



Real-Time Ridesharing and an Experiment Integrating Toll Discounts

Presentation to ACT Mid-Atlantic Chapter

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Overview

- What is real-time ridesharing?
- Tolling integration
- Preliminary results
- What could this mean to you?
- Questions



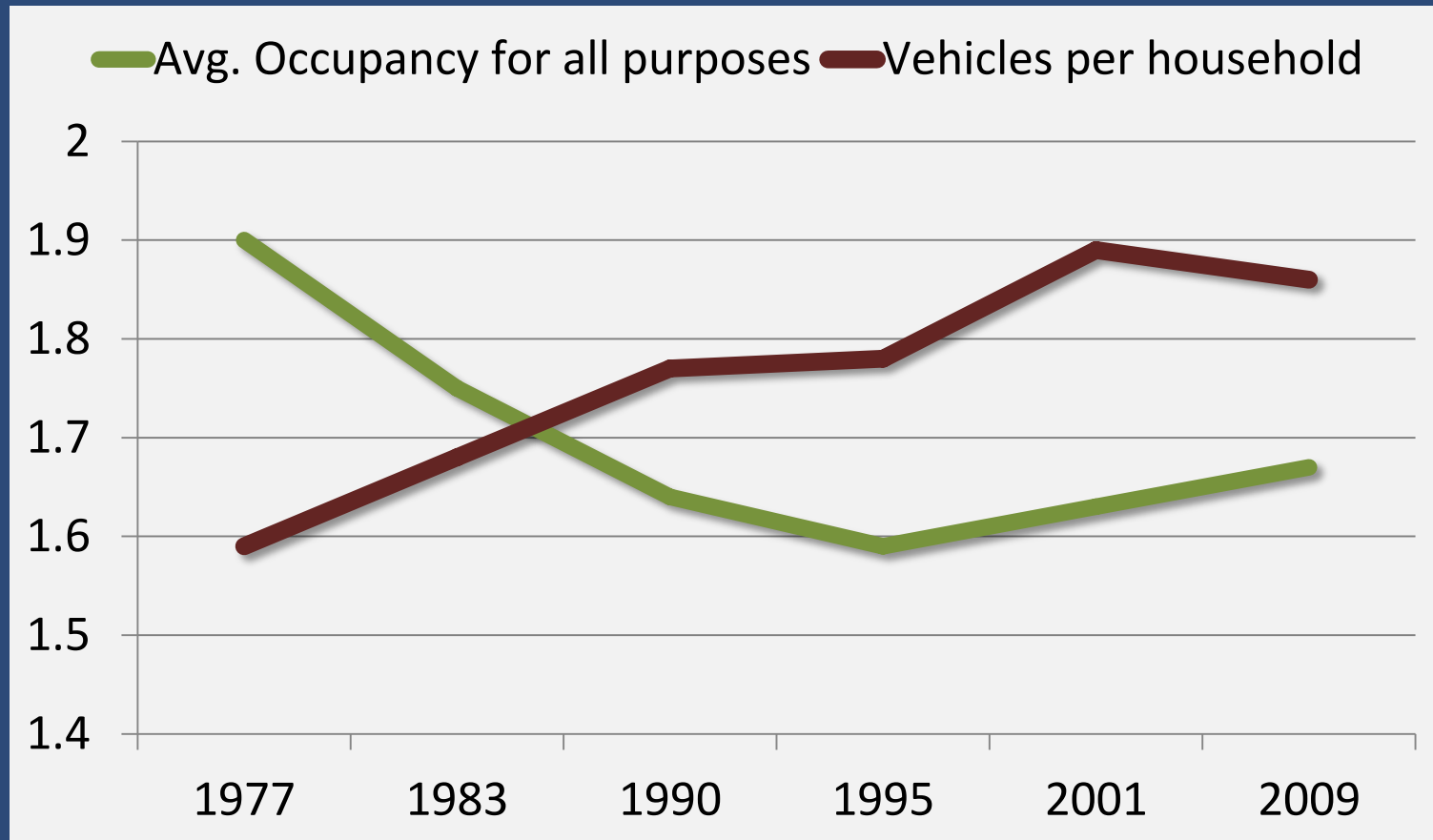
Real-time, aka 'Dynamic' Ridesharing

- Dynamic ridesharing is *real-time* coordination of vehicle use between two or more occupants.
- Traditional carpool coordination is non-dynamic, requiring pre-trip coordination between driver and passengers.

Formal Definition

- Real-time ridesharing: *A single, or recurring rideshare trip with **no fixed schedule**, organized on a one-time basis, with matching of participants occurring as little as a few minutes before departure or as far in advance as the evening before a trip is scheduled to take place. (Amey et al 2011)*

Remember Carpooling?



Data: FHWA. Summary of Travel Trends. 2009 National Household Survey. p 44. <http://nhts.ornl.gov/2009/pub/stt.pdf>

Enabling Technologies

Cell-based Internet
+ GPS
+ Personal verification
+ electronic \$
+ cloud-based servers
Smartphone revolution?

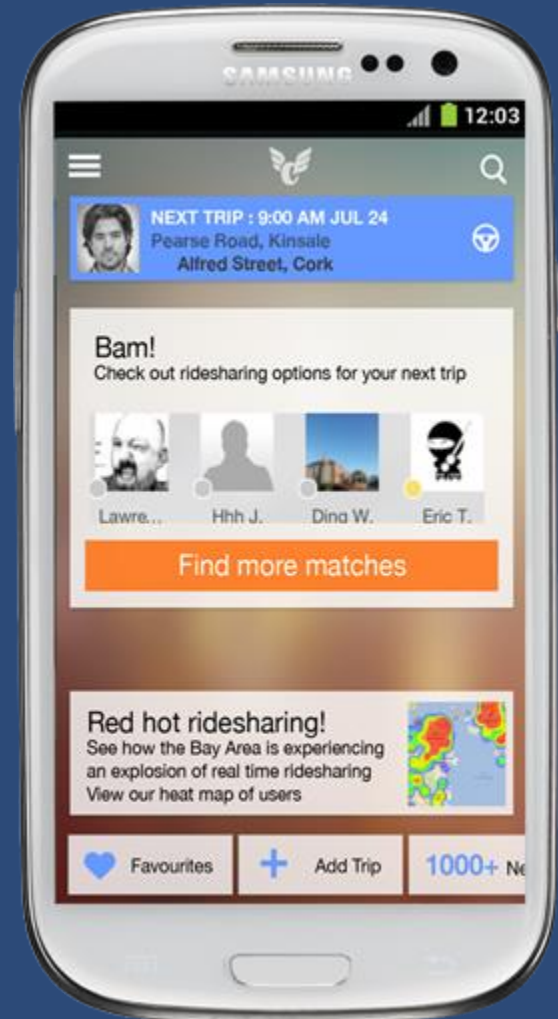


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Is smartphone ownership a barrier?

Smartphone ownership by age and income/education

% within each group who own a smartphone (for example, 58% of 18-29 year olds with a household income of less than \$30,000 per year are smartphone owners)

	18-29 (n=336)	30-49 (n=601)	50-64 (n=639)	65+ (n=626)
All adults	66%	59%	34%	13%
Annual Household Income				
Less than \$30,000	58	42	16	5
\$30,000 or more	72	69	44	27
Educational Attainment				
High school grad or less	63	43	22	8
Some college or college graduate	70	71	44	20

Source: Pew Research Center's Internet & American Life Project January 20-February 19, 2012 tracking survey. N=2,253 adults age 18 and older, including 901 interviews conducted on respondent's cell phone. Interviews conducted in both English and Spanish.

- Yes, for older low-income demographics.
- Smartphone adoption continues to increase.



Prospect

- **Increase managed lane person-throughput** via tech.-based enforcement
- **Decrease congestion** on entire system by encouraging carpooling
- **Potential infrastructure cost savings** through deferred expansions and reduced maintenance
- ❖ Each prospect is contingent on widespread adoption...still in evaluation and refinement

Advantages

- Dynamic ridesharing merges attributes of mass transit and personal automobility:

	Mass Transit	Dynamic Ridesharing	Personal Autos
\$ (personal)	Low *	Low	High
Time Accessibility	Scheduled	Fast	Instant
Roadway efficiency	High *	High	Low

*depending on utilization



Challenges

- Resistance to ridesharing remains:
 - **Coordination** with others still required
 - Concerns about **stranger danger** (may be mitigated with social media or employer networks)
 - **Marginal economy** of car and associated cost investments encourage continued use (households already own multiple cars)



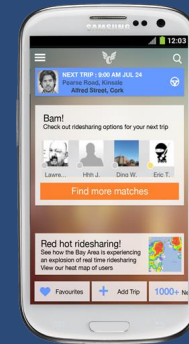
Existing Research

- Pricing for road and parking impact prospects for dynamic ridesharing (Deakin et al 2010)
- 3+ occupants could increase trust and utilization (Spielberg & Shapiro 2000)
- Preferences to schedule ride at least night before, rather than immediate (Deakin et al 2010)
- Targeting large employers may reap fast benefits (Amey et al 2011)

Tolling Integration Concept

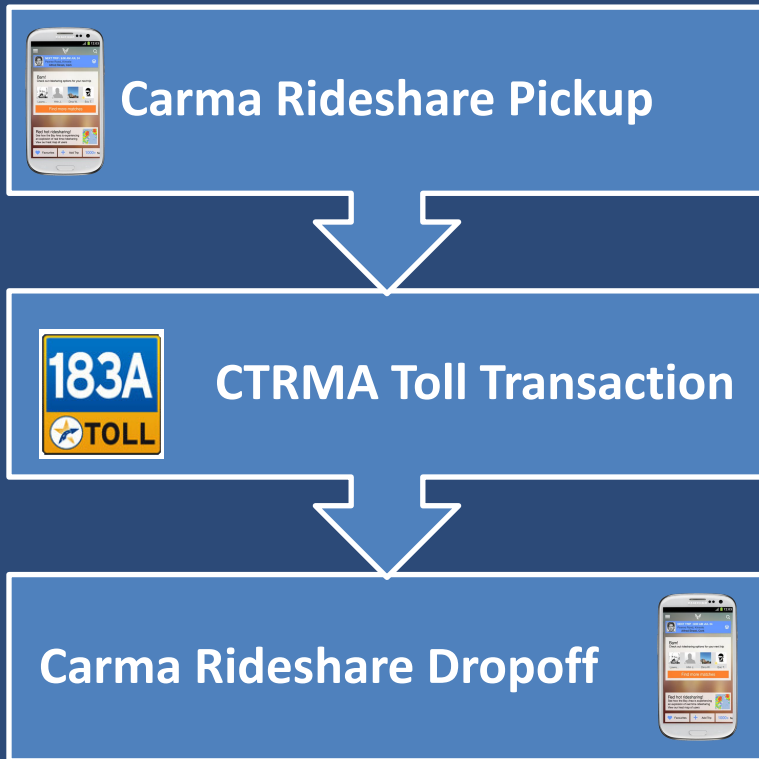
Single-occupant drivers + RtR software = Saving\$

1. 80-90% of work trips are SOV
2. Encourage carpooling with toll road discounts (2: ½ off or 3+: free)
3. Provide mobility with *software*:
not *hardware*:

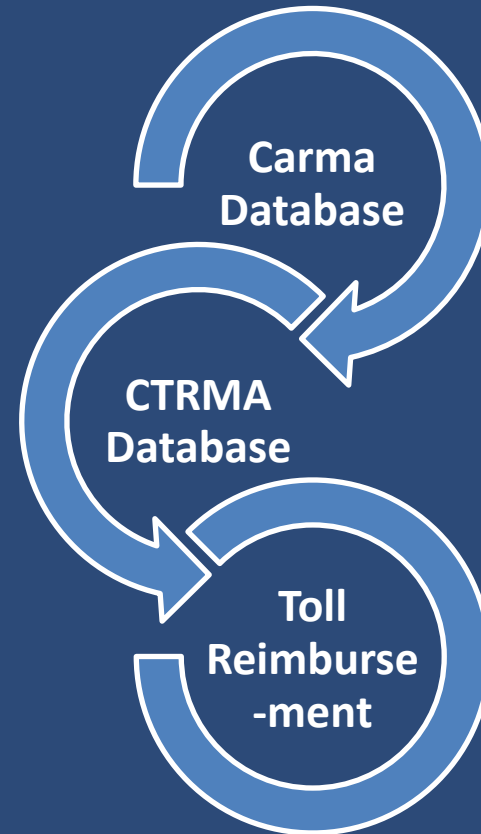


Tolling Integration Concept

Rideshare & Toll Transactions



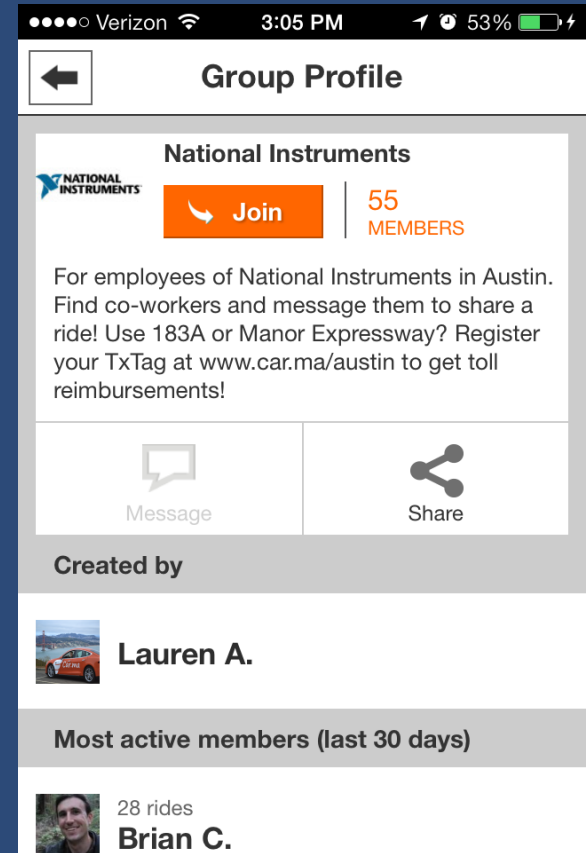
Backoffice Coordination



Preliminary Results

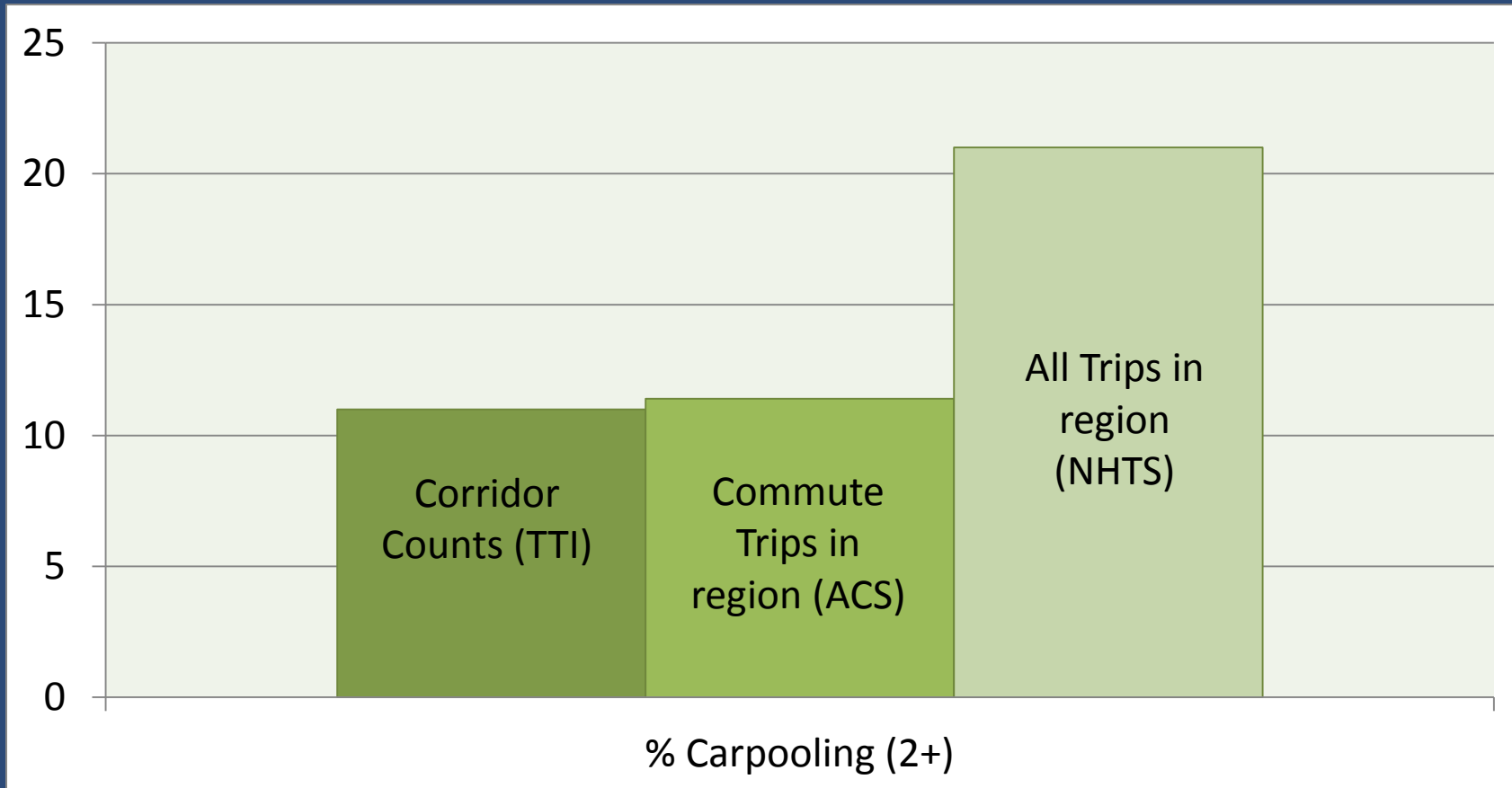
Recruiting

- Starting with major employers
- Next is residential communities, HOA meetings
- Small incentives to take first steps (lunch)



Preliminary Results

Vehicle Occupancy





Preliminary Results

Tolling Integration

- As a study, will require registration of ridesharing + toll accounts
- Tolling integration feasible w/ RtR, coordination requires administrative buy-in
- Consider automatic vs. rebate

What could this mean for you?

- **Technology** is enabling information-based revolution in transport options and efficiency
- “**Traditional**” vs. “**Dynamic**” carpooling dBase
- Is RtR + tolling = **virtual HOV lanes?**
- **Outreach** encouraging *intermodalism*
- Keep in touch with results in 2015



Potential Research Directions

- Feasibility for transportation management associations (TMAs)
- Human factors of stranger danger
- Effects of parking charges (Deakin et al 2010)
- Development and validation of travel demand models incorporating dynamic ridesharing (Bressan & Perico 2010)

References

- Amey, A., Attanucci, J. and R. Mishalani.** 2011. Real-Time Ridesharing: Opportunities and Challenges in Using Mobile Phone Technology to Improve Rideshare Services. In *Transportation Research Record No. 2217*, pp 103-110.
- Deakin, E., K. Frick, & K. Shively.** 2010. Markets for Dynamic Ridesharing? Case of Berkeley, California. In *Transportation Research Record No. 2187*, pp 131-137.
- Federal Highway Administration.** 2011. Summary of Travel Trends: 2009 National Household Travel Survey.
<http://nhts.ornl.gov/2009/pub/stt.pdf>
- Spielberg, F. & P. Shapiro.** 2000. Mating Habits of Slugs: Dynamic Carpool Formation in the I-95/I-395 Corridor of Northern Virginia. In *Transportation Research Record No. 1711*, pp 31-38.

Travel Options Info from TTI

<http://mobility.tamu.edu/mip/strategies.php>

TRAVEL OPTIONS

Travel options during peak periods of travel can reduce congestion at very low cost. Reducing single occupant vehicle trips by encouraging practices like ridesharing or vanpooling can reduce roadway congestion. Travel options are implemented by public agencies who determine a variable pricing system, or by individual employers who choose to participate in telecommuting and compressed work week scheduling.

Travel Option Strategies

Strategy	Executive Summary	Technical Information
Flexible Work Hours		
Compressed Work Weeks		
Telecommuting		
Carpooling		
Real-Time Ridesharing		
Vanpooling		
Land Use Planning		

Strategy	Executive Summary	Technical Information
Transportation Management Associations (TMA)		
Trip Reduction Ordinances		
State Employee Trip Reduction		
Parking Management		
Pay-As-You-Drive Auto Insurance		
Pay-To-Drive Off-Peak		
Variable Pricing		

ACTIVE TRAFFIC MANAGEMENT

Though relatively new to the United States, active traffic management refers to several congestion mitigation strategies used together to change traffic patterns, alter operating conditions, and modify road capacity on a minute-to-minute basis using current and near-future conditions. The strategies modify the way that travelers and shippers use the road and can postpone the onset and size of stop-and-go traffic congestion.

Active Traffic Management Strategies

Strategy	Executive Summary	Technical Information
Active Traffic Management		

Strategy	Executive Summary	Technical Information
Queue Warning		

Questions?

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