




Understanding and modeling complex travel behaviors (Focus on Impacts of the Pandemic)

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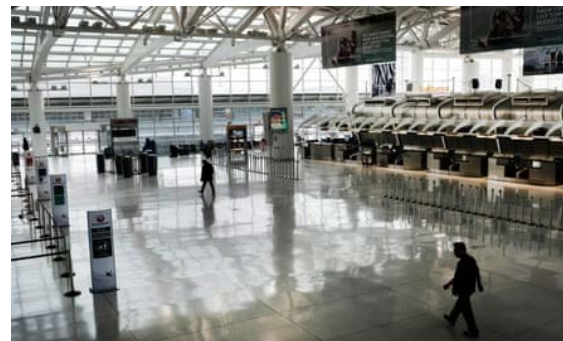


Let's Start with a:
Funny/Interesting Anecdote
from your 'Pandemic' Experiences

What Were We All Doing Three Years Ago, Today?

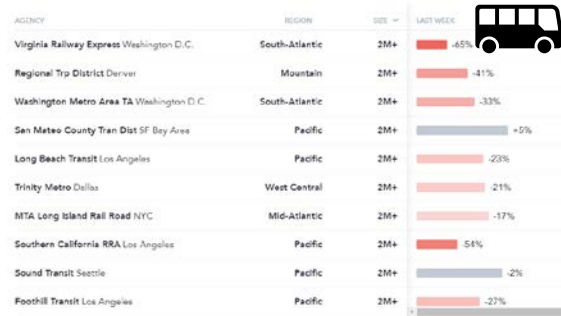


Anything Else Come to Mind?



How Has the Pandemic Impacted Our Use of Modes

Weekly transit ridership compared to pre-pandemic levels (Source: APTA)

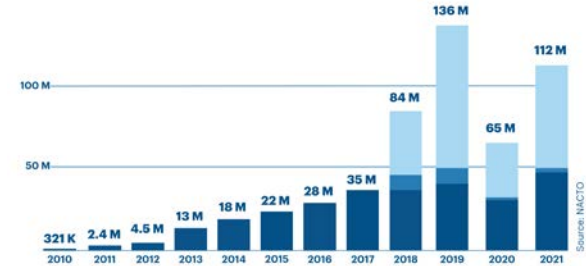


Shared Micromobility Ridership in the U.S. from 2010-2021

IN MILLIONS OF TRIPS



Station-Based Bikes Dockless Bikes E-Scooters



Since the introduction of the country's first bike share system in 2010, people in the U.S. have taken over 1 billion trips total on shared micromobility

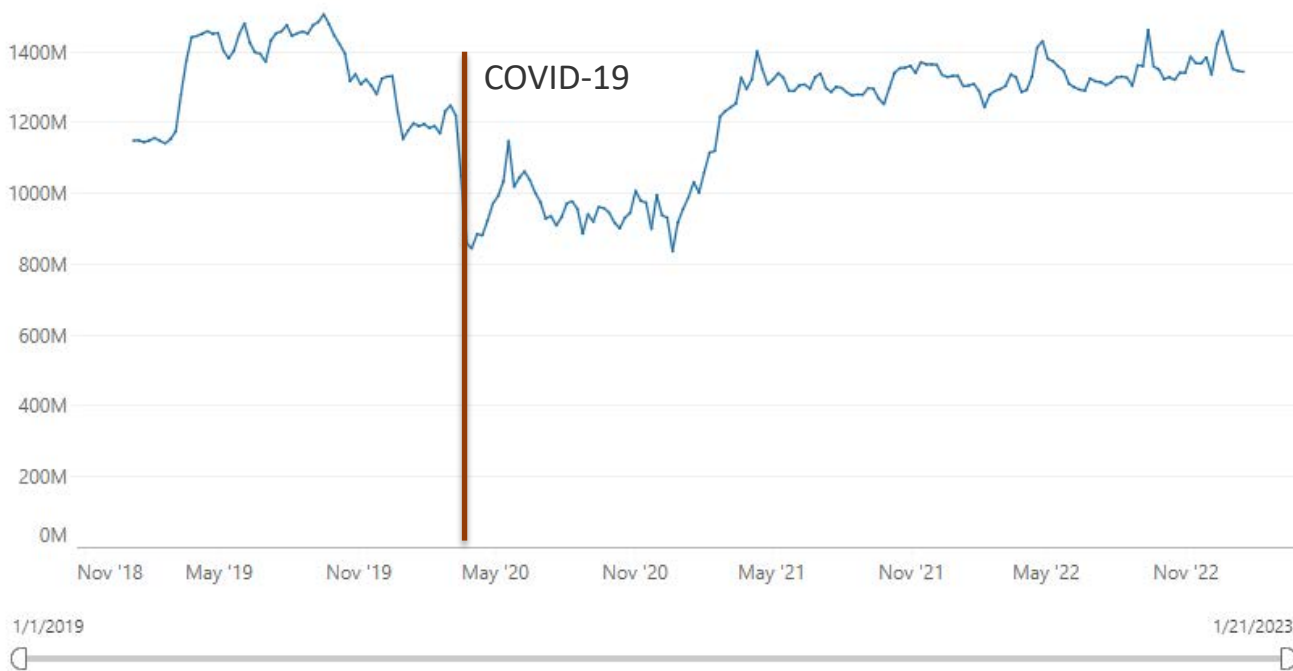
SPENDING

U.S. TRAVEL FORECAST - SPENDING (ADJUSTED FOR INFLATION)*

	ACTUAL			FORECAST				
	2019	2020	2021	2022	2023	2024	2025	2026
Total Travel Spending	\$1.17 T	\$722 B	\$886 B	\$1.05 T	\$1.15 T	\$1.21 T	\$1.24 T	\$1.26 T
Business	\$306 B	\$101 B	\$122 B	\$222 B	\$270 B	\$287 B	\$287 B	\$286 B
Leisure	\$867 B	\$622 B	\$764 B	\$827 B	\$880 B	\$920 B	\$952 B	\$970 B
Domestic	\$992 B	\$682 B	\$846 B	\$941 B	\$1.01 T	\$1.04 T	\$1.05 T	\$1.06 T
Leisure	\$722 B	\$589 B	\$731 B	\$741 B	\$765 B	\$783 B	\$797 B	\$803 B
Business	\$270 B	\$93 B	\$115 B	\$201 B	\$244 B	\$256 B	\$256 B	\$255 B
Transient	\$157 B	\$63 B	\$80 B	\$124 B	\$146 B	\$151 B	\$151 B	\$150 B
Group	\$113 B	\$30 B	\$35 B	\$77 B	\$98 B	\$105 B	\$105 B	\$104 B
International**	\$181 B	\$41 B	\$40 B	\$109 B	\$141 B	\$167 B	\$186 B	\$198 B
Leisure	\$145 B	\$33 B	\$33 B	\$87 B	\$115 B	\$137 B	\$155 B	\$167 B
Business	\$36 B	\$8 B	\$7 B	\$22 B	\$26 B	\$30 B	\$31 B	\$31 B
Transient	\$22 B	\$5 B	\$4 B	\$15 B	\$17 B	\$19 B	\$19 B	\$19 B
Group	\$14 B	\$3 B	\$3 B	\$7 B	\$10 B	\$12 B	\$12 B	\$12 B

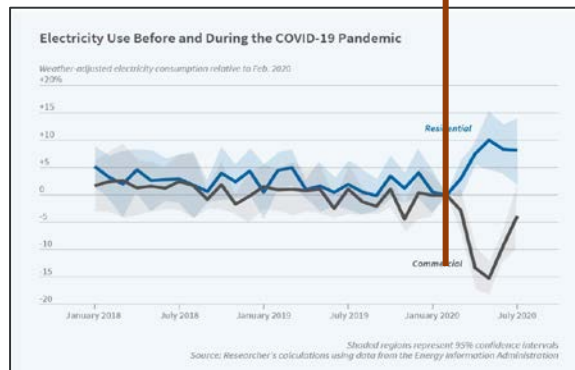
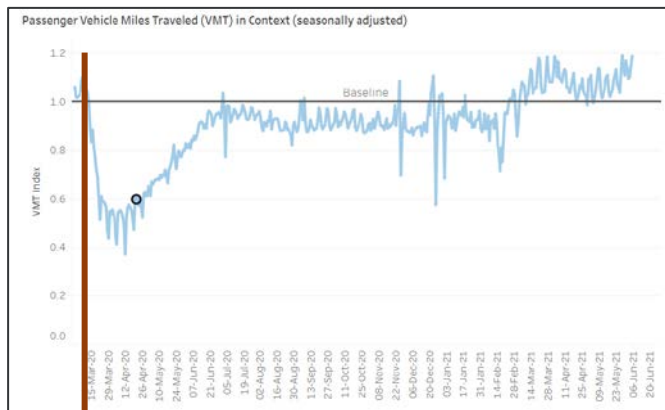
Domestic business travel volume will reach 81% of pre-pandemic levels in 2022 and 96% in 2023

Are We Traveling More or Less?



Trips per Day in the US (All Modes)

Implications of Telework



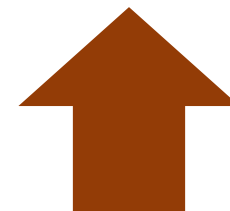
Pandemic drives down U.S. energy use in 2020 (LLNL, 2020)



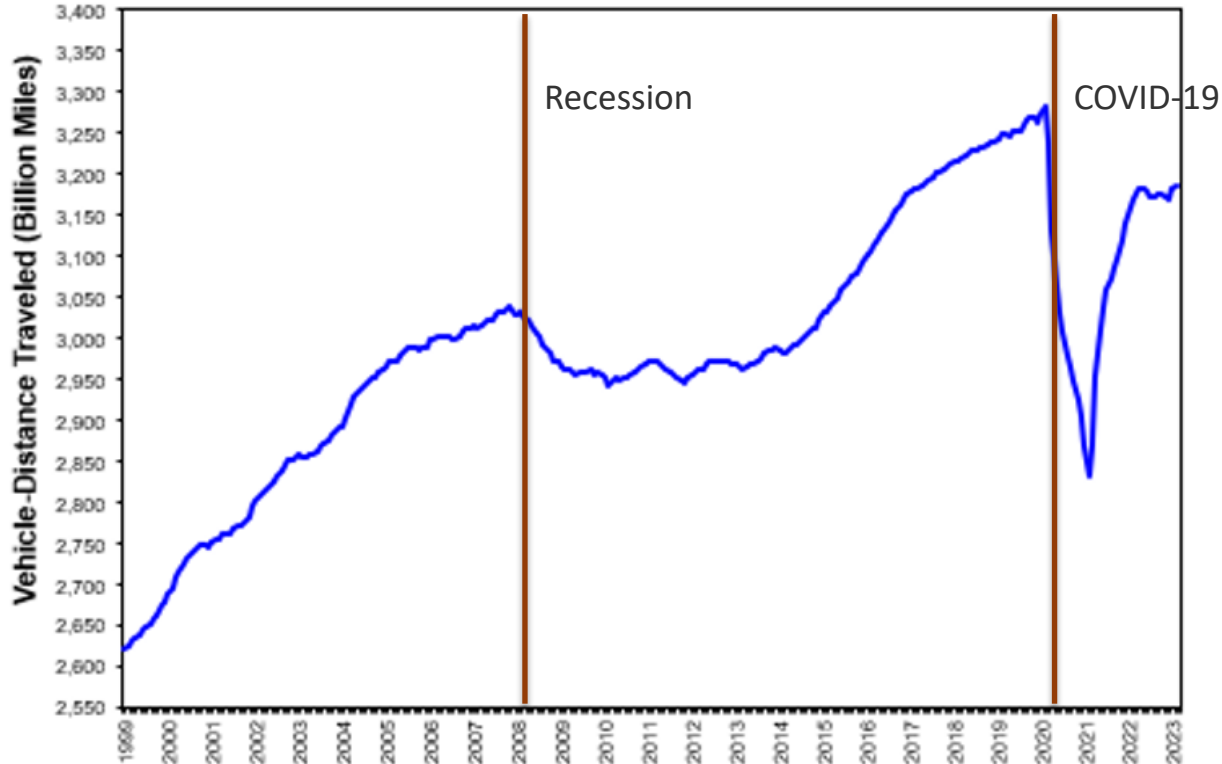
Decrease
in **Passenger
Vehicle Miles
Traveled**



Increase
in **Residential
Energy Use**



What Does the History Say About Reduced Travel?



What do (or did) the Academics Say?

Why COVID-19 Won't Change Long-Term Travel Behavior By Chandra Bhat

“history has shown that eventually most (individuals) will return to their personal normal for behavior and traveling”

The Long View: COVID-19 Impacts on Human Activity-Travel Patterns



Ram Pendyala · Follow
15 min read · Apr 20, 2020

“much of what is seen today in the midst of the pandemic is not necessarily what people are choosing to do of their own volition”

How is COVID-19 reshaping activity-travel behavior? Evidence from a comprehensive survey in Chicago

[Ali Shamshiripour](#), [Ehsan Rahimi](#), [Ramin Shabanpour](#), [Abolfazl \(Kouros\) Mohammadian](#)

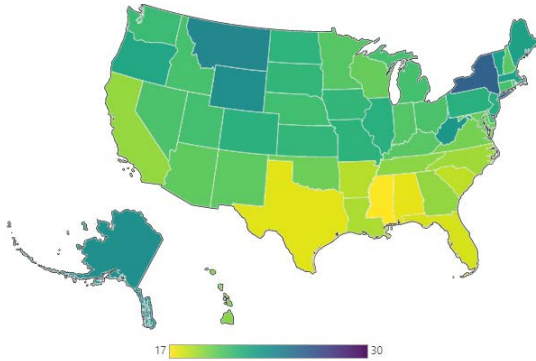
“significant changes in people's mobility-styles and habitual travel behaviors”

Impact of working from home on activity-travel behavior during the COVID-19 Pandemic: An aggregate structural analysis

[Rezwana Rafiq](#), [Michael G. McNally](#), [Yusuf Sarwar Uddin](#), [Tanjeeb Ahmed](#)

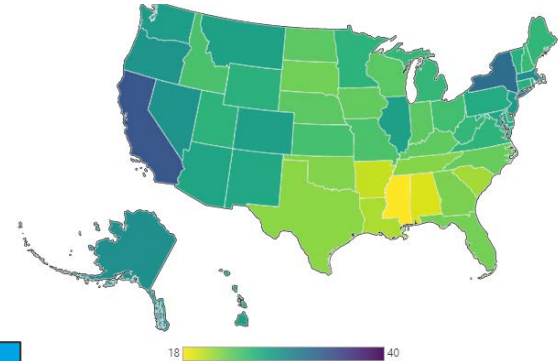
“a higher working from home proportion in a county corresponded to a reduction in average person-miles traveled”

Average Percent of People Staying at Home per Day

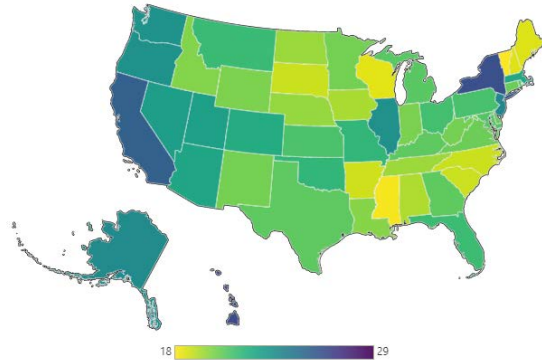


← Jan 2020

Jan 2021 →

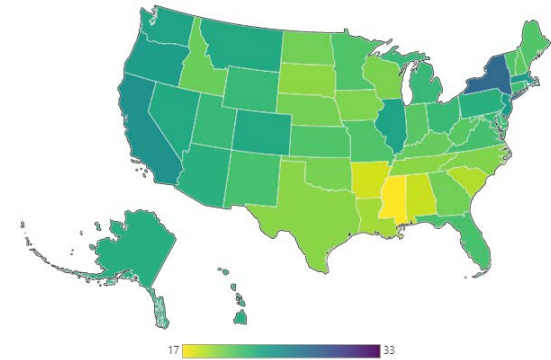


Match the Map Pairs



← Jan 2022

Jan 2023 →



Is the Pandemic Over?

Is the COVID-19 pandemic over, or not?

How will we know when it ends — and does

“no more precautions, restrictions, or changes in behavior compared with pre-pandemic times...”

Costco is bringing back free samples



By [Jordan Valinsky](#), CNN Business

Published 7:07 AM EDT, Fri May 28, 2021

declare an end to the pandemic...”

Here's what that means for you.

By Adrianna Rodriguez and Ken Alltucker, USA TODAY, May 11, 2023

Provocative Statements

- The **pandemic has created a permanent shift in our travel behavior** (for a majority of the US population).
- **Recovery of traditional public transit ridership** (to pre-pandemic levels) is close to **impossible**.
- **Cities** that re-imagined urban spaces during the pandemic **will fall back to their old ways**.

Challenges or Opportunities?

Lesser commute travel

Land use changes

Revenge/Displaced travel

Drop in transit ridership

Peak spreading

Safety

Use of shared mobility

Non-telecommuters

Framing the conversation

- Will the travel behavior changes brought about by the pandemic will last or dissipate over time?
- Ways to assess how travel patterns changed for various cohorts (telecommuters and commuters)?
- Solutions and strategies that can reduce VMT and GHG consumption for various cohorts?

Thank You

www.nrel.gov

NREL/PR-5400-86405

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