Gas Taxes & The "User Pay" Model: Who Damages Our Roads? Who Pays?

Alaska spends more on roads than any other state in the union, and yet our road conditions are ranked among the worst. In 2021, Alaska spent $2,266 in state and local funds for every 10,000 miles driven, more than three times the national average of $659, and yet the Reason Foundation's most recent Annual Highway Report rated Alaska's highway system the worst in the nation. Why? Our state faces structural challenges built into our geography, our climate, and the sheer scale of the infrastructure we maintain, and the tools we use to cover these costs haven't kept up.

The way we fund roads in the United States is described as a "user pay" system. The idea is that drivers who use the roads should pay proportionally for their upkeep through user fees like motor fuel taxes. But in Alaska, as in the rest of the country, this model has failed to deliver for decades.

Gas taxes have stayed flat even as construction and maintenance costs have climbed. Meanwhile, vehicles have become more fuel-efficient, and newer electric vehicles (EVs) use no gasoline at all. This has led some to worry that EV drivers aren't paying their fair share—a concern sometimes extended to people who bike or walk, since those modes of transportation also don't burn gasoline.

In practice, though, the shortfall isn't caused by EVs, bicyclists, or anyone choosing cleaner, lighter, or more efficient ways to travel. It's built into the structure of the system itself.

No one pays the full cost of their road use through gas taxes, not even drivers of gas-powered vehicles, and not at any level of government. It's been this way for decades: Alaska's state gas tax hasn't been raised since 1970 and remains the lowest in the nation; the federal gas tax hasn't changed since 1993. Today, less than half of all highway dollars come from fuel taxes and other user fees.

The shortfall is made up from general funds, made up of property, sales, and income taxes that are paid by everyone, regardless of whether they drive or what kind of car they have. In other words, **everyone pays for our roads, not just drivers.**

What causes Alaska's road funding challenge, then? The answer is complex, but the heart of the issue is an outdated and unsustainable model that no longer reflects how people use our transportation system, or what it truly costs to maintain it.

The pages that follow explain how the current gas tax system works, how road damage really happens, and what kinds of approaches could make transportation funding more fair, efficient, and sustainable for everyone.

How the Gas Tax Works

To start, we'll review the actual gas taxes levied at the local, state, and federal levels, and compare those revenues against government expenditures.

But first, a disclaimer: Transportation costs can be hard to quantify, because they are often spread across many agencies with complex relationships. To make this analysis as simple as possible and compare equivalent spending types, this section focuses on the most direct costs of building, maintaining and managing roads, while excluding adjacent or indirect costs such as public transit, traffic enforcement or municipal fleet vehicle maintenance.[1]

Municipality of Anchorage

- Local gas tax: **12¢ per gallon**
- Revenue (2024): **$14 million**
- Adjusted for inflation every five years (last in 2023)
- *Note:* The municipal fuel tax is "under the tax cap" and was implemented for the explicit purpose of offsetting property taxes and diversifying city revenue.

Now compare that to Anchorage's road-related spending:

Category	Annual Cost (2024)
Street Maintenance	$25 million
Traffic Engineering	$6.8 million
Project Management & Engineering (PM&E)	$912,000
2024 Road Bond	$47 million
Total	**$79.7 million**

The municipal gas tax does not even bring in enough revenue to cover the regular Street Maintenance department operations, let alone the full extent of constructing and maintaining the roads under municipal jurisdiction.

[1] Externalities such as noise, air and water pollution, injuries and death due to crashes, etc. are also excluded from this analysis, although they are very real costs that all citizens must bear. A 2008 paper by researchers at the University of Texas-Austin priced these externalities at 33¢ per vehicle mile traveled—51¢ when inflation-adjusted for 2025. Multiply that by the average American's roughly 9,600 vehicle miles traveled per year for a total of $4,896 in externalities per person, per year imposed as a cost on the community at large.

State of Alaska

- Alaska state gas tax: **8.95¢ per gallon**
- Revenue (2025): **$37 million**
- This tax is not automatically adjusted for inflation, and has been unchanged since 1970.
- *Note:* Alaska's gas tax is the lowest in the nation, by far. Next-lowest state: Mississippi at 18.4¢; national median: 30¢.

Compare this revenue against the 2025 budget for state transportation spending:

Category	Annual Cost (2025)
Highways & Aviation Operations	$85.5 (171) million[2]
State match for Federal Highway Aid	$87.1 million
Total	**$172.6 million**

We can see again here that the gas tax revenue doesn't even come close to covering expenses.

Federal

- Federal gas tax: **18.4¢ per gallon**
- Revenue (2024): **$35 billion**
- This tax is not automatically adjusted for inflation, and has been unchanged since 1993.

Federal gas tax revenue is fed into the Highway Trust Fund, which the federal government then uses to disburse funding for transportation projects.

The Highway Trust Fund paid out $69 billion in 2024. There are a few other sources of income for the Trust Fund (various other, smaller user taxes and fees), but in the end **the Trust Fund ran a deficit of about $20 billion**. It has been running a deficit since 2001.

Where does the rest of the money come from?

Congress has transferred a total of **$275 billion to the Fund since 2008** to keep it from completely running out, most recently transferring $118 billion in 2021. The transfers are made from general funds—a pool that includes Americans' regular federal taxes.

[2] The budget total in this category is $171 million, but aviation and highways are not separated out. To avoid counting aviation expenses in this analysis, 50% of the budget total is excluded here.

Across all levels of government, it is clear that gas tax revenue is not meeting our transportation funding needs. As a thought experiment, here's what gas tax rates would need to be just to break even on one year's road expenses:

- Local: **70¢ per gallon**
- State: **42¢ per gallon**
- Federal: **36¢ per gallon**
- Total: **$1.48 per gallon**[3]

Even more would be needed to start making a dent in Alaska's deferred maintenance backlog, which was about $190 million in 2022, according to the state Roads and Highways Advisory Board.

Bottom Line

Gas taxes have never covered the real cost of building and maintaining our roads. The "user pay" model of transportation funding is a myth, and it has been for decades. Everyone pays for roads, whether or not they drive, through their property, sales and income taxes.

[3] This is an oversimplified estimate assuming the same amount of gas sold and ignoring the municipal tax cap, for the purpose of demonstrating the budget gap. In practice, applying gas taxes this high would create downward pressure on gas demand, and the taxes would have to be even higher to make up the difference—another reason why the gas tax is not sustainable in the long term.

How Vehicles Damage Roads

To understand how to fund roads fairly, we need to look at what actually causes road damage.

In civil engineering, the “Fourth Power Law” says that pavement damage increases with the fourth power of axle weight. That means doubling the weight of a vehicle doesn’t just double the road wear it causes; it actually results in **16 times** more road damage.

This is an engineering rule of thumb, not a comprehensive technical analysis; to directly quantify damage on a specific road, you’d need a lot of other data points including vehicle speed and traffic volume, as well as non-vehicular factors such as weather and pavement condition.

But the question we’re asking right now is: Which types of vehicles are *inherently* more damaging? We use the Fourth Power Law to hold all those other variables constant so we can make a fair, apples-to-apples comparison between vehicles.

Here’s how the math works out, comparing the calculated road damage of various types of vehicles against a 4,000-lb “typical” sedan:

Vehicle	Weight (lbs)	Axles	Damage vs. 4,000-lb car
Very Heavy Bicycle + Very Heavy Rider	300	2	0.00003x
Toyota Rav4	3,515	2	0.6×
Honda CR-V	3,735	2	0.76×
Toyota Camry	3,774	2	0.79×
Typical Car (4,000 lbs)	**4,000**	**2**	**1.0×**
Chevy Silverado 1500	4,950	2	2.35×
Ford F-150	5,950	2	4.9×
Ram Pickup	6,440	2	6.7×
Max Legal Weight Semi Truck	**80,000**	**5**	**4,096×**

Even small increases in size add up fast: A typical pickup can cause 5 to 7 times more pavement damage per mile than a sedan. And while a fully loaded semi truck is about 20 times heavier than a typical sedan, the Fourth Power Law shows that such a heavy vehicle causes as much damage per mile as over 4,000 sedans. Bicycles, meanwhile, are so lightweight and efficient that they’re barely even a rounding error by comparison.

How do EVs fit into this calculation, and to what extent are they contributing to wear and tear on the roads?

Now that we understand the relationship between road damage and vehicle weight, we can compare EVs directly to internal combustion engine (ICE) vehicles to determine their impact on roads. The table below compares the curb weights of the 2025 top-selling cars for each fuel type:

Vehicle type - ICE	Weight (lbs)	Vehicle type - EV	Weight (lbs)
Honda Civic	2,926	Tesla Model 3	4,048
Toyota Rav4	3,515	Hyundai Ioniq 5	4,453
Chevrolet Equinox	3,705	Tesla Model Y	4,603
Honda CR-V	3,735	Ford Mustang Mach-E	4,890
Toyota Camry	3,774	Volkswagen ID.4	4,903
Toyota Tacoma	4,500	Chevrolet Equinox EV	5,073
Chevrolet Silverado 1500	4,950	Honda Prologue	5,273
GMC Sierra 1500	5,586	Chevrolet Blazer EV	5,730
Ford F-150	5,950	Tesla Cybertruck	6,863
Ram Pickup	6,440	Ford F-150 Lightning	6,893

While it is true that in general, EVs are often heavier than their direct ICE counterparts because of the battery and other components, the top-selling EVs are about on par weight-wise with the top-selling internal combustion engine (ICE) vehicles: Tall, bulky and heavy trucks and SUVs.

To illustrate: In the chart above, the EV Chevrolet Equinox is a little over ⅓ heavier than the gas-powered Chevrolet Equinox, but it's about the same weight as a gas-powered Chevrolet Silverado 1500.

Finally, we must consider the prevalence of EVs: Alaska's ~4,500 EVs make up about 1% of registered vehicles in the state. Even if they did, on average, cause more wear and tear on the road than their gas-powered counterparts, there are simply so few of them that their overall effect on road damage would still be negligible.

Bottom Line

It's not EVs, or bikes, or people walking that are wearing out our roads. It's the billions of miles driven every year by gas-powered pickups, SUVs, and above all, heavy freight trucks. Even the heaviest EVs barely register compared to the impact of a single semi-truck. And remember, no drivers—of electric or gas-powered vehicles—are truly paying their fair share for road damage through gas taxes or other user fees.

Why Are Our Roads in Such Poor Condition?

Gas taxes tell one part of the story, and road-wear data tell another. Now we can put these pieces together to answer the question: Why do we spend so much on roads and get so little in return?

In short, we spent decades growing our road network without matching it with sustainable long-term maintenance funding. Now the bill is coming due, and this structural imbalance can be seen in the strain on transportation budgets at all levels of government. A few of the many factors at play:

1. Bad Incentives in Federal Funding

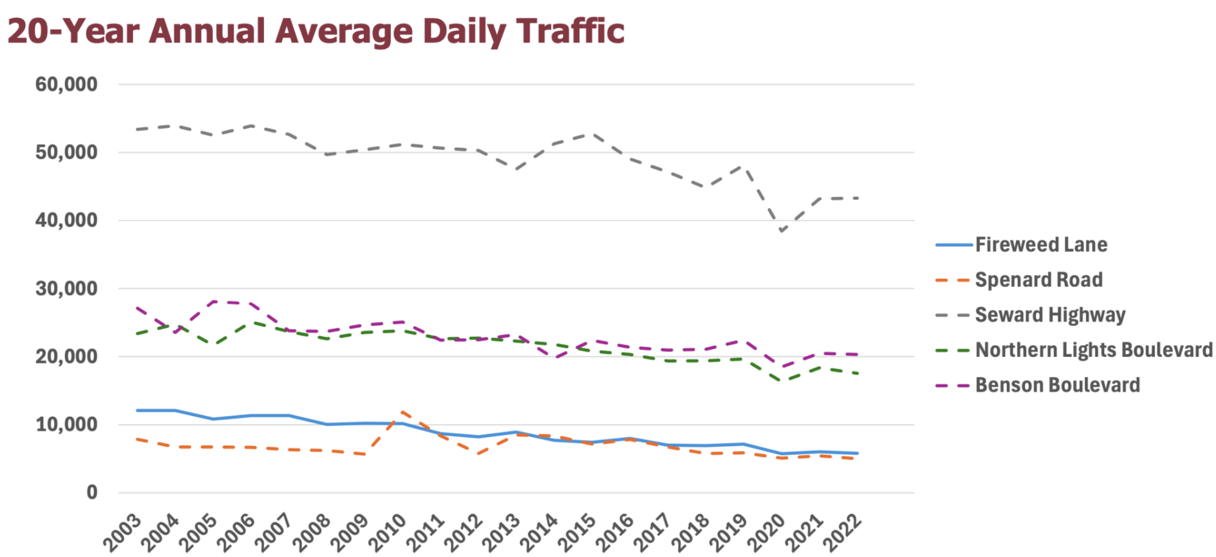
Federal funding programs encourage new and expanded roads with capital dollars, but maintenance costs fall on local and state budgets. Every new lane-mile adds decades of plowing, resurfacing, and striping costs that the city or state must bear for the long term.

2. Fiscal Constraints and Inflation

The cost of construction labor, materials and equipment has risen dramatically due to economic factors like inflation and tariffs, but fuel taxes haven't. Without automatic inflation adjustments, every tax increase becomes a political battle, and the real value of tax revenue erodes over time.

3. Overbuilt Infrastructure

Traffic counts in Anchorage have declined for decades, leaving our arterial roads with massive unused capacity citywide. Overly-wide, underutilized roads are dangerous for everyone because they encourage reckless and illegal driving behaviors, and they drain public resources as we continue plowing, repaving and sanding lane-miles of road that we don't need.



Graph courtesy of the Fireweed Lane Rehabilitation project.

Long-Term Solutions

Below are some potential strategies to resolve the road funding gap by either raising revenues or lowering expenses. All of these have their own pros and cons, and none are likely to be able to fully fix the problem alone. The best way forward is likely some combination of these approaches, based on local needs and political considerations.

Strategy	What It Is	Pros	Cons
Road Diets	Convert excess road lane-miles to create space for snow storage and pedestrian facilities.	Reduces maintenance costs, lowers crash rates, still handles same traffic. Eligible for federal funding.	Federal-funding road projects can take years or even decades to build.
Vehicle Miles Traveled (VMT) Tax	Drivers pay per mile driven, ideally adjusted for vehicle weight.	Fair across fuel types, reflects real use.	Requires new tech and data privacy rules.
Weight-Based Registration Fees[4]	Annual fee scales by weight class.	Easy to implement, discourages oversized vehicles.	Doesn't track mileage.
Indexing Taxes to Inflation	Automatically adjusts gas tax or fees on a periodic basis.	Prevents future shortfalls.	Requires political courage to adopt.
Abandon User Fees Altogether	Fund roads entirely from general revenue.	Simplifies the tax system and reduces administrative overhead.	Removes an incentive to drive efficiently.
Toll Roads Everywhere	Charge per-use tolls on major roads.	The most direct way to make drivers pay for road use.	Costly to operate, regressive, and doesn't address local roads.

[4] The State of Alaska does currently have some weight-based vehicle registration fees, but they would need to be significantly higher, and broken out into more granular weight classes, to make up the difference between fee revenue and road damage caused.

Resources & Further Reading

The following resources represent a wide range of political and nonpartisan perspectives, exploring different approaches to modernizing transportation funding. They examine a mix of potential solutions and tradeoffs, from vehicle-miles-traveled fees and inflation indexing to broader reforms in how states and the federal government plan, build, and maintain their transportation systems.

Who Pays for Roads? – Frontier Group
A detailed explainer on why the "user pay" system has never fully covered road costs, and how that ripples out into the broader transportation policy landscape.

Vehicle Miles Traveled (VMT) Tax Overview – Tax Foundation
A fiscally conservative look at how a per-mile user fee could replace the gas tax and better align road funding with actual use.

The Highway Trust Fund Isn't on Life Support—It's Been Dead Since 2008 – Transportation for America
A policy-advocacy perspective detailing the federal Highway Trust Fund's solvency crisis.

The Truth Is Out There: The Cost of Roads Is Bankrupting the Highway Trust Fund, Not Electric Vehicles – Union of Concerned Scientists
This article explores the structural factors driving up the cost of roadway construction, and runs the numbers on potential solutions.

Alternative Transportation User Fees – National Conference of State Legislatures (NCSL)
An overview of how states are experimenting with new funding tools like VMT fees and weight-based registration.

States Adapt Transportation Funding Strategies – Pew Charitable Trusts
A summary of recent state-level efforts to modernize transportation funding as gas-tax revenue declines.

The User Pays? A Potential Solution to the Transportation Funding Crisis – National Governors Association (NGA)
A bipartisan look at guiding principles for sustainable transportation funding, written for state leaders.

Mileage-Based User Fees Without GPS might be the best step to replace fuel taxes – Reason Foundation
A libertarian think-tank take on mileage-based fees, emphasizing privacy and administrative efficiency.