

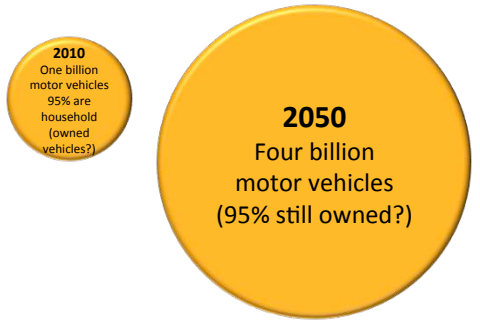
Making the Leap Toward Sustainable Urban Robo-Transit

By John Niles and Bern Grush – More at EndOfDriving.org

1890: Save us from horses!
2010: Save us from cars!



2050: Save us from automated vehicles!



Many dream of sharing cars instead of owning them!

“Technologies such as self-driving cars paired with transportation networks such as Uber will pretty much kill the need to own a car in 25 to 30 years”

Jamais Cascio, futurist and senior fellow at the Institute for Ethics and Emerging Technologies
<http://www.businessinsider.com/why-no-one-will-own-a-car-in-25-years-2015-6>

However, the many reasons for car ownership are barriers to sharing.



Classic carsharing today addresses a small fraction of demand: **less than 1/10th of one percent.**

Non-private vehicle travel: **under seven percent.**

We need to address *all or most of the reasons* for preferring ownership **to change an owner into a 100% sharer.**

Transit Leap is a preferred alternative to automotive Feature Creep as a path to robotic mobility.

Feature Creep	None	Assists	Partial automation	Conditional automation	High automation	Full automation
• Add by feature improvements	Driver does everything	Driver must drive	Driver must monitor	Driver must stay awake (system has fail-safe modes)	Driver may sleep	Driver not needed
• Household Consumer High Ownership Low density						
Transit Leap	Level 0	Level 1	Level 2	Level 3	Level 4	Level 5
• Add by spatial aggregations	None	Loops Shuttle, parking, shopping, Urban tourist 2km ²	Small area Campus, freetask 5km ²	Large area Borough, CBD island 50 km ²	City 500 km ²	Metropolitan 5,000 km ²
• Transit Sharing Low ownership High-density	Classic Bus Routes	Driverless, repetitive, short trips	Self-optimizing, flexible, constrained areas	Rich inter-connection with rail; strong tailoring; stop most addresses	Stop any address; any street anywhere in one vehicle; heavily tailored; high equity	Any where, Any time Any distance

FEATURE CREEP is fundamentally aligned to our current ownership & consumption model

- Consumer oriented
- Ownership oriented
- Congestion promoting
- Distracted-driving contributor

Transit Leap means public-use, robotic, shared-mobility applications that **start-small, expand by demand, grow, merge, and spread.** Transit Leap could **transform mobility for all urbanized areas** of the planet by mid-century.

Minibuses used for Transit Leap in EU

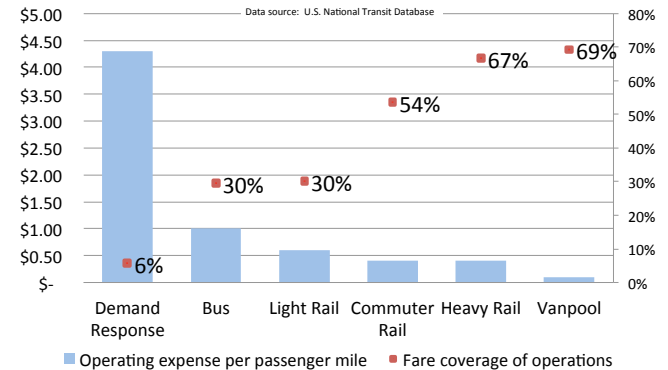


Photos of CityMobil 2 vehicles

GrushNiles
Pathways to Transportation as a Service

Transit Leap grows passenger miles served by using automated vehicles to reduce costs & subsidies

Effect of Paid Drivers on Cost per Passenger Mile by Mode



Transit Leap increases transit ridership, increasing non-driving service employment.

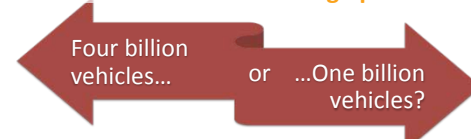
Transit Leap bypasses the interim challenges of semi-autonomous and mixed-driver scenarios.



Volvo consumer testing in 2017

- Can automated cars recapture driver attention quickly enough?
- Will it prove safe enough?
- How soon can it be scaled up?

Evidence indicates the best path to shared robo-cars runs through public transit!



Feature creep will encourage worldwide car ownership growth to over 0.4 per capita
→ Now at 0.12 per capita

Transit Leap enables ownership to remain at 0.1 per capita.

→ 80% of PKT in shared vehicles

This poster is a revision of one shown at the MIT Disrupting Mobility Summit in Cambridge, Massachusetts on 12 Nov. 2015 and 2 Dec. 2015 at the Florida Automated Vehicle Summit in Jacksonville, Florida

Poster prepared by Bern Grush and John Niles, jniles@alum.mit.edu, 1-206-781-4475. Copyright 2015, Grush Niles Associates, All rights reserved.