

# WAMPO One-Pager Supplemental Tables – Cost Estimate Assumptions, Methodology, and Interpretation

Understanding for Stakeholders and community leaders to make informed decisions regarding recommending for implementation and/or implementing any of the service alternatives data on the cost and benefits of the alternatives must be available. The purpose of this information document is to provide summaries of:

The assumptions that went into developing ridership estimates for each of the service alternatives that support one or more service concept themes.

The assumptions used to develop annual operating and capital cost estimates.

Annual total operating and rough capital costs for the service concepts.

Estimates of the local subsidy likely to be needed to implement the concept. Slide ## in the distributed packet includes charts of the typical Kansas distribution of cost responsibility for funding transit operations. This analysis uses those distribution assumptions.

## TABLE 1: Cost Estimates – Service Hours Method

This table provides information on what it would cost each municipality to run three different types of demand response services:

- Intracity service only
- Intracity and intercity service with a separate vehicle used to support each service geography. The destination of many of the intercity trips from communities in the WAMPO area is Wichita, which could be a 30-plus minute one-direction trip from many communities in the region. As most communities would need at most one vehicle to provide local (intracity) service, there would be no local service while trips to Wichita or other out of town trips are being made. Additionally, Wichita trips are not likely to be trips that are drop people off and immediately turn around and head back to the origin town. They will likely include multiple stops, requiring time in Wichita. This alternative provides a concept that supports both inter and intracity service needs.
- Intracity and intercity service sharing one or vehicles to support each service geography.

Cost estimates are derived from defining how many hours each day, how many days per year service would be available to people (in some communities there may not be demand in all of the service hours – which must be considered) and an estimated cost per hour for the service.

### *Assumptions*

- In-town (intracity) ridership was estimated by applying the capita trip observed on Derby Dash and Haysville Hustle services to the population of the community.
- Intercity (trips from a specific town to another town) ridership per capita from Sedgwick County Transportation service for the entire county was applied to the community population to estimate annual trips.

**TABLE 1:****Supplemental Table: Annual Ridership and Cost Estimates – Service Hours Based Cost Method**

City	Population (2022)	Community Based Intercity DR (No Separate Intercity Vehicle)			Community Based Intercity DR (Separate Intercity Vehicle)			Community Based Intra-city DR		
		Ridership (est.)	Annual Total Cost (est.)	Annual Local Cost (est.)	Ridership (est.)	Annual Total Cost (est.)	Annual Local Cost (est.)	Ridership (est.)	Annual Total Cost (est.)	Annual Local Cost (est.)
Andale	1,169	339	\$119,408	\$68,062	386	\$238,815	\$136,125	362	\$119,408	\$68,062
Andover	15,460	4,483	\$238,815	\$136,125	5,102	\$238,815	\$136,125	4,793	\$119,408	\$68,062
Bel Aire	8,341	2,419	\$119,408	\$68,062	2,753	\$238,815	\$136,125	2,586	\$119,408	\$68,062
Bentley	452	131	\$119,408	\$68,062	149	\$238,815	\$136,125	140	\$119,408	\$68,062
Cheney	2,380	690	\$119,408	\$68,062	785	\$238,815	\$136,125	738	\$119,408	\$68,062
Clearwater	2,544	738	\$119,408	\$68,062	840	\$238,815	\$136,125	789	\$119,408	\$68,062
Colwich	1,513	439	\$119,408	\$68,062	499	\$238,815	\$136,125	469	\$119,408	\$68,062
Derby	25,551	7,410	\$358,223	\$204,187	8,432	\$358,223	\$204,187	7,921	\$119,408	\$68,062
Eastborough	712	206	\$119,408	\$68,062	235	\$238,815	\$136,125	221	\$119,408	\$68,062
Garden Plain	1,059	307	\$119,408	\$68,062	349	\$238,815	\$136,125	328	\$119,408	\$68,062
Goddard	5,119	1,485	\$119,408	\$68,062	1,689	\$238,815	\$136,125	1,587	\$119,408	\$68,062
Haysville	10,891	3,158	\$119,408	\$68,062	3,594	\$238,815	\$136,125	3,376	\$119,408	\$68,062
Kechi	2,949	855	\$119,408	\$68,062	973	\$238,815	\$136,125	914	\$119,408	\$68,062
Maize	6,071	1,761	\$119,408	\$68,062	2,003	\$238,815	\$136,125	1,882	\$119,408	\$68,062
Mount Hope	818	237	\$119,408	\$68,062	270	\$238,815	\$136,125	254	\$119,408	\$68,062
Mulvane	6,003	1,741	\$119,408	\$68,062	1,981	\$238,815	\$136,125	1,861	\$119,408	\$68,062
Park City	7,703	2,234	\$119,408	\$68,062	2,542	\$238,815	\$136,125	2,388	\$119,408	\$68,062
Rose Hill	4,357	1,264	\$119,408	\$68,062	1,438	\$238,815	\$136,125	1,351	\$119,408	\$68,062
Sedgwick	1,465	425	\$119,408	\$68,062	483	\$238,815	\$136,125	454	\$119,408	\$68,062
Valley Center	8,448	2,450	\$119,408	\$68,062	2,788	\$238,815	\$136,125	2,619	\$119,408	\$68,062
Viola	203	59	\$119,408	\$68,062	67	\$238,815	\$136,125	63	\$119,408	\$68,062

**Key:**

One Vehicle
Two Vehicles
Three Vehicles

- Each vehicle would be “in-service” for nine hours every weekday from 8am to 5pm, minus holidays (250 service days per year), with a dedicated driver being assigned to each vehicle for the duration of service.
- Derby Dash carries more passengers annually using one vehicle compared to Haysville Hustle, so Derby Dash’s ridership is considered the maximum intracity ridership possible with one vehicle.
- For the purposes of estimating ridership for intercity and intracity demand response (DR) service operating together, it is assumed that each out-of-town trip will prevent about two in-town trips from being served in the shared vehicle alternative.

### *Methodology*

1. Estimate ridership.
  - a. Intracity only ridership = city population \* Derby and Haysville average annual passengers per capita
  - b. Separately operated intercity and intracity ridership = intracity only ridership + (city population \* Sedgwick County annual passengers per capita)
  - c. Jointly operated intercity and intracity ridership = intracity only ridership – (city population \* Sedgwick County annual passengers per capita)
2. Estimate vehicles needed to serve each city’s predicted ridership (based on the number of annual trips served per vehicle by existing transit agencies in the WAMPO area).
3. Estimated total costs = number of vehicles required \* 9 service hours per day \* Derby Dash cost per vehicle revenue hour (VRH) \* 250 service days per year
4. Estimate local cost share by multiplying the total cost by 57% (the share of total costs that the City of Derby contributes to its service according to the NTD).

### *Interpretation*

- Based on the demand estimates, each town could operate in-town only service with one vehicle.
- The minimum number of vehicles needed for any town to operate separate in-town and out-of-town services is two. Every community, except Derby, could operate this type of service with two vehicles. Derby would need three total vehicles, as its estimated out-of-town ridership is high enough that it would likely need two vehicles.
- For the alternative when vehicles are shared across both intra and intercity service, some number of intercity (local trips) would not be made
- Cost estimates across communities are based on the same assumptions regarding annual hours of service and the cost per hour. Most communities would need one vehicle for basic service. Thus, the cost for service in most communities would be the same and as the local responsibility share would also be consistent across communities, the local cost would be the same community-to-community (as long as the vehicle need assumptions were similar).

## TABLE 2: Cost Estimates – Ridership Method

This table provides estimates of annual operating cost by each community to provide the same three types of demand response service as in the Service Hours Method; however cost is based instead on an estimated cost per trip. This methodology has been included because the estimated demand in some communities is likely below a threshold of at least one reservation each hour of EVERY service day. If there are no reservations, a community would need to decide whether they would want to pay drivers and dispatchers during these hours (which is the primary assumption in the Service Hour Method) or not. To not pay for staff in zero trip hours reflects a service that is parttime and on-demand. This service concept can be provided if there are current staff who could have driving/dispatching/managing the service added to their job tasks.

As could be expected, a parttime service like this creates challenges to find and retain workers as hours could be different every day.

### *Assumptions*

- In-town rider demand would be derived through applying Derby Dash and Haysville Hustle trips per capita rates to the population of each community.
- Intercity rider demand will be calculated using the Sedgwick County Transportation trips per capita for their service area.
- While transit service may be “available” for a certain window of time every day, drivers are not necessarily solely dedicated to driving while at work. An option for providing service would be to train and use existing employees for driving, dispatching and/or management:
  - Example: A maintenance employee could be trained to drive a transit vehicle and would drive when there is demand for rides, though their primary job is working as a mechanic.
- For the purposes of estimating ridership for intercity and intracity demand response (DR) service operating together, it is assumed that each out-of-town trip will prevent two in-town trips from being served.
- Number of vehicles needed to serve the estimated ridership is the same as under the Service Hours Method.

### *Methodology*

1. Estimate ridership.
  - a. Intracity only ridership = city population \* Derby and Haysville average annual passengers per capita
  - b. Separately operated intercity and intracity ridership = intracity only ridership + (city population \* Sedgwick County annual passengers per capita)
  - c. Jointly operated intercity and intracity ridership = intracity only ridership – (city population \* Sedgwick County annual passengers per capita)
2. Estimated total cost:
  - a. For in-town trips: in-town ridership \* Derby Dash’s cost per passenger
  - b. For out-of-town trips: out-of-town ridership \* Sedgwick County’s cost per hour
    - i. We are suggesting this rate as it is HIGHER than the Derby Dash cost and as these trips would take longer the higher cost would account for the added

**TABLE 2**

**Supplemental Table: Annual Ridership and Cost Estimates – Ridership Based Cost Method**

City	Population (2022)	Community Based Intercity DR (No Separate Intercity Vehicle)			Community Based Intercity DR (Separate Intercity Vehicle)			Community Based Intra-city DR		
		Ridership (est.)	Annual Total Cost (est.)	Annual Local Cost (est.)	Ridership (est.)	Annual Total Cost (est.)	Annual Local Cost (est.)	Ridership (est.)	Annual Total Cost (est.)	Annual Local Cost (est.)
Andale	1,169	339	\$6,073	\$3,462	386	\$6,822	\$3,888	362	\$5,802	\$3,307
Andover	15,460	4,483	\$80,316	\$45,780	5,102	\$90,217	\$51,424	4,793	\$76,730	\$43,736
Bel Aire	8,341	2,419	\$43,332	\$24,699	2,753	\$48,674	\$27,744	2,586	\$41,397	\$23,596
Bentley	452	131	\$2,348	\$1,338	149	\$2,638	\$1,503	140	\$2,243	\$1,279
Cheney	2,380	690	\$12,364	\$7,048	785	\$13,888	\$7,916	738	\$11,812	\$6,733
Clearwater	2,544	738	\$13,216	\$7,533	840	\$14,846	\$8,462	789	\$12,626	\$7,197
Colwich	1,513	439	\$7,860	\$4,480	499	\$8,829	\$5,033	469	\$7,509	\$4,280
Derby	25,551	7,410	\$132,740	\$75,662	8,432	\$149,103	\$84,989	7,921	\$126,812	\$72,283
Eastborough	712	206	\$3,699	\$2,108	235	\$4,155	\$2,368	221	\$3,534	\$2,014
Garden Plain	1,059	307	\$5,502	\$3,136	349	\$6,180	\$3,522	328	\$5,256	\$2,996
Goddard	5,119	1,485	\$26,594	\$15,158	1,689	\$29,872	\$17,027	1,587	\$25,406	\$14,481
Haysville	10,891	3,158	\$56,580	\$32,251	3,594	\$63,554	\$36,226	3,376	\$54,053	\$30,810
Kechi	2,949	855	\$15,320	\$8,733	973	\$17,209	\$9,809	914	\$14,636	\$8,343
Maize	6,071	1,761	\$31,539	\$17,977	2,003	\$35,427	\$20,194	1,882	\$30,131	\$17,175
Mount Hope	818	237	\$4,250	\$2,422	270	\$4,773	\$2,721	254	\$4,060	\$2,314
Mulvane	6,003	1,741	\$31,186	\$17,776	1,981	\$35,031	\$19,967	1,861	\$29,793	\$16,982
Park City	7,703	2,234	\$40,018	\$22,810	2,542	\$44,951	\$25,622	2,388	\$38,231	\$21,792
Rose Hill	4,357	1,264	\$22,635	\$12,902	1,438	\$25,425	\$14,492	1,351	\$21,624	\$12,326
Sedgwick	1,465	425	\$7,611	\$4,338	483	\$8,549	\$4,873	454	\$7,271	\$4,144
Valley Center	8,448	2,450	\$43,888	\$25,016	2,788	\$49,298	\$28,100	2,619	\$41,928	\$23,899
Viola	203	59	\$1,055	\$601	67	\$1,185	\$675	63	\$1,008	\$574

**Key:**

One Vehicle
Two Vehicles
Three Vehicles

time of the trip. An alternate would be to estimate the number of hours each intercity would require and increase the cost per trip. As we refine the analysis, we can consider this alternate if it make more sense to participants.

3. Estimate local cost share by multiplying the total cost by 57% (the share of total costs that the City of Derby contributes to its service according to the NTD).

#### *Interpretation*

- In general, the cost of providing intracity service only is the lowest of the three service types, while providing intercity and intracity service separately is the most expensive.
- This cost estimation method is likely more reliable for smaller communities where low ridership levels and high costs would make it infeasible to hire employees specifically to drive a transit vehicle.

### TABLE 3: Demand Response Cost Comparison Table

This table provides a comparison of the local costs determined by each methodology for each of the three demand response service types. There are no new assumptions or calculations associated with this table – it is just a comparison of the two cost estimation methodologies described above.

#### *Interpretation*

- For many smaller communities with particularly low estimated ridership, the cost of having a dedicated driver available all day is significantly greater than utilizing existing municipal employee(s) to drive transit vehicles when a ride is requested.
- For any city where the ratio of estimated costs from the Ridership Method to estimated costs from the Service Hours Method is **less than 0.4**, ridership would likely be too low to justify hiring dedicated drivers for a municipally-operated transit service. Any such community that would like to provide its own transit service should consider utilizing existing employees to drive vehicles as needed instead.

### TABLE 4: Express Route and Local Route Extension Cost Estimates

This table provides an estimate of the annual costs for several proposed express fixed routes and local fixed route extensions in the greater Wichita area.

#### *Assumptions*

- Routes would be operated by Wichita Transit through service contracts with specific communities and integrated into the Wichita Transit bus network.
- Routes would be funded in whole or part by the outlying city served by the route.

**TABLE 3**

**Supplemental Table: ANNUAL Ridership and Cost Comparisons (Service Hours Method vs. Ridership Method)**

City	Population (2022)	Community Based Intercity DR (No Separate Intercity Vehicle)			Community Based Intercity DR (Separate Intercity Vehicle)			Community Based Intra-city DR		
		Annual Ridership (est.)	Local Cost	Local Cost	Ridership (est.)	Local Cost		Ridership	Local Cost	
			Service Hours Method	Ridership Method		Service Hours Method	Ridership Method		Service Hours Method	Ridership Method
Andale	1,169	339	\$68,062	\$3,462	386	\$136,125	\$3,888	362	\$68,062	\$3,307
Andover	15,460	4,483	\$136,125	\$45,780	5,102	\$136,125	\$51,424	4,793	\$68,062	\$43,736
Bel Aire	8,341	2,419	\$68,062	\$24,699	2,753	\$136,125	\$27,744	2,586	\$68,062	\$23,596
Bentley	452	131	\$68,062	\$1,338	149	\$136,125	\$1,503	140	\$68,062	\$1,279
Cheney	2,380	690	\$68,062	\$7,048	785	\$136,125	\$7,916	738	\$68,062	\$6,733
Clearwater	2,544	738	\$68,062	\$7,533	840	\$136,125	\$8,462	789	\$68,062	\$7,197
Colwich	1,513	439	\$68,062	\$4,480	499	\$136,125	\$5,033	469	\$68,062	\$4,280
Derby	25,551	7,410	\$204,187	\$75,662	8,432	\$204,187	\$84,989	7,921	\$68,062	\$72,283
Eastborough	712	206	\$68,062	\$2,108	235	\$136,125	\$2,368	221	\$68,062	\$2,014
Garden Plain	1,059	307	\$68,062	\$3,136	349	\$136,125	\$3,522	328	\$68,062	\$2,996
Goddard	5,119	1,485	\$68,062	\$15,158	1,689	\$136,125	\$17,027	1,587	\$68,062	\$14,481
Haysville	10,891	3,158	\$68,062	\$32,251	3,594	\$136,125	\$36,226	3,376	\$68,062	\$30,810
Kechi	2,949	855	\$68,062	\$8,733	973	\$136,125	\$9,809	914	\$68,062	\$8,343
Maize	6,071	1,761	\$68,062	\$17,977	2,003	\$136,125	\$20,194	1,882	\$68,062	\$17,175
Mount Hope	818	237	\$68,062	\$2,422	270	\$136,125	\$2,721	254	\$68,062	\$2,314
Mulvane	6,003	1,741	\$68,062	\$17,776	1,981	\$136,125	\$19,967	1,861	\$68,062	\$16,982
Park City	7,703	2,234	\$68,062	\$22,810	2,542	\$136,125	\$25,622	2,388	\$68,062	\$21,792
Rose Hill	4,357	1,264	\$68,062	\$12,902	1,438	\$136,125	\$14,492	1,351	\$68,062	\$12,326
Sedgwick	1,465	425	\$68,062	\$4,338	483	\$136,125	\$4,873	454	\$68,062	\$4,144
Valley Center	8,448	2,450	\$68,062	\$25,016	2,788	\$136,125	\$28,100	2,619	\$68,062	\$23,899
Viola	203	59	\$68,062	\$601	67	\$136,125	\$675	63	\$68,062	\$574

**Key: Number of Vehicle Needed to Provide Service**

One Vehicle
Two Vehicles
Three Vehicles

**TABLE 4****Supplemental Table 'B': Ridership and Annual Cost Estimates – Express Routes and Wichita Transit Local Fixed Route Extensions**

<b>Route</b>	<b>Annual Ridership Estimates</b>	<b>Annual total cost</b>	<b>Annual local cost</b>
Derby (Express)	9,000 - 14,000	\$144,000 - \$224,000	\$23,040 - \$35,840
Park City and Valley Center (Express)	5,000 - 8,000	\$150,000 - \$240,000	\$24,000 - \$38,400
Andover (Express)	4,000 - 6,000	\$140,000 - \$210,000	\$22,400 - \$33,600
Garden Plain and Goddard (Express)	2,000 - 2,500	\$105,000 - \$183,750	\$16,800 - \$29,400
Derby (Local Extension)	50,000 - 75,000	\$625,000 - \$937,500	\$100,000 - \$150,000
Haysville (Local Extension)	25,000 - 40,000	\$275,000 - \$440,000	\$44,000 - \$70,400
Bel Aire (Local Extension)	20,000 - 25,000	\$300,000 - \$375,000	\$48,000 - \$60,000



### *Methodology*

1. A range of annual costs for each route are estimated by multiplying both the low and high ends of the estimated ridership range (calculated as a certain percentage of travel flows) by the midpoint of the cost range per passenger.
2. Local costs are estimated by multiplying the total costs by 16%, the approximate share of operating costs contributed by the City of Wichita to its existing bus system.

## **TABLE 5: TNC Program Cost Estimates**

This table provides ridership and cost estimates for each community and Sedgwick County to operate a subsidized TNC (Uber, Lyft, etc.) program. This would function similarly to a temporary grant-funded program formerly operated by Park City in partnership with Lyft Concierge.

### *Assumptions*

- Service would be primarily subsidized by the local jurisdiction.
- Riders could be charged a flat fare of approximately \$2 to \$3 per trip (in line with other transit services in greater Wichita), or the ride could be free of charge to the passenger, depending on how a city sets up its program.
- A subsidized TNC program may need to be means-tested in order to prevent overuse of the service.

### *Methodology*

1. Estimate ridership.
  - a. Calculate a rate of monthly trips per capita using a one-month Lyft Concierge trip dataset provided by Park City
  - b. Multiply that ratio by the population of each community.
  - c. Multiply the resulting monthly ridership estimate by 12 to arrive at an estimate of annual subsidized TNC trips per community.
2. Estimate annual costs by multiplying the number of annual rides by \$23, the approximate midpoint of trip costs provided by Park City.

**TABLE 5****Supplemental Table: Ridership and Annual Cost Estimates – TNC Program**

City	Population (2022)	TNC Program	
		Ridership (est.)	Annual Cost (est.)
Andale	1,169	101	\$2,312
Andover	15,460	1,330	\$30,580
Bel Aire	8,341	717	\$16,498
Bentley	452	39	\$894
Cheney	2,380	205	\$4,708
Clearwater	2,544	219	\$5,032
Colwich	1,513	130	\$2,993
Derby	25,551	2,197	\$50,540
Eastborough	712	61	\$1,408
Garden Plain	1,059	91	\$2,095
Goddard	5,119	440	\$10,125
Haysville	10,891	937	\$21,542
Kechi	2,949	254	\$5,833
Maize	6,071	522	\$12,008
Mount Hope	818	70	\$1,618
Mulvane	6,003	516	\$11,874
Park City	7,703	662	\$15,237
Rose Hill	4,357	375	\$8,618
Sedgwick	1,465	126	\$2,898
Valley Center	8,448	727	\$16,710
Viola	203	17	\$402
Sedgwick County	522,700	44,952	\$1,033,901
Sedgwick County (minus Wichita)	126,749	10,900	\$250,710