



# Memorandum

**TO:** COMMUNITY AND ECONOMIC  
DEVELOPMENT COMMITTEE

**FROM:** John Aitken  
Kim Walesh

**SUBJECT: DOWNTOWN AIRSPACE AND  
DEVELOPMENT CAPACITY  
STUDY PROGRESS REPORT**

**DATE:** September 10, 2018

Approved

Date

9/17/18

**Council District:** Citywide

## **RECOMMENDATION**

Accept this progress report on the Downtown Airspace and Development Capacity Study.

## **OUTCOME**

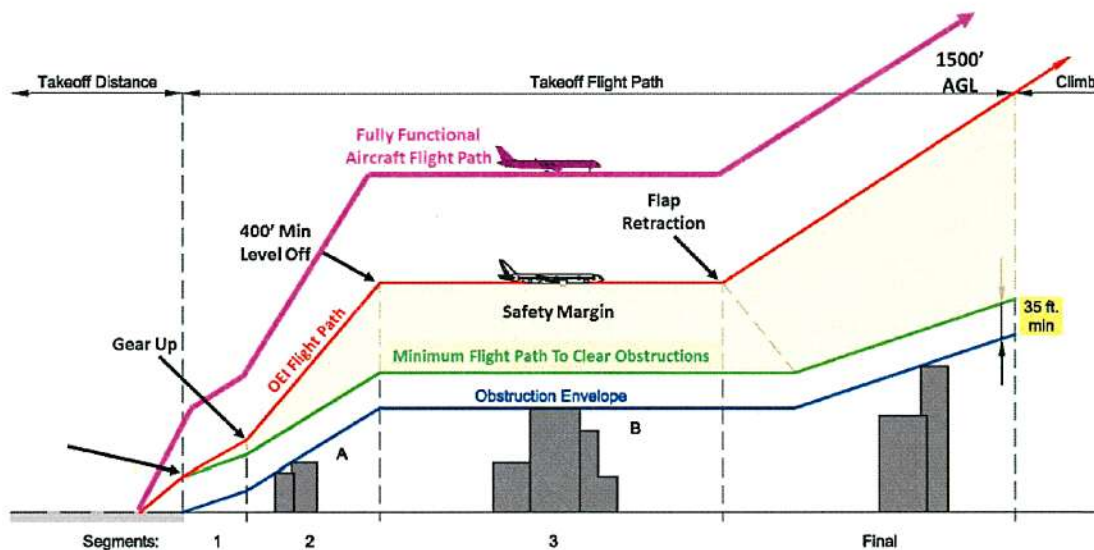
The Community and Economic Development Committee will receive an update on the work in progress on airspace protection at Mineta San Jose International Airport and its relationship to downtown development capacity. Completion of this work may provide new insights into how best to balance the City's goals of providing transcontinental and transoceanic air service at the Airport and maximizing high-rise building development downtown.

## **BACKGROUND**

Two of the City's primary economic priorities are the development of downtown and growth in air service at Mineta San Jose International Airport (Airport). The Airport and downtown are within two miles of each other and the primary aircraft approach and departure paths for the Airport are directly over downtown, which places limitations on downtown building heights.

The Federal Aviation Administration (FAA) protects airspace around airports through the application of Federal Aviation Regulations (FAR) Part 77 and Terminal Instrument Procedures (TERPs). These regulations define various invisible "surfaces" or slopes which radiate out from an airport's runways, mandate FAA review of any proposed structure which exceeds one or more of these surfaces, and guide FAA issuance of air safety determinations for proposed structures. In San Jose, proposed structures subject to FAA review are typically required to obtain a "determination of no hazard" clearance from the FAA as a condition of the City's development permit approval.

While FAR Part 77 and TERPs protect the ability to safely operate an airport, they do not consider specific airline emergency procedures. Under Part 25 of the Federal Aviation Regulations, airlines are required to have emergency flight procedures in place if an airplane engine loses power during takeoff. These emergency flight procedures are known as one-engine inoperative (OEI) procedures and are designed so that an aircraft can gain sufficient altitude immediately upon takeoff even if an engine loses power, follow a prescribed flight path over any obstacles in the surrounding terrain, and safely circle back to the airport for an emergency landing. The regulatory guidelines that govern OEI procedures for passenger airline and large cargo aircraft operators are FAA Advisory Circulars, International Civil Aviation Organization (ICAO), and Airline interpretations of the FAA and ICAO guidelines. The diagram below illustrates the requirements in these guidelines.



Protecting for OEI emergency procedures can limit maximum building heights around an airport more severely than FAA evaluations conducted under FAR Part 77 and TERPs. The FAA believes that airlines can mitigate for OEI airspace obstructions by revising their emergency procedures or by reducing takeoff weight to improve climb performance, thereby safely clearing obstructions. Implementing takeoff weight restrictions by reducing passengers, cargo, or fuel can negatively impact the economic viability of airline service. Even small weight penalties can affect the feasibility of airline service to a destination, more specifically transcontinental and transoceanic destinations, typically serviced by large, heavy aircrafts. Therefore, obstructions within the surrounding airspace can be a factor in an airport's ability to attract or retain desired air service.

The City's 2008 Airport Obstruction Study mapped out airline OEI protection surfaces and associated building elevation impacts on OEI procedures around the Airport. Under certain weather conditions aircrafts depart to the south. In this circumstance the study identified two OEI corridors used by the airlines: one over the Downtown core (east of Highway 87 and

referred to as the straight out corridor) and one over the Diridon area (west of Highway 87 and referred to as the west corridor). Airlines determine which corridor they will use - straight out or west - depending on the aircraft being flown and the aircraft's destination. Since the OEI west corridor requires a shallower aircraft climb rate due to the turning maneuver, OEI building height limits in the Diridon area are more restrictive than in the Downtown core.

The City does not condition development permit approvals on compatibility with airline OEI elevation limits because the FAA does not regulate OEI elevations. However, developers have been cooperative in maintaining maximum building heights compatible to OEI elevations determined in the Airport Obstruction Study. In June 2017, Council directed staff to re-evaluate the 2008 study, including providing an economic analysis to identify the tradeoff between maintaining existing OEI protection surfaces and increasing building heights.

## **ANALYSIS**

Office of Economic Development and Airport staff are managing the current Downtown airspace and development capacity study. National aviation planning/engineering consultant Landrum & Brown has been contracted to do the study. Landrum & Brown has extensive and ongoing experience working for the City on airport technical issues and nationally on OEI matters. Landrum & Brown have engaged consultants Jones, Lang & LaSalle for the economic analysis portion of the study's scope. A project steering committee comprised of Downtown stakeholder representatives including the San Jose Downtown Association, SPUR, Silicon Valley Organization, and Santa Clara & San Benito Counties Building & Construction Trades Council was formed to provide review and input on the technical analyses and resulting recommendations.

To date, the Landrum & Brown team has confirmed and updated the Downtown/Diridon area obstruction data, airline OEI procedures, current and anticipated aircrafts critical for SJC air service, and FAA's TERPS surfaces used in FAR Part 77 proposed building evaluations. Ten theoretical airspace protection scenarios were formulated to reflect various alternative combinations of OEI and FAA/TERPS surface protections impacting maximum building heights. With input from the project steering committee, four of the ten scenarios were selected for more detailed analysis. The four scenarios are:

- No OEI protection, TERPs only
- Straight-out OEI protection with west corridor alternatives
- Straight-out OEI protection without the OEI in the west corridor
- No OEI protection with increased FAA height limits.

The first step in the detailed analysis of these scenarios is an assessment of how each would impact current and future SJC air service. This assessment has included outreach to SJC airlines that utilize the OEI west corridor as well as one airline that utilizes a straight-out OEI procedure to obtain direct input on how each scenario would impact their air service at SJC. The tentative findings of this air service assessment were presented to the project steering committee on

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September 7 and will be presented to community stakeholders at a meeting on September 13 and to the Community and Economic Development Committee on September 24.

Future changes in aircraft technology are not expected to resolve the challenges between the need for OEI procedures and desire for increased building heights. While aircraft performance has improved over the years, the improvements have enabled two-engine aircrafts to serve markets previously served by three or four-engine aircrafts, not eliminated OEI procedures. Also, given increases in airline operating costs, aircraft manufacturers are more focused on fuel efficiency rather than takeoff performance. The aircraft most affected by OEI issues at the Airport include the newest aircrafts in the market such as the Boeing 787 and Airbus 320 and 330. Thus, this issue is anticipated to remain with the City for the long term.

The next step in the detailed airspace scenario analysis will be assessing the potential economic impact on Airport air service and on Downtown/Diridon area development. These critical assessments are currently being initiated by the consultant team and will be completed by the end of the year.

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