



## EXECUTIVE SUMMARY

### BACKGROUND

The Highway Cost Allocation Study (HCAS) is critical in the State of Oregon’s efforts to ensure that highway maintenance, operation, and improvement costs are fairly distributed among various road users. The Oregon HCAS is conducted biennially using projected data for revenue and expenditures.

### PURPOSE OF THE REVIEW STUDY

The Oregon’s Office of Economic Analysis (OEA) tasked a team of researchers from Oregon State University (OSU) to accomplish the following objectives:

1. **Objective 1.** Verify that the HCAS models for the 2017-2019, 2019-2021, and 2021-2023 biennia can be executed and produce the same output using projected data.
2. **Objective 2.** Examine the differences in the *scaled equity ratios* and *cost responsibility shares* across vehicle classes when using actual revenue and cost data versus projected data.

To fulfill these objectives, the Oregon Department of Transportation (ODOT) provided the OSU research team with revenue and cost data sets (i.e., projected and actual) for all biennia.

### Objective 1 Results

Each HCAS model includes an Input Workbook, a Python code file, and an Output Workbook. For all HCAS models, the OSU research team was able to (1) replicate the model environment under which the results of the HCAS Python model were produced, (2) verify that most of the projected data provided by ODOT were included in the HCAS Input Workbook, with a few exceptions (see Section 2.3 for more details), and (3) verify that the outputs generated with the HCAS Input Workbook are the same as (a) the Output Workbook included in the HCAS model, and (b) the Output Workbook provided to ODOT by ECONorthwest (EcoNW).

### Objective 2 Results

Tables ES1 through ES3 show the summary of the changes in the scaled equity ratio and the cost responsibility shares for each vehicle class for each biennium, with any difference greater than  $\pm 5\%$  highlighted.

Table ES1. 2017-2019 Biennium using Actual Data.

	Scaled Equity Ratio				Difference in Cost Responsibility Shares (Actual-Projected)	
	Projected		Actual		All-Fee	Full-Fee
	All-Fee	Full-Fee	All-Fee	Full-Fee		
Light (1 to 10,000 lbs)	2.50% Over	0.76% Over	4.71% Over	2.37% Over	0.73%	0.81%
Heavy (10,001 lbs and Up)	4.24% Under	1.35% Under	8.26% Under	4.36% Under	-0.73%	-0.81%



**Table ES2. 2019-2021 Biennium using Actual Data.**

	Scaled Equity Ratio				Difference in Cost Responsibility Shares (Actual-Projected)	
	Projected		Actual		All-Fee	Full-Fee
	All-Fee	Full-Fee	All-Fee	Full-Fee		
Light (1 to 10,000 lbs)	0.50% Over	1.54% Under	31.01% Under	31.75% Under	30.81%	30.18%
Heavy (10,001 lbs and Up)	0.85% Under	3.14% Over	760.96% Over	1160.05% Over	-30.81%	-30.18%

**Table ES3. 2021-2023 Biennium using Actual Data.**

	Scaled Equity Ratio				Difference in Cost Responsibility Shares (Actual-Projected)	
	Projected		Actual		All-Fee	Full-Fee
	All-Fee	Full-Fee	All-Fee	Full-Fee		
Light (1 to 10,000 lbs)	5.12% Under	1.54% Under	7.13% Under	9.08% Under	1.61%	1.65%
Heavy (10,001 lbs and Up)	10.70% Over	16.35% Over	16.04% Over	22.45% Over	-1.61%	-1.65%

## CONCLUSIONS

Based on the evaluation conducted by the OSU research team, the following conclusions were reached:

1. The HCAS models for all biennia can be run using projected and actual data.
2. The HCAS models for all biennia produce the same outputs as those generated by EcoNW when using the Input Workbook that EcoNW prepared for the Python model. The outputs generated by the OSU research team are the same as those provided to ODOT by EcoNW.
3. The *scaled equity ratios* and *cost responsibility shares* generated using projected versus actual data for each biennium differ. In some cases, the differences in the *cost responsibility shares* for light-weight or heavy-weight vehicles exceed  $\pm 5\%$  when comparing actual versus projected data.
  - In the 2019-2021 biennium, these differences are pronounced and are likely due to the effect of the COVID-19 pandemic and the actual data exceeding threshold limitations present in the HCAS's Python.
  - Due to these special circumstances, the validity of the calculated scaled equity ratios and cost responsibility shares using actual revenue and cost data for the 2019-2021 biennium cannot be substantiated nor refuted by the OSU research team as a result of this study.

## RECOMMENDATIONS

After completing the evaluation of the HCAS models for the 2017-2019, 2019-2021, and 2021-2023 biennia, the OSU research team recommends the following to OEA: (1) perform further research on the limitations of the HCAS model, (2) streamline the coding of project WorkTypes, and (3) improve the documentation on project WorkType and Bridge Type Coding process.