

## Aviation Congestion: Too Many Types and Too Costly to Ignore

Aviation congestion has been the subject of much analysis over the past sixty years. We review three perspectives that have received attention and two important views that have been overlooked by transportation policy makers. Our intention is to contrast the different views and identify logical disconnects. We are concerned with departures and arrivals, not ground transport to or from the airport.

Air-traffic controller strikes led to many long takeoff lines and flight delays. We call this form *congestion as leverage* where intentional delays impact passengers and airlines to gain leverage during negotiations. Here we are referring to policy that creates unintentional, chronic congestion or prevents remedy, not coercive actions taken during union contract disputes.

The OST/FAA<sup>1</sup> has interpreted signs of unused runway capacity as attempts by incumbent airlines to increase their prices while pre-empting competitors access to market. We label this perspective as *congestion as evidence* of anti-competitive behavior within airlines. This view is behind much of the logic for transparency into slot transactions within rule making proposals for slot restriction.

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<sup>1</sup> <https://www.federalregister.gov/articles/2015/01/08/2014-30378/slot-management-and-transparency-for-laguardia-airport-john-f-kennedy-international-airport-and#h-11>

In 2008, the Senate JEC<sup>2</sup> sought to estimate the economic impact of congestion delays upon passengers. Their findings offered a \$40B per year estimate largely attributed to airline misbehavior of crew scheduling resulting in cancelled flights and missed connections. We call this *congestion as evidence for more consumer protection*. The results and methods were questioned by the airlines and the FAA, which commissioned a new study with NEXTOR for verification, called the Total Delay Impact Study (TDIS).

In 2010, NEXTOR<sup>3</sup> released their assessment of the findings by the Senate JEC. The researchers modeled air traffic network delays by looking at statistical utilization of congested airports - where flight operations are over scheduled and offer too little buffer, or slack, for gracefully handling the accumulation of everyday random events without leading to flight cancellations or delays. We call this line of reasoning *congestion as delay costs*. Their estimate for the annual cost of delays was \$16.7B for passengers, \$8.3B for airlines, \$3.9B for lost demand, and \$4.0B for lost GDP, for a total of \$33B for 2007.

While not disputing the need for consumer protection, the two studies showed, without clearly stating, that there is a market failure that cost passengers and airline investors large sums of money due to failure to meter market demand to flight capacity at fourteen critical airports. The \$8.3B costs estimate airlines incurred from the fifteen constrained U.S. airports in 2007 was nearly twice the industry's domestic operating

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<sup>2</sup> [http://www.jec.senate.gov/public/\\_cache/files/47e8d8a7-661d-4e6b-ae72-0f1831dd1207/yourflightshasbeendelayed0.pdf](http://www.jec.senate.gov/public/_cache/files/47e8d8a7-661d-4e6b-ae72-0f1831dd1207/yourflightshasbeendelayed0.pdf)

<sup>3</sup> [http://www.isr.umd.edu/NEXTOR/pubs/TDI\\_Report\\_Final\\_10\\_18\\_10\\_V3.pdf](http://www.isr.umd.edu/NEXTOR/pubs/TDI_Report_Final_10_18_10_V3.pdf)

profits of \$4.3B and nearly the entire global industry profit of \$8.9B<sup>4</sup> for 2007. This clearly runs counter to policy in 49 USC 40101 for earning adequate profits to attract capital and for commerce in general.

Starting at about the same time as the 2010 NEXTOR study, Schlenker & Walker performed a study to determine to what degree, if any, airport pollution causes respiratory related health costs. We call this *congestion as carbon monoxide pollution*. (Authors of a previous study<sup>5</sup> published on the matter concluded that spatial resolution of air quality was too macroscopic to determine ties to airports versus other larger countywide problems.) Schlenker and Walker's<sup>6</sup> findings show the very real losses suffered by families downwind from aviation congestion. The findings estimate that congestion leads to \$500M in annual health care cost for California families, but experts in drug development acknowledge that due to the limited Medicare data on the subject the true market numbers are typically 10x higher than the hospitalization data used.

ADSE-X<sup>7</sup> time-lapse videos of LaGuardia show a spatial aspect to the congestion that had not been looked at in relation to the risk created by closely spaced aircraft, full of fuel and people waiting to takeoff. The excessive danger to takeoff lines stems from their easy targeting by standard rifles and ammunition or drones from nearby hotels, at least

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<https://www.transportation.gov/sites/dot.dev/files/docs/Airline%20Financial%20Review%20Q4%202007%20-%20Major%20Passenger%20Group.pdf>

<sup>5</sup> <http://web.mit.edu/aeroastro/partner/reports/proj15/proj15finalreport.pdf>

<sup>6</sup> [http://faculty.haas.berkeley.edu/rwalker/research/SchlenkerWalker\\_Airports\\_2014.pdf](http://faculty.haas.berkeley.edu/rwalker/research/SchlenkerWalker_Airports_2014.pdf)

<sup>7</sup> <https://www.youtube.com/watch?v=O2dg1750aXk>

for airports like LaGuardia. We call this *congestion as security risk*, which dwarfs the other estimates for economic impact due to the 5% of GDP linked to commercial aviation.

The last two forms of congestion are due to the spatial concentration of the group of aircraft waiting to depart. The other economic models are more concerned with the delay caused to those migrating through the congestion.

Existing policy supports reducing noise and pollution at the source and increasing flight capacity, but the issues are interrelated as we outline in our white paper titled: *Electrifying Takeoffs: Clear the Congestion and Let Them Fly*.