Cities have the capability of providing something for everybody, only because, and only when, they are created by everybody.

-Jane Jacobs
Jana Lynott
Senior Strategy Policy Advisor, AARP

Ryan Snyder
Principal, Transpo Group

Veronica Siranosian
Director, AECOM

Kristin Eberhard
Senior Researcher, Sightline
Agenda

Introduction/Equity Perspectives
Age/Ability
Geography
Gender
Socio-Economics
Q&A
Equity Perspectives
Equity & the Future of Transportation

Jana Lynott, AICP
Senior Policy Advisor
AARP Public Policy Institute
Twitter: @JanaLynott
Guiding Principles

1. Affordable
2. Livable
3. Accessible
Whim covers all your journeys

How it works

1. Choose how you want to travel
2. Grab a ticket
3. You're ready to go!
Introducing Uber Health, Removing Transportation as a Barrier to Care

Written by Chris Weber, General Manager, Uber Health
Guiding Principles

1. Affordable
2. Livable
3. Accessible
Guiding Principles

1. Affordable
2. Livable
3. Accessible
TOW AWAY

NO PARKING

7AM – 9:30AM
4PM – 6:30PM
Monday – Friday

Night Restriction
10PM – 7AM
Thursday – Sunday

IF TOWED CALL 311

DDOT/Brandon Millman
Guiding Principles

1. Affordable
2. Livable
3. Accessible
Jana Lynott @JanaLynott · 24 Aug 2016
@MercedesBenz Cool bus but I bet those seats are pretty hard for your older riders to get out of @businessinsider
Jana Lynott, AICP
Senior Strategic Policy Advisor
@JanaLynott
@AARPpolicy
@AARPLivable

www.aarp.org/livablepolicy
&
www.aarp.org/livable
Equity Issues with Autonomous Vehicles

URBAN VS. RURAL SETTINGS

By Ryan Snyder
Urban Contexts - Potential Positive Impacts

- Wider range of services available, especially Mobility as a Service (MaaS)
- Better access to transit stops and stations
- Lower-cost services available
- Elimination of racial discrimination from drivers
- Greater access to jobs and services
- Safer to walk and bicycle, improving a low-cost option
- Safer to walk and bicycle to transit
- Improved public transit from lower operating costs
- Possibly free transit
- Improved public transit from lane clearance technology
- More usable public space in streets making cities more livable
- Freed up land from parking lots could provide a reservoir of land for affordable housing
Lane Clearance
More Usable Public Space in Streets
Repurposing of Urban Space
Urban Contexts - Potential Negative Impacts

- Profit-based MaaS services could gravitate to areas where demand is greatest leaving some neighborhoods underserved.
- If public transit loses passengers, service will likely decline.
- Public support for transit subsidies may decline as service declines.
- Induced travel could increase congestion and reduce access.
- Without special access to app-based smartphone services and credit cards, unbanked people will be left out.
Suburban Contexts - Potential Positive Impacts

- Wider range of services available, especially Mobility as a Service (MaaS)
- Lower-cost services available
- Greater access to jobs and services
- Safer to walk and bicycle, improving a low-cost option
- Safer to walk and bicycle to transit
- More usable public space in streets making communities more livable
- More matching opportunities to pool long distances
- Greater use of micro-transit
- Freeway-based high-speed buses
Suburban Contexts—Potential Negative Impacts

- If public transit loses passengers, service will likely decline.
- Public support for transit subsidies may decline as service declines.
- Induced travel could increase congestion and reduce access.
- Without special access to app-based card services, unbanked people will be left out.
- Profit-based MaaS services could gravitate to areas where demand is greatest, leaving many neighborhoods underserved.
- Suburban sprawl could be exacerbated.
- Higher rates of owned vehicles than in urban areas.
- Services will take longer to become available.
Rural Contexts - Potential Positive Impacts

- Safer to walk and bicycle, improving a low-cost option
- Mobility as a Service (MaaS) available where there are little or no public services today; these will likely be with small vehicles carrying one or more passengers
- Lower-cost services available
- Possibly subsidized MaaS
- Low-cost deliveries could bring more goods
Rural Contexts - Potential Negative Impacts

- Profit-based MaaS services could gravitate to areas where demand is greatest leaving some communities underserved.
- People will have fewer options than in urban areas due to lack of critical mass.
- Higher rates of owned vehicles than in urban areas.
- Services will likely come later to rural areas.
Policies to Favor Equitable Outcomes

- Pricing that favors people in higher-occupancy vehicles
- Price empty seats and cargo space
- Cross subsidies from lower-occupancy vehicles to higher-occupancy vehicles and active transportation
- Subsidies for service in rural areas
- Transit stations/multi-modal transfer points along freeways
- Time advantages for higher-occupancy vehicles
  - Lane clearance technology that favors higher-occupancy vehicles
  - More frequent service in higher-occupancy vehicles
  - Higher speeds for higher-occupancy vehicles
- Locational advantages for higher-occupancy vehicles
  - Allowing higher-occupancy vehicles the optimal drop-off/pick-up curb space
  - Prohibiting travel on some streets, or in some neighborhoods, or at certain times by low-occupancy vehicles
Ryan Snyder
(310) 307-3319
Ryan.Snyder@transpogroup.com
EQUITY THROUGH THE LENS OF GENDER
A Gendered Approach

Mode Choice       Safety     Mobility of Care     Trip Chaining
you get what you measure
Whose peak hour?

Labour-force participation rate, 2010, %

<table>
<thead>
<tr>
<th>Country</th>
<th>1970</th>
<th>2010</th>
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<tr>
<td>China</td>
<td>48.1</td>
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<td>Sweden</td>
<td>87.9</td>
<td>83.0</td>
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<tr>
<td>Finland</td>
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<td></td>
</tr>
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<td>United States</td>
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<td>Spain</td>
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<td></td>
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<tr>
<td>Brazil</td>
<td></td>
<td></td>
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<tr>
<td>Japan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>India</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: The Economist, 2011
Disaggregated Data - Mode Usage

Transit Use - National

- Women: 51%
- Men: 50%


Transit Use - Portland

- Share of workers within city limits who take transit to work.

Source: US Census Bureau, 2006-2010 American Community Survey
Disaggregated Data- Mode Usage

Just 57% of women have a driver’s license. Women perform on average 15% more trips than men, mainly, walking and bus. These trips, however, shorter than those made by men.

25% of women’s trips are made by bus. 12% 18%
More Women Ride Mass Transit Than Men. Shouldn't Transit Agencies Be Catering to Them?

In cities like Philadelphia, a remarkable 64 percent of the people riding public transportation are thought to be women.

SARAH GOODYEAR | @buttermilk1 | Jan 30, 2015 | 19 Comments

[Image: Reuters/Shannon Stapleton]
Bus driver tells mum: No strollers

MICHELLE DUFF

Last updated 05:00 27/11/2013

A heavily pregnant mother says a Go Wellington bus driver threatened to bump her off a bus if she brought her stroller on board again.

Jane Crichton is now worried she won’t be able to use public transport, after she says a driver on a Karori route barked at her for bringing her stroller on board.

Crichton, who is 36 weeks pregnant, was boarding the bus in the rain yesterday to take her 2-year-old daughter Sofia to daycare when the driver warned her he did not carry prams.

He said he would overlook the stroller that day, but next time he wouldn’t be so kind, Crichton said. "I was so stunned I couldn't actually say anything, but I was like, ‘What do you want me to do, walk to town?’"

The Karori mother said she had been catching buses on that route for a year with no problems, and that there were only four or five people on the bus when she got on.

STROLLER DEBATE: Jane Crichton was warned by a bus driver that she would not be allowed on a Go Wellington bus with a stroller when she boarded with her daughter Sofia, 2, in Karori.

ROSS GIBLIN/Fairfax NZ
OPPORTUNITIES
• Ride sourcing data combined with on-board surveys can create a rich, gender-specific data set (if shared)
• Better understanding needs across genders can help design service to meet underserved groups
• Automated shuttles can cost-effectively provide trips in off-peak hours to supplement service designed to address peak demand

RISKS/CONCERNS
• Data will not be shared, service will continue to be designed to serve mainly peak trips
• Automated vehicles will undermine transit ridership and lead to declining service for a mode women rely on more than men
63% of New York City subway riders said they'd been harassed on a train

93% of witnesses reported that the victim was female

Source: NY Times
I am parking as close to [my destination] as I can. I’m definitely looking around and being very self-aware, understanding that it is important to be alert....

—Amy Stear, Wisconsin Director of 9to5
Safety and Mode Choice

Source: http://brokelyn.com
Safety and Mode Choice
Safety

OPPORTUNITIES
• Automated vehicles used for shared, on-demand services could reduce wait times at stations where women feel least safe
• Surveillance and security cameras used in vehicles could encourage a secure environment (although they raise privacy issues)
• Connected and automated technologies will make vehicles safer, making other options like biking and walking safer for all

RISKS/CONCERNS
• Removing drivers from vehicles could increase fears related to safety as well as actual unsafe behavior
Mobility of Care

**FACTORS ON TRAVEL PATTERNS OF WOMEN**

Having a young child in the house will add 23% more trips for a woman.

A woman takes children to school 3 TIMES more often than a man.

A woman with a child under the age of five is 87% less likely to drive.

A woman is 80% more likely to make stops on their journeys (school, supermarket, etc.).

Trains and subways transport are mostly used by women without children.

Source: The Relationship Between Gender and Transport, Inter American Development Bank
Mobility of Care

Average Time Spent Caring For Children
Spanish men and women, 2007*

MEN
- 5 minutes per day
  - Physical care, supervision of child
- Teaching, reading, talking with child
- Transporting a child

WOMEN
- 5 minutes per day
  - Physical care, supervision of child

*Data includes individuals without children

Public Transportation Trips by Purpose
2006-2007, Spain

Data As Traditionally Collected

<table>
<thead>
<tr>
<th>Purpose</th>
<th>5</th>
<th>10</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment</td>
<td>30%</td>
<td>25%</td>
<td>55%</td>
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<td>Study</td>
<td>13%</td>
<td>13%</td>
<td>26%</td>
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<tr>
<td>Shopping</td>
<td>12%</td>
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<tr>
<td>Leisure</td>
<td>11%</td>
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<tr>
<td>Escorting</td>
<td>10%</td>
<td>7%</td>
<td>17%</td>
</tr>
<tr>
<td>Visits</td>
<td>9%</td>
<td>5%</td>
<td>14%</td>
</tr>
<tr>
<td>Other</td>
<td>8%</td>
<td>5%</td>
<td>13%</td>
</tr>
</tbody>
</table>

Data Collected Using the Concept “Mobility of Care”

<table>
<thead>
<tr>
<th>Purpose</th>
<th>5</th>
<th>10</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment</td>
<td>30%</td>
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<tr>
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<tr>
<td>Visits</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>8%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Care-related Trips
Care-related trips are concealed within several travel categories

When identified as a dedicated category, caring work accounts for a full quarter of all public transportation use

Mobility of Care

OPPORTUNITIES
• Automated vehicles could conduct caring trips for women, freeing them from this responsibility
• Shared, automated shuttle services could provide off-peak trips to serve “care” trips better
• Automated delivery could reduce shipping costs, eliminating the need for some care trips (groceries, pharmacy, etc.)

RISKS/CONCERNS
• Safety/vulnerability of those who can’t take care of themselves in unattended vehicles
• Societal/developmental impacts of removing physical care/supervision
Trip Chaining

50% women undertake trip chaining - making multiple stops in a single trip

60% of men travel from an origin to a single destination, without trip chaining

Source: EMBARQ India, 2015
Trip Chaining by Women and Men During Commutes
Average number of stops per commute, United States, 2001

- **WOMEN**
- **MEN**

Two-adult households with no children

Two-adult households with children under age 5

Source: McGukin et al., 2005
Trip Chaining

OPPORTUNITIES
• Shared, automated services could better serve chained trips
• Shared, automated services and delivery could remove the need for some trip chaining (groceries, pharmacy, errands, etc.)

RISKS/CONCERNS
• Increased congestion due to AVs conducting errands with no human driver
Approaches and Case Studies

**APPROACHES**

- Be deliberate about where and how investments are being made
- Collect and share data to inform equitable service
- Structure services that are accessible to all
- Learn from ride-sourcing and AV companies to make mobility better, more efficient, more competitive, and safer for all
Hands Off, LA County Metro

*Sexual harassment on public transport is a problem we must solve*

A new study has revealed women across the world feel unsafe when taking public transport, with one in three London women reporting abuse on the tube

*Monique Villa* | Wednesday 29 October 2014 14:31 GMT | 0 comments

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*KEEP YOUR HANDS OFF ME*

Grab a handrail, not me. Sexual harassment is a crime, and if you make me uncomfortable, I will find an MBTA Station Official or Transit Police Officer, take your photo with my phone, or use my See Something, Say Something app to report you. Leave me and the other riders alone.
CREATED BY MOMS
DRIVEN WITH LOVE

LEARN MORE
Transdev Link

Flexible, accessible on-demand microtransit platform.
BlueLA, Los Angeles
Right Rides, NY & DC

I need RightRides because... Everyone deserves to get home safely.

www.collectiveactiondc.org

I need RightRides because... The best end to a good night is a safe ride home.

www.collectiveactiondc.org
SafetiPin App, India
Women-Only Car, India
Feminist Utopia Fantasy Story
By Xanthe Justice

It was midnight. Amanda felt like going for a walk.

So she did.

The End.
Equity and AEVs: Socio-economic and Sustainability Issues

KRISTIN EBERHARD
SIGHTLINE INSTITUTE
EQUALITY

EQUITY

CulturalOrganizing.org
Impacts on cost and access for under-served

1. Can FAVES make them better than now?
2. Can FAVES make them more similar to the well-served?
Higher income = bigger travel radius

b. Los Angeles

$100k+: 23 miles
At/Below Poverty: 11 miles

Data Source: 2009 FHWA NHTS
Median family income of adults by mode of travel to work (Portland MSA)

Source: American Community Survey, via City Observatory
(Data based on sample. For information on confidentiality protection, sampling error, nonsampling error, and definitions, see www.census.gov/acs/www/)

A majority of American households experienced a financial shock.

Percentage of respondents reporting a shock over a 12-month period, by type.

- Major home repair: 24%
- Major car repair: 30%
- Divorce, separation, or widowing: 4%
- Trip to hospital: 24%
- Pay cut: 24%
- Other large expense: 10%

Notes: This data is from a 2015 national survey of more than 7,800 households. Respondents could have experienced none, one or more of the identified shocks.

Source: Pew Charitable Trusts
Costs
Lower-Income Families Routinely Spent a Larger Share of Income on Transportation Than Wealthier Families Did During the Past 15 Years
Expenditures in dollars and as a share of income, by income thirds, 2000-14
Households at the Bottom Spent More on Gas in 2014 Than on All Transportation 19 Years Earlier


<table>
<thead>
<tr>
<th>Year</th>
<th>Lower Third</th>
<th>Middle Third</th>
<th>Upper Third</th>
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<tbody>
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<td>$196</td>
<td>$461</td>
<td>$1,471</td>
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<td>$468</td>
<td>$820</td>
<td>$2,081</td>
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<td>$918</td>
<td>$1,215</td>
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<td>2004</td>
<td>$178</td>
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<td>$313</td>
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<td>2014</td>
<td>$638</td>
<td>$793</td>
<td>$1,364</td>
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<td>$464</td>
<td>$383</td>
<td>$1,133</td>
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<tr>
<td></td>
<td>$2,095</td>
<td>$909</td>
<td>$4,007</td>
</tr>
</tbody>
</table>

Legend:
- Public transportation
- Auto insurance
- Vehicle maintenance and repair
- Gasoline and motor oil

Pew Charitable Trusts
Major disruption in used car values

Choice: buy new car

Choice: use existing car

Choice: use TaaS

NEW ICE
ICE operating cost
*Maintenance, fuel, insurance & tax cost

New EV
TaaS
TaaS (pool)
Access
Case Study
Oregon’s Clean Energy Jobs Bill caps most climate pollution in the state.

Total 2015 emissions = 65 MMT

- Electricity: 30%
- Transportation: 37%
- Natural Gas: 9%
- Agriculture: 9%
- Other: 6%
- Industrial: 9%

Source: Oregon Department of Environmental Quality
Oregon’s Clean Energy Jobs Bill will invest in clean energy, workers, and utility customers.

**Utility Assistance**
- Small Business: $100
- ALL Utility Customers: $132
- Low Income: $100
- Industrial: $40

**Climate Investments**
- Forests, AG: $58
- Impacted Comm: $17
- OTHER Comm: $3
- RURAL Comm: $3

**Transportation**
- Decarbonization Investment Fund: $346
- Elite Industry: $33
- Just Transition: $7

**Workers & Industry**

Source: SB 1070 and Sightline estimates
blueLA EV Carshare Pilot Project
Thanks!

KRISTIN@SIGHTLINE.ORG
Median family income of car commuters by time of departure for work. (Portland MSA)

Source: American Community Survey, via City Observatory
Less educated and more educated most likely to walk/bike to work

<table>
<thead>
<tr>
<th>Education Level</th>
<th>% Walking</th>
<th>% Biking</th>
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<tbody>
<tr>
<td>Less than high school</td>
<td>4%</td>
<td>1%</td>
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<td>High school graduate</td>
<td>3%</td>
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<td>Some college</td>
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<td>Bachelors degree</td>
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</tr>
<tr>
<td>Graduate degree</td>
<td>3%</td>
<td>2%</td>
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