



# Yukon's Rural Transportation Challenge

Considerations and preliminary options for improving intercommunity travel

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**Table of Contents**

**GLOSSARY ..... 0**

**INTRODUCTION ..... 1**

**1. YUKON’S RURAL INTERCOMMUNITY TRANSPORTATION CHALLENGE..... 2**

    1.1 TRANSPORTATION DISADVANTAGED GROUPS..... 3

    1.2 CUMULATIVE EQUITY IMPACTS..... 6

    1.3 ROLE OF SHARED-USE MOBILITY SERVICES IN INTERCOMMUNITY TRAVEL ..... 7

**2. CONSIDERATIONS FOR IMPROVING INTERCOMMUNITY MOBILITY..... 9**

    2.1 YUKON’S CURRENT INTERCOMMUNITY TRANSPORTATION LANDSCAPE ..... 9

    2.2 OPERATIONAL CONSIDERATIONS ..... 10

    2.3 ECONOMIC CONSIDERATIONS..... 12

    2.4 GOVERNANCE CONSIDERATIONS ..... 13

    2.5 CASE STUDIES..... 14

**3. ANALYSIS OF OPTIONS ..... 20**

    OPTION A – FIXED ROUTE SERVICE ..... 20

    OPTION B – BOOK-AHEAD PASSENGER AND VEHICLE POOLING BROKERAGES..... 26

    OPTION C – INTERCOMMUNITY RIDESHARING APP ..... 29

**CONCLUSION & NEXT STEPS ..... 33**

**APPENDIX A: KEY TRANSPORTATION STAKEHOLDERS, BY REGION ..... 34**

**APPENDIX B: SERVICE OPTIONS, POTENTIAL PARTNERS, AND COSTS FOR SCHEDULED ROUTE SERVICE..... 35**

**SOURCES..... 36**

## **Glossary**

**Brokerage service.** A service that receives requests for transportation and coordinates rides with one or more available transportation service providers based on passenger needs (e.g. accessibility) and the timing, point of origin and destination of requests.

**Carpooling/ridesharing.** A service that enables drivers and passengers with similar travel routes and timing to share transportation. These trips may be coordinated directly through a centralized dispatch, or indirectly by providing a platform or other resources that enables drivers and passengers to connect on their own.

**Fixed route service.** A regularly scheduled service that runs on specific days and times between designated pick-up/drop-off points.

**Flexible route service.** A regularly scheduled service that runs on specific days, but may have a less rigid schedule and more leniency to make frequent stops based on user demand.

**Intercommunity transportation.** Travel between one Yukon settlement area (City, village, town, hamlet, or unorganized) and another.

**Linehaul costs.** The costs of transporting goods or passengers.

**On-demand service.** A service that users can contact to book travel for specific trips between particular locations or within a general geographic boundary.

**Shared-use Mobility.** Transportation services and resources that are shared among users, either concurrently or one after another. This includes public transit and taxis; micro mobility (bikesharing); automobile-based modes (carsharing, rides on demand, and microtransit); and commute-based modes or ridesharing (carpooling and vanpooling).<sup>1</sup>

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<sup>1</sup> Source: Shared-use Mobility Centre <https://sharedusemobilitycenter.org/what-is-shared-mobility/>

## **Introduction**

The goal of the Yukon Community Travel Project is to explore how and why Yukoners travel between communities, understand the challenges they face, and identify opportunities for positive change. This report builds on previous analysis of Yukon's regional transportation landscape, examines key challenges that limit access to transportation, and outlines concrete options for improvement.

Section 1 presents an overview of key factors and trends that impact the supply and demand of intercommunity transportation in the Yukon, and the equity impacts of reduced access to transportation services for specific demographic groups.

Section 2 reviews general operational, economic, and governance considerations that should be taken into account during the design and development of options for improving intercommunity travel. Case studies that illustrate how organizations in other jurisdictions have sought to improve intercommunity travel are also used to highlight practical challenges and opportunities.

Section 3 explores three specific options for shared-use mobility transportation services. These options lay out concrete ideas for improving access to transportation between Yukon communities, based on the preceding considerations and case studies, and grounded in the specific context of Yukon's unique transportation landscape.

The report concludes with a brief summary of outstanding questions and areas for further analysis, and outlines next steps to further develop and refine these options through community and stakeholder engagement.

## **1. Yukon’s Rural Intercommunity Transportation Challenge**

One way to describe the transportation challenges faced by Yukoners living in rural Yukon communities is through an economic lens that considers both the demand and supply sides of the market equation for intercommunity transportation.

The **demand side** of the equation involves all the reasons why people need transportation on a day-to-day basis. People need (demand) transportation to get back and forth from where they reside and:

- school;
- work;
- stores to buy food, clothing, hardware, etc.;
- essential and professional services (e.g., medical appointments, haircuts);
- visiting family and friends, recreation and sport (all forms of socialization); and,
- being on the land and other cultural endeavors.

The **supply side** of the equation involves how people move back and forth from their homes and the places they go to fulfill the needs listed above (school, work, stores, etc.). In urban settings, three main modes of transportation have traditionally been used by residents to meet their transportation needs:

1. owner-operated road motor vehicles: cars, light trucks, motorcycles;
2. active transportation: walking, bicycling;
3. shared-use mobility: open-eligibility (passenger buses, taxis) and granted-eligibility (health service shuttles, care home shuttles, organization-based shuttles, carpools).

In rural settings, including the Yukon, and especially so in communities outside of Whitehorse, the use of owner-operated road motor vehicles dominates the use of shared-use vehicles and active transportation.

*Table 1 – Vehicle registrations by type<sup>2</sup>*

Yukon Road Motor Vehicle Registrations - 2019	Number	Share
Vehicles less than 4,500 kilograms (e.g., passenger cars, light trucks)	35,651	83%
Vehicles 4,500 kilograms to 14,999 kilograms (e.g., medium duty trucks)	3,862	9%
Vehicles 15,000 kilograms or more (e.g., heavy duty trucks)	1,629	4%
Buses	387	1%
Motorcycles	1,268	3%
Total	42,797	100%

With a total of 42,797 registered vehicles at the end of 2019, there were more road motor vehicles registered in the Yukon than people (41,761).

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<sup>2</sup> Department of Highways and Public Works, Government of Yukon (2019)

Yukon’s high rate of motor vehicle ownership and Yukoner’s preference for travelling in their own motor vehicles does not mean, however, that everyone has access to or is able to operate a road motor vehicle.

**1.1 Transportation disadvantaged groups**

*Table 2: Transportation disadvantaged demographic groups<sup>3</sup>*

Transportation disadvantaged group	Prevalence
People with disabilities	3-5% of individuals
Adolescents	5-15% of individuals
Seniors	10-20% of individuals (and increasing)
Low-income households	20-40% of households

As shown in the table above, the prevalence of transportation disadvantaged individuals in the general population is estimated at 3% to 5% for people with disabilities, 5% to 15% for adolescents and 10% to 20% for seniors. Low-income households are another key ‘non-driving’ population: an estimated 20% to 40% of households bear excessive transportation costs or experience reduced mobility due to low household income.

**Adolescents, Seniors, and People with Disabilities**

These groups are of interest to this analysis because they are generally less likely to be able to operate a road-motor vehicle. Obviously, this is not true of all individuals from each group: driving-age adolescents may have a license and ready access to a vehicle; seniors are often able to continue driving well into their 70s and 80s; and people with disabilities may have access to adapted vehicles. On the whole, however, individuals from these groups are more likely to depend on others for transportation.

This is both an equity issue and a supply and demand problem. In terms of equity, these groups experience reduced personal mobility that impacts their ability to live full lives, both socially and economically. These impacts are especially acute in rural areas with limited transportation services.

In terms of supply and demand, increased prevalence of these groups within a community or region means that there are likely to be fewer people who are able to provide transportation (supply) and more people who are reliant on others for it (demand).

In the Yukon context, seniors make up a particularly large proportion of rural residents. While the population of seniors is roughly 13% for the Whitehorse area, residents over age 65 account for 17% of the cumulative population of rural communities. Some communities, such as Faro (22%) and Tagish (32%), are notably higher.<sup>4</sup>

<sup>3</sup> Adapted from Litman, T. 2020. *Rural Multi-modal Planning*. Victoria Transport Policy Institute. Page 6.  
<sup>4</sup> Yukon Bureau of Statistics, 2020 Population Estimates (Q3)

Table 3 details the estimated number of adolescents, seniors without a driver's license, and people with disabilities that limit capacity to drive for Yukon communities and regions.<sup>5</sup> Those with a higher proportion than the rural average are highlighted.

*Table 3: Estimates of transportation disadvantaged groups, by region and community*

Region	Community	Population	Adolescents (10-19) #*	Seniors (65+) without a drivers license #**	Working age people with a disability #***	Cumulative Total			
						Community		Region	
						#	%	#	%
West	Beaver Creek	122	6	4	3	13	11%	236	16.7%
	Burwash Landing	108	11	4	3	19	17%		
	Destruction Bay	61	5	2	2	9	14%		
	Mendenhall	143	16	6	4	26	18%		
	Haines Junction	979	101	45	24	169	17%		
Southern Lakes	Carcross	470	41	22	12	75	16%	130	15.6%
	Tagish	361	17	30	9	55	15%		
North	Carmacks	601	85	20	14	119	20%	607	16.3%
	Pelly Crossing	401	46	13	10	69	17%		
	Dawson City	2269	213	79	61	353	16%		
	Mayo	458	35	20	12	67	15%		
Central	Faro	449	50	25	10	85	19%	150	17.5%
	Ross River	412	42	12	11	65	16%		
East	Johnson's Crossing	54	6	4	1	11	21%	356	17.4%
	Teslin	474	47	23	12	82	17%		
	Watson Lake	1510	162	63	38	263	17%		
<b>TOTAL</b>		<b>8872</b>	<b>883</b>	<b>370</b>	<b>225</b>	<b>1478</b>	<b>17%</b>		
Whitehorse Area		33285	3446	1072.25	1331	5850	18%		

\* Adolescent population based on Yukon Bureau of Statistics community population estimates of 10-19 year olds (Yukon Bureau of Statistics, 2020 Population Estimates (Q3))

\*\* Population of seniors without driver's licenses estimated at 25% of community population over age 65 (Yukon Bureau of Statistics, 2020 Population Estimates (Q3); *Profile of Seniors Transportation Habits*, Statistics Canada, 2012)

\*\*\* Population of persons with a disability based on average of 4% with a disability that affects capacity to drive, calculated from working age population only (age 20-64) as adolescents and seniors may also have disabilities. (Yukon Bureau of Statistics, 2020 Population Estimates (Q3); Litman, T., 2020. Rural Multi-modal Planning)

### Low-income households

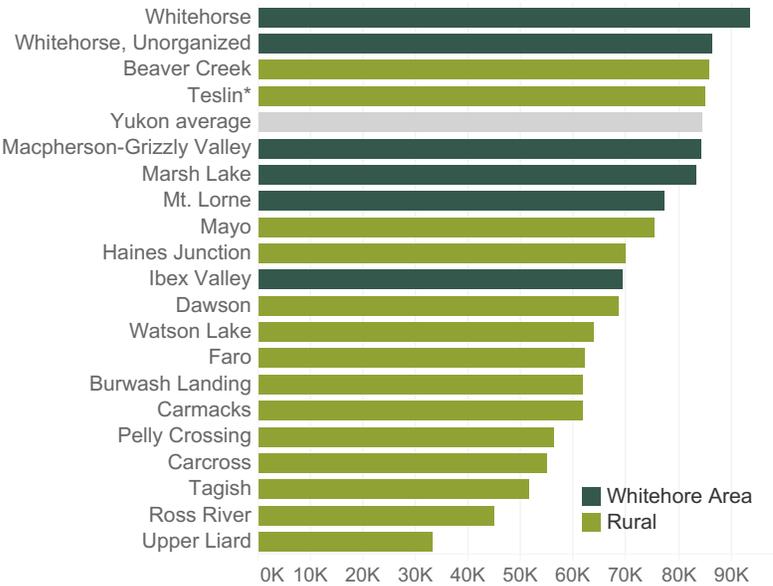
Household income is a key factor in access to transportation because owning and operating a vehicle is expensive. In 2017, the Canadian Automobile Association estimated that the average yearly cost of vehicle ownership in Canada was \$8,600 for a compact car, \$12,000 for a sport utility vehicle (SUV) and \$13,000 for a pickup truck.<sup>6</sup>

<sup>5</sup> Some communities not relevant to the scope of this analysis (e.g. Old Crow) excluded.

<sup>6</sup> Global News, "Own a car? You won't believe how much that's costing you every year"

Figure 1 illustrates household income for selected Yukon communities. As shown in the chart, household incomes were higher in Whitehorse and the areas around Whitehorse and lower in rural Yukon.

On the basis of national-level estimates, the average yearly cost to own and operate a pickup truck for a Whitehorse resident is roughly 13% to 15% of household income. For rural Yukoners, the average yearly cost to is from 15% to 40%.



\*excludes Teslin Post

Figure 1 – Median household income, by community (pre-tax, 2015)

The average yearly cost of vehicle ownership and share of household income are likely even higher in rural areas because of the long distances between people’s homes and the places they go for their day-to-day needs (school, work, stores, etc.).

**Communities with limited access to essential goods and services**

Lack of access to essential goods and services is a key driver of transportation demand. As shown in Table 4, some rural communities have limited or no access to healthcare, public services, professional services, or retail services that sell food and other essential goods.

Table 4 – Availability of select services, by community

		Whitehorse Area	Carcross	Tagish	Faro	Ross River	Teslin	Watson Lake	Carmacks	Pelly Crossing	Dawson City	Mayo	Haines Junction	Destruction Bay	Burwash Landing	Beaver Creek
<b>Healthcare</b>	Hospital	Yes	No	No	No	No	No	Yes	No	No	Yes	No	No	No	No	No
	Resident physician	Yes	No	No	No	No	No	Yes	No	No	Yes	No	Yes	No	No	No
	FT nurse/visiting physician	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Dentist	Yes	No	No	No	No	No	No	No	No	No	No	No	No	No	No
<b>Public Services</b>	Mental wellness counsellor	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
	Circuit court	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes
	High school	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
<b>Retail Services</b>	Basic food staples	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Food staples, produce	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No	No
	Non-food staples	Yes	No	No	Yes	No	No	Yes	No	Yes	No	No	No	No	No	No
<b>Professional Services</b>	Conventional bank services	Yes	No	No	No	No	No	Yes	No	No	Yes	No	No	No	No	No
	Automobile repair	Yes	No	No	No	No	No	Yes	No	No	Yes	No	Yes	No	No	No
	Vetrinary services	Yes	No	No	No	No	No	No	No	No	Yes	No	No	No	No	No
<b>Local Amenity Index (Scale: 0-1)</b>		1.0	0.4	0.1	0.5	0.5	0.4	0.8	0.5	0.4	0.9	0.5	0.6	0.2	0.2	0.2

The above selection of essential goods and services is not comprehensive<sup>7</sup>: rural residents with local access to all these services still need to travel to Whitehorse to access other essential services (e.g., dental care, pharma care, eye care) and a greater diversity of goods. Many goods are also likely to be cheaper – sometimes significantly – in Whitehorse.

This increased need for travel is further complicated by the remoteness of many rural communities. Not only do rural residents need to travel more frequently to meet their day-to-day needs, but many travel hundreds of kilometers every trip. This can add up to 33% more driving kilometers per year for rural residents, 38% more for rural workers, and 59% more for low-income rural workers, compared to their urban counterparts.<sup>8</sup>

### 1.2 Cumulative equity impacts

Table 6 illustrates how local access to essential goods and services, household income, and travel distance affect the cost of transportation in selected (larger) rural Yukon communities. *Income Index per KM* shows the relationship between **median household income** and **distance from Whitehorse**.<sup>9</sup> Recognizing that **access to local amenities** – particularly, healthcare services and groceries – is a key factor in travel demand, the *Local Amenity Index* shows where rural Yukon residents are likely to have increased travel needs.

Table 6: Household income per KM of highway travel distance / availability of local amenities<sup>10</sup>

		Median Household Income	Income Index	Highway KM to Whitehorse	Income Index per KM	Local Amenity Index
	Whitehorse	\$ 93,652	1.00	1	-	1.00
West	Beaver Creek	\$ 85,760	0.92	457	0.20	0.23
	Burwash Landing	\$ 61,995	0.66	284	0.23	0.15
	Destruction Bay	\$ 58,624	0.63	267	0.23	0.15
	Haines Junction	\$ 69,824	0.75	159	0.47	0.62
Southern Lakes	Carcross	\$ 54,848	0.59	74	0.79	0.38
	Tagish	\$ 51,712	0.55	103	0.54	0.08
North	Carmacks	\$ 61,824	0.66	177	0.37	0.54
	Pelly Crossing	\$ 56,448	0.60	285	0.21	0.38
	Dawson	\$ 68,608	0.73	538	0.14	0.92
	Mayo	\$ 75,264	0.80	410	0.20	0.46
Central	Faro	\$ 62,165	0.66	357	0.19	0.46
	Ross River	\$ 45,013	0.48	410	0.12	0.46
East	Teslin*	\$ 85,077	0.91	183	0.50	0.38
	Watson Lake	\$ 63,872	0.68	454	0.15	0.85

\*Household income data from the Teslin census division excludes the Teslin Post area.

<sup>7</sup> Note that certain services may become available or cease being available in different communities for different reasons. Table reflects best available information, as of Spring 2021.

<sup>8</sup> Brown and Shafft (2011)

<sup>9</sup> While some residents of more remote communities may travel to larger rural centres to access goods and services that are not locally available (e.g. Haines Junction, Dawson), it is assumed that most travel to Whitehorse.

<sup>10</sup> The Income Index uses before tax household income for Whitehorse residents as a baseline (1.00) to illustrate comparative income levels across select rural Yukon communities (Source: Statistics Canada, Census of Canada 2016). The Local Amenity Index replicates the same index detailed at the bottom of Table 4.

The implications of limited local access to essential goods and services, longer driving distances, and lower household incomes faced by many people in rural Yukon communities is summarized by Todd Litman at the Victoria Transport Policy Institute:

*The combination of low incomes and long travel distances make motor vehicle expenses a major financial burden to many lower-income rural households, sometimes leaving residents with insufficient money to purchase other essential goods such as utilities, medicine and healthy foods. Although lower-income motorists use various strategies to minimize expenses, such as owning older vehicles, performing some of their own repairs, and purchasing minimal insurance coverage, owning and legally operating an automobile usually costs several thousand dollars annually, sometimes including large unplanned expenses from mechanical failures or accidents.<sup>11</sup>*

The same circumstances have additional implications for rural Yukoners in terms of health and well-being.

Beyond securing the basic necessities of life, people need transportation to access a variety of activities that contribute to their physical, mental and spiritual wellbeing. These include accessing medical and personal services, socializing through visiting family and friends and taking part in recreation activities and spiritual endeavours, and harvesting food and medicine by being on the land. In this context, lack of access to intercommunity transportation can lead to:

- social isolation;
- decreased physical and mental health;
- loss of independence; and,
- forgone opportunities for training, education and employment.

### **1.3 Role of shared-use mobility services in intercommunity travel**

As noted earlier, three main modes of transportation are generally used by people to meet their transportation needs in urban contexts: owner-operated road motor vehicles, active transportation and shared-use mobility services.

As outlined above, a significant proportion of the Yukon's population, especially in communities outside of Whitehorse, cannot drive or feasibly own and operate a road motor vehicle. The long distances between Yukon communities means that active transportation (walking, bicycling) is not a practical intercommunity transportation solution. So, people in rural Yukon communities who cannot access owner-operated road motor vehicles to move between communities must rely on the third mode of transportation – shared-use mobility. Shared-use mobility is defined as:

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<sup>11</sup> Litman, T. 2020. *Rural Multi-modal Planning*. Victoria Transport Policy Institute. Page 11.

*Transportation services and resources that are shared among users, either concurrently or one after another. This includes public transit [and taxis]; micromobility (bikesharing, scooter sharing); automobile-based modes (carsharing, rides on demand, and microtransit); and commute-based modes or ridesharing (carpooling and vanpooling).<sup>12</sup>*

As can be seen in the definition above, shared-use mobility services can take many different forms. It should be noted that while some shared-use mobility services are suitable for intercommunity transportation, not all are. As a result, the focus of the analysis of options in this paper will be on shared-use mobility services that could possibly be implemented for intercommunity transportation between Yukon communities.

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<sup>12</sup> 'What is shared-use mobility?' Shared-use Mobility Centre (2021)

## **2. Considerations for Improving Intercommunity Mobility**

This section presents an overview of general considerations that should be factored into the design and development of any shared-use mobility service.

### **2.1 Yukon's current intercommunity transportation landscape**

A parallel study of Yukon's existing transportation landscape conducted for the Yukon Community Travel Project revealed some key insights into how, why, where, and how frequently Yukoners travel between communities. Some high-level insights from this analysis to consider in the development of shared-use mobility solutions include:

#### **Existing intercommunity transportation services**

- Private passenger transport services are available to and from several rural communities, but primarily serve tourists and workers at remote sites. Fares are often 5-10x higher than what most pay for transport in a personal vehicle.
- Many First Nations governments operate transportation services that support the needs of their citizens. Some of these services are regularly scheduled, but most appear to be on-demand, responding to citizen's travel needs as they arise.

#### **Intercommunity travel patterns and behaviours**

- Traffic between communities is lower for communities further from Whitehorse.
- Whitehorse is the primary destination for the vast majority of intercommunity trips that originate in rural communities.
- Residents of rural communities closer to Whitehorse (e.g. Carcross, Haines Junction) travel more frequently than those further from the capital.

#### **Social, economic, and political factors**

- There appears to be political will to invest in solutions that improve intercommunity mobility. In 2020 and 2021, the government of Yukon released four plans and strategies that included commitments to improve intercommunity transportation and access to transportation for specific disadvantaged groups.
- Federal government funding to finance the capital and operating costs of transportation – including a dedicated funding for rural transit announced in April 2021 – is available to Yukon government, First Nations governments, local governments and some non-profit service providers.
- Vehicle electrification and planned investments in highway charging stations will decrease the cost of intercommunity travel for electrical vehicle users.

For an in-depth look at Yukon's intercommunity transportation system, travel activities, and travel patterns, see the accompanying report: [Yukon's Transportation Landscape](#)

## 2.2 Operational considerations

Any option that seeks to improve shared-use mobility between communities must first establish some basic operational parameters about whose mobility will be improved and how this will be achieved. Some of these parameters serve to define demand for prospective shared-use mobility services, while others help to define how these services would be supplied.

**Operational parameters on the demand side** of this ledger include:

- **Geographic boundaries.** The regions, routes, and communities targeted for improved intercommunity mobility.
- **User eligibility.** The target group(s) served, and group characteristics that will shape other transportation service parameters (e.g. accessibility requirements, financial capacity, etc.).

**Operational parameters on the supply side** of this ledger include:

- **Service model.** Shared-use mobility can be provided through a variety of different models, each of which presents different costs and benefits. These models include:
  - *Fixed route service.* A regularly scheduled service that runs on specific days and times between designated pick-up/drop-off points.
  - *Flexible route service.* A regularly scheduled service that runs on specific days but may have a less rigid schedule and more leniency to make frequent stops based on user demand.
  - *On-demand service.* A service that users can contact to book travel for specific trips between particular locations or within a general geographic boundary.
  - *Carpooling and/or ridesharing.* A service that enables drivers and passengers with similar travel routes and timing to share transportation. These trips may be coordinated directly through a centralized dispatch, or indirectly by providing a platform or other resources that enables drivers and passengers to connect on their own.
- **Availability/frequency of service.** The availability or frequency of any shared-use mobility service has a tremendous impact on the value of this service for its users, and also on the cost of providing the service.

### Operational Efficiencies

The balance between demand-side and supply side parameters will determine the efficiency and effectiveness of the service. Two key factors that influence the overall efficiency of any shared-use mobility service are:

- **Number of people served per kilometer travelled.** The geographic boundaries and route structure of any intercommunity transportation service must contend with a basic balance between levels of service (e.g. frequency of trips, number of

communities served) and the efficiency of providing that service. If efficiency is a priority, these boundaries and routes should be designed in ways that maximize the number of people served per kilometer of service coverage.

- **Total number of people served.** The effectiveness of any intercommunity transportation service depends not only on the efficiency of its route, but the total volume of passengers.

While efficiency is an important operational consideration, in the Yukon context there are some communities where it will be difficult or impossible to establish a compelling business case for the provision of shared-mobility services. Equitable access to transportation, and common a baseline of intercommunity mobility for all Yukoners, may also be an important operational consideration – particularly for transportation disadvantaged residents in remote communities with limited access to essential goods and services.

### Rider needs and preferences

Beyond the supply and demand for transportation, the needs and preferences of riders who are expected to use the service are also important operational considerations. While further engagement with Yukoners is required to ground truth these needs and preferences within local and regional contexts, some obvious considerations include:

- **Safety.** Vehicles should be safe and reliable, drivers should be appropriately vetted and trained, and policy frameworks and protocols should proactively consider and address a wide range of issues that may affect the safety of users.
- **Accessibility.** Vehicles and terminal infrastructure should be appropriately accessible to the full range of eligible users (e.g. people with a physical disability requiring specialized equipment)
- **Cargo.** Adequate space should be provided to safely and securely accommodate passenger cargo.

#### Facilitating transportation connections for rural residents arriving in Whitehorse

Whitehorse is a dispersed City that can be challenging to navigate without a personal vehicle. Any prospective intercommunity transportation service that facilitates movement to and from Whitehorse should consider how users will connect to available urban transport. Current urban transportation options available to travellers include:

- **Active transportation.** Rural visitors who can afford the extra time and are unburdened by cargo may travel by foot or bicycle (if they can rent or otherwise access one).
- **Transit service.** Whitehorse transit runs every day except Sunday on an hourly basis, and on some routes, every half-hour during peak commuting hours in the morning and evening.
- **Handy Bus service.** Whitehorse transit operates a book-ahead transportation service for people who may have difficulty using regular transit service.
- **Taxi services.** Whitehorse has several taxi companies that provide door-to-door service.

## 2.3 Economic considerations

General economic considerations that should be integrated into new intercommunity transportation solutions largely relate to the cost and efficiency of different options. The costs of transportation may be broadly defined as either capital and operating costs.

**Capital costs** are fixed, one-time expenses, generally for tangible assets that are amortized over several years. The quantity or scope of assets is largely based on the levels of service (e.g. frequency of trips, number of passengers served). Notable capital expenditures for shared-use mobility services may include:

- **Vehicles** are the most basic physical asset required for transportation. As vehicles depreciate over time, maintaining any kind of transportation service that owns these assets generally requires ongoing capital investment.
- **Passenger terminals** are required to safely and comfortably load and unload passengers. Terminal costs may be free or negligible where public or private facilities are available. New passenger infrastructure (e.g. passenger shelters) generally require new investment and ongoing maintenance costs.
- **Supporting infrastructure** such as vehicle storage and maintenance facilities or offices and equipment for administrative staff.

**Operating costs** are variable expenses incurred through the operation of a shared-use mobility service. They are highly correlated with service levels, and may include:

- **Linehaul costs**, the costs of transporting goods or passengers, increase in proportion to travel time and distance, and include variable expenses such as fuel, driver wages and benefits. Linehaul efficiency is measured as cost per passenger per kilometre travelled or costs per 1 kilogram of freight per kilometre travelled.
- **Terminal costs** include variable costs that stem from the loading, unloading, and/or transfer of passengers or goods between vehicles or transportation modes (e.g. from taxi-cab to shuttle). Terminal costs vary depending on terminal infrastructure, the number of passengers or volume of goods, or time-related factors (e.g. wait times). Poor coordination of passenger transfers can lead to additional 'inter-modal friction' costs for service providers.
- **Administrative costs** include insurance, regulatory permitting, wages and benefits for staff (e.g. dispatch and scheduling support), phone and internet expenses, etc.

### Shared-use mobility and cargo transport services

Transporting cargo and other goods, on an ad-hoc basis by request or as a regularly scheduled service, can provide a source of stable revenue for passenger transport services.

Operators whose primary business is freight delivery rarely provide supplementary passenger transport services, however, due to regulatory and licensing requirements and practical differences in the operational models for these types of transport services.

## 2.4 Governance considerations

To be effective, efficient and sustainable, intercommunity transportation services benefit from clear governance structures that define decision-making processes, policies, and roles for participants and interested stakeholders.

Basic characteristics of transportation service governance structures may include:

- **Agreements on resources and funding.** Sources and terms of capital and operating funding flows should be clearly defined, particularly if the service depends on shared resources from two or more organizations.
- **Governance bodies.** A forum (e.g. an advisory committee) that facilitates discussion and deliberation between participants and/or stakeholder groups with vested interests in the transportation service.
- **Decision-making processes and protocols.** Clear rules that define how decision-making power is distributed between participants and/or stakeholder groups with vested interests, and how decisions will be made.
- **Mechanisms for operational oversight and improvement.** The goals and objectives of any shared-use mobility service for rural communities should be clearly defined, tied to clear metrics, and regularly evaluated.

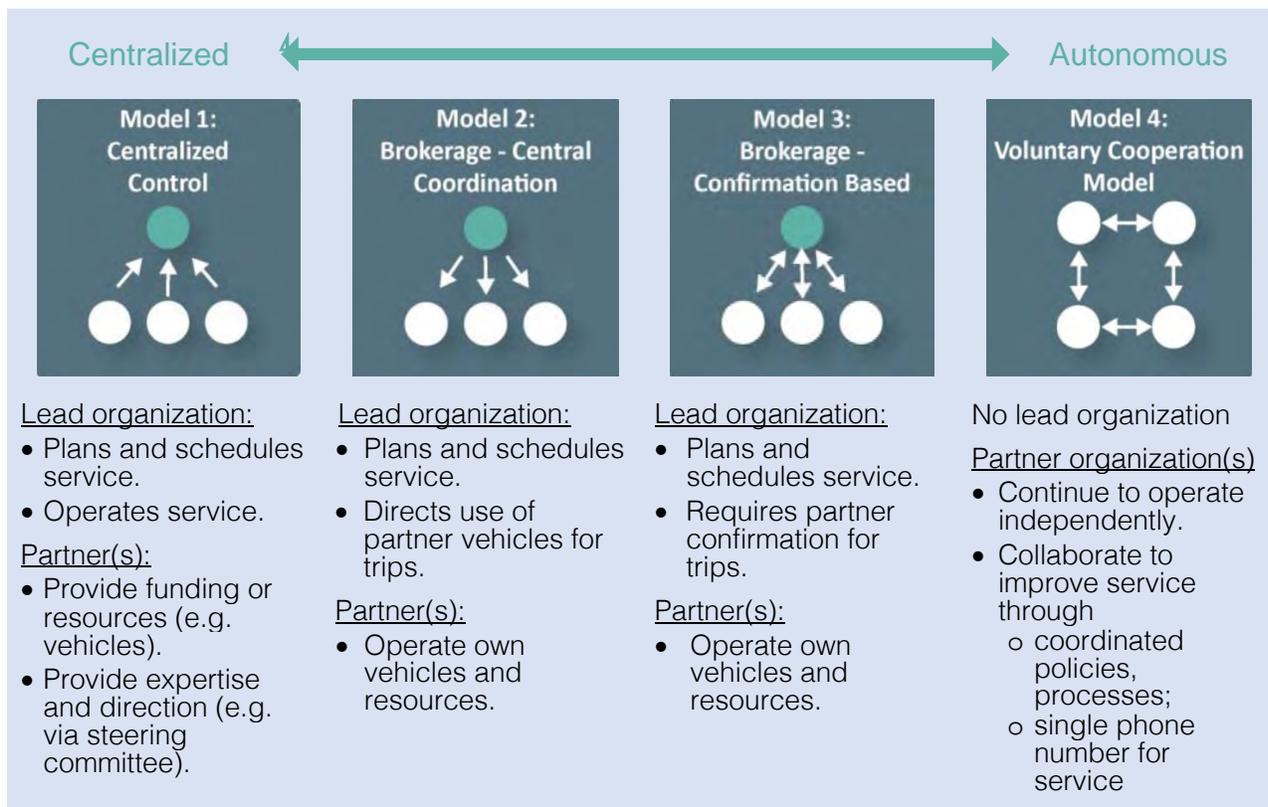
An intercommunity transportation service funded and operated by a single organization that uses only its own existing resources (e.g. capital and operating funding, fleet vehicles, administrative resources) may be able to operate using a less formal governance structure. Where two or more organizations collaborate in a coordinated service, governance structures may need to be more formal and detailed.

### 2.4.1 Coordinated Transportation

The costs and inefficiencies of improving Intercommunity transportation between communities that are widely dispersed and sparsely populated may be too much for any single organization to bear. In this context, coordinated service between stakeholders with shared interests and resources can be a less expensive and more efficient approach to improving intercommunity transportation.

Coordinated transportation services can be more centralized or more autonomous to adapt to the unique needs of partner organizations (see Table 6, below).

Table 6 - Coordinated transportation service models<sup>13</sup>



## 2.5 Case studies

This section explores three existing rural shared-use mobility service models from other jurisdictions. Each case study was selected to illustrate how the above considerations have been addressed in practice. These examples speak to different aspects of the options explored in [Section 3](#), and the factors that led to the selection of these service models.

### 2.5.1 [Highway 16 Action Plan - BC North Coast and Interior](#)

**This collaborative transportation service connects 12 communities along a 718 kilometer stretch of Highway 16. Additional community-based transportation services connect ‘off highway’ residents to seven on-route transportation hubs.**

**Regional context.** This section of Highway 16 spans from the coastal City of Prince Rupert to Prince George in BC’s interior. The route follows the Skeena, Bulkeley and Nechako rivers, traversing 12 cities, towns and villages and connecting other smaller, mostly Indigenous communities. The region’s First Nations comprise nearly two dozen Nations, some organized under Tribal Councils and some unaffiliated.

<sup>13</sup> Adapted from Dillon Consulting, 2014. *Towards Coordinated Rural Transportation: A Resource Document*

Momentum for improving transportation along Highway 16 is driven in part by the 2018 closure of Greyhound Canada’s northern bus route and long-standing calls to improve traveller safety. Highway 16 is called the ‘Highway of Tears’ due to the many Indigenous women whose death or disappearance are connected to this route.

Highway 16 Action Plan - Transportation Service Parameters	
Area population	~125,000 across several communities on or connected to Highway 16
Service coverage	12 communities on a 718 KM highway fixed route; 9 regional service areas with fixed/on-demand service; 5 ‘hubs’ linking regional and highway services. No eligibility requirements (accessible to all members of the public)
Frequency	~3 days per week/on-demand (varies by area)
Fare	\$2.75-\$5 one-way, per segment; \$0-\$40 for community-based services
Funding model	BC government funds capital costs and 2/3 of operating costs; community partners fund remaining 1/3 of operating costs
Ridership:	~9000 annually (18K in first 2 years)
Key stakeholders:	BC Ministry of Indigenous Relations and Reconciliation, BC Ministry of Transportation and Infrastructure, First Nations Health Authority, Northern Health Authority, BC Transit, Local governments, Community Transportation Grant Program recipient service providers (e.g. Indigenous service organizations)

**Service model.** Key components of the service include:

- *Fixed-route public transit service on Highway 16.* Six linked regional BC Transit bus routes that run between Prince George and Kitimat.
- *‘Community vehicles’ that connect off-highway settlement areas.* Twelve community organizations provide scheduled services to/from Highway 16 and on-demand service for local travel within designated service areas.
- *Safe bus-shelters and pull-outs.* A network of fifteen all-weather bus shelters, 12 monitored by web camera, and six shelters to support community vehicle travel.

**Keys to success** that facilitated the successful development and implementation of this transportation service include:

- *Extensive stakeholder engagement and community consultation.* The coordinated service model was developed through 20 community engagement events over a 2-year period. A 12-member community advisory group was tasked with service planning, implementation, and fine-tuning.
- *Stakeholder cost-sharing backed by government subsidy.* The BC government subsidizes the cost of vehicles and roughly two-thirds of operating costs, with local or First Nations governments covering the remaining operating costs.

- *Investments in passenger infrastructure and capacity development.* Initial investments included capital funding for all-weather and web-cam monitored bus shelters, and ongoing support for First Nations driver education programs.

### 2.5.2 EasyRide (Perth and Huron Counties, Ontario)

**EasyRide is a volunteer-driven transportation service that helps seniors and other transportation disadvantaged users access health care services and participate more fully in the economic and social life of their region.**

**Regional context.** Perth and Huron counties include nine different communities in southern Ontario. Some are more densely populated towns or villages, but others are more widely dispersed rural and agricultural areas with limited local amenities and transportation options. Many residents travel to larger urban centres such as London and Waterloo for shopping and work opportunities.

A high percentage of residents are over aged 65: almost 19% in Perth County and nearly 23% in Huron County, according to the 2016 Census. Many of these seniors experience difficulty accessing essential goods and services - particularly healthcare services - and social activities within this geographically dispersed region.

EasyRide - Transportation service parameters	
Area population	~136,000 (~77,000 in Perth County and ~59,000 in Huron County)
Service coverage	Door-to-door service anywhere in Perth or Huron county; Primarily serves seniors and people with disabilities.
Frequency	On-demand, 7 days a week.
Fare	Per-kilometer fee based on trip distance; subsidized rates available for trips to access healthcare services.
Funding model	Established through a partnership of seven community-support agencies, operated by OneCare Home & Community Support Services.
Ridership:	~72,000 annually (~60,000 in Perth Country and ~12,000 in Huron County)
Key stakeholders:	Perth County community organizations: Community Outreach and Perth East Transportation; Mitchell and Area Community Outreach and Mobility Bus; St. Mary's and Area Home Support and Mobility Services; Stratford Meals on Wheels and Neighbourly Services; VON Perth-Huron Huron County community organizations: Midwestern Adult Day Services; Town and Country Support Services

**Service Model.** EasyRide provides on-demand door-to-door transportation through a network of volunteer drivers using cars, vans, and wheelchair accessible vehicles coordinated by central dispatch. Taxis are also used to supplement this volunteer service.

The service is specifically for seniors, but may also be accessed by other adult OneHealth clients who:

- Live in Perth or Huron County or are travelling somewhere in these counties;
- Have a physical or cognitive disability or require specialized (e.g. wheelchair accessible) transportation;
- Do not have access to a personal vehicle, public transportation, or friends or family who can provide transportation.

Eligible users can use this service 7 days a week to access non-emergency medical appointments, shop and run errands, or attend social activities. Keys to Success that facilitated the successful development and implementation of this transportation service included:

- *Sharing transportation assets.* Collaboration between different organizations providing services to similar client groups allowed for a more efficient and cost-effective use of available vehicles and other transportation assets.
- *Centralized dispatch control.* Centralizing coordination of transportation services allowed the transportation provider to consolidate services under one banner, eliminating confusion and increasing the total client base. Centralized dispatch services also allowed EasyRide to more efficiently match users, drivers and vehicles by the location of pick up and destination.
- *Volunteer drivers.* While significant effort is likely required to recruit, vet and train volunteer drivers, this approach reduces the overall cost of the service relative to alternatives that use full or part-time employees.

### 2.5.3 Winnebago Catch-a-Ride (Winnebago County, Wisconsin)

**Catch-A-Ride provides subsidized transport for Winnebago County residents whose employment-transportation needs are not covered by existing services.**

**Regional context.** Winnebago county comprises the large urban centre of Oshkosh and its suburbs on the eastern edge of the county and several smaller cities, towns and dispersed rural areas to the west. Most county residents commute to work alone and are employed in manufacturing, healthcare and social assistance, or retail service.<sup>14</sup>

Regional transit service provides scheduled transportation six days per week between Oshkosh and two larger urban centres: the 'Fox Cities' area – which includes nine cities, towns and villages – roughly 32 km to the North, and the Fond-du-Lac metropolitan area roughly the same distance to the South. These routes provide inter-modal connectivity to local transit services, private bus lines and taxis.

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<sup>14</sup> Data USA, 'Winnebago County, WI'.

Several smaller private and non-profit transportation services provide specialized transit services for older adults, people with disabilities, and people in need of healthcare support. The non-profit operated 'Make the Ride Happen' program was launched in 2004 to coordinate access to these services through a central information hub – including telephone and email support for users.<sup>15</sup>

Winnebago Catch-a-Ride - Transportation service parameters	
Area population	~170,000
Service coverage	Door-to-door service, anywhere in Winnebago County not already covered by existing public transportation services
Frequency	On-demand 24/7 (based on volunteer driver availability)
Fare	\$0.20 per kilometre + \$2.55 booking fee <sup>16</sup>
Funding model	Seed funding for program model development provided by a worker-focused 'commute to careers' state grant, additional funding received through philanthropic organizations and community partners.
Ridership:	~1050 annually <sup>17</sup>
Key stakeholders:	East Central Wisconsin Regional Planning Commission (lead), Make the Ride Happen, Winnebago County Health Department, Wisconsin Department of Workforce Development, University of Wisconsin-Extension.

**Service Model.** Catch-a-Ride was launched in 2018 to support workforce development in Winnebago County by providing low-cost, safe, and reliable rides to work. The program provides door-to-door service to any county resident whose “hours of work, home address or work address does not fall within the limits and operational hours of ...any other public transportation”.<sup>18</sup> It specifically targets workers who are disabled, unemployed, underemployed, and low-income.

The program is operated by Feonix-Mobility Rising, a national NGO that provides transportation support services. For Catch-A-Ride, it provides insurance coverage for volunteer drivers and ride-sourcing software that allows riders to book travel through their computers or smartphones.<sup>19</sup> The 'Make the Ride Happen' program also provides telephone support for users and assists with driver recruitment and training. Volunteer drivers provide 24/7 service using their own vehicles and are compensated at the US federal reimbursement rate of \$0.45 per loaded kilometre (i.e. kilometres travelled carrying a passenger).<sup>20</sup>

<sup>15</sup> Make the Ride Happen, 'About Make the Ride Happen'.  
<sup>16</sup> Converted to CAD per kilometre from USD \$0.25 per mile + \$2 booking fee at a rate of \$1 USD = \$1.27 CAD.  
<sup>17</sup> Oshkosh Community Foundation, "Winnebago Catch-a-Ride program catching on as tool to fight poverty and get workers to jobs" (Feb 2020).  
<sup>18</sup> Winnebago Catch-a-Ride, 'Frequently Asked Questions'.  
<sup>19</sup> Feonix-Mobility Rising, 'Our Work'.  
<sup>20</sup> Converted from a rate of USD \$0.58 per loaded mile at a rate of \$1 USD = \$1.27 CAD.

Funding for this program was initiated through state and philanthropic grants and support from local and regional organizations in Winnebago County. Program funding was extended in January 2020 for a further three years.

Keys to Success that facilitated the successful development and implementation of this transportation service included:

- *Subsidized trips.* Catch-a-ride trips are effectively subsidized at a rate of \$0.25 per kilometre, making the service affordable for longer trips and for low-income users.
- *Online ride coordination.* Enabling drivers and riders to coordinate trips via a web-based or smartphone platform significantly reduces the administrative burden of coordinating trips.
- *Non-profit partnerships.* The service is supported by the 'Make the Ride Happen' program, which directly assists riders who cannot use the online coordination platform to book their trips, and also provides general administrative support to drivers and rider.
- *Employer partnerships.* Direct engagement with employers helps the program to identify eligible county residents who can benefit from the program and make arrangements with employers to facilitate regular work commuting.

### **3. Analysis of Options**

This section provides an overview of three specific options for the development and implementation of inter-community shared-mobility transportation services. These options are intended to provide insight into potential models for this type of service and are not mutually exclusive: each can be pursued independently or in tandem with other services and strategies to improve mobility between Yukon communities.

#### **Option A – Fixed Route Service**

A fixed-route passenger transportation service operated by two or more organizations that runs on a regular schedule between one or more rural communities and Whitehorse.

##### Operating considerations

**Route design.** Distance (kilometers travelled) and ridership (number of passengers) are the basic constraints of any fixed-route service. Routes should serve the most people while travelling the least distance. Given existing travel behaviour, any fixed route service should connect rural communities to Whitehorse with stops in other communities along the way.

To consider the efficiency of different fixed route options, it is useful to revisit the estimates of transportation disadvantaged individuals (adolescents, seniors and people with disabilities) in rural communities and regions, as detailed in Table 3. While there are certainly other prospective users from different demographic groups, these estimates provide a rough baseline that helps to scope the potential scale of passenger volumes along different routes.

**Route Options.** Five prospective routes between Whitehorse and various rural communities are detailed below. Each route – listed from most to least efficient – includes an accompanying chart that illustrates their relative efficiency based on the total number of transportation disadvantaged individuals served per kilometre.<sup>21</sup>

1. A **South-West route** between Whitehorse and Haines Junction is the most efficient route, serving an estimated 1.3 passengers (transportation disadvantaged individuals) served per kilometre travelled. This route would serve an estimated 169 people in Haines Junction and Mendenhall subdivision, and could also serve the smaller settlement area of Champagne. Adding route service to Destruction Bay, Burwash Landing, and Beaver Creek would slightly increase the number served to 236, but reduce route efficiency by almost half, from 1.3 to 0.8 passengers served per kilometre.

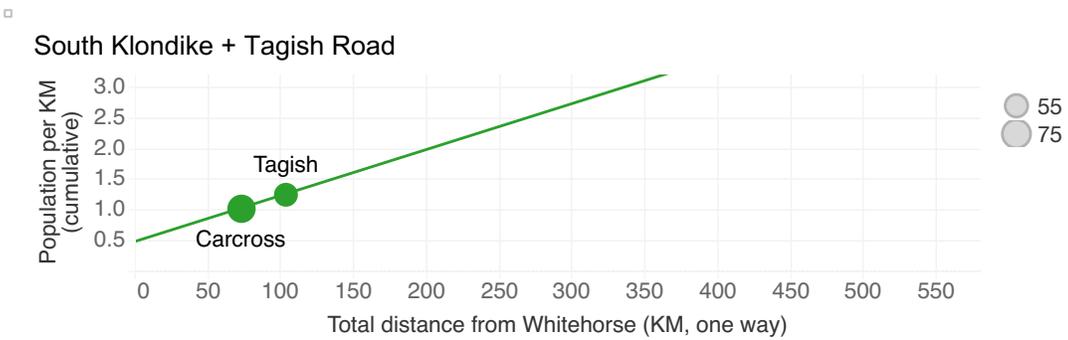
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<sup>21</sup> Each chart outlines: cumulative number of transportation disadvantaged individuals served per kilometre travelled along the route (y-axis); distance between Whitehorse and each community along the route (x-axis); number of transportation disadvantaged individuals in each community (bubble size); and relative efficiency of each route for each additional community served along the route (trend line). Routes with potential alternatives show comparative trendlines.

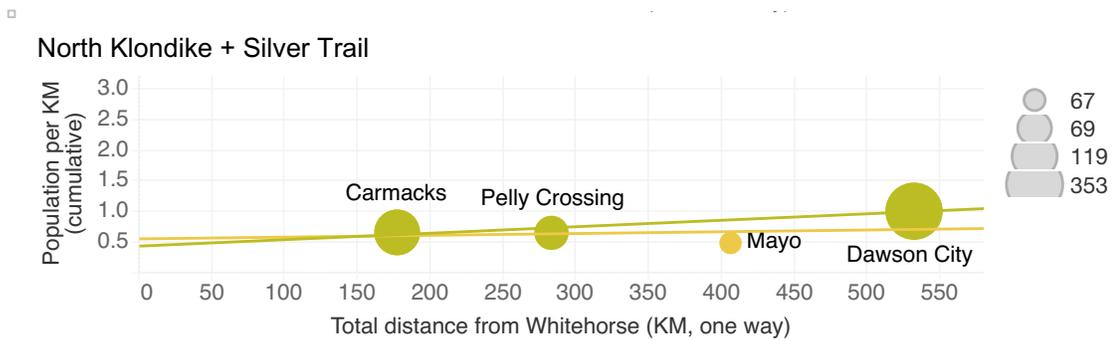


2. A **Southern Lakes loop** between Whitehorse, Tagish, and back along the Alaska Highway is just efficient of these five routes, serving 2.8 passengers served per kilometre travelled. This route is relatively short and serves an estimated 130 people in two communities.

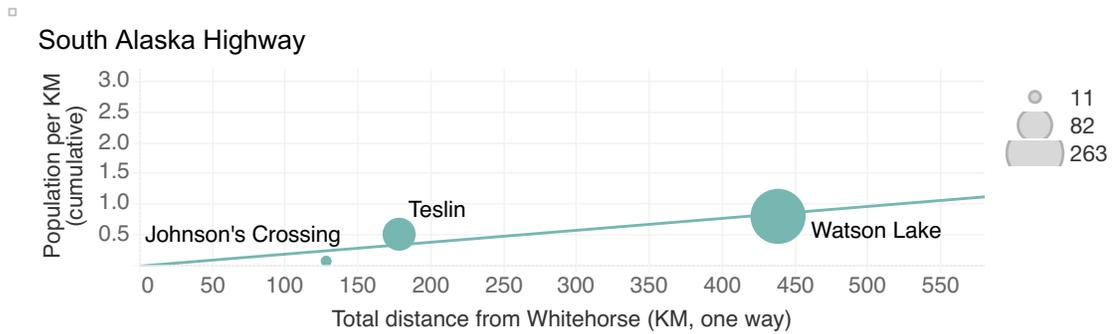
Adding stops in more populous rural residential areas along this route, particularly in the Marsh Lake area, could further increase route efficiency and total number of individuals served. A route extension to Atlin, BC, might also be considered.



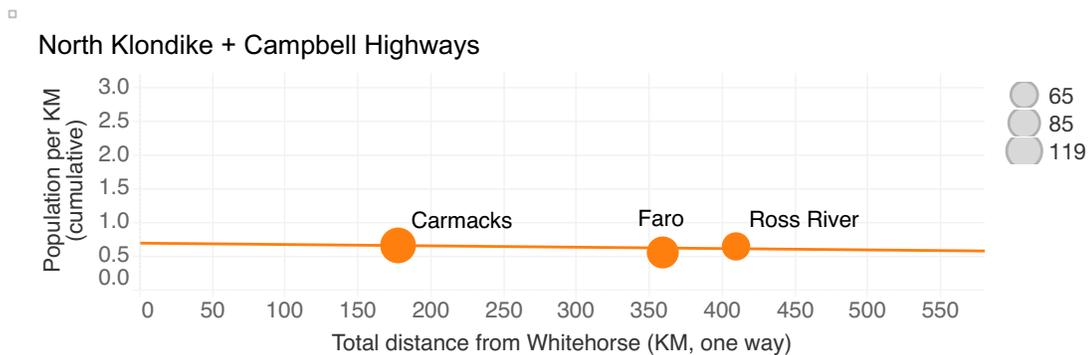
3. The **Northern route from Whitehorse to Dawson** via Carmacks and Pelly Crossing would be the longest route but would also serve the most passengers: an estimated 532 (1 passenger for every kilometre travelled), plus additional people in smaller enroute communities like Stewart Crossing. Adding a Silver Trail detour to Mayo would increase the total population served by a further 105, but decrease the route's efficiency to 0.8 passengers for every kilometer travelled).



4. A **South-East route** between Whitehorse and Watson Lake via Johnson's Crossing and Teslin would serve an estimated 356 people – the majority in Watson Lake (263). This route would serve roughly 0.8 people per kilometre.



5. A **Central out-and-back route** from Whitehorse to Ross River via Carmacks and Faro would serve 269 people, but is less efficient than all other routes (0.66 passengers served per kilometre travelled).



Where the limited size of estimated passenger volumes and travel distance make it inefficient to include a community on fixed-route service, it may be desirable to pursue alternative transportation connections that transport residents of more remote communities to fixed-route 'hubs'.

### Estimating regional travel demand from Whitehorse to rural Yukon

An important caveat to the estimates of potential users of shared-use mobility service discussed above is that they reflect only one side of each route: transportation demand from rural communities to Whitehorse.

Estimating the number of Whitehorse residents that would make use of shared-use mobility services to travel to rural communities requires a more detailed understanding of Whitehorse resident's travel behaviour and activities. It is anticipated that an online survey of Yukoners regarding intercommunity travel will provide additional data that can facilitate more in-depth analysis of this side of the equation

**Route schedule.** A fixed route service should ideally operate during the days and times when travel demand is highest. This would be different in each community or region, but should facilitate travel to activities that occur on different days and times. Specifically:

- Weekday commuting (morning and evening) to access work opportunities, particularly for communities close to centres of economic activity;
- Weekday travel (daytime) to access services and shopping during business hours;
- Weekend transportation (Thursday/Friday and Saturday/Sunday) to align with family, social, cultural or recreational gatherings or events.

Route schedules should also seek to balance the practical challenges of services with long travel times. For example, one-way service to between Whitehorse and Dawson four times per week would allow for weekday activities as well as weekend visits (Figure 2). Same-day, roundtrip service between Whitehorse and Dawson also presents logistical challenges for drivers whose total driving hours are limited by federal regulation.

Dawson to Whitehorse: Sunday, Monday, Thursday, Friday										
Southbound						Northbound				
	Dawson City	Stewart Crossing (Connection to Mayo, Keno)	Pelly Crossing	Carmacks (Connection to Fair, Ross River)	Whitehorse	Whitehorse	Carmacks (Connection to Fair, Ross River)	Pelly Crossing	Stewart Crossing (Connection to Mayo, Keno)	Dawson City
Sunday	-	-	-	-	-	11:00	1:25	3:15	4:05	6:10
Monday	7:00	9:05	10:05	11:45	2:10	-	-	-	-	-
Thursday	-	-	-	-	-	11:00	1:25	3:15	4:05	6:10
Friday	7:00	9:05	10:05	11:45	2:10	-	-	-	-	-

Figure 2 - Sample Schedule for Dawson City to Whitehorse Route

**Passenger fares.** Fares should be set at a rate that balances the costs of service delivery with the public interest of service providers in making intercommunity transportation affordable, and access to service equitable, to a broad population. Any transportation service that is priced at a rate comparable to what Yukoner’s would pay a friend or neighbour to travel in a personal vehicle would likely require a substantial subsidy.

**Passenger safety.** Any fixed-route service needs adequate planning and infrastructure in place to ensure passenger safety in the event of service disruption, especially in winter. Some passengers using shared transportation may also need social, health or wellness support services to travel safely. Specific passenger safety measures may include:

- Contingency planning to keep passengers safe in the event of a vehicle accident or break-down (e.g. communications systems, surplus fleet capacity).
- All-weather shelters for passengers at scheduled stops.

- Video cameras and surveillance at stops and on-buses.

**Coordination.** Fixed-route services are most efficient when existing capital assets (e.g. vans, shuttles), operational funding and resources are centralized. Coordination and resource-sharing is especially important to provide service to remote and sparsely populated communities where costs per passenger kilometer would be high.

### Economic considerations

The economic efficiency of any fixed route service increases when costs per passenger kilometer are reduced. The best way to achieve this is to consolidate the number of vans, shuttles, and buses being used to move people between communities along the proposed route. Consolidation and coordination of existing passenger transport services decreases operational costs and increases the number of passengers using the fixed route service.

**Route and Schedule.** The frequency and coverage of fixed-route service significantly impacts the capital and operating costs of service delivery. Specifically:

- Capital investment in fleet vehicle maintenance and replacement increases in proportion to how quickly fleet vehicles accumulate mileage. Longer travel routes and more frequently scheduled service is more expensive to maintain.
- One-way service is generally more expensive to provide because of the additional costs required to accommodate transportation vehicles and drivers - often overnight - in a second location.

**Capital costs.** Basic capital costs would include the purchase of light-duty shuttles, reservation and ticketing systems, and passenger transfer infrastructure. Specific capital cost considerations include:

- *Vehicle size.* The size of vehicles purchased should be sufficient to carry a number of passengers that is at or close to estimated peak demand.
- *Fleet size.* The number of vehicles needed depends on the frequency of the service and the contingency capacity required in the event of an accident or breakdown.
- *Passenger transfer infrastructure.* Capital investments in passenger shelters, garages.

**Operating costs.** Labour (driver wages), fuel and lubricants are the primary operating costs of a rural fixed-route service. Other variable costs may include vehicle maintenance and repair services, insurance, advertising and marketing, and maintenance of supporting infrastructure (passenger shelters, garage and maintenance facilities).

**Revenue.** There are a number of revenue sources available for a fixed route transportation service that provides Intercommunity transportation in Yukon. For example

- *Passenger fares.* Rates for private transportation services generally range between \$0.33 and \$0.78 per kilometer travelled and typically decrease as trip distance

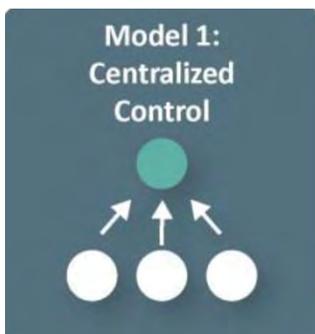
increases. Passengers in personal vehicles typically pay considerably less per kilometre.

- *Advertising.* Displaying advertising on the exterior or interior of fleet vehicles can provide an additional revenue stream, though soliciting and coordinating advertisements creates additional administrative costs.
- *Passenger subsidies.* Individual passengers may be eligible for travel subsidies that indirectly contribute to revenue. For example, territorial or federal medical travel subsidies, territorial student travel subsidies, or sport and recreation travel grants.
- *Service subsidies.* Direct revenue tied to the transportation of specific program beneficiaries may be available through various government-funded social, health, or recreation programs.

### Governance considerations

**Coordinating transportation service providers along proposed routes.** There are multiple actors directly or indirectly involved in the provision of scheduled or on-demand Intercommunity transportation services in any given region. These include private operators, First Nations governments, territorial government agencies, federal government agencies and non-profit organizations.

Given the great distances and low populations densities along Yukon’s highways, improved regional coordination is the most efficient way to provide a fixed route service.



**Centralized control.** A fixed route service would need to operate on a centralized control model of service coordination. In this model, “all transportation operations are combined, the fleet is pooled and everything is managed by the lead organization”.<sup>22</sup> This model allows relevant agencies who are responsible for passenger transportation along the proposed route to pool resources, enhance efficiency, and improve client service.

A lead organization would be selected to manage fleet vehicles and all aspects of transportation operations. Partner organizations would provide capital assets, operational capacity and/or funding to support the lead organization’s provision of the fixed route service.

An advantage of centralized control is potential improvements in service capacity through a consolidation of external funding and subsidies (e.g. gas tax funding, medical travel subsidies, and subsidies for seniors’ travel). A centralized service also simplifies transportation access for users by creating more of a ‘one-window’ approach to Intercommunity transport.

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<sup>22</sup> Dillon Consulting, “Towards Coordinated Rural Transportation: A Resource Guide”

A potential disadvantage is that centralized control may put some funding sources at risk, impact volunteer capacity (e.g. volunteer drivers), and reduce the autonomy of participating organizations.

**Service agreements and steering committees.** A fixed route service would require partner agencies to give up direct control over their respective assets and resources. This requires a level of trust and confidence that the arrangement will ultimately reduce costs and/or improve service for each organization and their clients.

A service agreement that details the role and contributions of each participating partner can help to alleviate this uncertainty. Establishing a steering committee can also provide a mechanism to negotiate and navigate changes in service as the needs of passengers and partners evolve over time.

*A breakdown of potential service schedules, resources, costs, and potential partners for each of the five routes examined in Option A is detailed in [Appendix B](#).*

## Option B – Book-ahead Passenger and Vehicle Pooling Brokerages

This option would establish of a dedicated transportation brokerage service – a service that receives and fills requests for transportation – for four regions based on Yukon’s highway system. Each regional brokerage service would increase access to transportation by improving coordination between regional supply (drivers with empty seats) and demand (passengers in need of a ride).

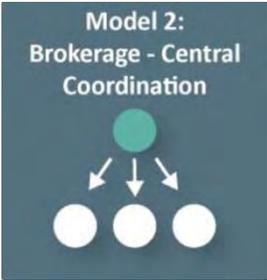
Option 2 also includes an in-community driver training component to increase the overall supply of drivers in Yukon’s rural regions. It would also include capital grants for “leap-frog” shuttles to bring passengers from more remote areas to larger communities with more readily available transportation options.

### Operating considerations

**Consolidating transportation supply and demand.** Option 2 is uses a “double-pool” approach: it aggregates demand for all types of passenger needs and also aggregates the supply of seats in all types of vehicles traveling between Yukon communities. These may include:

- Passenger needs: school, work, shopping, medical / personal services, socialization and being on the land.
- Vehicle seats: private transportation companies, medical travel agencies, Yukon First Nation government services and private vehicles.

Recognizing the Yukon’s vast geography, the Option 2 service is comprised of four (instead of one) brokerage agencies that would be established to coordinate travel between communities to the north, south, east and west of Whitehorse. While the four regional brokerage agencies would share operating guidelines and booking/payment systems, each of the four agencies would be operated separately by people who are familiar with each of the routes. And importantly, the agencies would be operated by people who are familiar with the circumstances of each potential passenger. Each of the four brokerage agencies could be a stand-alone entity or be hosted by an existing organization such as a self-governing Yukon First Nation or a municipal government.



Brokerage Agency	Yukon Communities Served
North	Carmacks, Pelly Crossing, Stewart Crossing, Dawson, Mayo
South	Carcross, Tagish, Atlin, Marsh Lake
East	Takhini, Mendenhall, Canyon City, Haines Junction, Destruction Bay, Burwash Landing, Beaver Creek
West	Teslin, Watson Lake

Given the relatively low number of people in Yukon communities outside of Whitehorse, and the correspondingly low cumulative volume of passengers per kilometre travelled, Option 2 is configured as a book-ahead service rather than on-demand service. Passengers would need to book trips at least two days in advance of the desired travel time. The two-day window allows time for a brokerage agency to find a vehicle seat among the different sizes and types of vehicles making trips between communities.

Option 2 is intended to be very flexible passenger-first service that allows for passengers to ride-through, ride-stack and ride-split when traveling between Yukon communities:

- *Ride-through*: a passenger may choose to ride between their home community and Whitehorse and return. For example, a passenger could book a ride from Burwash Landing to Whitehorse passing through Haines Junction.
- *Ride-stacking*: passengers may choose to travel only certain segments of a route. For example, a passenger from Watson Lake could choose to travel Teslin and back to Watson Lake without going all the way to Whitehorse. Alternatively, a passenger from Carcross could choose to travel to Carmacks and return.
- *Ride-splitting*: passengers may join a trip already underway by hailing a ride at a designated community location and making use of an unoccupied seat, subject to the seat being empty through to the passenger’s terminal destination.

## Economic considerations

Similar to Option A, the passenger and vehicle pooling approach improves overall economic efficiency and passenger costs by reducing the number of empty passenger seats moving between communities. As Option B makes use of capital investments already made by potential ride providers, overall costs are expected to be lower than for Option A.

In terms of revenue for vehicle operators, individuals, organizations or governments who transport passengers would be compensated according to the number of seat-kilometres delivered adjusted for the number of passengers. The fees would cover vehicle capital costs (amortized), operating and maintenance costs (e.g., fuel and oil changes) as well as driver compensation. For example, if the base seat-kilometre rate is set at \$0.35, fees payable to the vehicle owner for one passenger traveling between Haines Junction and Whitehorse (a distance of 159 kilometres) would be \$55.65. Transporting two passengers would earn the vehicle owner an additional 10%, three passengers and additional 20%, etc.

Passengers would pay an equalized fare that does not distort the transportation market for existing private sector operators. An equalized fare means that a passenger traveling from Beaver Creek to Whitehorse (457 km) would pay the same fare as a passenger traveling from Carmack to Whitehorse (177 km). The difference between fees paid to vehicle owners and fares received from passengers would be covered with a government subsidy.

Option B also recognizes that the long distances between Yukon communities, and small population sizes mean that trip frequencies are relatively low. To help increase number of matches between vehicle owners/drivers, Option B also provides for capital grants for “leap-frog” shuttles that move passengers from communities the greatest distance from Whitehorse to the next-closer town.

The idea of a leap-frog shuttle is inspired by the Community Transportation Grant Program that is part of the basket of Highway 16 transportation options in northern British Columbia (see [Section 2.5.1](#)). The program has allocated \$2 million to 12 community transportation services to assist in purchasing vehicles and to provide three years of operational support.

**Capital costs.** Capital costs would include the purchase of equipment to operate each of the four brokerage agencies (e.g. phones, computers, and software development costs for the booking and payment system). Capital funding would also be required for the purchase of at least four “leap-frog” shuttle vehicles.

**Operating costs.** operating expenses would include driver fees, fuel and lubricants, vehicle maintenance and repair services, insurance, advertising and marketing, and maintenance of supporting infrastructure (passenger shelters, garage and maintenance facilities.

The driver training component of the program would require ongoing annual funding as new participants are found. Estimated costs are \$2,000 to \$3000 per driving student.

## Governance considerations

All vehicles must meet minimum safety standards and all drivers must be licensed to carry passengers in line with current Yukon government regulations. With a nod to the Highway 16 initiative in British Columbia, Option B also includes an in-community driver training component intended to increase the number of people in a community who can work as drivers in all types of vehicles (i.e., class 4 and higher).

**Centrally coordinated brokerage.** A key feature of this service model is that it eliminates passenger segmentation. For example, people traveling between communities for medical travel could be traveling in the same vehicle as someone traveling to socialize with friends and family in another community. Accordingly, this approach requires:

- a high degree of collaboration among the agencies and organizations that could potentially supply vehicle seats for intercommunity transportation.
- centralized 'command and control' coordination by the brokerage so that it can direct the use of vehicles owned by individuals and/or partner organizations to coordinate more complex – but more efficient – travel itineraries.

## **Option C – Intercommunity Ridesharing App**

Adoption of an intercommunity ridesharing app, a pre-booking transportation service that enables passengers to connect with vehicle drivers who have already planned an intercommunity trip. The digital app is used by both drivers and passengers to arrange trips, make/receive payment and rate the quality of their experience.

## Operating considerations

Ride-hailing (or ridesourcing) and ridesharing are similar in that both approaches make use of underutilized capital investments in privately-owned vehicles. The key difference between the two approaches is that ride-hailing is an on-demand service (think Uber or Lyft) while ridesharing involves the sharing of rides between drivers and passengers with similar origin-destination pairings.

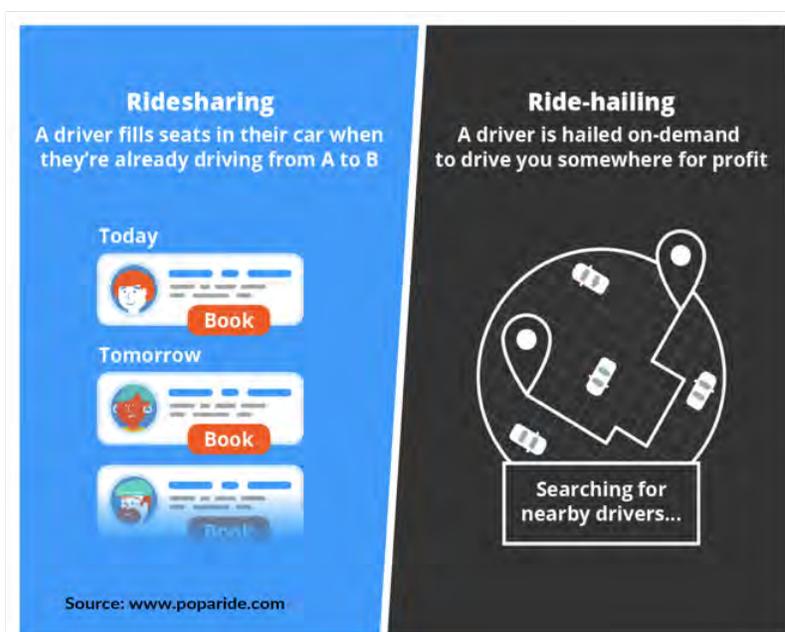


Figure 3 – Ridesharing and Ride-hailing

**Transportation efficiency.** Ridesharing services are all about filling empty seats in vehicles that are already on the road heading for a known destination. According to the 2016 Census of Canada (Statistics Canada), the average vehicle occupancy in the Yukon is 1.1, meaning that 9 out of 10 vehicles carry no passengers. Thus, nine out of ten vehicles on the road are traveling with at least three unfilled seats that could potentially be filled with additional passengers.

In contrast, ride-hailing services bring additional vehicles onto the road to meet demand at a particular point in time. Like in other places in North America, small population sizes and long distances between communities in the Yukon severely restricts the feasibility of ride-hailing services as an option for intercommunity transportation in the Yukon.

**Online platforms to enhance transportation connections.** Ridesharing is by no means a new concept, and is already familiar to many from childhood as carpooling. Carpooling is an informal type of ridesharing where, for example, a parent driving their own children to sports practice would also bring along a couple of other kids from the same neighborhood. What has changed are advances in digital technologies, in the form of internet connectivity and online platforms that connect passengers and drivers of personal vehicles.

These online ridesharing platforms are most successful when they are able to

- foster a sense of safety and trust between drivers and passengers;
- make it simple and easy for drivers and passengers to arrange transportation;
- sustain a consistent supply of rides that align with the transportation needs (demand) of passengers.

#### Leveraging existing online rideshare coordination platforms

Online coordination of ridesharing between Yukon communities is already happening through social media and rideshare specific platforms. Any transportation solution that aims to use online rideshare coordination should also seek to facilitate connection and inter-operability with existing online ridesharing platforms and spaces. Two specific platforms of note in the Yukon context:

- **Yukon Rideshare** – In 2016, Yukon government and the City of Whitehorse launched an online platform where registered users could offer or ask for rides, match with carpooling partners, and share commuting information.
- **Community Facebook groups** – Facebook groups for specific communities (geographic, interest-based, or otherwise) are increasingly used to facilitate the exchange of goods and services, including transportation. In particular, community 'buy-and-sell' groups and dedicated ridesharing groups (e.g. Dawson Rideshare) build on existing relationships to foster trust and connection that facilitates a productive marketplace for transportation services.

#### Economic considerations

As with Option A and Option B, the intercommunity ridesharing app approach improves overall economic efficiency and passenger costs by reducing the number of empty

passenger seats moving between communities. As Option C makes use of an existing software platform, most of the costs would be focused on awareness and trust building in the initial stages of option implementation. Adoption of the approach could be incentivized by providing a bonus to the first 25 drivers and subsidizing (i.e., waiving) passenger fees for the first 100 riders.

While several start-up companies are present in the technology-enabled ridesharing space, most are focused on urban commuting. Two Canadian examples of ridesharing start-ups that focus on intercommunity transportation have been identified: poparide.com and ridesharing.com. Poparide and ridesharing.com both operate in a similar fashion, as described in the illustration below from ridesharing.com.



A key feature of both intercommunity ridesharing services is the placement of the financial transaction in the hands of the ridesharing platform and outside of the vehicle. The passenger knows ahead of time the amount of money being charged by the driver to recover part of their trip costs, and the driver is guaranteed payment via credit card through the app upon completing the journey. Drivers and passengers both use the app to rate their trip experiences, thus providing a measure of ongoing quality control and safety.

Passenger costs for ridesharing are lower than private transport services because drivers are seeking cost-recovery on already-planned trips as opposed to earning revenues to cover the fixed and variable costs of operating a vehicle. Some sample fares posted on the poparide website for trips in British Columbia, shown in the illustration to the right, range between \$0.8 and \$0.11 per passenger kilometre.

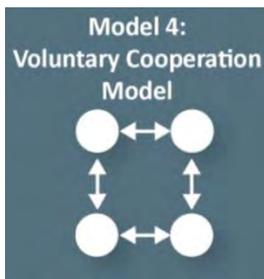
Adoption of an existing software platform would involve negligible capital and operating costs. The transportation network company receives a fixed percentage of the passenger fare (in the case of poparide, 15%) as payment for providing and operating the ridesharing platform.

British Columbia	
Vancouver to Whistler	\$15
Vancouver to Squamish	\$10
Squamish to Whistler	\$10
Kelowna to Vancouver	\$40
Kelowna to Kamloops	\$20
Vancouver to Seattle	\$25

## Governance considerations

A key advantage of a technology-based solution is scalability, both in terms of expanding the user base and implementation costs. Adopting an intercommunity ridesharing app that has already been developed means that the governance considerations for Option 3 would be minimal, drivers and passengers simply need to sign on to the app.

While further investigation is required to confirm that the Yukon's situation is the same as other jurisdictions, ridesharing services operate under carpooling regulations and are considered a non-commercial use for insurance and regulatory purposes.



The service proposed in Option C would operate as a voluntary cooperation model. Drivers and passengers voluntarily cooperate through the online platform to coordinate shared transportation, with a degree of autonomy. Admission of a driver to the ridesharing platform would, however, require vetting by a committee of community representatives to increase passenger safety.

It is hoped that the implementation of an existing rideshare app that has been tested and proven to be convenient, safe and efficient in other jurisdictions would help create the momentum needed for success in the Yukon.

## **Conclusion & Next Steps**

This analysis presents an initial scoping of potential solutions to Yukon's intercommunity transportation challenge. Bringing these solutions into focus will require additional layers of research, analysis, and engagement with prospective users and partners. Areas of further work to deepen understanding of this challenge and potential solutions include:

- **Detailed analysis of transportation demand** – This analysis uses community and regional population data to estimate, in very broad strokes, potential travel demand in Yukon's road accessible communities. A more precise estimate of transportation demand is required to attain a granular understanding of movement to and from specific communities at different times – and also potential demand for transportation from the Whitehorse area out to different rural regions.
- **Transportation demand forecasting** – Future assessment of intercommunity travel options should seek to provide more detailed analysis of the inter-play between current and future demographic, economic, technological and policy trends. This will facilitate an improved understanding of how these shifting trends may influence supply and demand for intercommunity transportation, and where – geographically and demographically – these efforts should be strategically focused.
- **Costing of operational and capital revenue and expenses** – This analysis identifies key areas of operational and capital revenues and expenditures, and some of the financial challenges that may be anticipated in the development of any shared-use mobility solution to Yukon's intercommunity transportation problem. Once the prospective solutions and service parameters are sufficiently narrowed, revenue and expenditures should be costed-out in detail.
- **Analyze and explore potential options for collaborative partnerships** – Detailed analysis of potential governance models (e.g. structure of collaborative governance bodies, funding arrangements, service agreements, etc.) is necessary to establish a starting point for potential inter-organizational transportation service partnerships.
- **Further explore how the proposed options address the needs and preferences of potential users** – specifically, passenger safety, affordability, accessibility (e.g. for people with disabilities or mobility challenges), reliability and convenience.

The *Yukon Community Travel Project* has engaged in targeted interviews with stakeholder organizations and conducted an online survey in the winter of 2020/2021. Data from these engagement efforts will provide a better understanding of intercommunity transportation demand and Yukoner's intercommunity travel needs and preferences. Additional stakeholder workshops in the spring of 2021 will provide an opportunity to ground truth these findings and solicit feedback on the three options provided in this report.

These options, and the broader considerations that affect intercommunity transportation supply and demand will be re-examined and synthesized in the project's Final Report.

## **Appendix A: Key transportation stakeholders, by region**

North Klondike	South-West	Southern Lakes	South East	Central
Communities, settlement areas and work sites				
Carmacks Minto Pelly Crossing Stewart Crossing Mayo Keno City Dawson City	Takhini Subdividsion Mendenhall Champagne Haines Junction Haines Destruction Bay Burwash Landing Beaver Creek	Carcross Tagish Atlin Marsh Lake	Marsh Lake Jake's Corner Johnson's Crossing Teslin Watson Lake	Carmacks Ross River
Notable regional transport operators, governments and major employers				
<u>Private operators:</u> - Husky Bus - Small's Expediting - Haldane services  <u>Governments</u> - Tr'ondëk Hwëch'in First Nation - Municipality of Dawson - Na-Cho Nyäk Dun First Nation - Village of Mayo - Selkirk First Nation - Village of Carmacks, - Little Salmon/ Carmacks First Nation  <u>Employers:</u> Victoria Gold Corp., Minto Explorations Ltd.	<u>Private operators:</u> - Hinterland Express  <u>Governments:</u> - Champagne and Aishihik First Nation - Village of Haines Junction - Kluane First FN - White River FN	<u>Private operators:</u> - Tagish Shuttle Service  <u>Governments:</u> - Carcross Tagish FN, - Taku River Tlingit FN	<u>Private operators:</u> - Watson Lake Shuttle and Freight  <u>Governments:</u> - Village of Teslin - Teslin Tlingit Council, - Liard First Nations, - Town of Watson Lake  <u>Employers</u> - BMC Minerals - Silvertip	<u>Governments</u> - Town of Faro - Kaska Dena Council  <u>Employers</u> - BMC Minerals

## Appendix B: Service options, potential partners, and costs for scheduled route service

Service Options	Potential regional partners	Buses*	Vehicle Type	Service hours	Annual Ridership**	Capital costs	Operating Costs	
Sample Service Options: Segment 1 - Whitehorse to Dawson								
Dawson-Stewart-Pelly-Carmacks-Whitehorse  One-way 4 days/week	Connections: @ Stewart to Mayo, Keno  @ Carmacks to Faro, Ross River	Husky Bus, Tr'ondëk Hwëch'in FN, Dawson City, Na-Cho Nyäk Dun FN, Village of Mayo, Victoria Gold Corp., Haldane Services, Selkirk FN, Minto Explorations Ltd., Village of Carmacks, Little/Salmon Carmacks FN	2	Light Duty (10-15 passengers)	1560 7.5 hr one-way/ 4x weekly	1040-2080	Vehicles Facilities/exchanges IT, security, equipment	Staff wages Fuel Maintenance Service management
Sample Service Options: Segment 2 - Whitehorse to Haines Junction								
Whitehorse - Haines Junction  Round trip 2 days/week	Connections: @ HJ to Burwash, D. Bay, Beaver Creek	Hinterland Express, Champagne and Aishihik FN, Village of Haines Junction, Kluane First FN, White River FN	1.5	Light Duty (10-15 passengers)	416 4 hr roundtrip/ 2x weekly	520-1040	Vehicles Facilities/exchanges IT, security, equipment	Staff wages Fuel Maintenance Service management
Sample Service Options: Segment 3 - Whitehorse to Watson Lake								
Whitehorse - Teslin – Watson Lake  Round trip 2 days/week	Connections: @ Jake's Corner to Tagish, Carcross	Watson Lake Shuttle and Freight, Village of Teslin, Teslin Tlingit Council, Liard First Nations, Town of Watson Lake	1.5	Light Duty (10-15 passengers)	1092 10.5 hr roundtrip/ 2x weekly	520-1040	Vehicles Facilities/exchanges IT, security, equipment	Staff wages Fuel Maintenance Service management
Sample Service Options: Segment 4 - Whitehorse to Carcross								
Whitehorse - Carcross - Tagish - Jake's Corner  Round trip 1 days/week	Connections: @ Jake's Corner to Atlin	Atlin Express, Carcross Tagish FN, Taku River Tlingit FN	1.5	Light Duty (10-15 passengers)	286 5.5 hr roundtrip/ 1x weekly	260-520	Vehicles Facilities/exchanges IT, security, equipment	Staff wages Fuel Maintenance Service management

\* .5 indicates that supplementary vehicle capacity is shared between different routes

\*\* Estimating average of 5-10 passengers per trip.

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