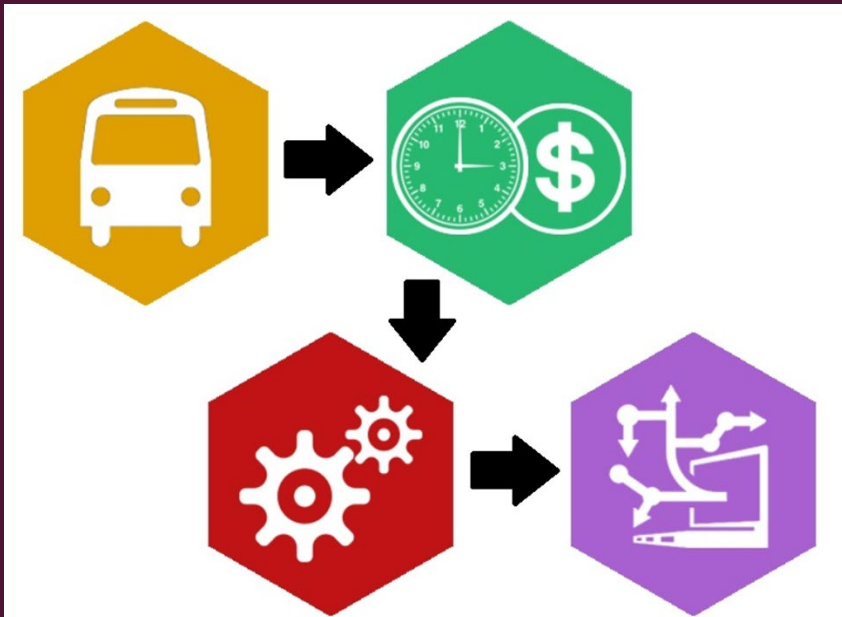# TWO VARIABLE COST ALLOCATION CALCULATOR

EXCEL VERSION WEBINAR

PRESENTERS

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PRESENTATION OVERVIEW

- Importance of cost allocation

- Discussion of two-variable methodology

- Overview of the Excel application version

- Stages of data input for the application

- Allocation outputs and reports

- Further uses of results for transit agencies

WHAT IS THE CALCULATOR?

- Application tool to help transit agencies accurately allocate costs

- Built on both Microsoft Excel and Microsoft Access, with the same functionality

- Requires no special skills in Excel to use the calculator tool

- Relies on standard transit agency data – no new data collection is necessary

- Can be used to allocate cost to individual routes/services or groups of routes

  ❑ Federal grant programs, contracts with human service agency, modes of service, purchased transportation, UZAs and geographic jurisdictions

WHY TWO-VARIABLES?

Transit costs will vary based both on time and distance

- Time measured by total vehicle hours

- Distance measured by total vehicle miles

Consider the following example:

- A route operates 11.25 revenue hours and 166 revenue miles per day

- A route operates 12.00 revenue hours and 166 revenue miles per day

Do these two routes cost the transit agency the same to operate?

KEY DEFINITIONS

- **Fully Allocated Cost**: represents the full cost of a transit route or service, including all costs incurred by the transit agency—both variable and fixed.

- **Variable Costs**: costs that are mainly a function of the amount of service provided (Ex. fuel, parts, and driver wages)

- **Fixed Costs**: costs that do not change with the amount of service provided (Ex. facility maintenance, administration salaries, computers)
  - *Direct Costs*: costs associated with assets and functions owned by the transit agency
  - *Indirect Costs*: indirect fixed costs are those associated with functions or assets utilized (but not directly managed by) the transit agency

ACCOUNTING METHODOLOGY

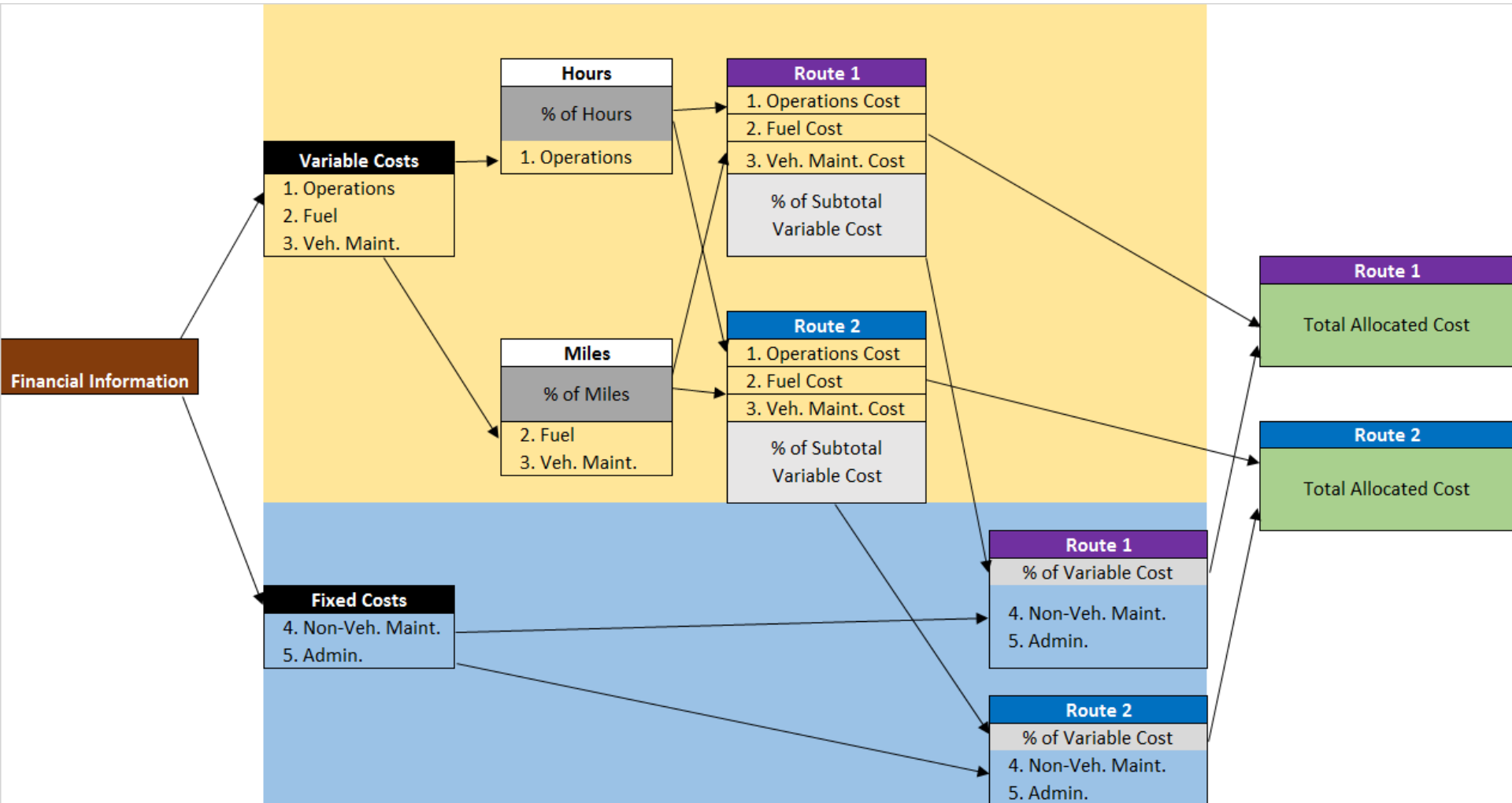Two variable cost allocation by Vehicle Hours and Vehicle Miles

Variable Costs

- Allocated by Vehicle Hours and Miles
- Operations (excluding Fuel) by % hours
- Vehicle Maintenance and Fuel by % miles

Fixed Costs

- Allocated based on the % of variable costs
- Non-Vehicle Maintenance and Administration

METHODOLOGY SCHEMATIC

APPLICATION METHODOLOGY—FOUR-STEP PROCESS

1. Service Data

2. Financial Data
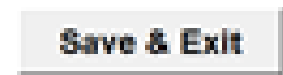
3. Operational Data

4. Allocate Costs

OVERVIEW OF EXCEL COMMANDS

- **Navigation** – Buttons on the Navigation Menu page *or* tabs at the bottom of the workbook

- **Saving Data** – Data entry pop-up menus actively save data when closed

- **Data Entry Menu** – Common action buttons in each menu:

 | Add | Clear | Delete | Save & Exit |
  |-----|-------|--------|-------------|

- **Deleting Data** – Clear all records on the page with the **trash can** button

- **Exporting Data** – Export data on the page into PDF reports

- **Return to Start** – **Finish and Back to Menu** in each page to return to the Navigation Page.

NAVIGATION MENU

- Application opens on the Navigation Menu page
- Two options to move through the application:
  1. Use the buttons on the Navigation Menu page
  2. Use the tabs at the bottom of the Excel workbook
- Steps 1 through 3 must be completed in order before allocating costs in Step 4
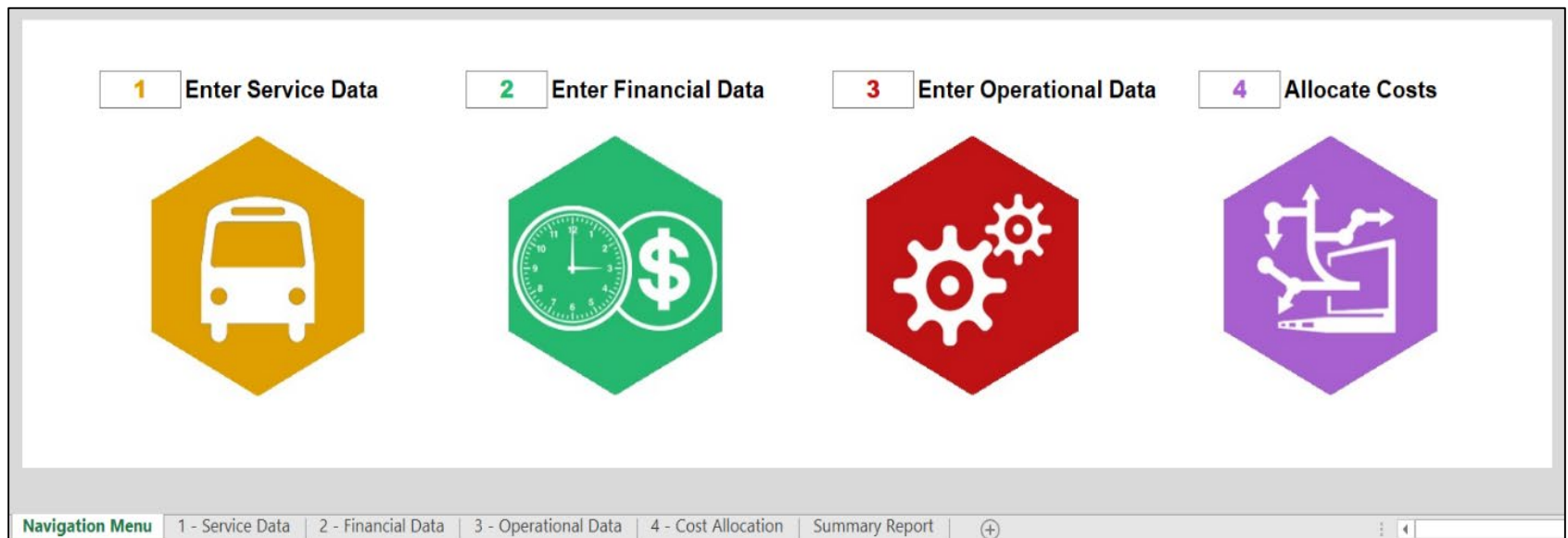
Service Data —
Characteristics of the Routes and Services

- **Route / Service Name**: Given name of the service

- **NTD Mode**: Options include nine fixed-route and demand responsive travel modes

- **NTD Jurisdiction**: Options include Urbanized Area (UZA) or Rural Area (non-UZA). UZAs can be named by the user, and multiple UZAs are allowed

- **Service Type**: Options include Directly Operated or Purchased Transportation

- **Sponsored Type**: Options include General Public Service or Sponsored

- **Funding Source**: Options include Section 5307 Urbanized, Section 5311 Non-Urbanized, Section 5310 Elderly & Disabled, or other sources

1

Users are required to enter information for NTD mode, route/service name, NTD jurisdiction, service type, sponsored type, and federal funding source. NTD mode, NTD Jurisdiction, service type, sponsored type, and federal funding labels will come from a dropdown list, while route/service names will be user-defined. Users can overwrite NTD jurisdiction names for UZAs and labels fo federal funding programs. This application allows users to categorize routes/services by different UZAs or the Non-UZA area. Users can choose to distinguish a route/service further with user-defined information about its geographic area.

[Click to Enter Service Data]   [Finish and Back to Menu]

NTD Mode	Route / Service Name	NTD Jurisdiction	Service Type	Sponsored Type	Funding Program	Service ID
Required	*Required*	*Required*	*Required*	*Required*	*Required*	*Tool Generated*

Navigation Menu | 1 - Service Data | 2 - Financial Data | 3 - Operational Data | 4 - Cost Allocation | Summary Report | ⊕
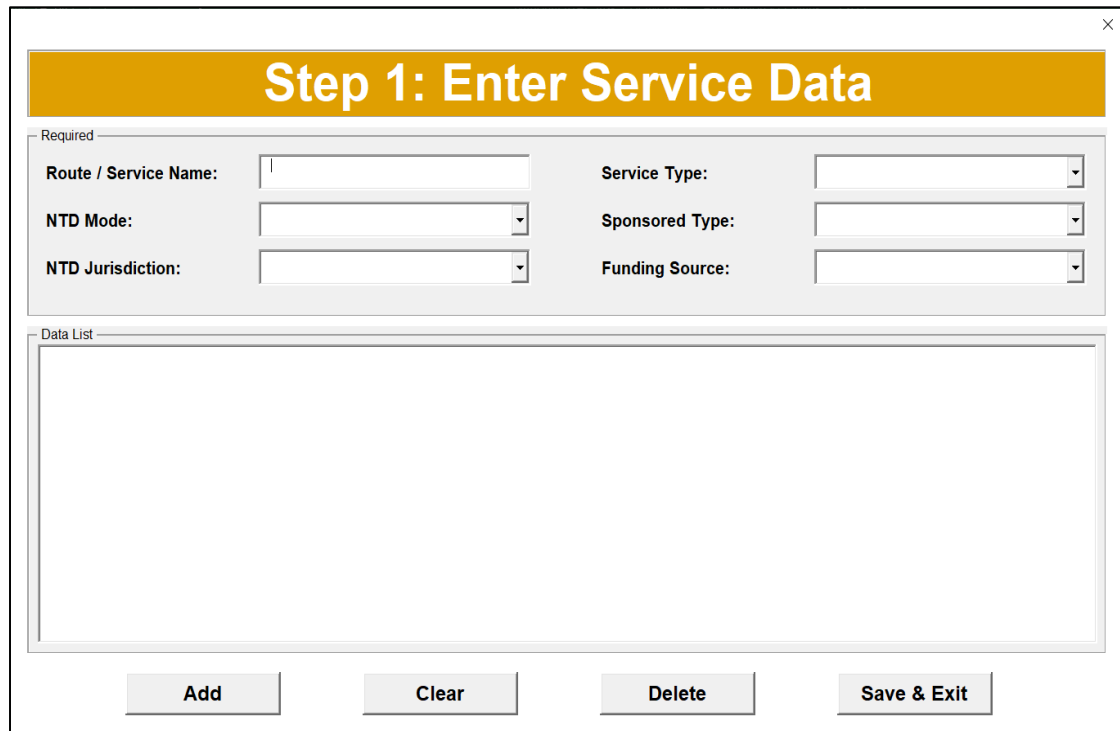
Service Data —
Characteristics of the Routes and Services

Data Entry Commands

- Click the **Add** button to add the route/service to the Data List

- Click the **Clear** button to clear all existing route/services in the Data List

- Click on the **Delete** button. To delete a route/service from the Data List

- Click the **Save & Exit** button to exit the Data Entry Menu

Step 1: Enter Service Data

Required

Route / Service Name:	Service Type:
NTD Mode:	Sponsored Type:
NTD Jurisdiction:	Funding Source:

Data List

Add	Clear	Delete	Save & Exit

Service Data —
Characteristics of the Routes and Services

Some route/service characteristics can be customized from the preset options:

Route/Service Name
To allocate costs for a route that operates in two different areas, input the route name twice with an applicable sub-description.
- Ex. "Route 1 – Rural" and "Route 1 – Urban"

NTD Jurisdiction
Name the UZA or write-in another geographic area. Click within the window, then type in the name applicable to the route.
- Ex. "UZA - Waco" or "McLennan County"

Federal Funding Source
Write in a custom funding source name. Click within the window, then type in the name of the main funding source for the route.
- Ex. "Head Start" or "Local Contract"

Service Data —
Characteristics of the Routes and Services

Step 1: Enter Service Data

Required

Route / Service Name:	Route 1
NTD Mode:	Demand Response
NTD Jurisdiction:	Rural Area (non-UZA

Data List

Step 1: Enter Service Data

Required

Route / Service Name:	Route 1	**Service Type:**	Directly Operated
NTD Mode:	Demand Response	**Sponsored Type:**	General Public Service
NTD Jurisdiction:	Rural Area (non-UZA)	**Funding Source:**	5311 Non-Urbanized

Data List

NTD Mode	Route / Service Name	NTD Jurisdiction	Service Type	Sponsored Type	Funding Program	Service ID
Demand Response	Route 1	Rural Area (non-UZA)	Directly Operated	General Public Service	5311 Non-Urbanized	1

Add	Clear	Delete	Save & Exit

Financial Data —
Expenses information from Chart of Accounts

- **Choose USOA Object Class**: Select the appropriate USOA Object Class for the expense from the available options

- **Subclass**: Select the appropriate subclass for the expenses from the available options, corresponding with the use of the expense for the transit agency

- **Enter Amount ($)**: Write in the amount of the expense using numeric text only; no commas are necessary

2 Users are required to enter the total operational expenses that they wish to allocate to routes/services according to USOA object classes used in a chart of accounts and required by NTD for full reporting agencies. This application provides help texts to guide users to choose USOA object classes and enter numbers into the pop-up user form. USOA object classes and subclasses will come from a dropdown list; and users are required to select for which routes/services the expense applies. The expenses information must be classified into the appropriate object class in order for the expense to be sorted by the application into the accurate cost function category.

Click to Enter Financial Data   **Finish and Back to Menu**

Tool Generated	Selected	Selected	Tool Generated	Required	Selected	Selected	Tool Generated	Tool Generated
USOA Code	USOA Object Class	USOA SubClass	Function	Amount	Service ID	Route / Service Name	Expense ID	Pool

Navigation Menu | 1 - Service Data | **2 - Financial Data** | 3 - Operational Data | 4 - Cost Allocation | Summary Report | +

Financial Data —
Expenses information from Chart of Accounts

Data Entry Commands

- Click the **Add** button to add the cost entry to the Data List

- Click the **Clear** button to clear all existing cost entries in the Data List

- Click on the **Delete** button to delete a cost/entry from the Data List

- Click the **Save & Exit** button to exit the Data Entry Menu

Financial Data —
Expenses information from Chart of Accounts

Cost Applicability

- For each cost entry, choose with routes/services which are applicable for the expense

- Use the checkboxes to select applicable routes/services

- Click the Select All box to select all routes/services

- Click the Select All box again to unselect all routes/services

- Checkboxes reset after each Add

Financial Data —
Expenses information from Chart of Accounts

Operational Data —
Information for each route/service

- **Revenue Hours**: Number of revenue hours for the route/service

- **Vehicle Hours**: Number of total vehicle hours for the route/service

- **Revenue Miles**: Number of revenue miles for the route/service

- **Vehicle Miles**: Number of total vehicle miles for the route/service.

    * Revenue hours/miles must be less than or equal to vehicle hours/miles *

- **Passenger Trips**: Number of passenger trips for the route/service.

3 The Operational Data tab requests data from users on hours, miles, and passenger trips for each route/service input previous in the Service Data tab. Users will also have the option to input passenger hours and miles, as well as sponsored trips data for any route/service classified as demand response, demand response taxi, vanpool, or volunteer driver program. This option will be useful for agencies with shared rides on demand responsive modes. The application will use the passenger hours and miles data to suballocate costs according to each sponsor.

Click to Enter Operational Data   **Finish and Back to Menu**

	Selected	Selected	Required	Required	Required	Required	Required	Optional	Optional	Optional	Optional
	Service ID	Route / Service Name	Revenue Hours	Vehicle Hours	Revenue Miles	Vehicle Miles	Passenger Trips	Sponsor	Passenger Hours	Passenger Miles	Sponsored Trip

Navigation Menu | 1 - Service Data | 2 - Financial Data | 3 - Operational Data | 4 - Cost Allocation | Summary Report | ⊕

Operational Data —
Information for each route/service

Data Entry Commands

- Click the **Add** button to add the route/service to the Data List

- Click the **Clear** button to clear all existing routes/services in the Data List

- Click on the **Delete** button to delete a route/service from the Data List

- Click the **Save & Exit** button to exit the Data Entry Menu

Step 3: Enter Operational Data

Select Applicable Service:

NTD Mode	Route / Service Name	NTD Jurisdiction	Service Type	Sponsored Type	Funding Program	Service ID
○ Motorbus	Route 1	Rural Area (non-UZA)	Directly Operated	General Public Service	5311 Non-Urbanized	1
○ Motorbus	Route 2	Rural Area (non-UZA)	Directly Operated	General Public Service	5311 Non-Urbanized	2
○ Motorbus	Route 3	Rural Area (non-UZA)	Directly Operated	General Public Service	5311 Non-Urbanized	3
○ Motorbus	Route 10	Urbanized Area (UZA) - Big	Directly Operated	General Public Service	5307 Urbanized	4
○ Motorbus	Route 11 - Country	Rural Area (non-UZA)	Directly Operated	General Public Service	5311 Non-Urbanized	5
○ Motorbus	Route 11 - Big City	Urbanized Area (UZA) - Big	Directly Operated	General Public Service	5307 Urbanized	6
○ Motorbus	Route 12 - Country	Rural Area (non-UZA)	Directly Operated	General Public Service	5311 Non-Urbanized	7

Data List

| Add | Clear | Delete | Save & Exit |

| Revenue Hours | | Revenue Miles | | Passenger Trips | |
| Vehicle Hours | | Vehicle Miles | | | |

☐ Would like further allocation by sponsor?

Operational Data —
Information for each route/service

Suballocation for Shared Ride Demand Responsive
Uses passenger hours and passenger miles to suballocate costs for modes indicated as Sponsored Service

For a sponsored service, click the check box
Would like further allocation by sponsor?

- **Name**: Name of the sponsored service

- **Passenger Hours**: Number of passenger hours for the sponsored service

- **Passenger Miles**: Number of passenger miles for the sponsored service

- **Sponsored Trips**: Number of passenger trips for the sponsored service.

Optional ─────────────────────────

Further Allocation By: **Sponsor**

Name: [   ]

Passenger Hours: [   ]

Passenger Miles: [   ]

Sponsored Trips: [   ]

[**Add**]   [**Complete**]

Operational Data —
Information for each route/service

Step 3: Enter Operational Data

Select Applicable Service:

	NTD Mode	Route / Service Name
⊙	Demand Response	Route 1
○	Motorbus	Route 2
○	Volunteer Driver Program	Route 3

Revenue Hours	400
Vehicle Hours	500

Data List

Add

Step 3: Enter Operational Data

Select Applicable Service:

	NTD Mode	Route / Service Name	NTD Jurisdiction	Service Type	Sponsored Type	Funding Program	Service ID
⊙	Demand Response	Route 1	Rural Area (non-UZA)	Directly Operated	General Public Service	5311 Non-Urbanized	1
○	Motorbus	Route 2	Urbanized Area (UZA)	Directly Operated	General Public Service	5307 Urbanized	2
○	Volunteer Driver Program	Route 3	Rural Area (non-UZA)	Directly Operated	Sponsored	5311 Non-Urbanized	3

Revenue Hours	400	Revenue Miles	10000	Passenger Trips	1000
Vehicle Hours	500	Vehicle Miles	12000		

Data List

Route / Service Nan	Revenue Hours	Vehicle Hours	Revenue Miles	Vehicle Miles	Passenger Trips	Sponsor	Passenger Hours	Passenger Miles	Sponsored Trips
Route 1	400	500	10,000	12,000	1,000	0	0	0	0

Add | **Clear** | **Delete** | **Save & Exit**

Operational Data —
Information for each route/service

Step 3: Enter Operational Data

Select Applicable Service:

NTD Mode	Route / Service Name	NTD Jurisdiction	Service Type	Sponsored Type	Funding Program	Service ID
○ Demand Response	Route 1	Rural Area (non-UZA)	Directly Operated	General Public Service	5311 Non-Urbanized	1
○ Motorbus	Route 2	Urbanized Area (UZA)	Directly Operated	General Public Service	5307 Urbanized	2
⊙ Volunteer Driver Program	Route 3	Rural Area (non-UZA)	Directly Operated	Sponsored	5311 Non-Urbanized	3

Revenue Hours `1000` **Revenue Miles** `50000` **Passenger Trips** `500`

Vehicle Hours `1000` **Vehicle Miles** `50000`

☑ Would like further allocation by sponsor?

Data List

Route / Service Name	Revenue Hours	Vehicle Hours	Revenue Miles	Vehicle Miles	Passenger Trips	Sponsor	Passenger Hours	Passenger Miles	Sponsored Trips
Route 1	400	500	10,000	12,000	1,000	0	0	0	0
Route 2	600	750	12,000	14,000	800	0	0	0	0
Route 3	1,000	1,000	50,000	50,000	500	Local	800	35,000	400
Route 3	1,000	1,000	50,000	50,000	500	Veterans	400	20,000	100

Add **Clear** **Delete** **Save & Exit**

Allocate Costs —
Putting the three data sets together

Allocate expenses information at the push of a button once data has been entered in the previous steps

- Click on the **Click to Allocate Costs** button at the top of the page

- Click on the **Generate Summary Report** button to navigate to the summary report tab and view the cost allocation tables

4 The Cost Allocation tab uses the data input into the previous three tabs to allocate variable and fixed costs. Users click the "Click to Allocate Costs" button to allocate total operational expenses by vehicle hours and miles data (or passenger hours and miles for shared ride demand responsive service), and then click the "Generate Summary Report" button to view results. Users must reclick the "Click to Allocate Costs" and "Generate Summary Report" buttons if any data point in the previous three tabs is changed.

Click to Allocate Costs   **Generate Summary Report**   **Finish and Back to Memu**

Expense ID	Service ID	Route/Service Name	Sponsor	GenAdmin_Alloc	NonVehMaint_Alloc	VehMaint_Alloc	VehOps_Alloc	VehOpsFuel_Alloc

Navigation Menu | 1 - Service Data | 2 - Financial Data | 3 - Operational Data | 4 - Cost Allocation | Summary Report | ⊕

Allocate Costs —
Putting the three data sets together

To view reports, click on the "**Generate Summary Report**" button

- Application will navigate to the summary report tab with cost allocation tables

- Separate tables are generated for costs by each group of routes/services

- Use the scroll bar at the bottom of the Excel workbook to view each table for different groups of routes

- To export a PDF report of all records on the page, click the **Print to PDF** button

Print to PDF	Finish and Back to Memu												

NTD Mode	Cost Allocation						Performance Measures						
	Operational Cost by Transit Function					Total Allocated Cost	Service Effectiveness Measures		Cost Efficiency Measures				Cost Effectiveness Measure
	General Administration	Non-Vehicle Maintenance	Vehicle Maintenance	Vehicle Operations	Vehicle Operations - Fuel		Passengers per Revenue Hour	Passengers per Revenue Mile	Cost per Revenue Hour	Cost per Revenue Mile	Cost per Total Vehicle Hour	Cost per Total Vehicle Mile	Cost per Passenger Trip
Commuter Bus	$37,898	$28,423	$102,981	$241,719	$22,527	$433,547	2.83	0.12	72.26	2.99	61.94	2.91	25.50
Demand Response	$50,262	$20,687	$67,141	$172,236	$14,363	$324,689	0.58	0.03	81.17	4.92	60.13	3.42	141.17
Motorbus	$228,402	$123,178	$449,341	$1,045,364	$96,760	$1,943,045	6.77	0.40	62.68	3.66	50.47	3.04	9.25
Vanpool	$13,184	$7,606	$29,388	$62,533	$6,350	$119,061	1.12	0.05	70.04	2.83	70.04	2.83	62.66
Total	329,745	179,895	648,851	1,521,852	140,000	2,820,343	5.41	0.29	66.05	3.60	53.62	3.05	12.20

Navigation Menu | 1 - Service Data | 2 - Financial Data | 3 - Operational Data | 4 - Cost Allocation | **Summary Report** | ⊕

Allocate Costs —
Putting the three data sets together

4

The Cost Allocation tab uses the data input into the previous three tabs to allocate variable and fixed costs. Users click the "Click to Allocate Costs expenses by vehicle hours and miles data (or passenger hours and miles for shared ride demand responsive service), and then click the "Generat Users must reclick the "Click to Allocate Costs" and "Generate Summary Report" buttons if any data point in the previous three tabs is changed.

Click to Allocate Costs   **Generate Summary Report**

Print to PDF   **Finish and Back to Memu**

	Cost Allocation					
NTD Mode	**Operational Cost by Transit Function**					**Total Allocated Cost**
	General Administration	Non-Vehicle Maintenance	Vehicle Maintenance	Vehicle Operations	Vehicle Operations - Fuel	
Demand Response	$5,576	$3,717	$12,632	$22,222	$7,895	$52,042
Motorbus	$7,471	$4,981	$14,737	$33,333	$9,211	$69,733
Volunteer Driver Program	$16,953	$11,302	$52,632	$44,444	$32,895	$158,225
Total	**30,000**	**20,000**	**80,000**	**100,000**	**50,000**	**280,000**

RESULTS AND OUTCOMES

- Create a consistent, equitable, transparent allocation process

- Report data to NTD / prepare data for State reporting

- Know cost of services and measure performance

- Use for planning and pricing services

- Understand costs by funding source

- Prepare information for monthly requests for reimbursements

- Automating accounting and financial reporting processes

- Budget future operating expenses and funding need

AVAILABLE ONLINE

- Today's PowerPoint

- Today's webinar recording

- Both application versions

- Instruction manual

- Data results Excel workbook

UPCOMING ANNOUNCEMENTS

Upcoming Financial Management Book

to published by National RTAP

Rich Garrity – RLS & Associates, Inc.

National RTAP Conference

September 15-18, 2019

DoubleTree by Hilton

Portland, Oregon

https://www.nationalrtap.org/News/2019-Conference

In partnership with Oregon Department of Transportation

4th National RTAP
Technical Assistance Conference
Charting New Trails
FOR **Rural & Tribal Transit**

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