Highway Cost Allocation Study

2019–2021 Biennium

PREPARED BY

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THE 2019 OREGON HIGHWAY COST ALLOCATION STUDY CONCLUDES THAT:

- Light vehicles (those weighing 10,000 pounds or less) paying full fees should pay 67.2 percent of state highway user revenues, and heavy vehicles (those weighing more than 10,000 pounds) paying full fees should contribute 32.8 percent during the 2019-21 biennium.
- For the 2019-21 biennium and under existing, current-law tax rates, full-fee-paying light vehicles will contribute 66.13 percent of state highway user revenues and full-fee-paying heavy vehicles, as a group, will contribute 33.87 percent.
- Equity ratios for full-fee-paying vehicles, the ratio of projected payments to responsibilities for vehicles in each class, are 0.9846 for light vehicles and 1.0314 for heavy vehicles. Under existing tax rates and fees, light vehicles are projected to underpay their responsibility by 1.54 percent. Heavy vehicles are projected to overpay by 3.14 percent during the next biennium.
- Equity ratios for the individual heavy vehicle weight classes show some classes are projected to overpay and some to underpay their responsibility during the 2019-21 biennium. Chapter 7 offers alternative fee schedules that would minimize this cross-subsidization of some heavy vehicle weight classes by others.
- The reduced rates paid by certain types of vehicles, principally publicly owned and farm vehicles, mean these vehicles are paying lower per-mile charges than comparable vehicles subject to full fees. Those vehicles are supposed to pay less than their cost responsibility and are not included in the calculation of the equity ratios reported above.
- Recent changes in rates, forecasts of miles traveled, and pavement factors affect the margins of error for estimating the inequity between light and heavy vehicles. One should therefore be cautious about interpreting a short-run divergence in equity ratios as a long-run trend.
- The legislature recently proposed incremental rate increases for tax rates and fees between 2018 and 2024, which are not fully accounted for in this study. These rate increases may impact equity ratios between light and heavy vehicles and should be assessed in future studies.
- If the Legislature should choose to modify user fee rates for other reasons beyond the scope of this study, the HCAS model can be used to design those rates to ensure those rates produce revenues in proportion to expected costs imposed by light and heavy vehicles.

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CHAPTER 1: INTRODUCTION AND BACKGROUND

INTRODUCTION

For more than 70 years, Oregon has based the financing of its highways on the principle of cost responsibility. Cost responsibility is the principle that those who use the public roads should pay for them and, more specifically, that users should pay in proportion to the road costs for which they are responsible.

Cost responsibility requires each category of highway users to contribute to highway revenues in proportion to the costs they impose on the highway system. The State of Oregon uses the cost allocation process to apportion costs of highway work to vehicles that impose those costs.

For more than 70 years, Oregon has based the financing of its highways on the principle of cost responsibility. Cost responsibility is the principle that those who use the public roads should pay for them and, more specifically, that users should pay in proportion to the road costs for which they are responsible. Cost responsibility requires each category of highway users to contribute to highway revenues in proportion to the costs they impose on the highway system. The State of Oregon uses the cost allocation process to apportion costs of highway work to vehicles that impose those costs.

This tradition has served Oregon well by ensuring that the state's highway taxes and fees are levied in a fair and equitable manner. The State of Oregon commissions periodic studies to determine the "fair share" that each class of road users should pay for the maintenance, operation, and improvement of the state's highways, roads, and streets. Prior to the present study, 20 such studies had been completed; the first in 1937, the most recent in 2017.

Oregon voters ratified the principle of cost responsibility in the November 1999 special election by voting to add the following language to Article IX, Section 3a (3) of the Oregon Constitution:

"Revenues … that are generated by taxes or excises imposed by the state shall be generated in a manner that ensures that the share of revenues paid for the use of light vehicles, including cars, and the share of revenues paid for the use of heavy vehicles, including trucks, is fair and proportionate to the costs incurred for the highway system because of each class of vehicle. The Legislative Assembly shall provide for a biennial review and, if necessary, adjustment, of revenue sources to ensure fairness and proportionality."

PURPOSE OF STUDY

The purpose of this 2019 Oregon Highway Cost Allocation Study (HCAS) is to:

> (1) determine the share that each class of road users should pay based on their respective share of costs for maintenance, operation, and improvement of Oregon's highways, roads, and streets; and
>
> (2) if necessary, recommend adjustments to existing tax rates and fees to bring about a closer match between payments and responsibilities for each vehicle class.

BACKGROUND

Past Oregon Highway Cost Allocation Studies

Oregon, more than any other state, has a long history of conducting highway cost allocation or responsibility studies and basing its system of road user taxation on the results of these studies. The State of Oregon completed studies in 1937, 1947, 1963, 1974, 1980, 1984, 1986, 1990, 1992, 1994, 1999, 2001, 2003, 2005, 2007, 2009, 2011, 2013, 2015, and 2017. As noted above, the Oregon Constitution requires that a study is conducted biennially and highway user tax rates adjusted, if necessary, to ensure fairness and proportionality between light and heavy vehicles.

Prior to 1999, Oregon used the term *cost responsibility studies*, whereas the federal government and most other states called their studies *cost allocation studies*. Oregon has now adopted the more conventional terminology, although the two terms are equivalent and used interchangeably in this report.[1]

In this study and all prior studies, highway users and other interested parties have been given the opportunity to offer their input in an open and objective

[1] It should be noted that, to be precise, neither term is technically correct. Since all previous state studies, including Oregon's, have allocated expenditures rather than actual costs imposed, they are really expenditure allocation studies. The 2011 Efficient Fee Study, performed for Oregon during the 2009-2011 biennium, was to our knowledge the first state-level study to estimate and allocate the actual costs of highway use.

process. During the 1986 Study, for example, three large public meetings were held to provide information on the study and solicit the input of all user groups.

As part of the 1994 Study process, a Policy Advisory Committee was formed to address several cost responsibility issues that arose during the 1993 legislative session. This committee consisted of 12 members, including a representative of AAA Oregon and five representatives of the trucking industry. The committee held six meetings devoted to understanding and recommending policies for the 1994 Study as well as future Oregon studies.

In 1996, the Oregon Department of Transportation (ODOT) formed the Cost Responsibility Blue Ribbon Committee to evaluate the principles and methods of the Oregon cost responsibility studies and, if warranted, recommend improvements to the existing methodology. This 11-member committee was chaired by the then Chairman of the Oregon Transportation Commission and included representatives of the trucking industry, AAA Oregon, local governments, academia, and Oregon business interests. The committee held a total of seven meetings and reached agreement on several recommendations for future studies. Because the trucking industry, in some cases, did not agree with the full committee recommendations, it was given the opportunity and elected to file a Minority Report that was included in the committee report.

All studies prior to 1999 were conducted by ODOT staff. In February 1998, the ODOT and Oregon Department of Administrative Services (DAS) Directors reached agreement to transfer responsibility for the study from ODOT to DAS. The 1999, 2001, and 2005 through 2017 studies, as well as the current study, were conducted by consultants to the DAS Office of Economic Analysis. ODOT's role in these studies was to provide technical assistance and most of the data and other required information. In 2003, ODOT conducted the study using the model developed for the 2001 Study.

The Oregon studies prior to 1999 relied on an internal technical advisory committee to provide the expertise and some of the many data elements required for the studies. As noted, highway users and other interested parties were also provided the opportunity to offer their input as the studies were being conducted. For the 1999 and subsequent studies, DAS formed a Study Review Team (SRT) to provide overall direction for the studies. The SRT's role has been to provide policy guidance and advisory input on all study methods and issues.

The SRT for the 2001 Study consisted of ten members and the SRTs for the 2003 and 2005 studies had eight members. The SRT for the 2007 through 2017 and the present study consisted of ten members. The composition of the SRTs has changed from study to study, but all have included motorist, trucking industry, and Oregon business representatives; academics; and state officials. All SRTs have been chaired by the State Economist. ODOT did not have a representative on the 1999 SRT, but was represented on subsequent SRTs.

OTHER HIGHWAY COST ALLOCATION STUDIES

Although Oregon has the longest history of conducting highway cost allocation studies, several other states have also conducted such studies, the majority of which have been completed over the past two decades. Since the first HCAS, 32 states have performed at least 88 cost allocation studies. Since the late 1970s, 30 states have conducted such studies.

The interest of other states in undertaking these studies has in many cases been sparked by the completion of similar studies by the federal government. Several states undertook studies following the release of the 1982 Federal HCAS. With the release of the 1997 Federal HCAS and the Federal Highway Administration's (FHWA) interest in helping states do their own studies, there was again a renewed interest among the states. Upon completion of the 1997 Federal Study, FHWA formed a state representatives' Steering Committee to assist the states in adopting the research and methods employed in that study.

A 1996 Oregon Legislative Revenue Office report concluded that most of the differences in study results among states can be explained by differences in the types of expenditures that are allocated.[2] Oregon, for example, does not include state police expenditures in its studies because, since 1980, state police do not receive Highway Fund monies. California, on the other hand, includes large Highway Patrol expenditures in its studies. Since policing expenditures are typically viewed as a common responsibility of all highway users and are assigned to all vehicle classes based on each class's relative travel, they are primarily the responsibility of automobiles and other light

[2] "Oregon Cost Responsibility Studies Compared to Other States," Legislative Revenue Office Research Report #4-96, September 10, 1996.

vehicles. Therefore, it is not surprising that the California studies find a higher light vehicle responsibility and lower heavy vehicle responsibility share than the Oregon studies.

A review of state studies conducted in connection with the 1997 Federal Study found that those studies attempting to clearly allocate costs between light and heavy vehicle classes have found heavy vehicles to be responsible for 30 to 40 percent of total highway expenditures. The past several Oregon studies have produced results in this range. Both the 1982 and 1997 Federal HCASs found trucks and other heavy vehicles to be responsible for 41 percent of federal highway expenditures.[3]

OREGON ROAD USER TAXATION

Oregon governs the State Highway Fund using the concept of cost responsibility. The State collects a fair share of revenue from each highway user class through three highway user taxes. The three taxes are: vehicle registration fees, motor vehicle fuel taxes (primarily the gasoline tax), and motor carrier fees (primarily the weight-mile tax).

REGISTRATION FEE

The registration fee is levied on a biennial basis for all road users, based on the type and weight of the vehicle being registered. The registration fee is considered payment for the fixed or non-use related costs of providing a highway system. These costs include minimal maintenance of facilities and equipment along with certain administrative functions necessary to keep the system accessible. Since these costs account for a small portion of total highway costs, registration fees in Oregon have traditionally been low (for both cars and trucks) in comparison to the corresponding fees in most other states.

Road user taxes were initially levied against motor vehicles to cover the cost of registration. A one-time fee of $3.00 was instituted in 1905. Because this proved to be a productive source of revenue, the state soon annualized the fee and began to increase the rates and use the proceeds to finance highways.

From 1990 to 2003, the two-year registration fee for automobiles and other vehicles weighing 8,000 pounds or less was $30, and in 2004, it was increased to $54. This shift to higher registration fees represents a change in philosophy away from the “user pays” approach and toward the use of fixed fees to cover more of the variable costs of road construction and maintenance. In 2018, the legislature increased the biennial registration rates for automobiles from $86 to $112. Starting in 2020, additional registration fees will be based on the fuel efficiency of registered vehicles, with increasing fees for high-efficiency vehicles.

FUEL TAX

The fuel tax applies to gasoline or diesel fuel purchased from an authorized seller who collects the taxes at the time of sale. In 1919, Oregon became the first state in the nation to enact a fuel tax on gasoline. It was regarded as a “true” road user tax because those who used the roads more paid more. The fuel tax came to be viewed as the most appropriate means of collecting the travel-related share of costs for which cars and other light vehicles are responsible.

The state fuel tax was extended to diesel and other fuels in 1943. Since that time, the tax on diesel and other fuels, referred to as a “use fuel” tax, has been at the same rate per gallon as the tax on gasoline. On January 1, 2018 the Oregon Legislature increased the fuel tax and use tax rates to $0.34. The rates are expected to increase by $0.02 in 2020, 2022, and 2024.

MOTOR CARRIER FEES

The primary motor carrier fee is the weight-mile tax, which applies to all commercial motor vehicles with declared gross weights of more than 26,000 pounds. It is based on the declared weight of the vehicle and the distance it travels in Oregon. The weight-mile tax is a use-tax that takes the place of the fuel tax on heavy vehicles. Vehicles subject to the weight-mile tax are not subject to the state fuel tax.

The Oregon weight-mile tax system consists of a set of schedules and alternate flat fee rates. There are separate schedules for vehicles with declared weights of 26,001 to 80,000 pounds and those over 80,000 pounds.

[3] It should be noted, however, that the results of the federal studies are not directly comparable to those of state studies for two reasons: highway maintenance is a state-funded activity and thus is not included in the federal studies, and the heavy vehicle responsibility share is generally lower for most maintenance activities than for construction, particularly major rehabilitation projects. Therefore, the responsibility for federal expenditures will typically be more weighted toward heavy vehicles than is the case for state expenditures.

Additionally, log, sand and gravel, and wood chip haulers have the option to pay flat monthly fees in lieu of the mileage tax.

Since 1947, the State has adjusted the weight-mile rates 15 times based on the results of updated cost responsibility studies or the passage of transportation funding packages. The most recent adjustment occurred on January 1, 2018, when HB 2017 increased weight-mile rates by an average of 31 percent across all weight classes. Other recent revisions to the weight-mile rates include:

- October 1, 2010, when weight-mile rates increased by an average of 24.5 percent because of the 2009 Jobs and Transportation Act (JTA).
- January 1, 2004, when the 2003 Legislature increased weight-mile rates by 9.9 percent when enacting the third phase of the Oregon Transportation Investment Act (OTIA III).
- On September 1, 2000, rates were reduced across the board by 12.3 percent to reflect the results of the 1999 Study.
- In January 1, 1996, the rates were also reduced by 6.2 percent based on the results of the 1994 Study.
- Rates were also increased on January 1, 1992, to maintain equivalency with the fuel tax increases enacted by the 1991 Legislature.

The 1999 Oregon Legislature repealed the weight-mile tax and replaced it with a 29 cent per gallon diesel fuel tax and higher heavy truck registration fees. This measure, House Bill 2082, was subsequently referred to the voters and defeated in the May 2000 primary election.

After the May 2000 vote, the trucking industry challenged the Oregon tax in the courts. The primary focus of the legal action was the feature that allows haulers of logs, sand and gravel, and wood chips to pay alternate flat fees in lieu of the mileage tax. The industry argued that these fees are, from a practical standpoint, available only to Oregon intrastate motor carriers, and this provision of the Oregon system therefore unfairly discriminates against non-Oregon based interstate firms. In February 2002, the Third District Circuit Court ruled in favor of the State in the lawsuit. The ruling was reversed in the Court of Appeals in 2003. The Oregon Supreme Court affirmed the original Circuit Court decision in December 2005.

For carriers hauling divisible-load commodities at gross weights between 80,001 and 105,500 pounds pay a weight-mile tax (statutory Table B) based on the vehicle's declared weight and number of axles. There are separate schedules for five, six, seven, eight, and nine or more axle vehicles, with each schedule graduated by declared weight. The rates are structured so that, at any declared weight, carriers can qualify for a lower per-mile rate by utilizing additional axles.

Carriers hauling non-divisible loads at gross weights greater than 98,000 pounds under special, single-trip permits pay a per-mile road use assessment fee. Non-divisible (or "heavy haul") permits are issued for the transportation of very heavy loads that cannot be broken apart, such as construction equipment, bridge beams, and electrical transformers.

The road use assessment fees are expressed in terms of permit gross weight and number of axles and are based on a charge of 8.5 cents per equivalent single axle load (ESAL)[4] mile of travel as of January 1, 2018. As with the Table B rates, carriers are assessed a lower per-mile charge the greater the number of axles used at any given gross weight. The road use assessment fee takes the place of the weight-mile tax for the loaded, front-haul portion of non-divisible load trips. With rare exceptions, empty back haul miles continue to be subject to the weight-mile tax and taxed at the vehicle's regular declared weight.

Each biennium, ODOT conducts a study to test for the revenue neutrality of flat-fee rates and recommends adjustments to those rates as necessary to treat intrastate and interstate carriers equitably.

ORGANIZATION OF THIS REPORT

This volume of the 2019 Study provides an overview of the study issues, methodology, and results, as well as recommendations for future studies. There are several exhibits throughout this report to illustrate specific data. Please note that amounts shown are rounded and may not total exactly.

This chapter has provided an introductory discussion of the purpose, scope, and process of the 2019 Study as well as a brief background discus-

[4] An ESAL is equivalent to a single axle carrying 18,000 pounds.

sion of the history of Oregon highway cost allocation studies, studies by the federal government and other states, and the evolution of Oregon road user taxation.

- **Chapter 2** briefly summarizes the basic structure and parameters of the 2019 Study, including the analysis periods, road (highway) systems, revenues attributed to vehicle classes, and expenditures allocated to those vehicle classes.
- **Chapter 3** presents the general methodology and approach used for the study. It includes a description of the special analyses conducted for the study and discussion of the major methodological and procedural changes from previous Oregon studies.
- **Chapter 4** summarizes the data and forecasts used in the study and compares them to the data and forecasts used in recent studies.
- **Chapter 5** presents the study expenditure allocation and revenue attribution procedures and results, and compares the methods and results to those of previous Oregon studies.
- **Chapter 6** brings together the expenditure allocation and revenue attribution results from the previous chapter to develop ratios of projected payments to cost responsibilities for light vehicles and the detailed heavy vehicle weight classes. It also compares these ratios with those from the 2001-2017 Oregon studies.
- **Chapter 7** contains recommendations for changes in existing tax rates and fees to bring about a closer match between revenues contributed and cost responsibilities for each vehicle class.
- **The Appendices** to this study are presented in a separate document because of their size. The appendices include:

Appendix A. **Glossary of terms**

Appendix B. **Summary of highway cost-allocation studies in other states**

Appendix C. **The minutes of each SRT meeting**

Appendix D. **HCAS model user guide**

Appendix E. **HCAS model reference guide**

Appendix F. **2019 input data and assumptions**

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CHAPTER 2: SUMMARY OF THE BASIC STRUCTURE AND PARAMETERS OF STUDY

The underlying approach and methods used in this highway cost allocation study are, with a few major exceptions, like those used in the last six Oregon studies. The analytical framework and basic parameters of the 2019 Study are briefly summarized below.

STUDY APPROACH

This study uses the cost-occasioned approach, employing an incremental, design-based allocation methodology for bridges and the 2010 version of the National Pavement Cost Model (NAPCOM) for pavement costs. This is the same general approach that was used in previous Oregon studies and virtually all studies conducted by the federal government and other states.

GENERAL METHODOLOGY

This section describes key assumptions and data sources for the analysis.

Analysis Periods

- **Base Year:** Calendar year 2017, the most recent full year for which data were available when the study was undertaken.
- **Forecast Year:** Calendar year 2020, the middle 12 months of the 24-month study biennium.
- **Study Period:** The 2019-21 State Fiscal Biennium, or July 1, 2019 to June 30, 2021.

The expenditures allocated in this study are those projected for the 2019-21 biennium using ODOT's Cash Flow Forecast model. All traffic data used in the study were first developed from data for the 2017 base year, and then projected forward to the 2020 forecast year using weight-class-specific growth rates.

ROAD (HIGHWAY) SYSTEMS

This study uses the Federal Highway Administration's classification system for highway functional classes. Every public road in Oregon is assigned to one of 14 functional classes, which are defined as combinations of urban or rural and seven classifications based on the purpose of the road:

1. Interstate Freeways
2. Other Freeways and Expressways
3. Other Principal Arterials
4. Minor Arterials
5. Major Collectors
6. Minor Collectors
7. Local Streets and Roads

Each roadway segment is also assigned to one of four ownership categories: state, county, city, or federal. Note that U.S. Highways and Interstates are owned by the state; federal ownership consists mostly of Forest Service and Bureau of Land Management roads.

In addition to the 14 federal functional classes, we developed three other categories to facilitate the allocation of costs for projects on multiple functional classes. The additional categories are: all roads, all state-owned roads, and all locally-owned roads.

VEHICLE CLASSES

Light vehicles include all vehicles up to 10,000 pounds gross weight, consistent with Oregon law and registration fee schedules. In studies prior to 2007, light vehicles were defined as vehicles up to 8,000 pounds.

Vehicles weighing more than 10,000 pounds are divided into 2,000-pound vehicle classes. All vehicles over 200,000 pounds are in the top weight class. Those over 80,000 pounds are further divided into subclasses based on the number of axles on the vehicle. The five subclasses are five, six, seven, eight, and nine or more axles.

Vehicles over 26,000 pounds are assigned to weight classes based on their declared weight, which may be different from their registered gross weight. For example, a given tractor may operate with different configurations (number and type of trailers) at various times, and may have different declared weights for different configurations.

For modeling purposes, each weight class up to 80,000 pounds is assigned a distribution of numbers of axles, and each combination of weight class and number of axles is assigned a distribution of operating weights. For vehicles over 26,000 pounds, these distributions are obtained from Weigh-In-Motion data, which are collected and supplied by ODOT.

For reporting purposes, the expenditure allocation and revenue attribution results reported in Chapters 5 and 6 are presented in terms of the following seven summary-level vehicle weight groups:

- 1 to 10,000 pounds
- 10,001 to 26,000 pounds
- 26,001 to 78,000 pounds
- 78,001 to 80,000 pounds
- 80,001 to 104,000 pounds
- 104,001 to 105,500 pounds
- 105,501 pounds and up

The study team determined the various weight classes based on the characteristics of the vehicles in each group, logical divisions in the tax structure, and the number of vehicles and miles in each group. Operators of vehicles in the 10,001 to 26,000-pound group, for example, pay the state fuel tax and higher registration fees rather than the weight-mile tax. Additionally, most of these vehicles are two-axle, single-unit trucks or buses used in local commercial delivery operations or passenger transport. Thus, they have similar characteristics with respect to their cost responsibility and tax payments. It is therefore, logical to combine them for reporting purposes.

Similarly, it makes sense to combine the individual weight classes above 105,500 pounds because these vehicles are (a) operated under special, single-trip, non-divisible load permits, (b) operated with multiple axles and legally allowed higher axle weights than regular commercial trucks, (c) subject to the road use assessment fee rather than the weight-mile tax for their loaded front haul miles, and (d) typically used for short-mileage hauls (e.g., transporting heavy equipment from one construction site to another) and so account for a very small proportion of total truck miles in the state.

The weight classes of 78,001 to 80,000 and 104,001 to 105,500 pounds are by far the largest two truck classes by miles of travel. These two classes alone account for a majority of the total commercial truck miles in Oregon. Because of the dominant role of these two classes in terms of miles of travel, cost responsibilities, and revenue contributions, it is logical they be kept as separate groups.

EXPENDITURES ALLOCATED

State Expenditures

All state expenditures of highway user fee revenues are allocated to vehicle weight classes, as are all state expenditures of federal highway funds (e.g., matching funds). Federal funds are included because they are interchangeable with state user fee revenues. Any differences in the way they are spent are arbitrary and subject to change.

State expenditures of bond revenues are included because the bonds are repaid from state user fees. Such expenditures are, however, reduced to the amount that will be repaid in the study period before these expenditures are allocated. The remaining expenditures will be included in future studies using the allocation to vehicle classes applied in this study, consistent with the approach taken in the 2005 through 2017 studies. Thus, expenditures of bond revenues that were allocated in the most recent prior study will be included in this and the next eight studies.

Local Government Expenditures

The study allocates all expenditures by local governments of state highway user fees and federal highway funds. Federal funds are included because, again, they are interchangeable with state user-fee revenues.

Some local-government own-source revenues are allocated because they are interchangeable with state highway user fees. The study excludes local-government own-source revenues reported as coming from locally issued bonds, property taxes (including local improvement districts), systems development charges, and traffic impact fees. These revenue sources must be spent on certain projects or certain types of projects and are not considered interchangeable with state highway user fees.

In studies prior to 2003, only the expenditures of state highway user fee revenues were allocated. This approach failed to account for the interchangeability of funds from other sources and required local governments to estimate how state funds were spent because their accounting systems do not track expenditures by funding source.

In the 2003 Study, all expenditures by local governments were allocated. The 2005 Study refined the approach taken in the 2003 Study by excluding certain categories of own-source revenue that are not interchangeable. This approach has been used to allocate local government expenditures since the 2005 Study.

Expenditure Categories

The four major expenditure categories used for the 2019 Study are:

- **Modernization (new construction or reconstruction).** Examples include adding lanes and straightening curves. Modernization adds to the capacity of a roadway either directly or by improving throughput. A replacement bridge with more lanes than the bridge it replaces is considered modernization.

- **Preservation (rehabilitation).** Most preservation projects involve repaving existing roads. Preservation projects extend the useful life of a facility but does not add to its capacity. A replacement bridge that does not add capacity is considered preservation.

- **Maintenance and Operations.** Examples of maintenance include pot-hole patching, pavement striping, snow and ice removal, and bridge maintenance. Examples of operations include traffic signals, signage, and lighting.

- **Administration, Revenue Collection, Planning, and Other Costs**. Within each of these major categories, expenditures are further broken down into several individual work types. Maintenance and Operations, for example, includes 16 individual work types. A separate allocation is performed for the expenditures in each individual work type. Chapter 3 contains a full listing of these work categories and the allocators used for each.

REVENUES ATTRIBUTED TO VEHICLES

The revenues attributed to vehicles are based on forecasted collections for the 2019-21 biennium by major state revenue source under the existing tax structure and current-law tax rates (i.e., current registration and title fees, fuel tax, weight-mile tax, flat fee, and road use assessment fee rates).

Because non-state funding sources are included as expenditures, the amount of total expenditures allocated is larger than the amount of total revenues attributed. This difference in absolute size does not, however, affect the calculation of equity ratios, which are ratios of ratios (each vehicle class's share of attributed revenues divided by its share of allocated expenditures).

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CHAPTER 3: GENERAL METHODOLOGY AND STUDY APPROACH

This chapter presents the general methodology and approach used in the 2019 Oregon Highway Cost Allocation Study.

COST-OCCASIONED APPROACH

All Oregon highway cost allocation studies, as well as the studies conducted by the federal government and most other states, use what is called the cost-occasioned approach. The basic premise of this approach is that each class of road user should pay for the system of roads in proportion to the costs associated with road use by that class. The equity of a road tax system may then be judged by how well shares of payments by different classes of road users match their shares of costs resulting from their use of the road system.

The principal alternative to the cost-occasioned approach is the benefits approach, in which an attempt is made to identify and measure the benefits received by both users and nonusers of the system. The benefits approach begins with the recognition that the purpose of a highway system is to provide benefits, both directly to highway users and indirectly to the rest of society. Basing user fees on the value of benefits received, rather than on the costs imposed, would promote both fairness (people pay in proportion to the value they receive) and efficiency (agencies would have less incentive to build facilities where the costs exceed the benefits).

The benefits approach has two major drawbacks: benefits are not directly measurable, and the benefits associated with traveling a mile on a given road can vary between identical-appearing vehicles or individuals and for the same vehicle or person at various times. Additionally, such an approach assumes that the benefits would not otherwise, and more economically, be realized through non-road-based modes of transportation.

A long-running debate about the proper balance of cost responsibility and tax burden between highway users and nonusers continues at both the state and federal levels, fueled over the years by numerous studies. Arguments that support charging nonusers for highways are based on the societal benefits attributable to the highway system, including increased mobility, safety, and economic development.

There are, however, some serious conceptual problems in quantifying benefits and deciding which accrue to users and which accrue to nonusers. In many cases, highway improvements benefit individuals or businesses simultaneously as both users and nonusers. Additionally, the more readily understood economic impacts of highway improvements often reflect a transfer of user benefits to nonusers — the clearest example being reduced shipping costs, which are passed to businesses and consumers in the form of lower product prices.

Because of these problems, and because of the inherent advantages of user fees in promoting an economically efficient allocation of scarce resources, the federal government and most states conducting cost allocation studies now rely on a cost-occasioned approach to determine responsibility for highways. The Oregon studies continue to use a cost-occasioned approach.

INCREMENTAL METHOD

Within the cost-occasioned approach, different methods may be used to allocate costs or expenditures to the various vehicle classes. Virtually every recent study, including Oregon's, has used some version of what is referred to as the incremental method. This method divides selected aspects of highway costs into increments, allocating the costs of successive increments to only those vehicles needing the higher cost increment. The design considered adequate for light vehicles only is viewed as a common responsibility of all highway users and is shared by all vehicle classes. Each group of successively larger and heavier vehicles also shares in the incremental costs they occasion.

In Oregon, the incremental method is used directly in the allocation of bridge costs. The first increment for a new bridge, for example, identifies the cost of building the bridge to support its own weight, withstand other non-load-related stresses (e.g., stream flow, high winds, and potential seismic forces), and carry light vehicle traffic only.[5] This cost is a common responsibility of all vehicles and is assigned to all classes on the basis of each class's share of total vehicle miles traveled (VMT).

[5] The factors influencing the design requirements, and therefore costs, of bridges, are sometimes expressed by the terms dead load, live load, and total load. Bridges need to be designed to support their own weight and the other non-load-related forces such as stream flow, wind, and seismic forces (the dead load) plus the traffic loadings anticipated to be applied to the bridge (the live load). The total design load is the sum of the dead and live loads. Although the precise relationships differ by the type and location of the bridge under consideration, as a rule, the longer the span length, the greater the relative importance of the non-load-related factors in determining the total cost of the bridge.

The second increment identifies the additional cost of building the bridge to accommodate trucks and other heavy vehicles weighing up to 50,000 pounds. This cost is assigned to all vehicles with gross weights exceeding 10,000 pounds based on the relative VMT of each class over 10,000 pounds. Similarly, the additional cost of the third increment is assigned to all vehicles with gross weights over 50,000 pounds, the cost of the fourth increment to vehicles having gross weights over 80,000 pounds, and the cost of the fifth and final increment to vehicles having gross weights over 105,500 pounds.

NATIONAL PAVEMENT COST MODEL (NAPCOM)

In the past, highway cost allocation studies typically used an incremental methodology to allocate pavement costs as well. Increased depth and strength of pavement surface and base is required to support increases in the number, and particularly weight, of the vehicles anticipated to use the pavement during its design life.

For the 1997 federal study, Roger Mingo adapted the National Pavement Cost Model (NAPCOM) for use in highway cost allocation. The model had two increments: non-load-related costs and load-related costs, with the load-related costs allocated using results from detailed engineering models of several different pavement degradation mechanisms that consider the effects of climate, traffic levels, mix of vehicle types, and the interactions between different mechanisms.

Mingo adapted the pavement model to use Oregon's special weighing data[6] and to use 2,000-pound increments of declared vehicle weight for data input and results reporting. The allocation of costs in the second increment used the detailed results of the Oregon-specific pavement cost model, which provides allocation factors by weight class and number of axles for each combination of functional class and pavement type (flexible or rigid).

An updated version of NAPCOM was completed in 2010. This version of the model is different from the earlier versions in several ways, though the fundamental idea of incremental allocation of non-load-related and load-related costs is the same. Among the main differences in the newest version of NAPCOM are the new pavement distress models and equations for load-related costs, which have been updated to reflect the current accepted pavement damage models and theories. Load-related costs are allocated using results from newer detailed, empirical engineering models that have been calibrated to pavement distress data.

The 2010 NAPCOM model was used to develop the pavement factors for the 2011 through 2017, and 2019 Oregon Studies. Like the development of pavement factors for past studies, pavement factors were developed by 2,000-pound increments of declared vehicle weight. Weigh-in-motion (WIM) data were also used to construct distributions of configurations and declared weights by operating weight. The 2011 Oregon Highway Cost Allocation Study was the first study to use the updated version of NAPCOM to generate pavement factors for highway cost allocation.

THE CHOICE OF APPROPRIATE COST ALLOCATORS

Some quantifiable measure, or allocator, must be used to distribute each category of cost, or each increment within a category where the incremental approach is used, to the individual vehicle classes. For many costs, there are logical relationships that suggest which allocator is most appropriate.

Wear-related costs are a direct, empirically established consequence of use by vehicles, and are the easiest cost to allocate. The amount of wear a vehicle imposes per mile of travel relates closely to measurable attributes of the vehicle. Two approaches may be used for choosing allocators for wear-related costs:

- Results from a detailed model that predicts costs imposed by individual vehicles are used to develop allocation factors that produce the same attribution of costs as the model. That is how pavement costs are handled in this study.
- When a detailed model for attributing wear-related costs does not exist, this analysis uses allocation factors based on how wear is expected to vary in proportion to the wear imposed per unit of use by the vehicles in each category. For example, striping costs are allocated according to axle-miles of travel because it is expected that stripes wear in proportion to the number of axles that pass over them.

For structures and, to a lesser extent, roadways, the cost of constructing a facility with a given capacity will vary with the maximum weight and size

[6] Special weighings, which are no longer conducted, record the weight of every truck passing the scale, even if empty. Weights were reported for each axle grouping, along with the number of axles in the group. These data replaced the more generalized assumed distributions of operating weight and vehicle configurations used in the national model. The 2010 version of NAPCOM, and Oregon HCAS studies since 2011 use weigh-in-motion data, which record the weight on each axle and the distances between axles for every truck passing each of many sensors around the state.

of vehicle expected to use it. Part of the difference in construction costs, however, may be offset by increased useful life of a sturdier facility. If one attributes capital costs based on differences in the size or strength of the structure required to accommodate several types of vehicles, then the incremental approach may be used.

The incremental approach, by itself, does not account for the capacity demand that drove the decision to build the facility. For bridges and structures, projects that added capacity were identified so that the base increment of the structure cost could be allocated using the peak-period passenger-car-equivalent VMT allocator (peak PCE-VMT). The incremental approach may be modified to consider the expected effects of structure design on useful life, as was done in the allocation of bridge costs in recent Oregon studies.

All other approaches to capital-cost allocation are theoretically arbitrary and thus inherently second best. However, other approaches may be selected because of their convenience, despite the lack of a compelling underlying logic. One such second-best approach to allocating capacity-enhancing capital costs was used in the most recent Oregon studies. The non-wear-related portion of capital costs were allocated in proportion to passenger-car-equivalent vehicle-miles traveled during the peak hour (peak PCE-VMT), which varies in proportion to each vehicle's contribution to congestion on existing facilities, but does not consider the relationship between volume and capacity on existing facilities. The approach also assumes that the value of time is equal across all vehicle types, trip types, and vehicle occupancies.

If the benefits resulting from a given expenditure vary with vehicle use, the cost may be allocated in proportion to the level of benefit. For example, if the occupants of every vehicle passing a safety improvement benefit from reduced risk of death or injury, the cost could be attributed based on occupant-miles traveled or, if occupancy is assumed to be the same across all vehicles, vehicle-miles traveled. Other costs may not vary at all with vehicle use but must still be allocated to vehicles. If one allocates costs that do not vary with use, any allocator that seems "fair" may be chosen. In these cases, there is no single right allocator to use.

In general, an allocator that varies more closely with costs imposed should be selected over one that varies less closely. The degree of correlation may be measurable given enough data, but the necessary data usually do not exist, so one must calculate the expected relationship based on engineering and economic theory. A strong statistical correlation does not necessarily indicate a good allocator, as there is no reason to believe that an accidental correlation will persist. An allocator must also vary with measurable (and measured) attributes of vehicles, such as miles traveled, weight, length, number of axles, or some combination of those.

Allocators Used In This Study

As noted above, there are several cost allocators available for use in a cost allocation study. Allocators may be applied on either a per-vehicle or per-vehicle-mile-traveled basis. Because it is vehicle use, rather than the existence of vehicles, that imposes costs on the highway system, many costs in the current Oregon study are allocated using some type of weighted vehicle-miles traveled (VMT). Exhibit 3-1 shows the allocators applied to each expenditure category for this study.

EXHIBIT 3-1: ALLOCATORS APPLIED TO EACH WORK TYPE

Work Type Description	Work Type	Allocator 1	Share 1	Allocator 2	Share 2
Preliminary and Construction Engineering (and etc.)	1	CongestedPCE	0.5595	Other_Construction	0.4405
Right of Way (and Utilities)	2	CongestedPCE	0.7375	Other_Construction	0.2625
Grading and Drainage	3	CongestedPCE	1.0000	None	0.0000
New Pavements-Rigid	4	CongestedPCE	0.0410	Rigid	0.9590
New Pavements-Flexible	5	CongestedPCE	0.0548	Flex	0.9452
New Shoulders-Rigid	6	CongestedPCE	1.0000	None	0.0000
New Shoulders-Flexible	7	CongestedPCE	1.0000	None	0.0000
Pavement and Shoulder Reconstruction-Rigid	8	CongestedPCE	0.0410	Rigid	0.9590
Pavement and Shoulder Reconstruction-Flexible	9	CongestedPCE	0.0548	Flex	0.9452
Pavement and Shoulder Rehab-Rigid	10	All_VMT	0.0410	Rigid	0.9590
Pavement and Shoulder Rehab-Flexible	11	All_VMT	0.0548	Flex	0.9452
Culverts	12	All_VMT	0.8752	Flex	0.1248
New Structures	13	None	1.0000	None	0.0000
Replacement Structures	14	None	1.0000	None	0.0000
Structures Rehabilitation	15	None	1.0000	None	0.0000
Climbing Lanes	16	UphillPCE	1.0000	None	0.0000
Truck Weight/Inspection Facilities	17	Over_26_VMT	1.0000	None	0.0000
Truck Escape Ramps	18	Over_26_VMT	1.0000	None	0.0000
Interchanges	19	None	1.0000	None	0.0000
Roadside Improvements	20	All_VMT	1.0000	None	0.0000
Safety Improvements	21	CongestedPCE	1.0000	None	0.0000
Traffic Service Improvements	22	CongestedPCE	1.0000	None	0.0000
Other Construction (modernization)	23	Other_Construction	1.0000	None	0.0000
Other Construction (preservation)	24	Other_Construction	1.0000	None	0.0000
Surface and Shoulder Maintenance-Rigid	25	All_VMT	0.0410	Rigid	0.9590
Surface and Shoulder Maintenance-Flexible	26	All_VMT	0.0548	Flex	0.9452
Surface and Shoulder Maintenance-Other	27	All_AMT	1.0000	None	0.0000
Drainage Facilities Maintenance	28	All_VMT	1.0000	None	0.0000
Structures Maintenance	29	All_VMT	1.0000	None	0.0000
Roadside Items Maintenance	30	All_VMT	1.0000	None	0.0000
Safety Items Maintenance	31	All_VMT	1.0000	None	0.0000
Traffic Service Items Maintenance	32	CongestedPCE	1.0000	None	0.0000
Pavement Striping and Marking (maintenance)	33	All_AMT	1.0000	None	0.0000
Sanding and Snow and Ice Removal (maintenance)	34	All_VMT	1.0000	None	0.0000
Extraordinary Maintenance	35	All_VMT	1.0000	None	0.0000
Truck Scale Maintenance-Flexible	36	Over_26_VMT	1.0000	None	0.0000
Truck Scale Maintenance-Rigid	37	Over_26_VMT	1.0000	None	0.0000
Truck Scale Maintenance-Buildings and Grounds	38	Over_26_VMT	1.0000	None	0.0000
Studded Tire Damage	39	Basic_VMT	1.0000	None	0.0000
Miscellaneous Maintenance	40	All_VMT	1.0000	None	0.0000

EXHIBIT 3-1: ALLOCATORS APPLIED TO EACH WORK TYPE (CONTINUED)

Work Type Description	Work Type	Allocator 1	Share 1	Allocator 2	Share 2
Bike/Pedestrian Projects	41	All_VMT	1.0000	None	0.0000
Railroad Safety Projects	42	All_VMT	1.0000	None	0.0000
Transit and Rail Support Projects	43	CongestedPCE	1.0000	None	0.0000
Fish and Wildlife Enabling Projects	44	All_VMT	1.0000	None	0.0000
Highway Planning	45	All_VMT	1.0000	None	0.0000
Transportation Demand & Transportation System Management	46	CongestedPCE	1.0000	None	0.0000
Multimodal	47	CongestedPCE	1.0000	None	0.0000
Reserve Money, Fund Exchange, Immediate Opportunity Fund	48	All_VMT	1.0000	None	0.0000
Seismic Retrofits on Structures	49	All_VMT	1.0000	None	0.0000
Other Common Costs	50	All_VMT	1.0000	None	0.0000
Other--Over 26,000 Only	55	Over_26_VMT	1.0000	None	0.0000
Other--Basic Only	56	Basic_VMT	1.0000	None	0.0000
Other--Over 8,000 Only	57	Over_10_VMT	1.0000	None	0.0000
Other--Under 26,000 Only	58	Under_26_VMT	1.0000	None	0.0000
Other Administration	59	All_VMT	1.0000	None	0.0000
Bridge --All Vehicles Share (no added capacity)	60	All_VMT	1.0000	None	0.0000
Bridge --Over 8,000 Vehicles Share	61	Over_10_VMT	1.0000	None	0.0000
Bridge --Over 50,000 Vehicles Share	62	Over_50_VMT	1.0000	None	0.0000
Bridge --Over 80,000 Vehicles Share	63	Over_80_VMT	1.0000	None	0.0000
Bridge --Over 106,000 Vehicle Share	64	Over_106_VMT	1.0000	None	0.0000
Bridge --All Vehicles Share (added capacity)	65	CongestedPCE	1.0000	None	0.0000
Other Bridge	66	Other_Bridge	1.0000	None	0.0000

Unweighted VMT is the most general measure of system use and is considered a fair way to assign many types of common costs, that is, costs considered to be the joint responsibility of all highway users. VMT represent a reasonable and accepted measure to assign costs among the members of a subgroup (e.g., the individual vehicle classes within a cost increment), especially when members of the subgroup have similar characteristics or when an investment is made to provide a safer highway facility. Unweighted VMT are used for many traffic-oriented services, such as the provision of lighting, signs, and traffic signals, since these services are related to traffic volumes.

Weighted VMT, with an appropriate vector of zeros and ones, will produce an allocator that restricts the allocation to a corresponding subset of weight classes. Such allocators are used to implement the incremental approach for bridge costs and for other costs allocated on VMT for a subset of all vehicles. One example is the allocation of Motor Carrier Transportation Division administrative costs only to vehicles over 26,000 pounds.

Other VMT weighting factors may also be used to allocate certain costs more appropriately. VMT can be weighted to account for the effective roadway space occupied by several types of vehicles relative to a standard passenger car. This is accomplished by using passenger-car equivalence (PCE) factors to weight VMT, producing PCE-VMT. Because trucks are larger and heavier than cars and require greater acceleration and braking distances, they occupy more effective roadway space and therefore have higher PCE factors.

A variety of PCE factors were developed for the 1997 federal study, including factors for different functional classes and traffic congestion, as well as uphill factors for steep grades. The uphill factors are used in this study to allocate the costs of climbing lanes.

Congested (or peak period) PCE-VMT is peak-period VMT weighted by the PCE factors for congested traffic conditions. It is used in this study for the common cost portion of projects undertaken to add capacity to the highway system.

VMT can also be weighted to reflect the amount of pavement wear imposed by vehicles of various weights and axle configurations. The factors used for this weighting are produced from the results of the pavement model described above.

Costs not accounted for as a part of specific construction projects but that are expected to vary with the overall level of construction are allocated with special factors developed during the allocation process. These factors allocate costs in proportion to the construction costs that were allocated from specific projects. Separate “other construction” factors are calculated and applied for work performed by the state and by local governments.

Prospective View

The costs or expenditures allocated in a cost allocation study can be those for a past period, those anticipated for a future period, or a combination of past and future costs. Some studies conducted by the federal government and other states have allocated both historical and planned expenditures.

The Oregon studies have traditionally used a prospective approach in which the expenditures allocated are those planned for a future period, specifically, the next fiscal biennium. Similarly, the traffic data used in these studies are those projected for a future year. This is done to allow for changes in expenditure levels and traffic volumes, and so that the study results will be applicable for the period for which legislation is enacted to implement the study recommendations.

There are some disadvantages associated with allocating only projected future expenditures. Specifically, it requires relying on forecasts, which are subject to greater error than historical data.

The 1996 Cost Responsibility Blue Ribbon Committee recommended that the Oregon studies continue allocating only projected future expenditures. The current Oregon study again follows that recommendation, except for incorporating study-period expenditures on the repayment of bonds issued in the prior study periods, allocated in the same proportions as in the prior studies.

Exclusion of External (Social) Costs

The Oregon studies, as well as studies conducted by most other states have chosen to allocate direct governmental expenditures and exclude external costs associated with highway use. The proponents of a cost-based approach argue that, to be consistent, a HCAS should include all costs that result from use of the highway system. They further argue that economically efficient pricing of highways requires the inclusion of all costs and that failure to do so encourages an over-utilization of highways. Including external costs adds to the breadth and completeness of the analysis and helps determine appropriate user charges necessary to reflect these costs.

However, there are several disadvantages associated with including external costs. Although these costs represent actual costs to society, they are decidedly more difficult to quantify and incorporate in the analysis than are direct highway costs. Inclusion of external costs therefore increases the data requirements and complexity of the studies, and could reduce their overall accuracy.

The 1996 Blue Ribbon Committee recommended that the Oregon studies continue to exclude social costs until the state implements explicit user charges to capture these costs. Both the 1982 and 1997 federal HCASs included some social costs in supplementary analyses. The 1999 Oregon Study recommended that future studies include “a separate assessment of the impacts of proposed changes in highway user taxes on the total costs of highway use including all major external costs.” The 2001 and 2003 studies made this same recommendation.

In 2009, the State Legislature directed the Oregon Department of Administrative Services to prepare a second highway cost allocation study based on the concept of the efficient pricing of highways, in addition to the traditional study. ORS 366.506 Section 30 in House Bill 2001 specifically required that an efficient fee study “consider the actual costs users impose on the highway system, including but not limited to highway replacement costs, traffic congestion costs and the cost of greenhouse gas emissions.” Additionally, the efficient fee study report needed to “include recommendations for legislation to implement the efficient fee method of cost allocation.” The results of the 2011 Oregon Efficient Fee Highway Cost Allocation Study were presented in a separate report.

EXPENDITURE ALLOCATION

The Oregon studies allocate expenditures of road-related user fees, rather than costs. Over the long run, expenditures must cover the full direct costs being imposed on the system or the system will deteriorate. Over any shorter period, however, expenditures will exceed or fall short of the costs imposed. Additionally, local governments spend money from sources other than user fees on local roads and bridges. Oregon's highway cost allocation process includes the expenditure of the portion of local governments' own-source revenues that are fungible with state user fees, but excludes the expenditure of own-source funds that are dedicated to specific projects or purposes. In this study, 22.8 percent of local government expenditures (5.4 percent of all expenditures) were excluded.

Some past Oregon studies, including a special analysis in the 2001 Study, attempted to estimate and allocate a full-cost budget in addition to a base-level (actual expenditure) budget. The intent was to approximate costs by estimating the level of expenditures required to preserve service levels and pavement conditions at existing levels. In these studies, heavy vehicles were found to be responsible for a greater share of the preservation level budget than of the base-level budget. This was because most unmet needs at that time involved pavement rehabilitation and maintenance, items for which heavy vehicles have the predominant responsibility.

There are convincing arguments for moving toward a full cost-based approach in highway cost allocation studies. Recognizing the benefit of moving toward a financing system based on efficient fees, a full 2011 Efficient Fee Highway Cost Allocation Study was performed in addition to the traditional study. "True" costs are still more difficult to quantify and incorporate in the analysis than are direct highway expenditures. Some of these problems are theoretical in nature or are limited by our knowledge of such costs, and data limitations also plague the calculation of many of these costs. As a practical matter, therefore, highway cost allocation studies, including this study, continue to focus on the allocation of expenditures rather than costs.

Treatment of Debt-Financed Expenditures and Debt Service

Oregon has traditionally relied much less on debt financing of its highway program than have other states. This has changed since the enactment of the Oregon Transportation Investment Act (OTIA) by the 2001 Legislature. The first OTIA authorized the issuance of $400 million in new debt for projects to be completed across Oregon. It provided $200 million for projects that add lane capacity or improve interchanges and $200 million for bridge and pavement rehabilitation projects. Automobile and truck title fees were increased to finance the repayment of construction bonds for OTIA projects.

Favorable bond-rate conditions allowed the 2002 Special Legislative Session to authorize an additional $100 million in debt without needing to further increase revenues. The original OTIA projects became known as OTIA I and the additional projects as OTIA II.

The 2003 Legislature authorized an additional $2.46 billion in new debt and increased title, registration, and other DMV fees to produce the additional revenue necessary to repay the bonds. The OTIA III money was to be spent as follows:

- $1.3 billion to repair or replace 365 state bridges
- $300 million to repair or replace 141 locally owned bridges
- $361 million for local-government maintenance and preservation
- $500 million for modernization

The issue of how to treat OTIA project expenditures and the associated debt service was discussed at some length by the Study Review Teams for both the 2003 and 2005 studies. Debt finance introduces a disconnect between study-period revenues and expenditures because the period in which the revenues are received differs from the period in which the funds are expended. Care needs to be taken to avoid double counting, which would occur if both the debt-financed project expenditures and full debt service expenditures (including interest and repayment of principal) were included.

While not all the funds expended on OTIA projects come from bonds, the bonded amounts are easily identifiable, as are the associated debt service expenses. The dollar amount allocated in the model is the study-period debt service expenditure, given the bond rate and amortization period, in this case 20 years. The expenditures associated with each bond-financed project are scaled down by a bond factor to one study-period worth of debt service expenditure before allocation. This method retains the project detail necessary to assign expenditure shares by vehicle class. The dollar amounts allocated to each vehicle class for bonded projects are recorded and carried forward to each of the next nine studies.

This approach has two disadvantages: the choice of which projects get bond financing can affect the results of the study, as well as the next nine studies, and the allocation of those expenditures in future studies remains based on traffic conditions expected for the first two years of the 20-year repayment period. The Study Review Team considered several alternative approaches and decided that the advantages of simplicity and limited data requirements for the chosen approach outweighed its disadvantages. They also noted that the failure to update the allocation in future studies was consistent with the treatment of cash-financed projects, which are completely ignored in all future studies.

Treatment of Alternative-Fee-Paying Vehicles

Under Oregon's existing highway taxation structure, some types of vehicles are exempt from certain fees or qualify to pay according to alternative-fee schedules. These types of vehicles are collectively referred to in this report as "alternative-fee-paying" vehicles. The two main types of such vehicles are publicly owned vehicles and farm trucks. Publicly owned vehicles pay a nominal registration fee and are not subject to the weight-mile tax. Most types of publicly owned vehicles are now subject to the state fuel tax, but many diesel-powered publicly owned vehicles are not. Operators of farm trucks pay lower annual registration fees than operators of regular commercial trucks, and most pay fuel taxes, rather than weight-mile taxes when operated on public roads.

The reduced rates paid by certain types of vehicles mean they are paying less per mile than comparable vehicles subject to full fees. The difference between what alternative-fee-paying vehicles are projected to pay and what they would pay if they were subject to full fees is the alternative-fee difference. The approach used in past Oregon studies was to calculate this difference for each weight class and sum these amounts. The total alternative-fee difference (subsidy amount) was then reassigned to all other, full-fee-paying vehicles on a per-VMT basis, that is, this amount was treated as a common cost to be shared proportionately by all full-fee-paying vehicles.

The rationale for this approach was that the granting of these reduced fees represents a public policy decision, and most vehicles paying reduced fees are providing some public service that should be paid for by all taxpayers in relation to their use of the system. Because the heavy vehicle share of the total alternative-fee difference is greater than their share of total statewide travel, reassigning this amount based on relative vehicle miles had the effect of increasing the light vehicle responsibility share and reducing the heavy vehicle share.

Beginning with the 2013 study, the Study Review Team recommended that the alternative-fee difference be reported, but that the results be calculated for full-fee paying vehicles only, without any adjustment related to alternative-fee paying vehicles.

Treatment of Tax Avoidance and Evasion

When vehicles subject to Oregon's fuel tax purchase fuel in another state and then drive in Oregon, they avoid the Oregon fuel tax. The reverse is also true, so if the number of miles driven in Oregon on out-of-state fuel equaled the number of miles driven outside Oregon on in-state fuel, the net avoidance would be zero. The net avoidance is specifically accounted for in the highway cost allocation study by assuming that 3.5 percent of VMT by fuel-tax paying vehicles do not result in fuel-tax collections for Oregon.

The International Fuel Tax Agreement sorts out the payments of state fuel taxes and the use of fuel in other states for interstate truckers. If truckers pay fuel tax in California, for example, and then use that fuel in Oregon while paying the weight-mile tax, IFTA provides a mechanism for California to reimburse them. If truckers then buy fuel in Oregon, paying no fuel tax, and drive in Washington, IFTA provides a mechanism for them to pay what they owe to Washington.

The avoidance of the weight-mile tax by vehicles that are not legally required to pay it is treated as described above, under alternative-fee paying vehicles, rather than as avoidance.

Virtually any tax is subject to some evasion. While it is generally agreed that evasion of the state gasoline tax and vehicle registration fees is quite low, there is more debate concerning evasion of the weight-mile and use fuel (primarily diesel) taxes. For this study, we assume that evasion of the weight-mile tax is equal to 5.0 percent of what would be collected if all that is due were paid. This is the midpoint of the 3 to 7 percent evasion rate estimated by the Oregon Weight-Mile Tax Study conducted by consultants for the Legislative Revenue Office in 1996. This study also assumes that an additional 1.0 percent of the use-fuel tax on diesel (beyond the 3.5 percent avoidance) is successfully evaded.

TYPES OF DATA

Five major types of data are required to conduct a highway cost allocation study:

- Traffic data. The miles of travel by vehicle weight and type on each of the road systems used in the study.
- Expenditure data. Projected expenditures on construction projects by work type category, road system, and funding source, and projected expenditures in other categories by funding source.
- Revenue data. Projected revenues by revenue source or tax instrument.
- Allocation factors. Factors used to allocate costs to individual vehicle classes, including passenger-car equivalence (PCE) factors, pavement factors, and bridge increment shares.
- Conversion factors and distributions. Examples include distributions used to convert VMT by declared weight class to VMT by operating weight class or to VMT by registered weight class.

The allocation factors used in this study are described in Chapter 3 and the development and use of conversion factors is described in Appendix E: Model Reference Guide.

The remainder of this chapter presents the traffic, expenditure, and revenue data used in the 2019 Study and compares them with the data used in the previous Oregon studies.

Traffic Data and Forecasts

VMT by road system, by vehicle weight class and number of axles, and by vehicle tax class are important throughout the cost allocation and revenue attribution processes. VMT estimates and projections are used in both the allocation of expenditures and the attribution of revenues to detailed vehicle classes. Additionally, as explained in Chapter 3, VMT weighted by factors such as PCEs or pavement factors is used to assign several of the individual expenditure categories allocated in the study.

For this study, the required traffic data were first collected for the 2017 base year, the latest year for which complete historical data were available. These data were then projected forward to calendar year 2020, the middle 12 months of the 2019-21 fiscal biennium, which is the study period.

The base year traffic data were obtained from several sources. These include ODOT Motor Carrier Transportation Division (MCTD) weight-mile tax information, Highway Performance Monitoring System (HPMS) submittals, MCTD and Driver & Motor Vehicle Services vehicle registrations data, and the Weigh-In-Motion data. For each road system used in the study, travel estimates are developed for light vehicles and each 2,000-pound heavy-vehicle weight class.

Information from state economic forecasts and from ODOT's revenue forecasting model is used to forecast projected study year traffic from the base year data. Data from Weigh-In-Motion are used to convert truck miles of travel by declared weight class to miles of travel by operating weight class and to obtain detailed information on vehicle configurations and axle counts for each weight class. HPMS and FHWA Highway Statistics data are used to spread VMT to functional classifications.

EXHIBIT 4-1: CURRENT AND FORECASTED VMT BY WEIGHT GROUP (MILLIONS OF MILES)

Declared Weight in Pounds			2017 VMT (estimate)	2020 VMT (forecast)	Avg. Annual Growth Rate
1	to	10,000	33,814	34,293	0.5%
10,001	to	26,000	940	954	0.5%
26,001	to	78,000	446	532	6.0%
78,001	to	80,000	1,214	1,203	-0.3%
80,001	to	104,000	240	224	-2.4%
104,001	to	105,500	278	275	-0.3%
105,501	and	up	3	3	0.8%
Total for all vehicles			36,935	37,483	0.5%
Total by Weight Range					
1	to	10,000	33,814	34,293	0.5%
10,001	and	up	3,121	3,191	0.7%
1	to	26,000	34,754	35,246	0.5%
26,001	and	up	2,182	2,237	0.8%
% of Total by Weight Range					
1	to	10,000	91.5%	91.5%	
10,001	and	up	8.5%	8.5%	
1	to	26,001	94.1%	94.0%	
26,001	and	up	5.9%	6.0%	

Exhibit 4-1 shows that total vehicle travel in Oregon is projected to increase from 36.9 billion miles in 2017 to 37.5 billion miles in 2020. This represents an average annual growth of about 0.5 percent. Light vehicle travel is projected to increase from 33.8 billion miles in 2017 to 34.3 billion miles in 2020, which also represents an average annual growth of 0.5 percent. Total heavy vehicle travel (10,001 pounds or greater) is forecast to increase from 3.1 billion miles in 2017 to 3.2 billion miles in 2020, for an average annual growth of 0.7 percent. These projections are based on the projections from ODOT's revenue forecast model.

While these traffic projections are based on accepted practices and the best available data, VMT has, in recent years, become more difficult to forecast accurately. Potential explanations include changes in the distribution of ages in the population, differences in preferences for travel modes between age cohorts, changes in commuting patterns including telecommuting, and an increase in delivery trucks, which may not be clearly represented in the underlying data.

Forecasted heavy vehicle travel is expected to grow at about the same rate as light vehicle travel between 2017 and 2020. The share of travel accounted for by light vehicles is not expected to change by much between 2017 and 2020 (forecasts are 91.5 percent in both 2017 and 2020.

Exhibit 4-1 also shows that the growth projected for heavy vehicle travel varies by weight group. The fastest growth among the heavy vehicle weight classes, 6 percent, is expected to be in the 26,001 to 78,000-pound weight class group.

EXHIBIT 4-2: PROJECTED 2020 VMT BY ROAD SYSTEM (MILLIONS OF MILES)

		VMT by VC		Percent of Total VMT	
Road System	Total VMT	Light	Heavy	Light	Heavy
State Roads	22,416	19,978	2,438	89.1%	10.9%
Urban Interstate	5,803	5,227	576	90.1%	9.9%
Rural Interstate	4,011	3,171	839	79.1%	20.9%
Urban Other	6,551	6,211	340	94.8%	5.2%
Rural Other	6,052	5,369	683	88.7%	11.3%
Local Roads	14,881	14,142	739	95.0%	5.0%
County Roads	8,471	7,986	484	94.3%	5.7%
City Streets	6,410	6,155	255	96.0%	4.0%
State and Local Roads	37,297	34,119	3,178	91.5%	8.5%
Federal Roads	186	173	13	93.1%	6.9%
Total All Roads	37,483	34,293	3,191	91.5%	8.5%

Note: Light includes all vehicles 10,000 pounds and under. Heavy includes all vehicles over 10,000 pounds.

Exhibit 4-2 shows the distribution of projected 2020 travel between light and heavy vehicles for different combinations of road system and ownership. Although light vehicles are projected to account for 91.5 percent and heavy vehicles 8.5 percent of total statewide VMT, the mix of traffic varies significantly among the different road systems. Within that distribution of total VMT, heavy vehicles are expected to account for 10.9 percent of the overall travel on state roads and 5 percent of the travel on local roads.

EXHIBIT 4-3: DISTRIBUTION OF PROJECTED 2020 VMT BY ROAD SYSTEM

Road System	Percent of Total VMT	Percent of VC Total VMT Light	Heavy
State Roads	59.8%	58.3%	76.4%
Urban Interstate	15.5%	15.2%	18.1%
Rural Interstate	10.7%	9.2%	26.3%
Urban Other	17.5%	18.1%	10.7%
Rural Other	16.1%	15.7%	21.4%
Local Roads	39.7%	41.2%	23.2%
County Roads	22.6%	23.3%	15.2%
City Streets	17.1%	17.9%	8.0%
State and Local Roads	99.5%	99.5%	99.6%
Federal Roads	0.5%	0.5%	0.4%
Total All Roads	100.0%	100.0%	100.0%

Exhibit 4-3 illustrates the separate distributions of projected VMT by road system for light vehicles, heavy vehicles, and all vehicles. As shown, 59.8 percent of total travel in the state is expected to be on state highways and 39.7 percent on local roads and streets. The distribution of VMT, however, differs significantly for light versus heavy vehicles across road systems.

Rural interstate highways, for example, are projected to handle 10.7 percent of total VMT in 2020 but 26.3 percent of heavy vehicle VMT. At the other extreme, 17.9 percent of light vehicle travel, but only 8 percent of heavy vehicle travel, is forecast to be on city streets. State highways are expected to handle about 58.3 percent of total travel by light vehicles and 76.4 percent of travel by heavy vehicles.

EXHIBIT 4-4: COMPARISON OF FORECAST VMT USED IN PRIOR OR HCASs (BILLIONS OF MILES)

	2009 Study		2011 Study		2013 Study		2015 Study		2017 Study		2019 Study	
Road System	2010 VMT	% of Total	2012 VMT	% of Total	2014 VMT	% of Total	2016 VMT	% of Total	2018 VMT	% of Total	2020 VMT	% of Total
State Roads	23.7	61.6%	23.4	61.7%	23.8	62.0%	21.3	59.4%	22.7	59.0%	22.4	60.1%
Urban Interstate	5.1	13.2%	5.0	13.2%	5.5	14.4%	4.9	13.6%	6.0	15.5%	5.8	15.6%
Rural Interstate	4.8	12.6%	4.8	12.7%	4.8	12.6%	4.5	12.7%	4.1	10.6%	4.0	10.8%
Urban Other	6.1	15.9%	5.7	15.1%	5.8	15.2%	5.0	14.0%	6.6	17.2%	6.6	17.6%
Rural Other	7.7	19.9%	7.8	20.6%	7.6	19.8%	6.9	19.2%	6.1	15.7%	6.1	16.2%

Note: VMT on Federally-owned roads not included in Totals.

Exhibit 4-4 compares the VMT projections by road system used in the 2009 through 2019 studies. It shows a steady decline in the share of VMT that is on rural road systems and a corresponding increase in the share of VMT on urban roads. The systems projected to account for the largest shares of total statewide travel are Other State Rural highways, County Roads, and City Streets.

Expenditure Data

Until the 2001 Study, Oregon highway cost allocation studies allocated only expenditures of Oregon highway user fees by state and local-government agencies. Because federal funds are in many cases interchangeable with state funds, and because the proportion of federal funds used for any particular project is arbitrary and subject to change between the time of the study and the time the money is spent, excluding federal funds can introduce arbitrary bias and inaccuracy into the study results.

The 2001 Study included the expenditure of federal funds by the state and reported their allocation both separately and in combination with state funds.

The 2003 Study, for the first time ever, included all expenditures on roads and streets in the state. In addition to state-funded expenditures, expenditures (both state and local) funded from federal highway revenues and locally generated revenues were also included. This change increased the level and breadth of expenditures allocated in the 2003 Study as compared to previous studies.

Since 2005, Oregon highway cost allocation studies have included expenditures of state, federal, and local revenues but exclude certain categories of local revenues determined to not be interchangeable with state user fees. Those sources are locally issued bonds, property taxes (including local improvement districts), systems development charges, and traffic impact fees.

The expenditure data for this study were obtained from several sources. Data from ODOT's monthly Budget and Cash Flow Forecast were used to develop projected construction expenditures by project for 2019-21 biennium. Projected expenditures on maintenance and other programs were obtained from ODOT Financial Services and based on ODOT's Agency Request Budget.

Identifying those expenditures projected to be federally funded was straightforward, and based on detailed information from the ODOT Cash Flow Forecast model and Project Control System. Local expenditures were projected from data obtained from the 2017 Local Roads and Streets Survey combined with information from ODOT's Agency Request Budget.

EXHIBIT 4-5: ANNUAL EXPENDITURES BY CATEGORY AND FUNDING SOURCE (THOUSANDS OF DOLLARS)

	Funds by Source					Percent of All Funding Sources				Percent of Source				
Major Expenditure Category	All Sources	State	Federal	Local	Bond	State	Federal	Local	Bond	Sources	State	Federal	Local	Bond
Modernization	279,618	93,739	170,650	14,889	340	33.5%	61.0%	5.3%	0.1%	15.4%	9.4%	23.4%	16.7%	27.0%
Preservation	289,732	52,364	230,236	6,664	469	18.1%	79.5%	2.3%	0.2%	15.9%	5.2%	31.6%	7.5%	37.2%
Maintenance	471,061	386,638	42,220	42,203	0	82.1%	9.0%	9.0%	0.0%	25.9%	38.7%	5.8%	47.3%	0.0%
Bridge	101,180	17,217	83,019	494	450	17.0%	82.1%	0.5%	0.4%	5.6%	1.7%	11.4%	0.6%	35.8%
Other	677,149	449,684	202,477	24,988	0	66.4%	29.9%	3.7%	0.0%	37.2%	45.0%	27.8%	28.0%	0.0%
Total	1,818,740	999,642	728,603	89,237	1,259	55.0%	40.1%	4.9%	0.1%	100.0%	100.0%	100.0%	100.0%	100.0%

Exhibit 4-5 presents the average annual expenditures projected for the 2019-21 biennium by major category (modernization, preservation, maintenance, bridge, and other) and funding source (state, federal, local, and bond). As shown, projected expenditures total $1.8 billion. This compares to $1.5 billion annual expenditures allocated in the 2017 study.

Of the $1.8 billion total annual expenditures, $999 million (55 percent) are projected to be state funded, $728 million (40.1 percent) federally funded, and $89 million (4.9 percent) locally funded. The remaining $1.2 million (0.1 percent) of allocated expenditures are the allocated portion of the $97 million per year of expended bond revenue. An additional $217 million per year of previously-allocated bond expenditures from prior studies is included in the allocated costs in this study.

The local funds column of Exhibit 4-5 includes only local expenditures from the own-source revenues that were included in this study. Local expenditures from state and federal revenues are included in the state funds and federal funds columns, respectively.

Bridge and interchange expenditures are shown separately from other modernization, preservation, and maintenance expenditures.

The “other” category in the exhibit encompasses expenditures for many activities. In addition to general administrative and tax collection costs for the state, counties, and cities, it includes expenditures for:

- Preliminary engineering
- Right of way acquisition and property management
- Safety-related projects, safety inspections, and rehabilitation and maintenance of existing safety improvements
- Pedestrian/bike projects
- Railroad safety projects
- Fish- and wildlife-enabling projects (e.g., salmon culverts)
- Transportation demand management and transportation system management projects (e.g., Traffic Operations Centers)
- Multi-modal projects
- Transportation project development and delivery
- Transportation planning, research, and analysis

The exhibit shows significant differences in the funding of different expenditure categories. Modernization, preservation, and bridge expenditures have large federal funds components. About 61 percent of modernization, 79.5 percent of preservation, and 82.1 percent of bridge expenditures will be federally funded. Maintenance expenditures, on the other hand, are largely state-funded, and to a lesser extent, locally funded, with a small federal-funds component.

About 35.8 percent of the bond expenditures in the study period will be on state- and locally-owned bridges, a much lower proportion than in studies before 2015. Modernization expenditures make up an additional 27.0 percent of bond expenditures. No bond expenditures fall into the “other” category.

Revenue Data and Forecasts

The revenues projected for this study include receipts from taxes and fees collected by the state from highway users, that is, revenues flowing into Oregon’s dedicated State Highway Fund. Revenues from federal taxes and user fees are not estimated. Similarly, revenues generated by local governments from their own funding sources (e.g., property taxes, street assessments, system development charges, local fuel taxes) are not included. Because the expenditures of federal and local revenues are included among the expenditures to be allocated, and because a portion of the expenditure of bond revenue in the prior biennium is included, average annual allocated expenditures exceed average annual attributed revenues in this study by $337 million.

The revenue data required for the study are obtained directly from ODOT's revenue forecasting model. The revenue forecast used for this study was the June 2018 forecast. This is a change from previous studies that relied on the December forecast. In the 2019 study, the SRT decided to rely on the updated June forecast to ensure that the model is internally consistent with the VMT forecast provided by ODOT. The forecasts include the 40 percent of State Highway Fund revenues transferred to local governments for use on local roads and streets, and all state funds used for highways, including matching requirements for federal-aid highway projects.

EXHIBIT 4-6: REVENUE FORECASTS BY TAX AND FEE TYPE (THOUSANDS OF DOLLARS) AVERAGE ANNUAL AMOUNTS FOR 2019-2021 BIENNIUM

Tax or Fee Type	Forecast Revenue	Percent of Total
Fuel Tax	663,170	44.8%
Registration Fees	330,601	22.3%
Title Fees	110,234	7.4%
Other Motor Carrier Revenue	6,621	0.4%
Road Use Assessment Fees	2,438	0.2%
Weight-Mile Tax	368,463	24.9%
Total	1,481,528	100.0%

Average annual state revenues for the 2019-21 biennium are expected to total $1.5 billion. As shown in Exhibit 4-6, fuel taxes and the weight-mile tax are the two largest sources of state user-fee revenue. Revenue from the state fuel tax is projected to average $663 million per year (44.8 percent of total revenues) and weight-mile tax revenue is forecast to average $368 million (24.9 percent of total revenues). These two sources account for 69.7 percent of highway user revenues, illustrating that Oregon's system of highway finance is based heavily on taxes and fees related to use of the system.

Revenue from registration and title fees is anticipated to average $441 million annually (29.8 percent of total revenues), consistent with recent prior studies, but up sharply from pre-OTIA prior studies. This is primarily the result of registration fee increases. Other revenue sources bring in smaller amounts of revenue.

EXHIBIT 4-7: COMPARISON OF FORECAST REVENUE (MILLIONS OF DOLLARS) USED IN PRIOR OR HCASs

Year of Study	Average Annual Forecast Revenue
1999	691
2001	690
2003	713
2005	826
2007	879
2009	870
2011	1,126
2013	1,096
2015	1,123
2017	1,186
2019	1,482

Exhibit 4-7 compares the forecasts of average annual total revenues used in the 1999 through 2019 studies. The increase between the 2017 and 2019 studies reflects the increases in the fuel tax, weight-mile tax, and registration fees enacted as by the Oregon Legislature in 2017.

Caution should be used in comparing these forecasts, however, because they were made at various times for different biennia, and they used different assumptions regarding the treatment of ODOT beginning and ending balances. Additionally, title fees were not identified as a revenue source in studies prior to 2003 because they did not produce net revenue.

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CHAPTER 5: EXPENDITURE ALLOCATION AND REVENUE ATTRIBUTION RESULTS

This chapter presents the expenditure allocation and revenue attribution results of the 2019 Study and compares them to the results of previous Oregon studies. The following chapter reports equity ratios for each vehicle group and weight class based on the expenditure allocation and revenue attribution results.

EXPENDITURE ALLOCATION RESULTS

The 2003 Study was the first to base expenditure allocation results on all highway expenditures, including those financed by federal, state, and local revenues. This approach was considered necessary to address the impacts of the federal advance construction program on expenditures. This change in approach meant the expenditure allocation results for the 2003 Study were not directly comparable to those of the earlier Oregon studies.

For the 2005 and later studies, the approach used in the 2003 Study was modified to exclude the expenditure of certain local-government, own-source revenues that were not considered to be interchangeable with State Highway Fund monies. The excluded categories were property taxes (including local improvement districts), local bond revenues, systems development charges, and traffic impact fees. The 2019 Study uses the same methodology as the 2005 through 2017 studies. As a result, the expenditure allocations in this study are comparable to the 2005 and later studies, but not directly comparable to those in the 2003 or earlier studies.

EXHIBIT 5-1: AVERAGE ANNUAL COST RESPONSIBILITY BY EXPENDITURE CATEGORY AND WEIGHT CLASS (THOUSANDS OF DOLLARS)

			Expenditure Categories						
Declared Weight in Pounds			Modernization	Preservation	Maintenance	Bridge	Other	Prior Bonds	Total
1	to	10,000	229,504	83,139	271,827	62,856	571,948	117,987	1,337,261
10,001	to	26,000	8,136	25,212	35,476	8,594	14,389	11,740	103,546
26,001	to	78,000	7,475	24,668	35,149	4,563	20,190	10,236	102,281
78,001	to	80,000	19,754	87,823	69,840	13,679	48,104	43,842	283,042
80,001	to	104,000	5,328	24,927	21,362	2,534	9,495	22,128	85,773
104,001	to	105,500	8,023	35,567	33,833	2,968	12,103	22,402	114,896
105,501	and	up	1,399	8,397	3,574	5,986	919	1,751	22,026
	Total		279,618	289,732	471,061	101,180	677,149	230,084	2,048,825
Total by Weight Range									
1	to	10,000	229,504	83,139	271,827	62,856	571,948	117,987	1,337,261
10,001	and	up	50,114	206,593	199,234	38,324	105,201	112,098	711,564
1	to	26,001	237,639	108,351	307,303	71,450	586,337	129,726	1,440,807
26,001	and	up	41,978	181,381	163,758	29,731	90,812	100,358	608,018
% of Total by Weight Range									
1	to	10,000	82.1%	28.7%	57.7%	62.1%	84.5%	51.3%	65.3%
10,001	and	up	17.9%	71.3%	42.3%	37.9%	15.5%	48.7%	34.7%
1	to	26,001	85.0%	37.4%	65.2%	70.6%	86.6%	56.4%	70.3%
26,001	and	up	15.0%	62.6%	34.8%	29.4%	13.4%	43.6%	29.7%

Exhibit 5-1 presents the expenditure allocation results by major expenditure category and vehicle weight group. Light (up to 10,000 pound) and heavy (over 10,000 pound) vehicles are projected to be responsible for 65.3 percent and 34.7 percent (respectively) of average annual total expenditures for the 2019-21 biennium.

As shown in the exhibit, the responsibility shares vary significantly among the major expenditure categories. Heavy vehicles, as a group, are projected to be responsible for much of the preservation expenditure (71.3 percent). That group is responsible for smaller shares of modernization, maintenance, bridge, and other expenditures (17.9 percent, 42.3 percent, 37.9 percent, and 15.5 percent, respectively); this illustrates the point made previously that the mix of expenditures allocated can have a significant impact on the overall results.

EXHIBIT 5-2: SOURCES AND EXPENDITURES OF FUNDS (THOUSANDS OF ANNUAL DOLLARS)

	Source of Funds				
Expenditures of Funds	State Revenues	Bond Revenues	Federal Revenues	Local Revenues	All Sources
State Government	769,136	0	708,645	0	1,477,781
Local Governments	230,505	0	19,958	89,237	339,700
Expenditure of Bond Revenue	0	9,363	0	0	9,363
Total Expenditures	999,642	9,363	728,603	89,237	1,826,845
Allocated State Expenditures	769,136	0	708,645	0	1,477,781
Allocated Local Expenditures	230,505	0	19,958	89,237	339,700
Allocated Current Bond	0	1,259	0	0	1,259
Allocated Prior Bond	0	230,084	0	0	230,084
Total Allocated Expenditures	999,642	231,343	728,603	89,237	2,048,825

Both the state and local governments spend funds from state user fees and from the federal government. Exhibit 5-2 shows the funds received from each revenue source and by whom they are expended. The difference between the funds received and the expenditures allocated is due to the allocation of bond expenditures. The upper part of the table shows the full expenditure of bond revenues and the lower part shows the portions of current and prior expenditures of bond revenues that are allocated to vehicles in this study. In the exhibits that follow, where allocated expenditures are broken down into state, federal, local, and bond, the categories correspond to rows in the lower part of Exhibit 5-2.

EXHIBIT 5-3: EXPENDITURE ALLOCATION RESULTS FOR WEIGHT GROUPS BY FUNDING SOURCE (THOUSANDS OF DOLLARS)

		Allocation to Vehicles			
Funding Source	Avg. Annual Total Expenditures Allocated	Under 10,001 Pounds	Over 10,000 Pounds	Under 26,001 Pounds	Over 26,000 Pounds
State (Highway Fund)	769,136	579,727 75.4%	189,410 24.6%	604,079 78.5%	165,057 21.5%
Federal	708,645	458,217 64.7%	250,428 35.3%	492,800 69.5%	215,845 30.5%
Local	339,700	180,527 53.1%	159,174 46.9%	213,323 62.8%	126,377 37.2%
Bond	1,259	804 63.9%	455 36.1%	879 69.8%	380 30.2%
Current (subtotal)	1,818,740	1,219,274 67.0%	599,466 33.0%	1,311,080 72.1%	507,660 27.9%
Prior Bond	230,084	117,987 51.3%	112,098 48.7%	129,726 56.4%	100,358 43.6%
Total	2,048,825	1,337,261 65.3%	711,564 34.7%	1,440,807 70.3%	608,018 29.7%

The responsibility amounts for state, federal, local, and bond expenditures are broken out separately in Exhibit 5-3. In this exhibit, the expenditure of state and federal monies by local governments are counted under the state and federal categories. The local category contains only the expenditure by local governments of their own revenues.

Light vehicles are projected to be responsible for 75.4 percent of state, 64.7 percent of federal, 53.1 percent of local, and 63.9 percent of bond expenditures. Heavy vehicles are projected to be responsible for 24.6 percent of state, 35.3 percent of federal, 46.9 percent of local, and 36.1 percent of bond expenditures. Overall, state-funded expenditures are expected to average $769.1 million annually over the 2019-21 biennium. Comparable annual amounts for federal, local, and bond-funded expenditures are $708.6 million, $339.7 million, and $1.2 million, respectively.

The allocation results for state, federal, local, and bond expenditures are further broken out by major category in Exhibit 5-4 through Exhibit 5-7.

EXHIBIT 5-4: AVERAGE ANNUAL COST RESPONSIBILITY, STATE HIGHWAY FUND DETAIL (THOUSANDS OF DOLLARS)

Declared Weight in Pounds			Modernization	Preservation	Maintenance	Bridge	Other	Total
1	to	10,000	49,621	12,643	198,214	9,802	309,446	579,727
10,001	to	26,000	866	2,594	11,608	1,368	7,917	24,353
26,001	to	78,000	689	2,447	9,223	723	15,626	28,708
78,001	to	80,000	2,531	9,877	34,811	2,216	36,690	86,126
80,001	to	104,000	572	2,738	8,951	399	6,846	19,508
104,001	to	105,500	809	3,820	12,220	466	8,427	25,742
105,501	and	up	190	990	2,631	966	197	4,974
	Total		55,279	35,109	277,659	15,940	385,149	769,136

Total by Weight Range								
1	to	10,000	49,621	12,643	198,214	9,802	309,446	579,727
10,001	and	up	5,658	22,465	79,445	6,138	75,703	189,410
1	to	26,000	50,487	15,237	209,822	11,170	317,363	604,079
26,001	and	up	4,792	19,872	67,837	4,770	67,786	165,057
% of Total by Weight Range								
1	to	10,000	89.8%	36.0%	71.4%	61.5%	80.3%	75.4%
10,001	and	up	10.2%	64.0%	28.6%	38.5%	19.7%	24.6%
1	to	26,000	91.3%	43.4%	75.6%	70.1%	82.4%	78.5%
26,001	and	up	8.7%	56.6%	24.4%	29.9%	17.6%	21.5%

EXHIBIT 5-5: AVERAGE ANNUAL COST RESPONSIBILITY, FEDERAL DETAIL (THOUSANDS OF DOLLARS)

Declared Weight in Pounds			Modernization	Preservation	Maintenance	Bridge	Other	Total
1	to	10,000	138,271	65,044	29,035	51,555	174,312	458,217
10,001	to	26,000	3,839	18,631	959	6,966	4,187	34,583
26,001	to	78,000	3,353	17,777	518	3,683	2,880	28,210
78,001	to	80,000	12,918	72,021	1,609	11,287	9,761	107,597
80,001	to	104,000	3,250	20,046	296	2,097	2,169	27,858
104,001	to	105,500	4,590	27,994	352	2,447	2,880	38,264
105,501	and	up	1,099	7,233	13	4,873	699	13,917
	Total		167,320	228,746	32,781	82,909	196,889	708,645

Total by Weight Range								
1	to	10,000	138,271	65,044	29,035	51,555	174,312	458,217
10,001	and	up	29,049	163,701	3,746	31,354	22,577	250,428
1	to	26,000	142,110	83,675	29,994	58,521	178,499	492,800
26,001	and	up	25,211	145,070	2,787	24,388	18,390	215,845
% of Total by Weight Range								
1	to	10,000	82.6%	28.4%	88.6%	62.2%	88.5%	64.7%
10,001	and	up	17.4%	71.6%	11.4%	37.8%	11.5%	35.3%
1	to	26,000	84.9%	36.6%	91.5%	70.6%	90.7%	69.5%
26,001	and	up	15.1%	63.4%	8.5%	29.4%	9.3%	30.5%

EXHIBIT 5-6: AVERAGE ANNUAL COST RESPONSIBILITY, LOCAL GOVERNMENT DETAIL (THOUSANDS OF DOLLARS)

Declared Weight in Pounds			Modernization	Preservation	Maintenance	Bridge	Other	Total
1	to	10,000	41,340	5,194	44,578	1,224	88,190	180,527
10,001	to	26,000	3,423	3,959	22,908	220	2,285	32,796
26,001	to	78,000	3,426	4,421	25,409	137	1,684	35,076
78,001	to	80,000	4,270	5,834	33,419	112	1,653	45,288
80,001	to	104,000	1,499	2,118	12,114	27	480	16,238
104,001	to	105,500	2,612	3,719	21,261	42	796	28,430
105,501	and	up	109	163	930	119	23	1,345
	Total		56,678	25,409	160,621	1,881	95,111	339,700
Total by Weight Range								
1	to	10,000	41,340	5,194	44,578	1,224	88,190	180,527
10,001	and	up	15,338	20,215	116,042	657	6,921	159,174
1	to	26,000	44,763	9,154	67,486	1,445	90,475	213,323
26,001	and	up	11,915	16,256	93,134	436	4,636	126,377
% of Total by Weight Range								
1	to	10,000	72.9%	20.4%	27.8%	65.1%	92.7%	53.1%
10,001	and	up	27.1%	79.6%	72.2%	34.9%	7.3%	46.9%
1	to	26,000	79.0%	36.0%	42.0%	76.8%	95.1%	62.8%
26,001	and	up	21.0%	64.0%	58.0%	23.2%	4.9%	37.2%

EXHIBIT 5-7: AVERAGE ANNUAL COST RESPONSIBILITY, BOND DETAIL (THOUSANDS OF DOLLARS)

Declared Weight in Pounds			Modernization	Preservation	Maintenance	Bridge	Other	Current	Prior	Total
1	to	10,000	272	257	0	275	0	804	117,987	118,791
10,001	to	26,000	8	28	0	39	0	75	11,740	11,814
26,001	to	78,000	7	24	0	21	0	51	10,236	10,287
78,001	to	80,000	34	91	0	63	0	188	43,842	44,030
80,001	to	104,000	6	24	0	11	0	41	22,128	22,169
104,001	to	105,500	12	33	0	13	0	59	22,402	22,460
105,501	and	up	1	11	0	29	0	41	1,751	1,791
	Total		340	469	0	450	0	1,259	230,084	
Total by Weight Range										
1	to	10,000	272	257	0	275	0	804	117,987	118,791
10,001	and	up	68	211	0	175	0	455	112,098	112,553
1	to	26,000	280	285	0	314	0	879	129,726	130,605
26,001	and	up	60	184	0	137	0	380	100,358	100,738
% of Total by Weight Range										
1	to	10,000	80.0%	54.9%	0.0%	61.0%	0.0%	63.9%	51.3%	51.3%
10,001	and	up	20.0%	45.1%	0.0%	39.0%	0.0%	36.1%	48.7%	48.7%
1	to	26,000	82.4%	60.8%	0.0%	69.7%	0.0%	69.8%	56.4%	56.5%
26,001	and	up	17.6%	39.2%	0.0%	30.3%	0.0%	30.2%	43.6%	43.5%

Because of restrictions on the types of expenditures for which federal-aid highway funds can be used, federal funds tend to be concentrated on construction (i.e., modernization, preservation, and bridge) projects and other types of work for which heavy vehicles have the predominant responsibility.

Additionally, federal funds are focused on projects on interstate and other higher order highways where the heavy vehicle share of travel is highest. Hence, the inclusion of federally funded expenditures in a state HCAS will typically have the effect of reducing the light vehicle responsibility share and increasing the heavy vehicle share.

Conversely, state funds are more concentrated on maintenance, operations, administration, and other activities for which light vehicles have the largest responsibility share.

The inclusion of local expenditures in a state HCAS will, by itself, typically increase the relative responsibility of light vehicles and reduce that of heavy vehicles. This is because local streets see a higher proportion of traffic from light vehicles and many types of expenditures are allocated on a relative travel basis.

This factor, however, is partially offset by the fact that local governments spend more of their road and street funds on activities having a comparatively high heavy vehicle responsibility component, including rehabilitation, repair, and maintenance of pavements and bridges. In addition, locally-owned roads often are less able to withstand the weight of heavy vehicles than are freeways and state highways.

Because pavements and bridges represent two of the largest and most important expenditure areas in a highway cost allocation study, the responsibility results for these expenditures are broken out separately in Exhibit 5-8 and Exhibit 5-9.

EXHIBIT 5-8. COMPARISON OF PAVEMENT RESPONSIBILITY RESULTS FROM PRIOR OR HCASs (THOUSANDS OF ANNUAL DOLLARS)

	2015 Study			2017 Study			2019 Study		
Expenditure Work Type	Expenditures Allocated	Light Vehicle Responsibility	Heavy Vehicle Responsibility	Expenditures Allocated	Light Vehicle Responsibility	Heavy Vehicle Responsibility	Expenditures Allocated	Light Vehicle Responsibility	Heavy Vehicle Responsibility
New Pavements	48,984 3.4%	7,530 15.4%	41,454 84.6%	37,084 2.5%	3,938 10.6%	33,146 89.4%	31,199 1.7%	5,097 16.3%	26,103 83.7%
Pavement and Shoulder Reconstruction	28,823 2.0%	4,233 14.7%	24,590 85.3%	4,106 0.3%	384 9.4%	3,722 90.6%	1,988 0.1%	245 12.3%	1,743 87.7%
Pavement and Shoulder Rehabilitation	64,885 4.5%	11,114 17.1%	53,771 82.9%	141,338 9.4%	14,780 10.5%	126,558 89.5%	208,765 11.5%	26,918 12.9%	181,847 87.1%
Pavement Maintenance	221,898 15.4%	54,784 24.7%	167,114 75.3%	227,903 15.2%	29,773 13.1%	198,131 86.9%	211,770 11.6%	36,577 17.3%	175,193 82.7%
Other Pavement Expenditures	5,013 0.3%	4,957 98.9%	56 1.1%	5,416 0.4%	4,434 81.9%	983 18.1%	5,883 0.3%	4,225 71.8%	1,658 28.2%
Total Pavement Expenditures	369,604 25.7%	82,618 22.4%	286,986 77.6%	415,848 27.8%	53,308 12.8%	362,539 87.2%	459,605 25.3%	73,062 15.9%	386,544 84.1%

EXHIBIT 5-9: COMPARISON OF BRIDGE AND INTERCHANGE RESPONSIBILITY RESULTS FROM PRIOR OR HCASs (THOUSANDS OF DOLLARS)

	2015 Study			2017 Study			2019 Study		
Expenditure Work Type	Expenditures Allocated	Light Vehicle Responsibility	Heavy Vehicle Responsibility	Expenditures Allocated	Light Vehicle Responsibility	Heavy Vehicle Responsibility	Expenditures Allocated	Light Vehicle Responsibility	Heavy Vehicle Responsibility
Bridge and Interchange	86,528 6.0%	54,743 63.3%	31,785 36.7%	42,474 2.8%	26,727 62.9%	15,747 37.1%	97,647 5.4%	59,707 61.1%	37,940 38.9%
Bridge Maintenance	20,064 1.4%	17,883 89.1%	2,181 10.9%	1,098 0.1%	984 89.6%	114 10.4%	3,533 0.2%	3,149 89.1%	384 10.9%
Total Bridge and Interchange Expenditures	106,592 7.4%	72,626 68.1%	33,966 31.9%	43,572 2.9%	27,711 63.6%	15,861 36.4%	101,180 5.6%	62,856 62.1%	38,324 37.9%

Exhibit 5-8 shows that pavement expenditures allocated in the 2019 Study total $459.6 million, 10.5 percent more than in the 2017 Study, and 24.4 percent more than the pavement expenditures allocated in the 2015 Study.

Given the substantial changes to the distress equations in the 2010 NAPCOM model (which is used to generate pavement factors for pavement expenditure allocation), the pavement expenditure allocation based on the 2011 pavement factors was compared to the pavement expenditure allocation when using the 2009 Study pavement factors with the 2011 model. First, the pavement factors developed for the 2011 Study for light vehicles are slightly lower than those from the 2009 Study.

Pavement factors are also lower for certain heavy vehicle weight classes but are offset by increases in the pavement factors for other heavy vehicle classes. Sensitivity analyses performed using new pavement factors demonstrated that pavement expenditure allocations are sensitive to the light vehicle pavement factors. In the 2019 study, additional weigh-in-motion data was provided to the study team, which revealed information about the distribution of light vehicles in Oregon. This added information shifted pavement expenditure allocations toward light vehicles by 1.2 percentage points.

Exhibit 5-9 compares the bridge and interchange expenditure amounts and responsibility results in the 2015 through 2019 studies. Bridge-related expenditures were higher as a share of total expenditures in the current study (5.6 percent) than in the 2017 study, but lower than all other studies between 2003 and 2015. The expenditure amounts reported in Exhibit 5-9 do not include this study's share of prior biennia's bond expenditures.

The heavy vehicle responsibility share for total bridge plus interchange expenditures in the current study is 37.9 percent, compared to 36.4 percent in the 2017 study, 31.9 percent in the 2015 study, 24.7 percent in the 2013 study, 48.1 percent in the 2011 Study, and 51.3 percent in the 2009 Study. The change since 2011 reflects the results of a new bridge cost allocation study completed for the 2013 study.

EXHIBIT 5-10: AVERAGE ANNUAL COST RESPONSIBILITY BY WEIGHT GROUP WITH PRIOR ALLOCATED EXPENDITURES (THOUSANDS OF DOLLARS)

Declared Weight in Pounds			Total Without Prior Allocated Expenditures	Prior Allocated Expenditures	Total With Prior Allocated Expenditures
1	to	10,000	1,219,274	117,987	1,337,261
10,001	to	26,000	91,806	11,740	103,546
26,001	to	78,000	92,045	10,236	102,281
78,001	to	80,000	239,200	43,842	283,042
80,001	to	104,000	63,645	22,128	85,773
104,001	to	105,500	92,494	22,402	114,896
105,501	and	up	20,276	1,751	22,026
Total			1,818,740	230,084	2,048,825

Exhibit 5-10 shows the amounts of allocated expenditures of bond revenues, including the amount that carried forward from the prior studies. These represent amounts that were spent in prior biennia and that will be repaid during the 2019-21 biennium. The 2021 Study will include the same allocated expenditures from the 2005 through 2017 studies, as well as allocated bond expenditures from the current study.

EXHIBIT 5-11: COST RESPONSIBILITY DISTRIBUTIONS BY WEIGHT GROUP-COMPARISON BETWEEN CURRENT AND PRIOR OR HCAS

Declared Weight in Pounds			2017 Study	2019 Study	Change in Percentage
1	to	10,000	62.9%	65.3%	2.3%
10,001	to	26,000	5.1%	5.1%	0.0%
26,001	to	78,000	4.3%	5.0%	0.7%
78,001	to	80,000	15.8%	13.8%	-2.0%
80,001	to	104,000	4.9%	4.2%	-0.7%
104,001	to	105,500	6.4%	5.6%	-0.8%
105,501	and	up	0.6%	1.1%	0.5%
Total			100.0%	100.0%	
% for Vehicles Over 10,000 Pounds			37.1%	34.7%	-2.3%

For illustrative purposes, Exhibit 5-11 compares the expenditure allocation results (with prior allocated costs) for the current study with those of the previous study. As shown, the shares are similar: the all-vehicle responsibility shares in the 2017 Study are 62.9 percent for light vehicles and 37.1 percent for heavy vehicles; the 2019 Study shares are 65.3 percent for light vehicles and 34.7 percent for heavy vehicles.

REVENUE ATTRIBUTION RESULTS

The attribution of revenues to the various vehicle types and weight classes is a principal element of a highway cost allocation study. Once accomplished, the shares of projected payments are compared to the shares of cost responsibility for each class to determine whether each class is paying more or less than its fair share under the existing tax structure and rates. Where significant imbalances are detected, recommendations for changes in tax rates are made to bring payments back into balance with cost responsibilities.

As noted in Chapter 4, most of the required revenue data for the study, including control totals for forecasted revenues by tax instrument (e.g., fuel taxes, registration fees, weight-mile tax), are obtained from ODOT's revenue forecasting model. Every effort is made to ensure that the data used in the HCAS are consistent with the revenue forecast upon which the Agency Request Budget is based.

Some information required for the HCAS, however, is not available from the revenue forecasting model and so must be estimated from other sources.

The revenue model, for example, does not project fuel tax payments by detailed, 2,000-pound weight class. Therefore, estimated fuel efficiencies by vehicle type and weight group must be used together with control totals from the revenue model to attribute projected fuel tax payments to the detailed vehicle classes.

EXHIBIT 5-12: AVERAGE ANNUAL USER-FEE REVENUE BY TAX INSTRUMENT AND WEIGHT CLASS (THOUSANDS OF DOLLARS)

Declared Weight in Pounds			Fuel Tax	Registration and Title Fees	Weight-Mile Tax	Other Motor Carrier	Flat Fee	RUAF	Total
1	to	10,000	632,697	339,171	0	0	0	0	971,868
10,001	to	26,000	22,288	52,131	0	0	0	0	74,419
26,001	to	78,000	5,997	9,060	31,496	1,056	15	0	47,625
78,001	to	80,000	1,125	29,467	238,220	4,021	2,789	0	275,623
80,001	to	104,000	317	4,696	38,184	638	5,432	40	49,309
104,001	to	105,500	746	6,177	51,538	895	788	26	60,170
105,501	and	up	0	134	0	10	0	2,372	2,515
	Total		663,170	440,835	359,438	6,621	9,025	2,438	1,481,528
Total by Weight Range									
1	to	10,000	632,697	339,171	0	0	0	0	971,868
10,001	and	up	30,473	101,665	359,438	6,621	9,025	2,438	509,660
1	to	26,000	654,985	391,301	0	0	0	0	1,046,287
26,001	and	up	8,185	49,534	359,438	6,621	9,025	2,438	435,241
% of Total by Weight Range									
1	to	10,000	95.4%	76.9%	0.0%	0.0%	0.0%	0.0%	65.6%
10,001	and	up	4.6%	23.1%	100.0%	100.0%	100.0%	100.0%	34.4%
1	to	26,001	98.8%	88.8%	0.0%	0.0%	0.0%	0.0%	70.6%
26,001	and	up	1.2%	11.2%	100.0%	100.0%	100.0%	100.0%	29.4%

The revenue attribution results are summarized in Exhibit 5-12. For the next biennium, under existing tax rates, it is forecasted that light vehicles will contribute 65.6 percent of State Highway Fund revenues and heavy vehicles will contribute 34.4 percent. These shares are for all vehicles and differ from the shares for full-fee paying vehicles that are used in the calculation of equity ratios.

Exhibit 5-12 also illustrates how the relative payments of different vehicle weight groups vary by tax instrument. Light vehicles are projected to contribute 95.4 percent of fuel tax revenues and 76.9 percent of registration and title fee revenues. Heavy vehicles, on the other hand, contribute 100 percent of weight-mile tax, flat fee, and road use assessment fee revenues. Heavy vehicles also contribute 100 percent of the other motor carrier revenue identified in the exhibit. This category includes revenues from truck overweight/overlength permit fees, overdue payment penalties and interest, etc.

EXHIBIT 5-13: REVENUE ATTRIBUTION DISTRIBUTIONS BY WEIGHT GROUP-COMPARISON BETWEEN CURRENT AND PRIOR OR HCAS

Declared Weight in Pounds			2017 Study	2019 Study	Change in Percentage
1	to	10,000	64.5%	65.6%	1.1%
10,001	to	26,000	5.1%	5.0%	0.0%
26,001	to	78,000	2.6%	3.2%	0.6%
78,001	to	80,000	19.3%	18.6%	-0.7%
80,001	to	104,000	3.7%	3.3%	-0.4%
104,001	to	105,500	4.6%	4.1%	-0.5%
105,501	and	up	0.2%	0.2%	0.0%
Total			100.0%	100.0%	
% for Vehicles Over 10,000 Pounds			35.5%	34.4%	-1.1%

Exhibit 5-13 compares the revenue attribution results of the current study with those of the 2017 Study. The projected share of revenues contributed by light vehicles has increased from 64.5 percent in the 2017 Study to 65.6 percent in the current study. Conversely, the overall heavy vehicle share of projected payments has decreased from 35.5 percent in the previous study to 34.4 percent in the current study.

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CHAPTER 6: COMPARISON OF EXPENDITURES ALLOCATED TO REVENUES PAID

This chapter brings together the expenditure allocation and revenue attribution results reported in Chapter 5 to compare projected responsibilities and tax payments for each vehicle class and for broader groups of vehicles (e.g., all heavy vehicles combined).

This comparison is facilitated by the calculation of equity ratios, or the ratio of the share of revenues contributed by the vehicles in a class to the share of cost responsibility for vehicles in that class. An equity ratio greater than one indicates that the vehicles in that class are projected to pay more than their cost-responsible share of user fees. Conversely, an equity ratio less than one indicates that the vehicles in that class are projected to pay less than their cost-responsible share.

The comparison of revenue shares to cost responsibility shares in the Oregon studies is traditionally done for full-fee-paying vehicles only. This study takes the same approach, which requires some further adjustments to the numbers presented in Chapter 5. The model separately estimates the revenue contributions from full-fee-paying and alternative-fee-paying vehicles for each tax instrument. For alternative-fee-paying vehicles, the model also estimates the fees they would pay if they were full-fee-paying vehicles. The expenditures allocated to each vehicle class are apportioned among full-fee-paying and alternative-fee-paying vehicles on the basis of the relative miles of travel of each in that class.[7]

PRESENTATION OF EQUITY RATIOS

EXHIBIT 6-1: COMPARISON OF AVERAGE ANNUAL COST RESPONSIBILITY AND USER FEES PAID BY FULL-FEE-PAYING VEHICLES BY DECLARED WEIGHT CLASS

Declared Weight			Annual User Fees			Annual User Fees		
			All	Full-Fee	Alternative Fee Difference	All	Full-Fee	Alternative Fee Difference
1	to	10,000	971,867,858	954,301,254	5,638,977	65.60%	66.13%	16.1%
10,001	to	26,000	74,418,874	60,261,625	7,436,181	5.0%	4.2%	21.2%
26,001	to	78,000	47,624,659	42,670,676	15,450,791	3.2%	3.0%	44.1%
78,001	to	80,000	275,622,701	274,686,669	3,600,076	18.6%	19.0%	10.3%
80,001	to	104,000	49,308,735	49,103,653	929,048	3.3%	3.4%	2.7%
104,001	to	105,500	60,169,874	59,610,244	1,947,556	4.1%	4.1%	5.6%
105,501	and	up	2,515,317	2,515,310	0	0.2%	0.2%	0.0%
	Total		1,481,528,018	1,443,149,433	35,002,628	100.0%	100.0%	100.0%
10,001	and	up	509,660,160	488,848,178	29,363,651	34.4%	33.87%	83.9%
26,001	to	80,000	323,247,360	317,357,345	19,050,866	21.8%	22.0%	54.4%
80,001	to	105,500	109,478,609	108,713,898	2,876,604	7.4%	7.5%	8.2%
26,001	to	105,500	432,725,969	426,071,243	21,927,470	29.2%	29.5%	62.6%
26,001	and	up	435,241,286	428,586,553	21,927,470	29.4%	29.7%	62.6%

[7] If, for example, 80 percent of the VMT in a weight class are by full-fee-paying vehicles and 20 percent are by alternative-fee-paying vehicles, then 80 percent of the total responsibility of that class is assigned to full-fee-paying vehicles and 20 percent to alternative-fee-paying vehicles. This division is based on the reasonable assumption that two vehicles that are identical, except one is subject to full fees and the other alternative fees, have exactly the same per-mile cost responsibility.

EXHIBIT 6-1 (CONTINUED): COMPARISON OF AVERAGE ANNUAL COST RESPONSIBILITY AND USER FEES PAID BY FULL-FEE-PAYING VEHICLES BY DECLARED WEIGHT CLASS

Declared Weight			Annual Cost Responsibility				Percent of Annual Cost Responsibility			
			State	Federal	Local	Full-Fee	State	Federal	Local	Full-Fee
1	to	10,000	698,517,173	458,217,091	180,526,735	1,305,515,014	69.8%	64.7%	53.1%	67.2%
10,001	to	26,000	36,166,898	34,582,502	32,796,225	75,028,904	3.6%	4.9%	9.7%	3.9%
26,001	to	78,000	38,994,765	28,209,520	35,076,283	68,931,358	3.9%	4.0%	10.3%	3.5%
78,001	to	80,000	130,156,506	107,597,090	45,288,235	278,443,681	13.0%	15.2%	13.3%	14.3%
80,001	to	104,000	41,676,953	27,858,138	16,238,117	83,716,412	4.2%	3.9%	4.8%	4.3%
104,001	to	105,500	48,202,235	38,263,904	28,429,945	110,257,971	4.8%	5.4%	8.4%	5.7%
105,501	and	up	6,764,893	13,916,711	1,344,819	22,024,288	0.7%	2.0%	0.4%	1.1%
	Total		1,000,479,423	708,644,956	339,700,358	1,943,917,628	100.0%	100.0%	100.0%	100.0%
10,001	and	up	301,962,250	250,427,865	159,173,623	638,402,614	30.2%	35.3%	46.9%	32.8%
26,001	to	80,000	169,151,271	135,806,610	80,364,518	347,375,039	16.9%	19.2%	23.7%	17.9%
80,001	to	105,500	89,879,188	66,122,042	44,668,061	193,974,383	9.0%	9.3%	13.1%	10.0%
26,001	to	105,500	259,030,459	201,928,652	125,032,579	541,349,422	25.9%	28.5%	36.8%	27.8%
26,001	and	up	265,795,352	215,845,363	126,377,398	563,373,710	26.6%	30.5%	37.2%	29.0%

EXHIBIT 6-1 (CONTINUED): COMPARISON OF AVERAGE ANNUAL COST RESPONSIBILITY AND USER FEES PAID BY FULL-FEE-PAYING VEHICLES BY DECLARED WEIGHT CLASS

Declared Weight			Annual User Fees			Annual User Fees		
			All	Full-Fee	Alternative Fee Difference	All	Full-Fee	Alternative Fee Difference
1	to	10,000	971,867,858	954,301,254	5,638,977	65.60%	66.13%	16.1%
10,001	to	26,000	74,418,874	60,261,625	7,436,181	5.0%	4.2%	21.2%
26,001	to	78,000	47,624,659	42,670,676	15,450,791	3.2%	3.0%	44.1%
78,001	to	80,000	275,622,701	274,686,669	3,600,076	18.6%	19.0%	10.3%
80,001	to	104,000	49,308,735	49,103,653	929,048	3.3%	3.4%	2.7%
104,001	to	105,500	60,169,874	59,610,244	1,947,556	4.1%	4.1%	5.6%
105,501	and	up	2,515,317	2,515,310	0	0.2%	0.2%	0.0%
	Total		1,481,528,018	1,443,149,433	35,002,628	100.0%	100.0%	100.0%
10,001	and	up	509,660,160	488,848,178	29,363,651	34.4%	33.87%	83.9%
26,001	to	80,000	323,247,360	317,357,345	19,050,866	21.8%	22.0%	54.4%
80,001	to	105,500	109,478,609	108,713,898	2,876,604	7.4%	7.5%	8.2%
26,001	to	105,500	432,725,969	426,071,243	21,927,470	29.2%	29.5%	62.6%
26,001	and	up	435,241,286	428,586,553	21,927,470	29.4%	29.7%	62.6%

EXHIBIT 6-1: (CONTINUED): COMPARISON OF AVERAGE ANNUAL COST RESPONSIBILITY AND USER FEES PAID BY FULL-FEE-PAYING VEHICLES BY DECLARED WEIGHT CLASS

Declared Weight			Scaled Equity Ratio All	Scaled Equity Ratio Full-Fee	Share of Cost All	Share of Cost Full-Fee
1	to	10,000	1.0050	0.9846	65.3%	67.2%
10,001	to	26,000	0.9939	1.0819	5.1%	3.9%
26,001	to	78,000	0.6439	0.8338	5.0%	3.5%
78,001	to	80,000	1.3467	1.3288	13.8%	14.3%
80,001	to	104,000	0.7950	0.7901	4.2%	4.3%
104,001	to	105,500	0.7242	0.7282	5.6%	5.7%
105,501	and	up	0.1579	0.1538	1.1%	1.1%
	Total		1.0000	1.0000	100.0%	100.0%
10,001	and	up	0.9905	1.0314	34.7%	32.8%
26,001	to	80,000	1.1601	1.2306	18.8%	17.9%
80,001	to	105,500	0.7545	0.7549	9.8%	10.0%
26,001	to	105,500	1.0212	1.0602	28.6%	27.8%
26,001	and	up	0.9899	1.0247	29.7%	29.0%

Exhibit 6-1 includes calculated equity ratios for the summary-level weight groups shown in earlier exhibits. As shown in the first table within Exhibit 6-1, projected 2020 vehicle miles traveled (VMT) for full-fee-paying vehicles are 36.2 billion, 92.5 percent of these miles being traveled by light vehicles and 7.5 percent by heavy vehicles. This compares to projected 2020 miles of travel by all vehicles of 37.4 billion, 91.5 percent by light vehicles and 8.5 percent by heavy vehicles.

Exhibit 6-3, at the end of this chapter, shows the equity ratios for each 2,000-pound weight class. These equity ratios are for full-fee-paying vehicles only and exclude vehicles that pay on an alternative-fee basis.

As explained in Chapter 3, alternative-fee-paying vehicles are disproportionately concentrated in the heavy vehicle classes, so excluding them will reduce the heavy vehicle share of VMT. The heavy vehicle-share of VMT, in other words, will always be lower if only full-fee-paying vehicles are considered than if all vehicles are considered.

The projected total cost responsibility of full-fee-paying vehicles is $1.94 billion per year, with responsibility shares of 67.2 percent for light vehicles and 32.8 percent for heavy vehicles. This compares to the projected total responsibility for all vehicles of $2.05 billion. The difference between these two amounts is the projected responsibility of alternative-fee-paying vehicles.

Forecasted average annual user fees paid by full-fee-paying vehicles total $1.44 billion, 66.1 percent from light vehicles and 33.9 percent from heavy vehicles. The difference between this total and the $1.481 billion for all vehicles represents projected revenues from alternative-fee-paying vehicles.

The total of the Alternative-Fee Difference column represents the average annual difference between what alternative-fee-paying vehicles are projected to pay and what they would pay if subject to full fees. This total is $35 million annually for the next biennium under existing tax rates.[8] Beginning with the 2013 study, equity ratios are calculated using allocated costs and attributed revenues for full-fee paying vehicles only.

Because the current study includes expenditures of funds from federal and local revenue sources, the allocated expenditures for full-fee-paying vehicles are more than the attributed state revenues for these vehicles. This does not present a problem in calculating the equity ratios.[9]

This study finds full-fee equity ratios of .9846 for light vehicles and 1.0314 for heavy vehicles as a group. This means that, for the 2019-21 biennium, under the existing tax structure and rates, light vehicles are expected to underpay their fair share by 1.54 percent and heavy vehicles are expected to overpay by 3.14 percent.

Exhibit 6-1 also shows the overall equity ratios for vehicles under and over 26,000 pounds, as well as for the summary-level weight groups shown in earlier exhibits. Vehicles with declared weights between 10,001 pounds and 26,000 pounds are projected to overpay their responsibility by 8.19 percent. Vehicles with weights between 26,001 and 78,000 pounds as a group underpay their fair share by 16.62 percent and those between 78,001 and 80,000 pounds overpay by 32.88 percent.

Vehicles in the 78,001- to 80,000-pound class alone account for 43.65 percent of the VMT by full-fee-paying heavy vehicles and 59.02 percent of the VMT by full-fee-paying vehicles over 26,000-pounds. These vehicles

[8] These amounts represent the underpayment by alternative-fee-paying vehicles relative to what they would pay on a full-fee basis – the difference, for example, between revenues from publicly owned vehicles under the existing tax structure versus revenues from these vehicles if they were all subject to the state fuel tax or weight- mile tax and full registration fees.

[9] The calculation of equity ratios in the model is accomplished by comparing ratios of revenues attributed to ratios of expenditures allocated. For each vehicle class, the ratio of the revenues attributed to this class to the total revenues attributed to all classes is first calculated. This ratio is then divided by the ratio of the expenditures allocated to this class to the total expenditures allocated to all classes. Thus, the calculation of the equity ratios does not require scaling of either the attributed revenues or allocated expenditures when the two are not equal.

also account for 43.62 percent of the cost responsibility and 56.19 percent of the user fees paid by full-fee-paying heavy vehicles. The reason for the difference in the equity ratio between this group and the groups above and below it is that most truckers who can operate at 80,000 pounds and do not know in advance how much their loads will weigh declare at 80,000 pounds. As a result, the average operating weights of vehicles declared at 80,000 pounds are a lower fraction of their declared weight than for other declared weight classes, and the wear-related costs they impose per mile are correspondingly lower.

As a group, vehicles between 80,001 and 105,500 pounds (Schedule B vehicles) pay 24.51 percent less than their fair share. Those in the 104,001 to 105,500 range pay 27.18 percent less than their fair share.

Vehicles over 105,500 pounds all pay the road use assessment fee, as do some vehicles between 98,001 and 105,500 pounds. Those over 105,500 pounds underpay their fair share by 84.62 percent. This is consistent with underpayment levels found in previous studies. The model was changed for the 2005 Study to attribute portions of vehicle registration fees to these vehicles. Since no vehicle can register above 105,500 pounds, no registration fees were attributed to these vehicles in pre-2005 studies.

COMPARISON WITH PREVIOUS OREGON STUDIES

EXHIBIT 6-2: COMPARISON OF EQUITY RATIOS FROM PREVIOUS OREGON HCASs

			Study Year									
Declared Weight			2001	2003	2005	2007	2009	2011	2013	2015	2017	2019
1	to	10,000	1.0027	0.9921	1.0032	0.9933	0.9915	0.9954	0.9927	0.9974	1.0076	0.9846
10,001	to	26,000	0.9440	1.3803	1.1846	1.2557	1.1576	1.2439	1.1189	1.0498	1.0993	1.0819
26,001	to	78,000	0.9596	1.0091	0.7401	0.7485	0.7881	0.8301	0.8885	0.9031	0.7705	0.8338
78,001	to	80,000	1.0603	1.0931	1.0610	1.1274	1.1234	1.2630	1.2014	1.3423	1.2065	1.3288
80,001	to	104,000	0.9479	0.7430	0.9034	0.8427	0.8278	0.7114	0.8084	0.6929	0.7513	0.7901
104,001	to	105,500	0.8712	0.7576	0.8759	0.8299	0.9210	0.6813	0.7444	0.7325	0.7219	0.7282
105,501	and	up	0.4727	0.2678	0.6395	0.6127	0.5932	0.4776	0.3866	0.2406	0.3133	0.1538
	Total		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
10,001	and	up	0.9952	1.0158	0.9936	1.0129	1.0173	1.0089	1.0139	1.0047	0.9865	1.0314
26,001	to	80,000			1.0189	1.0742	1.0655	1.1903	1.1527	1.2680	1.1310	1.2306
80,001	to	105,500			0.8880	0.8357	0.8763	0.6945	0.7751	0.7109	0.7348	0.7549
26,001	to	105,500			0.9812	1.0007	1.0068	0.9934	1.0173	1.0194	0.9847	1.0602
26,001	and	up	0.9996	0.9870	0.9789	0.9984	1.0013	0.9857	1.0023	0.9986	0.9712	1.0247

Overall, the heavy and light equity ratios found by this study align with those ratios determined in previous Oregon studies (see Exhibit 6-2). The difference between the heavy and light equity ratios has widened compared to recent studies, but this partly due to recent changes in pavement factors that reallocated cost responsibility toward light vehicles.

The 2001 Study found adjusted equity ratios of 1.003 for light vehicles and 0.995 for heavy vehicles as a group. This indicated a situation of near-perfect equity for the 2001-03 biennium analysis period, that is, a 0.3 percent projected overpayment by full-fee-paying light vehicles and a 0.5 percent projected underpayment by heavy vehicles. Consequently, no adjustment in tax rates was deemed necessary by the legislature to satisfy the constitutional requirement of “fairness and proportionality” between light and heavy vehicles.

The 2003 Study found adjusted equity ratios of 0.9921 for light vehicles and 1.0158 for heavy vehicles. The 2003 Legislature did not change rates as a direct result of the 2003 Study but did increase registration and other fees to meet the debt-service requirements of the OTIA III bond program. Those fee increases were designed to preserve light/heavy equity given the nature of the projects they would fund, and the results of subsequent studies indicate that they succeeded.

The 2005-2017 Studies found adjusted equity ratios ranging between 0.9913 to 1.0076 for light vehicles and 0.9865 to 1.0173 for heavy vehicles. Over these biennia the gap between the heavy and light equity ratios ranged from 0.7 percent to 2.1 percent. These adjusted equity ratios indicated near-perfect equity between heavy and light vehicles.

The 2019 Study found adjusted equity ratios of 0.9846 for light vehicles and 1.0314 for heavy vehicles. The gap between the heavy and light equity ratios is partially attributable to proposed rate and fee changes made by the legislature in HB 2017. However, underlying changes in the weigh-in-motion data revealed information about the distribution of vehicle weights in the light vehicle weight class that shifted cost responsibility back to that weight group. The full extent of both HB 2017 and the improved weigh-in-motion data will be determined in future studies.

EXHIBIT 6-3: DETAILED COMPARISON OF AVERAGE ANNUAL COST RESPONSIBILITY AND USER FEES PAID BY FULL-FEE-PAYING VEHICLES BY DECLARED WEIGHT CLASS

		Annual VMT		Annual Cost Responsibility		Annual User Fees		Full-Fee Scaled
Weight Class	Axles	All	Full-Fee	All	Full-Fee	All	Full-Fee	Equity Ratio
1	0	34,292,548,174	33,478,458,221	1,337,261,000	1,305,515,014	971,867,858	954,301,254	0.9846
10,001	0	152,882,664	129,051,056	9,013,180	7,608,190	9,886,417	8,781,415	1.5547
12,001	0	90,495,622	68,009,192	6,155,694	4,626,122	5,861,775	4,783,683	1.3929
14,001	0	206,664,885	139,964,498	15,382,956	10,418,159	13,091,354	9,772,819	1.2636
16,001	0	92,607,533	78,738,191	8,235,998	7,002,536	7,771,681	6,949,051	1.3367
18,001	0	109,001,729	84,204,024	11,063,346	8,546,454	9,394,623	7,888,568	1.2433
20,001	0	26,912,909	16,105,690	3,446,589	2,062,568	2,036,484	1,475,004	0.9633
22,001	0	47,491,891	32,232,817	7,088,565	4,811,019	4,273,762	3,359,334	0.9406
24,001	0	227,554,999	157,930,042	43,159,298	29,953,856	22,102,778	17,251,751	0.7758
26,001	0	17,170,861	5,982,501	2,431,466	847,147	769,480	474,333	0.7542
28,001	0	28,583,050	9,101,083	4,088,585	1,301,840	1,102,585	753,300	0.7794
30,001	0	61,862,322	32,645,722	11,328,298	5,978,122	2,522,082	2,718,496	0.6125
32,001	0	38,299,375	27,089,382	6,336,933	4,482,151	2,844,204	2,548,084	0.7658
34,001	0	15,875,126	5,433,028	2,375,141	812,857	751,728	514,740	0.8530
36,001	0	8,621,597	3,176,194	1,792,377	660,311	385,188	301,139	0.6143
38,001	0	61,385,022	13,617,524	8,709,969	1,932,201	1,873,093	1,389,819	0.9689
40,001	0	3,181,864	2,287,885	605,089	435,083	284,326	247,266	0.7655
42,001	0	7,847,471	4,125,371	1,691,535	889,231	663,732	482,452	0.7308
44,001	0	45,187,692	34,738,302	8,951,672	6,881,650	4,929,969	4,317,265	0.8451
46,001	0	31,964,231	18,469,281	6,029,018	3,483,632	3,153,582	2,377,384	0.9193
48,001	0	34,247,569	21,646,500	6,415,272	4,054,833	3,587,531	2,840,751	0.9437
50,001	0	20,288,935	16,821,830	4,248,519	3,522,504	2,373,268	2,187,357	0.8364
52,001	0	35,587,814	29,276,283	7,103,685	5,843,840	4,263,078	3,926,161	0.9050
54,001	0	40,045,849	35,450,571	8,942,193	7,916,073	5,219,409	4,963,341	0.8446
56,001	0	14,428,949	13,910,389	4,342,276	4,186,220	1,988,013	1,963,020	0.6316
58,001	0	15,972,605	14,266,798	4,257,765	3,803,054	2,196,614	2,089,560	0.7401
60,001	0	6,485,859	6,147,520	1,659,815	1,573,230	941,756	921,111	0.7887
62,001	0	7,923,662	7,464,599	1,798,227	1,694,046	1,201,433	1,179,015	0.9375
64,001	0	11,058,190	10,539,402	3,121,508	2,975,064	1,753,872	1,731,361	0.7839
66,001	0	3,207,163	3,044,095	722,981	686,221	531,147	525,475	1.0315

EXHIBIT 6-3 (CONTINUED): DETAILED COMPARISON OF AVERAGE ANNUAL COST RESPONSIBILITY AND USER FEES PAID BY FULL-FEE-PAYING VEHICLES BY DECLARED WEIGHT CLASS

		Annual VMT		Annual Cost Responsibility		Annual User Fees		
Weight Class	Axles	All	Full-Fee	All	Full-Fee	All	Full-Fee	Full-Fee Scaled Equity Ratio
68,001	0	5,849,044	5,621,930	1,327,827	1,276,269	1,040,796	1,031,333	1.0885
70,001	0	4,518,351	4,318,694	1,017,629	972,662	840,877	833,191	1.1538
72,001	0	3,405,455	3,165,116	792,078	736,177	664,470	651,356	1.1918
74,001	0	6,005,742	5,703,434	1,559,272	1,480,784	1,225,556	1,212,358	1.1028
76,001	0	2,685,018	2,152,295	631,437	506,156	516,869	491,006	1.3067
78,001	0	1,203,440,105	1,183,889,645	283,041,831	278,443,681	275,622,701	274,686,669	1.3288
80,001	5	9,338,866	9,184,207	3,202,202	3,149,171	2,016,881	2,011,915	0.8606
80,001	6	384,403	377,004	86,129	84,471	82,533	82,163	1.3102
80,001	7	238,882	233,887	105,924	103,709	49,080	48,811	0.6340
80,001	8	137,970	135,085	21,949	21,490	27,128	26,971	1.6905
80,001	9	3,199	3,132	1,397	1,368	598	595	0.5856
82,001	5	7,584,843	7,360,693	2,725,978	2,645,419	1,823,168	1,812,728	0.9230
82,001	6	663,909	644,961	223,951	217,560	146,376	145,452	0.9006
82,001	7	35,017	33,979	33,130	32,148	7,237	7,187	0.3012
82,001	8	11,056	10,728	7,691	7,463	2,180	2,164	0.3906
82,001	9	337	327	766	743	63	63	0.1137
84,001	5	7,057,275	6,676,148	3,162,264	2,991,487	1,697,206	1,679,346	0.7562
84,001	6	4,127,260	3,897,177	1,365,996	1,289,845	925,386	912,836	0.9533
84,001	7	511,801	481,767	3,901,351	3,672,408	106,468	104,876	0.0385
84,001	8	69,001	64,952	16,376	15,415	13,669	13,452	1.1755
84,001	9	844	795	1,277	1,202	160	157	0.1758
86,001	5	2,231,615	2,166,128	859,991	834,755	531,976	529,618	0.8546
86,001	6	15,521,675	15,190,954	5,775,240	5,652,186	3,090,374	3,082,819	0.7347
86,001	7	468,551	449,487	180,949	173,587	103,511	102,291	0.7938
86,001	8	141,492	135,726	64,721	62,084	29,337	28,985	0.6289
86,001	9	5,389	5,169	6,793	6,517	1,063	1,049	0.2169
88,001	5	2,406,274	2,326,072	761,303	735,929	629,133	625,125	1.1442
88,001	6	40,102,796	39,127,568	11,452,948	11,174,433	8,265,847	8,242,274	0.9935
88,001	7	1,051,882	1,014,355	486,116	468,773	228,578	226,492	0.6508
88,001	8	702,528	676,949	69,934	67,388	146,387	144,914	2.8966
88,001	9	1,810	1,745	1,619	1,560	359	355	0.3068

EXHIBIT 6-3 (CONTINUED): DETAILED COMPARISON OF AVERAGE ANNUAL COST RESPONSIBILITY AND USER FEES PAID BY FULL-FEE-PAYING VEHICLES BY DECLARED WEIGHT CLASS

		Annual VMT		Annual Cost Responsibility		Annual User Fees		
Weight Class	Axles	All	Full-Fee	All	Full-Fee	All	Full-Fee	Full-Fee Scaled Equity Ratio
90,001	5	855,597	845,955	241,681	238,957	237,657	237,130	1.3367
90,001	6	8,804,592	8,709,580	3,129,313	3,095,544	2,088,286	2,083,487	0.9066
90,001	7	1,108,139	1,095,368	556,721	550,305	245,383	244,657	0.5989
90,001	8	40,206	39,742	8,321	8,225	8,491	8,465	1.3862
90,001	9	4,362	4,312	1,057	1,045	876	873	1.1262
92,001	5	332,948	318,314	84,106	80,409	91,128	90,511	1.5162
92,001	6	1,698,220	1,620,895	529,103	505,012	404,805	401,097	1.0698
92,001	7	1,905,599	1,803,491	812,413	768,881	417,159	411,660	0.7212
92,001	8	213,156	201,734	17,974	17,011	44,527	43,907	3.4768
92,001	9	828	784	488	462	164	162	0.4727
94,001	5	582,912	557,554	210,434	201,280	158,502	157,860	1.0564
94,001	6	4,118,366	3,974,448	1,315,459	1,269,490	949,062	945,028	1.0027
94,001	7	11,327,318	10,748,569	5,196,024	4,930,542	2,519,142	2,490,023	0.6803
94,001	8	448,204	425,484	220,641	209,457	95,419	94,239	0.6060
94,001	9	80,012	75,870	11,934	11,316	16,157	15,940	1.8973
96,001	5	2,056,628	2,028,651	580,080	572,189	634,813	633,548	1.4914
96,001	6	4,750,805	4,709,812	1,410,581	1,398,409	1,118,647	1,117,703	1.0766
96,001	7	25,385,392	25,039,019	10,225,196	10,085,678	5,845,907	5,828,284	0.7784
96,001	8	1,943,957	1,916,732	813,574	802,180	422,738	421,346	0.7075
96,001	9	248,674	245,147	98,435	97,039	45,662	45,560	0.6324
98,001	5	0	0	2,249	0	0	0	
98,001	6	1,631,966	1,589,000	536,219	522,101	373,910	371,875	0.9594
98,001	7	14,929,432	14,563,951	5,347,580	5,216,668	3,178,827	3,162,495	0.8166
98,001	8	1,061,865	1,031,875	423,474	411,514	222,044	220,432	0.7215
98,001	9	20,380	19,805	2,188	2,127	608	571	0.3616
100,001	5	0	3,857	738	0	862	0	
100,001	6	0	0	5,117	0	0	0	
100,001	7	8,949,181	8,847,917	3,330,197	3,292,514	1,980,797	1,976,688	0.8087
100,001	8	8,684,320	8,571,903	3,219,039	3,177,369	1,851,734	1,846,486	0.7828
100,001	9	30,124	29,733	2,772	2,736	834	812	0.3998

EXHIBIT 6-3 (CONTINUED): DETAILED COMPARISON OF AVERAGE ANNUAL COST RESPONSIBILITY AND USER FEES PAID BY FULL-FEE-PAYING VEHICLES BY DECLARED WEIGHT CLASS

		Annual VMT		Annual Cost Responsibility		Annual User Fees		
Weight Class	Axles	All	Full-Fee	All	Full-Fee	All	Full-Fee	Full-Fee Scaled Equity Ratio
102,001	5	0	0	982	0	0	0	
102,001	6	0	0	1,935	0	0	0	
102,001	7	2,794,889	2,777,903	1,898,537	1,886,999	638,594	637,790	0.4553
102,001	8	26,701,786	26,525,421	11,020,499	10,947,709	5,790,915	5,782,008	0.7114
102,001	9	14,579	14,483	2,150	2,136	384	378	0.2384
104,001	5	6,098	6,098	32,141	32,141	887	887	0.0372
104,001	6	167,431	167,431	49,614	49,614	37,312	37,312	1.0130
104,001	7	89,035,778	85,469,977	34,911,304	33,513,139	20,462,975	20,287,605	0.8154
104,001	8	183,052,265	175,627,223	78,277,931	75,102,790	39,593,027	39,215,790	0.7033
104,001	9	3,084,253	2,961,261	1,625,092	1,560,288	75,673	68,650	0.0593
106,001	5	0	0	181	0	5	0	
106,001	6	21,119	21,119	118,527	118,527	11,794	11,794	0.1340
106,001	7	30,399	30,399	132,741	132,741	9,985	9,985	0.1013
106,001	8	2,560	2,560	15,557	15,557	585	585	0.0506
106,001	9	860	860	3,852	3,852	171	171	0.0597
108,001	5	0	0	0	0	1	0	
108,001	6	36,356	36,356	200,114	200,114	21,393	21,393	0.1440
108,001	7	80,734	80,734	314,069	314,069	28,939	28,939	0.1241
108,001	8	2,786	2,786	19,322	19,322	664	664	0.0463
108,001	9	4,257	4,257	35,031	35,031	845	845	0.0325
110,001	5	0	0	0	0	0	0	
110,001	6	33,734	33,734	193,275	193,275	22,887	22,887	0.1595
110,001	7	25,241	25,241	117,356	117,356	9,553	9,553	0.1096
110,001	8	2,409	2,409	14,780	14,780	622	622	0.0567
110,001	9	1,813	1,813	8,860	8,860	378	378	0.0575
112,001	5	0	0	0	0	0	0	
112,001	6	43,445	43,445	269,525	269,525	29,909	29,909	0.1495
112,001	7	25,477	25,477	120,605	120,605	9,896	9,896	0.1105
112,001	8	2,728	2,728	16,272	16,272	732	732	0.0606
112,001	9	504	504	3,179	3,179	115	115	0.0488

EXHIBIT 6-3 (CONTINUED): DETAILED COMPARISON OF AVERAGE ANNUAL COST RESPONSIBILITY AND USER FEES PAID BY FULL-FEE-PAYING VEHICLES BY DECLARED WEIGHT CLASS

		Annual VMT		Annual Cost Responsibility		Annual User Fees		
Weight Class	Axles	All	Full-Fee	All	Full-Fee	All	Full-Fee	Full-Fee Scaled Equity Ratio
114,001	5	0	0	0	0	0	0	
114,001	6	41,486	41,486	265,418	265,418	29,806	29,806	0.1513
114,001	7	110,009	110,009	455,513	455,513	44,933	44,933	0.1329
114,001	8	7,324	7,324	42,958	42,958	2,332	2,332	0.0731
114,001	9	3,775	3,775	19,649	19,649	862	862	0.0591
116,001	5	0	0	0	0	1	0	
116,001	6	12,341	12,341	93,339	93,339	9,607	9,607	0.1386
116,001	7	45,873	45,873	213,009	213,009	20,113	20,113	0.1272
116,001	8	8,509	8,509	50,064	50,064	2,795	2,795	0.0752
116,001	9	1,341	1,341	7,637	7,637	320	320	0.0564
118,001	5	0	0	1,869	0	0	0	
118,001	6	33,024	33,024	226,446	226,446	27,689	27,689	0.1647
118,001	7	122,573	122,573	522,856	522,856	58,645	58,645	0.1511
118,001	8	14,434	14,434	80,392	80,392	5,174	5,174	0.0867
118,001	9	4,560	4,560	24,140	24,140	1,179	1,179	0.0658
120,001	5	0	0	0	0	0	0	
120,001	6	19,680	19,680	183,042	183,042	17,484	17,484	0.1287
120,001	7	35,484	35,484	184,411	184,411	18,042	18,042	0.1318
120,001	8	3,852	3,852	25,458	25,458	1,458	1,458	0.0771
120,001	9	939	939	5,791	5,791	252	252	0.0586
122,001	5	0	0	0	0	0	0	
122,001	6	3,787	3,787	41,072	41,072	3,554	3,554	0.1165
122,001	7	39,169	39,169	201,723	201,723	21,090	21,090	0.1408
122,001	8	2,538	2,538	17,652	17,652	1,037	1,037	0.0791
122,001	9	553	553	4,951	4,951	176	176	0.0479
124,001	5	0	0	0	0	0	0	
124,001	6	12,257	12,257	116,034	116,034	12,605	12,605	0.1463
124,001	7	118,134	118,134	535,166	535,166	67,153	67,153	0.1690
124,001	8	11,772	11,772	73,850	73,850	4,926	4,926	0.0898
124,001	9	3,898	3,898	22,528	22,528	1,280	1,280	0.0766

EXHIBIT 6-3 (CONTINUED): DETAILED COMPARISON OF AVERAGE ANNUAL COST RESPONSIBILITY AND USER FEES PAID BY FULL-FEE-PAYING VEHICLES BY DECLARED WEIGHT CLASS

		Annual VMT		Annual Cost Responsibility		Annual User Fees		
Weight Class	Axles	All	Full-Fee	All	Full-Fee	All	Full-Fee	Full-Fee Scaled Equity Ratio
126,001	5	0	0	0	0	0	0	
126,001	6	4,044	4,044	48,700	48,700	4,361	4,361	0.1206
126,001	7	60,834	60,834	311,726	311,726	36,406	36,406	0.1573
126,001	8	6,033	6,033	41,776	41,776	2,645	2,645	0.0853
126,001	9	443	443	4,701	4,701	154	154	0.0443
128,001	5	0	0	0	0	0	0	
128,001	6	866	866	11,752	11,752	1,020	1,020	0.1169
128,001	7	115,147	115,147	579,448	579,448	75,819	75,819	0.1762
128,001	8	14,684	14,684	92,736	92,736	7,026	7,026	0.1020
128,001	9	4,467	4,467	27,535	27,535	1,601	1,601	0.0783
130,001	5	0	0	0	0	0	0	
130,001	6	240	240	3,536	3,536	305	305	0.1161
130,001	7	46,219	46,219	264,304	264,304	32,744	32,744	0.1669
130,001	8	7,927	7,927	58,494	58,494	4,030	4,030	0.0928
130,001	9	2,983	2,983	17,119	17,119	1,129	1,129	0.0888
132,001	5	0	0	0	0	0	0	
132,001	6	275	275	3,995	3,995	373	373	0.1258
132,001	7	79,871	79,871	467,751	467,751	59,779	59,779	0.1721
132,001	8	13,535	13,535	91,329	91,329	7,152	7,152	0.1055
132,001	9	490	490	4,736	4,736	185	185	0.0527
134,001	5	0	0	0	0	0	0	
134,001	6	51	51	1,770	1,770	73	73	0.0559
134,001	7	93,815	93,815	523,811	523,811	73,030	73,030	0.1878
134,001	8	23,623	23,623	150,795	150,795	13,192	13,192	0.1178
134,001	9	9,771	9,771	57,405	57,405	3,991	3,991	0.0936
136,001	5	0	0	0	0	0	0	
136,001	6	0	0	1	0	0	0	
136,001	7	31,519	31,519	222,738	222,738	27,057	27,057	0.1636
136,001	8	18,377	18,377	135,054	135,054	10,814	10,814	0.1079
136,001	9	1,648	1,648	11,335	11,335	690	690	0.0820

EXHIBIT 6-3 (CONTINUED): DETAILED COMPARISON OF AVERAGE ANNUAL COST RESPONSIBILITY AND USER FEES PAID BY FULL-FEE-PAYING VEHICLES BY DECLARED WEIGHT CLASS

		Annual VMT		Annual Cost Responsibility		Annual User Fees		
Weight Class	Axles	All	Full-Fee	All	Full-Fee	All	Full-Fee	Full-Fee Scaled Equity Ratio
138,001	5	0	0	0	0	0	0	
138,001	6	0	0	51	0	0	0	
138,001	7	65,900	65,900	441,883	441,883	59,208	59,208	0.1805
138,001	8	35,046	35,046	223,899	223,899	21,674	21,674	0.1304
138,001	9	7,098	7,098	45,905	45,905	3,112	3,112	0.0913
140,001	5	0	0	0	0	0	0	
140,001	6	0	0	0	0	0	0	
140,001	7	26,691	26,691	217,668	217,668	25,582	25,582	0.1583
140,001	8	22,266	22,266	159,639	159,639	15,107	15,107	0.1275
140,001	9	2,088	2,088	14,581	14,581	937	937	0.0865
142,001	5	0	0	0	0	0	0	
142,001	6	0	0	0	0	0	0	
142,001	7	22,047	22,047	248,025	248,025	22,674	22,674	0.1231
142,001	8	14,162	14,162	115,661	115,661	10,174	10,174	0.1185
142,001	9	1,388	1,388	10,164	10,164	692	692	0.0917
144,001	5	0	0	0	0	0	0	
144,001	6	0	0	0	0	0	0	
144,001	7	44,959	44,959	387,783	387,783	48,486	48,486	0.1684
144,001	8	33,311	33,311	230,523	230,523	24,932	24,932	0.1457
144,001	9	12,810	12,810	82,473	82,473	6,513	6,513	0.1064
146,001	5	0	0	0	0	0	0	
146,001	6	0	0	0	0	0	0	
146,001	7	52,243	52,243	586,611	586,611	61,043	61,043	0.1402
146,001	8	29,935	29,935	229,612	229,612	23,004	23,004	0.1349
146,001	9	5,760	5,760	39,068	39,068	3,044	3,044	0.1049
148,001	5	0	0	0	0	0	0	
148,001	6	0	0	0	0	0	0	
148,001	7	16,734	16,734	190,656	190,656	20,556	20,556	0.1452
148,001	8	36,861	36,861	284,515	284,515	30,906	30,906	0.1463
148,001	9	18,750	18,750	124,796	124,796	10,096	10,096	0.1090

EXHIBIT 6-3 (CONTINUED): DETAILED COMPARISON OF AVERAGE ANNUAL COST RESPONSIBILITY AND USER FEES PAID BY FULL-FEE-PAYING VEHICLES BY DECLARED WEIGHT CLASS

		Annual VMT		Annual Cost Responsibility		Annual User Fees		
Weight Class	Axles	All	Full-Fee	All	Full-Fee	All	Full-Fee	Full-Fee Scaled Equity Ratio
150,001	5	0	0	0	0	0	0	
150,001	6	0	0	0	0	0	0	
150,001	7	1,183	1,183	18,294	18,294	1,525	1,525	0.1123
150,001	8	13,224	13,224	115,198	115,198	11,484	11,484	0.1343
150,001	9	4,929	4,929	35,341	35,341	2,802	2,802	0.1068
152,001	5	0	0	0	0	0	0	
152,001	6	0	0	0	0	0	0	
152,001	7	420	420	6,798	6,798	571	571	0.1131
152,001	8	28,062	28,062	247,813	247,813	25,493	25,493	0.1386
152,001	9	10,203	10,203	67,930	67,930	6,004	6,004	0.1191
154,001	5	0	0	0	0	0	0	
154,001	6	0	0	0	0	0	0	
154,001	7	554	554	9,853	9,853	785	785	0.1074
154,001	8	35,690	35,690	287,920	287,920	33,493	33,493	0.1567
154,001	9	22,521	22,521	164,402	164,402	13,928	13,928	0.1141
156,001	5	0	0	0	0	0	0	
156,001	6	0	0	0	0	0	0	
156,001	7	35	35	733	733	52	52	0.0959
156,001	8	34,124	34,124	295,928	295,928	34,754	34,754	0.1582
156,001	9	8,894	8,894	64,139	64,139	6,123	6,123	0.1286
158,001	5	0	0	0	0	0	0	
158,001	6	0	0	0	0	0	0	
158,001	7	343	343	7,015	7,015	545	545	0.1046
158,001	8	35,803	35,803	337,574	337,574	37,538	37,538	0.1498
158,001	9	38,682	38,682	285,181	285,181	27,791	27,791	0.1313
160,001	5	0	0	0	0	0	0	
160,001	6	0	0	0	0	0	0	
160,001	7	0	0	12	0	0	0	
160,001	8	14,317	14,317	172,489	172,489	15,583	15,583	0.1217
160,001	9	9,790	9,790	73,203	73,203	7,327	7,327	0.1348

EXHIBIT 6-3 (CONTINUED): DETAILED COMPARISON OF AVERAGE ANNUAL COST RESPONSIBILITY AND USER FEES PAID BY FULL-FEE-PAYING VEHICLES BY DECLARED WEIGHT CLASS

		Annual VMT		Annual Cost Responsibility		Annual User Fees		
Weight Class	Axles	All	Full-Fee	All	Full-Fee	All	Full-Fee	Full-Fee Scaled Equity Ratio
162,001	5	0	0	0	0	0	0	
162,001	6	0	0	0	0	0	0	
162,001	7	0	0	0	0	0	0	
162,001	8	9,602	9,602	123,973	123,973	11,316	11,316	0.1229
162,001	9	10,926	10,926	84,378	84,378	8,505	8,505	0.1358
164,001	5	0	0	0	0	0	0	
164,001	6	0	0	0	0	0	0	
164,001	7	140	140	3,618	3,618	251	251	0.0934
164,001	8	7,887	7,887	108,827	108,827	9,688	9,688	0.1199
164,001	9	43,621	43,621	338,923	338,923	36,574	36,574	0.1454
166,001	5	0	0	0	0	0	0	
166,001	6	0	0	0	0	0	0	
166,001	7	0	0	0	0	0	0	
166,001	8	5,038	5,038	76,200	76,200	6,390	6,390	0.1130
166,001	9	16,382	16,382	130,261	130,261	14,554	14,554	0.1505
168,001	5	0	0	0	0	0	0	
168,001	6	0	0	0	0	0	0	
168,001	7	13	13	382	382	26	26	0.0925
168,001	8	11,112	11,112	166,425	166,425	14,984	14,984	0.1213
168,001	9	43,289	43,289	353,661	353,661	40,191	40,191	0.1531
170,001	5	0	0	0	0	0	0	
170,001	6	0	0	0	0	0	0	
170,001	7	0	0	0	0	0	0	
170,001	8	695	695	12,364	12,364	965	965	0.1052
170,001	9	12,273	12,273	105,719	105,719	11,763	11,763	0.1499
172,001	5	0	0	0	0	0	0	
172,001	6	0	0	0	0	0	0	
172,001	7	0	0	0	0	0	0	
172,001	8	46	46	965	965	67	67	0.0929
172,001	9	17,843	17,843	159,355	159,355	18,350	18,350	0.1551

EXHIBIT 6-3 (CONTINUED): DETAILED COMPARISON OF AVERAGE ANNUAL COST RESPONSIBILITY AND USER FEES PAID BY FULL-FEE-PAYING VEHICLES BY DECLARED WEIGHT CLASS

		Annual VMT		Annual Cost Responsibility		Annual User Fees		
Weight Class	Axles	All	Full-Fee	All	Full-Fee	All	Full-Fee	Full-Fee Scaled Equity Ratio
174,001	5	0	0	0	0	0	0	
174,001	6	0	0	0	0	0	0	
174,001	7	0	0	0	0	0	0	
174,001	8	421	421	8,064	8,064	657	657	0.1097
174,001	9	44,451	44,451	395,554	395,554	47,049	47,049	0.1602
176,001	5	0	0	0	0	0	0	
176,001	6	0	0	0	0	0	0	
176,001	7	0	0	1	0	0	0	
176,001	8	0	0	11	0	0	0	
176,001	9	13,310	13,310	123,250	123,250	14,753	14,753	0.1612
178,001	5	0	0	0	0	0	0	
178,001	6	0	0	0	0	0	0	
178,001	7	0	0	0	0	0	0	
178,001	8	0	0	1	0	0	0	
178,001	9	56,453	56,453	530,337	530,337	66,526	66,526	0.1690
180,001	5	0	0	0	0	0	0	
180,001	6	0	0	0	0	0	0	
180,001	7	0	0	0	0	0	0	
180,001	8	0	0	0	0	0	0	
180,001	9	10,633	10,633	101,500	101,500	13,062	13,062	0.1733
182,001	5	0	0	0	0	0	0	
182,001	6	0	0	0	0	0	0	
182,001	7	0	0	0	0	0	0	
182,001	8	0	0	0	0	0	0	
182,001	9	18,808	18,808	189,584	189,584	23,857	23,857	0.1695
184,001	5	0	0	0	0	0	0	
184,001	6	0	0	0	0	0	0	
184,001	7	0	0	0	0	0	0	
184,001	8	471	471	11,772	11,772	898	898	0.1028
184,001	9	59,087	59,087	600,963	600,963	79,675	79,675	0.1786

EXHIBIT 6-3 (CONTINUED): DETAILED COMPARISON OF AVERAGE ANNUAL COST RESPONSIBILITY AND USER FEES PAID BY FULL-FEE-PAYING VEHICLES BY DECLARED WEIGHT CLASS

		Annual VMT		Annual Cost Responsibility		Annual User Fees		
Weight Class	Axles	All	Full-Fee	All	Full-Fee	All	Full-Fee	Full-Fee Scaled Equity Ratio
186,001	5	0	0	0	0	0	0	
186,001	6	0	0	0	0	0	0	
186,001	7	0	0	0	0	0	0	
186,001	8	0	0	0	0	0	0	
186,001	9	17,421	17,421	183,546	183,546	24,015	24,015	0.1762
188,001	5	0	0	0	0	0	0	
188,001	6	0	0	0	0	0	0	
188,001	7	0	0	0	0	0	0	
188,001	8	0	0	1	0	0	0	
188,001	9	38,419	38,419	425,070	425,070	55,263	55,263	0.1751
190,001	5	0	0	0	0	0	0	
190,001	6	0	0	0	0	0	0	
190,001	7	0	0	0	0	0	0	
190,001	8	0	0	0	0	0	0	
190,001	9	22,518	22,518	246,621	246,621	33,967	33,967	0.1855
192,001	5	0	0	0	0	0	0	
192,001	6	0	0	0	0	0	0	
192,001	7	0	0	0	0	0	0	
192,001	8	0	0	0	0	0	0	
192,001	9	10,570	10,570	129,798	129,798	16,579	16,579	0.1721
194,001	5	0	0	0	0	0	0	
194,001	6	0	0	0	0	0	0	
194,001	7	0	0	0	0	0	0	
194,001	8	0	0	6	0	0	0	
194,001	9	50,773	50,773	579,880	579,880	82,174	82,174	0.1909
196,001	5	0	0	0	0	0	0	
196,001	6	0	0	0	0	0	0	
196,001	7	0	0	0	0	0	0	
196,001	8	0	0	0	0	0	0	
196,001	9	28,714	28,714	337,724	337,724	48,482	48,482	0.1934

EXHIBIT 6-3 (CONTINUED): DETAILED COMPARISON OF AVERAGE ANNUAL COST RESPONSIBILITY AND USER FEES PAID BY FULL-FEE-PAYING VEHICLES BY DECLARED WEIGHT CLASS

		Annual VMT		Annual Cost Responsibility		Annual User Fees		
Weight Class	Axles	All	Full-Fee	All	Full-Fee	All	Full-Fee	Full-Fee Scaled Equity Ratio
198,001	5	0	0	0	0	0	0	
198,001	6	0	0	0	0	0	0	
198,001	7	0	0	0	0	0	0	
198,001	8	0	0	0	0	0	0	
198,001	9	68,368	68,368	849,977	849,977	118,854	118,854	0.1884
200,001	5	0	0	0	0	0	0	
200,001	6	0	0	0	0	0	0	
200,001	7	0	0	0	0	0	0	
200,001	8	0	0	0	0	0	0	
200,001	9	132,954	132,954	1,693,612	1,693,612	237,781	237,781	0.1891

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Recent information about the distribution of light vehicles has resulted in cost responsibility being allocated toward light vehicles in this study. Despite that reallocation, light and heavy vehicles continue to pay reasonably equitable shares of highway costs in Oregon. Additionally, forthcoming rate changes that will fall primarily on light vehicles should close the gap in equity ratios between light and heavy vehicles.

This report does not recommend any change that would affect the distribution of revenue burdens between light and heavy vehicles for the 2019-21 biennium. If rates are adjusted for other reasons, which reside outside the scope of this study, those adjustment should strive to maintain the proportional burden on light and heavy vehicles.

Within the various classes of heavy vehicles, there are inequities that the legislature could choose to address through changes to the rate structure. In this chapter, we offer alternative rate schedules that, if implemented, would bring about substantially greater equity within heavy vehicle classes without materially changing the total amount of revenue collected from heavy vehicles.

The inequities within heavy vehicle classes may be generalized as follows:

- Vehicles between 10,001 and 26,000 pounds are paying more than their fair share.
- Vehicles weighing between 26,001 and 78,000 pounds are paying less than their fair share.
- Vehicles with a declared weight of 78,001 to 80,000 pounds (which account for 59.0 percent of vehicle miles by full-fee-paying vehicles over 26,000 pounds) are paying more than their fair share.
- Vehicles weighing more than 80,000 pounds are paying less than their fair share.

To achieve equity within heavy vehicle classes, several rate schedules would need to be changed. These include the Table A and Table B weight-mile tax rates; the optional flat fee rates for haulers of logs, sand and gravel, and wood chips; and the road use assessment fee applicable to vehicles operated under single-trip, non-divisible load permits at gross weights over 98,000 pounds.

WEIGHT-MILE TAX TABLE A AND TABLE B RATES

Commercial vehicles operated at declared weights of 26,001 to 105,500 pounds are subject to the weight-mile tax for their Oregon miles of travel. Operators of vehicles with declared weights of 26,001-80,000 pounds pay the statutory Table A rates. Vehicles operated under special annual permits at declared weights of 80,001-105,500 pounds are subject to the statutory Table B rates.[10]

Table A rates are specified for each 2,000-pound declared gross weight increment. The rates for 2020 range from 6.54 cents per mile for vehicles declared at 26,001-28,000 pounds to 21.50 cents per mile for vehicles declared at 78,001-80,000 pounds.

FIGURE 7-1: WEIGHT-MILE TAX TABLE A

Declared Weight	Current WMT Rate	Alternative Rate	Difference	Percent Difference
26,001 to 28,000	0.0623	0.0600	-0.0023	-3.69%
28,001 to 30,000	0.0660	0.0620	-0.0040	-6.06%
30,001 to 32,000	0.0689	0.0641	-0.0048	-6.97%
32,001 to 34,000	0.0721	0.0662	-0.0059	-8.18%
34,001 to 36,000	0.0749	0.0684	-0.0065	-8.68%
36,001 to 38,000	0.0787	0.0707	-0.0080	-10.17%
38,001 to 40,000	0.0817	0.0730	-0.0087	-10.65%
40,001 to 42,000	0.0847	0.0754	-0.0093	-10.98%
42,001 to 44,000	0.0878	0.0779	-0.0099	-11.28%
44,001 to 46,000	0.0907	0.0805	-0.0102	-11.25%
46,001 to 48,000	0.0937	0.0832	-0.0105	-11.21%
48,001 to 50,000	0.0968	0.0860	-0.0108	-11.16%
50,001 to 52,000	0.1004	0.0888	-0.0116	-11.55%
52,001 to 54,000	0.1041	0.0917	-0.0124	-11.91%
54,001 to 56,000	0.1080	0.0947	-0.0133	-12.31%
56,001 to 58,000	0.1125	0.0978	-0.0147	-13.07%
58,001 to 60,000	0.1177	0.1010	-0.0167	-14.19%
60,001 to 62,000	0.1237	0.1043	-0.0194	-15.68%
62,001 to 64,000	0.1306	0.1078	-0.0228	-17.46%
64,001 to 66,000	0.1380	0.1114	-0.0266	-19.28%
66,001 to 68,000	0.1478	0.1151	-0.0327	-22.12%
68,001 to 70,000	0.1583	0.1189	-0.0394	-24.89%
70,001 to 72,000	0.1687	0.1228	-0.0459	-27.21%
72,001 to 74,000	0.1783	0.1269	-0.0514	-28.83%
74,001 to 76,000	0.1875	0.1311	-0.0564	-30.08%
76,001 to 78,000	0.1966	0.1354	-0.0612	-31.13%
78,001 to 80,000	0.2048	0.1400	-0.0648	-31.64%

[10] Under the Oregon weight-mile tax system, a power unit (tractor) can have multiple declared weights, depending on the configuration in which it is being operated (i.e., the number of trailers/semi-trailers the truck or tractor is pulling). Hence, during any given reporting period, portions of a vehicle's miles may be reported under both Table A and Table B.

To achieve better equity within heavy vehicle classes, Table A rates could be changed to range from 6.00 cents per mile to 14.00 cents per mile, as shown in Exhibit 7-1. These modified rates are lower than the existing rates across all weight classes and would result in a 33.2 percent reduction in revenue collected from vehicles paying Table A rates. If Table A rates are to be adjusted as recommended here, Table B rates must also be adjusted as described below to maintain revenue neutrality.

Table B rates are specified for combinations of 2,000-pound increment and number of axles. The rates are structured so that, at any given declared weight, carriers can qualify for a lower rate by utilizing additional axles. At a declared weight of 96,000 pounds, for example, the per-mile rate for a five-axle vehicle is 30.25 cents and the rate for a six-axle vehicle is 24.97 cents. Thus, by adding an axle, a carrier can reduce his or her tax liability by more than five cents per mile. Current Table B rates range from 17.01 cents per mile for a nine-axle vehicle declared at 82,000 pounds to 30.25 cents per mile for a five-axle vehicle declared at 96,000 pounds. Vehicles declared at over 98,000 pounds must have six or more axles, and vehicles declared at over 100,000 pounds must have seven or more axles.

To achieve better equity within the heavy vehicle classes, Table B rates could be adjusted as shown in Exhibit 7-2.

FIGURE 7-2: WEIGHT-MILE TAX TABLE B

Declared Weight	Axles	WMT Rate	Alternative Rate	Difference	Percent Difference
80,001 to 82,000	5	0.2115	0.2000	-0.01	-5.44%
80,001 to 82,001	6	0.1934	0.1700	-0.02	-12.10%
80,001 to 82,002	7	0.1808	0.1600	-0.02	-11.50%
80,001 to 82,003	8	0.1718	0.1400	-0.03	-18.51%
80,001 to 82,004	9	0.1620	0.1300	-0.03	-19.75%
82,001 to 84,000	5	0.2183	0.2057	-0.01	-5.77%
82,001 to 84,000	6	0.1966	0.1761	-0.02	-10.43%
82,001 to 84,000	7	0.1838	0.1661	-0.02	-9.63%
82,001 to 84,000	8	0.1740	0.1459	-0.03	-16.15%
82,001 to 84,000	9	0.1642	0.1353	-0.03	-17.60%
84,001 to 86,000	5	0.2249	0.2115	-0.01	-5.96%
84,001 to 86,000	6	0.2011	0.1824	-0.02	-9.30%
84,001 to 86,000	7	0.1868	0.1724	-0.01	-7.71%
84,001 to 86,000	8	0.1762	0.1521	-0.02	-13.68%
84,001 to 86,000	9	0.1665	0.1408	-0.03	-15.44%
86,001 to 88,000	5	0.2325	0.2175	-0.02	-6.45%
86,001 to 88,000	6	0.2054	0.1890	-0.02	-7.98%
86,001 to 88,000	7	0.1897	0.1789	-0.01	-5.69%
86,001 to 88,000	8	0.1793	0.1585	-0.02	-11.60%
86,001 to 88,000	9	0.1687	0.1465	-0.02	-13.16%
88,001 to 90,000	5	0.2415	0.2237	-0.02	-7.37%
88,001 to 90,000	6	0.2107	0.1958	-0.01	-7.07%
88,001 to 90,000	7	0.1928	0.1857	-0.01	-3.68%
88,001 to 90,000	8	0.1822	0.1652	-0.02	-9.33%
88,001 to 90,000	9	0.1718	0.1525	-0.02	-11.23%
90,001 to 92,000	5	0.2520	0.2301	-0.02	-8.69%
90,001 to 92,000	6	0.2168	0.2029	-0.01	-6.41%
90,001 to 92,000	7	0.1956	0.1927	0.00	-1.48%
90,001 to 92,000	8	0.1852	0.1722	-0.01	-7.02%
90,001 to 92,000	9	0.1748	0.1587	-0.02	-9.21%
92,001 to 94,000	5	0.2633	0.2366	-0.03	-10.14%

FIGURE 7-2 (CONTINUED): WEIGHT-MILE TAX TABLE B

Declared Weight	Axles	WMT Rate	Alternative Rate	Difference	Percent Difference
92,001 to 94,000	6	0.2227	0.2102	-0.01	-5.61%
92,001 to 94,000	7	0.1987	0.2000	0.00	0.65%
92,001 to 94,000	8	0.1882	0.1795	-0.01	-4.62%
92,001 to 94,000	9	0.1771	0.1652	-0.01	-6.72%
94,001 to 96,000	5	0.2753	0.2433	-0.03	-11.62%
94,001 to 96,000	6	0.2295	0.2178	-0.01	-5.10%
94,001 to 96,000	7	0.2025	0.2076	0.01	2.52%
94,001 to 96,000	8	0.1913	0.1871	0.00	-2.20%
94,001 to 96,000	9	0.1799	0.1719	-0.01	-4.45%
96,001 to 98,000	5	0.2881	0.2502	-0.04	-13.16%
96,001 to 98,000	6	0.2378	0.2256	-0.01	-5.13%
96,001 to 98,000	7	0.2070	0.2155	0.01	4.11%
96,001 to 98,000	8	0.1944	0.1950	0.00	0.31%
96,001 to 98,000	9	0.1830	0.1789	0.00	-2.24%
98,001 to 100,000	6	0.2467	0.2337	-0.01	-5.27%
98,001 to 100,000	7	0.2115	0.2237	0.01	5.77%
98,001 to 100,000	8	0.1980	0.2032	0.01	2.63%
98,001 to 100,000	9	0.1860	0.1862	0.00	0.11%
100,001 to 102,000	7	0.2160	0.2322	0.02	7.50%
100,001 to 102,000	8	0.2025	0.2118	0.01	4.59%
100,001 to 102,000	9	0.1891	0.1938	0.00	2.49%
102,001 to 104,000	7	0.2205	0.2410	0.02	9.30%
102,001 to 104,000	8	0.2070	0.2207	0.01	6.62%
102,001 to 104,000	9	0.1928	0.2017	0.01	4.62%
104,001 to 106,000	7	0.2264	0.2500	0.02	10.42%
104,001 to 106,000	8	0.2115	0.2300	0.02	8.75%
104,001 to 106,000	9	0.1966	0.2100	0.01	6.82%

OPTIONAL FLAT FEE RATES

Under existing law, carriers hauling qualifying commodities — logs, sand and gravel, and wood chips — have the option of paying monthly flat fees in lieu of the weight-mile tax. There are separate flat fee rates applicable to each of the three different commodity groups. Each rate is set so that carriers paying it should, on average, pay the same amount as they would on a mileage basis. For this reason, flat fee vehicles are treated as full fee vehicles in this study. Before the 2015 study, flat fee vehicles were classified as alternative fee vehicles.

When paying the weight-mile tax, log haulers can use a lower declared weight when their trailer is empty and stowed above the tractor unit. It was assumed that 55 percent of log-truck miles are with an empty, decked trailer. Weight-mile taxes apply only to miles on public roads in Oregon, but log trucks may incur some of their miles on private logging roads.

The existing statutory flat fee rate for carriers transporting logs is $9.10 per 100 pounds of declared combined weight. These that are typically paid in monthly installments. The monthly flat fee applicable to a log truck declared at 80,000 pounds, for example, is $606.67 ($9.10 x 800 = $7,280/12 months = $606.80). This amount must be paid each month the vehicle remains on a flat fee basis, regardless of the number of miles traveled during the month.

The flat fee rates are required to be reviewed biennially and appropriate adjustments presented to each regular legislative session. This review is accomplished through the biennial flat fee studies, the latest of which was completed in November 2018 and entitled “Testing for Revenue Neutrality of Flat Fee Firms in Oregon (2017).”

That study compared flat fee revenues in 2017 to what those vehicles would have paid in weight-mile tax in 2017. The 2017 flat fee study found that wood chip haulers overpaid relative to a mileage basis, while flat fee log haulers, along with sand and gravel haulers underpaid less than they would have on a mileage basis.

In 2017, the legislature passed HB2017, which increases flat fees by 53.4 percent between 2018 and 2024. A large share of the rate increases (around 32 percent) are front-loaded between 2018 and 2020. Based on the proposed rate changes from the legislature, the report recommends waiting until the impact of those new rates can be assessed across commodities before recommending further adjustment.

ROAD USE ASSESSMENT FEE RATES

Since 1990, carriers operating vehicles under single-trip, non-divisible load permits at gross weights above 98,000 pounds pay the road use assessment fee. The road use assessment fee takes the place of the weight-mile tax for the loaded portion of non-divisible load hauls. With rare exceptions, the empty back haul portion of these trips is subject to the weight-mile tax and taxed at the vehicle’s regular declared weight.[11]

The fees carriers pay are contained in a table of per-mile rates expressed in terms of permit gross weight and number of axles. Because of its size, that table is not reproduced in this report. Per-mile rates for loads over 200,000 pounds are calculated from the actual weight on each axle. As with the Table B rates, carriers are charged a lower per-mile fee for the use of additional axles at any given gross weight. This reflects the fact that spreading any given total load over additional axles reduces the amount of pavement damage imposed by that load.

For the 2019 HCAS, the equity ratios presented in Chapter 6 suggest that vehicles in weight classes above 105,500 significantly underpay relative to their cost responsibility. With recent and forthcoming rate changes from HB 2017, this report does not recommend further changes to the flat fee rates until the current rate changes can be assessed.

[11] See Appendix A for a detailed explanation of declared and operating weight.