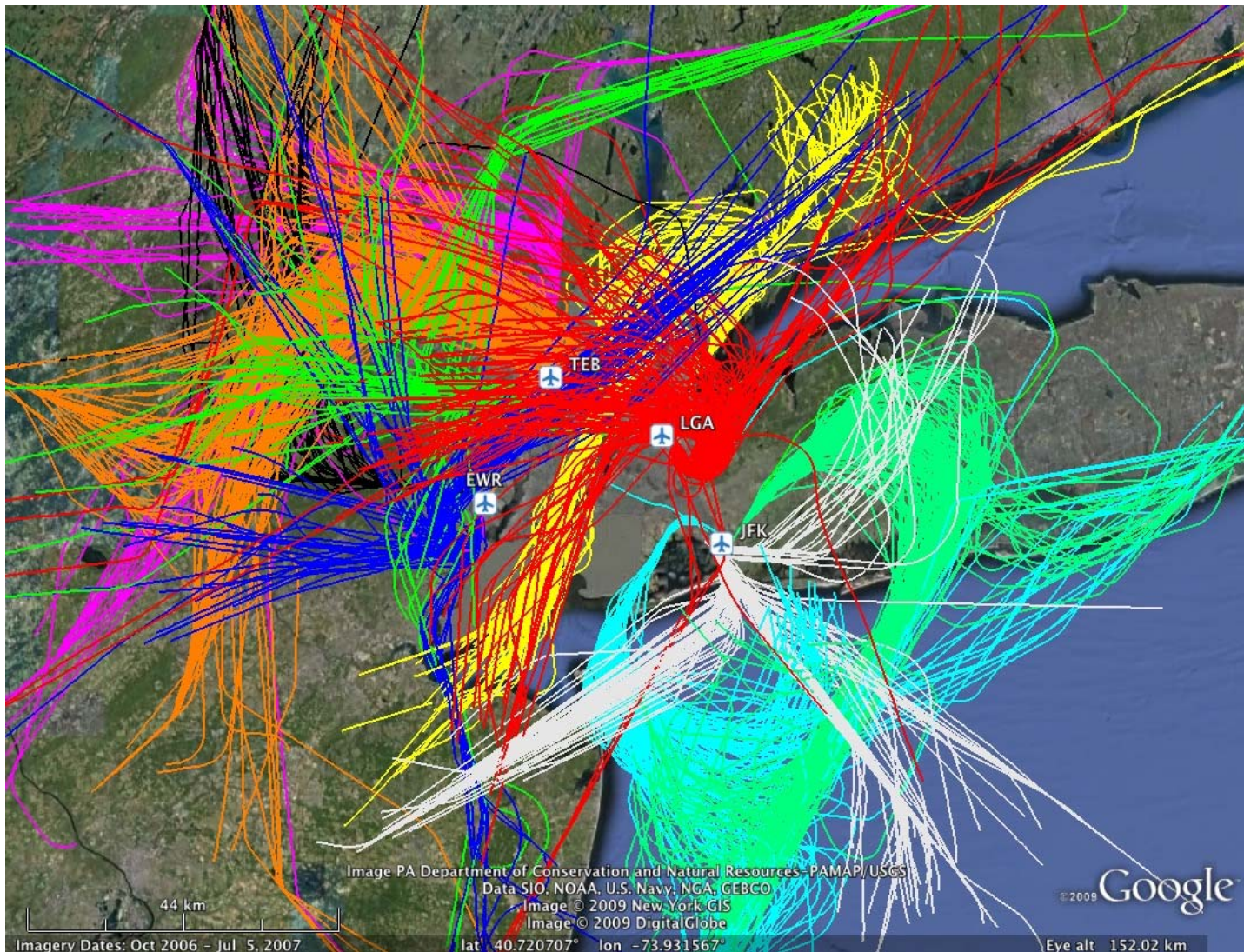


Prototype NextGen Procedures to Evaluate Wake Vortex Issues

- NextGen lacked sufficient definition for in depth analysis, therefore hypothetical prototype NextGen procedures were created to facilitate modeling the wake hazard of potential close proximity procedures
 - Newark (EWR) selected as the location for design of wake vortex test procedures due to its:
 - Closely spaced parallel runways (CSPR)
 - Tight airspace geometry
 - Readily available PDARS flight track data
- The wake impact from these test procedures will be modeled by the other members of the team at George Mason University and Virginia Tech
- PDARS flight track data was used as the baseline for development of hypothetical procedures

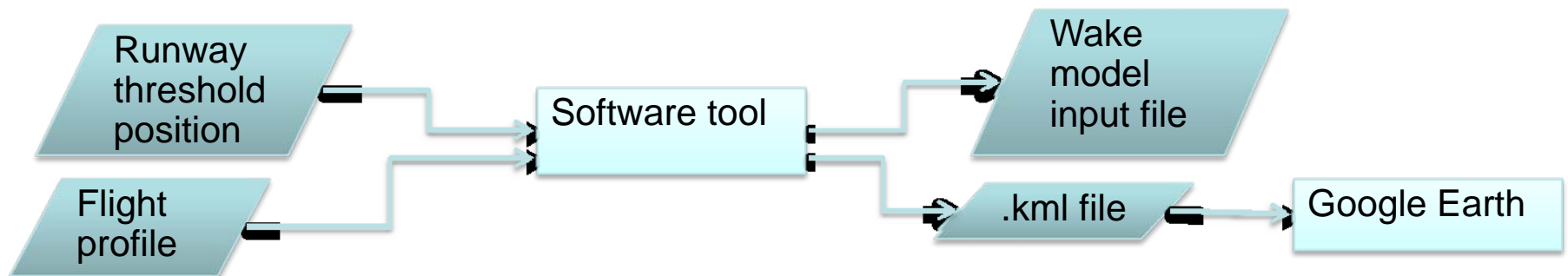
Example New York PDARS Data

EWR 11 Arr.
EWR 22L Arr.
EWR 22R Dep.
JFK 22L Arr.
JFK 13L Arr.
JFK 13R Dep.
LGA 22 Arr.
LGA 13 Dep.
TEB 19 Arr.
TEB 24 Dep.



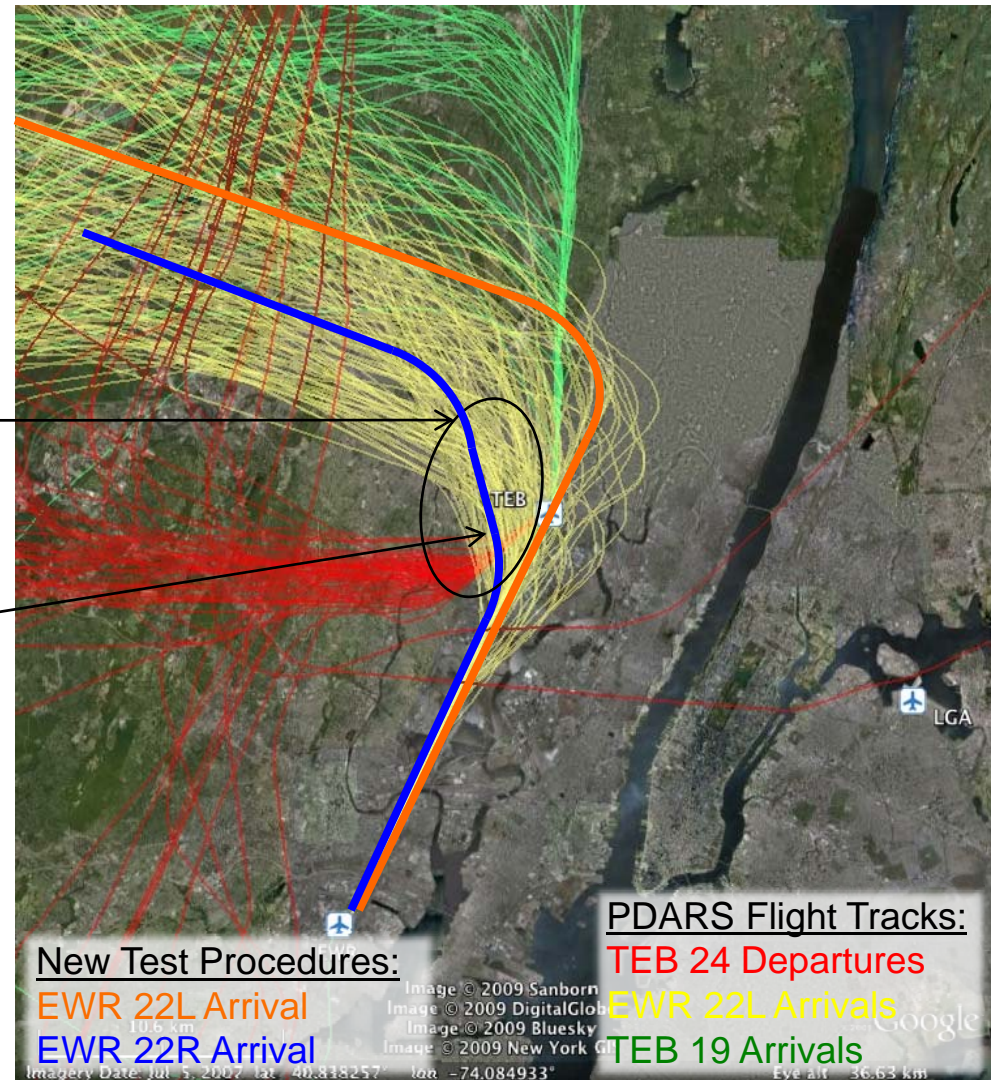
Procedure Generation Tool

- In order to rapidly prototype new procedures a software tool was created
- Flight profile data is input as maneuvers (e.g. straight segment X n.m., turn heading Y radius Z n.m.), allowing intuitive design and adjustment of procedures
- RNP procedure design guidelines and the airport geometry are used to constrain the procedure design
- Output of procedures into Google Earth allows comparison with other data sets such as PDARS flight tracks



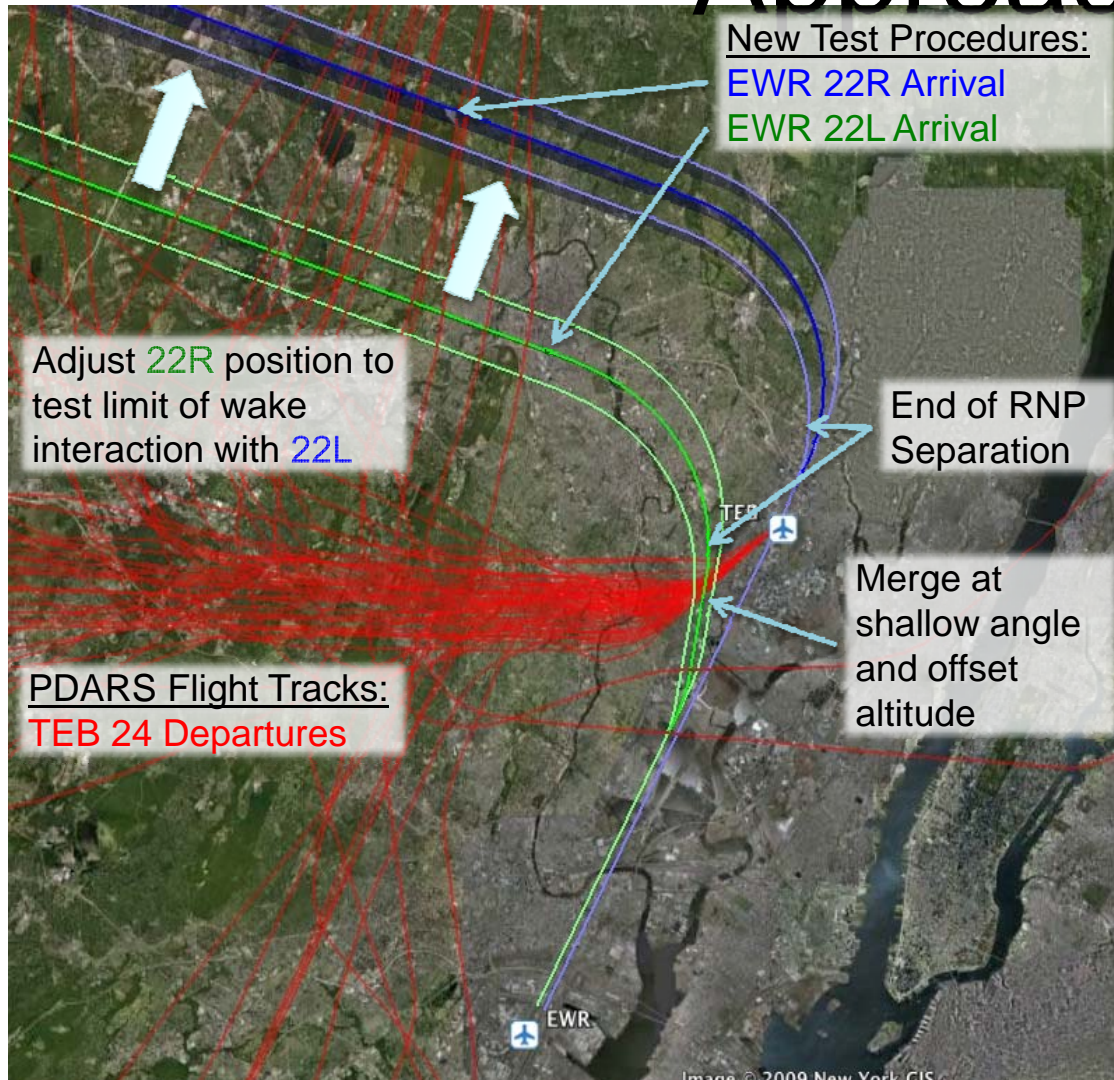
Arrival-Arrival Interaction

- An example to explore NextGen wake vortex issues on closely spaced turn to final
- Use current 22L maneuvering space for new 22R turn & merge
- Vary EWR 22R turn and final approach geometry to test the limit of wake interaction with EWR 22L during the merge maneuver

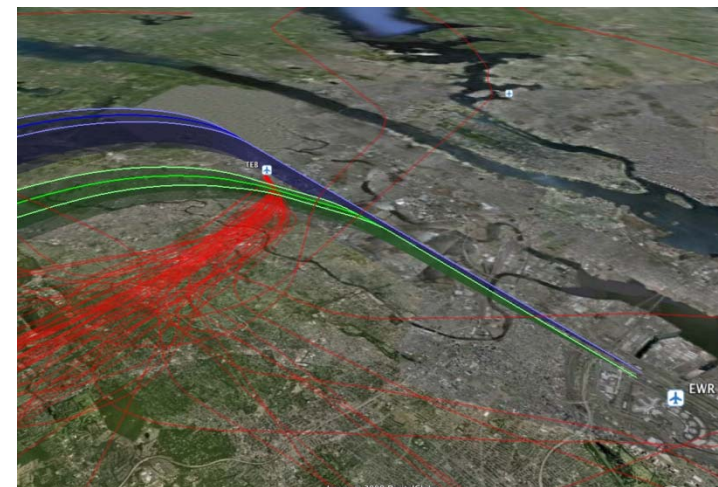


Potential NextGen EWR 22

Approach

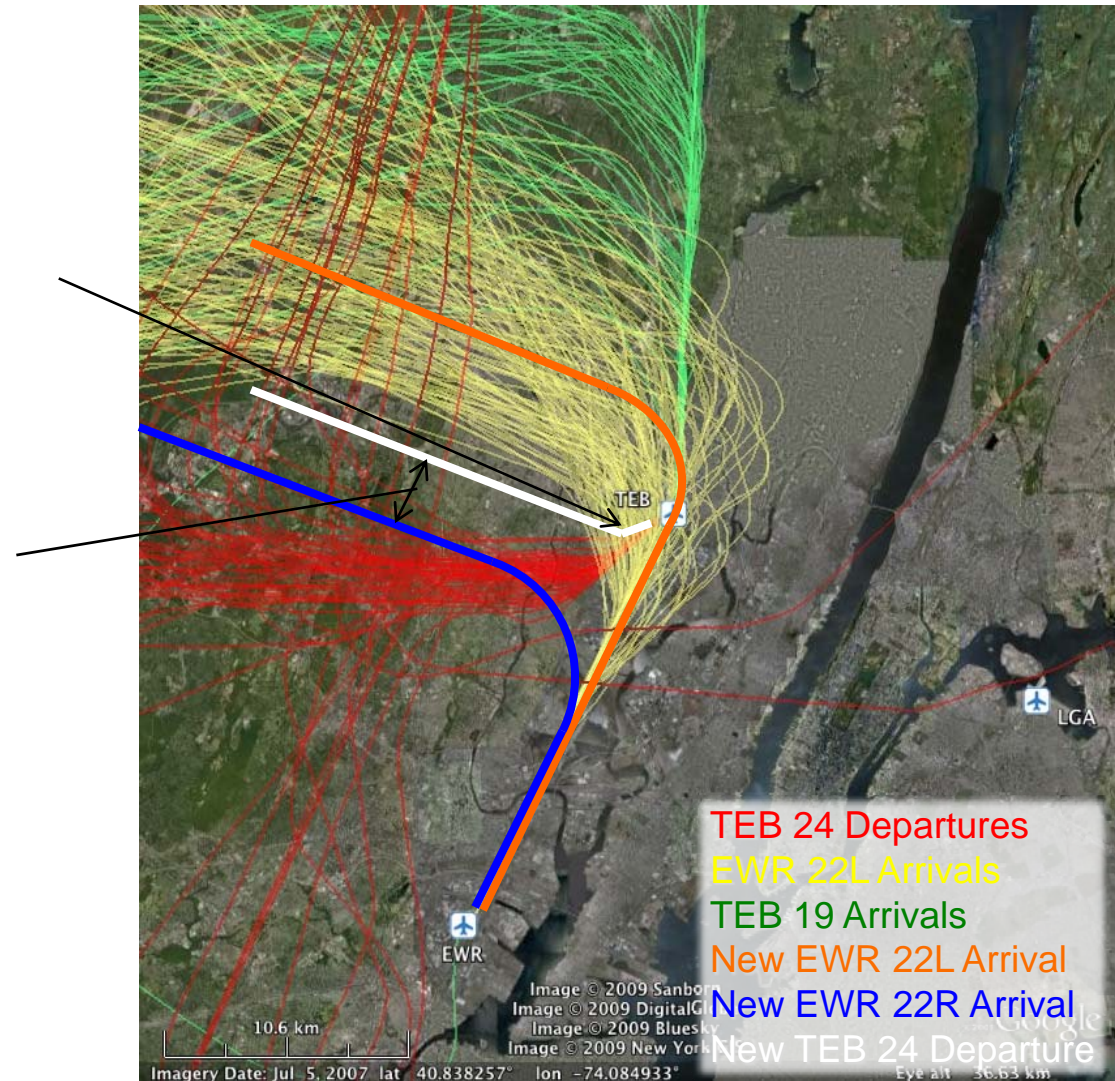


- Assume tight RNP (0.3 shown) is available
- Use current 22L maneuvering space for new 22R turn & merge
- Vary geometry to test the limit of wake issues at several interaction points



Arrival-Departure Interaction

- Depart TEB 24 between EWR 22 L and R arrival streams
- Test the limits placed on the TEB 24 departure climb by the EWR 22L arrivals
- Also explore the interaction between parallel approach and departure routes



Arrival Departure Interaction

