DRAFT MEETING MINUTES
TAVCO
May 7, 2024

Minutes of the Tempe Aviation Commission meeting held via virtual Microsoft Teams meeting with call in +1 (480) 498-8745 United States, Phoenix (Toll) Conference ID: 619 476 816# at the Tempe Public Library Second Floor Hackberry Room, on May 7, 2024, 6:30 p.m.

(MEMBERS) Present:
James P. Camargo
Aaron McBride (attending remotely)
Alana Billingsley
Joel Hunter
Stuart Mitnik
Peter H. Schelstraete (attending remotely)
Desiree Walker, Vice Chair (attending remotely)

(MEMBERS) Absent:
John Lynch (Excused)
Vikas Seelam

Guests Present:
Jasdeep Mandia, Ph.D. Graduate Department of Economics, ASU

City Staff Present:
Oddvar Tveit Temporary Aviation Coordinator

Agenda Item 1 – Call to Order
Ms. Walker calls the meeting to order at 6:30 p.m.

Agenda Item 2 – Public Appearances
Mr. Tveit confirms there are no public appearances.

Agenda Item 3 – Consideration of Meeting Minutes, April 9, 2024
Ms. Walker asks for a discussion and approval of the April meeting minutes. Mr. Camargo states he has no comments to the drafted minutes and makes a motion to approve the April 9, 2024, meeting minutes. The motion is seconded by Mr. Mitnik. The minutes are approved with Mr. Camargo, Mr. McBride, Mr. Hunter, Ms. Billingsley, and Ms. Walker voting yes. Mr. Schelstraete is abstaining.

Agenda Item 4 – Noise Pollution & Urban Economics
Mr. Mandia, and urban and environmental economist, is presenting his research at ASU on household evaluation of amenities, mainly noise pollution impact on housing prices. His research also includes evaluations of amenities like access to electricity and water, and how people sort into different neighborhoods, but his dissertation theses is focused on noise pollution in the Phoenix metropolitan area.

Correlation and Causality:
Research shows that 1dB noise is associated with discounting of property by 0.1% to 1.5%, but it more difficult to find proof of causality between noise and property values compared to finding correlation. For example, in areas with much noise pollution you also find lower school quality. To overcome the challenge, the study uses quasi-random changes in PHX flight paths to quantify causality.

The dissertation has three chapters, and the presentation focuses on the first, called "Capitalization of Noise Pollution and Environmental Justice: Evidence from Changes to Flight Paths." The chapter addresses the price of noise pollution, and the welfare effects of policies

that change the noise pollution in the Phoenix metropolitan area. The study included conventional departure paths out of Phoenix that had been in place for a decade until NextGen was implemented nationwide with new optimized flight paths saving about $6 million in fuel and carbon emissions. The technology enabled a concentration of flight paths over fewer people. Complaints increased thirty times after implementation in September 2014, and by 2017 noise complaints amounted to more than one hundred thousand. The City of Phoenix got one complaint every 5 minutes 24-7. The City of Phoenix were in contact with the FAA in 2015 to get the flight paths reversed. The reversal happened in 2018.

The important factor to determine causality was present in this period when the random changes happened to flight paths after a decade of no change and with other amenities being the same. The situation made it possible to establish causality.

Study Data Input:

The study is based on using established aircraft noise metrics and the FAA's AEDT modeling tool to determine noise exposure at the property level. The generated noise maps show areas were noise increased and areas were aircraft noise decreased under the 2014 NextGen flight paths. Flight track (GIS) data from Phoenix of flight paths from the second week of every month (2010-2019), and housing data from the Maricopa County Assessor's Office were used. Adding census data, you get neighborhood characteristics, like ethnic composition, income, education, family composition and how populations are moving inside the study area.

Study Findings

	OLS			FE	
	(1)	(2)	(3)	(4)	(5)
Noise	-0.0125***	-0.0158***	-0.0078***	-0.0104***	-0.0060*
	(0.004)	(0.003)	(0.002)	(0.000)	(0.003)
Any phase: all transactions	✓				
Conventional & NextGen		✓		✓	
NextGen & Reversal			✓		✓
Observations	138,307	26,277	12,577	26,277	12,577
Adjusted R^2	0.787	0.759	0.822	0.806	0.814

The noise pollution impact (1) is a general expression with 1dB increase, the property value decreases with 1.25%. This includes all property transaction in the study area over the last 10 years. Impact (2) includes the policy change going from conventional routing to Next Gen, and (3) the 2018 reversal. The (4) and (5) are fixed effects between areas, like between Tempe and Scottsdale where Tempe has a higher rate of moving populations. Some neighborhood qualities are not observed in this study, e.g., crime rates. When your focus is on value of the same property before and after NextGen, you can do without including neighborhood quality. There were relatively few homes sold in the period the changes happened, so the price difference e.g., between properties sold in 2017 and 2018 after the reversal with market price increases accounted for, you can isolate a fixed dollar effect of noise pollution. Considering the willingness to pay varies with age, income, and ethnicity, the effect of 1dB increase in noise pollution is a reduction in the property values by 1%. The willingness to pay to avoid that 1dB increase is estimated to $3,038. So, if you can offer a reduction in noise pollution by a standard deviation of

two, your home will increase in value by $6,000, which is comparable to amenities like school quality, which is supported by public funding. Therefore, you could price noise pollution with a tax, which in the study was calculated to $16 for a one-way flight. Total annualized capitalization and net gain and losses caused by the NextGen are a $6.2 million gain in reduced fuel and carbon emissions, a $7.1 million loss in home values, leaving $13.3 million in gains and losses. There is a higher welfare loss for older, lower-income households.

Questions and Answers:
Ms. Walker asks if London Heathrow was used as an example where you find ample evidence of serious impacts on surrounding communities over many decades. Could the Heathrow example have been helpful for the analysis? Mr. Mandia responds that you still would have to deal with the challenge of proving causation.

Mr. Camargo asks if the paths used in the study were the new NextGen departure routes used by aircraft that had the new technology? Mr. Mandia responds that the routes were developed by asking computers what the shortest flight paths were. Mr. Tveit states that by 2014 when the new routes were implemented, the technical challenges to get the various aircraft to navigate more uniformly within tighter tolerances to nav fixes, (waypoints), had largely been solved. By 2014 all airlines were eager to use the new NextGen area navigation (RNAV) procedures for PHX. Mr. Mandia comments that The City of Phoenix is monitoring the track accuracy of the flights with the new routes, and deviation rate is very low.
Mr. Tveit explains that before the implementation the PHX FAA (P-50) came to inform TAVCO about the 2014 NexGen departure procedures to the east, and that they would mirror the preexisting, conventional procedures along the riverbed in north Tempe. The west side did not have similar conventional noise mitigation flight procedures, causing the 2014 NexGen departures to include turns directly after takeoff to reduce the procedures' overall leg length. This caused new areas in Laveen and along Grand Avenue being exposed to heavy departure traffic at relatively low altitudes. The annoyance caused a lawsuit from a Grand Avenue historic neighborhood coalition and the City of Phoenix. The modeling the FAA had done before implementation showed that the PHX 2014 NextGen did not need to undergo a full environmental assessment. Mr. Mandia mentions FAA flight procedure guidance requires that a procedure change cannot add 3dB or more noise pollution. Mr. Tveit comments that the guidance is complicated, federal law delegates to the agency to set thresholds for what constitutes significant impact from their own actions and when impacts need to be mitigated. EPA is not involved. The court faulted the FAA for not notifying the public before the changes were implemented, and for not properly consult with the State Historic Preservation Officer.

Mr. Hunter asks, and Mr. Mandia conforms that a "heatmap" form where noise complaints were coming from is included in the study.

Mr. Mitnik asks about the following: a) How you can determine causality in a study based on regression analysis. Mr. Mandia explains that is possible because the new routing was not determined based on areas to avoid, it was done by computing shortest distance. b) About home price inflation. Mr. Mandia explains the price index data used in the study. c) Noise not being disclosed in property sales. Mr. Mandia responds that airport disclosure notifications are used sparingly within study area.

Ms. Billingsley asks about the following: a) If the study accounted for new noise sources like the infrastructure changes that happened from 2014 to 2018 like the light rail connections. According to Mr. Mandia property value losses due to noise pollution from freeways show are similar results. Noise from light rail has not been evaluated separately. b) If the 1dB and 1% decreased value applies to Tempe or a bigger area. Mr. Mandia explains that the noise pollution

was isolated to flights over properties within a 15-mile radius of PHX. c) Is pricing of rentals sales included? They were not according to Mr. Mandia.

Mr. Mandia ends his presentation with a recommendation about the benefit for policy makers to have an estimate for capital gains and losses associated with noise pollution to get a better understanding of what economic impacts a particular policy or policy change will have.

Agenda Item 5 – PHX flight procedures

Mr. Tveit presents a draft first quarter report 2024 about flight procedure compliance, complaints, and noise. He explains the Noise Monitoring and Operations System (NOMS) at PHX changed from the older (Passur) application to the new (Casper) application. The imaginary gates used in Tempe noise reports were not transferred to the new system. To find a way to measure compliance with the area navigation (RNAV) departure routes going east, he used FAAs RNP (Required Navigation Performance) criteria to determine how well airlines on departure navigate to the waypoints. Seven Standard Instrument (RNAV) departure procedures have the same fly-over way point in the procedure, located at 4-DME, close to the SR101/ 202 intersection. Using an accuracy standard of RNP0.3 for which airline crews need the FAA's authorization to use, and most airline crews have, the compliance out to the intersection for these routes were quite high during the quarter. The problem is that the Tempe's access to tools in the application does not allow creating accurate portals or gates using coordinates around where waypoints are located, so the 99% compliance rate found for airlines using the seven procedures includes inaccuracies. Few departures to the east used classic Standard Instrument Departure procedures during the quarter, which are based on headings off the runways. Compliance was estimated to 75%. The most significant deviation rate was found for airlines departing to a first fly-by waypoint just outside Tempe borders on two routes with sharp turns south after the SR101/ 202 intersection. For these departures the aircraft navigation system will position the aircraft favorably to the upcoming waypoints further down the route, causing turn anticipations before Tempe's east border, approximately over the area around the Tempe Marketplace. The estimated compliance to the first waypoint for the two routes was only 10.7%, using the same RNP0.3 accuracy standard.

The report also included City of Phoenix 4-DME/ SR101/ 202 notices of deviations to airlines during the quarter, where one airline stood out. Southwest had a higher monthly rate of deviation notices than other airlines. Mr. Mitnik commented that the airline according to the previous TAVCO chair, a retired airline pilot, Southwest rates its pilots on their ability to achieve fuel savings, which is an incentive to cut corners. The report has the jet departure split east and west annualized. Mt Tveit explained that the annual split is quite stable due to the diurnal winds cause quite regular shift in runway flow directions at PHX. The wind speeds were low during the quarter. The Tempe side gets more departures during night and mornings before the flow shifts around mid-day. Just looking at total volume of departures, day and night, the west side gets more of the total departure activity. The draft report also included complaints received by the the City of Tempe sorted by postal codes, and complaints from Tempe residents to Phoenix. Noise event registrations by the PHX monitoring sites in Tempe is included in the draft report. The application now has graphs available which show the Lden, a European noise metric, which in addition to the night-time 10dB event penalty included in the Ldn/DNL metrics, has a 5dB penalty for evening noise. A graph shown in the draft report includes variations in the number noise events registered by monitoring sites in Tempe.

Questions and Answers:
Mr. Mitnik asks if the PHX system no longer uses actual noise data from the fixed noise monitors. Mr. Tveit stated that system give access to noise monitor readings, it is the AEDT

application that can generate noise exposure data based on operational data, the aircraft types, type of engines, loads, flight trajectories and weather data.

Ms. Walker asked about NMS 14 location. Mr. Tveit would give the members information about where in Tempe the PHX monitors are located.

Ms. Billingsley asks if good neighborhood ordinances have been discussed to have more of the night and morning departures be directed to the Phoenix side. Mr. Tveit explains that the air traffic control is running the direction of flight and is primarily considering efficiency and safety in managing the air traffic flow. There is also a big task for air traffic controllers to switch over the flow of operations to the opposite direction. The aircraft need to be redirected or held back, get new taxiway assignments etc. The airline's preference also plays into the issue, particularly at night when the air traffic volumes are low, air traffic control can more easily accommodate an airline's preference to take off to the east on a more direct route to destinations in the U.S.

Agenda Item 6 – Commissioners' Business

Mr. Mitnik proposes an ongoing agenda item about what information the commission needs to be able to make recommendation to the Mayor and Council. Members need to prepare information to make recommendations that help residents dealing with the various problems with how the airlines operate and how the airport is operated. Mr. Mandia suggests that perhaps the commission could consider discussing a recommended subsidy on home improvement upgrades to homeowners under the flight paths to compensate or reduce the property value damages attributed to aircraft noise. Ms. Billingsley suggests the future agenda item be a discussion of establishing a living document to include information on issues that could be brought to Mayor and Council for consideration. Mr. Mitnik agrees that a discussion of a list of issues and what information is necessary to make convincing arguments for recommendations, is a good idea.

Mr. Camargo suggests discussing a calendar for processing the issues the Commissioners want to bring forward, like a path forward to host a resident aviation forum.

Agenda Item 7– Schedule Next TAVCO Meeting

The next TAVCO meeting was scheduled to Tuesday, August 13, 2024.

Agenda Item 8 – Adjournment.

Mr. Hunter motions to adjourn the meeting. Mr. Schelstraete seconds. Unanimous approval.

The meeting is adjourned at 8:08 p.m.

Prepared by: Oddvar Tveit