Virtual Civic Lab – June 16th, 2020

Highlighting Colorado's Crisis Innovation

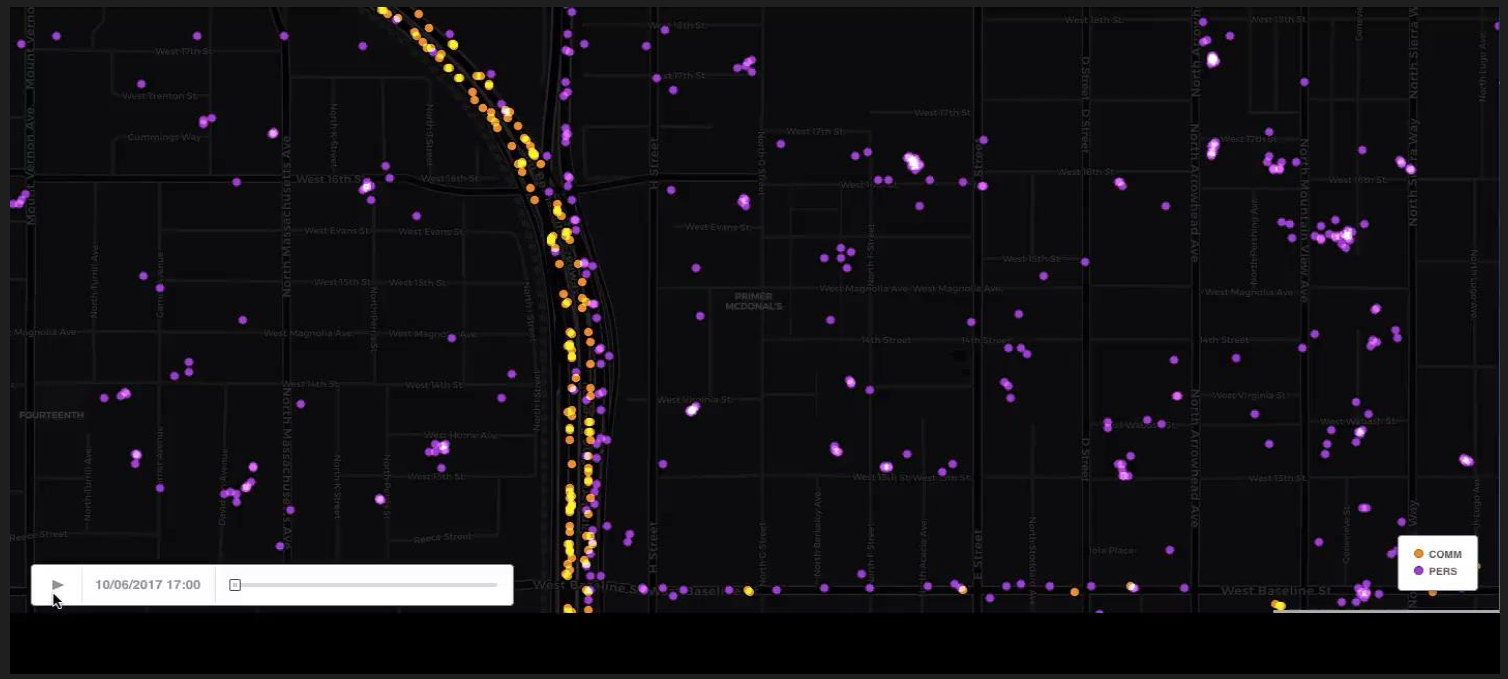
StreetLight Data

Mobility Data to Assist with Virus Response,

Mobility and Economic Development

Milton Ospina
Director, North Central
Louisville, CO

Big Data for Transportation Planning



MOBILE DEVICE DATA
from ~28% of U.S. and Canadian adults

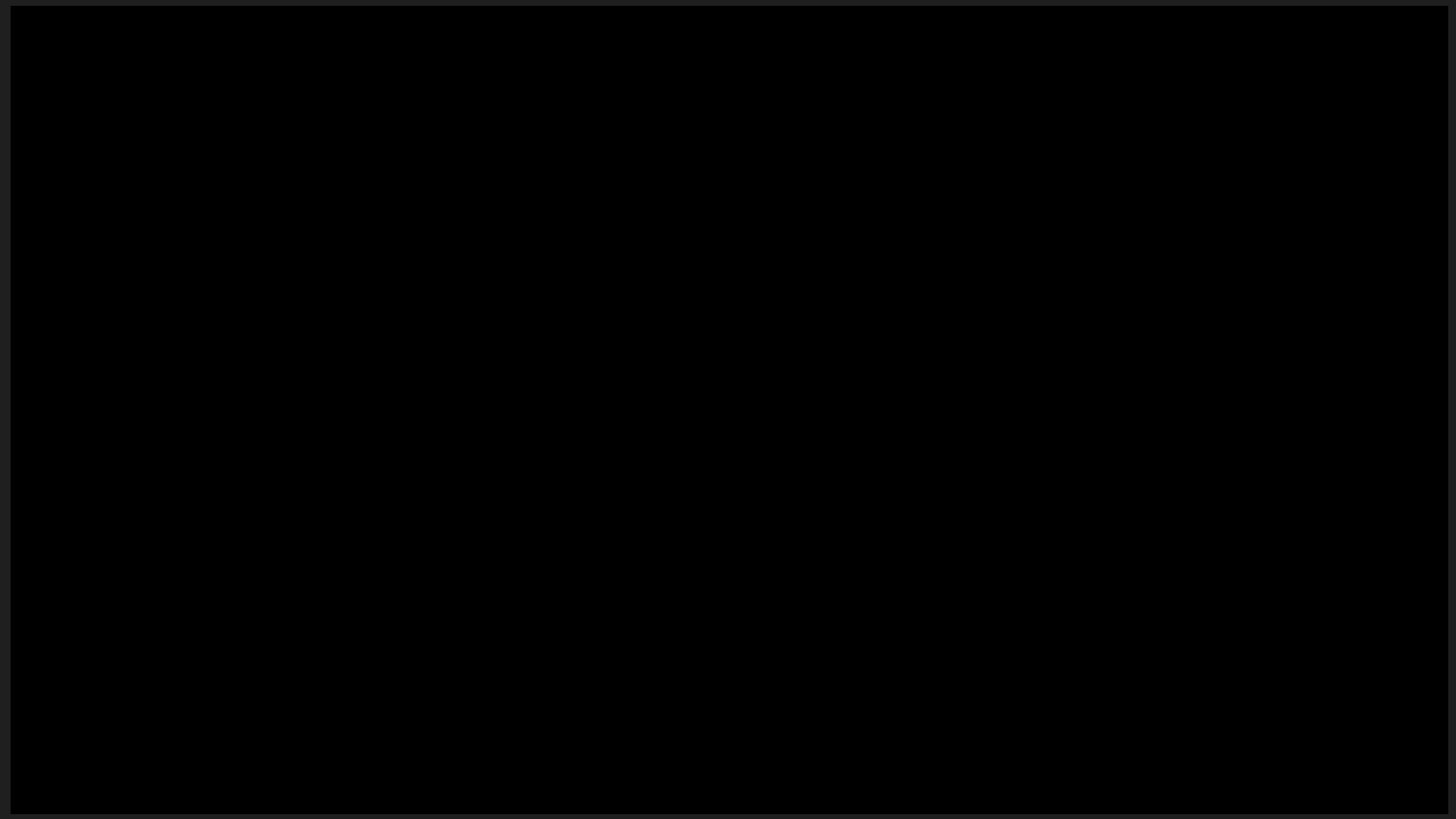
Example, San Bernardino, CA
Oct 8, 2017 24-hr snapshot

CONTEXT

Parcel Data
Digital Road Network Data
U.S. Census

- Founded in 2011
- Every month, we process over 100 billion anonymized location records from **smart phones** and **GPS navigation devices** in cars and trucks.
- **Route Science®** transforms them into **contextualized**, normalized and aggregated travel patterns.
- **Privacy** is one of the core principles at StreetLight Data. Our analytics only describe the movement of groups of people – not the movement of individuals.

StreetLight InSight® is the only interactive transportation data platform.



- It's NOT a model, a report or a static heatmap.
- It's your self-serve desktop software with **on-demand access to accurate mobility metrics.**

StreetLight vs incumbent technologies. We're faster, more accurate, and cost less.

	Traditional Data Collection Methods	Big Data
TIME	Weeks / months to collect, analyze and extrapolate data	On demand. Ready in minutes.
COST	Expensive collection techniques with linear marginal costs, high maintenance costs.	Run many times the analytics for the same price. Cost doesn't scale linearly.
SAFETY	Placing and maintaining sensors put employees at risk.	No staff in harm's way.
ACCURACY	Poor, biased survey response rates = low accuracy. Sensors often miss data and are hard to expand.	Vastly larger sample size, 365/7/24 coverage → More accurate outputs.

"With StreetLight we get more data at finer resolution for a third of the cost. And we can get an answer in 30 minutes."

Josh Johnson,
Sr. Traffic Engineer at HDR

Unique viewpoint to the adoption of Big Data in transportation

3,000+ monthly transportation analyses

95% of all U.S. MSAs
(all top 50 U.S. MSAs & top 15 Canadian MSAs)

Government & Private

SIEMENS · NEW YORK CITY DOT · odot transportation.ohio.gov · FEHR & PEERS · VDOT · MnDOT · ARUP · ARCADIS · Uber · Caltrans · NVCOG · RENEWATLANTA · TORONTO · HDR · SANDAG · AECOM · vhb

At your fingertips:
Analytics for every road, bike lane and Census Block

MODES:

Trucks
Cars*
Cyclists
Pedestrians

* Ride hailing and delivery mode also available

FUNDAMENTAL ANALYTICS:

- Origin Destination
- Routing
- Select Link
- AADT, MADT, hourly traffic

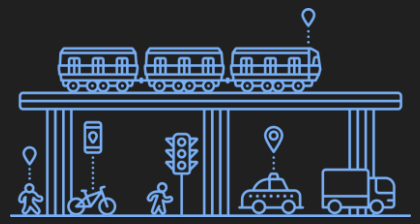
TRIP ATTRIBUTES:

- Trip speed, duration, length
- Travel time
- Trip circuity

TRAVELER ATTRIBUTES:

- Inferred trip purpose
- Demographics

Faster, better answers to your biggest problems



TRANSPORTATION PLANNING:

- Active Transportation
- Before & After Studies
- Congestion Studies
- Event & Tourism Studies
- Freight Studies
- Last Mile Studies
- Travel Demand Management

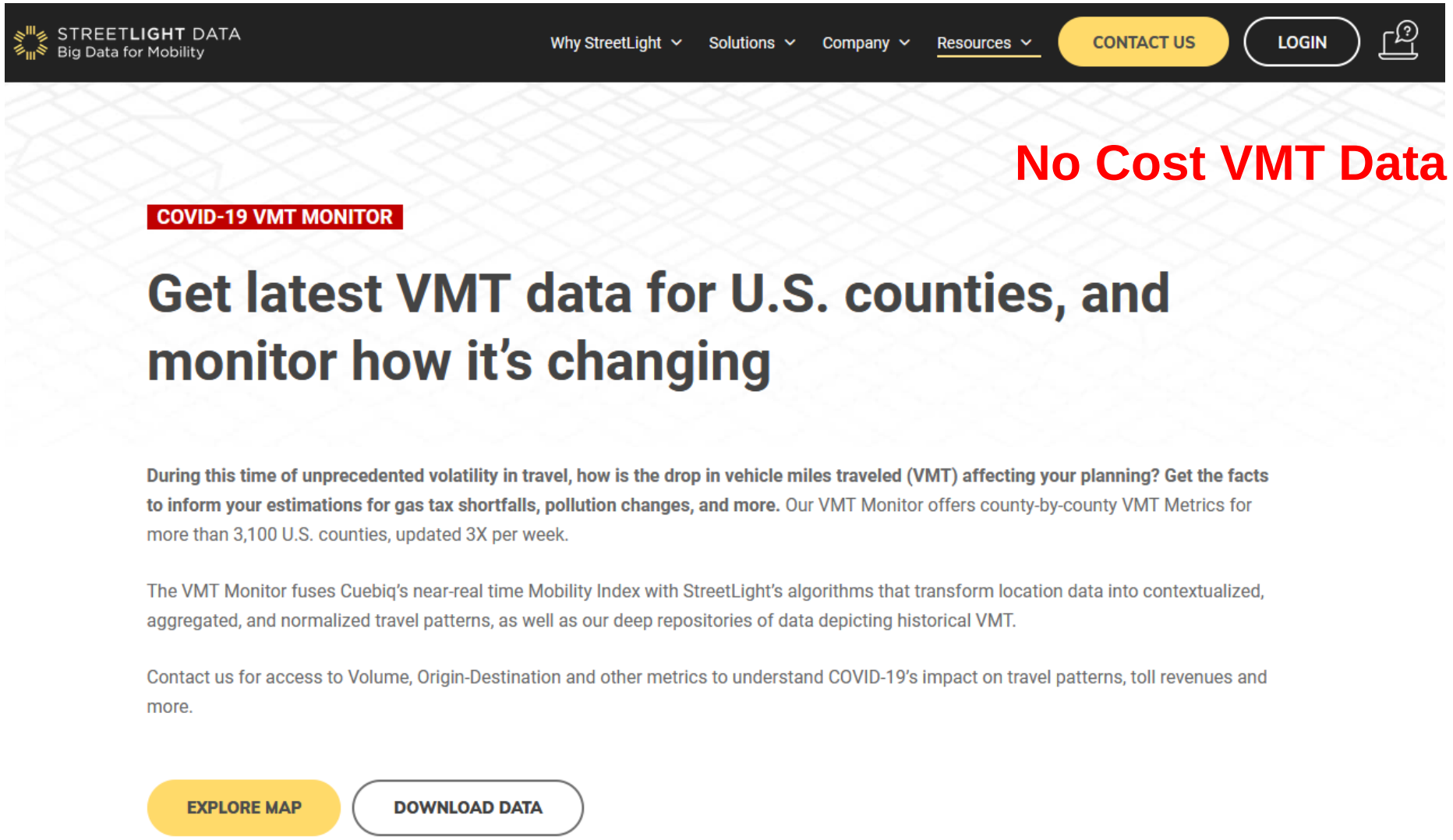
TRAFFIC ENGINEERING & OPERATIONS:

- Congestion Studies
- Corridor Studies
- Travel Time
- Turning Movements
- Safety
- Circuity

SMART CITIES & NEW MOBILITY:

- Before & After Studies
- Greenhouse Gas Emissions & VMT
- Ride Hailing & Delivery Studies
- Social Equity
- Travel Demand Management

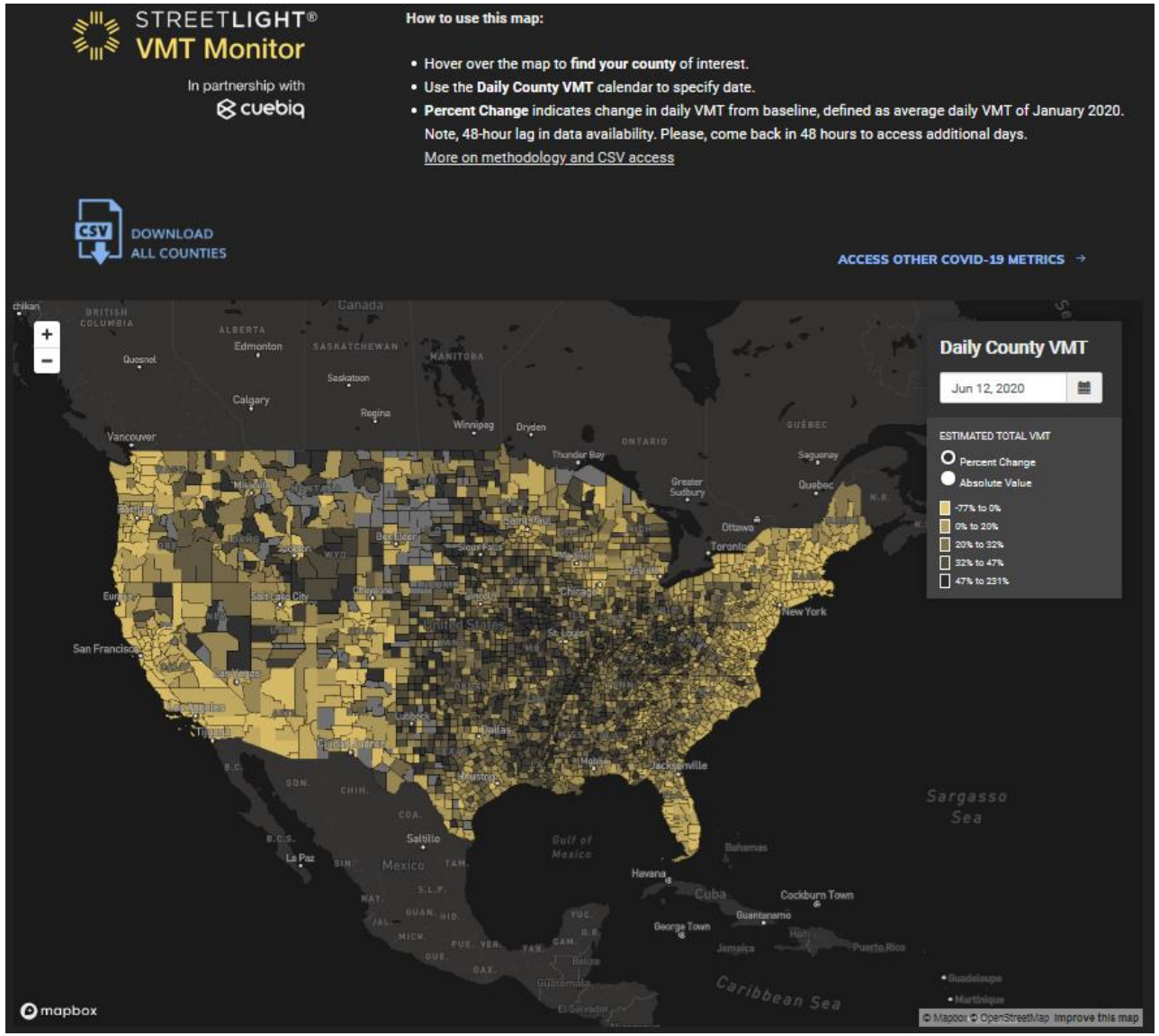
VMT: Vehicles Miles Traveled and COVID Response



No Cost VMT Data

https://www.streetlightdata.com/VMT-monitor-by-county/

VMT: Vehicles Miles Traveled and COVID Response

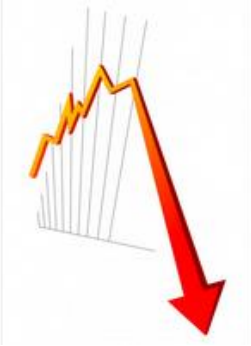


No-cost VMT Data Requests Stats

Up to today:

- 880 individual agency requests
- Industries:
  - Transportation Agencies
    - Transportation Departments
    - MPOs & Regional Councils
    - Transit Agencies
  - Cities
  - Counties
  - Universities/Colleges
  - Economic Development
    - Departments of Commerce
    - Tax Agencies
    - Tourism Boards
  - Health Organizations
    - Hospitals and Health Non-Profits
  - Commercial

StreetLight VMT Data Use Cases



Impact to Toll Roads and Express Lanes Usage

Health and Emergency Management Agencies on Enforcement of Stay Home Orders

Impact on Vehicle Emissions

VMT Tracking Dashboards

% Changes in Biking and Walking

Use to Model People Migration

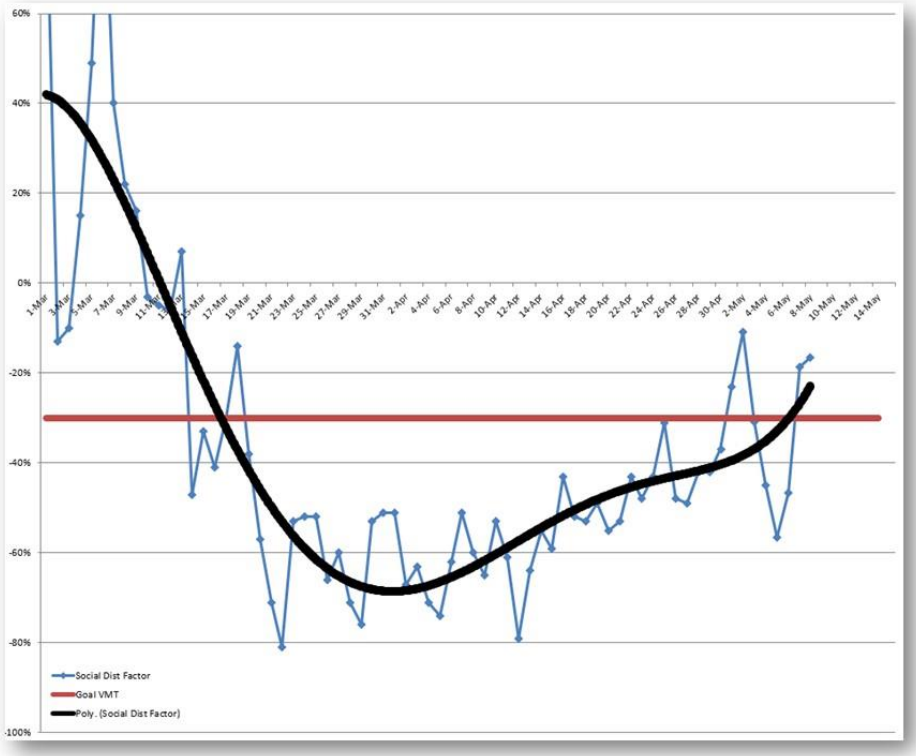
VMT Reduction and the Impacts on Gas Tax

Models to Infer Losses in Parking Lot Revenue

OD by Pre-Set for hospitals | Hotels/Tourism Destinations | Shopping Centers/stores

Zone Analysis for commercial neighborhoods: To model decrease in sales tax revenue

Calibrate Degree of Social Distancing in Epidemiological Models



Huron, SD

Impact of "State of Emergency Declaration Due to Covid- 19 Spread" in Travel Pattern of BHJ Region

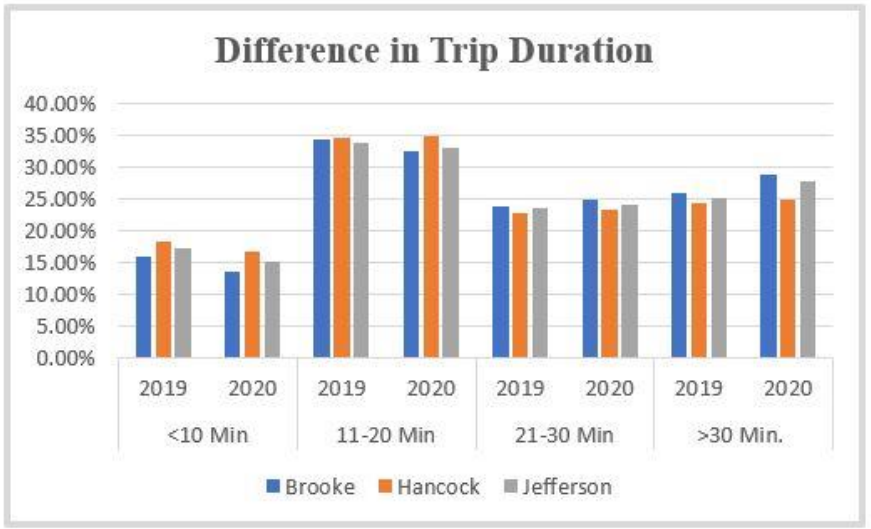
Comparison Period- March 2019 & March 2020

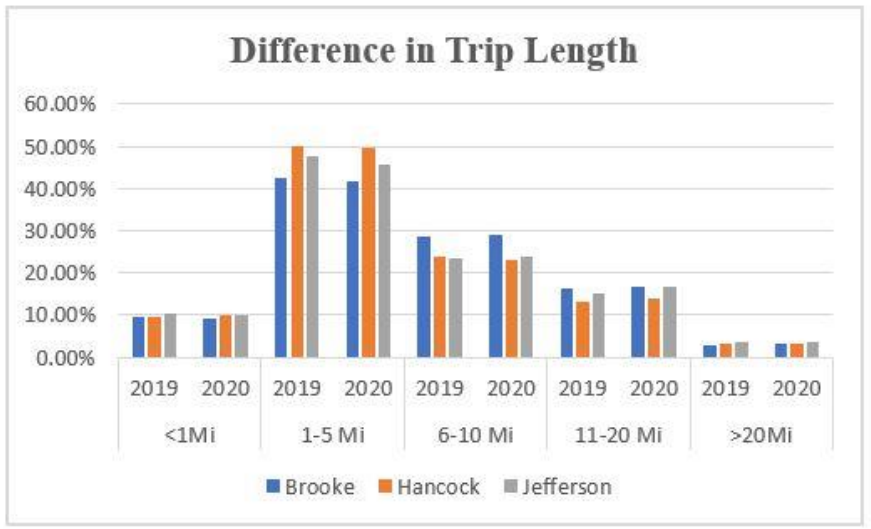
Weekday Trip Decrease -3.51%

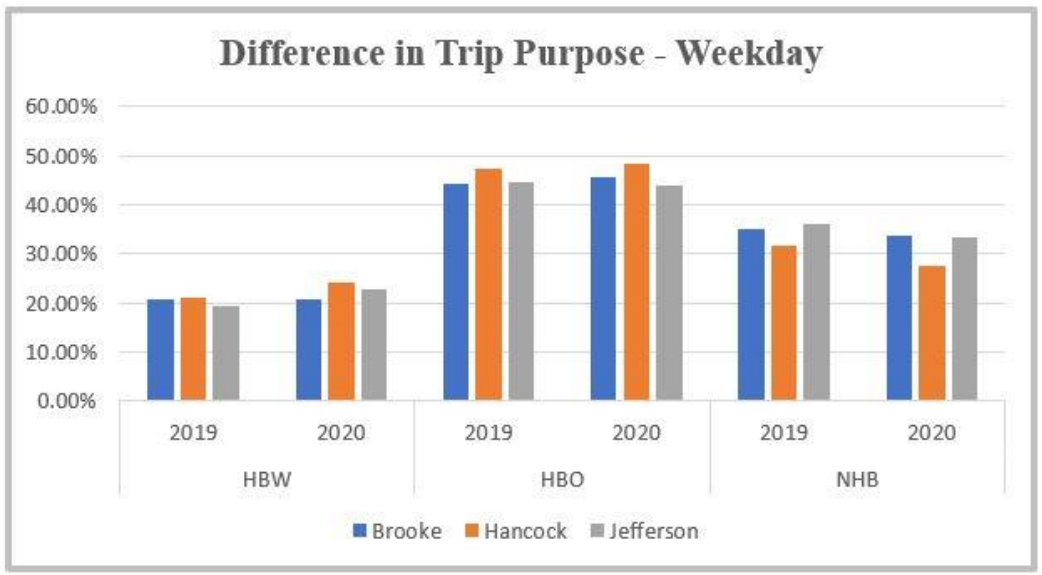
Change in trip	Brooke	Hancock	Jefferson
Brooke	-1.35%	-7.10%	-5.41%
Hancock	-3.38%	-7.74%	0.44%
Jefferson	-10.37%	-6.47%	-1.51%

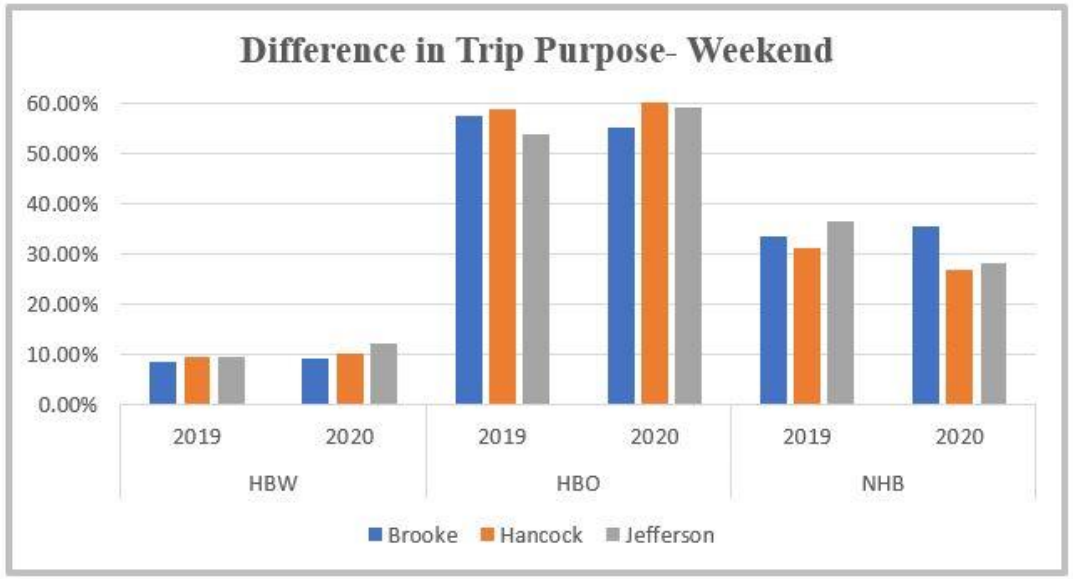
Weekend Trip Decrease -9.87%

Change in trip	Brooke	Hancock	Jefferson
Brooke	2.26%	-7.75%	-20.20%
Hancock	-14.29%	-9.26%	-23.00%
Jefferson	-17.74%	-24.36%	-10.14%

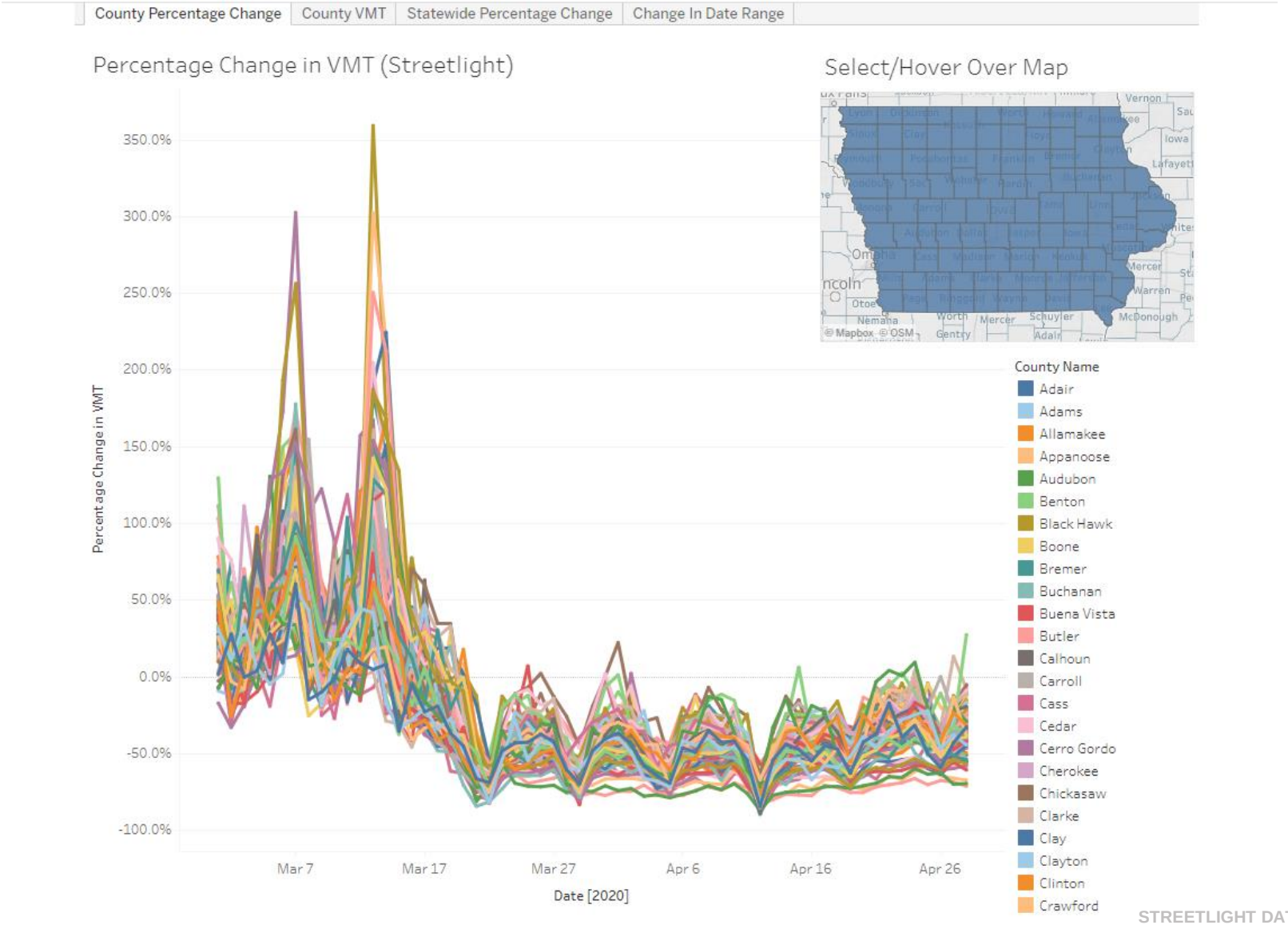








VMT Data Use Cases



Trip Reduction Index (TRI) Suggests Adherence to Stay-at-Home Orders by State in the Contiguous US

BCG | STREETLIGHT DATA

The TRI represents car travel behavior with values from 0 to 10:

- 10 means 0% of cars on roads
- 0 means 130% or more cars on roads (compared to the average vehicle miles traveled in January 2020)

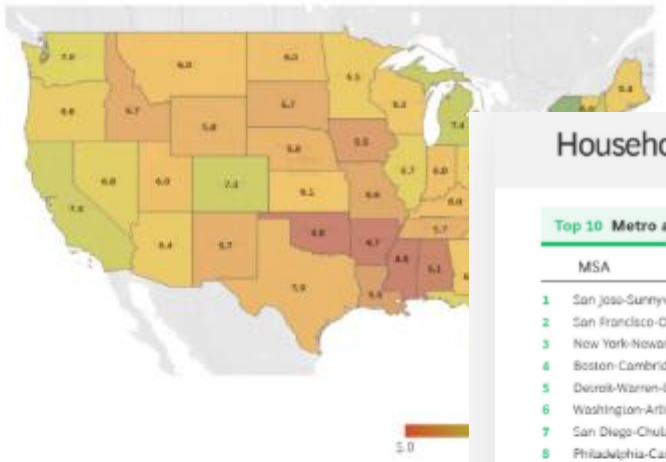
Top five states by TRI

1	District of Columbia	8.9
2	New Jersey	8.4
3	Massachusetts	8.2
4	New York	8.1
5	Connecticut	8.0

Bottom five states by TRI

45	Louisiana	5.5
46	Alabama	5.1
47	Oklahoma	4.8
48	Arkansas	4.7
49	Mississippi	4.6

Trip reduction index as of April 24, 2020



Household Income Correlates Significantly with Trip Reduction Index

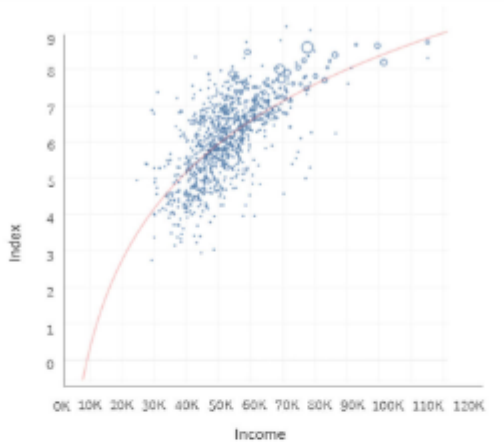
BCG | STREETLIGHT DATA

Top 10 Metro areas (MSAs) >1 million by average TRI* for April 18 to April 25, 2020

	MSA	Avg. Index	Population	Income
1	San Jose-Sunnyvale-Santa Clara, CA	8.9	1,836,911	$115,148
2	San Francisco-Oakland-Berkeley, CA	8.8	4,335,391	$99,615
3	New York-Newark-Jersey City, NY-NJ-PA	8.7	19,397,109	$77,666
4	Boston-Cambridge-Newton, MA-NH	8.6	4,552,402	$98,412
5	Detroit-Warren-Dearborn, MI	8.4	4,296,250	$59,135
6	Washington-Arlington-Alexandria, DC-VA-MD-WV	8.4	5,649,540	$101,655
7	San Diego-Chula Vista-Carlsbad, CA	8.3	3,095,313	$74,855
8	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	8.2	5,965,343	$71,469
9	Los Angeles-Long Beach-Anaheim, CA	8.2	12,828,837	$69,213
10	Baltimore-Columbia-Towson, MD	8.1	2,710,489	$90,221

Bottom 10 Metro areas (MSAs) >1 million by average TRI for April 18 to April 25, 2020

	MSA	Avg. Index	Population	Income
42	Nashville-Davidson-Murfreesboro-Franklin, TN	7.1	1,646,200	$64,858
43	San Antonio-New Braunfels, TX	7.1	2,142,508	$58,273
44	Jacksonville, FL	7.1	1,345,596	$59,009
45	Louisville/Jefferson County, KY-IN	7.0	1,202,718	$57,915
46	Kansas City, MO-KS	7.0	2,009,342	$65,419
47	Riverside-San Bernardino-Ontario, CA	7.0	4,224,851	$62,125
48	Salt Lake City, UT	7.0	1,087,873	$71,219
49	Birmingham-Hoover, AL	6.6	1,061,024	$55,980
50	Oklahoma City, OK	6.4	1,252,987	$57,340
51	Memphis, TN-MS-AR	6.3	1,316,100	$51,700



*TRI represents car travel behavior with values from 0 to 10: 0 means 130% or more cars on roads (compared to the average vehicle miles traveled in January 2020) and 10 means 0% of cars on roads.

MOBILITY DATA PARTNER STREETLIGHT DATA

When our partner Boston Consulting Group used StreetLigh Reduction Index, we were impressed by the methodology a COVID's impact on tax revenue to understanding how hous sheltering in place, the examples illustrate how transportat the pandemic's impact on residents, businesses, and budg

Just Where Are People Travelir

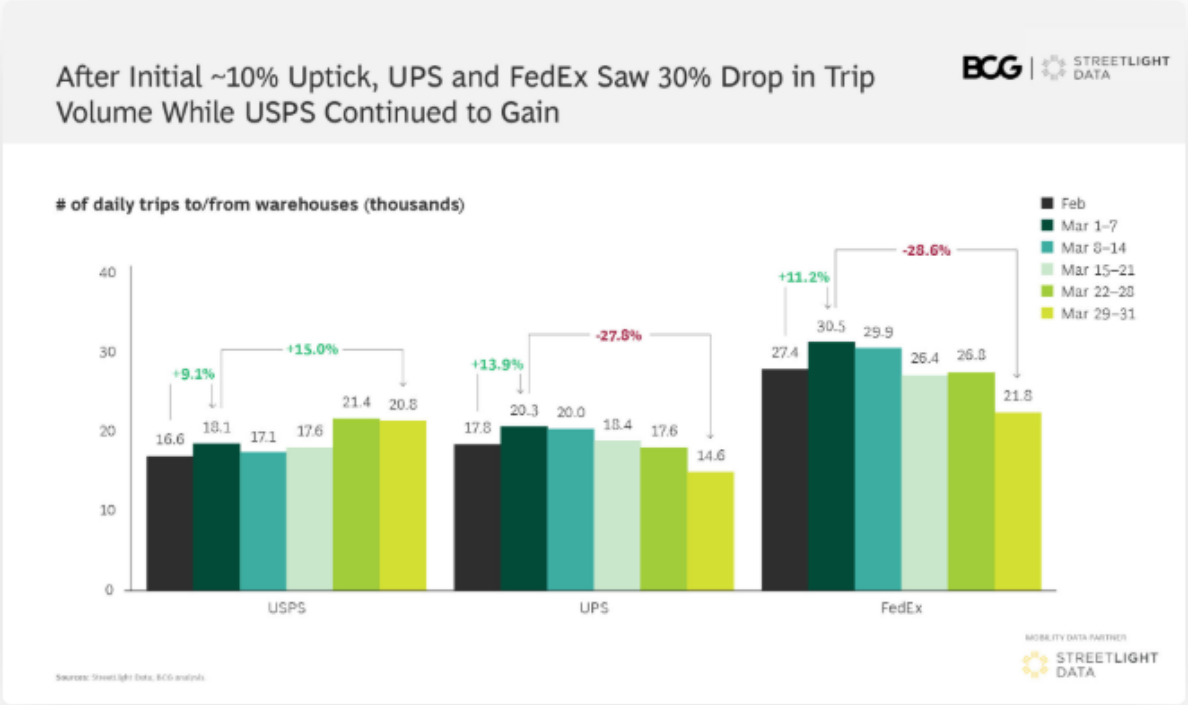
BCG and StreetLight have studied vehicle miles traveled (of March, as the COVID-19 pandemic took hold, and creat was used to measure adherence to stay-at-home policies few key insights stand out.

Using additional metrics from StreetLight InSight® we overlaid demographic data for an interesting finding. One of the key correlating factors for trip reductions turns out to be household income. This possibly results from the ability that higher-wage workers have to work from home, compared with those in positions requiring them to be at a physical location.

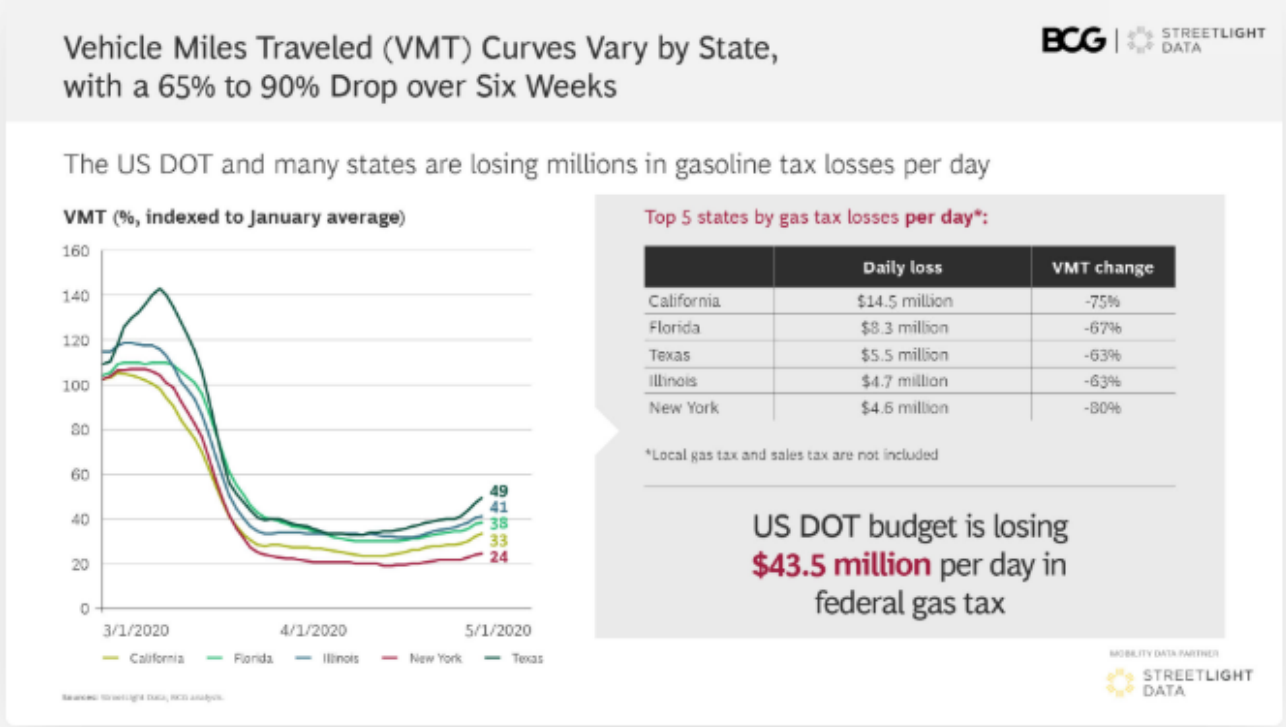
https://www.streetlightdata.com/vmt-statistics-boston-consulting-group/

Impact on Freight and Commercial Travel

BCG and StreetLight studied VMT statistics from the perspective of commercial activity by studying trip volume at warehouses across the U.S. in March, as the COVID-19 pandemic took hold. We saw an initial surge in trip volume by approximately 10% across the top three players (the U.S. Postal Service, UPS and Fedex), driven by an uptick in online ordering at the beginning of lockdown measures. But over the long term, two of these top U.S. logistics players have experienced a 30% decline in trip volume.



The demand for food and consumables spiked, leading some CPGs, distributors, and retailers to run flat out for a few weeks while consumers scrambled to stock up on necessities. That surge has begun to slow down as consumers gain confidence that essentials would be available in the days ahead. Yet business has slowed among other parts of the retail value chain, as well as in manufacturing and non-essential retail segments, with stay-at-home orders significantly reducing customer visits.



This broad VMT decrease poses a significant revenue challenge for state budgets. It may ultimately accelerate the deployment of congestion pricing schemes and changes in tolling rates to recoup lost revenue, anticipating that VMT picks up as lockdown measures are relaxed and private vehicle usage rebounds faster than transit ridership.

California feels the largest impact, with an estimated daily $14.5 million loss in gas tax vs. what is expected at a VMT baseline. Florida, Texas, Illinois, and New York also face more than $4.5 million in daily losses, and the USDOT an additional $43.5 million.

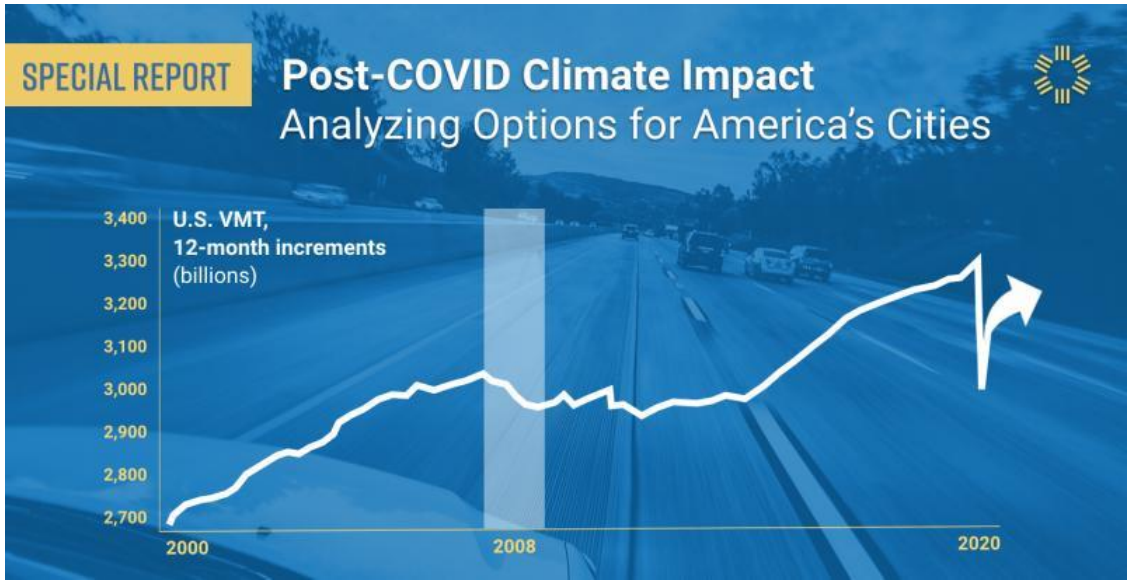
We performed our analysis in StreetLight InSight® , the proprietary online platform for customers. But StreetLight is offering vehicle miles traveled statistics via their VMT Monitor — available for free during the pandemic. This resource is an invaluable starting point for understanding the impact of reduced travel on your region.

StreetLight VMT Data: What Next?

Comparative Analysis: 2020 vs 2019

Preparation for Next Time: Not If but When?

StreetLight VMT Data and Climate Index:

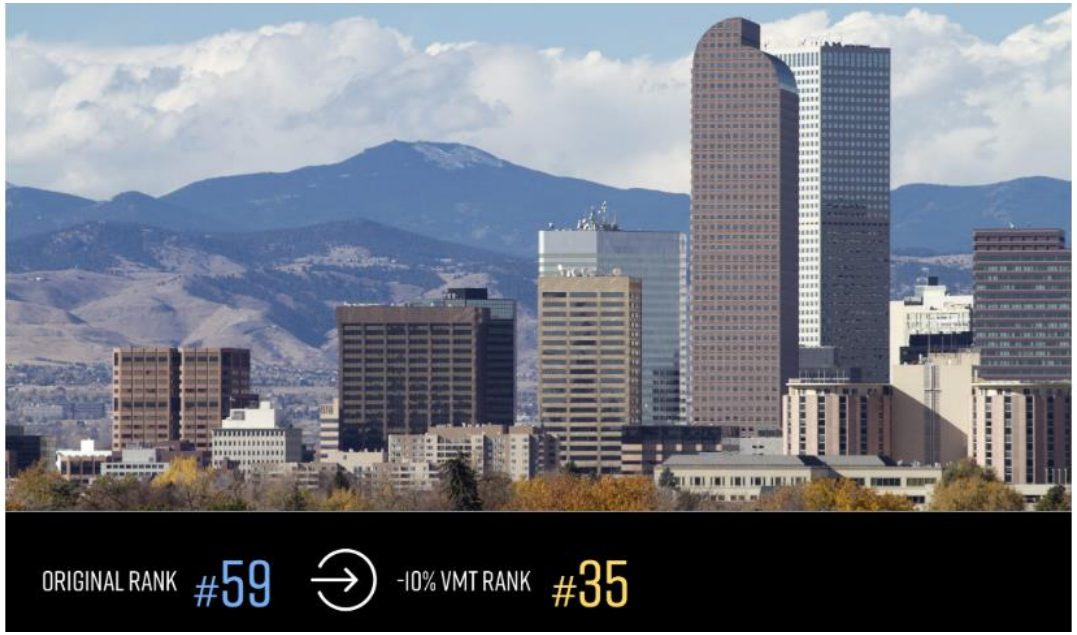


https://www.streetlightdata.com/special-report-post-covid-climate-impact/

StreetLight VMT Data and Climate Index

Change in Vehicle Miles Traveled (March 1 – May 5)

SEATTLE-TACOMA-BELLEVUE, WA	-71%
LOS ANGELES-LONG BEACH-ANAHEIM, CA	-72%
ATLANTA-SANDY SPRINGS-ROSWELL, GA	-72%
DENVER-AURORA-LAKEWOOD, CO	-73%



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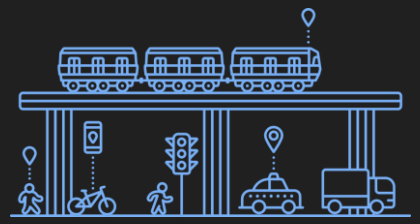
Faster, better answers to your biggest problems



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STREETLIGHT DATA

Big Data for Mobility

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