

Naturalistic Data for UBI: Enhancing Public, Company, and Driver Benefits

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Presentation at:
Casualty Actuarial Society
Ratemaking & Product Management Seminar
Orlando, Florida
March 16, 2016

What is PAYDAYS Pricing and its Relationship to Usage-Based Insurance (UBI)?

- Pay-as-you-drive-and-you-save (PAYDAYS) pricing converts hidden and lump-sum auto ownership and usage costs to transparent, variable costs.
- Such costs may relate to insurance, but also to parking, vehicle taxes and fees, or to the car itself (which can be made variable through carsharing).

Why PAYDAYS Pricing?

- Most of the costs of owning and operating a vehicle are fixed.
- The financial incentive not to use personal vehicles heavily is relatively small.
- Many households, especially low-income ones, would prefer variable costs to fixed ones.
- Various studies project substantial driving reductions, public policy benefits, and consumer savings resulting from PAYDAYS pricing.

UBI Is Not a New Concept (But Tools to Offer It Are New)

- As early as 1929, virtues of charging for car insurance by the mile were recognized.
- Concept promoted by Nobel economist William Vickery in his 1968 work: “Automobile Accidents, Tort Law, Externalities and Insurance.”

Projected Results of PAYDAYS Pricing

- Cuts vehicle miles traveled (Brookings, MIT)
- Curtails crash claims in excess of driving reductions
- Relieves congestion at a rate greatly exceeding driving reductions
- Diminishes air pollution and carbon emissions
- Lowers infrastructure costs
- Strengthens cities and lessens urban sprawl
- Provides substantial consumer savings
- Potentially increases insurance company profits

Using Behavioral Economics to Maximize Driving Reductions (Governmental Objective)

- Direct and transparent per-mile or per-minute-of-driving pricing—avoid rebates
- In-vehicle graphic displays of “insurance pricing meter” with e-mail and Web summaries
- Frequent billing without automatic bill payment
- Transit pass discounts for UBI customers or bundling transit passes with a few free miles of insurance
- Individualized assistance to identify alternatives
- Peer comparisons and “regret lotteries” to encourage continuous mileage reductions

Using Behavioral Economics to Attract Customers (Insurance Company Objective)

- Emphasize likely total savings
- Cap the maximum monthly bills
- Provide individualized price comparisons
- Appeal to personal values
- Bundle a small number of free miles of insurance with transit passes
- Sell in small price buckets (e.g., \$49 or \$99)

Research Provides Actuarial Justification for UBI

- Research from Massachusetts that combines vehicle mileage and loss cost data shows a compelling relationship (R^2 rises 0.15 to 0.72).
- Host of mostly small instrumented vehicle studies consistently shows a strong linkage between certain driving habits and crashes.
- Actions of insurance companies also suggest actuarial underpinnings for UBI.

Typical Company Approach to Introduce UBI Pricing— Premium Discounts for Data

- Willing participants are likely lower risk
- Gets data that companies need to offer an attractive UBI product
- Pricing power comes with data control

Strategy Will Not Work Beyond the Short Term

- Customers will gain control of their data and get UBI price quotes, as they do today for non-UBI policies (hastened by ACORD common data standard, USDOT SBIR project for shared data/competitive UBI pricing).
- Why? Because customers have smart phones and their vehicles have OEM-installed telematics, the data will be theirs to share.
- A “green brand” comes from an external credible source (e.g., CERES/NRDC/EDF *PAYD Insurance Product Rating System*; State Climate Action Plan UBI goals tied to driving reductions).

Evolutionary UBI Unresponsive to Revolutionary Changes

- Changes noted in Zogby's "The Way We'll Be," CCC Info Services "Crash Course," etc.:
 - Young people delay licensure (68% of 19 year olds in 2012 v. 87% in 1983 in the U.S.), own fewer cars, live in cities, and take transit
 - "Automobility" increasingly met through car sharing (beginning on college campuses), "dynamic ridesharing" (e.g., casual carpooling, Zimride, Carma), and ridesourcing (e.g., Uber, Lyft)
- Insurance products and new data sources, though, are limited to particular driver/vehicle combinations.

Governmental UBI Activities to Watch – General Research & Promotion

- Federal Value Pricing Pilot Program project with Texas Transportation Institute to learn about driving changes resulting from UBI
- Government transportation funding shortfalls lead to mileage-based road user fee deployments (e.g., Oregon's implementation with 3rd party data vendors); NYC pilot combined with UBI tests
- \$15-\$20M annual FAST Act monies for Surface Transportation System Funding Alternatives

Federal Government UBI Activities to Watch – Data from Completed NDS

- Data collected for 3,147-participant, 6-city Naturalistic Driving Study until Dec. 2013
- 5.4M trips (consented drivers) and 49.6M miles
- 3,958 vehicle-years of data
- Road data for over 200,000 centerline miles
- Supplementary site data on traffic, weather, work zones, railroad crossings, crash histories, etc.
- Data access support began in Jan. 2015
(<https://insight.shrp2nds.us/>)

Governmental UBI Activities to Watch – GPS Travel and Location Data

- TRB/AASHTO Highway Safety Manual “converted” to the Interactive Highway Safety Design Model, including a Crash Prediction Module (<http://www.ihsdm.org>)
- National Renewable Energy Lab Transportation Secure Data Center houses GPS and other travel data sources (http://www.nrel.gov/transportation/secure_transportation_data.html)
- Development and provision of road weather data informs immediate (and past) driving risk
- Roadway attribute data (e.g., the precise location of hills) feeds into eco-cruise control systems and could also inform risk

Federal Government UBI Activities to Watch – Metropia App Actuarial Study

- Chosen by FHWA via a competitive solicitation, Metropia, Inc., with its Smartrek mobile app, and Illinois State Univ., Dept. of Finance, Insurance & Law.
- Preexisting Smartrek partnerships with several cities guide and reward users for traffic avoidance; app also provides data on driving behaviors, roadway context, and likely crashes (triggering claims' surveys).
- Also correlating driving behavior data from app with crash histories learned through user survey.
- Goal is to inform but by no means supplant actuarial efforts on the part of companies and regulators.

Federal Government UBI Activities to Watch – Competitive UBI Price Quotes

- USDOT SBIR Program solicitation, Personalized Driving Data for Insurance Discounts and Public Benefits
- Two teams—Vehicle Data Science Corp. with ATG Risk & Agnik, Inc.—were selected, and both have completed successful Phase I detailed concepts (\$150K each)
- Consumers to see their own driving data, take action to reduce risk/premium, and have multiple insurance companies provide a UBI quote based on such data
- Efforts will also entail preliminary scoring of driving risks (even though that wasn't an initial Federal requirement)

Shared Mobility and UBI

- Market has begun responding adequately to provide full coverage for ridesourcing (e.g., Uber and Lyft)
- Peer-to-peer carsharing (e.g., Getaround and Turo) cannot get started without UBI (Assurant providing coverage)
- Non-car owners using vehicles from different carsharing and car rental providers may at times face uncertain or inadequate coverage and expensive add-on insurance costs
- Except for traditional car rentals, no daily insurance options are available in the U.S. (Tokyo Marine offers it in Japan; National Unity offers it to drivers/cars registered in Mexico for short visits to the U.S.)

Actuarial Considerations for the Long Term

- **Factors:**

- Advanced vehicle safety technologies and semi-automation features
- V2V and V2I communications
- Self-driving cars

- **Impacts:**

- Fewer crashes
- Driver skill becomes less of a risk factor
- Driver or “operator” judgment likely to remain a key risk factor in crashes that do occur

Thank you!

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