



## ***Collision Course?***

**The LAX North Airfield Safety Study**

In 2005, **Antonio Villaraigosa** defeated the incumbent Mayor to become Mayor of Los Angeles. During the campaign, he said that he opposed reconfiguring the LAX North Airfield unless it was necessary for “to ensure the **safety** of passengers, workers, and the surrounding community.”

**In 2008, Los Angeles World Airports decided to commission a study of safety on the LAX North Airfield, which it was hoped would be definitive.**

**The **North Airfield Safety Study** began in summer 2008. An **Academic Panel** was charged with devising, monitoring, and analyzing an experiment to be undertaken at Future Flight Central of **NASA Ames**, in collaboration with NASA colleagues.**

# Who are the members of this Academic Panel?

<b>Arnold Barnett</b>	<b>(MIT) Panel Chair</b>
<b>Michael Ball</b>	<b>(U of Maryland)</b>
<b>George Donohue</b>	<b>(George Mason U)</b>
<b>Mark Hansen</b>	<b>(Berkeley)</b>
<b>Amedeo Odoni</b>	<b>(MIT)</b>
<b>Anonio Trani</b>	<b>(Virginia Tech)</b>

# Primary Aim of North Airfield Safety Study:

To estimate **as specifically as possible** the level of future safety associated with each of several alternate configurations of the LAX North Airfield.

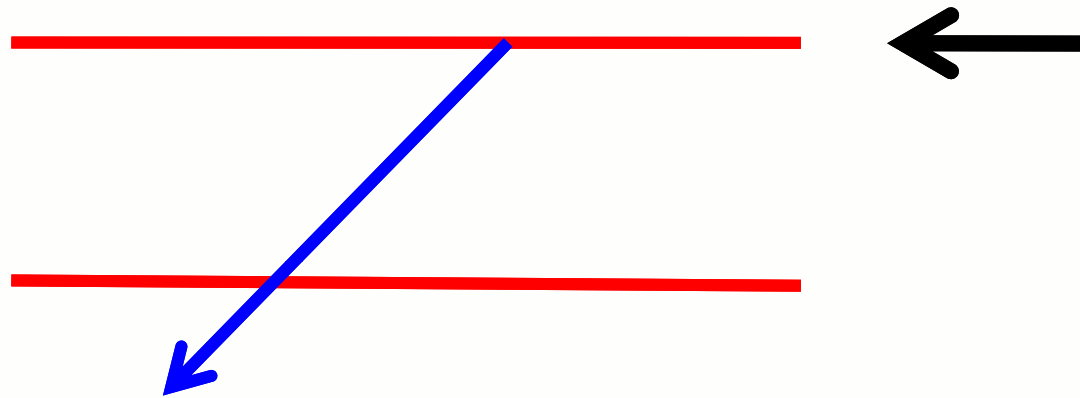
## **Auxiliary Aim:**

**To provide useful information about the capacity implications of the various configurations, in light of projections about LAX traffic levels in 2020.**

**What possible configurations of the North Airfield would the Panel and its NASA colleagues investigate?**

**In essence, there were three.**

# Configuration 1: **Status Quo**

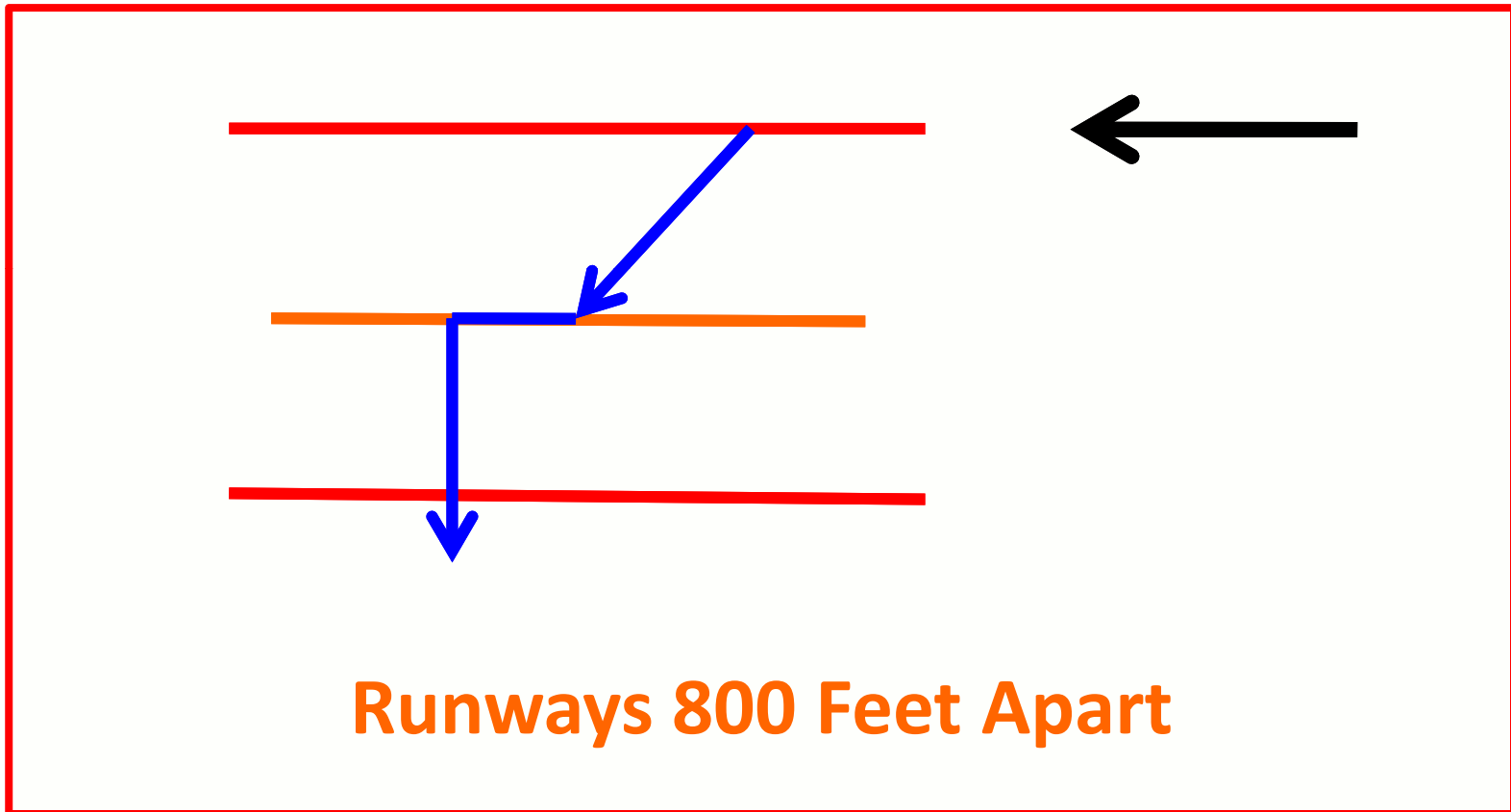


**New technologies like ASDE-X radar and Runway Status Lights would apply.**

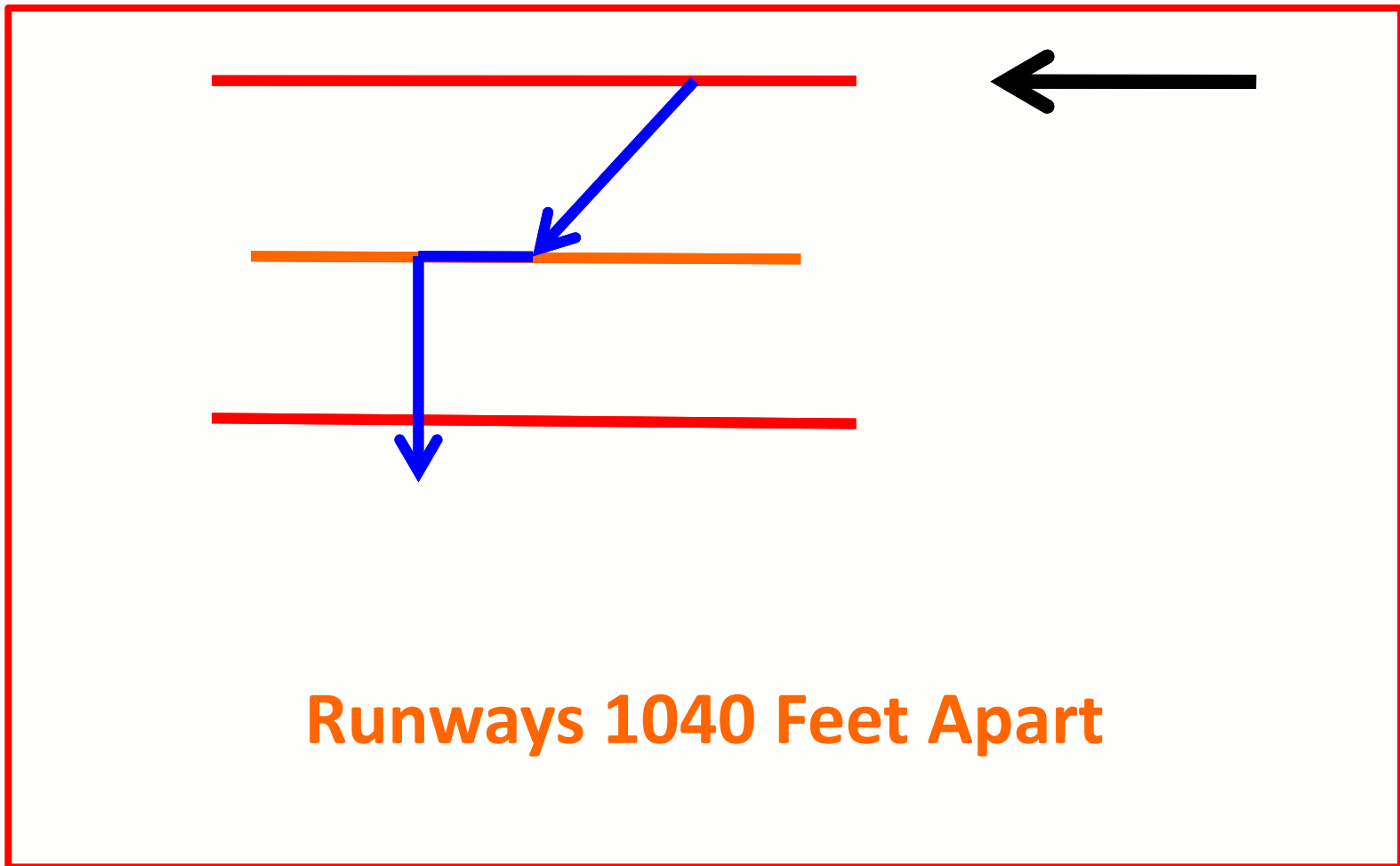
**Runways 700 Feet Apart**



## Configuration 2: Centerline Taxiway Added, and Runways 100 Feet Further Apart



# Configuration 3: Centerline Taxiway And Runways 340 Feet Further Apart



At NASA Future Flight Central, **human-in-the-loop simulations** involving actual pilots and controllers could take place, in **“virtual reality”** cockpits and control towers.

*Such simulations about LAX-North occurred in **August 2009**.*

**We supplemented the information from NASA Ames with other kinds of information:**

- **Historical data related to runway safety** that were collected and analyzed by the Academic Panel
- Data and analyses from **previous studies about runway safety**

## **Results:**

# **Risk Estimates for the Various LAX-North Configurations at 2020 Traffic Levels**

## **Part I: The Baseline Case**

We estimated the **frequency** of fatal collisions for *baseline LAX-North at 2020 traffic levels* in two stages:

- First, we estimated the **annual probability** of a fatal runway collision at *some* US towered airport, based on projected traffic levels for 2020 and assuming use of the latest technologies (AMASS, ASDE-X, RWSL).
- Second, we estimated the **probability** that, if a fatal accident occurred in the US at 2020 traffic levels, it would do so at LAX-North **rather than elsewhere**.

**We will not try to describe our estimation procedure now, but we attempted to be conservative and if anything to **overestimate** the level of risk.**

*Our full study appears at the LAX website, under the key words **“North Airfield Safety Study.”***

**We estimated that at 2020 traffic levels:**

**(i) there will be one fatal runway collision in the US every **four** years**

**(ii) each such collision will have a **1 in 50** chance of occurring at baseline LAX-North**

**Taken together, these estimates imply that fatal runway collisions at LAX North in the baseline case will occur on average **once every  $4 \times 50 = 200$  years.****



**We also estimated that, at 2020 traffic levels and the baseline configuration, the chance an LAX passenger would perish because of a runway collision on the North Airfield would be about 1 in 150 million.**

# Other Study Findings:

- *Compared to the baseline case*, moving the runways **100** feet further apart would cut fatal collision risk by **40%**.
- *Compared to the baseline case*, moving the runways **340** feet further apart would cut fatal collision risk by **55%**.
- Moving the runways 340 feet further apart would **raise airport capacity** considerably.

**How Does It  
All Add Up?**

**I. For projected 2020 traffic levels and traffic mix, the LAX North Airfield is extremely safe under the current configuration.**

**The death risk per LAX passenger caused by runway collisions on the North Airfield would be approximately 1 in 150 million.**

**II. The proposals to create new configurations on the North Airfield would reduce by a **substantial percentage** the risk of a runway collision.**

**Passenger mortality risk would drop by approximately**

- **40%** under the 100' North Configuration
- **55%** under the 340' North Configuration

**III. However, because the baseline level of collision risk is so low, reducing that risk by a substantial percentage is of limited practical importance.**

# Mortality Risk Summary at 2020 Traffic Levels:

## 750 Million LAX Passenger Per Decade

### Baseline Case

### 100' North Case

5 Runway Deaths on  
LAX-N

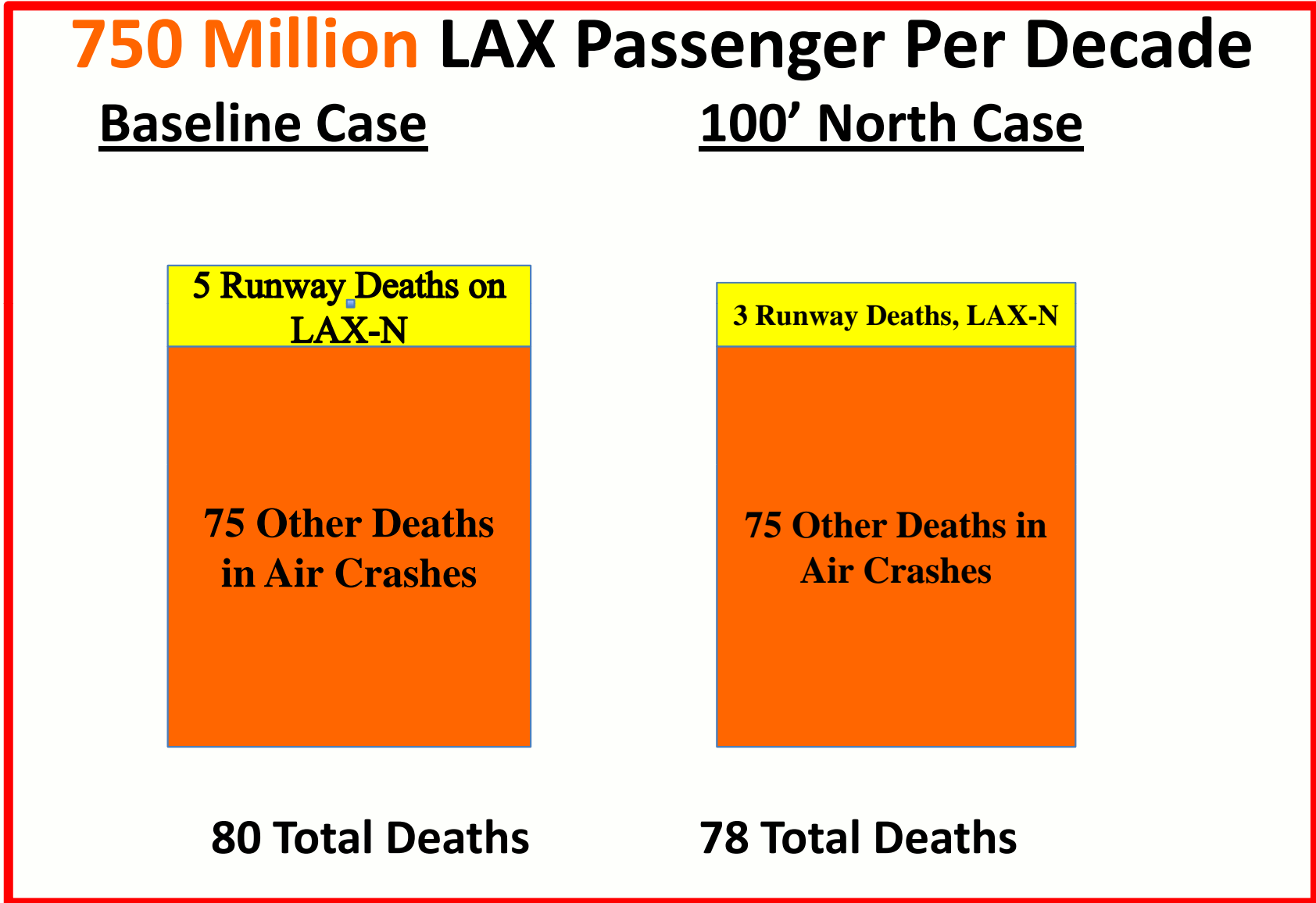
3 Runway Deaths, LAX-N

75 Other Deaths  
in Air Crashes

75 Other Deaths in  
Air Crashes

80 Total Deaths

78 Total Deaths



**IV. In terms of capacity, reconfigurations would probably have **major effects**:**

**340' North configuration could **substantially reduce** delays at gates and in taxiing, and **appreciably raise** the airport's takeoff and landing capacity in peak conditions.**



**V. A serious case could be made for building 340' North based on its capacity benefits, and it *would* improve safety.**

**But the safety benefits should be considered the “icing on the cake” rather than the cake itself.**

VI. However, we took very seriously the fact that this effort was called the **North Airfield *Safety* Study.**

**Our key conclusion:**

**“The Panel does not see a compelling case *on safety grounds alone* for reconfiguring the North Airfield.”**