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The Economic and Environmental Impacts of Smart-parking Programs

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In 2011, San Fransisco introduced SFPark, a smart parking program. SFpark uses demand-responsive pricing to open up parking spaces and reduce circling and double-parking. Rates can vary by block, time of day and day of week, and are adjusted at most once per month.

In this NITC report, researcher Nicole Ngo of the University of Oregon investigates the effects of the demand-responsive pricing program on transit usage and congestion.

The study focused on metered, on-street parking and used the timing of SFpark's pricing changes as a natural experiment. Researchers observed effects on three important aspects of urban transportation:

- Parking Availability
- Transit Bus Ridership
- Congestion

Results show that SFpark was effective at reducing parking occupancy range; since the program's implementation, more areas met the target occupancy range of 60-80%.

Ngo also found the the program affected transit ridership: an increase in meter rates is associated with a modest increase in ridership, suggesting people are substituting between transit and non-transit travel and that meter rates factor into mode choice.

> "There's a lot of survey data suggesting that if you change parking prices, people are more likely to take the bus. In this study we used data on transit bus ridership and parking data to see if people actually behave that way. We're able to see in the data that parking rate changes do seem to influence transit ridership," Ngo said.

Finally, the study found that SFpark reduced congestion, decreasing lane occupancy and increasing vehicle speed.

These results have important implications for transportation policy as cities continue to expand and implement demand-responsive pricing programs globally. They suggest that policy makers and transportation planners interested in reducing traffic-related externalities should consider enacting policies that rationalize on-street parking, since not only does it increase turn over and reduce cruising for parking, but also affects shifts in modal choice towards transit.

For future research, Ngo recommends including data for other modes.

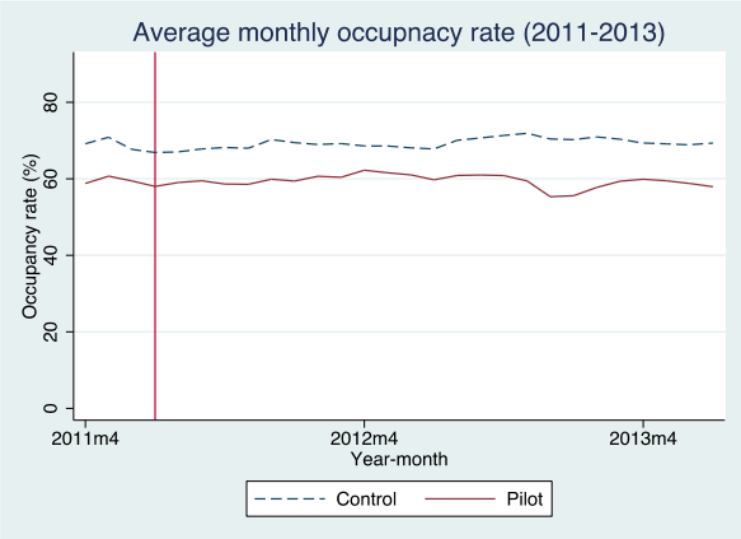
> "It's interesting that we find parking rate increases are associated with increases in transit ridership, but we don't have information on auto uses, so it would be good to complement it with data on Uber, for example—another mode that isn't transit that involves a car," Ngo said.

In future studies, the researchers would also be interested in looking at impacts of SFpark on air quality, active transportation modes and additional measures of congestion.

> "We measured congestion using the speed of the bus between bus stops. That's one good data source, but it would be good to measure it at a larger spatial scale," Ngo said.

Results of this study suggest that SFpark achieved its goal of increasing parking availability, agreeing with previous literature. After the implimentation of SFpark, distance to the target occupancy range of 60-80% decreased, with greater impacts during peak periods on weekdays.

This graph shows average monthly parking occypancy for pilot and control blocks before and after SFPark, which started in July 2011 (represented by the vertical line).



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THE FULL REPORT and ONLINE RESOURCES

For more details about the study, download the full report Design for an Aging Population at https://nitc.trec.pdx.edu/research/project/986

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