technological innovations that are providing cost-effective, low-carbon solutions to traffic and congestion issues in other cities. He also discussed the pilot program he's managing in Austin, Texas, and how the Roaring Fork Valley is well-suited to implementing such a program.

LINK: **https://www.aspeninstitute.org/events/community-forum-transportation-mobility-positioning-roaring-fork-valley-mobility-future-session-4/**

Community Forum Task Force
on Transportation and Mobility

3

Options Matrix & Scoring System

THE ASPEN INSTITUTE
community programs

Options Matrix & Scoring System

	ESSENTIAL COMMUNITY VALUES		OPERATING SYSTEM VALUES				MINIMUM SYSTEM REQUIREMENTS		
OPTIONS	Community Character	Environmental Quality	Traffic & Congestion Reduction	Social Equity	Convenience & Comfort	Adaptable to the Future	Safety	Financial Viability	Capacity to Move People and/or Reduce Travel Demand
Ride Sharing Systems	67	51	43	45	39	62	29	61	47
Ride Hailing Systems	62	43	37	34	52	65	45	52	40
Light Rail Transit (LRT)	37	51	58	50	50	13	63	-29	55
Enhanced Bus Rapid Transit (BRT)	53	52	51	52	42	56	61	32	56
Snowmass Connection Enhancements	49	43	31	37	44	45	53	22	35
Mountain to Mountain Connection	54	38	14	18	33	13	46	4	16
Transit-Oriented Affordable Housing	55	50	44	45	51	34	49	21	37
HOV Lane Enforcement	48	42	42	38	29	48	52	59	38
Dynamic Road Pricing (VMT fees, etc.)	17	50	57	-6	20	59	46	60	53
Parking Strategies	45	47	44	6	3	47	33	49	34
Airport/Transit Connectivity	65	53	38	39	56	50	53	38	42
Increased Highway Capacity	-35	-37	-25	18	5	-13	-7	-23	-23

OPTION/VALUE RATING SYSTEM

3 = Fully consistent with this value. Substantial progress

2 = Adequately consistent with this value

1 = Minimally consistent with this value

0 = Neutral or Not Applicable

-1 = Inconsistent with this value

-2 = Extremely inconsistent with this value. Detrimental impacts

Community Forum Task Force
on Transportation and Mobility

4

Options Scoring Results

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community programs

Community Forum Task Force on Transportation and Mobility

CONTENTS

A Survey Results Option Scoring

B Value Areas Scoring

C Highest Selection Summary of Options

D Additional Evaluation, Q&A

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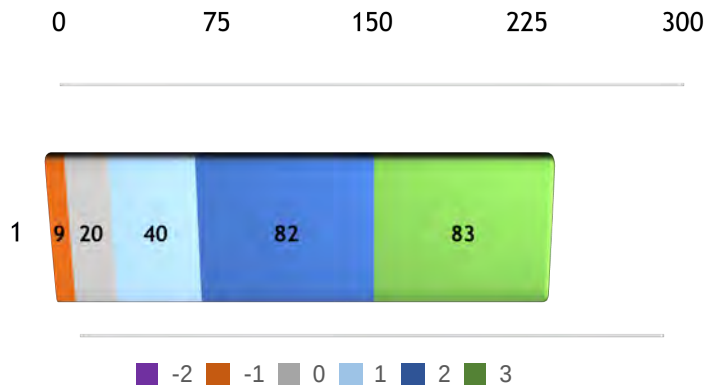
community programs

A. SURVEY RESULTS OPTIONS SCORING

1 - Ride Sharing Systems		Value						
#	Question	-2	-1	0	1	2	3	Total Score
1	Community Character	0	0	1	0	8	17	67
2	Environmental Quality	0	0	1	7	10	8	51
3	Traffic & Congestion Reduction	0	0	3	8	10	5	43
4	Social Equity	0	2	3	5	6	10	45
5	Convenience & Comfort	0	3	2	6	9	6	39
6	Adaptable to the Future	0	0	1	3	7	15	62
7	Safety	0	3	6	5	9	3	29
8	Financial Viability	0	0	1	1	12	12	61
9	Capacity to Move People and/or Reduce Travel Demand	0	1	2	5	11	7	47
	Total Responses	0	9	20	40	82	83	444

Ride Sharing Systems



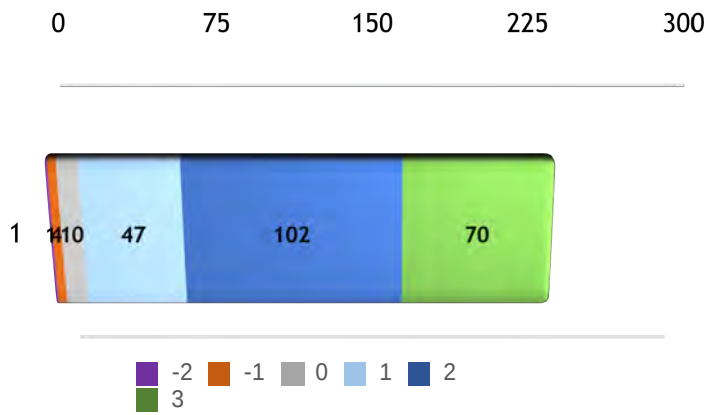
2 - Ride Hailing Systems		Value						
#	Question	-2	-1	0	1	2	3	Total Score
1	Community Character	0	0	0	2	12	12	62
2	Environmental Quality	0	2	1	8	8	7	43
3	Traffic & Congestion Reduction	0	2	2	9	9	4	37
4	Social Equity	0	2	6	7	4	7	34
5	Convenience & Comfort	0	1	1	4	11	9	52
6	Adaptable to the Future	0	0	0	2	9	15	65
7	Safety	0	1	4	2	13	6	45
8	Financial Viability	0	1	1	5	9	10	52
9	Capacity to Move People and/or Reduce Travel Demand	0	1	1	12	7	5	40
	Total	0	10	16	51	82	75	430

3 - Light Rail Transit (LRT)		Value						
#	Question	-2	-1	0	1	2	3	Total Score
1	Community Character	0	6	2	3	5	10	37
2	Environmental Quality	1	1	1	4	7	12	51
3	Traffic & Congestion Reduction	0	0	1	4	9	12	58
4	Social Equity	0	0	4	3	10	9	50
5	Convenience & Comfort	0	2	2	3	8	11	50
6	Adaptable to the Future	3	4	5	7	5	2	13
7	Safety	0	0	1	3	6	16	63
8	Financial Viability	13	7	2	4	0	0	-29
9	Capacity to Move People and/or Reduce Travel Demand	0	2	1	3	6	14	55
	Total Responses	17	22	19	34	56	86	348

4 - Enhanced Bus Rapid Transit (BRT)		Value						
#	Question	-2	-1	0	1	2	3	Total Score
1	Community Character	0	0	0	7	11	8	53
2	Environmental Quality	0	0	0	6	14	6	52
3	Traffic & Congestion Reduction	0	0	1	7	10	8	51
4	Social Equity	0	2	1	2	11	10	52

5	Convenience & Comfort	0	0	3	8	11	4	**42**
6	Adaptable to the Future	0	0	1	4	11	10	**56**
7	Safety	0	0	0	4	9	13	**61**
8	Financial Viability	1	2	4	5	11	3	**32**
9	Capacity to Move People and/or Reduce Travel Demand	0	0	0	4	14	8	**56**
	Total Responses	1	4	10	47	102	70	**455**

Enhanced Bus Rapid Transit



5 - Snowmass Connection Enhancements		Value						
#	Question	-2	-1	0	1	2	3	**Total**
1	Community Character	0	1	2	4	11	8	**49**

2	Environmental Quality	0	2	3	4	10	7	**43**
3	Traffic & Congestion Reduction	0	2	4	9	9	2	**31**
4	Social Equity	0	1	5	7	8	5	**37**
5	Convenience & Comfort	0	0	1	10	11	4	**44**
6	Adaptable to the Future	0	0	4	7	7	8	**45**
7	Safety	0	0	1	6	10	9	**53**
8	Financial Viability	2	2	4	10	6	2	**22**
9	Capacity to Move People and/or Reduce Travel Demand	1	0	3	9	11	2	**35**
	Total	3	8	27	66	83	47	**359**

6 - Mountain to Mountain Connection					Value			
#	Question	-2	-1	0	1	2	3	**Total**
1	Community Character	1	0	2	5	3	15	**54**
2	Environmental Quality	2	3	3	2	5	11	**38**
3	Traffic & Congestion Reduction	1	4	6	10	5	0	**14**
4	Social Equity	2	3	6	8	4	3	**18**
5	Convenience & Comfort	0	3	3	6	12	2	**33**
6	Adaptable to the Future	5	2	4	7	6	2	**13**
7	Safety	0	2	3	3	9	9	**46**
8	Financial Viability	4	5	7	5	3	2	**4**

9	Capacity to Move People and/or Reduce Travel Demand	1	4	3	15	2	1	**16**
	Total	16	26	37	61	49	45	**236**

7 - Transit Oriented Affordable Housing (TOAH)		Value						
#	Question	-2	-1	0	1	2	3	**Total**
1	Community Character	0	0	2	4	9	11	**55**
2	Environmental Quality	1	0	2	4	9	10	**50**
3	Traffic & Congestion Reduction	1	1	2	4	11	7	**44**
4	Social Equity	0	2	1	7	8	8	**45**
5	Convenience & Comfort	0	0	2	7	7	10	**51**
6	Adaptable to the Future	0	2	6	5	8	5	**34**
7	Safety	0	0	5	1	12	8	**49**
8	Financial Viability	2	2	5	10	4	3	**21**
9	Capacity to Move People and/or Reduce Travel Demand	1	1	3	7	9	5	**37**
	Total	5	8	28	49	77	67	**386**

8 - High Occupancy Vehicle (HOV) Lane Enforcement		Value						
#	Question	-2	-1	0	1	2	3	**Total**

1	Community Character	0	3	3	1	7	12	**48**
2	Environmental Quality	0	1	4	7	6	8	**42**
3	Traffic & Congestion Reduction	0	2	0	9	10	5	**42**
4	Social Equity	0	3	3	6	7	7	**38**
5	Convenience & Comfort	0	3	5	8	6	4	**29**
6	Adaptable to the Future	0	1	2	5	10	8	**48**
7	Safety	0	1	3	2	9	11	**52**
8	Financial Viability	0	1	0	2	11	12	**59**
9	Capacity to Move People and/or Reduce Travel Demand	0	2	3	7	9	5	**38**
	Total	0	17	23	47	75	72	**396**

9 - Dynamic Road Pricing					Value			
#	Question	-2	-1	0	1	2	3	**Total**
1	Community Character	3	6	1	8	3	5	**17**
2	Environmental Quality	0	1	3	3	9	10	**50**
3	Traffic & Congestion Reduction	0	1	1	3	8	13	**57**
4	Social Equity	5	8	6	3	3	1	**-6**
5	Convenience & Comfort	2	2	9	4	5	4	**20**
6	Adaptable to the Future	0	0	0	5	9	12	**59**
7	Safety	0	0	5	5	7	9	**46**
8	Financial Viability	1	0	0	4	5	16	**60**

9	Capacity to Move People and/or Reduce Travel Demand	1	0	2	3	8	12	**53**
	Total	12	18	27	38	57	82	**356**

10 - Parking Strategies					Value			
#	Question	-2	-1	0	1	2	3	**Total**
1	Community Character	0	1	4	4	9	8	**45**
2	Environmental Quality	0	0	2	8	9	7	**47**
3	Traffic & Congestion Reduction	0	1	1	9	9	6	**44**
4	Social Equity	4	4	7	7	1	3	**6**
5	Convenience & Comfort	1	8	7	7	3	0	**3**
6	Adaptable to the Future	0	0	2	9	7	8	**47**
7	Safety	0	0	10	6	3	7	**33**
8	Financial Viability	0	0	3	5	10	8	**49**
9	Capacity to Move People and/or Reduce Travel Demand	1	0	4	10	7	4	**34**
	Total	6	14	40	65	58	51	**308**

11 - Airport/Transit Connectivity								
#	Question	-2	-1	0	1	2	3	**Total**
1	Community Character	0	0	0	1	11	14	**65**

2	Environmental Quality	0	0	1	6	10	9	**53**
3	Traffic & Congestion Reduction	0	1	2	13	4	6	**38**
4	Social Equity	0	1	5	7	6	7	**39**
5	Convenience & Comfort	0	0	0	6	10	10	**56**
6	Adaptable to the Future	0	1	2	4	10	9	**50**
7	Safety	0	0	3	3	10	10	**53**
8	Financial Viability	0	2	4	6	8	6	**38**
9	Capacity to Move People and/or Reduce Travel Demand	0	0	2	11	8	5	**42**
	Total	0	5	19	57	77	76	**434**

12 - Increased Highway Capacity

#	Question	-2	-1	0	1	2	3	**Total**
1	Community Character	17	4	2	3	0	0	**-35**
2	Environmental Quality	18	5	0	2	1	0	**-37**
3	Traffic & Congestion Reduction	13	7	1	3	1	1	**-25**
4	Social Equity	3	4	5	4	6	4	**18**
5	Convenience & Comfort	6	5	1	7	6	1	**5**
6	Adaptable to the Future	8	7	4	4	3	0	**-13**
7	Safety	6	5	8	4	3	0	**-7**
8	Financial Viability	9	12	1	1	3	0	**-23**

9	Capacity to Move People and/or Reduce Travel Demand	13	6	2	1	4	0	-23
	Total	93	55	24	29	27	6	-140

B. VALUE AREAS SCORING

Essential Community Values

(Community Character and Environmental Quality)

#1 Ride Sharing and Airport Connectivity (TIE)

#3 Ride Hailing, Enhanced BRT and Affordable Housing (TIE)

Operating System Values

(Congestion Reduction, Social Equity, Convenience/Comfort, Adaptable to Future)

#1 Enhanced BRT

#2 Ride Sharing

#3 Ride Hailing

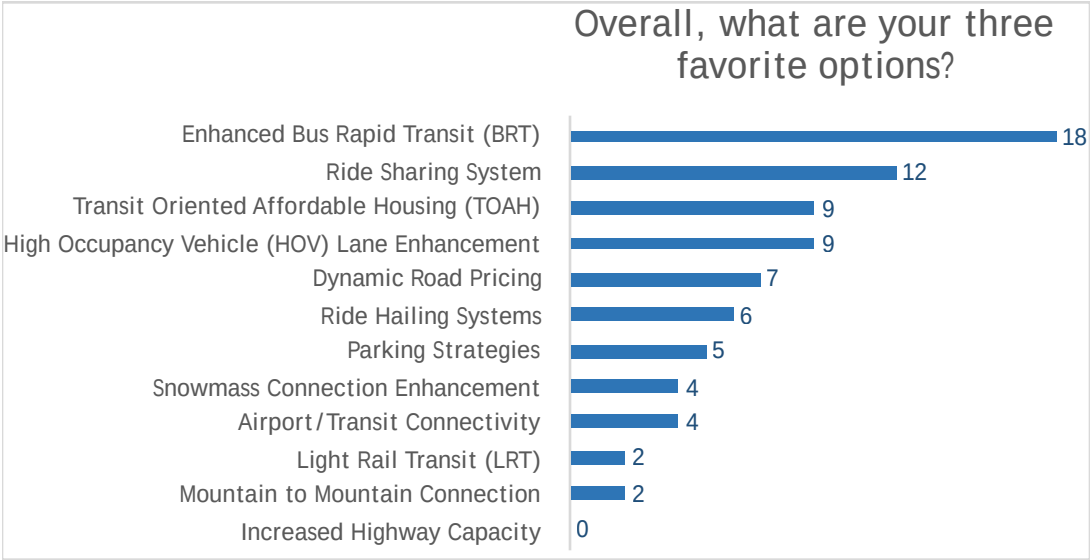
Minimum System Requirements

(Safety, Financial Viability, Capacity to Move People and/or Reduce Travel Demand)

#1	**Dynamic Road Pricing**
#2	**Enhanced BRT and HOV Lane Enforcement (TIE)**

C. HIGHEST SELECTION SUMMARY OF OPTIONS

	Overall "Favorite" Options of Forum Members
#1	**Enhanced BRT**
#2	**Ride Sharing System**



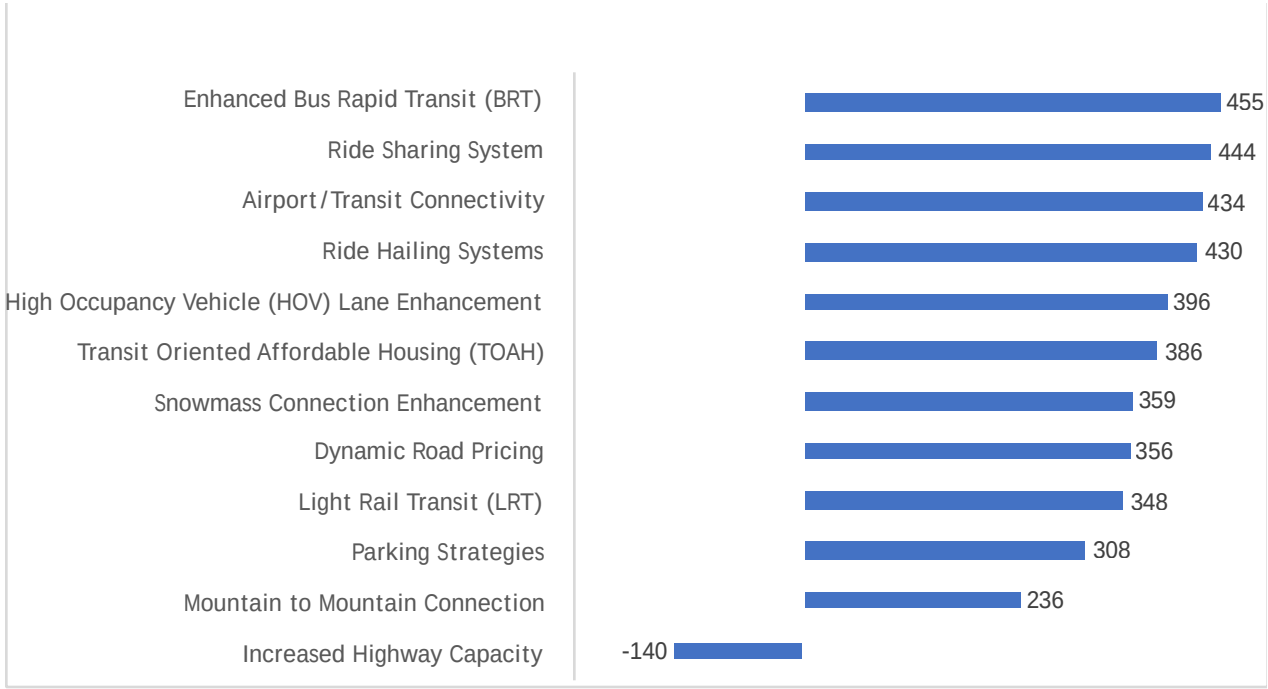
Overall Top Scoring Options by Values Assessment

#1 **Enhanced Bus Rapid Transit (BRT)**

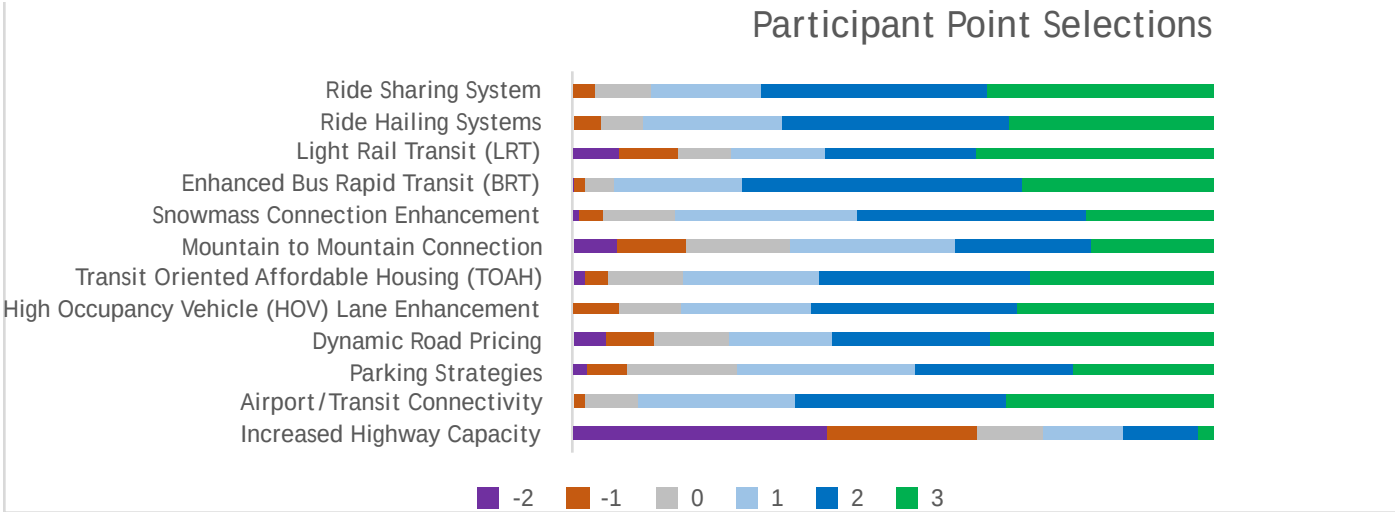
#2 **Ride Sharing System**

#3 **Airport/Transit Connectivity**

#4 **Ride Hailing Systems**



D. ADDITIONAL EVALUATION



14 - Please weigh the relative importance of each value.

(1= least valuable, 3 = most valuable)

Question	1	2	3	Mean
Capacity to Move People and/or Reduce Travel Demand	0	4	22	2.85
Traffic & Congestion Reduction	0	5	21	2.81
Environmental Quality	0	8	18	2.69
Safety	4	5	17	2.5
Community Character	2	10	14	2.46
Adaptable to the Future	2	13	11	2.35
Convenience & Comfort	1	17	8	2.27
Financial Viability	5	12	9	2.15
Social Equity	6	10	10	2.15

Total	20	84	130

FEHR PEERS

Memorandum

Date: April 6, 2020

To: David Pesnichak, AICP, Regional Transportation Administrator, Pitkin County

From: Ann Bowers, PE, PTP; Chris Breiland, PE; and Marissa Milam

Subject: Integrated Mobility Study

DN20-0650

Background

Fehr & Peers is working with the Elected Officials Transportation Committee (EOTC) and the Roaring Fork Transit Authority (RFTA) to evaluate the *Integrated Mobility Study* (IMS) proposal outlined in the Community Forum Task Force on Transportation and Mobility's 2017 Upper Valley Mobility Report to identify both near- and long-term solutions that would improve mobility and reduce air pollution emissions in the upper Roaring Fork Valley. The evaluation considers the effectiveness of each strategy at managing traffic, reducing congestion, and reducing air pollution through both literature review and analytical techniques. Upon conclusion of the analysis, a pilot program will be identified that brings together two or three of the IMS strategies to be implemented in the short-term that would improve the region's mobility, traffic congestion, and air quality issues. A strategy to implement a more comprehensive long-term solution will also be identified.

This memorandum outlines Task 1: Review and refine the five principle strategies outlined in the IMS:

- Ride Sharing
- Ride Hailing
- Congestion Reduction Measures
- HOV Lane Enforcement
- Phased BRT Enhancement

Task 1 adds more definition so that the parameters of each of the systems can be roughly identified and modeled for how effective the IMS could be at improving mobility and managing traffic congestion.

The table below reflects our work on Task 1 of this project and provides a more extensive description of the IMS's initial strategies and outlines the parameters, assumptions, and additional information needed for modeling each strategies effectiveness in reducing traffic congestion, improving mobility, and reducing air pollution emissions.

IMS Strategy Review

Strategy	Refined Definition	Modeling Parameters, Assumptions, and Additional Information Needed for Analysis
Ride Sharing	Ride sharing in the Upper Valley would be most successful using an app-based peer-to-peer system to move riders from down valley communities and park-and-ride lots to the job centers/resorts in Aspen and Snowmass. The primary markets for ride sharing are commuters and skiers/snowboarders. The most common and widely-adopted ride sharing apps are created and operated by private organizations and include WazeCarpool, Scoop, Duet, Sameride, Carma and others. We could not find any examples of successful ridesharing apps developed by a public entity. Research suggests that the critical mass of riders to make these types of programs work is about 200 active riders per day. This level of ridership is feasible to the resort areas in Aspen and Snowmass.	For analysis purposes, it is assumed that there will be one fewer car trip entering Aspen for every new ride sharing participant. We also assume that VMT will decrease by 80% for each new ride sharing participant, since some people will drive to meet their driver.
	To help facilitate adoption, RFTA, employers, and local jurisdictions could designate existing park-and-rides or other underutilized community owned/retail parking lots as the organizing place for riders and drivers. This would allow for trips to be on-demand or scheduled, depending on the number of commuters in the program. As is typical for these apps, we assume that drivers would be compensated for driving by the rider, using the standard IRS mileage reimbursement rate, currently set at 57.5 cents/mile. The app would also add on a fee to maintain the platform – this fee is also charged to the rider. The benefit to the driver is usage of the HOV lanes. This strategy would be enhanced if there were higher parking costs or a toll entering Aspen and with improved HOV lane enforcement (see descriptions of these strategies below).	Based on carpooling commuting data from the US Census Bureau and examples from other communities, we expect that approximately 1 percent of commute trips and 0.5 percent of resort trips could shift to ridesharing.
	One other area to be mindful with on ride sharing is that the additional ridesharing participants do not come at a large expense to bus ridership. Shifting people from bus to ridesharing does not achieve the goals of congestion reduction or reduced greenhouse gas emissions. If this is occurring, then further changes to parking pricing or HOV lane enforcement/occupancy requirements may be warranted.	

Ride Hailing	It should be noted, that in many dense, urban communities, ride hailing generates more VMT and GHG emissions than a non-ride hailing scenario. This is because, in these communities, ride hailing tends to replace lower-carbon trips like transit, walking, or biking. However, in Pitkin County and Aspen in particular, ride hailing could reduce vehicle trips and GHGs if ride hailing replaces private vehicle trips (both tourist and local resident trips). Shared ride hailing (like the Aspen Downtowner) is even more effective at reducing VMT and GHGs. Ride hailing works particularly well in conjunction with higher parking fees and/or tolls, because they provide residents and visitors with a lower cost alternative to driving private vehicles. To ensure effectiveness of ride hailing as a solution to reduce congestion and GHG emissions, periodic monitoring of traffic volumes and ride hailing VMT should be performed. As an example, New York City performs biennial checks on ride hailing vehicle odometers to develop a baseline of whether this mode is beneficial or detrimental to congestion relief and GHG emissions goals.	Based on a literature review, ride hailing resulted in an 8 percent decrease in car rental market share between 2016 and 2017, although that decline was mostly from business trips, not tourism. Given that Aspen is a tourist destination, we conservatively estimate that ride hailing could reduce tourism-related VMT by about 2 percent. This is less than was observed in areas with a strong business travel market and also accounts for the deadhead trips made by ride-hailing vehicles. If this strategy is combined with parking pricing, elasticities could be used to figure out mode shift from single occupancy vehicles. This is particularly true for local resident (or down valley resident) travel. In the absence of pricing, we don't expect to see a notable decrease in traffic from local residents as a result of ride hailing.

Congestion Reduction Measures	For Pitkin County, congestion reduction measures could include dynamic road pricing and dynamic parking pricing. Dynamic road pricing would be most effective at pinch-points like the Castle Creek Bridge or on Highway 82, just east of the Brush Creek Park and Ride. Dynamic parking pricing could be effective in both central Aspen and Snowmass Village. Increasing public pricing costs in these more central areas is likely a less controversial and easier-to-implement short-term solution to reduce the number of vehicles in downtown Aspen and Snowmass. Because Colorado policy does not currently permit parking taxes, the jurisdictions could only influence the costs of publicly-owned parking. To be more effective, Pitkin County and area cities should lobby the state legislature to allow for parking taxes enacted at the local level. This would enable the County and cities to enact parking taxes on private parking lots and create higher parking fees at key areas that generate traffic congestion. Dynamic road pricing would work well in Aspen because Highway 82 is the only access road to downtown. Cordon pricing, where vehicles are charged to enter a specified area, could be implemented using electronic tolls on Highway 82, and could vary by time of day depending on levels of congestion and mode choice. This would be a more long-term solution, given the time needed for implementation, construction, and potential toll exemptions for key constituencies like residents, service vehicles, or certain employees. Under Colorado law, two or more local governments must create a public highway authority in order to establish, collect, and increase tolls on the highway that it finances, operates, and maintains. Therefore, any tolling would require input and cooperation from CDOT.	For parking prices: use NCHRP elasticities to find reduction in vehicle trips with respect to higher downtown parking fees. For road pricing: can use road pricing elasticities from NCHRP– add toll by time of day and mode to the inbound Highway 82 links outside of the City of Aspen and calculate reduction in single occupancy vehicle trips. In general, price elasticities are often in the range of 0.4. In other words, doubling the price of travel results in a 40 percent decrease in travel. Typical traffic decreases in response to parking and tolling range between 5 and 20 percent.

HOV- Lane Enforcement	HOV lane enforcement on Highway 82 could improve mobility during peak periods when congestion is the worst; if HOV violation went down, the more efficient HOV lane could cause mode shift from single occupancy vehicles to carpools and transit. However, it is likely that the existing HOV lane is underutilized even with violations and increasing enforcement would do little to improve mobility. HOV enforcement has always been a challenge because of the burden it places on law enforcement. However, HOV lane verification has evolved in recent years due to new technologies. One potential enforcement tool is app-based, where a prospective user must take pictures of all the people in the car to self-verify they are a carpool. If they choose not to self-verify, they can't use the lane. UDOT is testing this type of technology on the I-15 HOT lanes in Salt Lake City to allow verified carpools to opt out of paying the tolls. There are other technologies in testing that use high-definition cameras or infrared sensors to detect occupants. Better HOV lane enforcement could complement many of the other strategies in this document, but is likely an enabling tool, rather than a stand-alone solution to reducing traffic congestion and GHG emissions.	Overall, we do not expect that this strategy would substantially change people's travel modes without other programs in place.

Phased BRT Enhancement	BRT Enhancement has both short- and long-term benefits to improving mobility in the Upper Valley. A near-term strategy could involve improving the existing line with increased frequencies to downtown Aspen. Other short-term strategies could examine the current BRT travel times and identify speed improvements such as additional bus/HOV lanes, better HOV lane enforcement, transit que jumps, or transit signal priority. Long-term goals could include constructing additional park & rides, adding service to connect to Snowmass, additional down valley service and improved first mile/last mile connections. The improved first mile/last mile connections could be in conjunction with the improvements to the ride-hailing Aspen Downtowner service. The proposal to consolidate the express, local, and skier-shuttle bus routes would require further analysis, as the consolidated BRT line may not be as convenient as existing services and would add travel time for riders through transfers or longer routes.	Assuming 20 percent improvement in transit speeds, we would expect about an 8 percent increase in BRT ridership and a corresponding decrease in vehicle trips. Based on expanded coverage, we would expect a transit commute mode share of 9 percent for new areas served by BRT connections to Aspen/ Snowmass (for trips to Aspen/ Snowmass, specifically).

Source: Fehr & Peers.

FEHR PEERS

Memorandum

Date: June 16, 2020

To: Pitkin County

From: Ann Bowers, PE, PTOE; Chris Breiland, PE; and Marissa Milam

Subject: Aspen Institute's Integrated Mobility Study – Task 2 Results

DN20-0650

Background

The table below reflects our work on Task 2 of the Integrated Mobility Study and provides a refined description of the IMS's initial list of mobility strategies. Based on this refined description, we have prepared a high level effectiveness analysis for each strategy in reducing traffic congestion, improving mobility, and reducing air pollution emissions. **Table 1** summarizes the expected VMT and GHG emission reductions for each strategy.

Table 1: High Level Effectiveness Summary

Strategy	Short Term Effectiveness[1]		Long Term Effectiveness	
	VMT reduction	GHG emission reduction	VMT reduction	GHG emission reduction
Ride Sharing	Commute VMT: 3,575 vehicle-miles-traveled/day Visitor VMT: 600 vehicle-miles-traveled/day	478 metric tons/year	Commute VMT: 35,600 vehicle-miles-traveled/day Visitor VMT: 1,300 vehicle-miles-traveled/day	3,800 metric tons/year
Ride Hailing	Visitor VMT: 2,400 vehicle-miles-traveled/day	532 metric tons/year	Additional benefits of long-term ride hailing captured in conjunction with the congestion reduction measures, but without implementation of other measures, ride hailing is not expected to reduce GHG emissions alone.	
Congestion Reduction Measures	Commute VMT: 47,500 vehicle-miles-traveled/day	4,674 metric tons/year	Commute & Visitor VMT: 150,000 vehicle-miles-traveled/day	17,600 metric tons/year
HOV Lane Enforcement	No VMT/GHG emission benefit as a stand-alone strategy. Integral part of implementing the other strategies in the IMS			

Phased BRT Enhancements	Commute/Resident VMT: 6,885 vehicle-miles-traveled/day	772 metric tons/year	Additional benefits of long-term BRT enhancements captured in conjunction with the congestion reduction measures; additional BRT and local bus service likely necessary to achieve the full congestion and GHG emissions benefits outlined in the Congestion Reduction Measures. If BRT enhancements are the only strategy implemented, long-term effectiveness would be the same as the short-term effectiveness.

1. Short term effectiveness is estimated within a 0 – 10 year time frame, but could vary based on funding and political challenges of implementing change (either faster or slower). Long-term time frame is estimated at being 10+ years from today.

IMS Strategy Review

For each IMS strategy, we have provided a refined definition, as well as modeling parameters and high-level effectiveness analysis. For more detailed definitions of each strategy, refer to the Task 1 memo.

Ride Sharing

Ride sharing in the Upper Valley would be most successful using an app-based peer-to-peer system to move riders from down valley communities and park-and-ride lots to the job centers/resorts in Aspen and Snowmass. To help facilitate adoption, RFTA, employers, and local jurisdictions could designate existing park-and-rides or other underutilized community owned/retail parking lots as the organizing place for riders and drivers. This would allow for trips to be on-demand or scheduled, depending on the number of commuters in the program. This strategy would be enhanced if there were higher parking costs or a toll entering Aspen and with improved HOV lane enforcement (see descriptions of these strategies below).

If additional ridesharing participants are coming at a large expense of bus ridership, then further changes to parking pricing or HOV lane enforcement/occupancy requirements may be warranted. The City of Aspen should monitor both program usage and carpool parking, in both the residential and downtown areas, to determine if parking fees should apply to participants. For ridesharing to act as a complement to BRT, the program should serve communities that cannot easily reach BRT, such as south Carbondale, Glenwood Springs, and other towns along I-70, such as New Castle.

Effectiveness

For analysis purposes, it is assumed that there will be one fewer car trip entering Aspen for every new ride sharing participant. We also assume that VMT will decrease by 80% for each new ride sharing participant, since some people will drive to meet their driver.

Based on carpooling commuting data from the US Census Bureau and examples from other communities, in the short term we expect that approximately 2%of commute trips to both Aspen and Snowmass and 0.5% of resort trips could shift to ridesharing. Aspen's current ridesharing program has about 300 active riders, with these new improvements, we expect about 150 new riders per day, with approximately 110 commuters to Aspen, and 40 to Snowmass. This reduction will lower commute VMT to 171,700 vehicle-miles-traveled/day, from 175,275. Likewise, visitor VMT will decrease by 0.5%, to 119,400 vehicle-miles-traveled/day, from 120,000. With these near term VMT reduction measures, we would expect a GHG emission reduction[1] of 478 metric tons/year along Highway 82. To put these reductions in perspective, an average household's transportation GHG emissions are 7.7 metric tons per year.

[1] GHG emissions calculated using EMFAC emission factors for the Lake Tahoe Air Basin, assuming that VMT falls into the 35-40 mph speed bin.

In the long term, we would expect commute carpool rates to double given that people are likely to be more comfortable with technology and the ability to match up with empty seats, decreasing commute VMT by 18.5% based on current employment numbers. 1% of annual visitor trips may switch to carpooling, which would decrease annual visitor VMT from 70,588,000 vehicle miles traveled, to 69,882,000. This increase in carpooling rates could reduce annual GHG emissions by 3,457 metric tons/year.

Ride Hailing

It should be noted, that in many dense, urban communities, ride hailing generates more VMT and GHG emissions than a non-ride hailing scenario. This is because, in these communities, ride hailing tends to replace lower-carbon trips like transit, walking, or biking. However, in Pitkin County and Aspen in particular, ride hailing could reduce vehicle trips and GHGs if ride hailing replaces private vehicle trips (both tourist and local resident trips). Ride hailing works particularly well in conjunction with higher parking fees and/or tolls, because they provide residents and visitors with a lower cost alternative to driving private vehicles.

To ensure effectiveness of ride hailing as a solution to reduce congestion and GHG emissions, periodic monitoring of traffic volumes and ride hailing VMT should be performed. As an example, New York City performs biennial checks on ride hailing vehicle odometers to develop a baseline of whether this mode is beneficial or detrimental to congestion relief and GHG emissions goals.

Effectiveness

Based on a literature review, ride hailing resulted in an 8% decrease in car rental market share between 2016 and 2017, although that decline was mostly from business trips, not tourism. Given that Aspen is a tourist destination, we conservatively estimate that ride hailing could reduce tourism-related VMT by about 2% to 69,176,00 annual vehicles miles traveled, from the baseline of 70,588,000 vehicle miles traveled by visitors. This is less than was observed in areas with a strong business travel market and also accounts for the deadhead trips made by ride-hailing vehicles. Reducing visitor VMT by 2 percent would reduce GHG emissions by 532 metric tons/year.

In the long term, in the absence of complementary congestion pricing measures, we don't expect to see a notable decrease in traffic from local residents as a result of ride hailing.

Congestion Reduction Measures

For Pitkin County, congestion reduction measures could include dynamic road pricing and dynamic parking pricing. Dynamic road pricing would be most effective at pinch-points like the Castle Creek Bridge or on Highway 82, just east of the Brush Creek Park and Ride. Dynamic parking pricing could be effective in both central Aspen and Snowmass Village. Increasing public parking costs in these more central areas is likely a less controversial and easier-to-implement short-term solution to reduce the number of vehicles in downtown Aspen and Snowmass compared to dynamic road pricing.

While often pitched as a straightforward solution to traffic congestion and air pollution generated by driving, higher costs to park or drive are truly only effective in locations where there are viable alternatives to driving. Fortunately, Aspen and Snowmass have strong transit service and roadway treatments to facilitate carpooling, which make these solutions more viable than would be the case in most small cities or resort town settings.

Dynamic road pricing would work well in Aspen because Highway 82 is the only access road to downtown. Cordon pricing, where vehicles are charged to enter a specified area, could be implemented using electronic tolls on Highway 82, and could vary by time of day depending on levels of congestion and mode choice. This would be a more long-term solution, given the time needed for implementation, construction, and potential toll exemptions for key constituencies like residents, service vehicles, or certain employees. Public knowledge and acceptance of the tolls, revenue allocation, and economic impact is key to successful congestion pricing, as public support is necessary to overcome the political difficulties of implementation. There are also legal challenges to implementing congestion pricing; more details on Colorado-specific tolling can be found in the Task 1 memo.

Effectiveness

Using data from the American Community Survey (ACS) and Longitudinal Employer-Household Dynamics (LEHD), we assume there are about 9,500 SOV commute into Aspen/Snowmass each day. We do not anticipate major reductions in non-commute trips with higher parking prices, as many of these trips will park at private lots. In the short term, doubling the price of parking (particularly for long-term employee parking) and extending the hours of parking fees would result in a 20% decrease in commute trips, reducing VMT to 190,000 vehicles-miles-traveled/day, from 237,500. This reduction would result in a decrease in GHG emissions of 4,674 metric tons/year. Under this scenario, traffic across the Castle Creek Bridge could decrease by about 1,000 vehicles/day. While Aspen currently has high parking prices during the peak hours of peak season compared to other resort communities, the prices are low compared to many urban areas, especially for all-day garages and off peak prices.

In general, price elasticities are often in the range of 0.4. In other words, doubling the price of travel results in a 40% decrease in travel. Typical traffic decreases in response to parking and tolling range between 5 and 20% although more substantial decreases can result from higher charges. Long term, with both higher parking prices and tolling along Highway 82, a 40% decrease in vehicle trips to Aspen/Snowmass would result in a GHG emission reduction of 17,600 metric tons/year.[2] The Castle Creek Bridge could see a decrease around 6,000 vehicles/day with long term congestion reduction measures in place.

[2] Assumes a 10% increase in overall traffic over the long-term (10+ years in the future). For reference, Pitkin County grew by about 10% per decade between 2000-2019.

HOV Lane Enforcement

HOV lane enforcement on Highway 82 could improve mobility during peak periods when congestion is the worst; if HOV violation went down, the more efficient HOV lane could cause mode shift from single occupancy vehicles to carpools and transit. However, it is likely that the existing HOV lane is underutilized even with violations and increasing enforcement would do little to improve mobility as a stand-alone strategy. However, increasing enforcement is necessary to get the efficacy expected from the BRT and ridesharing strategies described in this document.

HOV enforcement has always been a challenge because of the burden it places on law enforcement. However, HOV lane verification has evolved in recent years due to new technologies. One potential enforcement tool is app-based, where a prospective user must take pictures of all the people in the car to self-verify they are a carpool. If they choose not to self-verify, they can't use the lane. UDOT is testing this type of technology on the I-15 HOT lanes in Salt Lake City to allow verified carpools to opt out of paying the tolls. There are other technologies in testing that use high-definition cameras or infrared sensors to detect occupants. Better HOV lane enforcement would complement many of the other strategies in this document, but is likely an enabling tool, rather than a stand-alone solution to reducing traffic congestion and GHG emissions.

Effectiveness

Overall, we do not expect that this strategy would substantially change people's travel modes without other programs in place.

Phased BRT Enhancement

BRT Enhancement has both short- and long-term benefits to improving mobility in the Upper Valley. A near-term strategy could involve improving the existing line with increased frequencies to downtown Aspen during commute hours in order to relieve crowding. Other short-term strategies could examine the current BRT travel times and identify speed improvements such as additional bus/HOV lanes, better HOV lane enforcement, transit queue jumps, or transit signal priority. Long-term goals could include constructing additional park & rides, adding service to connect to Snowmass, and improved first mile/last mile connections. A new park & ride at Catherine Store would serve multiple communities along the BRT line. While the new park & ride may not induce more transit trips, it would reduce VMT for commuters traveling to the bus since they can park closer to home. However, adding this BRT stop would increase travel time for the route, so a travel time analysis is needed in order to identify other speed improvements that could make up for the additional delay.

A BRT connection to Snowmass is highly desired by residents and may be best served through an express overlay route during commute periods that serves Snowmass as the final destination (with the rest of the line continuing through Glenwood Springs). This new service would eliminate the current transfer penalty for commuters who have to transfer routes at the Brush Creek Park

and Ride. The improved first mile/last mile connections could be in conjunction with the service improvements to the ride-hailing Aspen Downtowner service, or the City of Aspen's carsharing program. The proposal to consolidate the express, local, and skier-shuttle bus routes would require further analysis, as the consolidated BRT line may not be as convenient as existing services and would add travel time for riders through transfers or longer routes.

Effectiveness

Assuming 10% improvement in transit speeds, we would expect about a 1.5% increase in BRT ridership and a corresponding decrease in vehicle trips. Based on expanded coverage, we would expect a transit commute mode share of 15% for new areas served by BRT connections to Snowmass, which equates to a 36% increase in transit mode share for commutes to Snowmass. These near-term BRT improvements would reduce VMT by 80% for the approximately 360 new riders on the system (since we assume that some of the new riders would be driving to the BRT line) and would reduce annual GHG emissions by 772 metric tons.

In the long term, BRT must be able to support higher demand in concurrence with the congestion reduction measures. Further VMT and GHG reductions will be tied to higher parking pricing or roadway tolls.

Other Measures

There are multiple other measures that could complement the strategies above to reduce both VMT and GHG emissions in the Aspen/Snowmass area. To support GHG emission reductions, future parking pricing or tolls could include electric vehicle/low emission vehicle pricing incentives. Furthermore, the City of Aspen's carsharing program has frequent requests to expand their service; future improvements should include fleet electrification. Other measures could include expanding the Aspen Downtowners' service and fleet, as well as providing additional transit options down valley to connect to BRT.

FEHR PEERS

Memorandum

Date: Updated July 28, 2020

To: David Pesnichak, AICP, Regional Transportation Administrator, Pitkin County

From: Chris Breiland, PE; Marissa Milam; and Ann Bowers, PE, PTOE

Subject: Integrated Mobility Study – Task 3 Results

DN20-0650

Background

Figure 1 reflects a phased implementation framework for improving mobility and reducing the environmental impacts of transportation in the Aspen/Snowmass area. This approach recognizes that some strategies will take more time to implement than others due to political, technical, and financial obstacles. Based on our experience in a variety of communities, the short-term strategies identified in this framework can be implemented within a few years given a community willingness to advance transportation mobility and sustainability. These short-term strategies, when implemented together will help to reduce vehicle-miles traveled (VMT) and transportation greenhouse gas (GHG) emissions by 22%, for commute trips, and 0.5% for resort/visitor trips. See the Task 2 memo for quantification of the VMT and GHG reduction benefits for each strategy, and the Task 1 memo for detailed definitions of each strategy.

Over the long-run, as the region continues to grow and mobility technologies change, more aggressive mobility management strategies may become necessary. Further mobility management will help ensure a sustainable transportation system from the perspective of economic vitality, quality of life, and environmental outcomes. As noted, these more aggressive strategies will require greater levels of funding, agency/jurisdictional cooperation, and public willingness for additional costs/restrictions on mobility. In exchange, there will be even greater levels of GHG emissions and VMT reductions, particularly for resort/visitor trips.

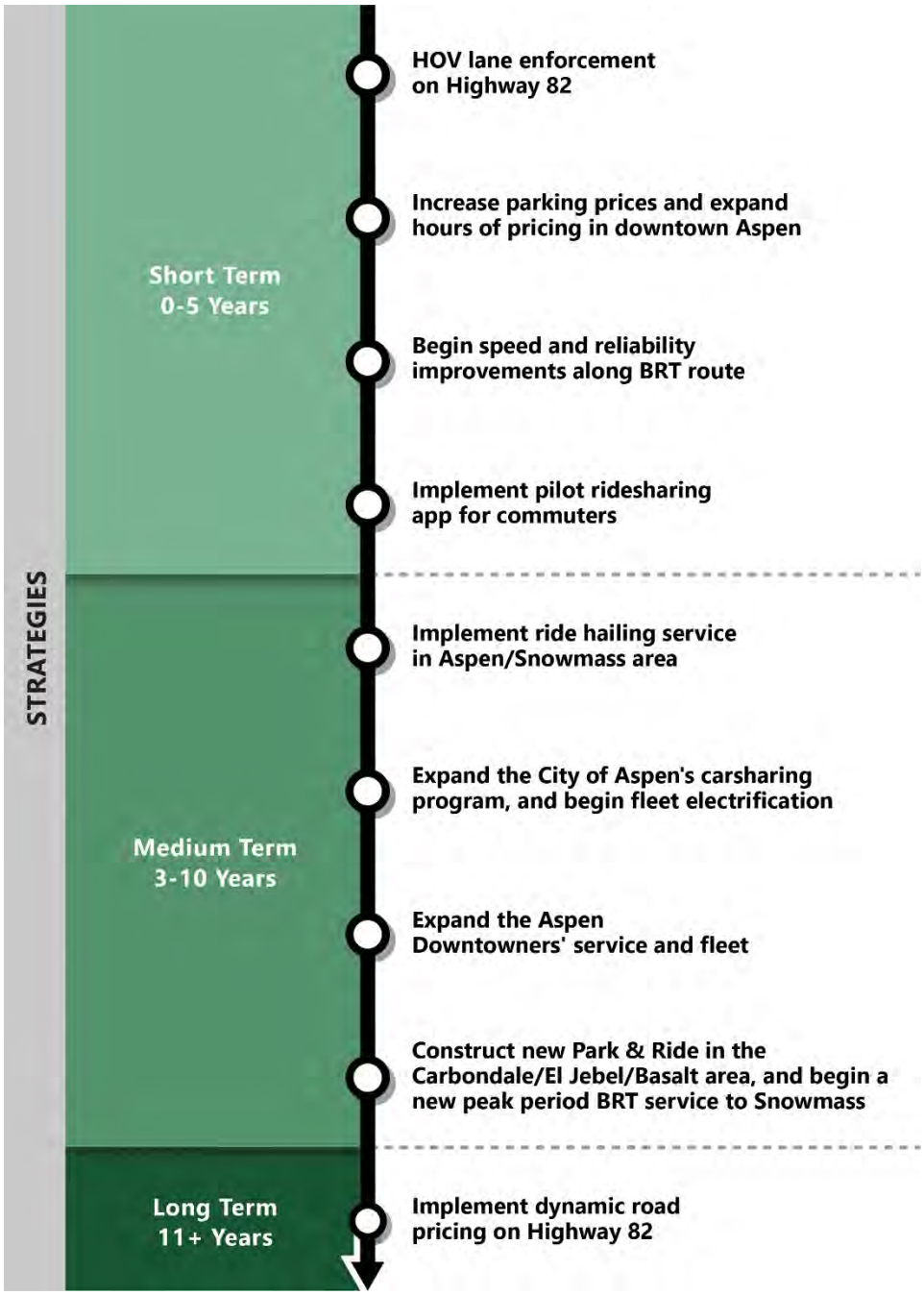


Figure 1: Implementation Timeline

Short Term Strategies

The short-term strategies identified in the section below can be implemented in the 0-5-year timeframe and are generally easier to implement with community support and less substantial financial investments by local jurisdictions. All the short-term strategies identified in this section are in-place in other similar areas across the country; these examples show there is a good return on investment for mobility improvements after implementation.

HOV lane enforcement

HOV lane enforcement will not improve mobility as a stand-alone strategy, but it is required to get the expected efficacy out of the other strategies, such as ridesharing and BRT improvements. HOV lane enforcement has been inconsistent along Highway 82 in the past, and the Sheriff's office has indicated that more staff and funding would be required to begin enforcement. This strategy faces a few political and legal obstacles, such as local judges dismissing HOV lane non-compliance citations, and securing the Sheriff's Office buy in. This strategy can be implemented quickly with additional funding (note that some states and jurisdictions set HOV lane violation fees to more than cover the police/sheriff and court expenses related to enforcement) and the Sheriff's Office support. HOV lane enforcement is also generally popular with the public nationwide and is the first or second most requested enforcement (after speeding) emphasis areas in many jurisdictions that have HOV lanes. As we note in our Task 2 memo, there are emerging technologies that may reduce the costs and level of manual enforcement required for HOV lanes that should also be considered in the future.

Parking Pricing

Increasing parking pricing through higher rates or dynamic parking pricing can also be implemented in the short term and is an effective strategy at reducing SOV commute trips. Like HOV lane enforcement, parking prices support the longer-term strategies discussed later in this document. Higher parking prices discourage SOV trips, and with implementation of a ridesharing service and BRT improvements, commuters, visitors, and residents have viable alternative solutions to driving and parking. Extending the hours of parking prices in downtown spaces as well as publicly owned garages will discourage commuters from taking these spaces during the morning peak period. With dynamic parking pricing, rates increase on blocks where demand is high using sensors that track occupancy. This system can help geographically distribute demand for parking and can encourage employees to park outside of the downtown core where prices may be lower. During Aspen's peak season, higher midday parking prices can encourage residents and visitors to park for shorter durations in the downtown core and shift some trips to greener alternatives such as walking and biking. Since the City of Aspen already has relatively high parking prices compared to other resort areas, it is likely that collaboration will be required between the City of Aspen, Snowmass, and private entities that provide parking in the area, such as hotels and

ski resorts.[1] Cities that raise public parking costs without addressing private parking costs can see a limited VMT and GHG benefit. While raising parking prices is not typically a popular policy, with the proper information about why parking prices are being raised, where the revenues are going, increasing bus/shuttle service to areas that have less frequent transit service, cooperation with retail/recreation interests, and a phased approach over several years can go a long way to reducing public opposition.

Ridesharing

A pilot ridesharing app for commuters can likely be implemented within the next 2-4 years in the Upper Valley. Aspen's existing carpooling program shows that a critical mass of users exists already; the main obstacle to implementation is developing the app and managing the program. This will likely require that jurisdictions/organizations like Pitkin County, Aspen, Snowmass, the Aspen Institute, and the Aspen Skiing Company partner with a private company (e.g., Waze, Scoop), who would develop and manage the program, with coordination and oversight from the participating parties. This strategy would further benefit from coordination between RFTA, employers, and down-valley jurisdictions to designate existing park-and-rides or other underutilized community owned/retail/church parking lots as the organizing place for riders and drivers. The City of Aspen may also need to monitor the change in carpool parking usage after implementation, to determine if parking fees should apply to help manage the carpool parking supply or to adjust how carpool and SOV parking is allocated downtown. This strategy would be most successful following the implementation of both HOV lane enforcement and increased parking prices. Higher parking prices for employees will further discourage SOV usage and more efficient use of parking spaces (getting more people in town per parking space), while the HOV lane enforcement should provide additional travel time benefits for those in the ridesharing program.

A longer-term strategy could include building off of the ridesharing app to create a Mobility as a Service (MaaS) app that integrates multimodal trip planning with payment services in order to facilitate trip and route planning across multiple modes of transportation. Integrating transit, bike-share, car-share, and ride-hailing and ridesharing into one platform provides the convenience of a car and makes it easier for residents and visitors to choose alternative transportation modes. While fairly new, MaaS platforms have been successful in Europe, created by both public agencies and private companies. Private companies, such as Hamburg's MaaS Global, tend to have more resources and technological skills to develop and maintain an integrated platform. However, one of the first US MaaS platforms was created by Louisville, Kentucky's Transit Authority of River City, with the help of a private developer. Combined with policy measures such as roadway pricing, dynamic parking pricing, and investment into

[1] The Aspen Skiing Company charges relatively high parking fees of $20-30 at the parking lots closest to the mountain bases. Given the high fees, these may not need to be adjusted in the short-term, but the slightly outlying free lots would benefit from a parking fee (e.g., Town Park lot) to further encourage people to carpool or use buses to get to the mountain.

alternative transportation modes, MaaS can help lead to permanent changes in people's travel choices. Portland's TriMet is also piloting a MaaS app, combining the bus, rail, streetcar, bikeshare, scooter, and Uber/Lyft into a single platform. In the Aspen area, MaaS would complement all strategies outlined in this document, and would benefit both residents and tourists with more transparent and flexible multimodal transportation options. However, in the US, the only MaaS implementations have been taken through a public agency that can compel or cajole a mix of private transportation providers into joining a single platform. This requires public funding or some sort of surcharge on MaaS users/service providers to pay for the setup and ongoing maintenance of the system.

BRT Speed & Reliability Improvements

Speed and reliability improvements along the VelociRFTA BRT route, such as strategic transit queue jumps or transit signal priority, can be implemented within 2-5 years. These travel time improvements, along with better HOV lane enforcement, can increase ridership up to 1.5% along the Highway 82 corridor. These improvements should be made around the same time as the increased parking prices to provide commuters and visitors with a competitive and reliable transportation option, which would further increase ridership. Identifying down-valley park-and-ride options may also be necessary to accommodate the new riders who cannot walk, roll, or bike to transit.

Complementary Strategies

Aspen, Snowmass, and Pitkin County may also want to further explore complementary strategies that could be implemented in the short term. For example, the City of Aspen currently operates a Transportation Demand Management (TDM) program; expansion of this program would provide further VMT and GHG reduction benefits. An expansion could happen by either encouraging/requiring more businesses to participate in the TDM program and to increase the incentives and disincentives related to non-SOV and SOV travel, respectively. Other TDM strategies could include provision of a trip reduction ordinance, expansion of the Emergency Ride Home program, and working closely with employers and schools to reduce SOV trips through existing programs and incentives. Adding/strengthening TDM programs in other Pitkin County communities could also dovetail with the strategies outlined above. These TDM programs can be modeled after Aspen's successful program, with some modifications to reflect the unique characteristics of the other communities along the Highway 82 corridor.

Medium Term Strategies

The strategies described in this section can be implemented within a 3-10-year timeframe, as they require additional planning, coordination between jurisdictions, and financial investments.

Ridehailing

Ridehailing (using an app to hail a ride from a company like Uber or Lyft or expanding/modifying Aspen's Downtowner service) in the Upper Valley could be implemented within 3-6 years,

depending on current operators' current growth plans, and/or Downtowner's service costs and ability to scale up, although there is considerable uncertainty in timing due to COVID-19 economic disruptions.[2] Due to the relatively isolated location of Aspen and Snowmass, there may not be a critical mass of drivers or year-round travel demand to ensure success for the current for-profit ridehailing companies. If the current private operators choose not to expand in the Upper Valley, this strategy would likely fall under long term implementation due to the time required to pivot towards a smaller pilot program, which could be operated by a private company, and coordinated and managed (and possibly subsidized) by local governments. As noted in the Task 2 memo, while Ridehailing can reduce the need to own vehicles for residents and likely reduces VMT for visitors, ridehailing can also run the risk of increasing traffic congestion and GHG emissions if not monitored and managed. If ridehailing substantially expands or is subsidized by local governments, the ridehailing companies should be required to provide monthly VMT reporting to ensure deadhead trips do not override the potential benefits of fewer resident and visitor trips caused by less private vehicle and rental car travel.

BRT Service Improvements

More substantial BRT improvements that would improve mobility in the Upper Valley could be implemented in the 5 to 8-year range. These improvements would include construction of a new park-and-ride at in the Carbondale/El Jebel/Basalt area, new peak period BRT service to Snowmass Village, consistent daily service to the West Glenwood park-and-ride and downtown Glenwood Springs, and improved first mile/last mile connections. Some first mile/last mile improvements could build off the other proposed strategies, such as the expansion of the Aspen Downtowner and new/expanded ridehailing services. This strategy implementation requires more time due to the collaboration required between RFTA, local jurisdictions, and the public, as well as additional funding.

Carsharing and Downtowner Improvements

Other medium-term strategies would focus on GHG and VMT reductions through expansion of the City of Aspen's Downtowner and carsharing program and shift towards the carsharing fleet's electrification. While these strategies have broad public support, both strategies require additional government investment which may take 5-8 years to implement. Downtowner may also require larger vehicles and a more robust technical infrastructure to significantly expand its service area. The Downtowner expansion faces significant opposition from taxi and limo companies, and more legal review is required to determine boundaries that best balance the improvement of public mobility while protecting private businesses from publicly supported transportation services. Building off the short-term strategies, additional parking revenue from higher fees could be allocated towards these programs. Electrification of Aspen's carsharing program may also benefit from medium-term implementation as less expensive, longer range electric vehicles are now regularly entering the market. Also, as more electric vehicles enter the

[2] Note that Lyft currently operates in Aspen, but service can be limited or unavailable due to a lack of drivers. See additional discussion on Downtowner expansion at the end of this section.

market, Aspen and other communities will also benefit from private sector investment in new DC fast charging stations, which can allow an electric vehicle to be charged in about 15 minutes. Aspen and other communities who embrace shared electric vehicles will still likely have to install standard electric vehicle charging infrastructure at the vehicle's home parking place, but the private sector infrastructure will greatly expand the range and practicality of zero GHG vehicle travel in the area.

Other Strategies

Another medium-term strategy is improved airport/transit connectivity, which would aim to reduce VMT and GHG impacts from the region's high visitor volumes. This strategy could include creating a designated airport transit shuttle from the existing BRT stop on Highway 82. Another option would expand the options to directly transport visitors' luggage to their hotels or ski equipment to the mountain bases or hotels. These types of "visitor concierge" services, while not new to Aspen or other resort areas (particularly in Canada and Europe) could help to reduce the incentive for visitors to rent a vehicle. However, this strategy faces legal obstacles due to security requirements by Homeland Security. Recently, there have been a few companies cleared to operate in the Orlando metro area, such as HoldMyLuggage; more review is required to determine the viability of this strategy in Colorado. Consideration for using locally generated transportation revenues to encourage transit/shuttle travel to the Denver, Grand Junction, and Vail airports may also be worth considering.

Long Term Strategy

Implementing dynamic roadway pricing on Highway 82 is a long-term strategy, given the time needed for implementation, construction, and potential toll exemptions for key constituencies like residents, service vehicles, or certain employees. Public knowledge and acceptance of the tolls, revenue allocation, and economic impact is key to successful congestion pricing, as public support is necessary to overcome the political difficulties of implementation. Furthermore, beginning stages of roadway pricing discussion need to be focused on mitigating and managing equity issues that may arise with implementation. Specifically, equity considerations in setting tolling prices, expanding alternative modes of travel, and providing low-cost access to lower-income groups, and toll revenue allocation to support mobility improvements for all modes must be considered. There are also legal challenges to implementing congestion pricing that require coordination with CDOT and the High-Performance Transportation Enterprise (HPTE), which finances Express Toll Lanes in Colorado.

Other Strategies

Other potential long-term strategies identified in the Upper Valley Mobility Report could likely be implemented in the beyond 10-year time frame, due to the extensive financial investment and planning required. The options below are complementary to the other strategies identified in this document, and likely have differing levels of public and political support. Additional analysis

would be required to identify the level of VMT and GHG reductions associated with these strategies.

A mountain-to-mountain aerial connection has been proposed in Aspen and Snowmass for decades. This strategy could alleviate some winter peak-hour roadway travel demand and may also reduce crowding on peak hour BRT buses traveling to Aspen. However, expanded BRT and local bus service may be a more practical way to achieve the same goal of making it easier to get between Aspen and Snowmass.

Light Rail Transit (LRT) is another transit option that has been proposed along Highway 82 between Aspen and the Brush Creek lot. LRT may provide a better visitor/commuter experience than buses, provide greater passenger capacity, and provides an opportunity for future down-valley rail connections. However, it is unlikely that there would be sufficient ridership density to support the capital costs of LRT over the successful BRT in the near-to-midterm.

Transit-Oriented Affordable Housing (TOAH) has been pursued for years in the Upper Valley, as most of Aspen and Snowmass' workforce commutes along Highway 82 from down-valley. This strategy would focus local efforts to build affordable housing near RFTA park-and-ride lots and transit stops along Highway 82 to reduce travel demand along the highway. Subsidizing affordable housing near existing transit infrastructure may be a more cost-effective way to reduce vehicle trips into Aspen and Snowmass than some of the other large-scale transportation options that have been considered over the years. Affordable housing essentially moves people to existing transit as opposed to bringing new transportation infrastructure to existing residential areas.