# Smart mobility

Reducing congestion and fostering faster, greener, and cheaper transportation options

**Deloitte University Press**

# Smart Mobility

Deloitte Public Sector Research recently completed one of the first nationwide studies quantifying the potential congestion relief benefits of alternative modes of transportation in the country's 99 largest metropolitan areas.

The study maps the economic potential of four alternative commuting modes which could ease gridlock at far lower costs than traditional approaches to congestion reduction:

- o Ridesharing*
- o Bike commuting
- o Carsharing**
- o On-demand ride services***

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# Traffic congestion in America
## America's gridlock problem becomes more acute each year.

Every 20-mile commute costs government $1 in infrastructure costs. If you include the cost of congestion, air pollution, or even lost property value near roadways, the total estimated external cost of driving runs between 27-55 cents per mile.

The average American spends about 34 hours every year sitting in traffic – that's 5.5 billion hours for all commuters. The economic opportunity cost of this wasted time is staggering: $124 billion annually.
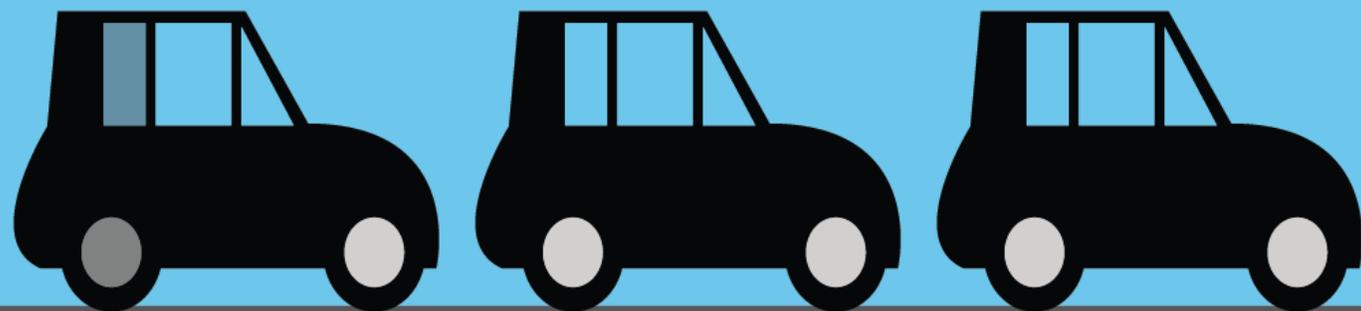
# Ridesharing*

Taps into an abundant yet underutilized re - source: empty car seats. Adds no new vehi - cles to the system, and could help reduce the traffic congestion that plagues most cities today. Carpooling has declined from around 20% of all commuters in 1970 to less than 10% today.

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# Deloitte analysis of ridesharing

If cities embraced real-time ridesharing the number of carpoolers could approach 30 million representing 27% of all urban commuters.

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# Ridesharing
## Projected modal shift & associated congestion reduction potential

Currently **11 million** urban commuters utilize ridesharing, out of **109 million** total urban commuters. This represents only **10%** of the modal share.

If cities embraced ridesharing, **30 million** urban commuters out of **109 million** total urban commuters would utilize ridesharing. This creates a modal share of **27%**.

The projected number of vehicle miles reduced if ridesharing is fully embraced could be **28 billion** miles reduced out of **3 trillion** miles traveled annually.

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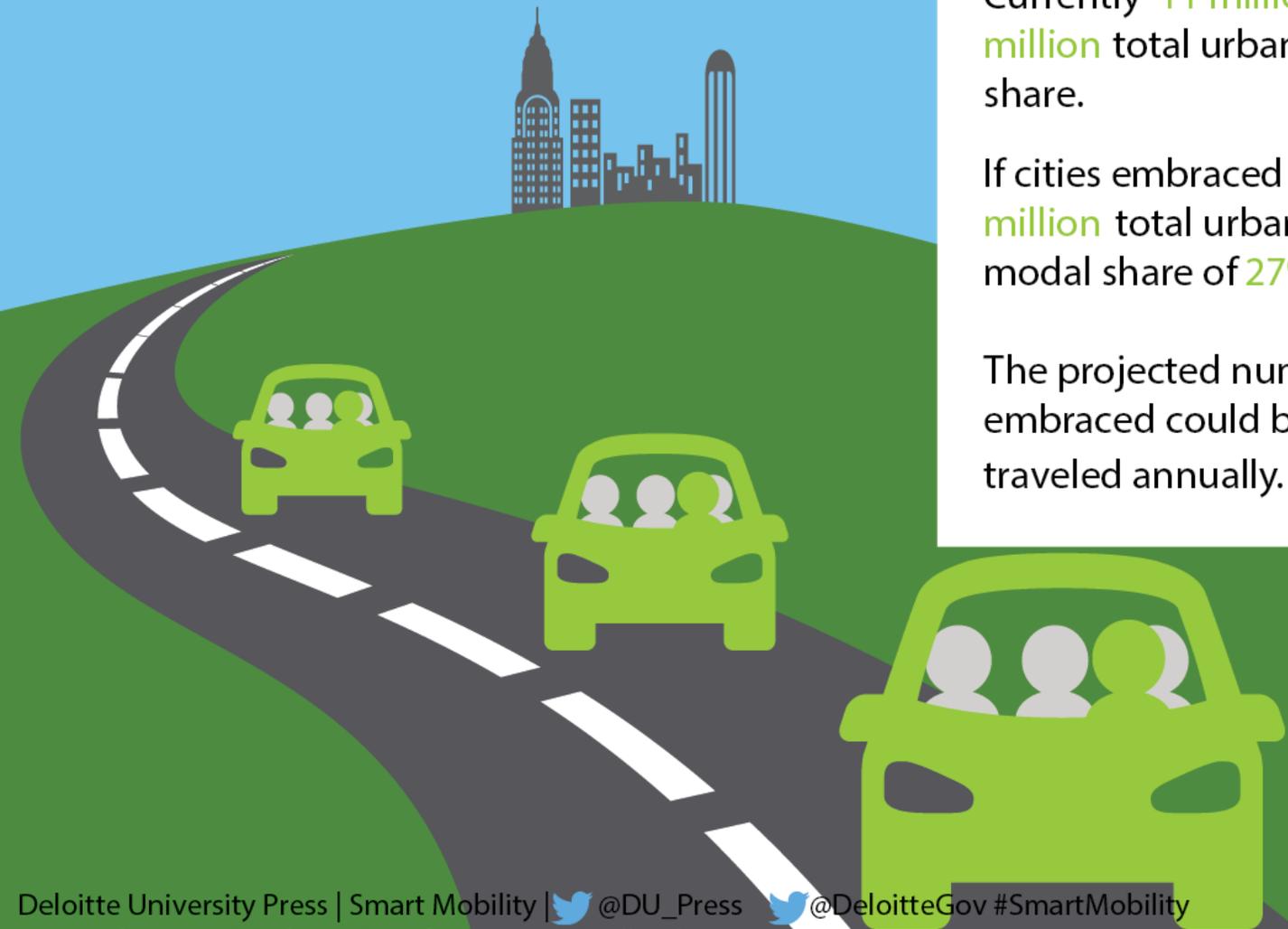
# Ridesharing

## Top 10 metro areas with greatest potential for ridesharing

| Metro area | Current rideshare commuters | Potential new rideshare commuters | Projected total rideshare commuters | Total annual mobility savings ($)* |
|---|---|---|---|---|
| New York-Newark-Jersey City NY-NJ-PA | 638,290 | 908,884 | 1,547,174 | $1.675 billion |
| Los Angeles-Long Beach-Anaheim CA | 624,743 | 899,024 | 1,523,767 | $1.671 billion |
| Chicago-Naperville-Elgin IL-IN-WI | 386,878 | 663,367 | 1,050,245 | $1.278 billion |
| Dallas-Fort Worth-Arlington TX | 320,503 | 612,063 | 932,566 | $1.227 billion |
| Miami-Fort Lauderdale-West Palm Beach FL | 247,220 | 570,154 | 817,374 | $1.199 billion |
| Houston-The Woodlands-Sugar Land TX | 320,895 | 540,591 | 861,486 | $1.073 billion |
| Philadelphia-Camden-Wilmington PA-NJ-DE-MD | 227,149 | 447,934 | 675,083 | $827 million |
| Washington-Arlington-Alexandria DC-VA-MD-WV | 317,102 | 428,901 | 746,003 | $750 million |
| Atlanta-Sandy Springs-Roswell GA | 260,974 | 395,154 | 656,128 | $773 million |
| Boston-Cambridge-Newton MA-NH | 181,851 | 354,144 | 535,995 | $592 million |

* Ridesharing offers savings to both individuals and cities from reduced congestion, deferred road construction, safety improvement, and lower greenhouse gas emissions.
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# Ridesharing

## Top 10 metro areas with greatest potential for carbon emissions reductions

| Metro area | Reduced carbon reductions (metric tons per year) |
|---|---|
| Los Angeles-Long Beach-Anaheim CA | 466,397 |
| New York-Newark-Jersey City NY-NJ-PA | 465,442 |
| Houston-The Woodlands-Sugar Land TX | 379,954 |
| Chicago-Naperville-Elgin IL-IN-WI | 367,052 |
| Dallas-Fort Worth-Arlington TX | 365,237 |
| Miami-Fort Lauderdale-West Palm Beach FL | 304,527 |
| Washington-Arlington-Alexandria DC-VA-MD-WV | 239,042 |
| Atlanta-Sandy Springs-Roswell GA | 226,162 |
| Philadelphia-Camden-Wilmington PA-NJ-DE-MD | 192,085 |
| Phoenix-Mesa-Scottsdale AZ | 180,196 |

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# Ridesharing

Top 10 metro areas with greatest potential traffic safety improvements

| Metro area | Annual traffic accidents avoided |
|---|---|
| Los Angeles-Long Beach-Anaheim CA | 1,170 |
| New York-Newark-Jersey City NY-NJ-PA | 1,167 |
| Houston-The Woodlands-Sugar Land TX | 953 |
| Chicago-Naperville-Elgin IL-IN-WI | 921 |
| Dallas-Fort Worth-Arlington TX | 916 |
| Miami-Fort Lauderdale-West Palm Beach FL | 764 |
| Washington-Arlington-Alexandria DC-VA-MD-WV | 600 |
| Atlanta-Sandy Springs-Roswell GA | 567 |
| Philadelphia-Camden-Wilmington PA-NJ-DE-MD | 482 |
| Phoenix-Mesa-Scottsdale AZ | 452 |

# Ridesharing

## Top 10 metro areas with greatest potential for fuel savings

| Metro area | Annual fuel wastage avoided ($) |
|---|---|
| Los Angeles-Long Beach-Anaheim CA | $57 million |
| New York-Newark-Jersey City NY-NJ-PA | $56 million |
| Chicago-Naperville-Elgin IL-IN-WI | $42 million |
| Dallas-Fort Worth-Arlington TX | $34 million |
| Miami-Fort Lauderdale-West Palm Beach FL | $33 million |
| Houston-The Woodlands-Sugar Land TX | $30 million |
| Philadelphia-Camden-Wilmington PA-NJ-DE-MD | $26 million |
| Washington-Arlington-Alexandria DC-VA-MD-WV | $25 million |
| Atlanta-Sandy Springs-Roswell GA | $22 million |
| Boston-Cambridge-Newton MA-NH | $20 million |

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# Ridesharing policy recommendations

Achieving ridesharing's potential won't be easy. Here are eight ways to accelerate progress toward that goal:

✔ Expand tax incentives to rideshare

✔ Improve ridematching platforms' customer experience

✔ Include ridesharing initiatives in road construction infrastructure projects

✔ Focus on building critical ridesharing mass in key corridors

✔ Recruit participants through trusted channels (e.g. employers)

✔ Target younger commuters

✔ Establish public-private partnerships to improve mobility

✔ Encourage nationwide leadership in carpooling advocacy

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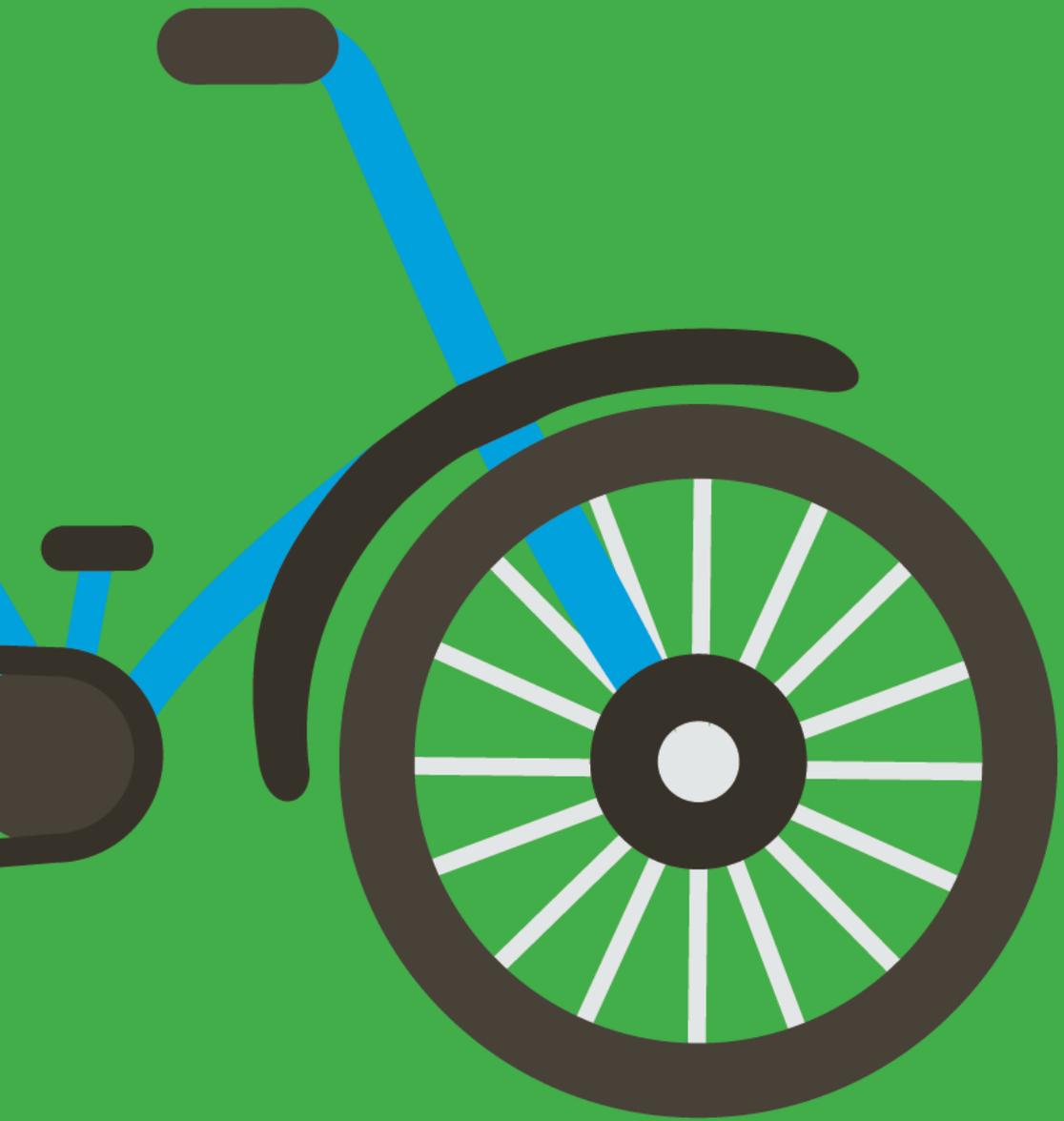
# Bicycle commuting

Currently used by less than 1 percent of urban commuters, but has been growing steadily by 7.5 percent per year for past decade. For commutes of a few miles or less, biking is often the fastest way to get to work.

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# Bike commuting's potential for economic, environmental, and wellness savings is surprisingly large.
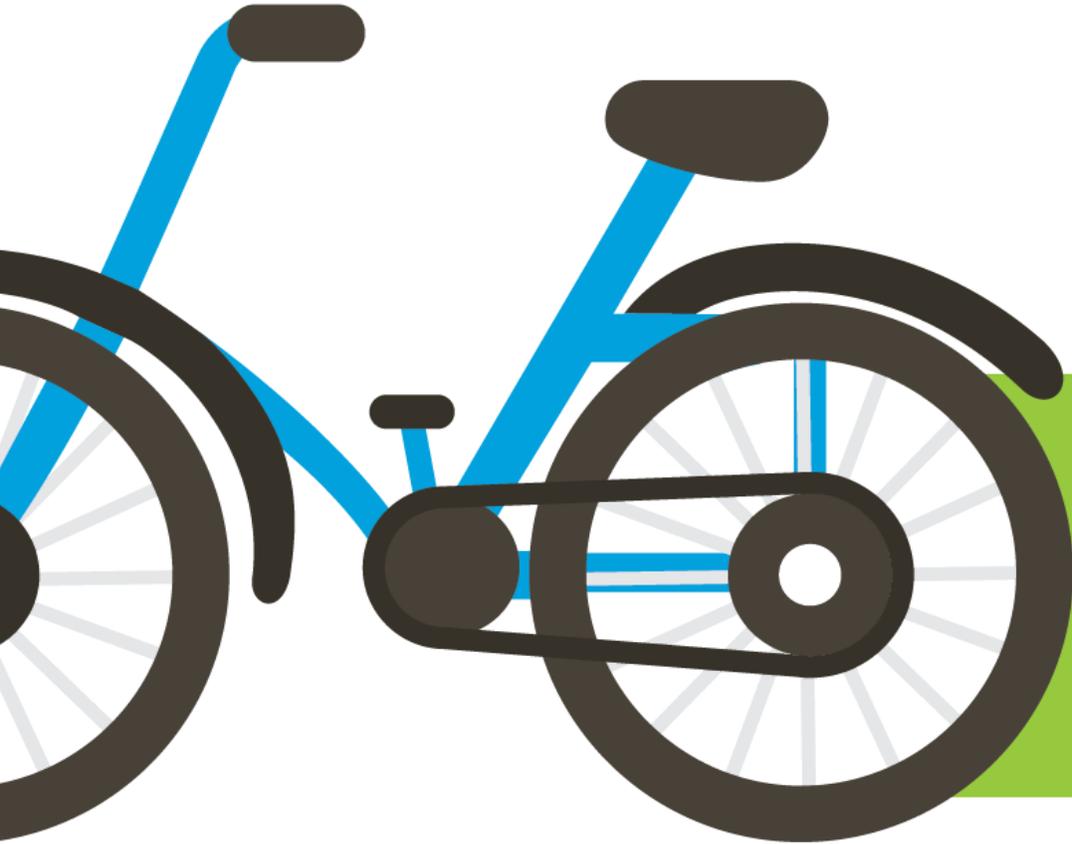
Current number of urban bike commuters: .6%

- Potential savings of $27.6 billion yearly
- Potential carbon emissions reductions of 5 million metric tons of carbon dioxide per year
- Potential congestion relief of 21 hours per urban commuter per year

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# Bike commuting
## Projected modal shift and VMT reduction

Current: 635,000 bike commuters, out of 109 million total commuters

Projected total potential bike commuters, if fully implemented: 29 million out of 109 million total commuters

Projected annual vehicle miles reduced:13 billion out of total of 3 trillion VMT (2014)

Current modal share:0.6%
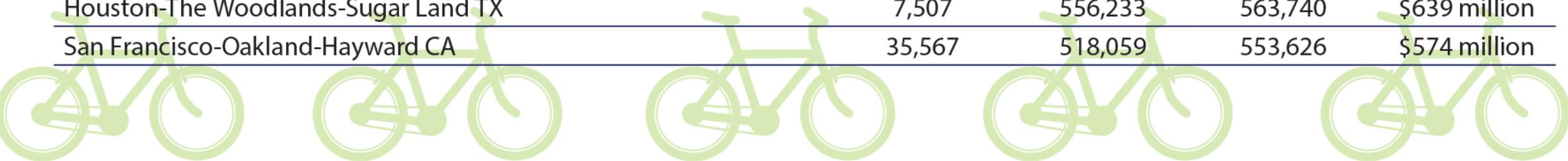
Projected potential modal share: 27% modal share

Projected total VMT: reduction of 0.4%

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# Bike commuting
## Top 10 metro areas with greatest potential for new bike commuters

| Metro area | Current bike commuters | Potential new bike commuters | Projected new bike commuters total | Total annual mobility savings ($)* |
|---|---|---|---|---|
| New York-Newark-Jersey City NY-NJ-PA | 42,914 | 1,748,469 | 1,791,383 | $1.9 billion |
| Los Angeles-Long Beach-Anaheim CA | 49,796 | 1,611,013 | 1,660,809 | $1.8 billion |
| Chicago-Naperville-Elgin IL-IN-WI | 26,915 | 1,054,066 | 1,080,981 | $1.2 billion |
| Miami-Fort Lauderdale-West Palm Beach FL | 13,957 | 728,543 | 742,500 | $823 million |
| Philadelphia-Camden-Wilmington PA-NJ-DE-MD | 16,756 | 727,514 | 744,270 | $835 million |
| Dallas-Fort Worth-Arlington TX | 4,829 | 691,151 | 695,980 | $795 million |
| Boston-Cambridge-Newton MA-NH | 19,712 | 610,598 | 630,310 | $687 million |
| Washington-Arlington-Alexandria DC-VA-MD-WV | 18,459 | 590,982 | 609,441 | $677 million |
| Houston-The Woodlands-Sugar Land TX | 7,507 | 556,233 | 563,740 | $639 million |
| San Francisco-Oakland-Hayward CA | 35,567 | 518,059 | 553,626 | $574 million |

*Ridesharing offers savings to both individuals and cities from reduced congestion, deferred road construction, and lower greenhouse gas emissions.

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# Bike Commuting

Top 10 metro areas with greatest potential carbon emissions reductions

| Metro area | Reduced carbon emissions (metric tons per year) |
|---|---|
| New York-Newark-Jersey City NY-NJ-PA | 277,391 |
| Los Angeles-Long Beach-Anaheim CA | 263,709 |
| Chicago-Naperville-Elgin IL-IN-WI | 178,063 |
| Philadelphia-Camden-Wilmington PA-NJ-DE-MD | 127,232 |
| Miami-Fort Lauderdale-West Palm Beach FL | 122,496 |
| Dallas-Fort Worth-Arlington TX | 122,435 |
| Washington-Arlington-Alexandria DC-VA-MD-WV | 104,168 |
| Boston-Cambridge-Newton MA-NH | 99,842 |
| Houston-The Woodlands-Sugar Land TX | 99,023 |
| Atlanta-Sandy Springs-Roswell GA | 90,139 |
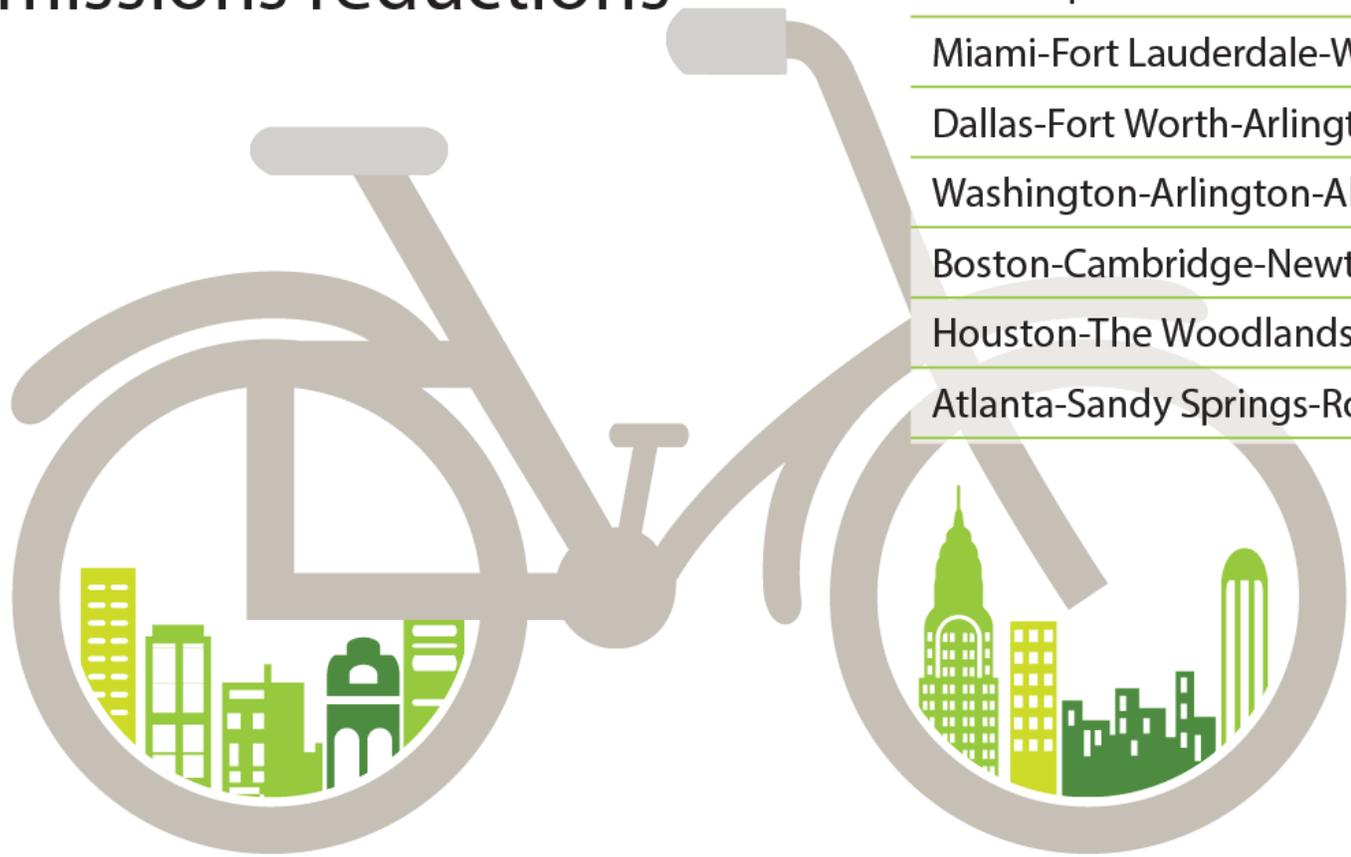
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# Bike Commuting

Top 10 metro areas with greatest potential for fuel savings

| Metro area | Annual fuel wastage avoided ($) |
|---|---|
| New York-Newark-Jersey City NY-NJ-PA | $101 million |
| Los Angeles-Long Beach-Anaheim CA | $93 million |
| Chicago-Naperville-Elgin IL-IN-WI | $56 million |
| Philadelphia-Camden-Wilmington PA-NJ-DE-MD | $42 million |
| Dallas-Fort Worth-Arlington TX | $39 million |
| Miami-Fort Lauderdale-West Palm Beach FL | $39 million |
| Boston-Cambridge-Newton MA-NH | $35 million |
| Washington-Arlington-Alexandria DC-VA-MD-WV | $31 million |
| Houston-The Woodlands-Sugar Land TX | $30 million |
| Atlanta-Sandy Springs-Roswell GA | $28 million |

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# Bike commuting policy recommendations

Bike commuting has beeh growing steadily every year, here are nine ways to accelerate bike commutings growth:

✓ Increase investment in bike lanes, paths and facilities

✓ Take advantage of developments in smart biking infrastructure

✓ Encourage bikesharing programs to achieve a tipping point for biker safety

✓ Use innovative funding mechanisms for infrastructure improvements

✓ Provide tools to build biking infrastructure where it can have the biggest impact

✓ Develop regional bike plans that extend across the metropolitan region

✓ Link bike commuting to public health

✓ Use big data to encourage bike commuting

✓ Expand tax incentives to encourage bikesharing and bike commuting

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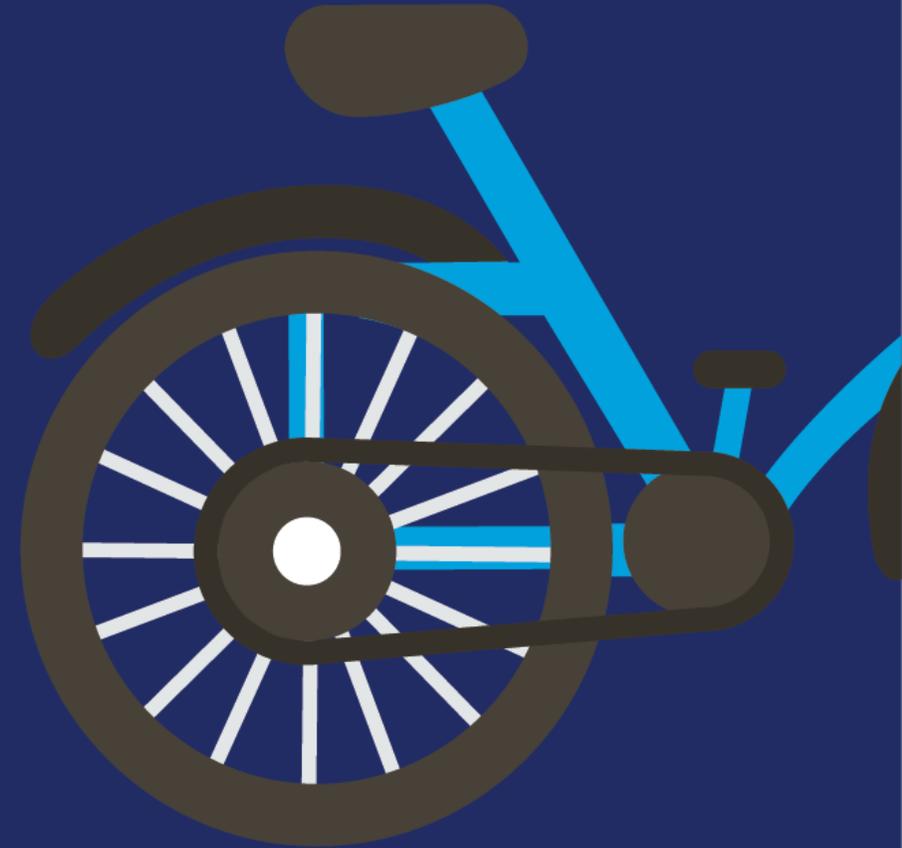
# Carsharing*

A growing transportation option is enabled by new technology that allows companies and inviduals to rent cars by the minute or hour.

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# Carsharing

Current national carsharing membership: 1.3 million

If cities embraced carsharing the number of users could grow to 3.8 million members creating $4.3 billion in savings.

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# Carsharing

This new mobility option has been growing steadily over the past few years. But carsharing has the potential to spread to millions more Americans, and to bring large congestion and economic benefits.

Current commercial carshare members: 1.3 million

Projected total potential: Could spread to 3.8 million   urban commuters, or 3.5% of all urban commuters.

**INTERSTATE**

Urban carsharing could reduce nationwide vehicle ownership by 2 million cars

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# Carsharing

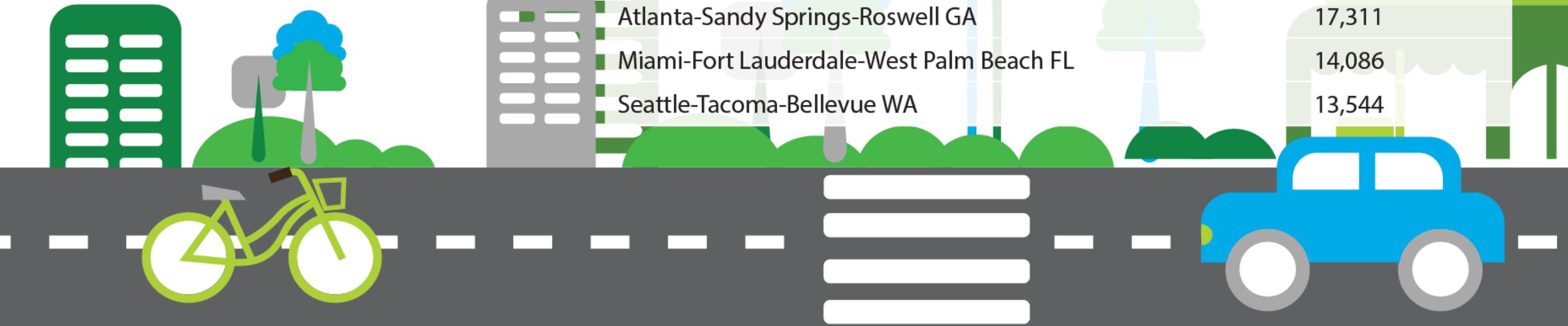## Top 10 metro areas with greatest potential for carsharing

| Metro area | Total commuters | Potential new commercial carshare members | New carshare members % of commuters |
|---|---|---|---|
| New York-Newark-Jersey City NY-NJ-PA | 8,693,469 | 1,148,622 | 13% |
| Chicago-Naperville-Elgin IL-IN-WI | 4,212,913 | 258,212 | 6% |
| Los Angeles-Long Beach-Anaheim CA | 5,521,388 | 165,194 | 3% |
| Boston-Cambridge-Newton MA-NH | 2,210,145 | 161,372 | 7% |
| Washington-Arlington-Alexandria DC-VA-MD-WV | 2,848,122 | 155,713 | 6% |
| San Francisco-Oakland-Hayward CA | 1,964,152 | 147,115 | 8% |
| Philadelphia-Camden-Wilmington PA-NJ-DE-MD | 2,655,135 | 119,845 | 5% |
| Atlanta-Sandy Springs-Roswell GA | 2,309,559 | 66,013 | 3% |
| Miami-Fort Lauderdale-West Palm Beach FL | 2,402,217 | 53,714 | 2% |
| Seattle-Tacoma-Bellevue WA | 1,623,998 | 51,640 | 3% |

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# Carsharing

## Top 10 metro areas with greatest carbon emissions reductions

| Metro area | Reduced carbon emissions (metric tons per year) |
| --- | --- |
| New York-Newark-Jersey City NY-NJ-PA | 301,219 |
| Chicago-Naperville-Elgin IL-IN-WI | 67,713 |
| Los Angeles-Long Beach-Anaheim CA | 43,324 |
| Boston-Cambridge-Newton MA-NH | 42,319 |
| Washington-Arlington-Alexandria DC-VA-MD-WV | 40,834 |
| San Francisco-Oakland-Hayward CA | 38,579 |
| Philadelphia-Camden-Wilmington PA-NJ-DE-MD | 31,430 |
| Atlanta-Sandy Springs-Roswell GA | 17,311 |
| Miami-Fort Lauderdale-West Palm Beach FL | 14,086 |
| Seattle-Tacoma-Bellevue WA | 13,544 |

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# Carsharing

## Top 10 Metro Areas with greatest potential reduction in traffic accidents

| Metro area | Annual traffic accidents avoided |
|---|---|
| New York-Newark-Jersey City NY-NJ-PA | 636 |
| Chicago-Naperville-Elgin IL-IN-WI | 143 |
| Los Angeles-Long Beach-Anaheim CA | 91 |
| Boston-Cambridge-Newton MA-NH | 89 |
| Washington-Arlington-Alexandria DC-VA-MD-WV | 86 |
| San Francisco-Oakland-Hayward CA | 81 |
| Philadelphia-Camden-Wilmington PA-NJ-DE-MD | 66 |
| Atlanta-Sandy Springs-Roswell GA | 37 |
| Miami-Fort Lauderdale-West Palm Beach FL | 30 |
| Seattle-Tacoma-Bellevue WA | 29 |
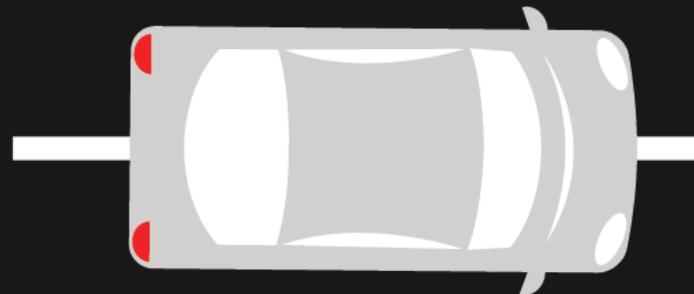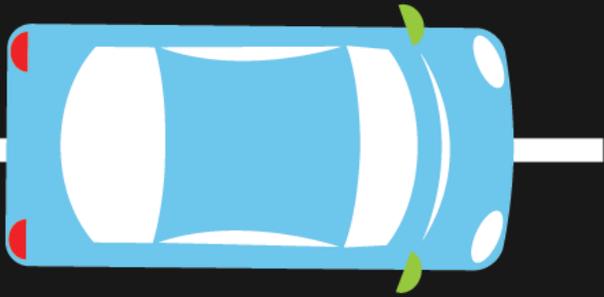
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# Carsharing

Top 10 metro areas with greatest potential for fuel savings

| Metro area | Annual fuel wastage avoided ($) |
|---|---|
| New York-Newark-Jersey City NY-NJ-PA | $66 million |
| Chicago-Naperville-Elgin IL-IN-WI | $15 million |
| Los Angeles-Long Beach-Anaheim CA | $10 million |
| Boston-Cambridge-Newton MA-NH | $9 million |
| San Francisco-Oakland-Hayward CA | $9 million |
| Washington-Arlington-Alexandria DC-VA-MD-WV | $8 million |
| Philadelphia-Camden-Wilmington PA-NJ-DE-MD | $7 million |
| Atlanta-Sandy Springs-Roswell GA | $3 million |
| Seattle-Tacoma-Bellevue WA | $3 million |
| Miami-Fort Lauderdale-West Palm Beach FL | $3 million |

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# Carsharing policy recommendations
Carsharing has been growing steadily over the past few years, but policy changes could accelerate its growth.

✔ Assist carshare providers with startup costs

✔ Build public awareness of carsharing as a less expensive alternative to car ownership

✔ Provide additional public parking spaces for carshare vehicles

✔ Consider development requirements that support carsharing

✔ Support carsharing through fleet sharing

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# On-demand ride services

enabled by companies such as Lyft, Uber and Sidecar, allow ordinary motorists to use their personal cars to offer prearranged transportation services.

- These services, enabled by mobile and GPS technologies, are making the taxi market more competitive.

- Offers potential to extend taxi service to underserved neighborhoods, and to reduce congestion by facilitating shared taxi rides.

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# Potential benefits of on-demand ride services

## National coverage & congestion reduction potential for NYC

If on-demand ride services providers could facilitate trip sharing for 30 percent of New York City's taxi trips, the total number of trips could be reduced by almost 52 million a year, reducing New York's total vehicle miles traveled by 431 million per year.

Seattle
Portland
San Jose
Los Angeles
San Diego
Phoenix
El Paso
Denver
Oklahoma City
Fort Worth Dallas
Austin
San Antonio Houston
Memphis
Nashville
Milwaukee Detroit
Chicago
Indianapolis
Columbus
Charlotte
Jacksonville
Boston
New York
Philadelphia
Baltimore
Washington

**Legend**

**2013 US Combined Statistical Areas**

Has On-Demand Car Services

On-Demand Car Services Not Currently Available

The following on-demand services providers are included in this analysis: Uber, Lyft and Sidecar.
Data current as of 30 March 2015.
Sources: https://www.lyft.com/cities;
https://www.side.cr/about/;
https://www.uber.com/cities

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# On-demand ride services policy recommendations
Here are seven ways to help increase public value in on-demand ride services.

✔️ Ensure that government data collection captures on-demand services

✔️ Encourage cities to release taxi trip and fare data online

✔️ Support pilot partnerships between government agencies and on-demand mobility providers

✔️ Fund studies and pilots to determine the optimal position of on-demand ride services within mobility ecosystems

✔️ Enlist private partners to achieve ridesharing targets

✔️ Contract with on-demand ride services to provide guaranteed rides home

✔️ Craft thoughtful regulation to encourage the spread of on-demand mobility

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