

Long Distance Travel Data: Challenges and Opportunities

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NHTS Workshop Session 7c

Outline

- Differences between daily and long-distance travel demand
- Challenge of defining long-distance travel
- Challenge of obtaining enough samples to estimate flows
- Importance of understanding the traveler

Difference Between Long-Distance and Daily Travel

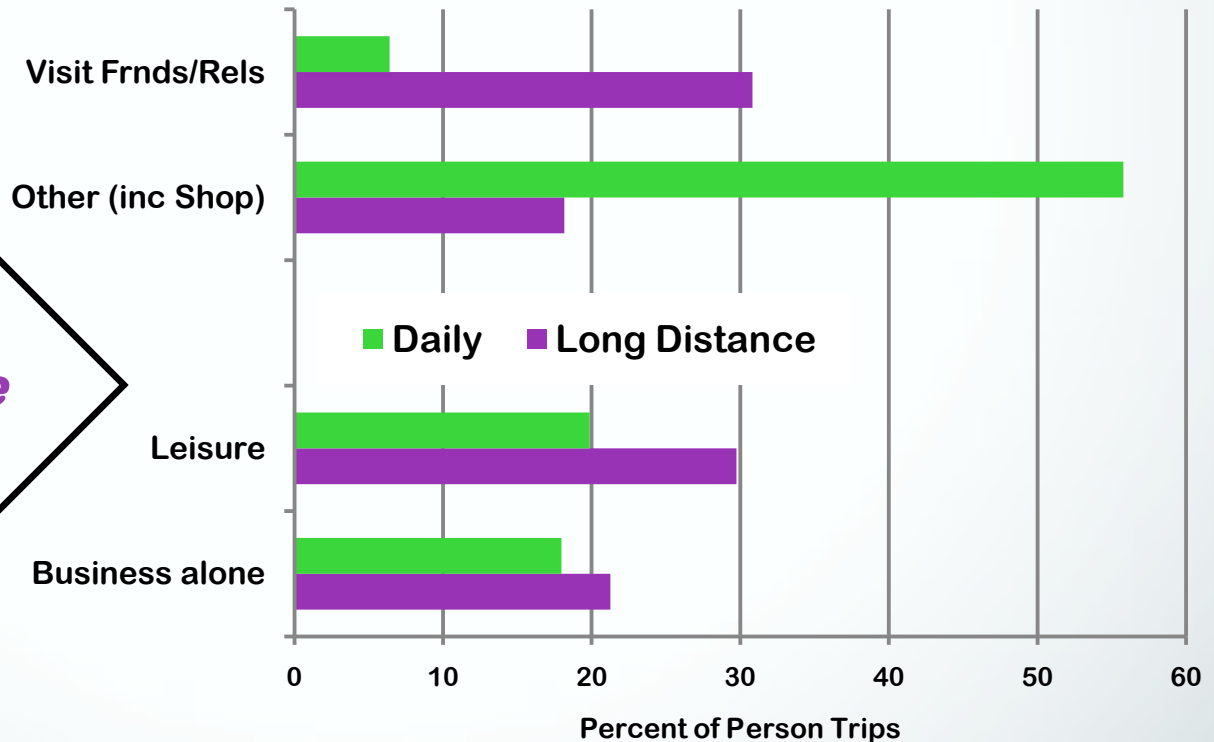
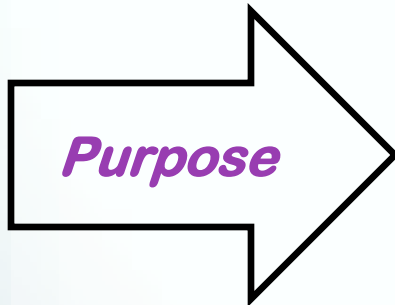


Incidence Rate and Purpose Differences...



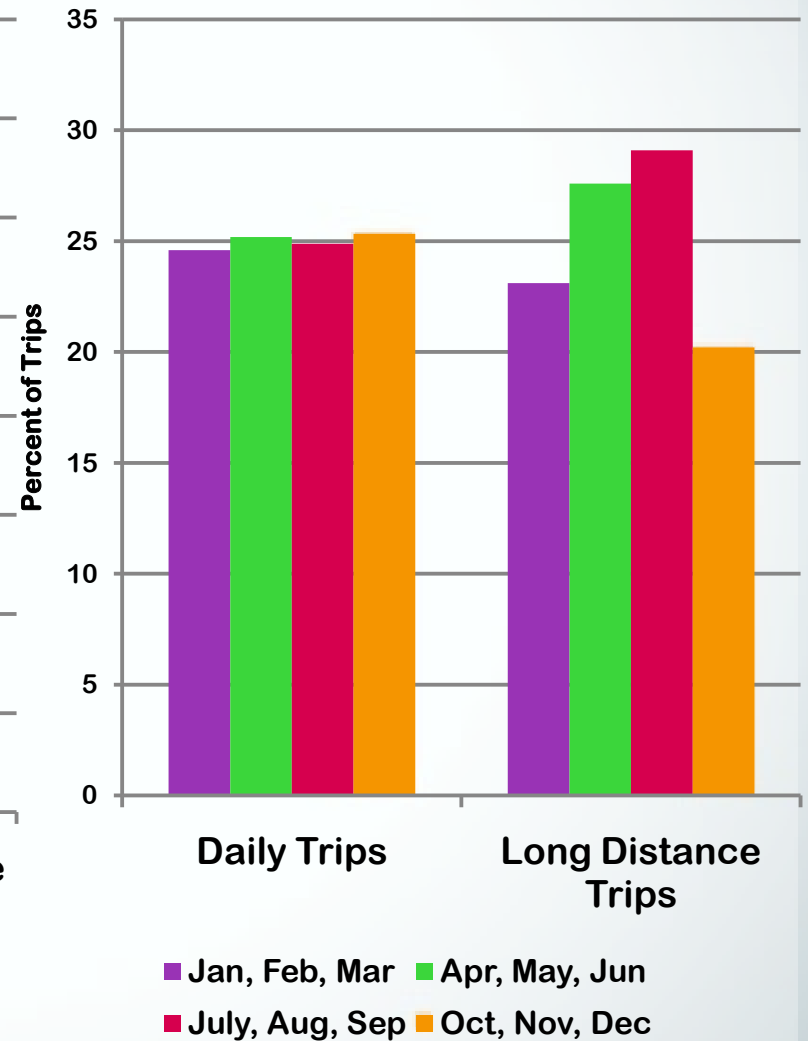
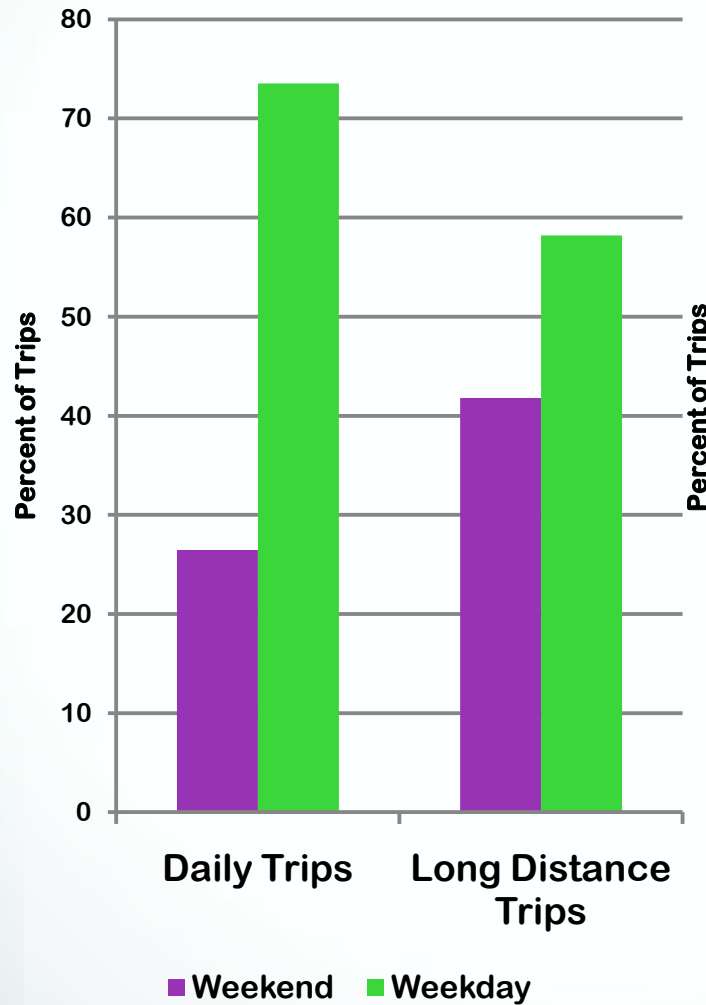
□ 38 percent of people make no long distance travel in an average year

□ 12 percent of people do not leave the house in an average day



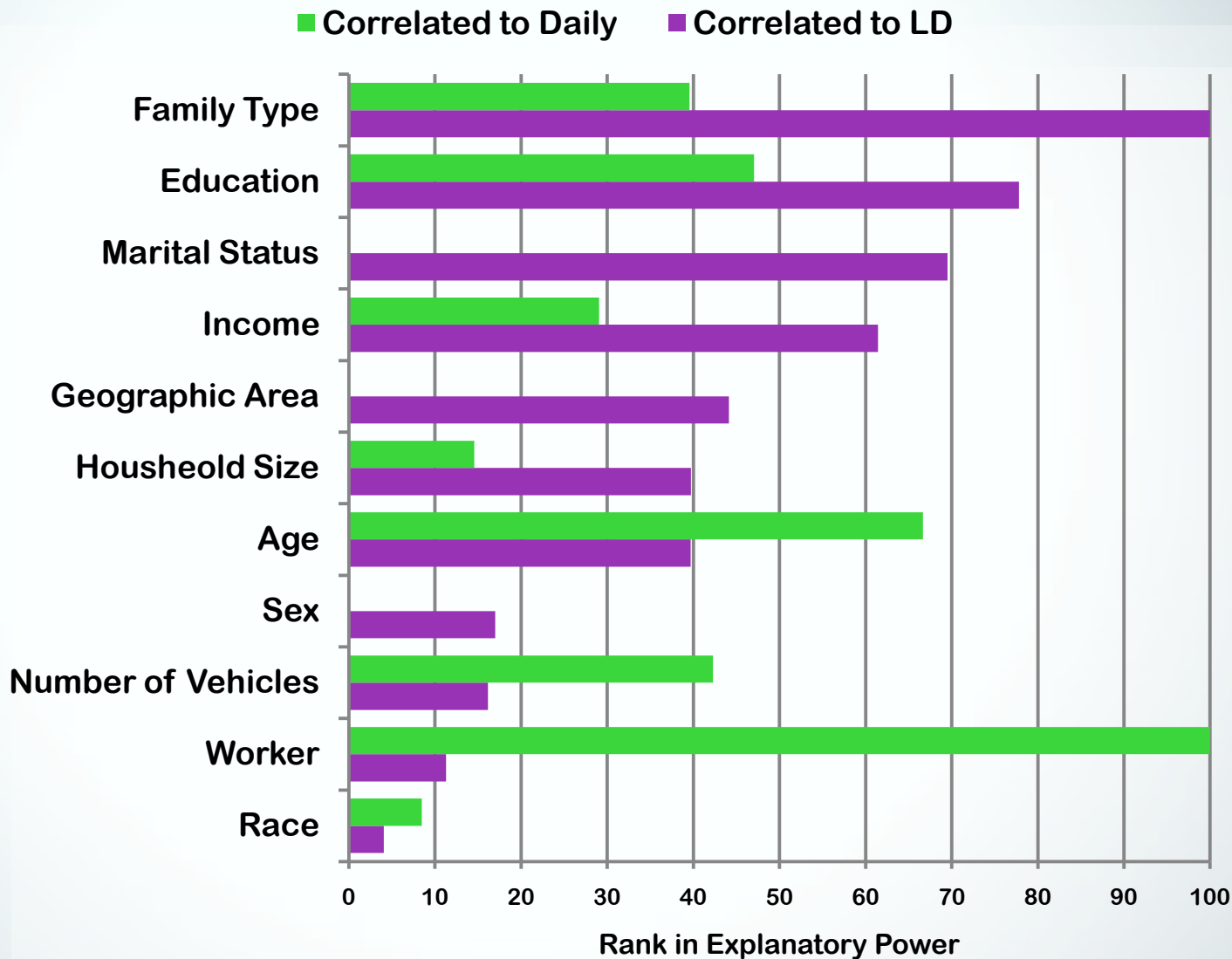
Day of Week and Seasonal differences

Source: McGuckin's analysis of ATS/NHTS

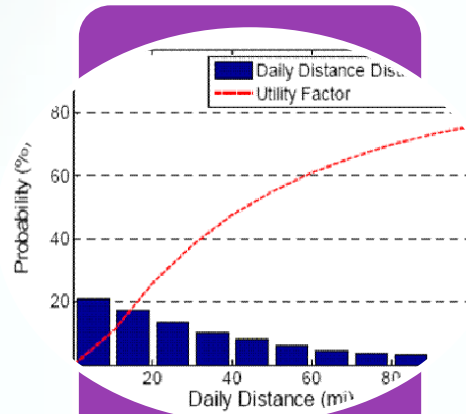


Different Factors Correlated to Travel Demand...

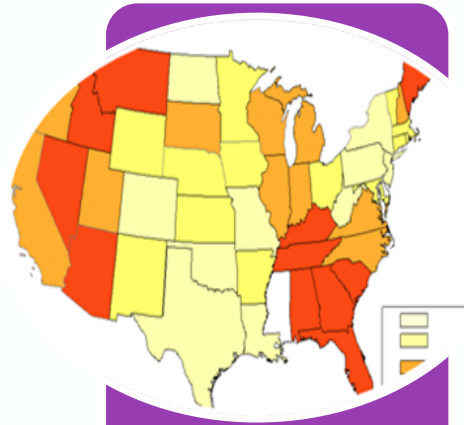
Source: "Exploring the Full Continuum of Travel: Data Fusion by Recursive Partitioning Regression" Contrino, H., McGuckin, N, and Banks, D., IATBR, July 2000



Long-Distance Data: Focus on three challenges



Defining Long-Distance Trips



Obtaining Sufficient Samples

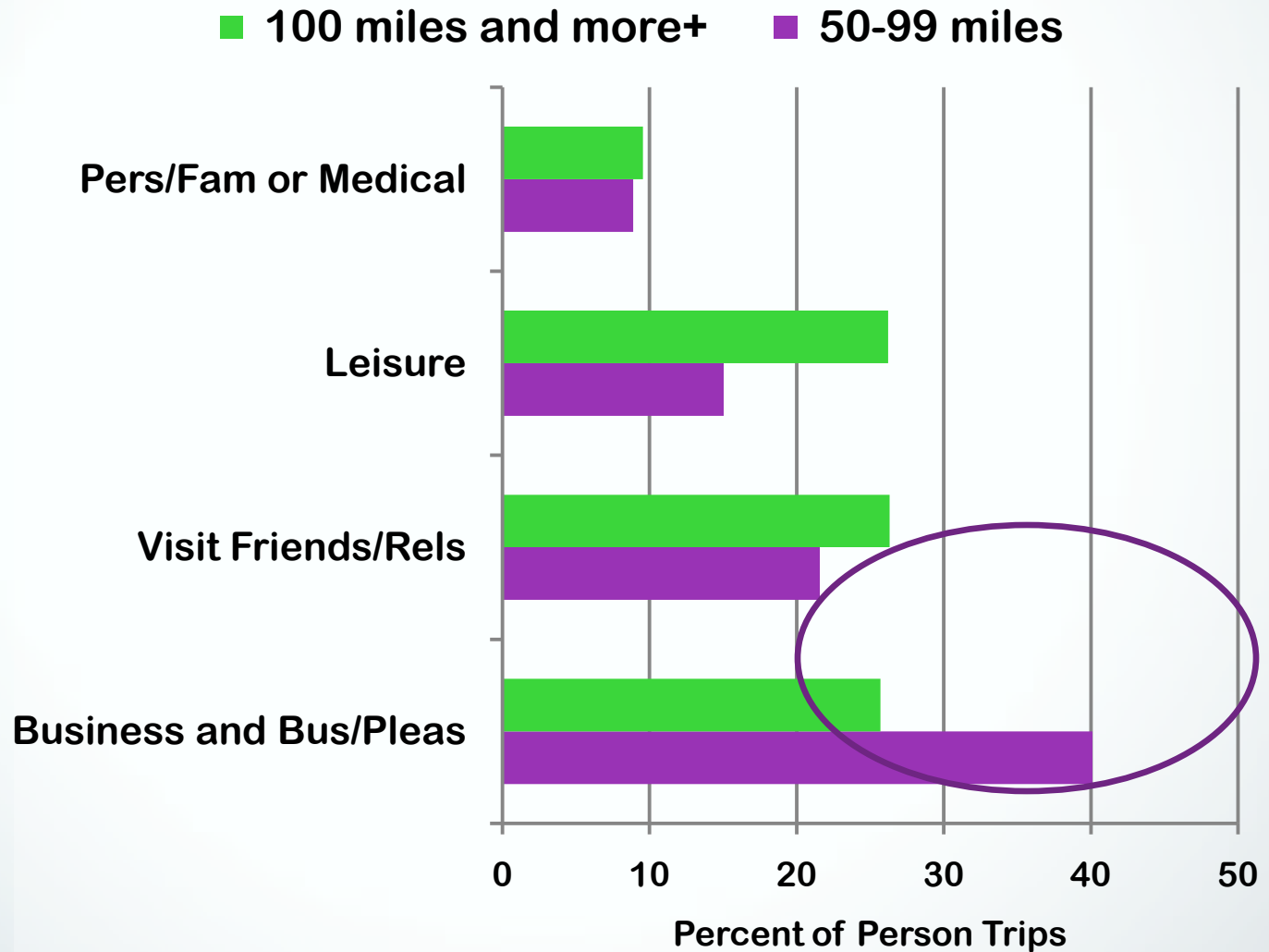


Understanding the Context and Decision-maker

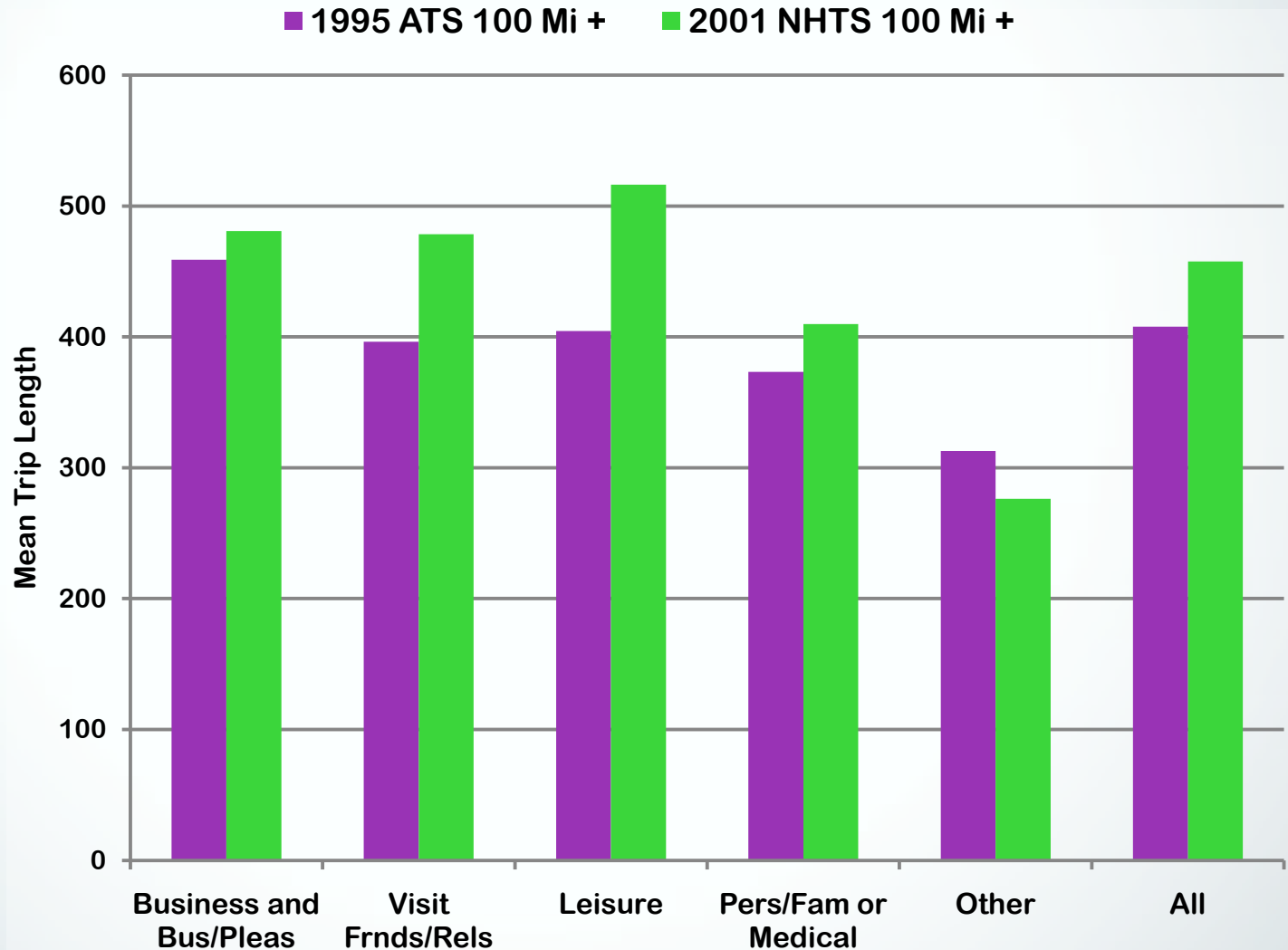


Defining 'Long-Distance' Travel

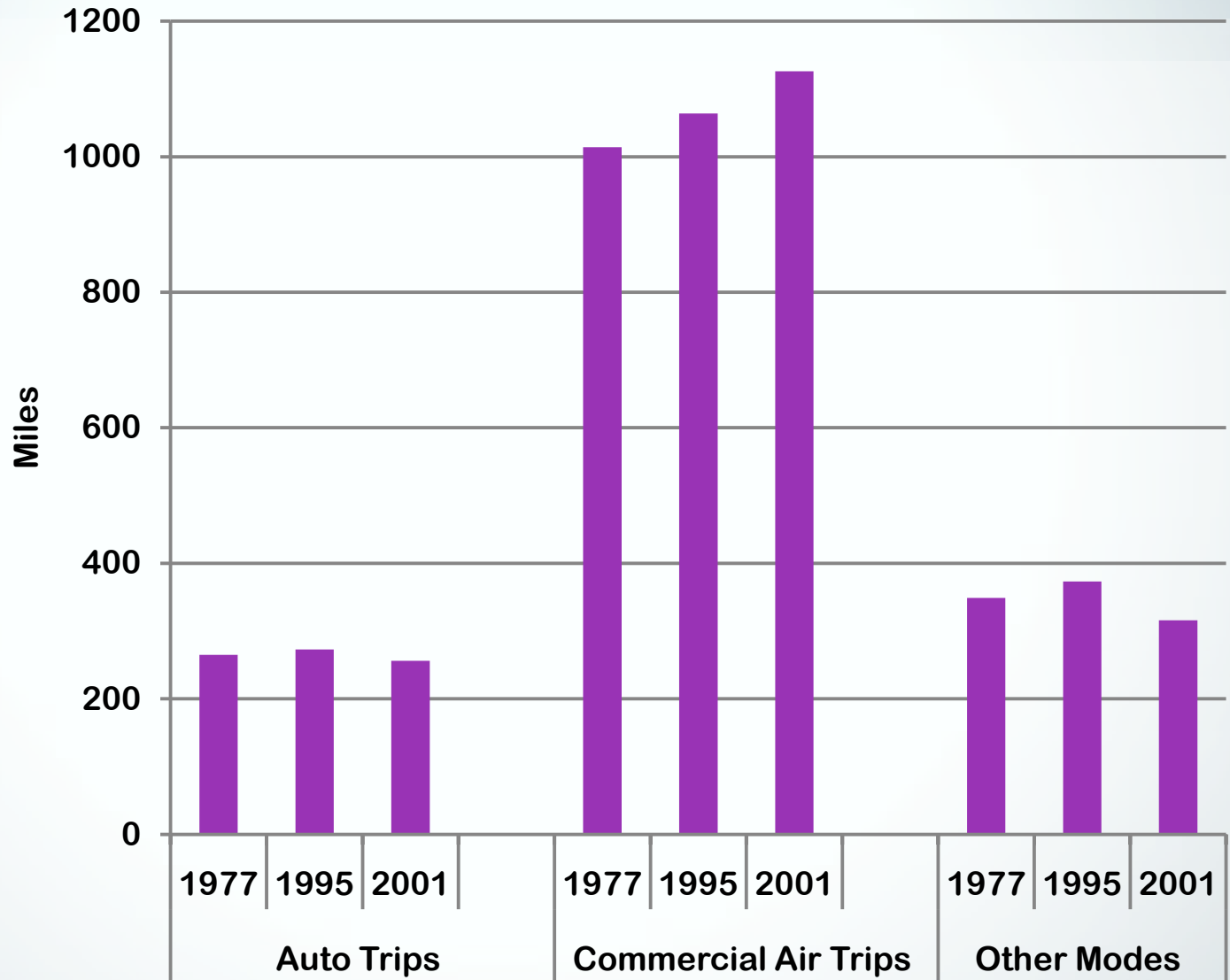
Challenge: Different trip definitions capture different kinds of trips...



Average one-way trip distance is between 300 and 500 miles across all purposes...

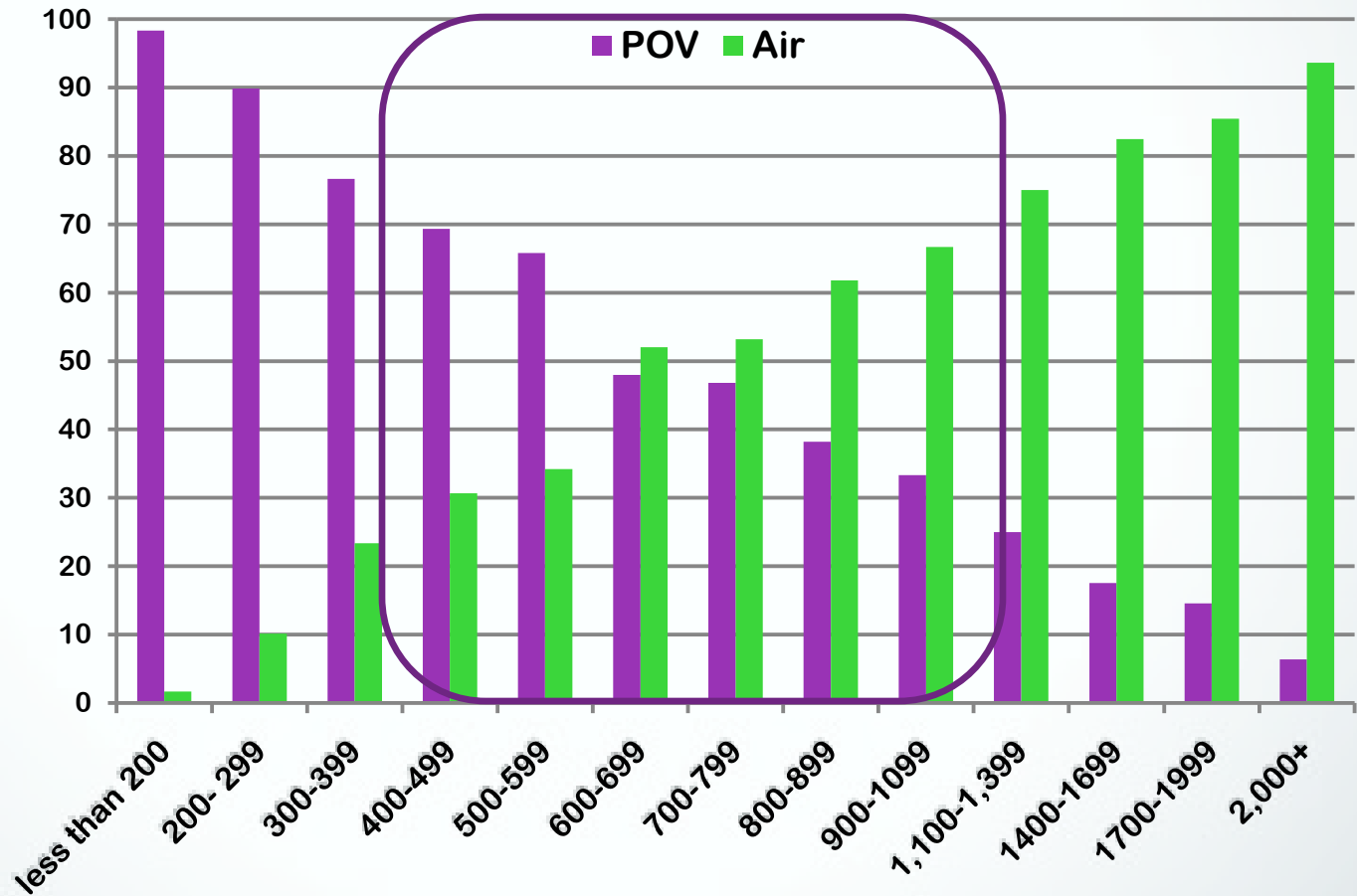


Average trip length has remained relatively stable over time by mode...



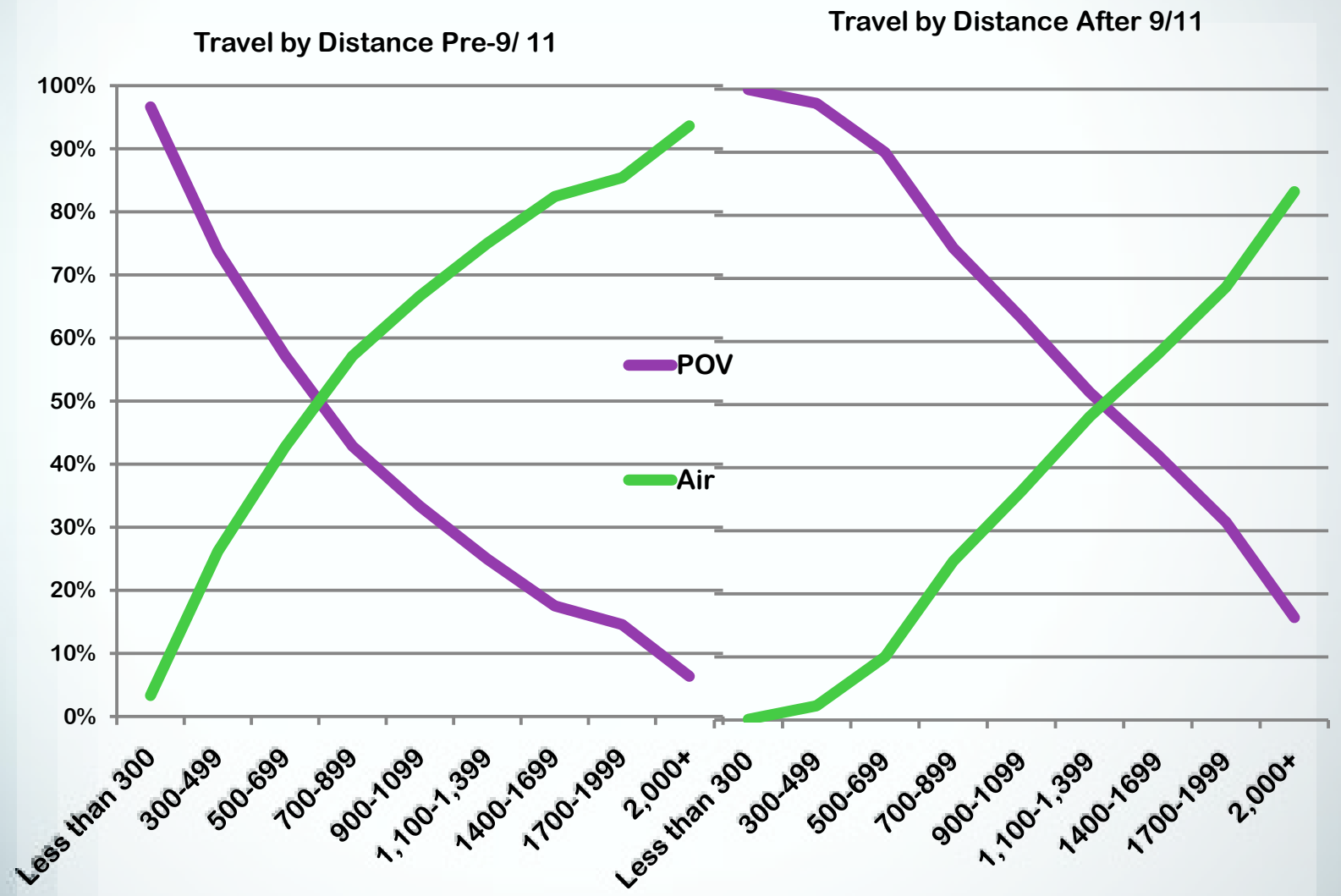
Mid-range trips (300-1000 miles) are where the mode shift occurs...

**Trip Length Distribution for Air and POV
(percent of person trips)**



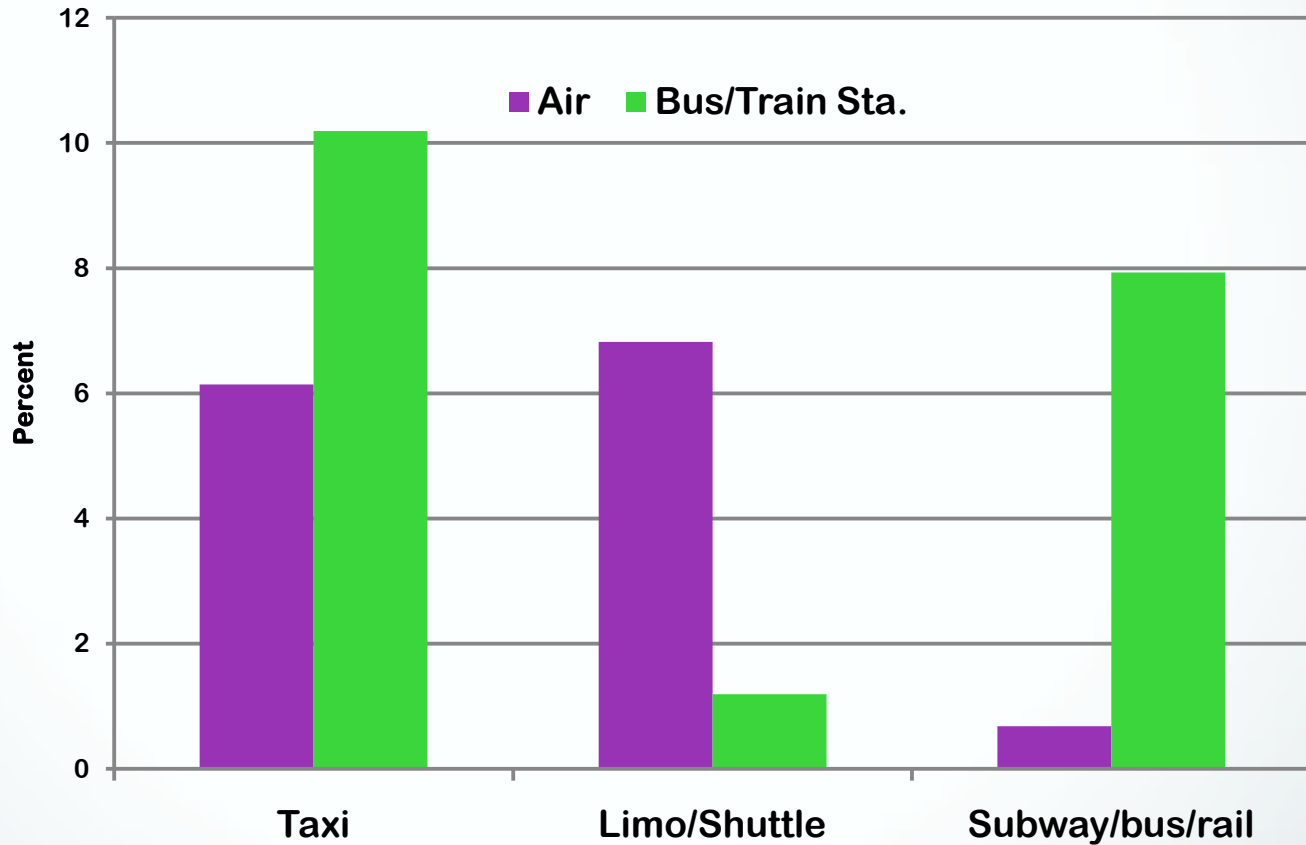
Challenge: Understanding mid-range mode decisions...

Source: McGuckin's analysis of 1995 ATS and 2001 NHTS (post 9/11) trips of 100 miles or more one way, POV plus Air only

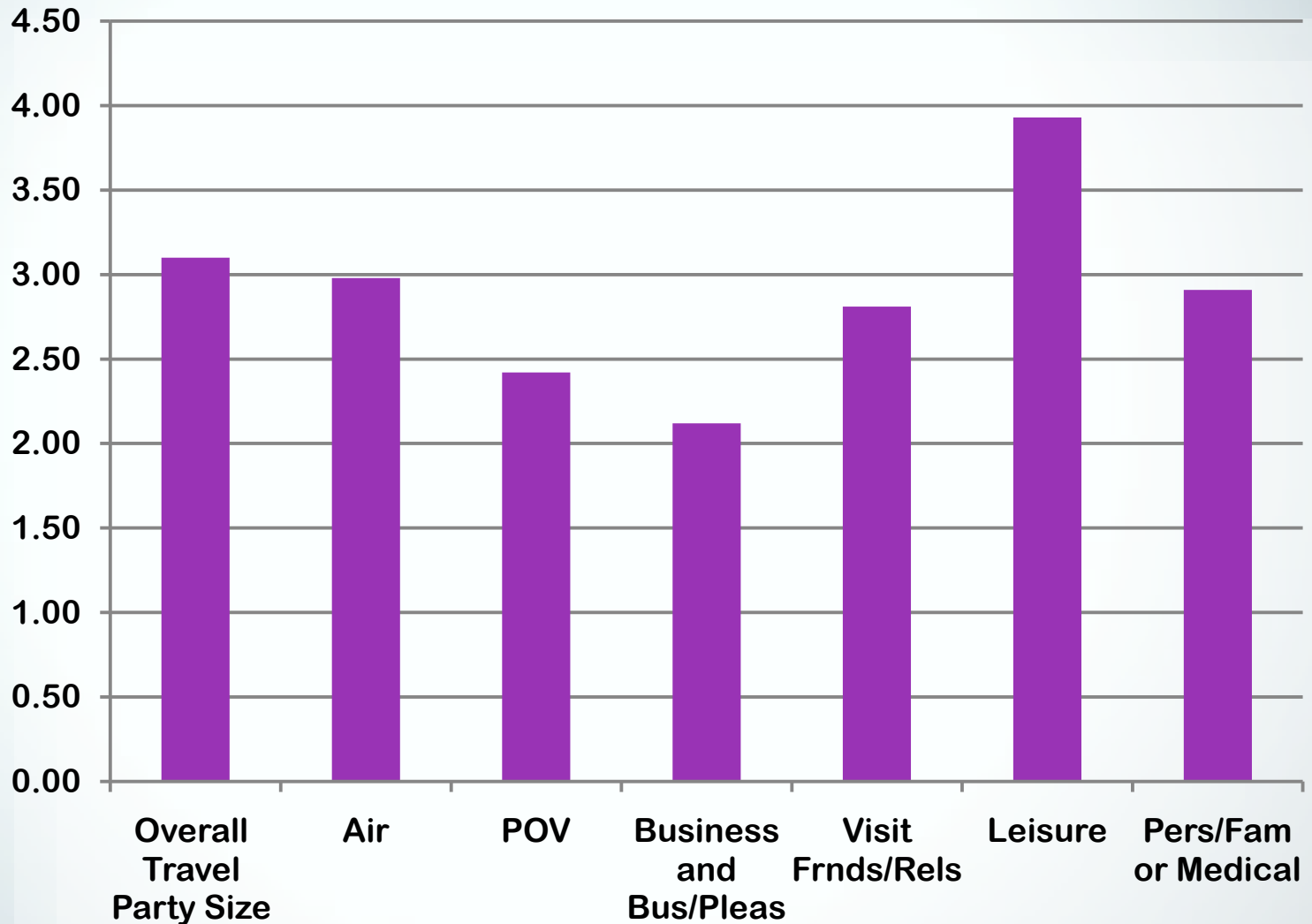


Mode of access is needed to determine total travel time/cost

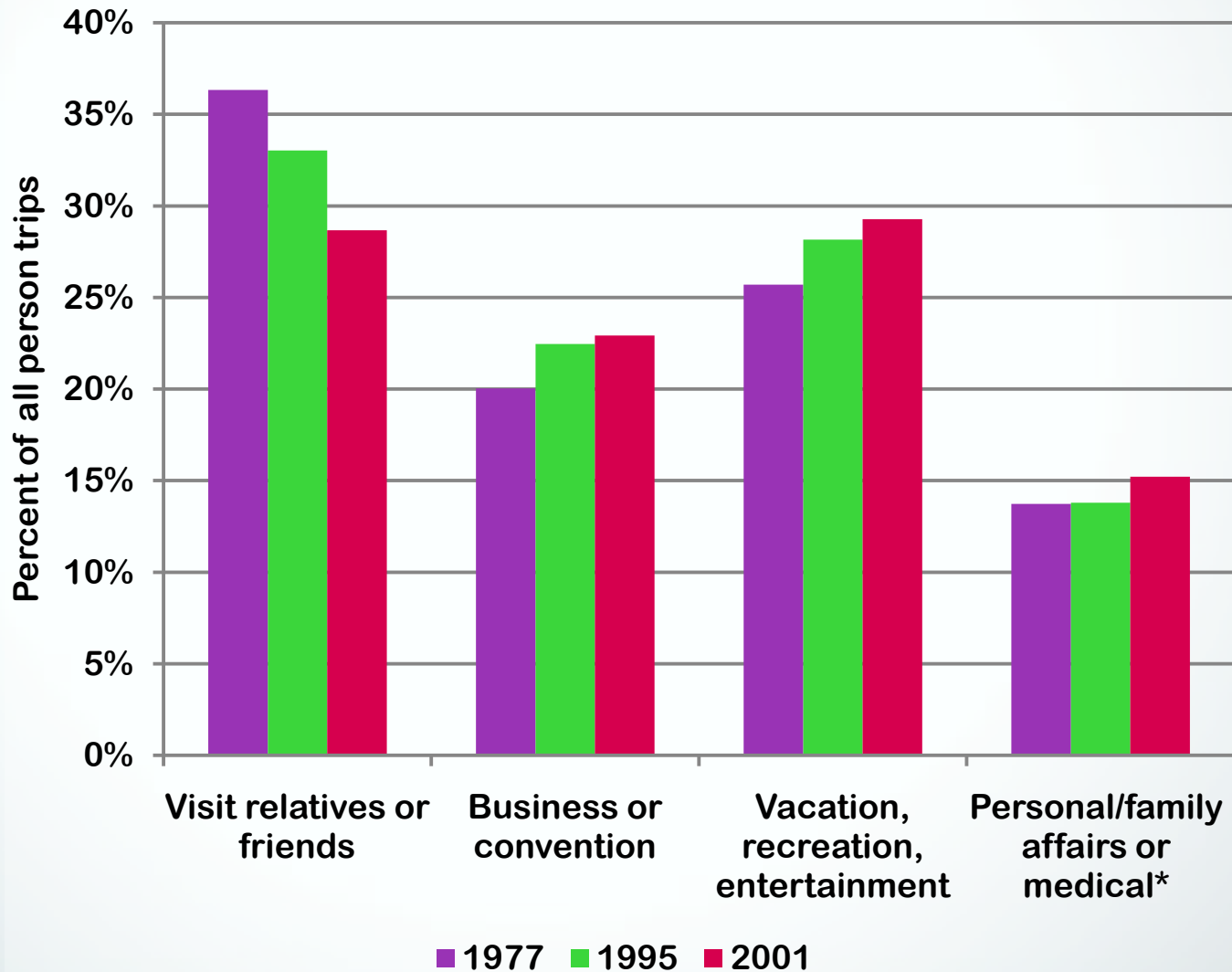
Mode of Access to Airport/Station (Non-POV)



Travel party size effects mode decisions...



Challenge: The purpose of travel is needed to understand trends and changes over time...



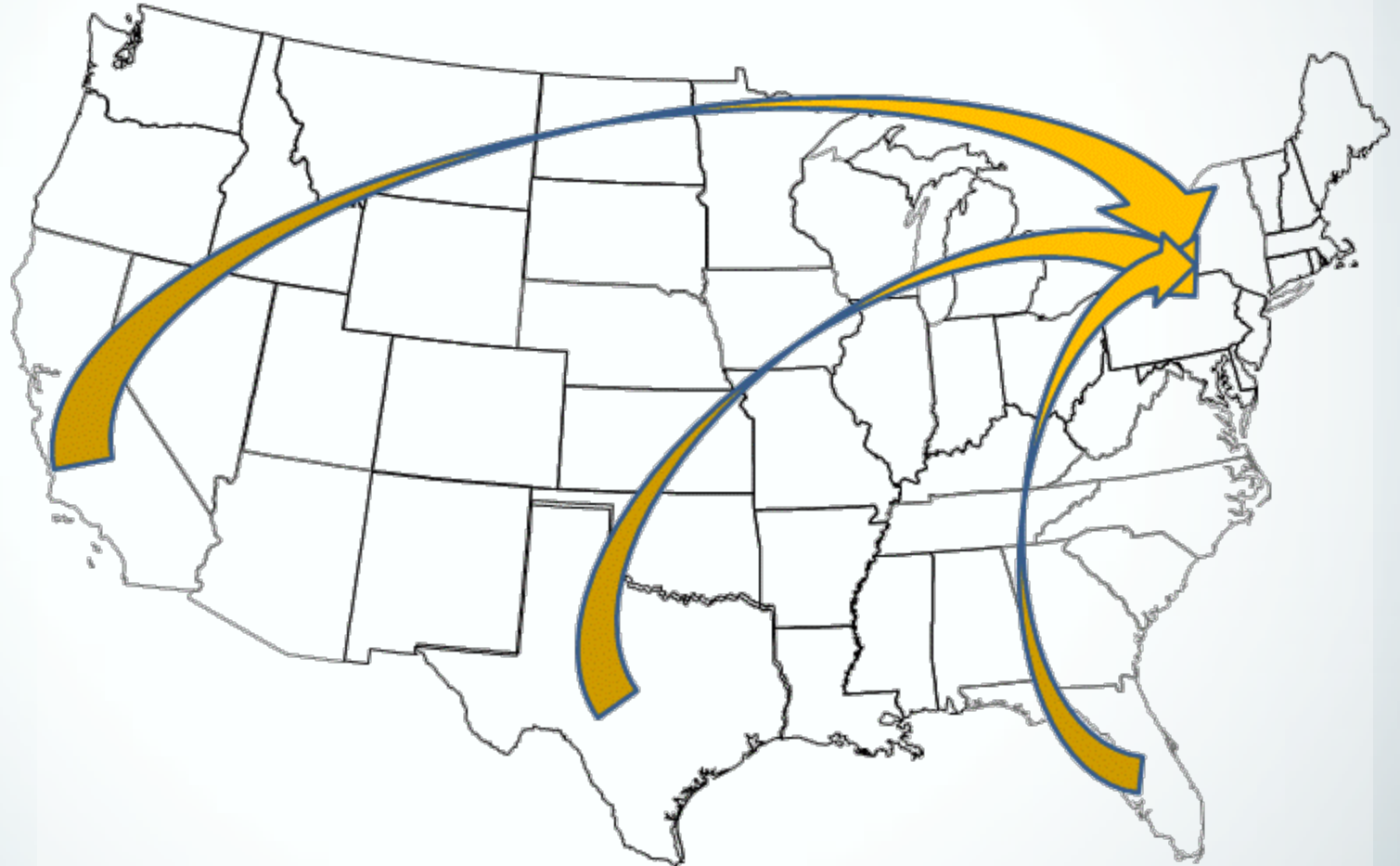
Source: 1977 ATS published figures, authors analysis of 1995 ATS and 2001 NHTS
2001 NHTS only trips of 100+ miles included
* Includes shopping

The Challenge of Sample Size

Challenge: We want to know how many people are travelling from each state....to every other state

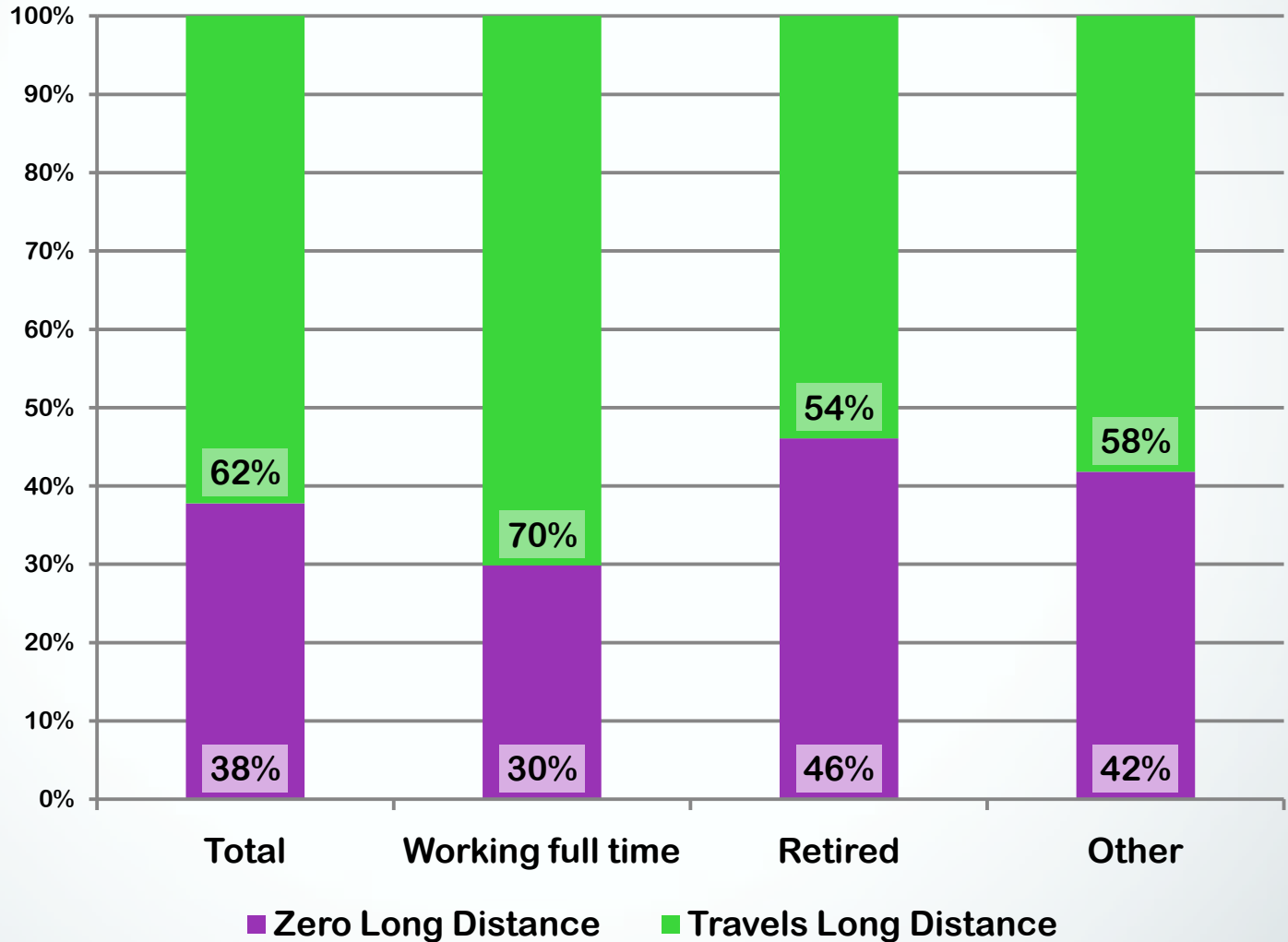


Challenge: We want to know how many people are travelling to each state....from every other state



Challenge: Many people don't make any long distance trips...

Percent of People by Travel Status

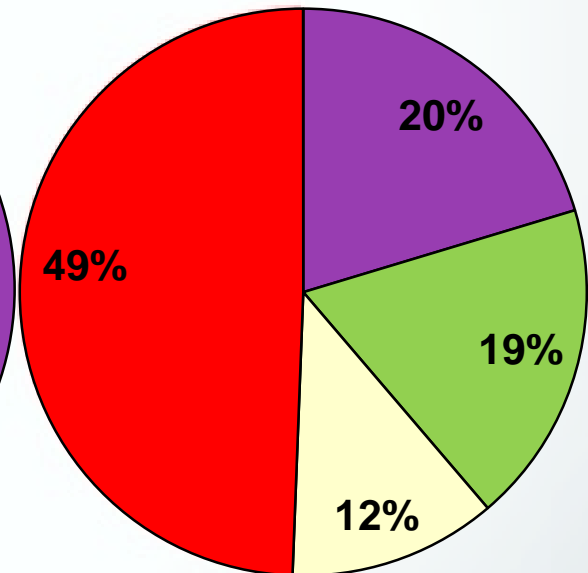
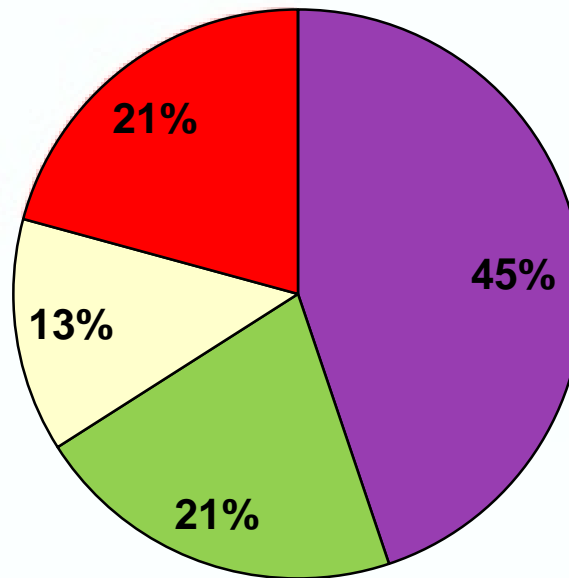


Challenge: Most long distance trips (100+) are within the same State...

Person Trips by Destination Type

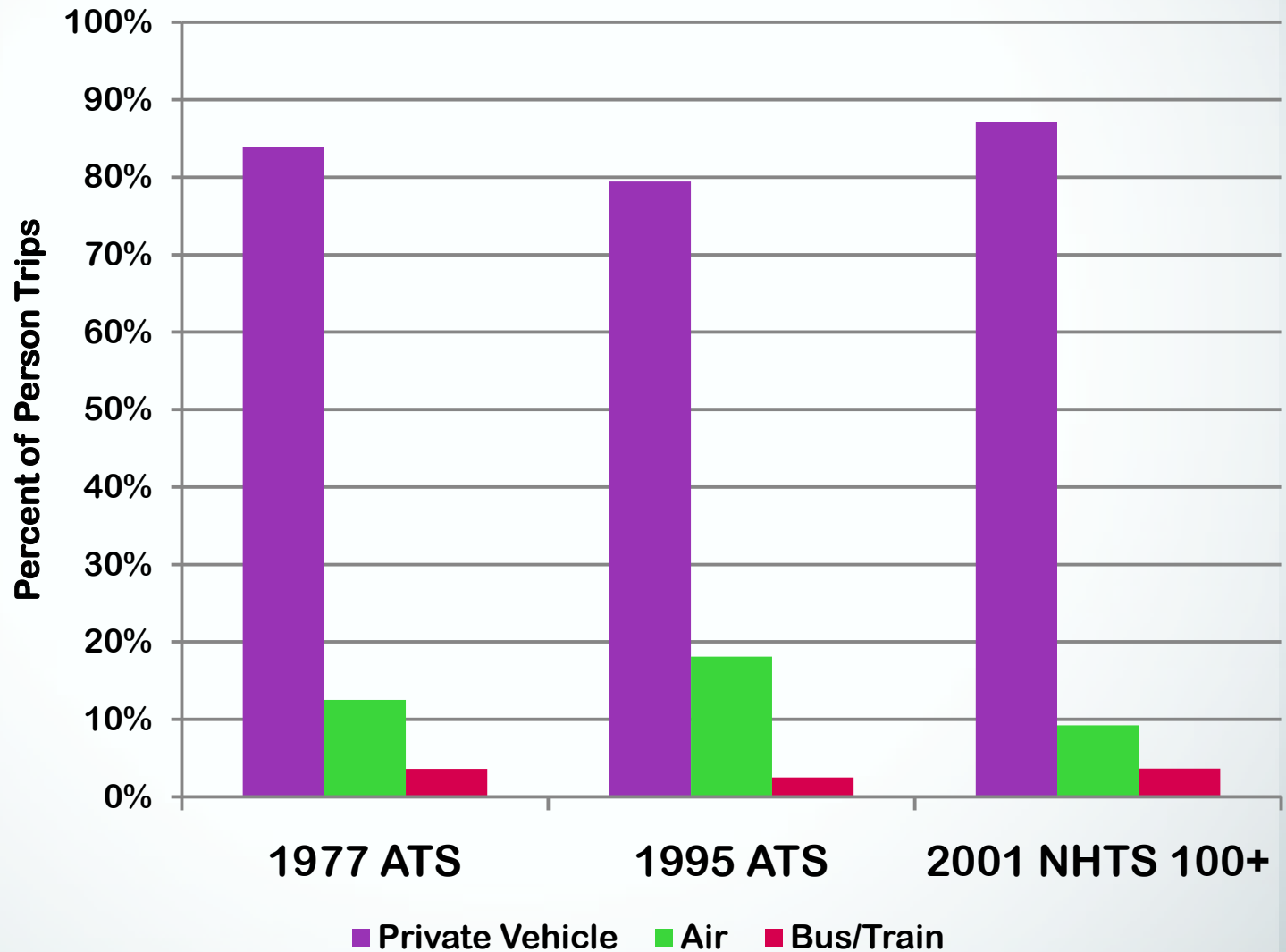
Person Miles by Destination Type

- Same State
- Neighboring State (same Census Division)
- Regional Trip (same Census Region)
- Different State, division, and region



Challenge: long distance trips (100 miles or more) are predominately private vehicle trips

Source: ATS 1977 and 1995 (published) and McGuckin's analysis of NHTS 2001 Long Distance



Understanding the Traveler

We must understand the traveler for travel demand forecasting

People who have strong household ties, such as small children, may travel less*

People in urban areas with many attractive destinations may travel less frequently*

Baby boomers in second life may increase frequency of recurring long trips to university and second homes

As social networking increases, long-distance travel IRL may be increasing**

The dispersion of treatment centers and specialists may increase recurring long trips for medical purposes

*Henderson and Trani, 2008

**Auxhuasen, 2008

Long-Distance travel behavior is about motivation, resources, constraints, obligations



- *Trip purpose is linked to travel party size (sometimes the fun is in going together)*

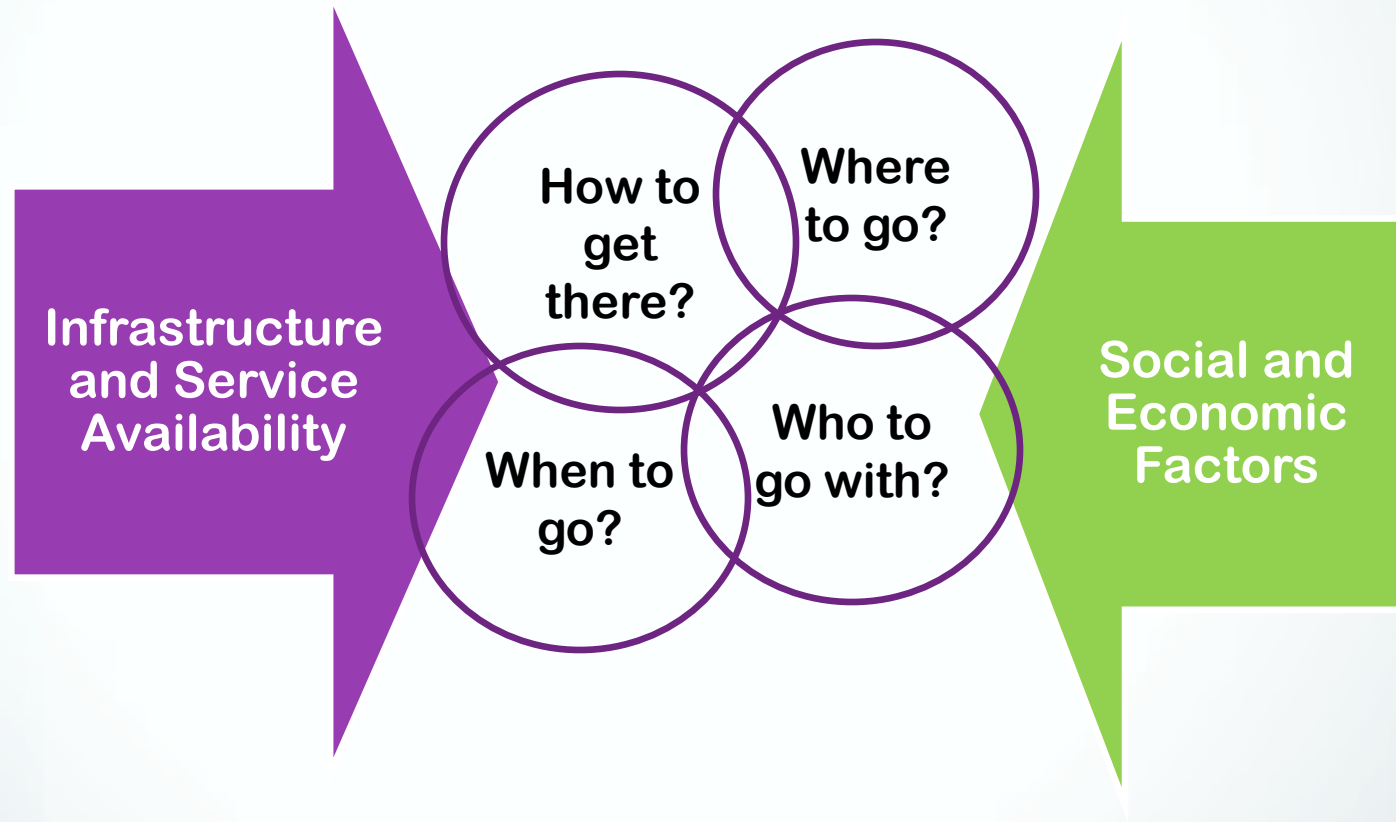


- *Travel party size effects mode choice (bring the kids and we can't afford to fly)*

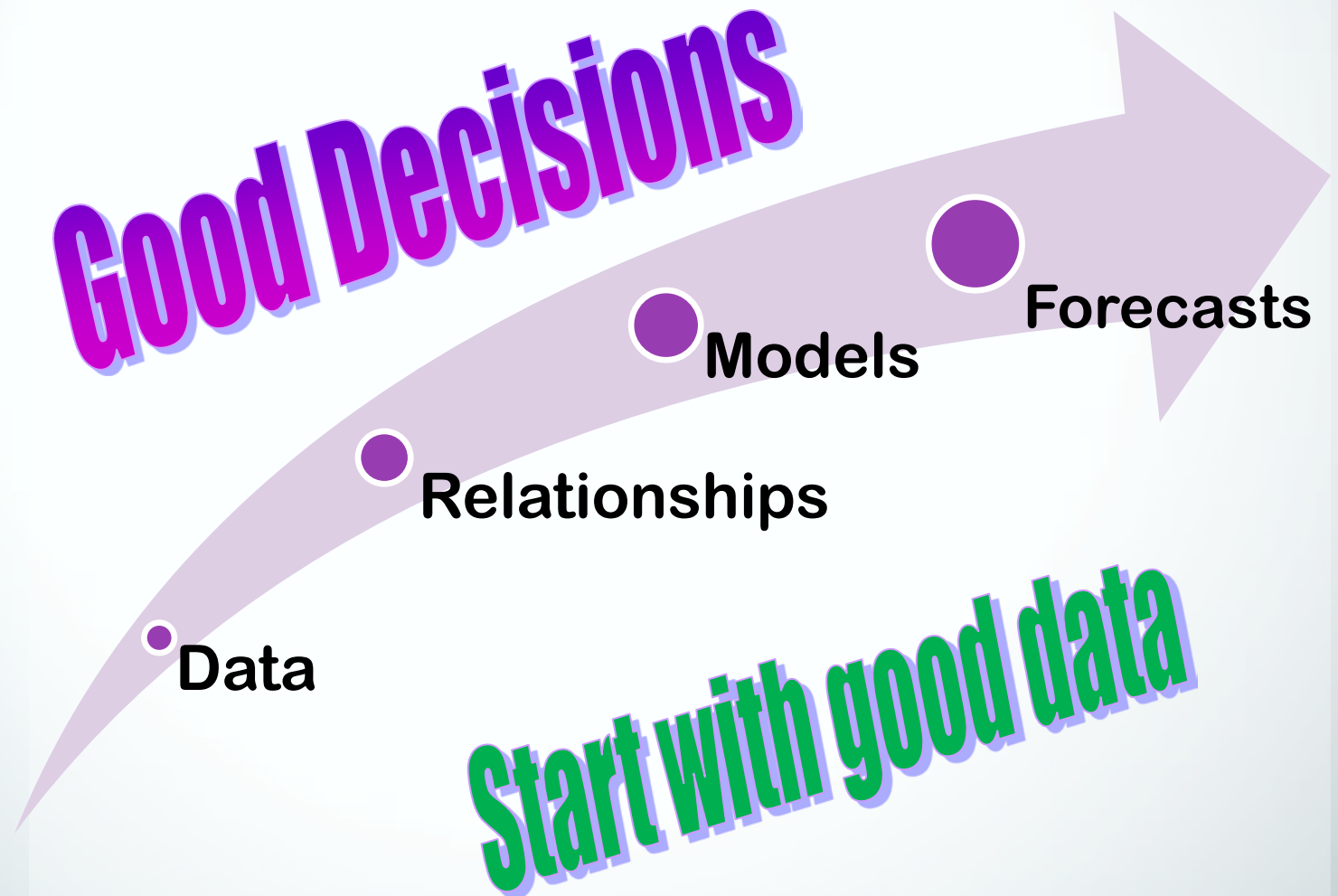


- *Mode choice can be made before destination choice (where can we drive to this weekend?)*

We also need to understand the effect of infrastructure and service....



Without *travel flow data* we can't analyze the relationships that build the models that fuel the forecasts that help make good decisions ...



Joint Program in Survey Methodology expert panel design suggestions include:

Suggestion:

Area probability sample to improve coverage and response rates

Face-to-Face interviews in round 1 to improve panel response rates

Panel design to collect one-year of travel reports from the same household

One month reference period for trips between 50 and 100 miles, three month reference for 100 miles and longer to improve trip reporting

Challenge:

How to draw a representative address sample (PSUs)

How to conduct face to face interviews at a national scale with a large sample

Non-response increases with multiple contacts, but we need one-year reports to make annual estimates

Different trip definitions in the same survey can be confusing...people don't know how far they've travelled

Cite: paper by Bose, Geisbrecht, Sharp?

Good data results from good research:

- ❑ **What sample sizes are required for state to state and corridor level estimates?**
- ❑ **Can a national study be designed with an area-probability sample? (address-based?)**
- ❑ **Effect of the length of the recall period on reports of different kinds of trips**
- ❑ **Effect of different modes for responding: e.g. mail-back, web, phone**

How can we use new technology to inform the process?

- ❑ **Travel volumes can be counted through new technology such as BlueTooth: Challenge is identifying the traveler for follow-up**
- ❑ **In-vehicle navigation systems (such as Tom-Tom) may sell OD data: Challenge is determining representativeness**
- ❑ **License plate capture can be used to re-identify long-distance traveler: Challenge is identifying vehicle owner for follow-up**
- ❑ **Possibility of GPS base sample (huge) with web-based, incentivized prompted recall (for purpose, travel party size, demographics): Challenge is low response/participation**

Thank you!

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