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Game on: How can commuters be incentivized to travel off-peak?

The New York metropolitan region has been experiencing solid economic and employment growth since the recession. That, combined with a growing population, has led to stresses on transit systems in the region. For instance, major Trans-Hudson crossings have seen an increase of 92 percent in public transit passengers since the 1980s. The time of day with the most ridership, the peak periods like morning and evening rush hours, have increased substantially, leading to overcrowding, train delays, and increased wait times during those time periods. The off peak periods however, have unused seats and fewer delays.

From an infrastructure capital planning perspective, a system must provide for passengers at peak periods not the average daily ridership. Accommodating peak periods involve either adding capacity or incentivizing different passenger demand patterns. Adding capacity during the peak period generally is very costly and requires significant additions to infrastructure assets, like adding trains and extending station platforms. A far more economical solution may be to manage passenger demand by broadening peak hour travel, essentially shifting riders to off-peak periods that have excess capacity. While past research on travel demand management strategies have been focused on reducing auto congestion during peak hours, the PA Planning Department has been investigating initiatives utilized by various transit agencies, which have incorporated travel demand management strategies.

Examples include the adoption of variable pricing strategies, in which there are discounts for commuting during off-peak hours, surcharges for commuting during peak hours, or a combination of the two. Another strategy, adopted by transit systems in Singapore and in Melbourne, is the provision of free trips to commuters who exit their arrival station by a particular time (7:45AM for Singapore and 7:15AM for Melbourne).

Another strategy to spread peak demand is the use of real time crowding levels to inform travelers. This usually comes in the form of mobile applications which use historical crowding levels but are updated by commuters who report on current crowding conditions. The expectation is that users who have information about crowding conditions would choose to delay

THE WATCHLIST

Economic Variables

Current - One Year Trend

UNITED STATES

Variable	Current	One Year Trend	July 2016 - July 2017
Real GDP [Annual Rate]	Q2 2017 3.0%		
Unemployment Rate	Jul-17 4.3%		
Consumer Price Index [Annual]	Jul-17 1.7%		
Gasoline Price [Regular]	Aug-17 \$2.40		

PORT AUTHORITY REGION

Variable	Current	One Year Trend	July 2016 - July 2017
Regional Employment [NY MSA]	Jul-17 9,679		
Consumer Price Index [Annual]	Jul-17 1.6%		
Port District Exports [\$Bill]	Jun-17 \$12.15		
Port District Imports [\$Bill]	Jun-17 \$22.07		
Case-Shiller Home Price Index	Jun-17 3.9%		
Commercial Real Estate Asking Rent			
Midtown	Q2 2017 \$83.95		
Downtown	Q2 2017 \$61.72		

their departure times in order to avoid delays. Transport for London, Singapore MRT, and San Francisco BART are among the cities/agencies, which provide access to real time crowding information.

While all these strategies are valid and potentially critical to affecting peak demand, one particular strategy that we are interested in is the use of gameification to incentivize commuters to travel outside the peak. While the rules of the “game” are different across agencies that have tried this approach, the idea is the same – commuters earn points when travelling outside of peak hours and can either exchange the points for cash or use the points to play a raffle-like game for opportunity to win bigger cash prizes. Two case studies of such initiatives are Singapore and San Francisco.

Singapore - The Incentives for Singapore Commuters (INSINC) program, now renamed the Travel Smart Rewards (TSR) program, was originally a six-month program launched in 2012, but was extended most recently through the end of 2017 (although now a completely revamped program). Through this scheme, commuters earn 1 credit for 1 kilometer traveled with a multiplier for traveling outside of the AM peak hours. Credits are redeemable either for prizes, with 1,000 credits equivalent to SG\$1 or can be used to play an online “Spin to Win” game for prizes ranging from SG\$1 to SG\$100. Commuters also have the opportunity to earn bonus points if they invite their friends to join the program.

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MONTHLY ECONOMIC INDICATORS

THE PORT AUTHORITY OF NY & NJ

Planning and Regional Development Department

August 2017

AVIATION	Jun '17	YTD	Jun '17/16	YTD '17/16	PORT COMMERCE	Jun '17	YTD	Jun '17/16	YTD '17/16
Revenue Passengers (000's)	11,819.8	63,582.0	1.2%	2.4%	Port Trade				
John F. Kennedy International Airport (JFK)	5,452.3	28,528.1	1.7%	1.4%	Container Imports (TEUs)	292,266	1,627,988	8.0%	5.5%
LaGuardia Airport (LGA)	2,572.8	14,028.0	-4.7%	-2.3%	Container Exports (TEUs)	121,258	691,660	4.8%	2.2%
Newark Liberty International Airport (EWR)	3,764.5	20,878.8	4.7%	7.2%	Containers lifted on/off Express Rail	50,693	278,957	8.9%	4.6%
Stewart International Airport (SWF)	30.1	147.1	33.4%	13.2%					
Revenue Freight (Short Tons)	188,824	1,064,678	8.5%	7.0%	TUNNELS, BRIDGES & TERMINALS	Jun '17	YTD	Jun '17/16	YTD '17/16
Domestic	66,857	375,083	1.5%	5.1%	Eastbound Vehicle Volumes (000's)	10,362	57,643	1.0%	0.2%
International	121,967	689,595	12.8%	8.0%	George Washington Bridge	4,487	24,948	0.9%	0.3%
Flights	113,168	631,467	0.8%	-0.7%	Lincoln Tunnel	1,635	9,306	-0.7%	-1.4%
Domestic Air Carrier	79,709	453,471	1.1%	-0.9%	Holland Tunnel	1,271	7,231	-2.8%	-4.1%
International Air Carrier	26,413	144,650	0.7%	-0.5%	Bayonne Bridge	240	1,087	72.4%	33.3%
General Aviation	7,046	33,346	-3.2%	2.2%	Goethals Bridge	1,326	7,570	-3.5%	-0.1%
Paid Parked Cars	650,371	3,425,079	-12.7%	-13.7%	Outerbridge Crossing	1,403	7,501	4.2%	2.8%
Revenue AirTrain Passengers	1,101,076	5,077,327	23.4%	6.8%	Eastbound Volumes by Vehicle Type (000's)				
					Autos	9,454	52,609	1.0%	0.2%
					Trucks	649	3,588	0.6%	-0.3%
					Buses	259	1,443	0.2%	-1.2%
FERRY OPERATIONS	Jun '17	YTD	Jun '17/16	YTD '17/16	PORT AUTHORITY PULSE	Apr '17	Mar '17	Change	
Passengers (000's)					(Seasonally Adjusted, 2010=100)				
New Jersey Ferries	846.6	4,201.5	0.0%	-0.3%	PA Pulse (Transportation Activity Index)	100.7	98.2	2.5%	
					PA Freight Pulse	97.1	95.3	1.9%	
					PA Passenger Pulse	104.2	101.1	3.1%	
PATH	Jun '17	YTD	Jun '17/16	YTD '17/16	U.S. TRANSPORT. SERVICES INDEX	Jun '17	May '17	Change	
Passengers (000's)	7,232.0	40,376.0	3.7%	3.6%	(Prelim., Seasonally Adj., 2000=100)				
Average Weekday	288.2	1,661.5	3.7%	4.2%	TSI - Combined Index	126.5	126.9	-0.3%	
Average Saturday	124.2	671.5	2.7%	0.8%	TSI - Freight	126.2	127.2	-0.8%	
Average Sunday	98.6	522.0	4.7%	4.6%	TSI - Passenger	126.8	126.2	0.5%	

TRANSPORTATION FOCUS

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The program also personalizes rewards to commuters, awarding extra credits based on a personalized travel behavior targets, such as extra points for inviting more friends.

At the end of the original six-month trial, 7.5% of commuters shifted from peak to off-peak travel; however, this included many of the users who were already traveling during off-peak hours. For commuters who traveled during peak hours at least 5 times a week before the start of the program (around 36% of total participants), 10.1% shifted their commute from peak to off-peak hours.

San Francisco - San Francisco's six-month long BART Perks program received almost 18,000 participants over the life of the program with 2,600 of the participants travelling during the peak before the start of the program. Participants earned 1 point for every mile earned while travelling on BART, with a multiplier of up to 6 times the points if they travel between 6:30 – 7:30AM and 8:30 – 9:30AM. Points could either be redeemed for cash or be used to play the "Spin to Win" game, which gives users the chance to win additional points or win random cash rewards ranging from \$1 to \$100. At the end of the month, the rewards would be transferred to the participants' PayPal accounts. Through the program, an average of 250 participants shifted their commute to outside of morning peak hours every weekday, meaning that about 10% of peak commuters shifted their travel because of the program.

While these two gameification trials were moderately successful, there is no guarantee that similar applications would work in this region. In fact, transit agencies working with employers and municipalities may potentially create a larger impact by adding flexibility to employment relationships in the form of staggered work hours, job-sharing or teleworking. We are currently in the process of conducting research into the effectiveness of such measures and will report back with our findings in a later MEI.

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