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Quantified: the cost of facility shutdowns and the Port Authority's role in the regional economy

The Port Authority of New York and New Jersey's facilities – its bridges, tunnels, airports, seaports, the PATH rail transit system, and the World Trade Center – are strategically important assets for the metropolitan region. But just how important are they?

One way to tackle this question would be to consider the potential cost to society, as measured through the economy, if a severe event – such as a storm, flood or terror attack – were to shut down one or more facilities for an extended period of time. The social or economic values we are talking about focus on things like travel times (the average time it takes to get from point A to point B) and productivity losses at the workplace, not things like physical damage to infrastructure, and ignores losses such as foregone revenue that are limited to the agency's bottom line.

This type of prism would let an analysis along these lines serve as a proxy for the broader economic value of the facilities' contribution to the region when times are normal. An analysis, however rough, would need a few important assumptions to be in place to work, such as:

- Facility shutdowns could cover a range of time horizons, for example one day, three days, seven days, and thirty days. In each case, it is possible that there are longer lasting impacts beyond the time period during which the facility itself is closed. But an analysis would need to draw the line somewhere, for practical purposes.
- Each facility could be analyzed in isolation or as part of a group (for example, the three bridges connecting Staten Island to New Jersey might be evaluated collectively). While it is possible that a storm that disrupts transit service on PATH would also disrupt automobile traffic through the Holland and Lincoln Tunnels, we could assume that while a facility is shut down, all other facilities are functioning.

Our team ran preliminary estimates to put this analytical approach into action. Our team ran preliminary estimates to put this analytical

THE WATCHLIST

Economic Variables		Current - One Year Trend	
UNITED STATES		Jun 2017 - Jun 2018	
Real GDP [Annual Rate]	Q2 2018	4.1%	
Unemployment Rate	Jun-18	4.0%	
Consumer Price Index [Annual]	Jun-18	2.8%	
Gasoline Price [Regular]	Jun-18	\$2.89	
PORT AUTHORITY REGION			
Regional Employment [NY MSA]	Jun-18	9,784	
Consumer Price Index [Annual]	Jun-18	2.0%	
Port District Exports [\$Bill]	May-18	\$12.29	
Port District Imports [\$Bill]	May-18	\$24.93	
Case-Shiller Home Price Index	May-18	4.0%	
Commercial Real Estate Asking Rent			
Midtown	Q1 2018	\$83.17	
Downtown	Q1 2018	\$62.28	

approach into action. The table below summarizes the results, which reflect data-driven educated guesses regarding the social costs associated with hypothetical facility-level shutdowns.

	Days of Shutdown			
	1	3	7	30
Aviation	\$178.7	\$775.5	\$1,414.8	\$4,048.4
Port	\$27.5	\$208.0	\$540.4	\$2,043.9
Tunnels	\$18.8	\$55.9	\$128.1	\$541.6
WTC	\$8.1	\$23.4	\$52.1	\$188.2
PATH	\$2.4	\$5.3	\$17.4	\$80.4

(In Million 2018\$)

Note: due to partial overlap in some of these estimates, results should not be added together

In this analysis, we considered each facility in isolation. We also make general assumptions regarding the workplace's response to the situation. For instance, as World Trade Center offices are shut down or its workers otherwise cannot use bridges, tunnels and PATH to reach the center's campus, many would become more productive over time as they work remotely. In other words, we assume their average productivity would increase from, say, the second day to the fifth day and from the tenth day to the fifteenth day as they learn how to create a better work environment, adapt to the lack of office environment and use tools such as remote networking and cloud services to an increasing degree.

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MONTHLY ECONOMIC INDICATORS

THE PORT AUTHORITY OF NY & NJ

Planning and Regional Development Department

July 2018

AVIATION	May '18	YTD	May '18/'17	YTD '18/'17	PORT COMMERCE	May '18	YTD	May '18/'17	YTD '18/'17
Revenue Passengers (000's)	12,422.9	53,735.6	7.6%	3.7%	Port Trade				
John F. Kennedy International Airport (JFK)	5,533.7	23,602.2	7.6%	2.0%	Container Imports (TEUs)	302,081	1,447,087	6.6%	8.3%
LaGuardia Airport (LGA)	2,715.2	11,594.5	3.0%	1.2%	Container Exports (TEUs)	130,341	626,884	9.3%	9.9%
Newark Liberty International Airport (EWR)	4,113.1	18,297.0	10.0%	6.8%	Containers lifted on/off Express Rail	57,732	260,305	19.6%	16.6%
Stewart International Airport (SWF)	60.8	242.0	116.0%	106.9%					
Revenue Freight (Short Tons)	192,529	928,867	2.3%	6.0%	TUNNELS, BRIDGES & TERMINALS	May '18	YTD	May '18/'17	YTD '18/'17
Domestic	70,416	330,211	6.1%	7.1%	Eastbound Vehicle Volumes (000's)	10,490	47,635	1.5%	0.7%
International	122,113	598,656	0.2%	5.4%	George Washington Bridge	4,528	20,462	0.8%	0.0%
Flights	131,031	598,109	3.1%	1.2%	Lincoln Tunnel	1,658	7,690	0.6%	0.2%
Domestic Air Carrier	82,750	381,541	5.1%	2.2%	Holland Tunnel	1,303	5,958	2.5%	-0.1%
International Air Carrier	26,001	121,140	0.4%	1.9%	Bayonne Bridge	264	1,127	20.0%	33.2%
General Aviation	22,280	95,428	-0.9%	-3.7%	Goethals Bridge	1,391	6,327	1.7%	1.3%
Paid Parked Cars	570,315	2,628,704	-5.4%	-5.3%	Outerbridge Crossing	1,346	6,071	1.1%	-0.4%
Revenue AirTrain Passengers	2,052,134	8,252,637	10.0%	2.7%	Eastbound Volumes by Vehicle Type (000's)				
					Autos	9,562	43,414	1.4%	0.6%
					Trucks	666	3,019	3.4%	2.7%
					Buses	261	1,203	0.7%	1.7%
FERRY OPERATIONS	May '18	YTD	May '18/'17	YTD '18/'17	U.S. TRANSPORT. SERVICES INDEX	May '18	Apr '18	Change	
Passengers (000's)					(Prelim., Seasonally Adj., 2000=100)				
New Jersey Ferries	784.5	3,548.3	3.4%	5.8%	TSI - Combined Index	133.5	132.5	0.8%	
					TSI - Freight	135.6	134.2	1.0%	
					TSI - Passenger	129.1	128.9	0.2%	
PATH	May '18	YTD	May '18/'17	YTD '18/'17					
Passengers (000's)	7,315.0	33,586.0	2.5%	1.3%					
Average Weekday	291.7	1,387.3	2.7%	1.0%					
Average Saturday	116.3	564.4	5.2%	3.1%					
Average Sunday	84.9	398.9	-8.7%	-5.8%					

TRANSPORTATION FOCUS

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Alternative work arrangements, including remote work, have been found to provide roughly the same productivity as traditional on-site options. But, for this analysis, we assumed the relevant workplace would, on average, be less than fully prepared to shift to remote work arrangements in the days leading to a major event such as a storm. So we cap remote productivity at 75 percent of normal levels.

Unlike commuter heavy facilities, like the PATH and tunnels, the airport and seaport users have no alternatives in the short term. The economic impacts of a short term shutdown to these facilities are substantial, although over longer durations passengers and companies shipping cargo begin to make plans around the closed facilities. Passengers would choose another airport to book flights and cargo would get into the region using an alternative sea port and by truck.

The importance of accurately estimating transportation infrastructure's public value should be of interest not only to academic circles. It carries weight for policy specialists and decision-makers, who are positioned to decide what to build or repair and how and where to do it. The analysis described above thus fits within a broader, community-level consideration of how to evaluate transportation infrastructure policy in the face of limited public resources, climate change and other major sources of uncertainty.

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