VMT-Based Fees
The Oregon Experience

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Columbia Gorge
History of the Vehicle Miles Traveled Fee

- 1919: Oregon enacts gas tax as a surrogate for a distance-based user fee
- 1996: Oregon’s Governor John Kitzhaber proposes VMT tax
- 2000: University of Iowa’s 15 state consortium begins study of VMT charges
- 2002: Oregon’s Road User Fee Task Force proposes mileage fee for replacing gas tax
Puget Sound

VMT Fee Pilots Completed
Recently Completed USA Road Pricing Pilots

Oregon’s Road User Fee Pilot Program (2006-07)
Pilot program demonstrated feasibility and implement-ability of a VMT fee electronically collected during refueling with dual purpose of replacing the gas tax and congestion charging (Final Report issued 2007)

Puget Sound Regional Council (2005-07) Research project demonstrated usefulness of electronically collected congestion charges in Seattle area (Final Report issued 2008)
University of Iowa VMT Fee Pilot Studies explore technological feasibility, public acceptance and various privacy applications.
States Expressing Interest in Conducting VMT Fee Pilots, Development or Implementation
Road User Fee Task Force

Legislative Mandate:

“To develop a design for revenue collection for Oregon’s roads and highways that will replace the current system for revenue collection.”
The Oregon Solution

An electronically collected charge on vehicle miles traveled within state

The Challenge

Create a system to emulate best attributes of the gas tax
The Gas Tax – *Nearly* Perfect

- Broadly applied
- Raises substantial revenue
- Easy to pay
- Easy to collect
- Easy to administer
- Minimal evasion or avoidance
- Protects privacy
- Minimal burden on business
The Gas Tax – A *Not-So-Perfect* Tax

Revenue erosion

Disconnected from highway system

![Light Vehicle Fuel Tax Revenue Chart](chart.png)
Oregon’s Mileage Fee Concept

Electronic Collection of VMT data and fee payment at fuel pump

+ Capital costs affordable
+ Operations affordable
+ Enforcement simple
+ Integrates with fuel tax
+ Gas tax provides redundancy
+ Motorist friendly
+ Protects privacy of motorist
Road User Fee Pilot Program

April 1, 2006 to March 25, 2007
Creation of Electronic Zones

Charge on miles driven within State by zone

Zone 1 = in state
Zone 2 = out of state
Zone 3 = local option
Zone 4 = rush hour
Oregon Pilot Program Field Test

285 participant passenger vehicles
Compensation $300 per vehicle
Control phase & experiment phase

Three zones:
- *In Oregon*
- *Not in Oregon*
- *Rush Hour*

Three test groups
- *Control group* paid state gas tax
- *VMT group* paid 1.2 cents per mile but no state gas tax
- *Rush hour group* paid 10 cents per mile in congestion zone and .43 cents per mile for regular travel but no state gas tax
The Oregon Technology Configuration

C-STORE

POS System Software

OSU Software

VB.NET Software

READ Commands

READ Commands via RF

VMT Data

VMT Data via RF

RSSI Levels

ON Vehicle Device

On-vehicle Device

GPS Satellite

Location Information

Ethernet Connection

Wireless Connection

Internet Connection

Payment type

Transaction authorization

VMT price adjustment

Transmit RSSI level command

RFID Reader

@ C-Store

Central DBMS @ CSU

DB Query (VMT)

Updated VMT Data

Current VMT Data

VMT data

XML Messages

XML Messages

XML Messages

RFID Software

READ Commands

VMT data

XML Messages

XML Messages

OSU Software

VB.NET Software

READ Commands

VMT data

XML Messages

XML Messages

Ethernet Connection

Wireless Connection

Internet Connection
VMT Data Generation and Upload

GPS Satellite Signals

On-Vehicle Device
VMT Data Processing and Fee Charging

Data Transferred:
1. Vehicle Device Identification
2. Mileage Totals for Each Zone
3. Fuel Purchase Amount
Fee Payment and Receipt

Fuel tax deducted from fuel purchase price

Mileage fee imposed as part of fuel purchase

Leathers Fuels
11421 SE Powell Blvd
Portland, OR 97266

Pump# 1 Unleaded
19.50 @ 2.549

ST Fuel Tax @ .24 (4.68)
VMT Fee :
Rush Hour : 40
In-Oregon : 28.6
Non-Oregon: 0
No Signal : 0

Subtotal 50.15
Total 50.15
Cash 50.15

Thank You!
Oregon Field Test Final Results

Successes
• Zone differentiation
• Mileage counting
• Vehicle identification with fuel pump
• Transmission accuracy
• Transaction administration
• Reduced Peak Driving 22%
• Acceptance by Participants

Needs More Work
• Perfect vehicle identification with pump
• Improve cash transaction time

Fundamental Lessons
• Retrofitting extremely difficult
What About…

… non-equipped vehicles?

… heavy trucks?
An Automated Truck Weight Distance Tax System

1. Trucks are equipped with GPS devices. If a truck has more than one declared weight, at start of trip the driver enters the weight of the combination and number of axles.

2. Truck travels through Oregon as GPS satellites track movement.

3. At end of month, GPS on-board unit wirelessly sends mileage data to ODOT data repository.

4. ODOT generates a highway use tax statement for the motor carrier.

5. Motor carriers elect to receive their highway use tax statement by mail or via Trucking Online.
Designer Road Pricing: Congestion Charging Under a Distance-based Charge Collection System

- GPS electronic tolling
  - Area pricing
  - Facility pricing
- Characteristics of vehicles known
  - DMV registrations
Congestion Pricing Today: Cordon Pricing

Point charges with photo enforcement, expensive back room operations
Adaptability of Oregon System to Congestion Pricing

Area pricing

• Separate “rush hour” zone
• Higher mileage fee rates during peak periods
Future Testing: Pricing Specific Facilities

GPS tolling of new bridges or roads, point or distance
Future Testing: Congestion Pricing for On-Ramps

- Managing traffic flow on limited access highways with minimal physical infrastructure
- Point charge or distance charge
The Critical Pathway for VMT Charging: Obtaining Public Acceptance

Two Big Issues:

- Privacy
- Rate Structure
Privacy

No data transferred except mileage totals within zones

Data transferred only at time of fueling via short range radio frequency

No vehicle location data stored in vehicle
Receiving Not Transmitting Location Data

GPS Satellite

On-Vehicle Device

mileage reader

GPS Satellite Signals
The Privacy Continuum

Absolute Privacy
- No records maintained
- No ability to audit
- No ability for customer validation

No Privacy
- Detailed trip data maintained
- Full ability to audit
- Full ability for customer validation
Rate Structuring

Flat Rate for Revenue Stability

Variable Rates for Other Policies

- Fuel efficiency
- Weight
- Emissions
- Congestion charging
Flat Rate Structure

Possibility #1: Flat VMT fee for every vehicle

![FLAT VMT CHARGE VS. FUEL TAX](chart)

- **VMT Fee Per 100 Miles**
- **MPG**
- **Flat VMT Charge**
- **Gas Tax**

*winners* → *losers*
Split Rate Structure

Possibility # 2: Fuel efficient vehicles pay VMT fee & Low fuel efficiency vehicles pay gas tax

VMT CHARGE ABOVE 20 MPG VS. FUEL TAX

- VMT Fee Per 100 Miles
- VMT Charge Above 20 MPG
- Gas Tax
Stacked Rate Structure

Possibility # 3: VMT Fee paid with stacked rate to account for various policy objectives

![VMT Fee with Stacked Rate vs. Fuel Tax Graph]
Multiplier Rate Structure

Possibility # 4: VMT fee adjusted by multiplier to account for externalities

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VMT Fee By Externality Multiplier

![Graph showing VMT fee per 100 miles vs. MPG with multipliers applied](image)
Achieving Public Acceptance

• Direction communications
• Public must understand situation:
  - Severe funding shortfalls
  - Limitations of adding capacity
• Funding shortfall may be obvious
• Finding comfort with technology
Key Steps to Implementation of Oregon Road User Fee System

• Refine technologies to commercial viability
• Define manufacturing standards
• Address concerns of fuel distribution industry
• Integrate collection system for all-electric vehicles
VMT Fee Collection Possibilities for All-Electric Vehicles

• Pre-Critical Mass
  ➢ Collection at re-registration

• Post-Critical Mass
  ➢ Centralized collections
  ➢ Utility meter collection
  ➢ Combining systems
National Support for VMT Fees

- National Surface Transportation Policy & Revenue Study Commission, December 2007
- American Association of State Highway Transportation Officials, October 2008
- National Surface Transportation Infrastructure Financing Commission, January 2009
Congressional Support

Rep. James Oberstar (D-MN), Chairman of the House Transportation and Infrastructure Committee —

Sees need for a “two-tier approach” to raising money for future projects: maintaining the federal gasoline tax as the “cornerstone of financing through the Highway Trust Fund” but also identifying supplemental revenue sources such as charging a fee based on trip length and vehicle weight.

“This effects the stress put on the infrastructure — the roadways and the bridges — better than the amount of fuel purchased times cents per gallon. It’s a tantalizing proposal that in addition to a user fee — the gas tax — that we charge by vehicle miles traveled, and to which I would add, weight.”

June 10, 2008
Congressional Support

Rep. Peter DeFazio (D-OR), Chairman of the House Highway and Transit Subcommittee —

“I’m very interested in a vehicle-mileage fee. I just don’t see it moving very quickly with passenger vehicles in the next reauthorization, but we may be able to move a little bit more quickly with commercials.”

“Commercial trucks are . . . already monitored and regulated very heavily. There are no privacy issues and many of the larger firms have GPS devices and they’re tracked already anyway.”

September 16, 2008
VMT Fee Recommendation for Reauthorization

- Establish *Six Year Timeline* for Completing Preparation
- Mandate USDOT Actions
- Policy Oversight Board Reports to Congress
- Additional Pilot Projects
- USDOT Authorities Upon Recommendation to Implement
Oregon’s Final Report