Informational Briefing on Hollywood Burbank & Van Nuys Airports

AGENDA

- **Opening remarks – R. Girvin**
- **Introductions – All**
- **Background and Context – R. Girvin**
- **Hollywood Burbank (BUR) and Van Nuys (VNY) Airports – C. Desing**
- **Addressing Community Concerns – B. White, R. Girvin**
  - Developing Our National Strategy
  - Noise and Emissions
- **Ongoing Engagement – R. Girvin**

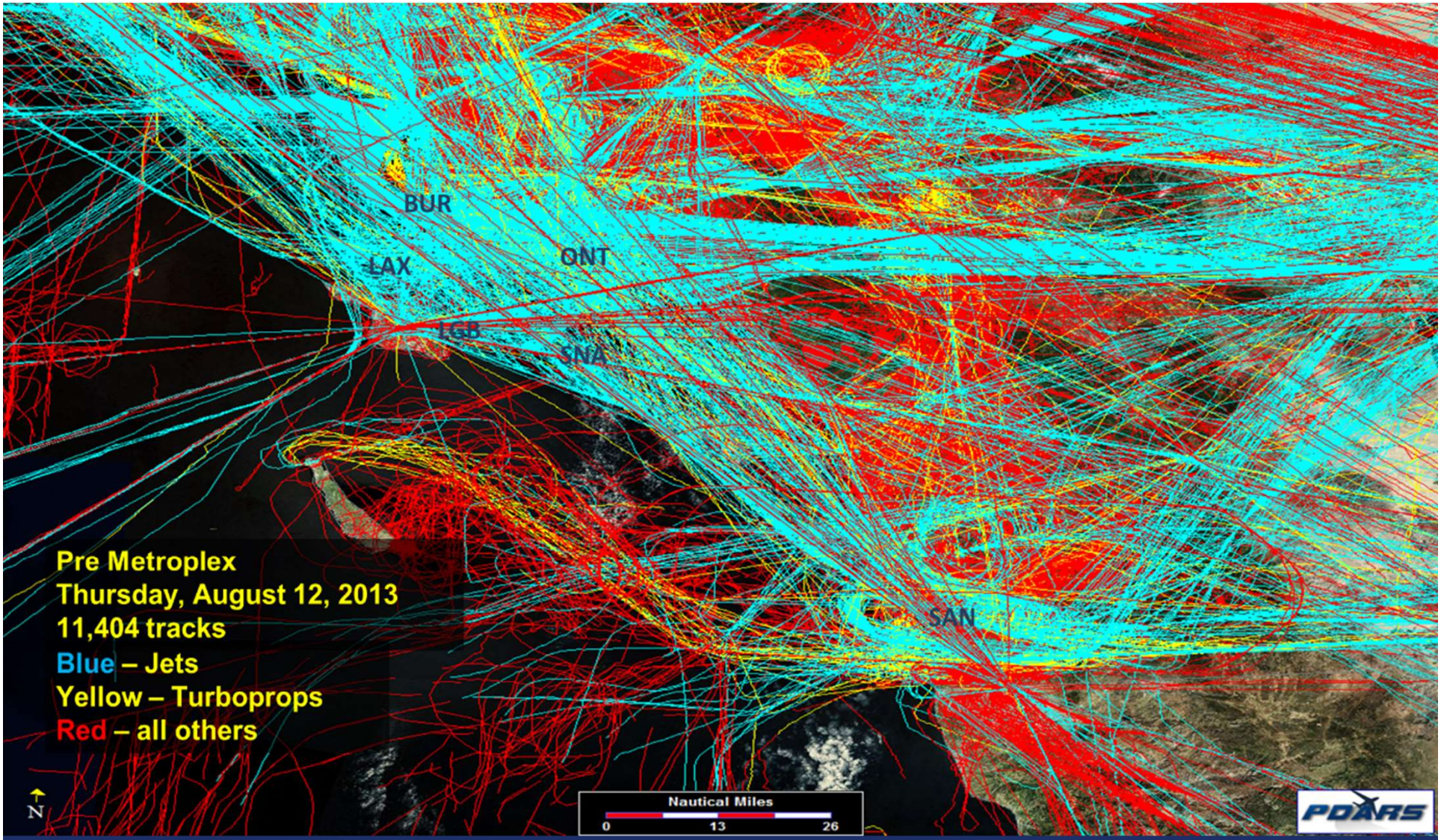
Safety of the U.S. Aviation System

- FAA's statutory mission from the Federal Aviation Act of 1958, as amended, is to ensure the safety of aviation in the United States

- The commercial aviation system in the United States operates at an unprecedented level of safety

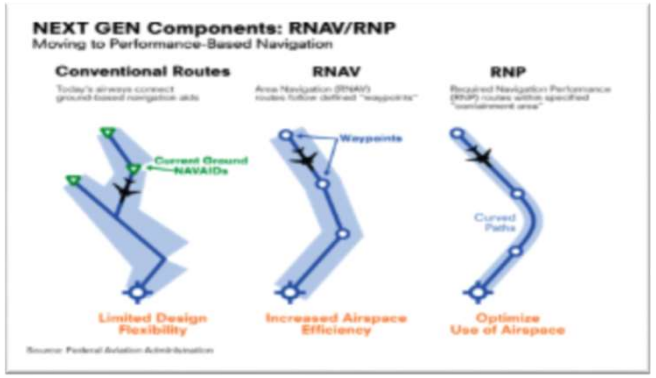
- In the last ten years, more than 7 billion people have flown on 90 million commercial U.S. flights with one single fatality

Southern California airspace is the busiest and most complex in the US



State-of-the-Art Airspace

In 2012, Congress directed FAA to modernize the airspace to ensure the continued safety and efficiency of the U.S. air transportation system



"Transportation is a derived demand,
derived from a desire to consume
some good or service
at a location that differs
from where the good or service is produced."

--Patrick S. McCarthy, *Transportation Economics*

In 2018 –

10 million people in Los Angeles County

19 million people in the Southern California region that includes six counties and 191 incorporated cities

--Southern California Association of Governments Regional Council,
Profile of Los Angeles County

Southern California

In Southern California, we modernized the airspace with satellite-based procedures for 21 airports, including:

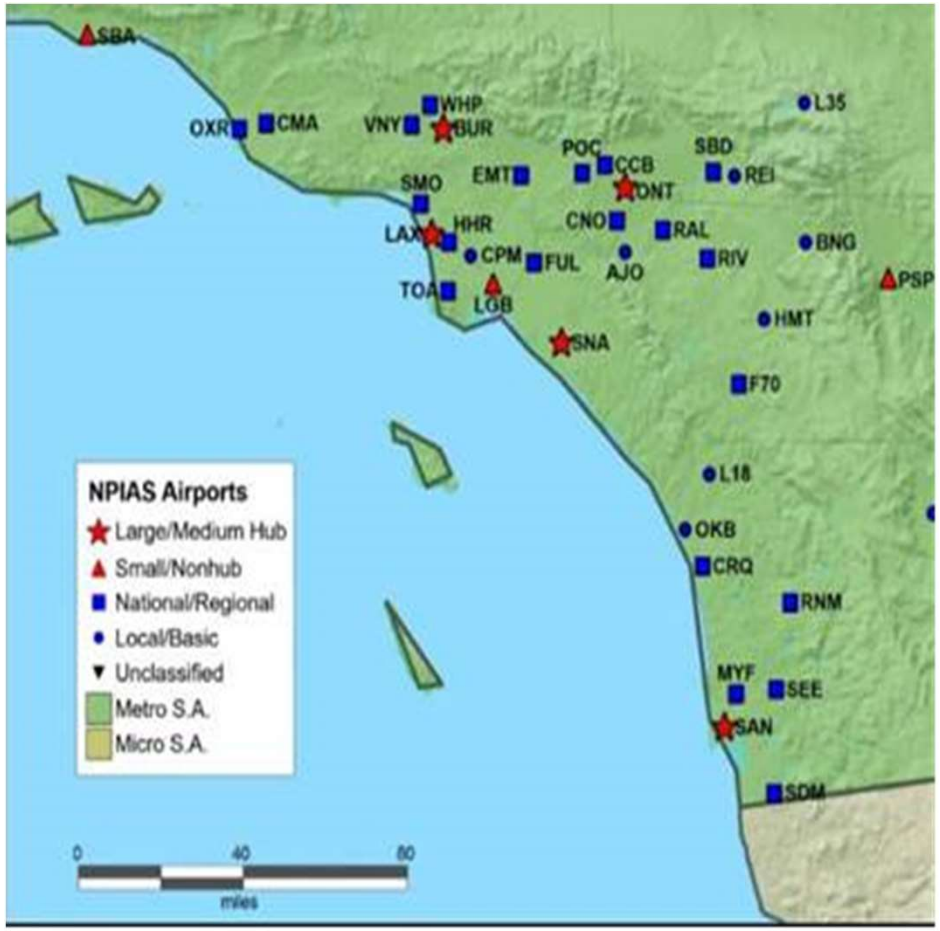
5 Large and Medium Hub Commercial Service Airports

- LAX - Los Angeles International Airport
- SAN - San Diego International – Lindbergh Field
- BUR - Hollywood Burbank Airport
- SNA - John Wayne Airport Orange County
- ONT - Ontario International Airport

3 Small and Non-Hub Commercial Service Airports

- LGB - Long Beach Daugherty Field
- SBA - Santa Barbara Airport
- PSP - Palm Springs International

The region also has 20 General Aviation Airports that are considered “reliever” airports because they function to relieve congestion at nearby commercial service airports



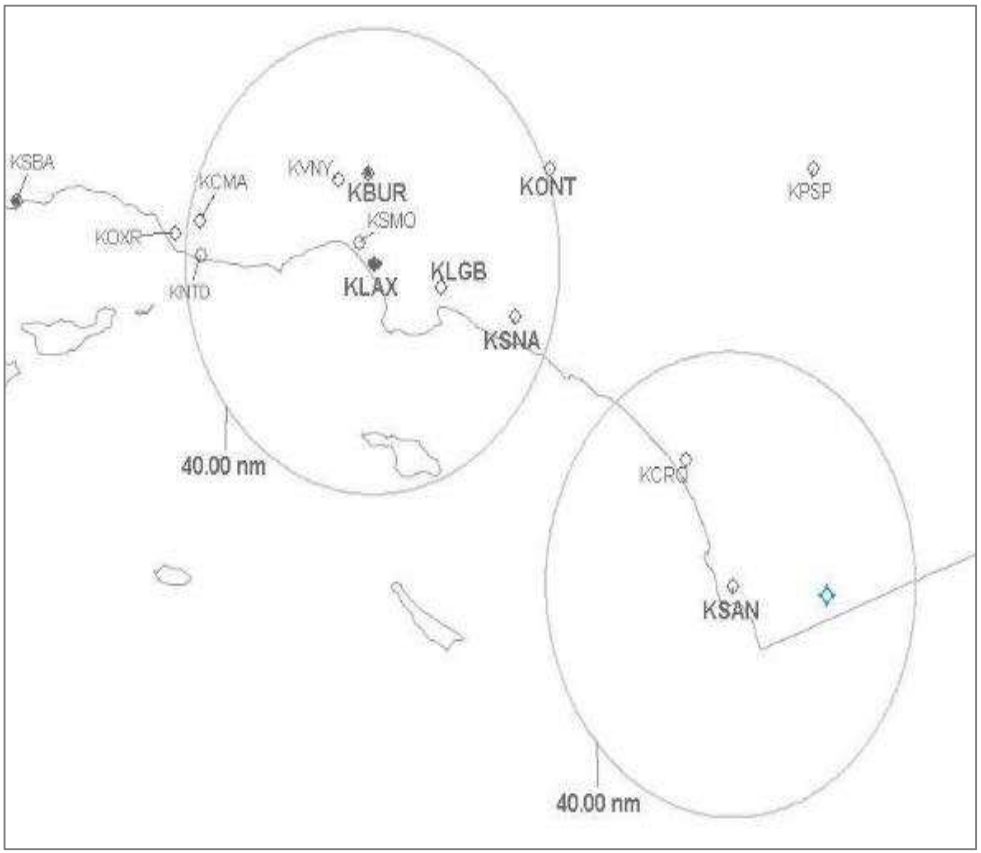
•Source: NPIAS Report to Congress

SoCalMetroplex URL
https://www.faa.gov/nextgen/snapshots/metroplexes/?locationId=18

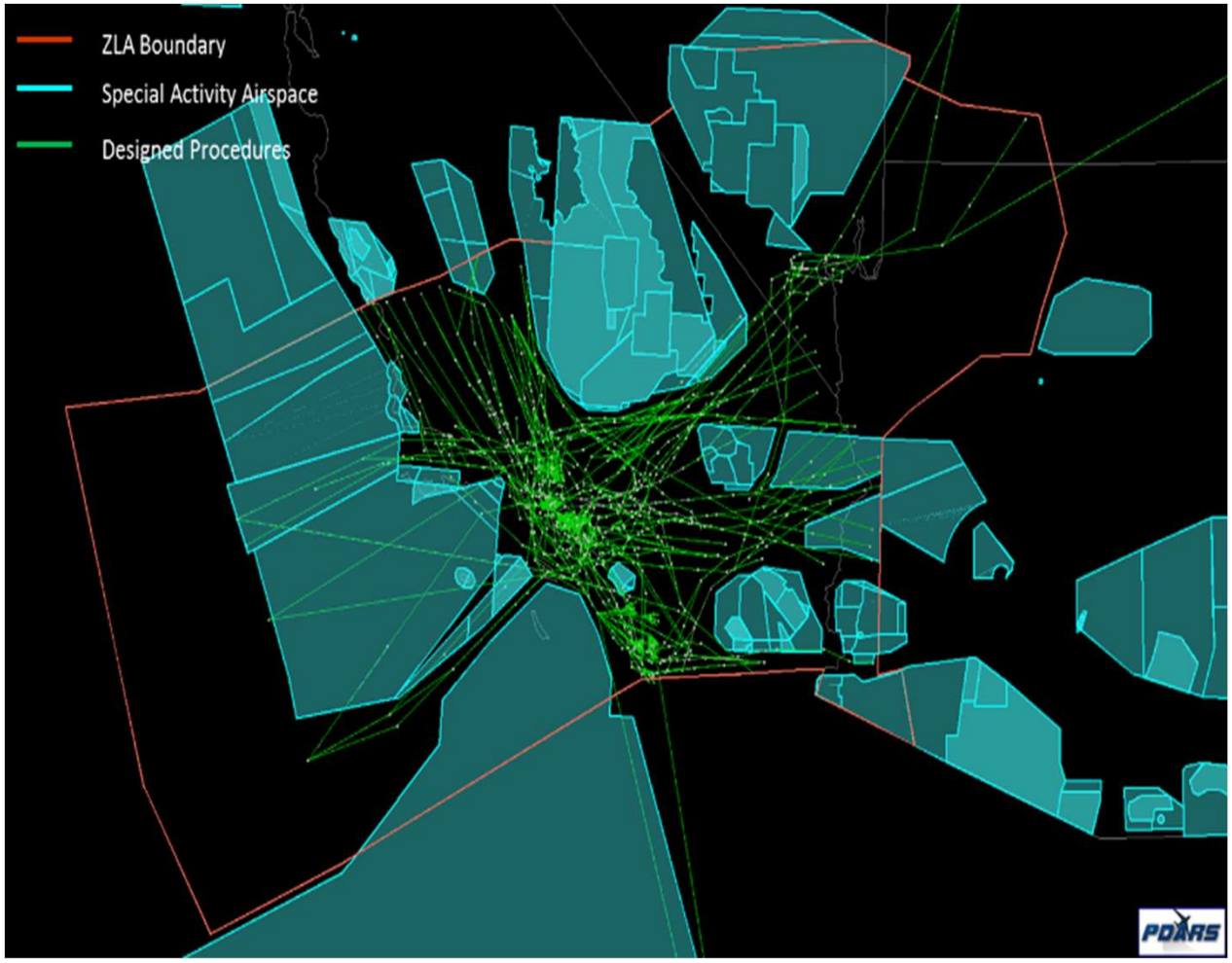
Airspace Design Considerations

Design Considerations:

- **Safety Data**
- **Interacting Procedures**
- **Procedural Design Criteria, including**:
  - Bank angles
  - Climb gradient
  - Leg lengths
- **Military Facilities (e.g., Point Mugu, Edwards AFB)**
- **Military Airspace**
  - Special Activity Airspace (SAA)
- **Precipitous Terrain**
- **Traffic Volume**
- **Aircraft Fleet Mix**



SoCal Special Activity Airspace Constraints

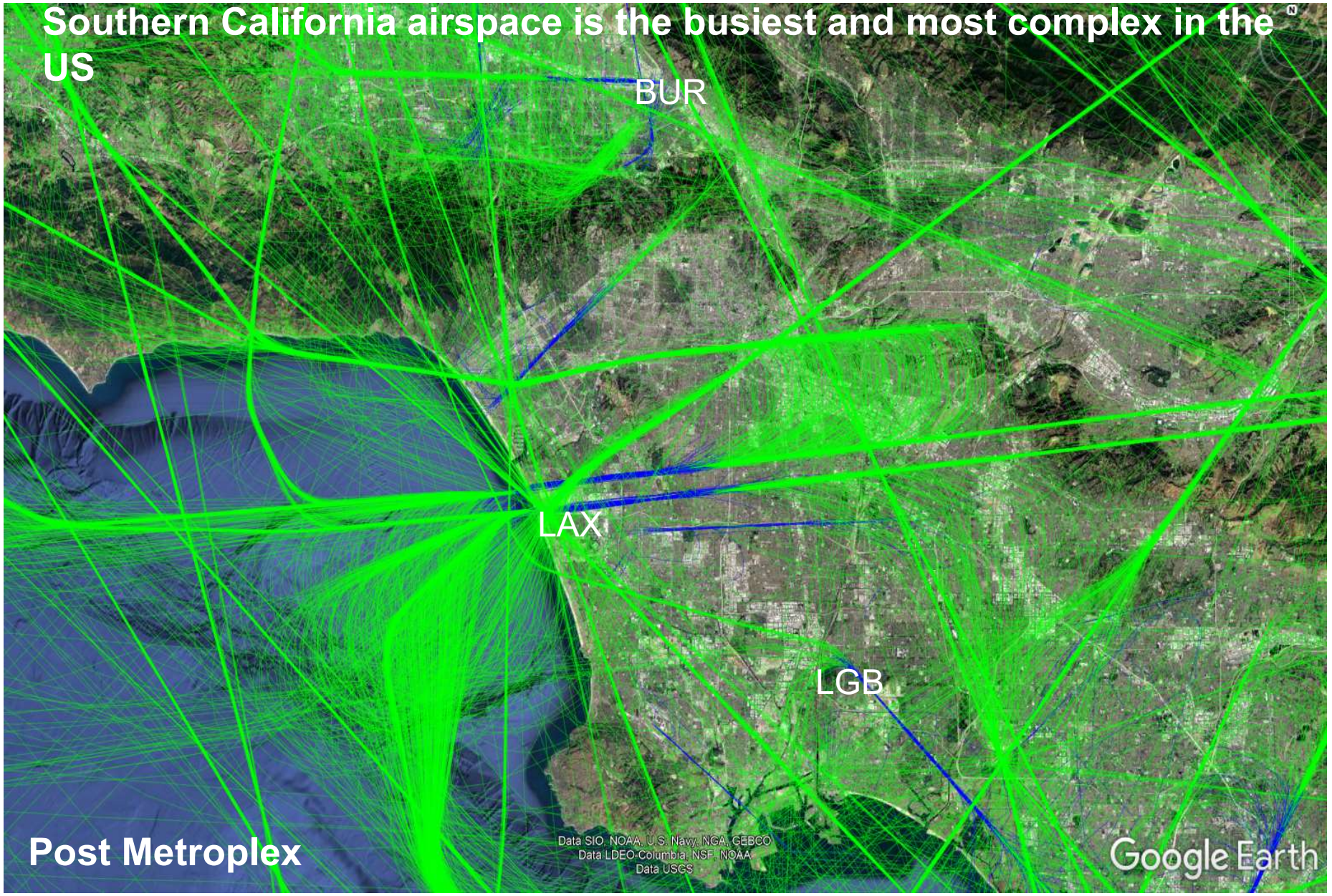


In addition to being the busiest and most complex airspace in the US, Southern California route options are limited by large blocks of Special Activity Airspace*

The FAA cannot design air traffic routes that go through Special Activity Airspace

*airspace with limitations imposed upon aircraft operations; may be restricted areas, prohibited areas, military operations areas, air ATC assigned airspace, and any other designated airspace areas

Southern California airspace is the busiest and most complex in the US



From the FAA Aerospace Forecast FY2019-2039

"...over the medium and long term, **aviation demand is driven by economic activity**, and a growing U.S. and world economy provides the basis for aviation to grow over the long run. The 2019 FAA forecast calls for U.S. air carrier domestic passenger growth to average 1.8% per year."

"**Los Angeles is the world's third largest metropolitan economy**"
– Los Angeles Mayor Eric Garcetti, 2019 State of the City Speech

"Los Angeles had 50 million visitors in 2018, who spent $24 billion in the region"

"Tourism supported over 500,000 jobs in LA County's leisure and hospitality sector"

"Tourism's economic impact in Los Angeles in 2018 was $36.6 billion"
-- Los Angeles Tourism and Convention Board

BUR - Economic Impact

Economic and fiscal impact in LA County of the Burbank Airport including airport revenues, the contribution made by on-site tenants and concessionaires, off-site spending of passenger and crew deplaning at the airport and capital expenditures during the fiscal year:

- 12,440 jobs
- Generating $663 million in labor income / $1.8 billion in business revenues
- Generating $122 million in state and local taxes

Source: LA County Economic Development Corporation
"Burbank Bob Hope Airport in FY2013: Economic Impact Analysis"
April 2014.

VNY - Economic Impact

Economic and fiscal impact of VNY including airport revenues, on-site tenants, and off-site spending of incoming visitors:

- 10,480 jobs
- Generating $675 million in labor income / $2.0 billion in business revenues
- Generating $125 million in state and local taxes / $170 million in federal tax revenues

- In addition, other ongoing capital improvements was another source of economic benefit
- Supports over 670 additional jobs
- Generating $37.2 million in labor income / $107.5 million in business revenues
- Generating $4.5 million in state and local taxes / $8.5 million in federal tax revenues

Source: LA County Economic Development Corporation
"Los Angeles World Airports: Van Nuys Airport in 2015 An Economic Impact Analysis" November 2016.

Economic Benefits of Aviation

SOURCE: FAA Air Traffic Organization

5.1% of U.S. GDP

10.6 Million
U.S. jobs

$1.6 Trillion
in U.S. economic activity annually

$59.9 Billion

•of U.S. Trade Balance (exports-imports)

Aviation equipment (aircraft, spacecraft, and related equipment) is largest export sector in U.S. economy accounting for over 8% of total exports.

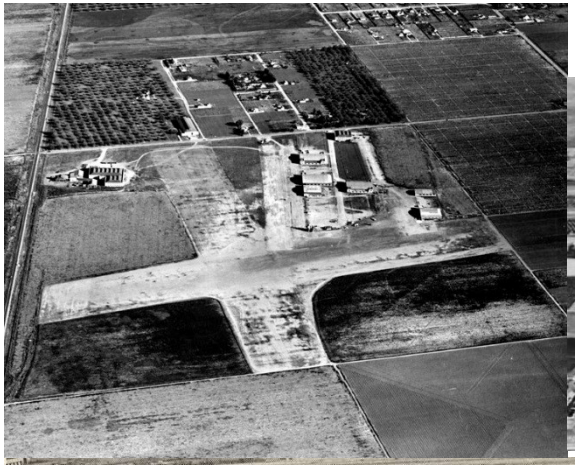
SOURCE: U.S. International Trade Commission

The History of Two Airports

By: Clark Desing

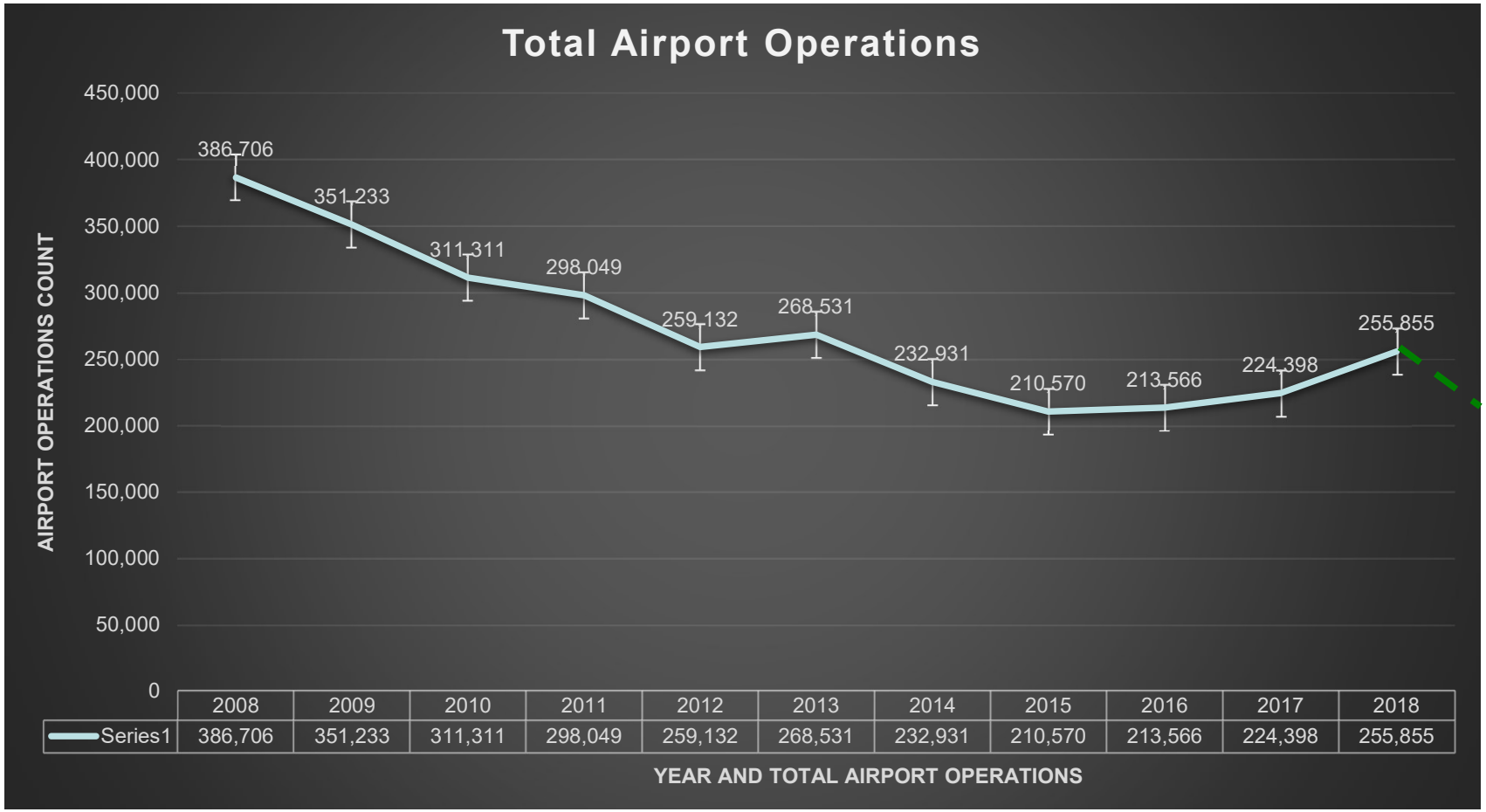
Date: July 30, 2019

History of Van Nuys (VNY)



- **Opened December 1928.**
- **U.S. Army took control of airport in 1941.**
- **Home to many military aircraft:**
  - P-80's first test flight.
  - P-38 Lightning.
  - F-86 jets.
- **City of Los Angeles bought airport in 1949.**
- **Voluntary Noise abatement and Curfew Ordinance was implemented in the 1980's.**

VNY Airport Operations Yearly Traffic Count (OPSNET)

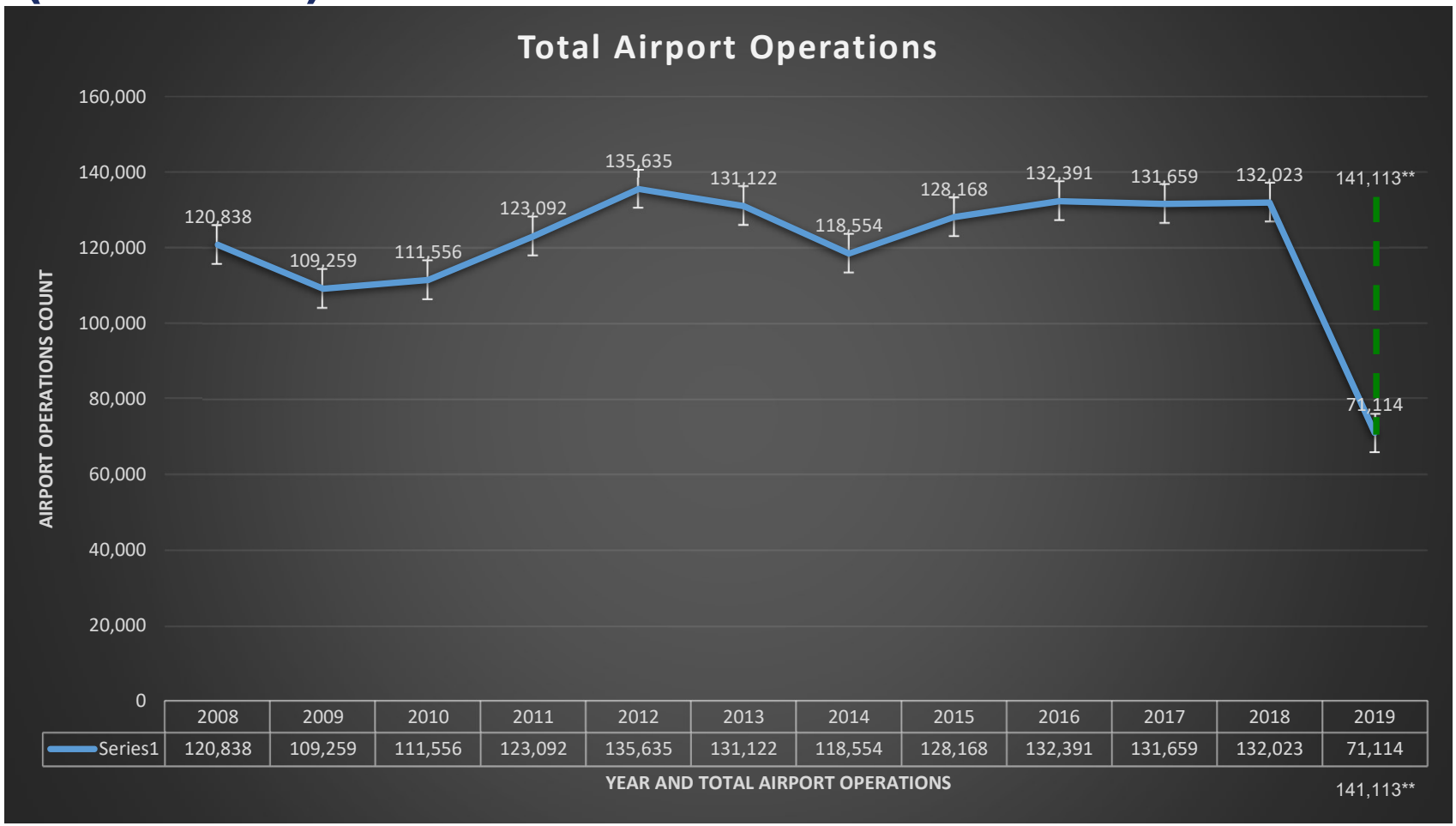


*** Green dashed line is 2019 project of total airport operations***

History of Burbank (BUR)

- **Opened in 1930 as United Airport.**
- **Renamed United Air Terminal in 1934.**
- **Lockheed bought airport in 1940 and renamed it "Lockheed Air Terminal."**
- **Jet service arrived in 1960's**
- **Home to many aircraft:**
  - Douglas DC-4
  - Lockheed L-188 turboprop
  - Boeing 727-100s/737/767
  - DC-9/DC-10
- **1973 U.S. Supreme Court overturned Airport Curfew ordinance.**
- **1978 Lockheed sold to Burbank Glendale Pasadena Airport Authority.**
- **Home of the "Skunk Works" program (1943 to 1989)**

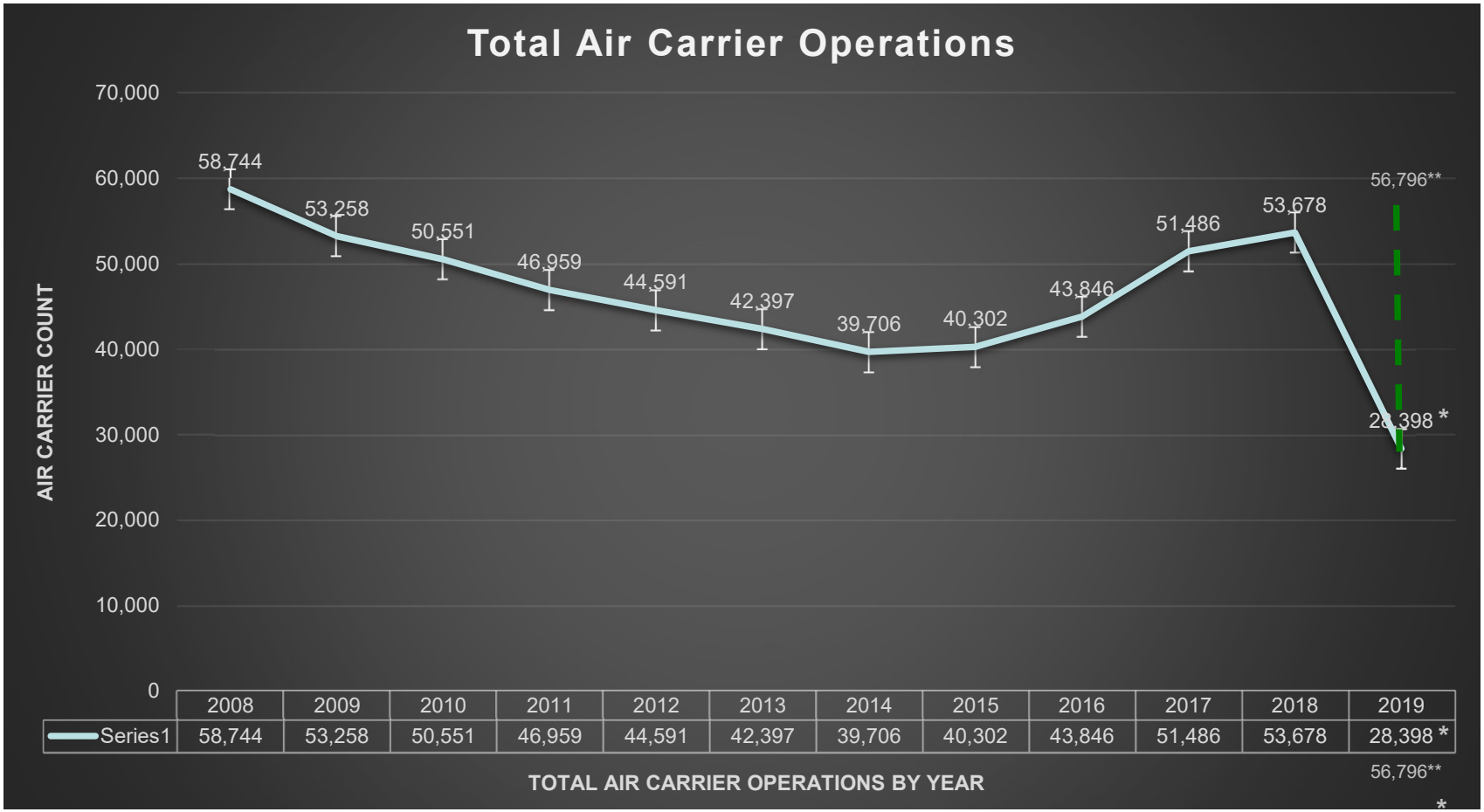
BUR Airport Operations Yearly Traffic Count (OPSNET)



** 2019 data only includes count through June*

*** Green dashed line is 2019 project of total airport operations*

BUR Air Carrier Yearly Traffic Count (OPSNET)



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***** Green dashed line is 2019 project of total airport operations***

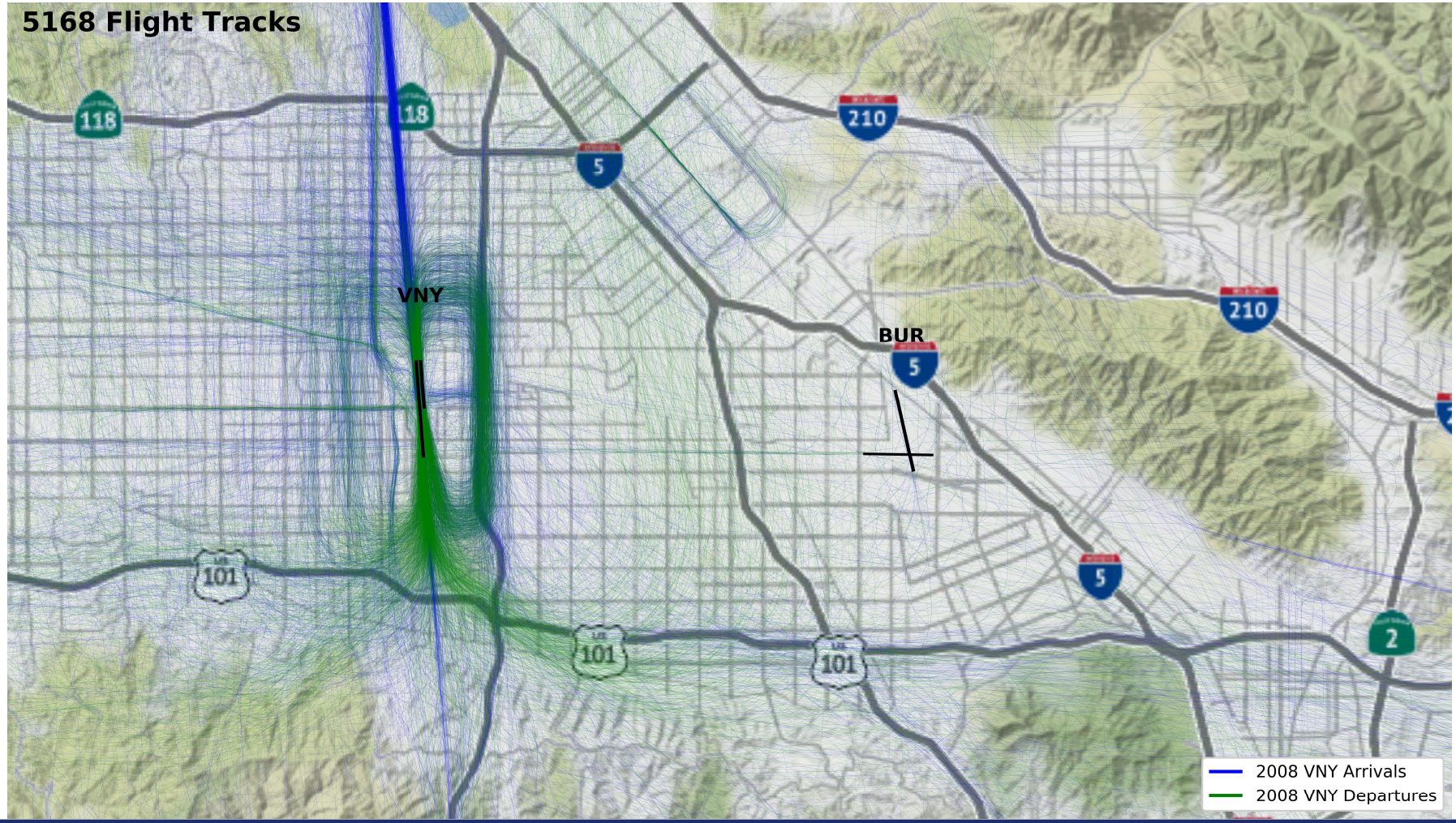
Overview

- **14 random days of flight tracks from VNY and BUR were used, except in 2019 where only 7 random dates were used.**
- **Same dates used for each of the years starting in 2008 except in 2019 where only 7 days was used.**
- **All track data displayed is sourced from PDARS.**
- **All traffic count data was obtained from Operational Network (OPSNET).**
- **Dates generated by a "random calendar date generator" (Random.org).**

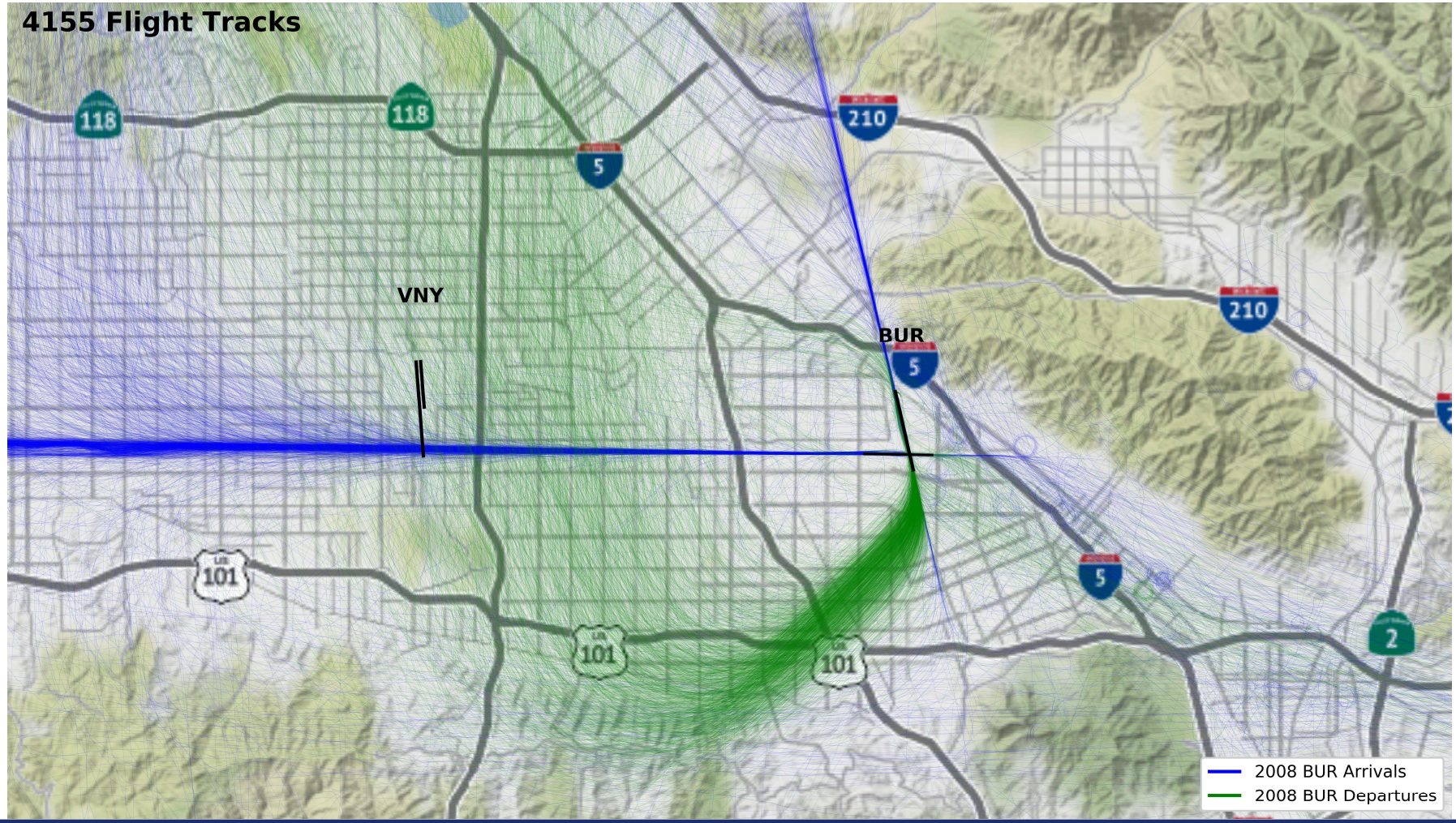
Overview

- **The initial Metroplex changes occurred in March 2, 2017.**
- **First Area Navigation (RNAV) departures were implemented at VNY and BUR on March 2, 2017.**
- **Both VNY and BUR have seen an overall increase in traffic over the last 3 years.**
- **The following items were not analyzed:**
  - Airline flight schedules
  - General Aviation flight schedules
  - Weather/Temperature

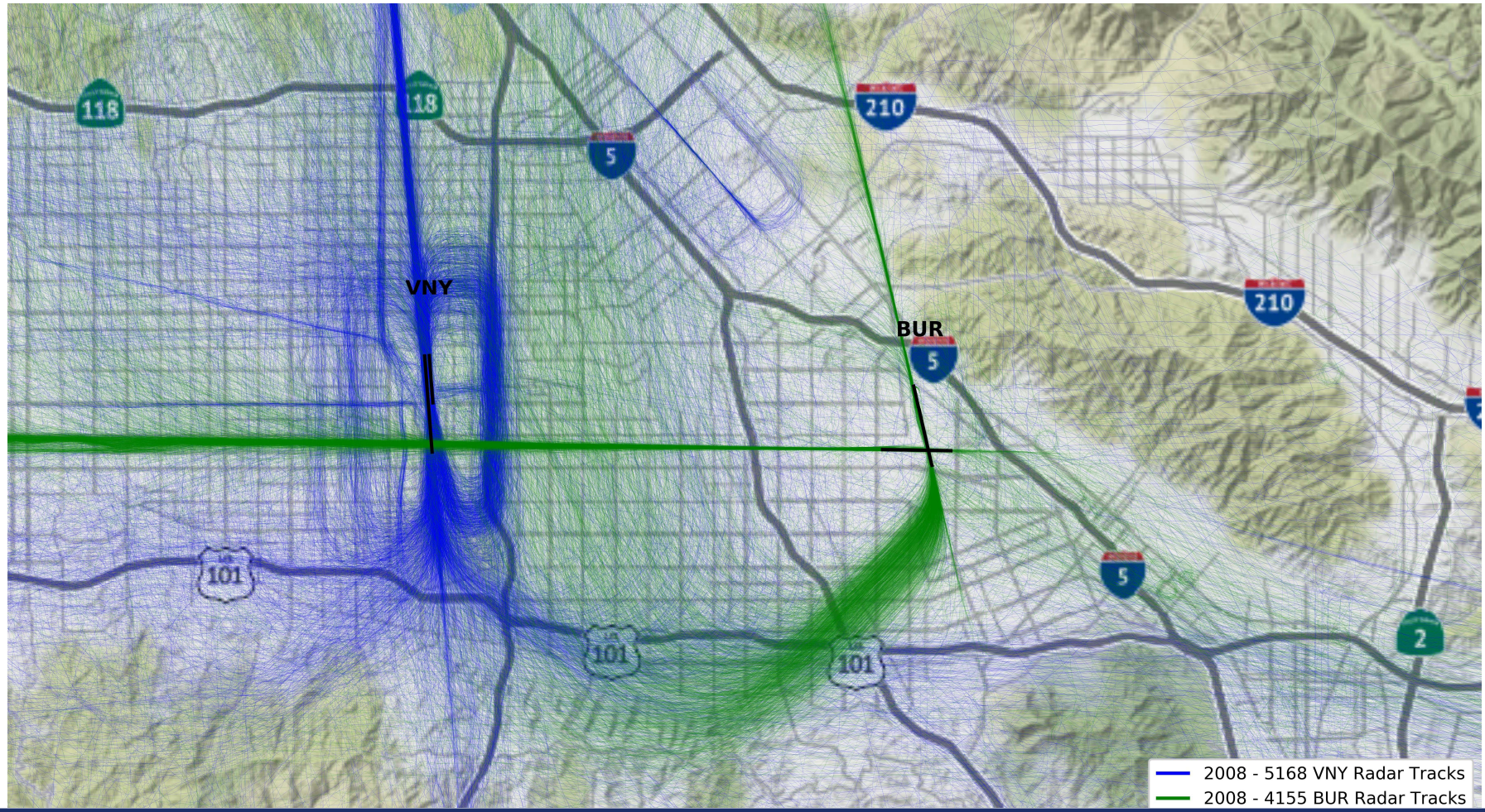
VNY Flight Tracks 2008



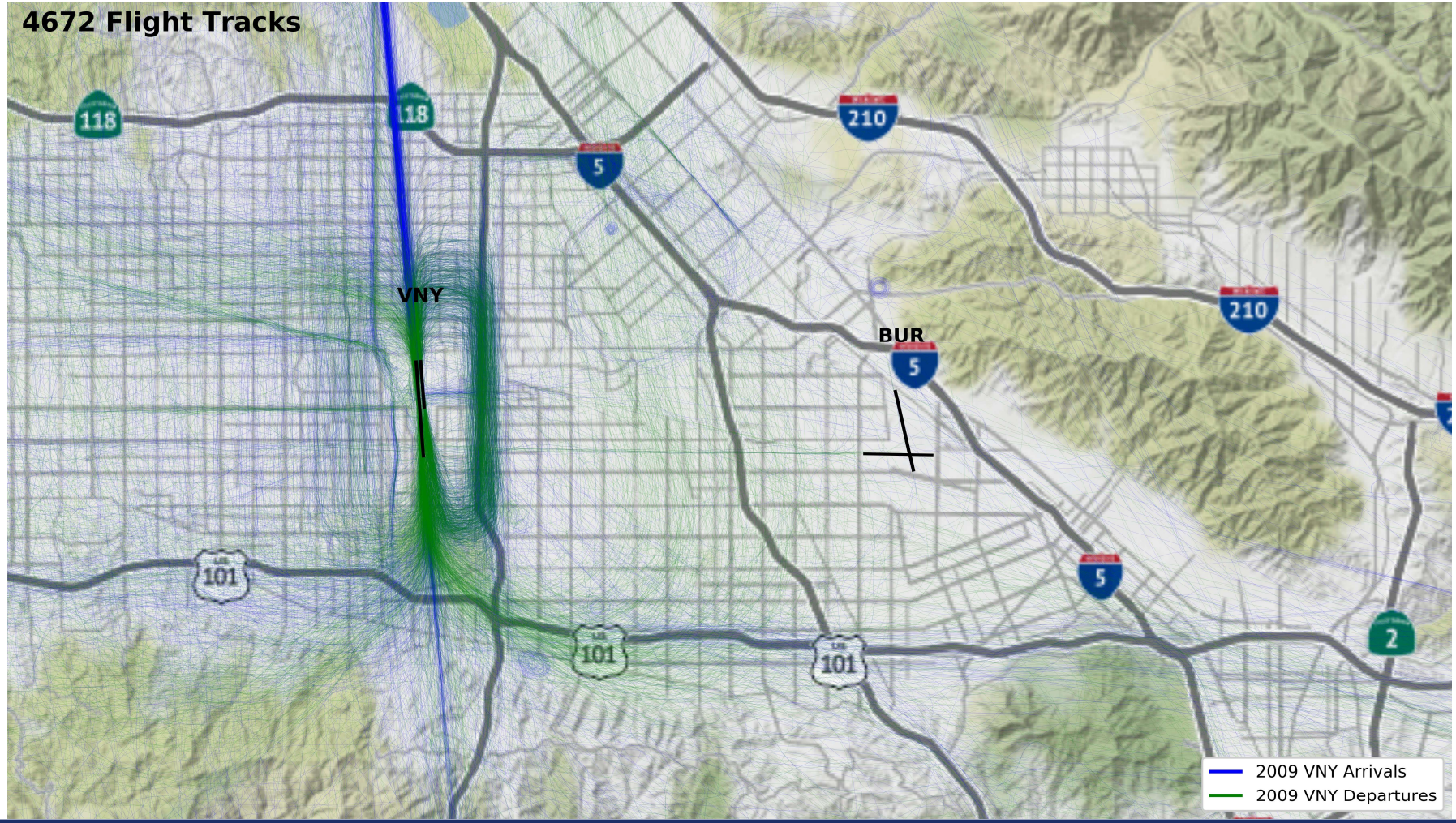
BUR Flight Tracks 2008



VNY and BUR Flight Tracks Combined 2008



VNY Flight Tracks 2009



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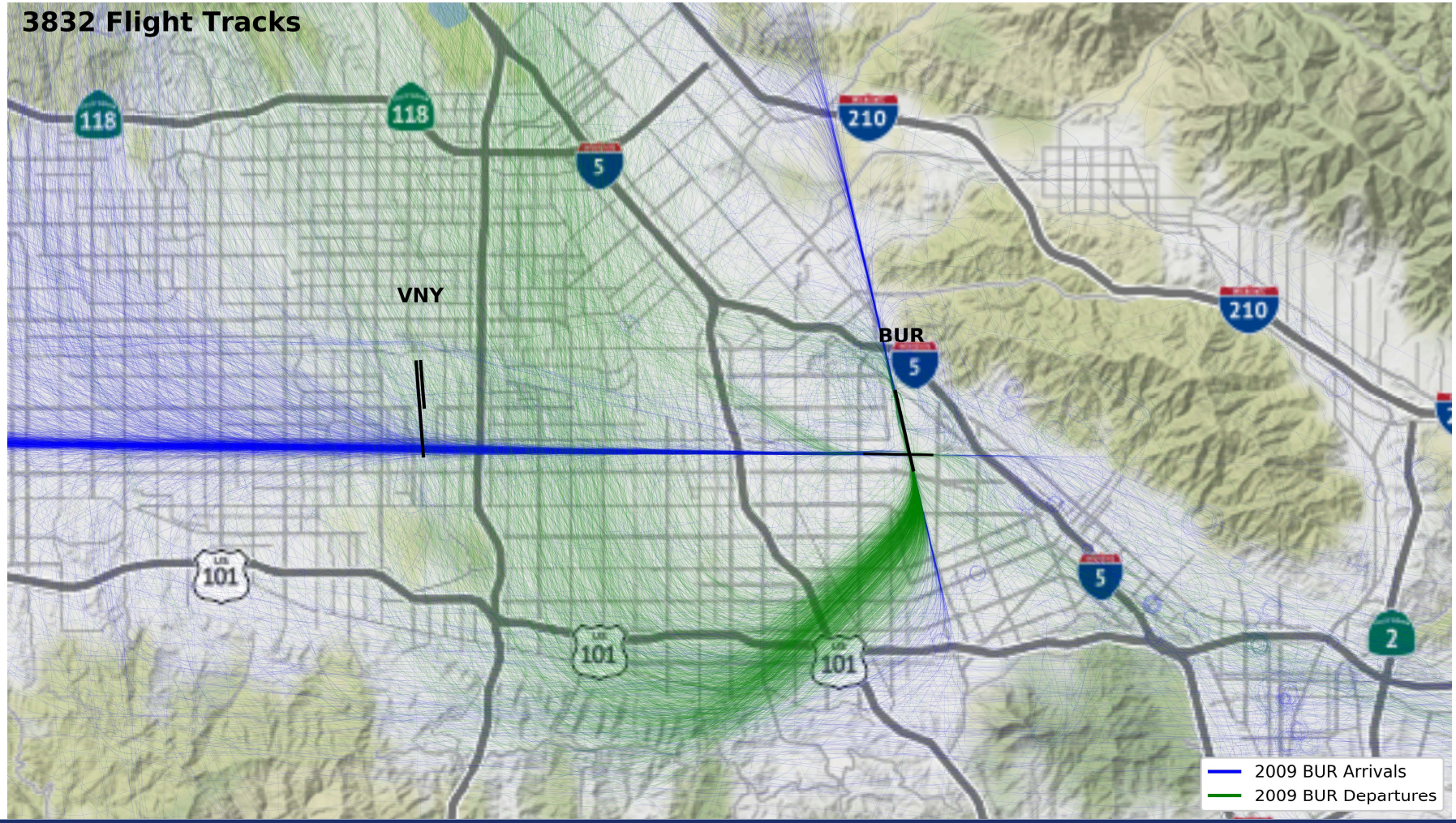

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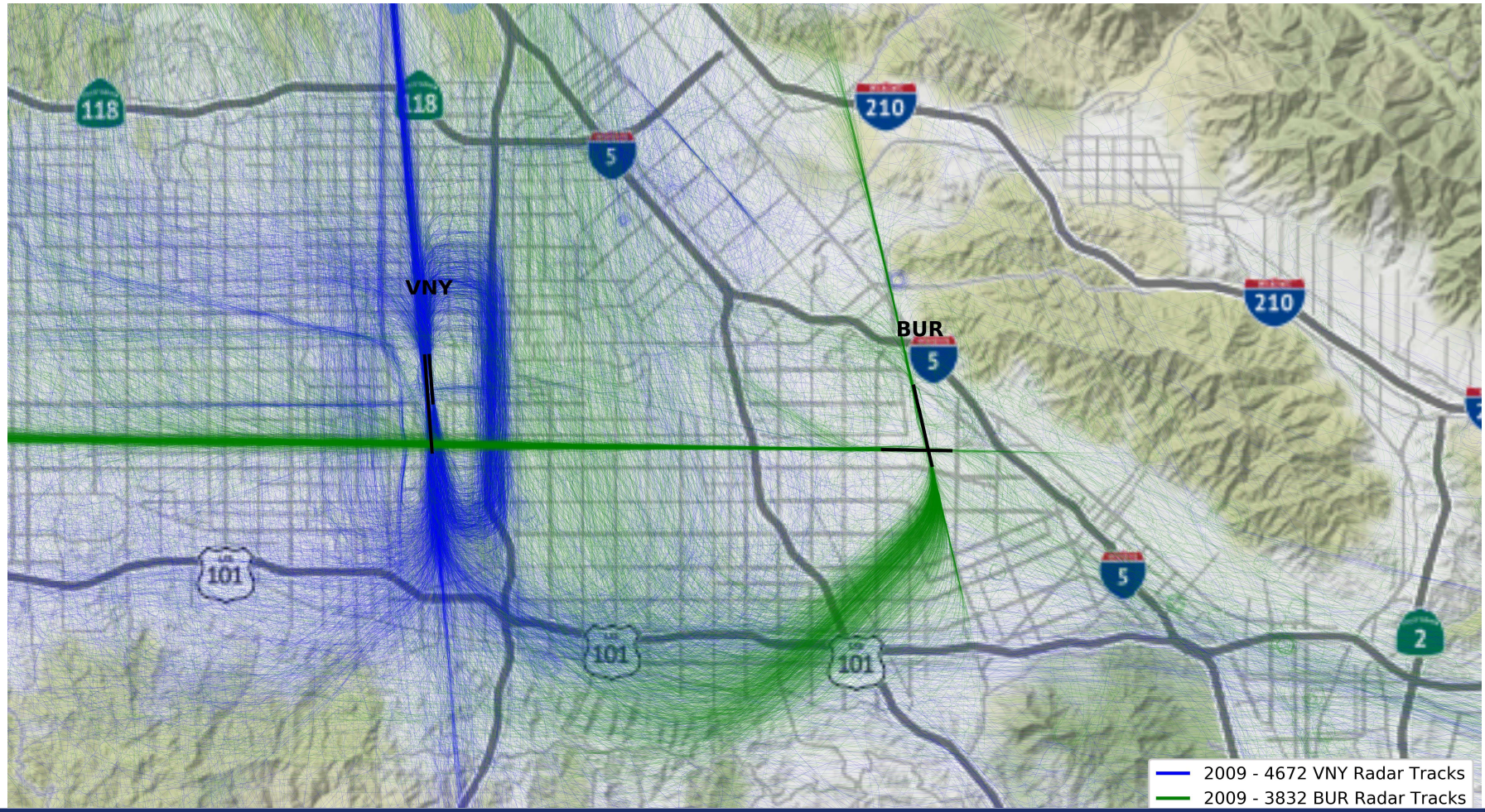

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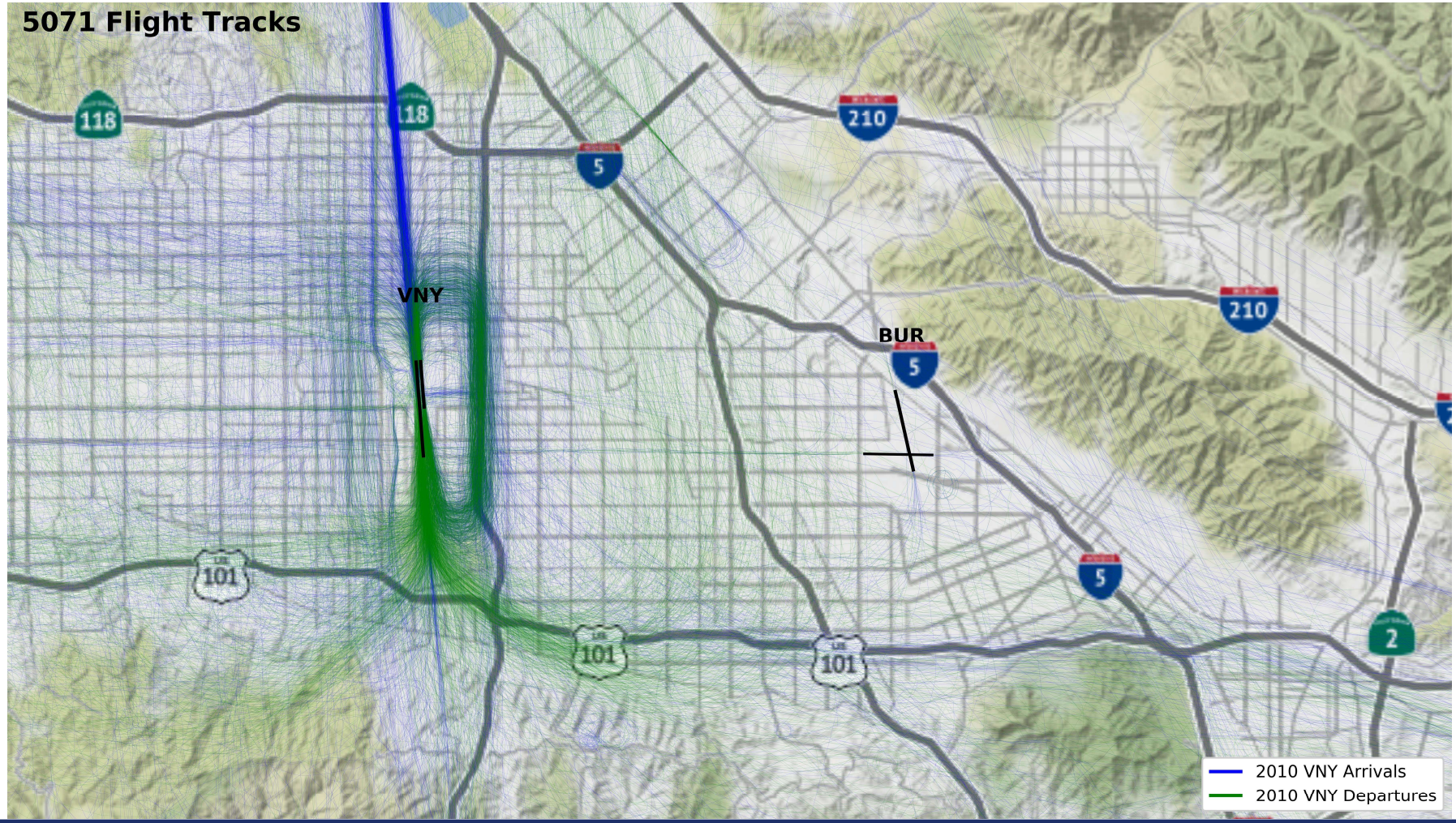

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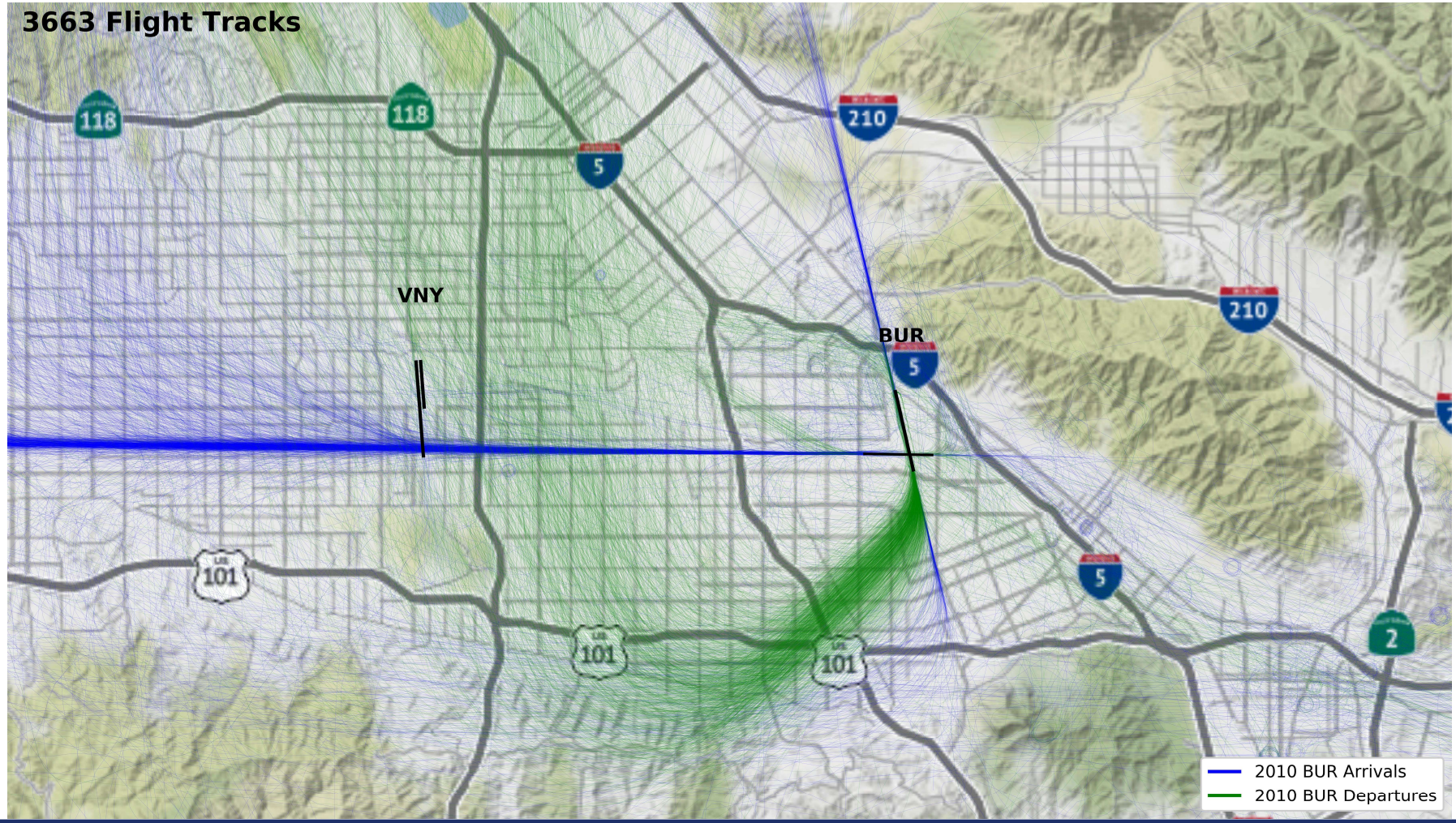

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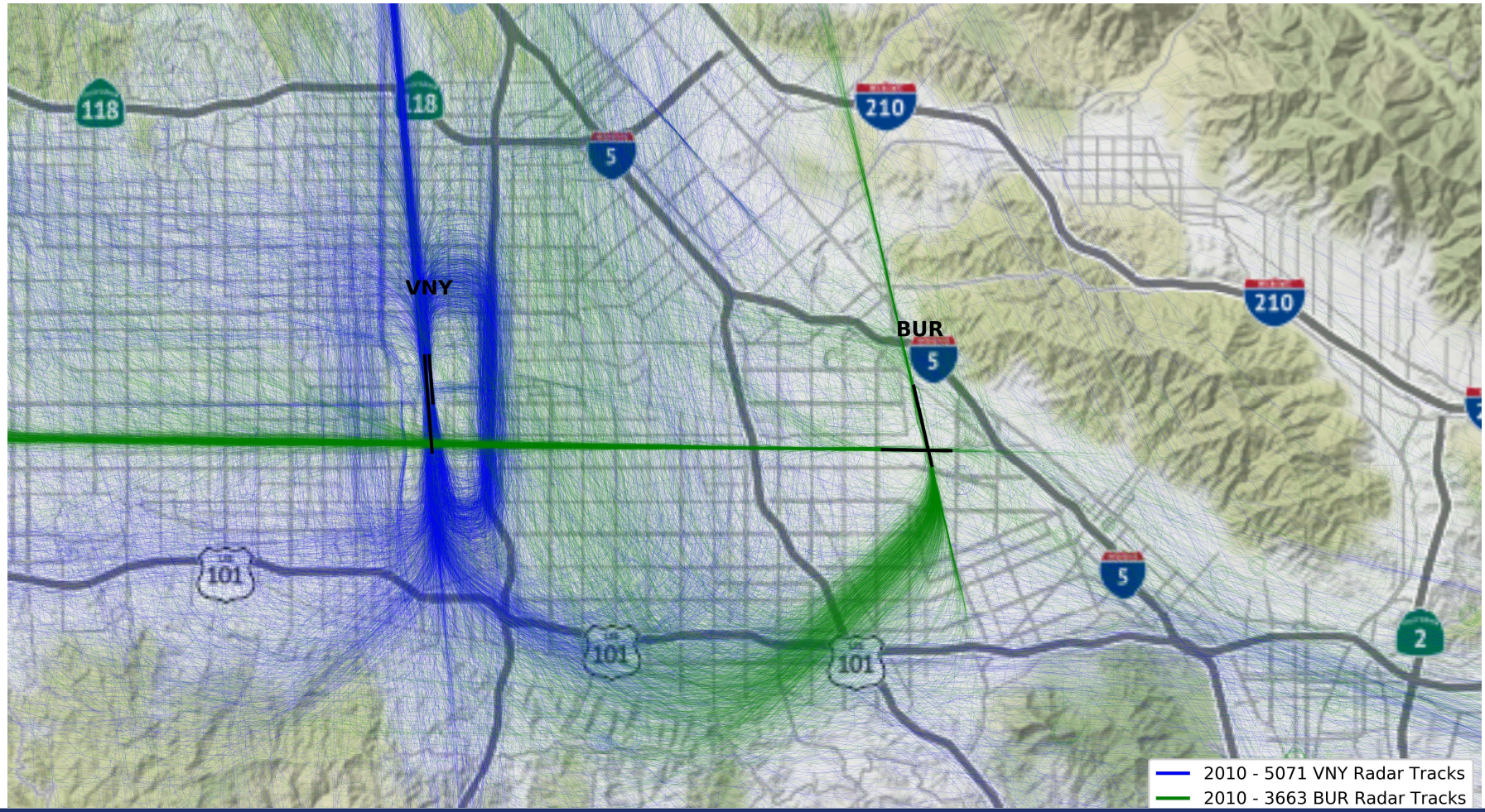

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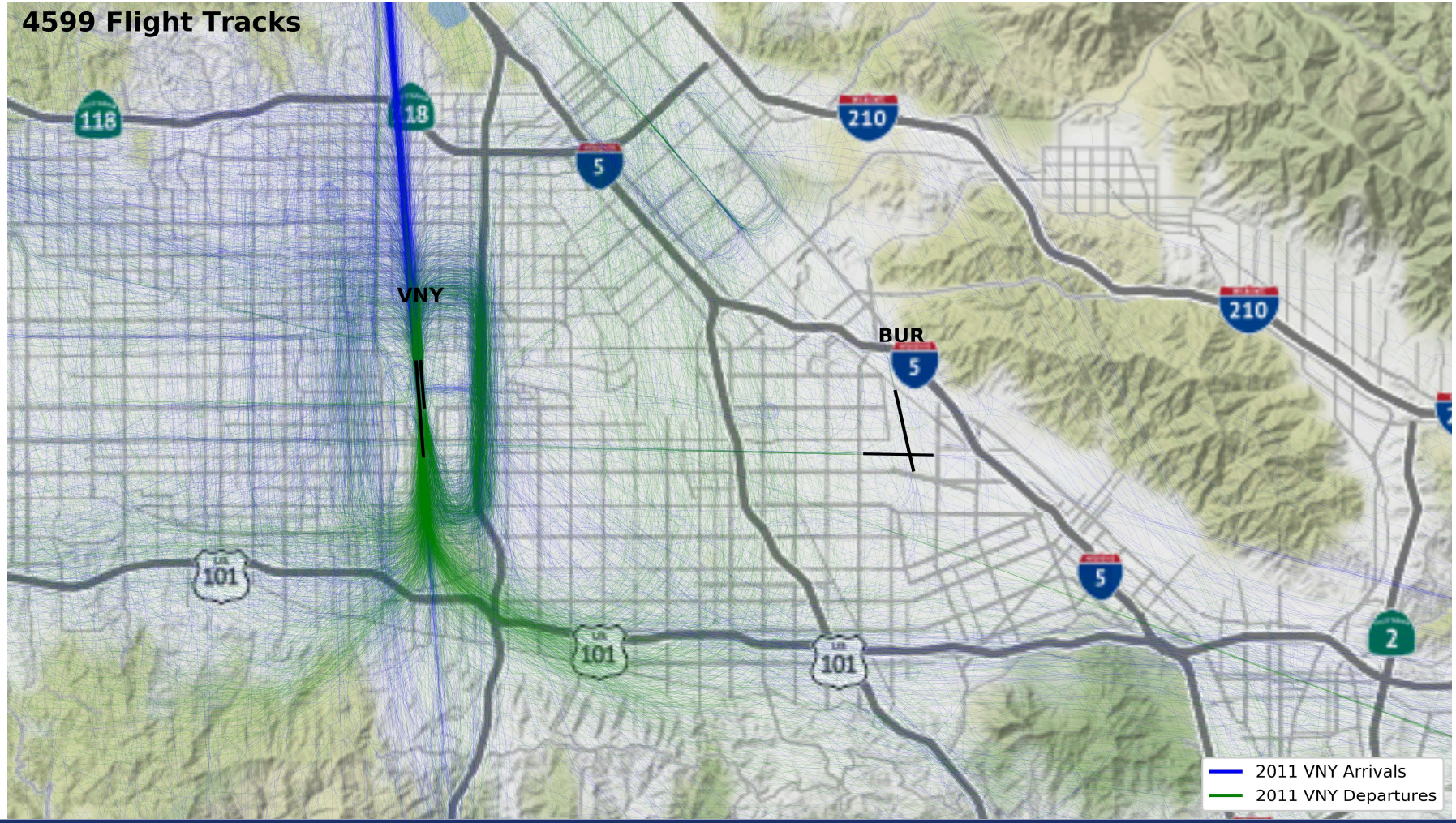

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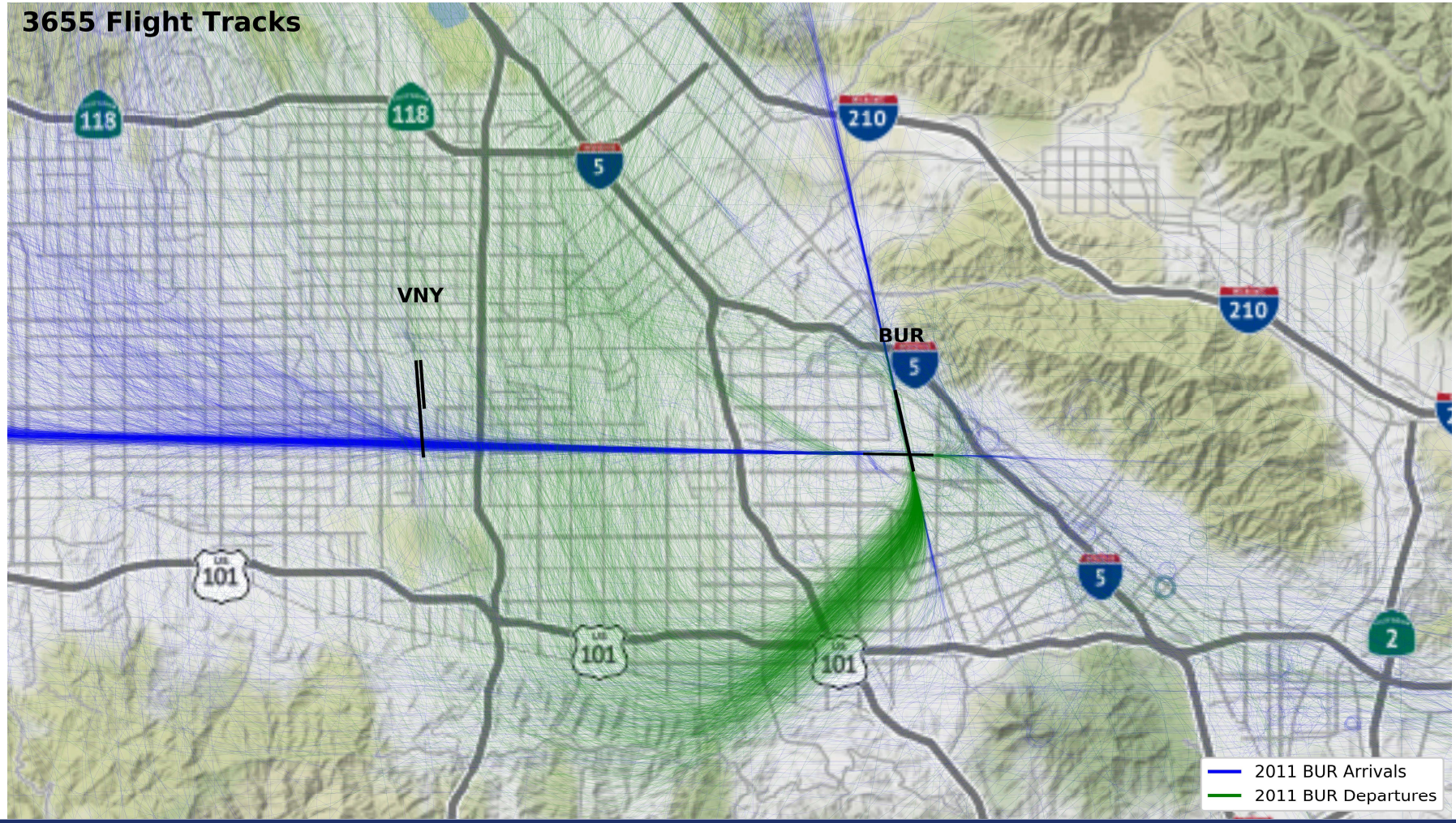

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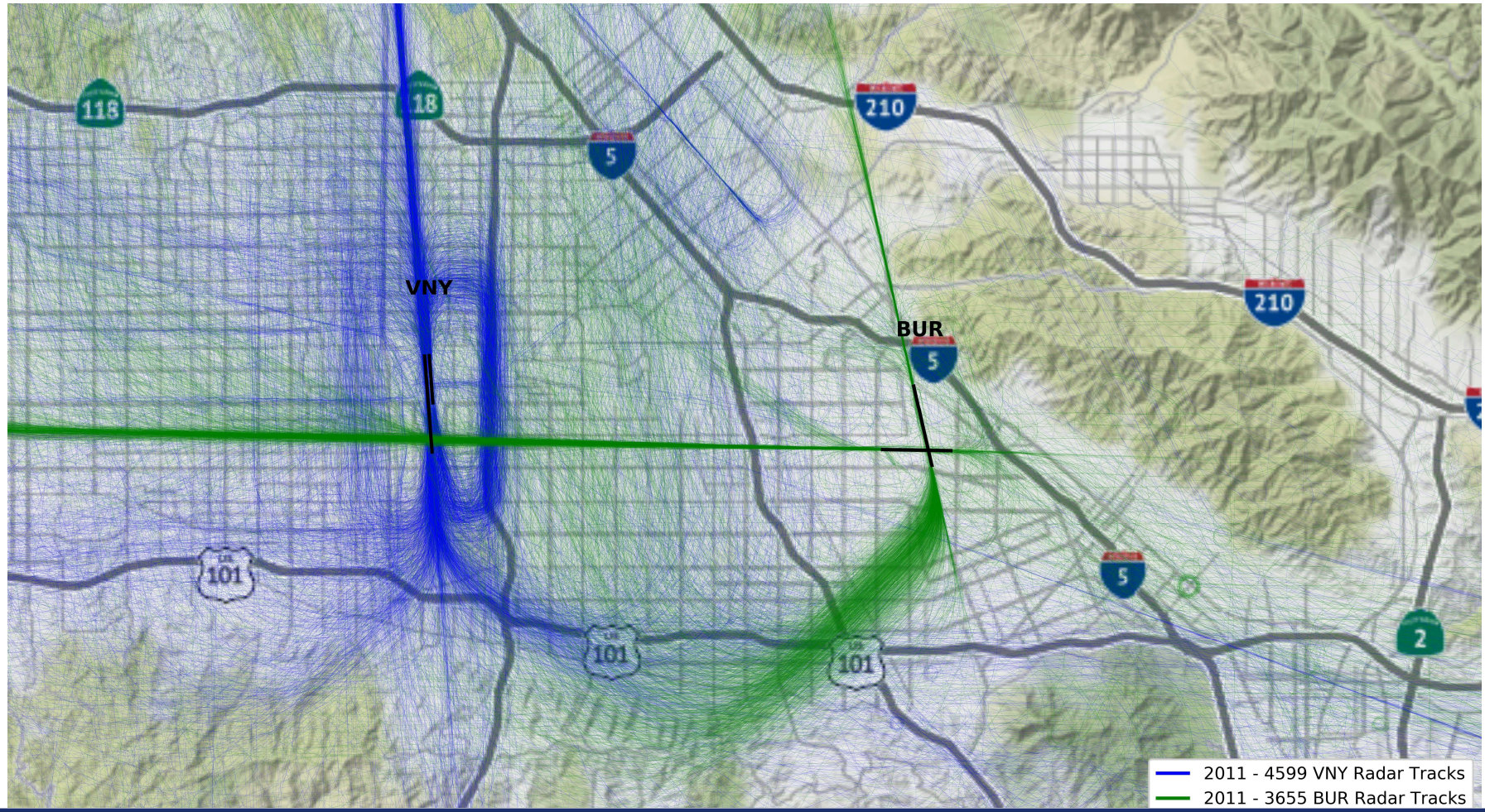

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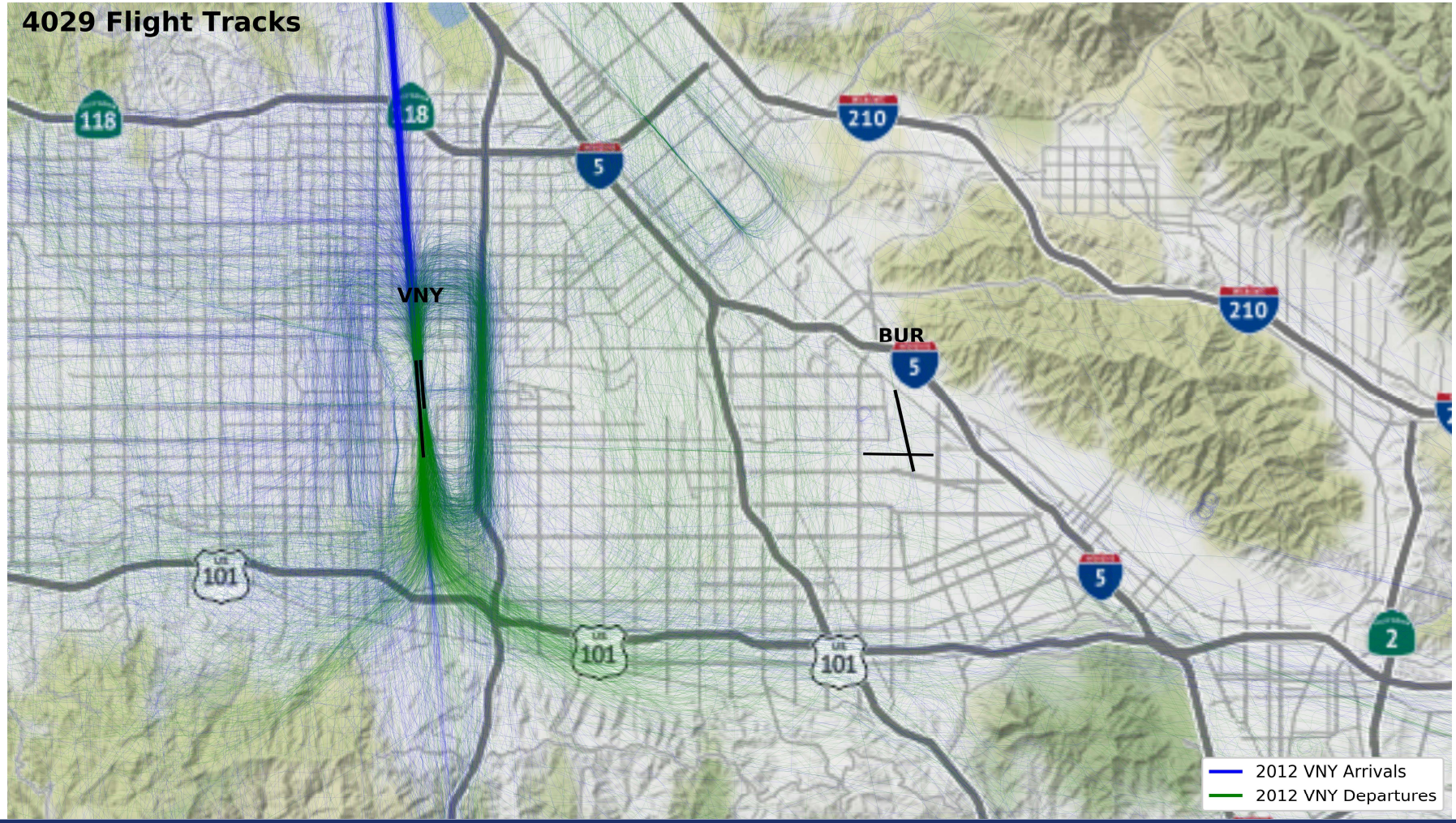

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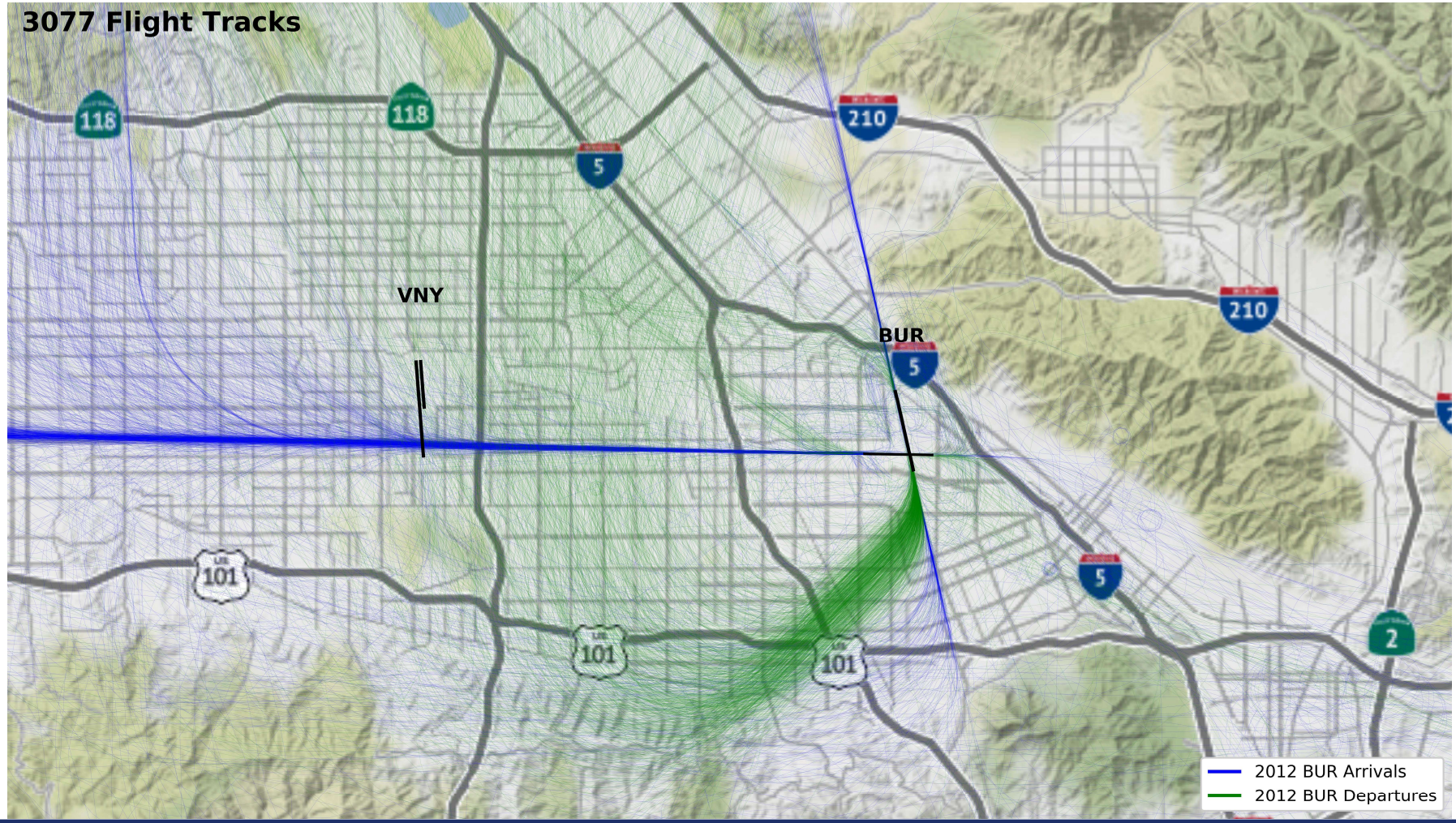

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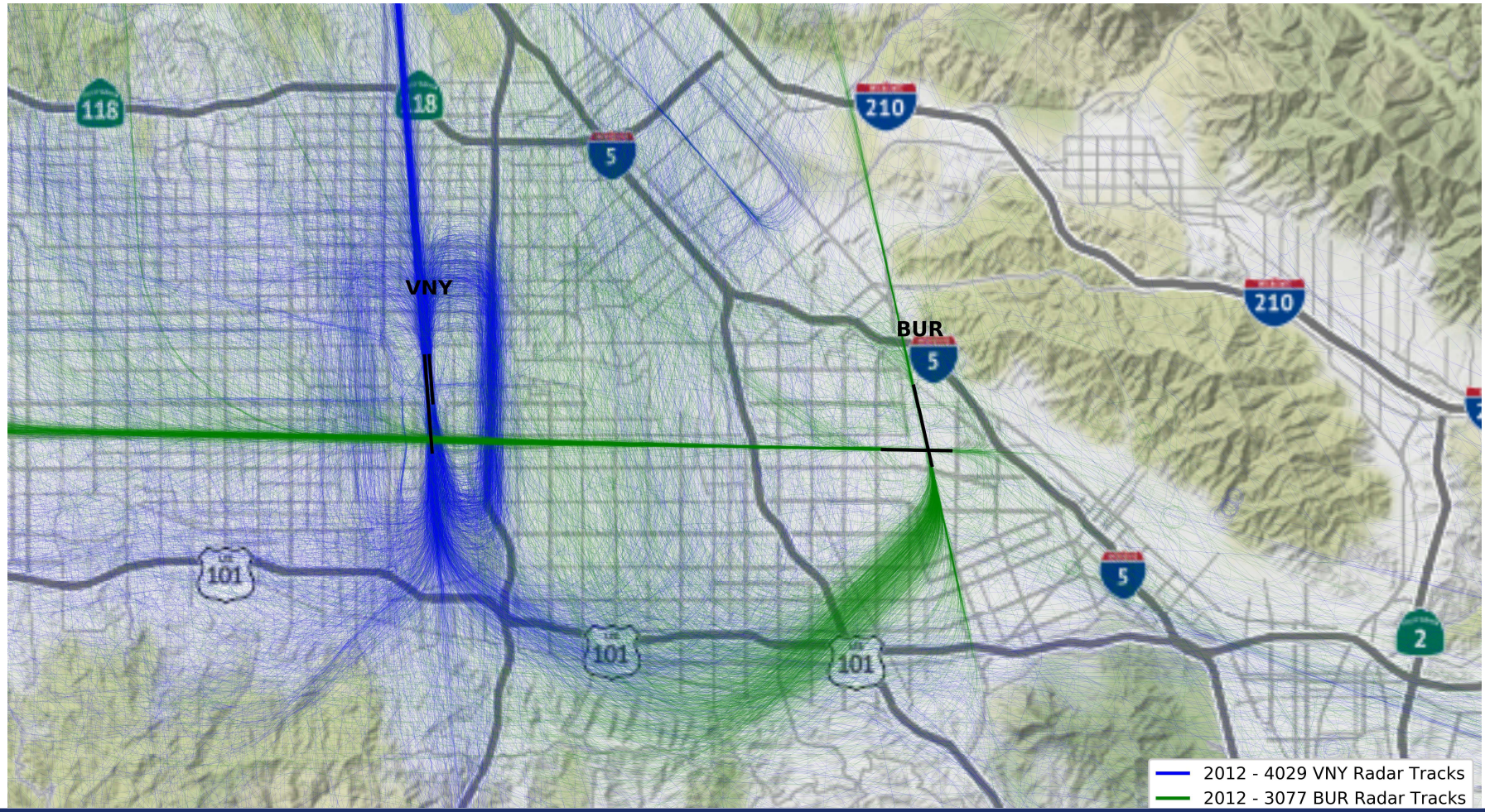
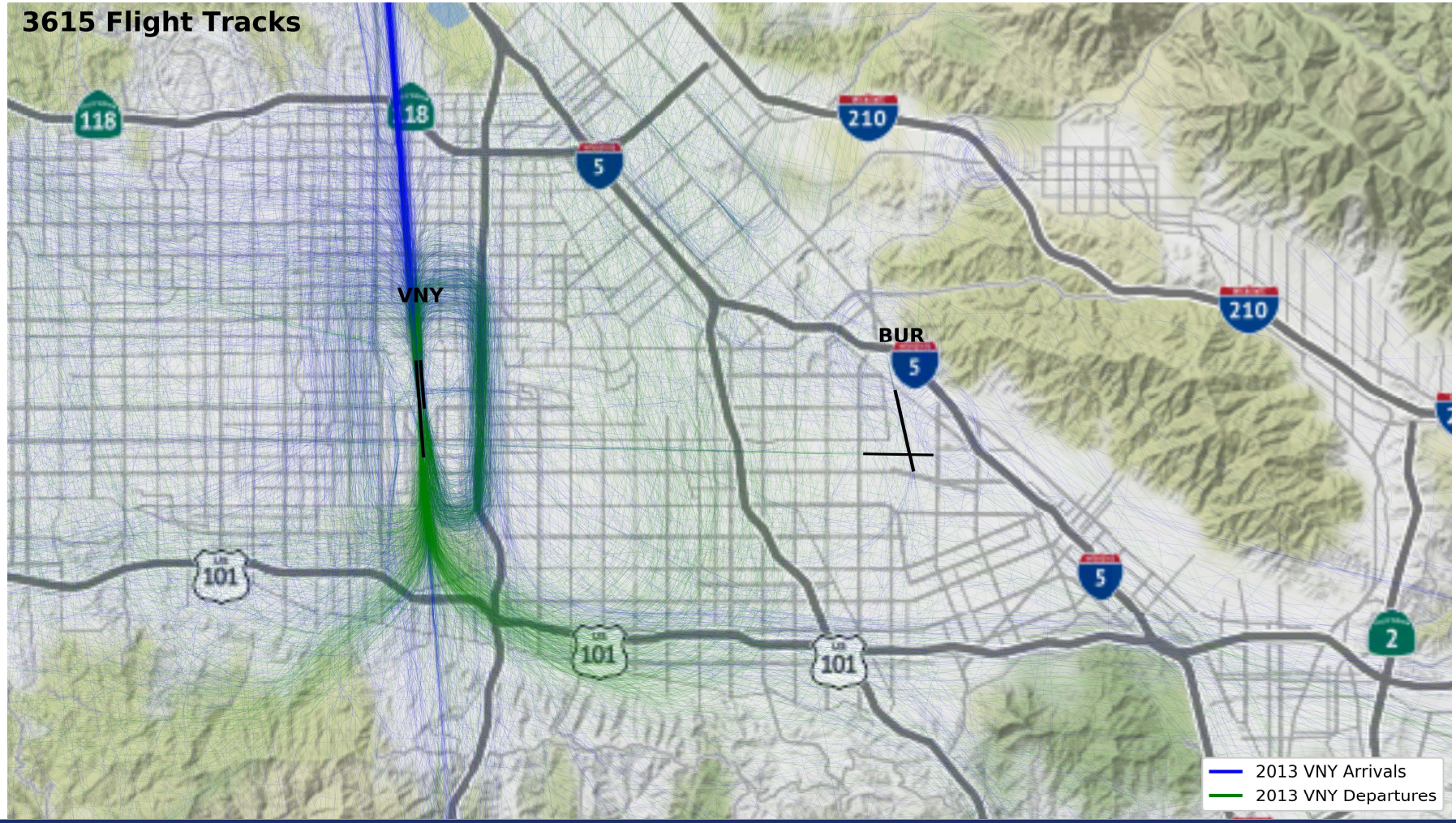


VNY Flight Tracks 2013



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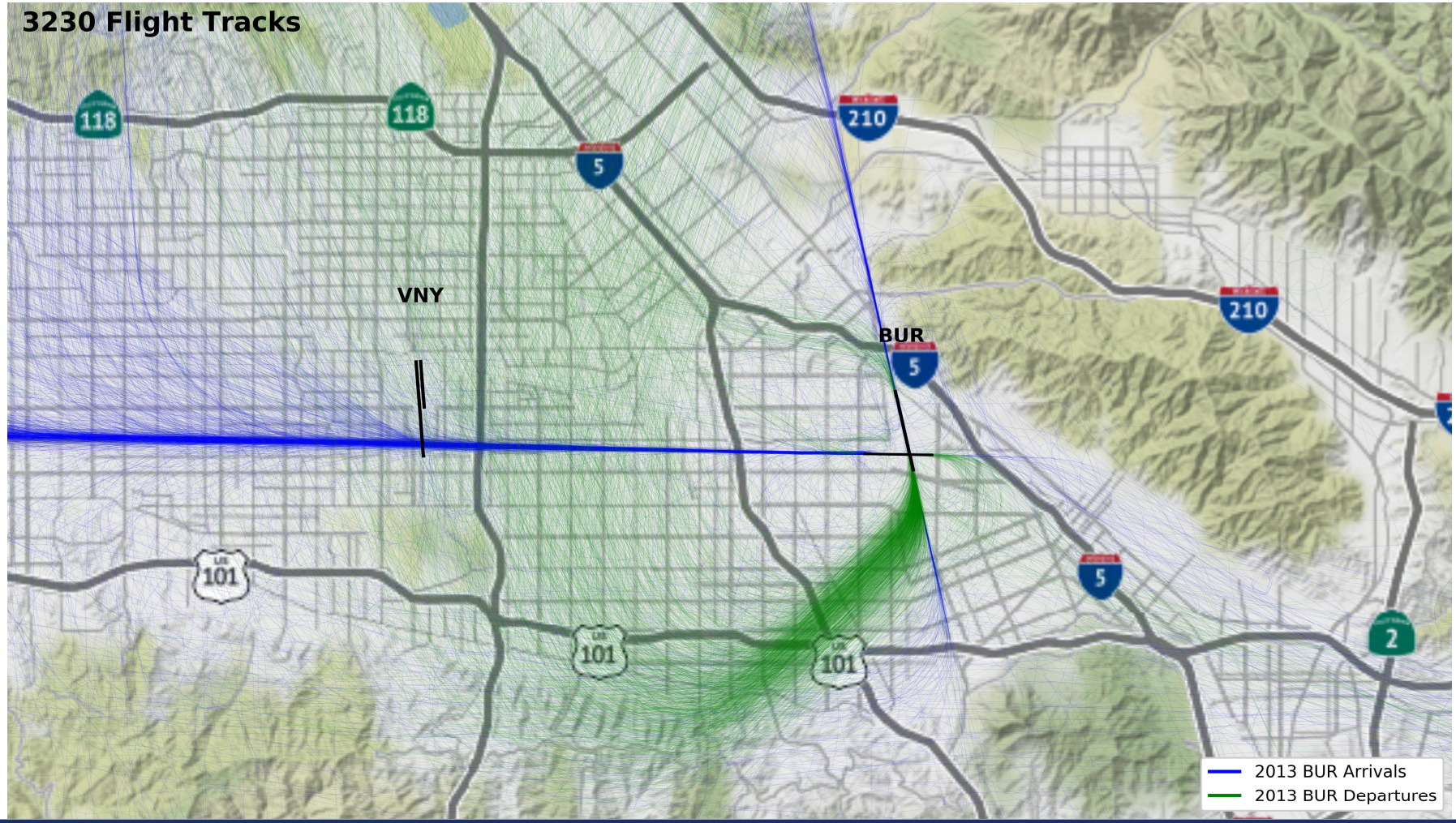

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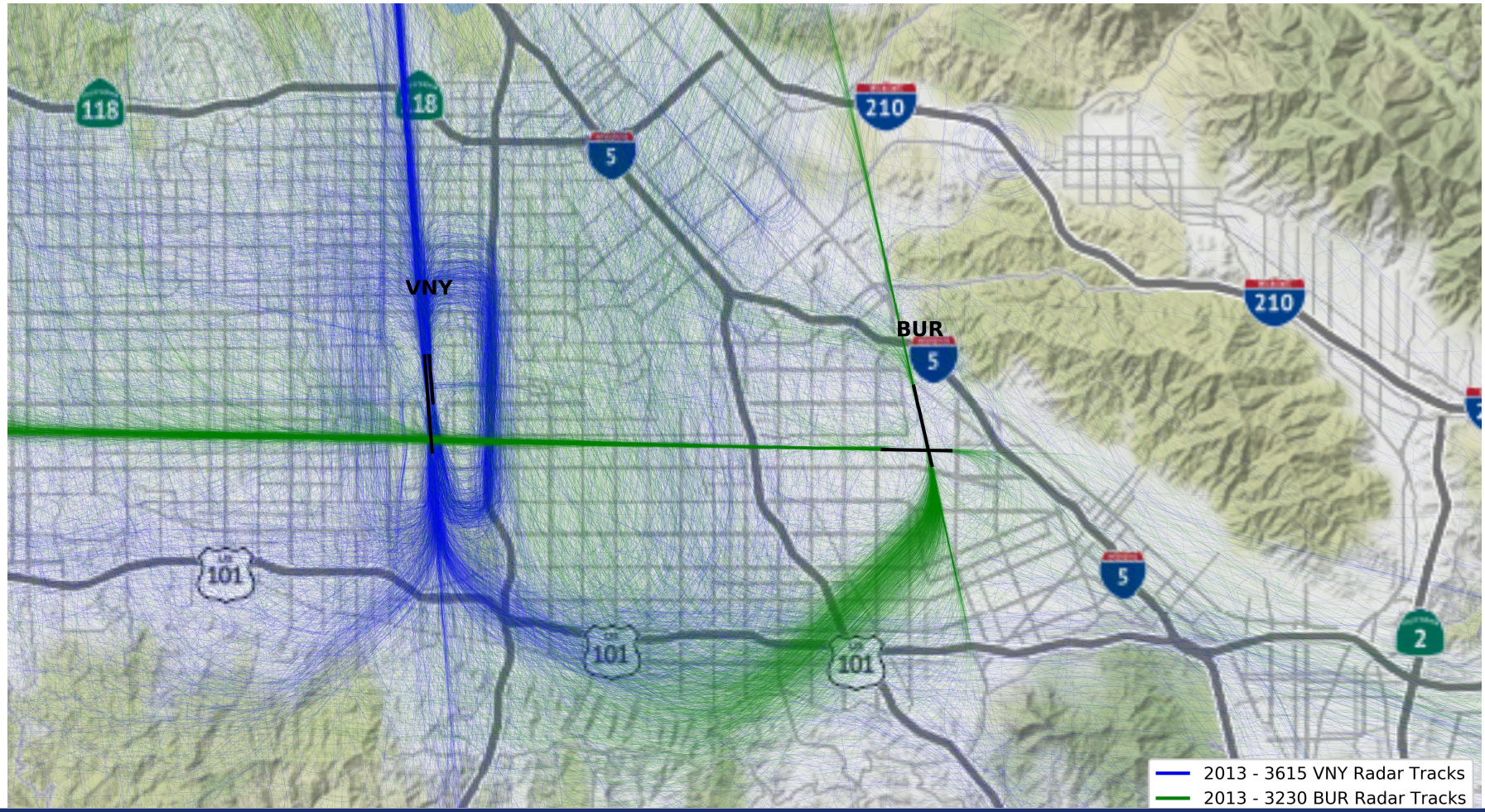
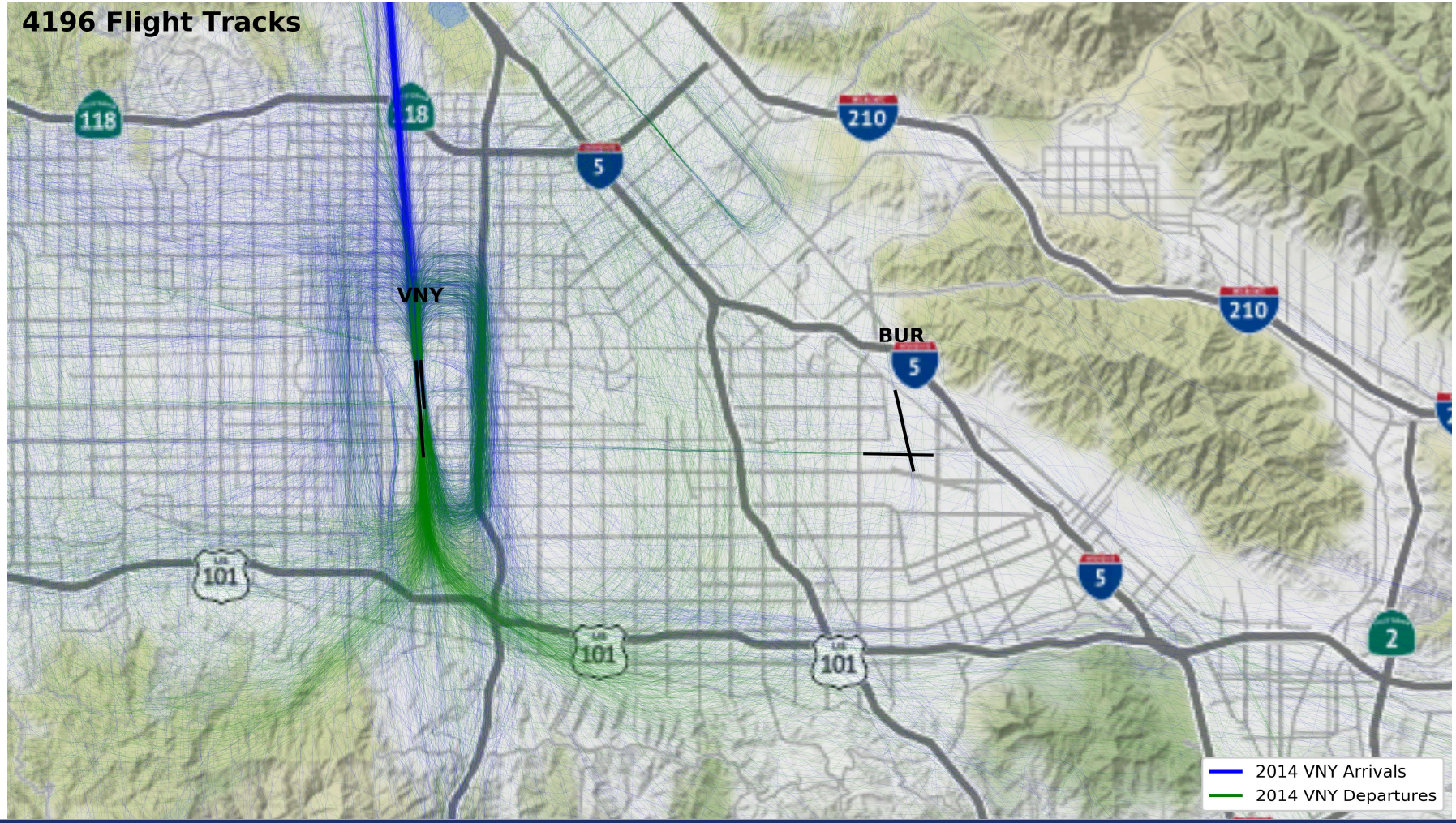


VNY Flight Tracks 2014



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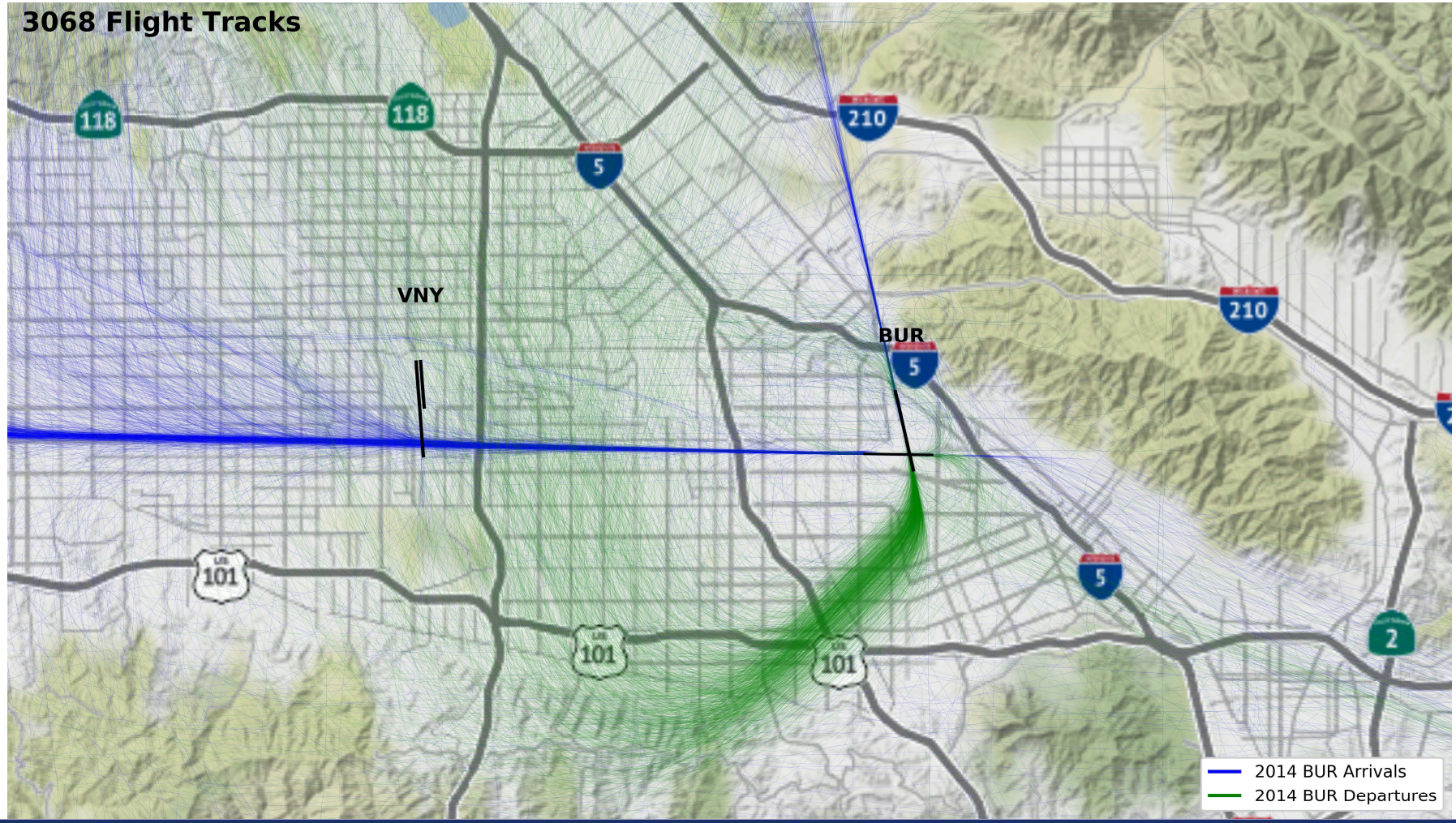

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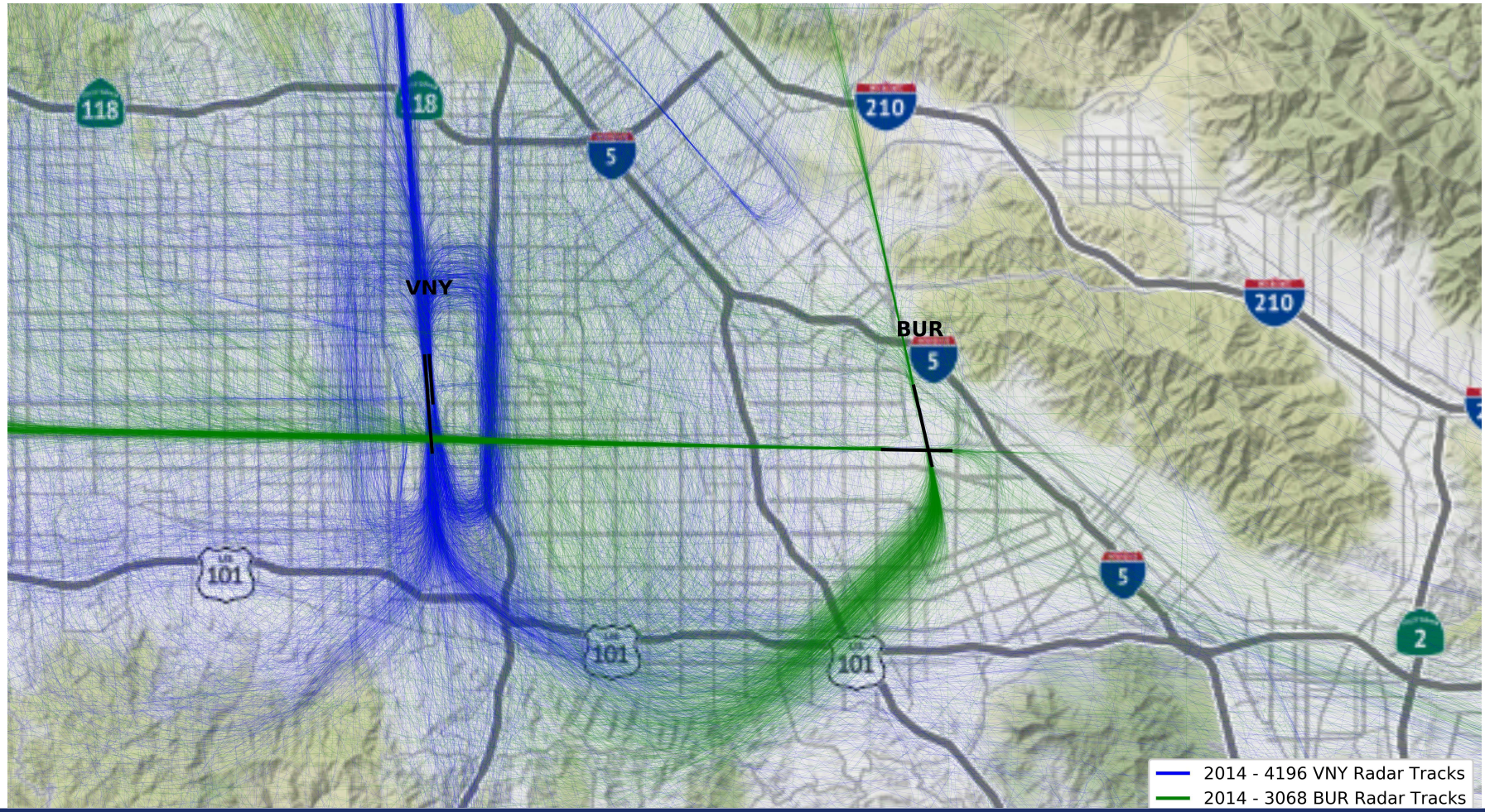

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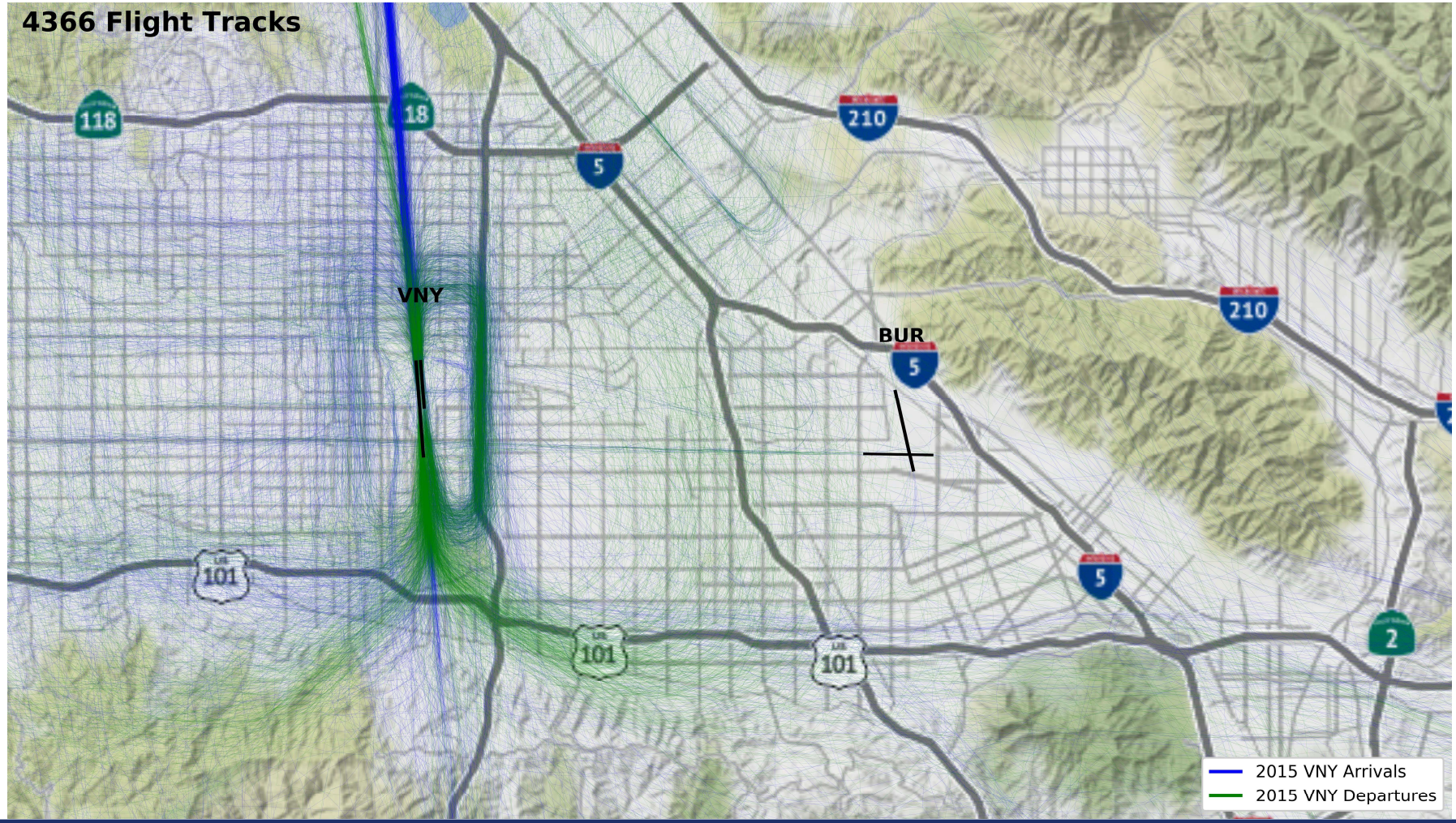

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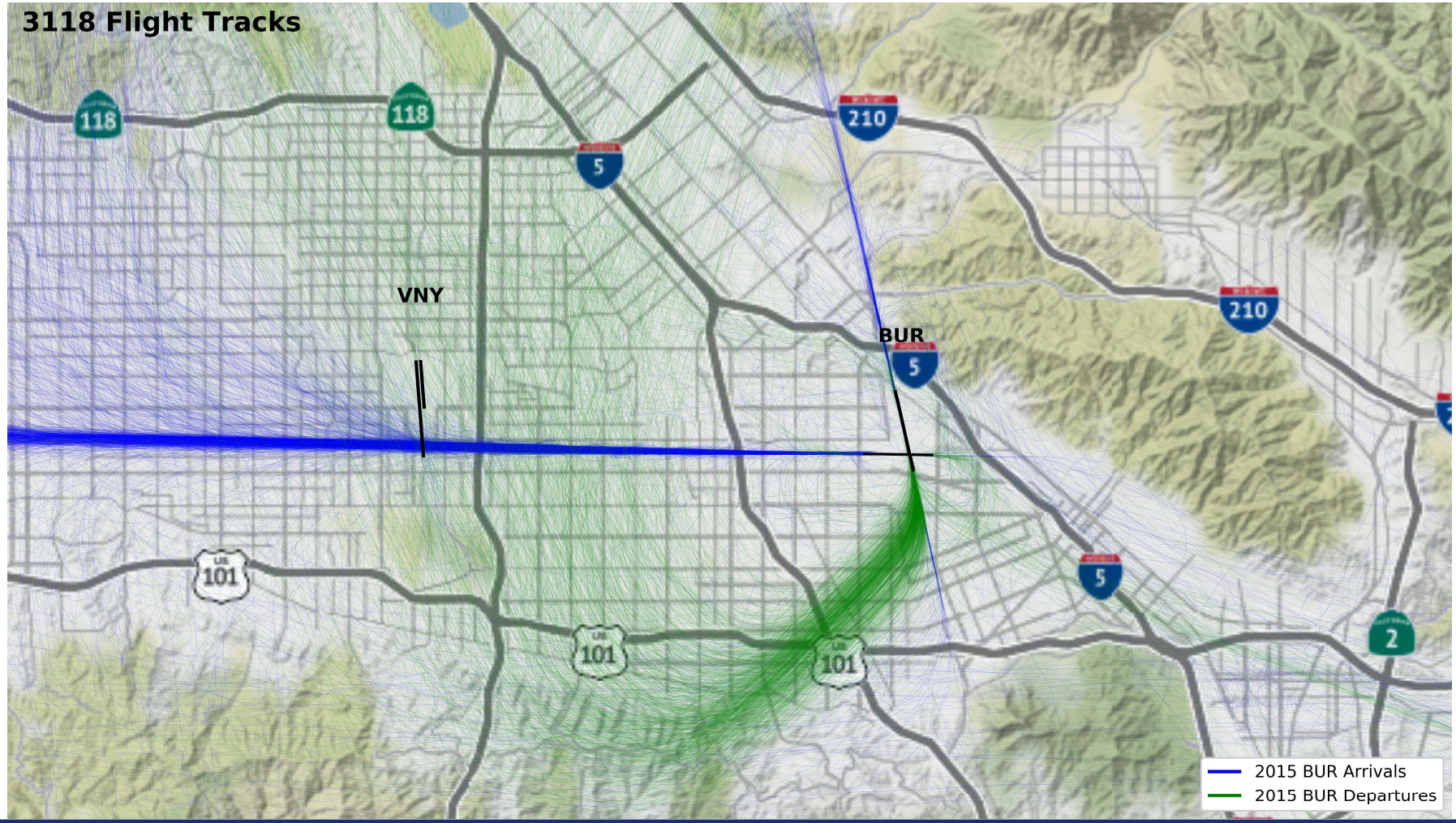

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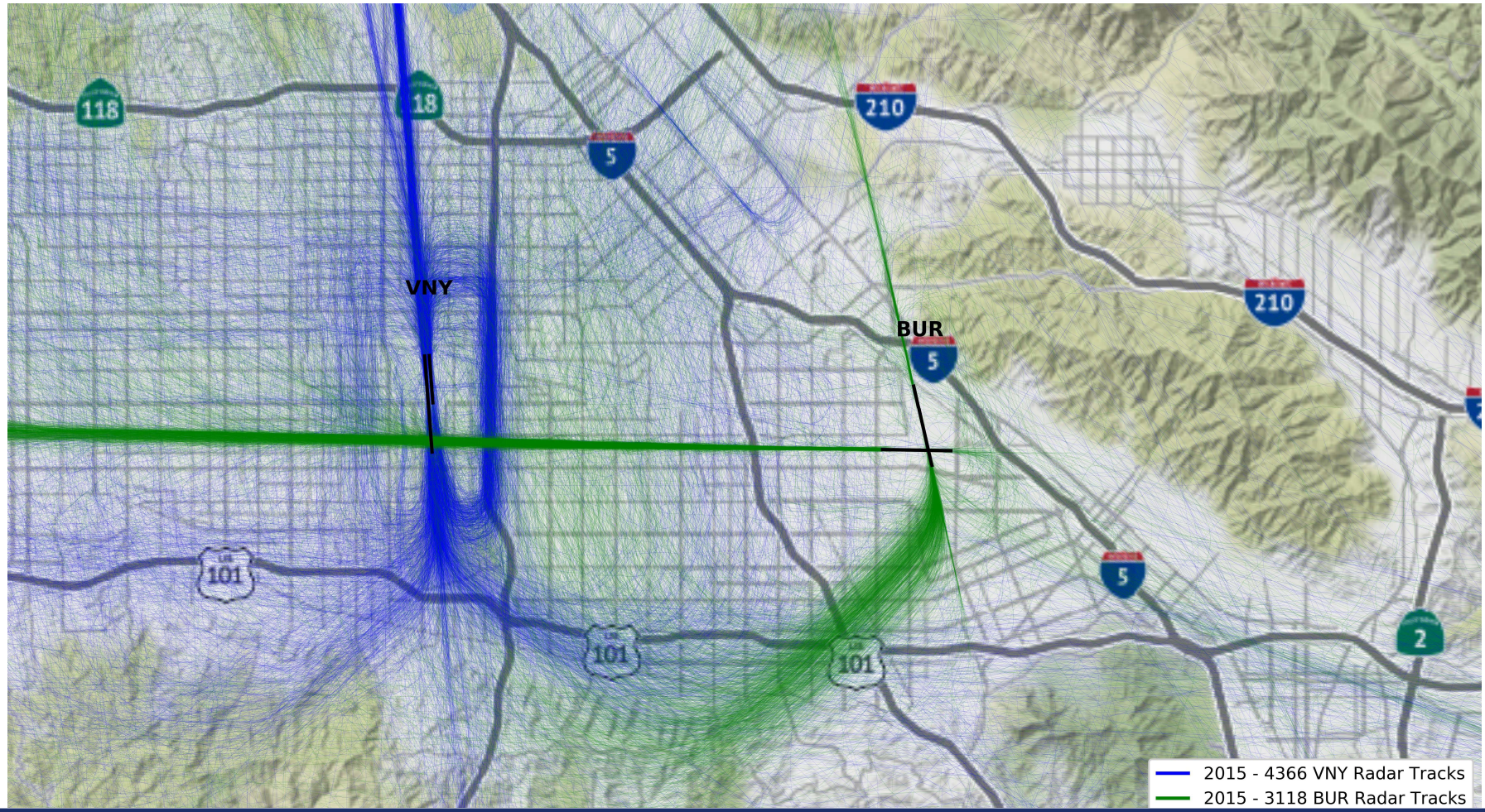
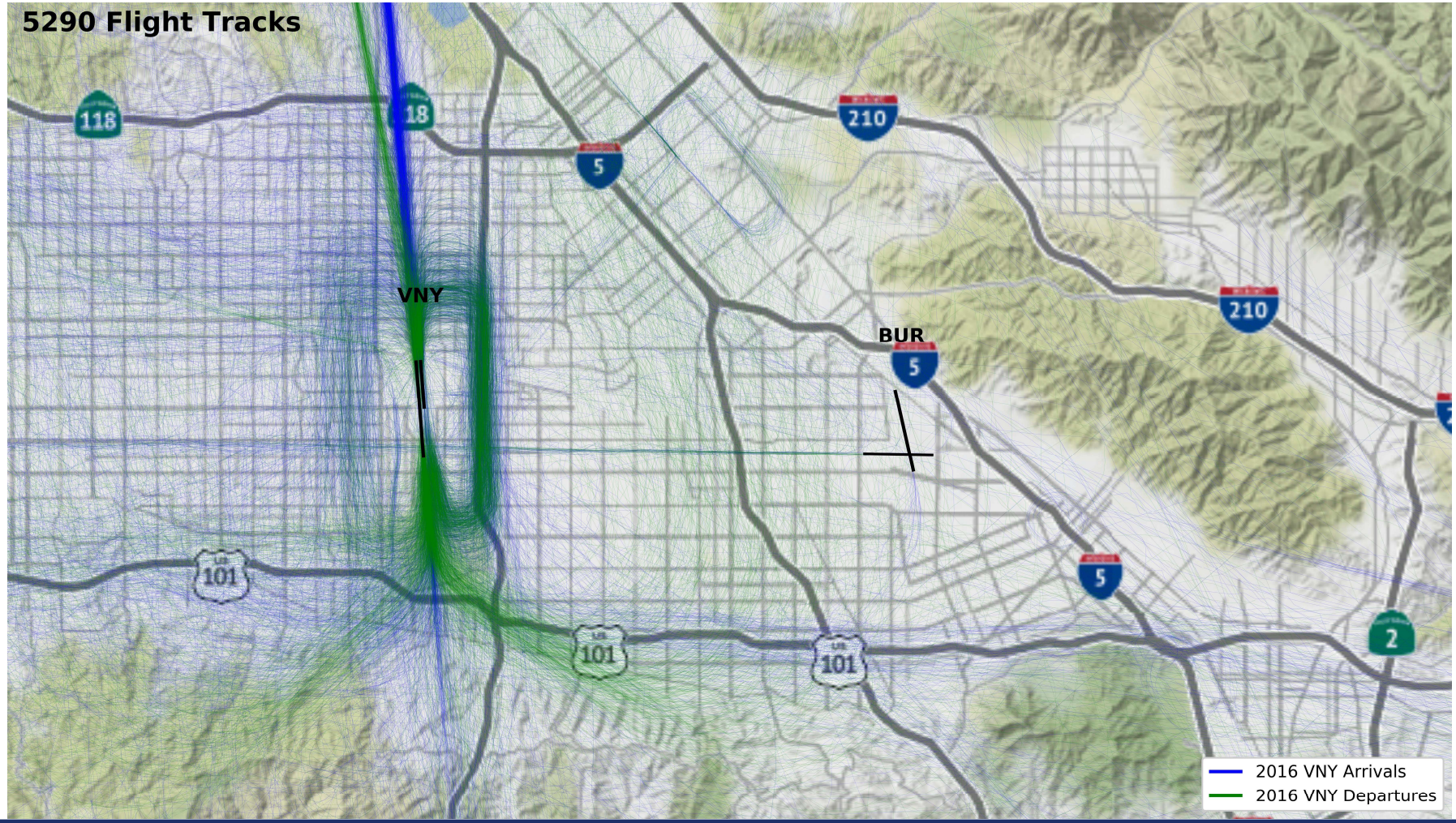


VNY Flight Tracks 2016



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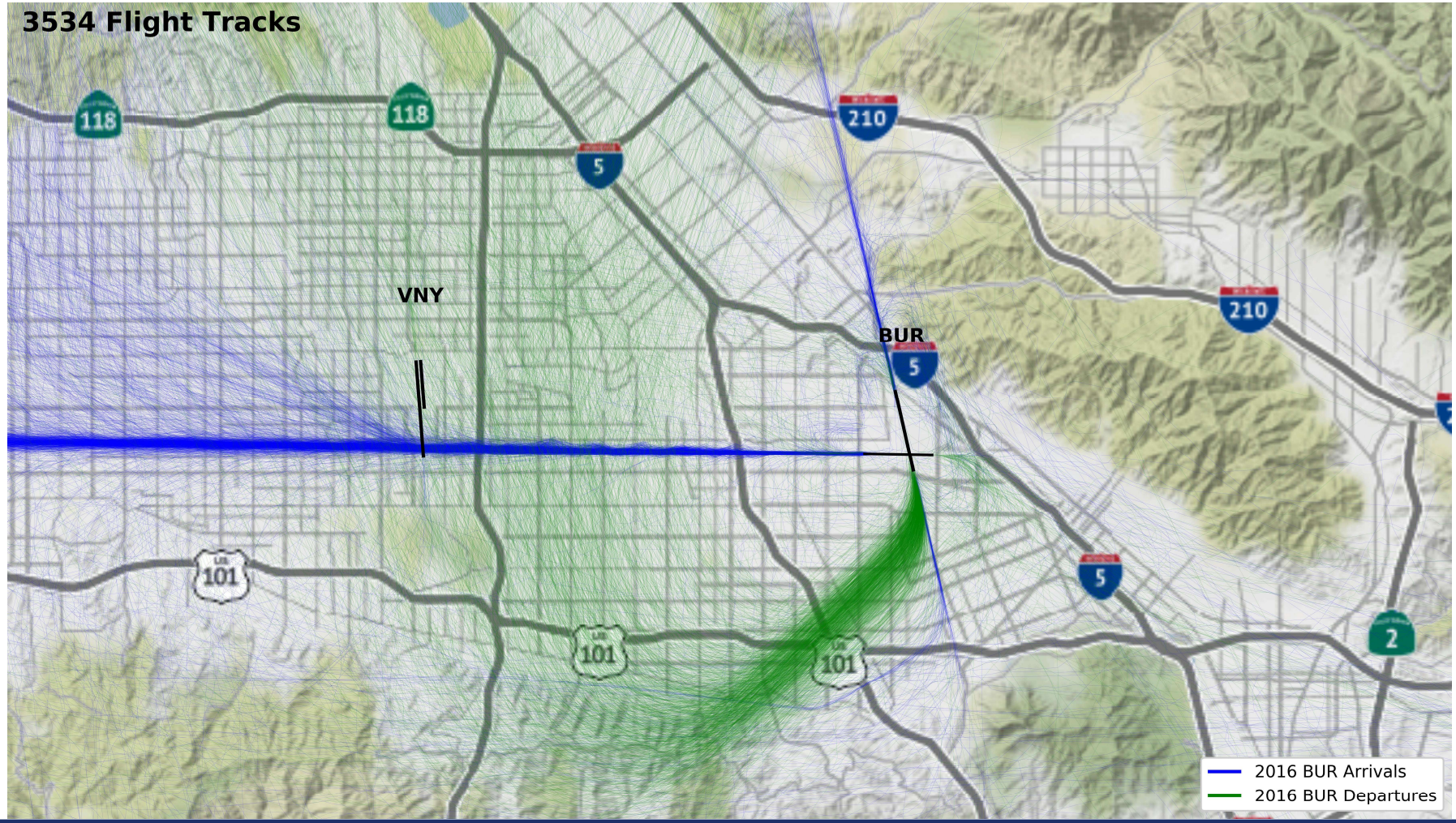

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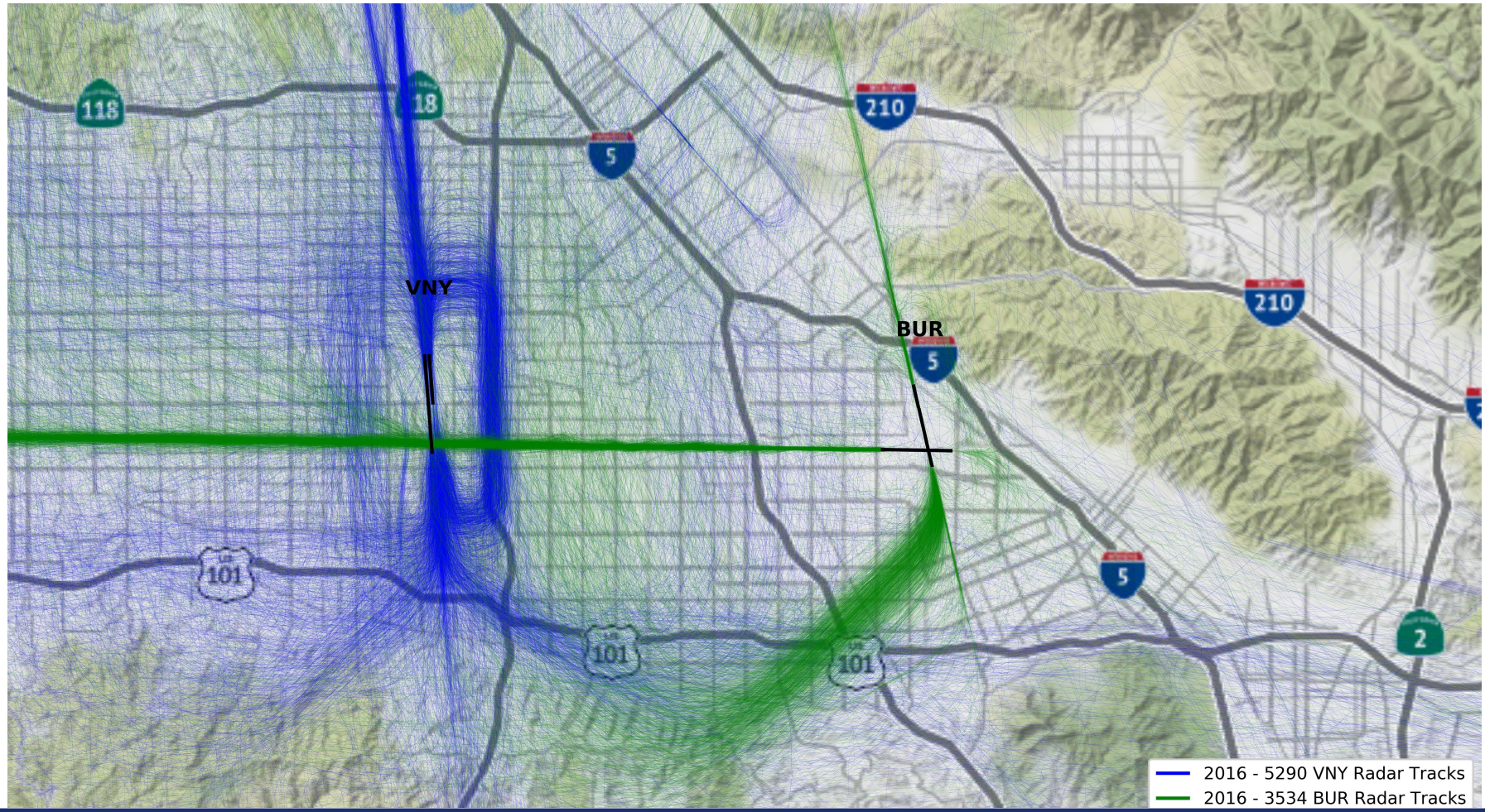

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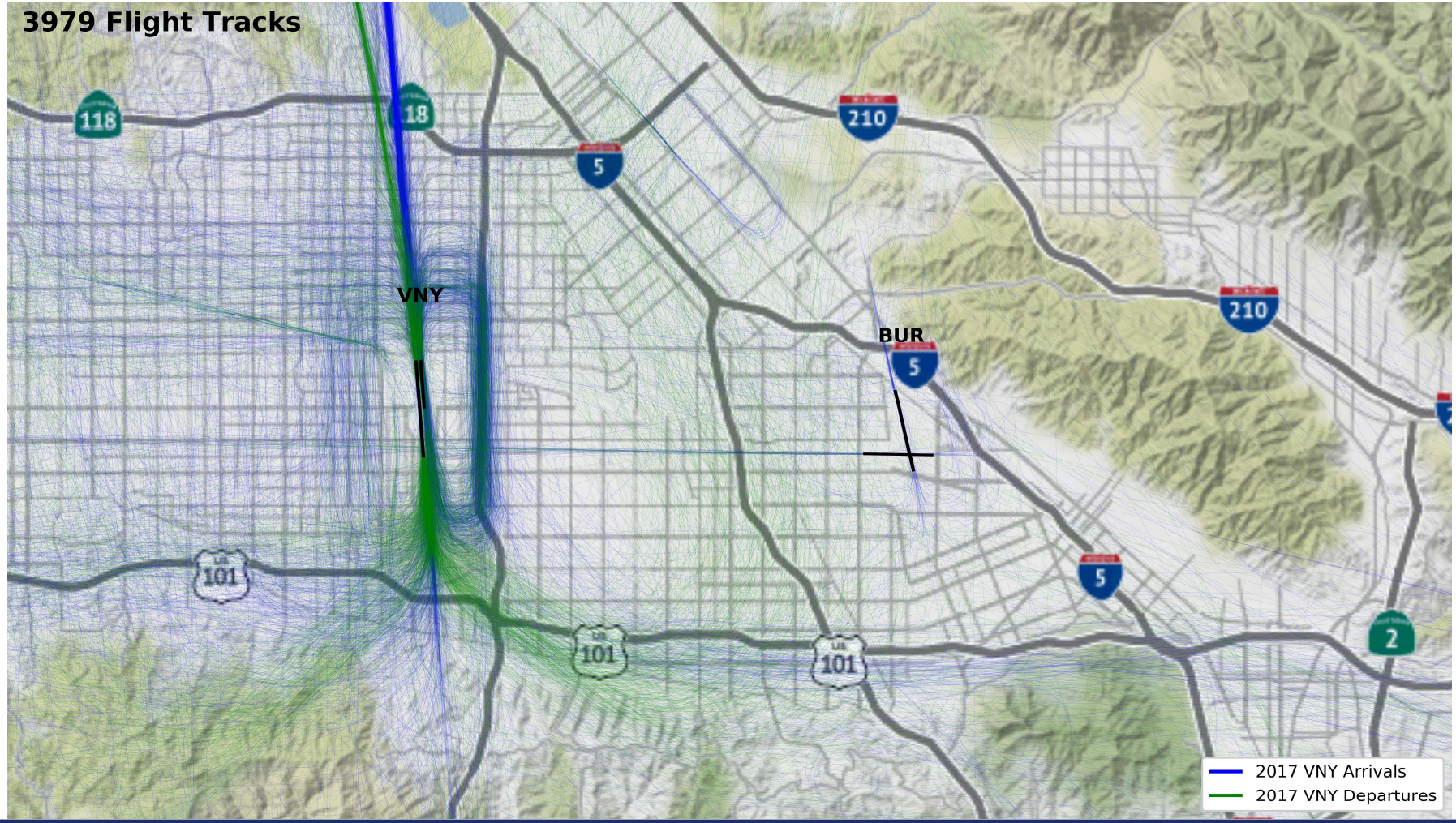

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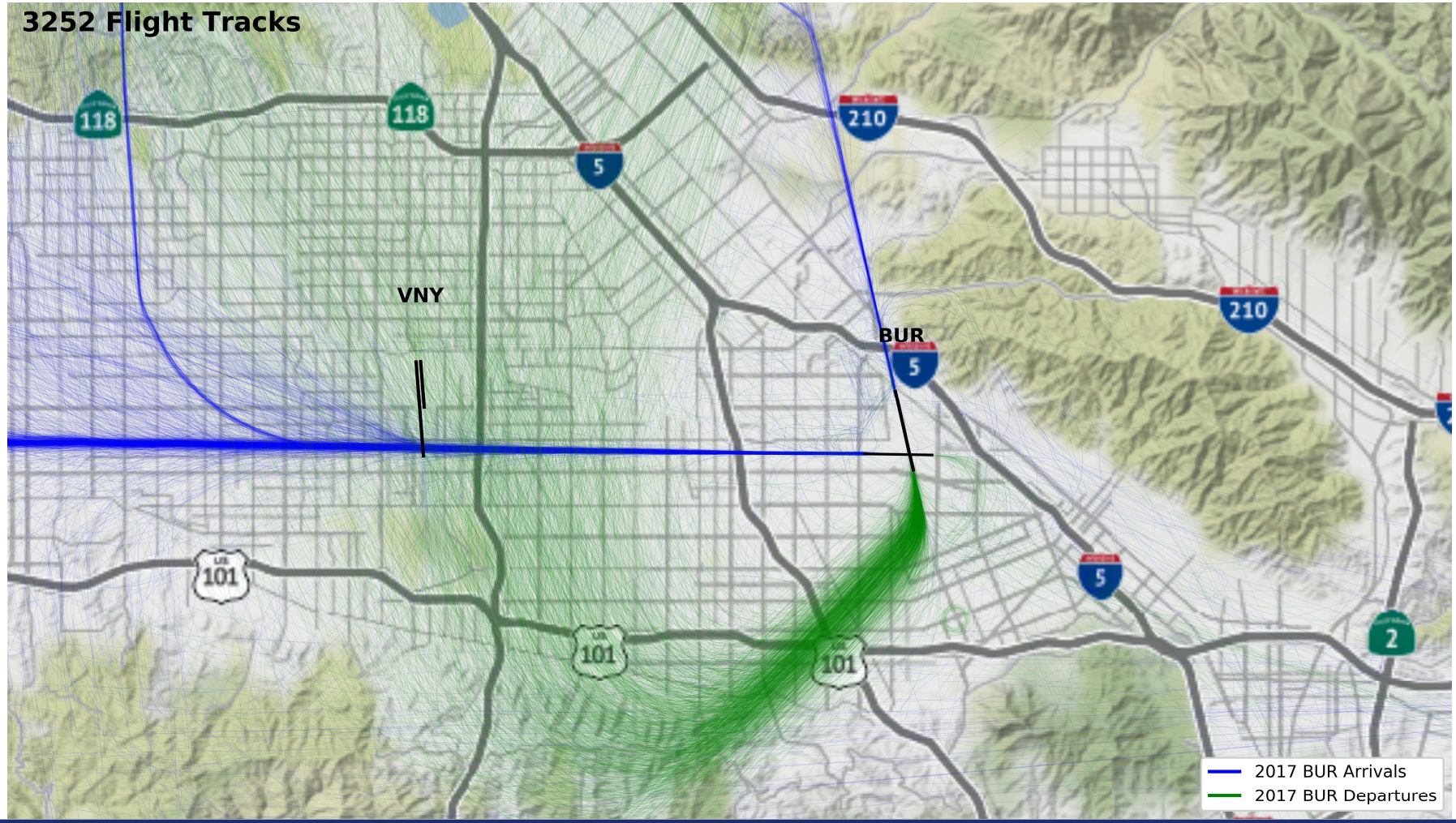

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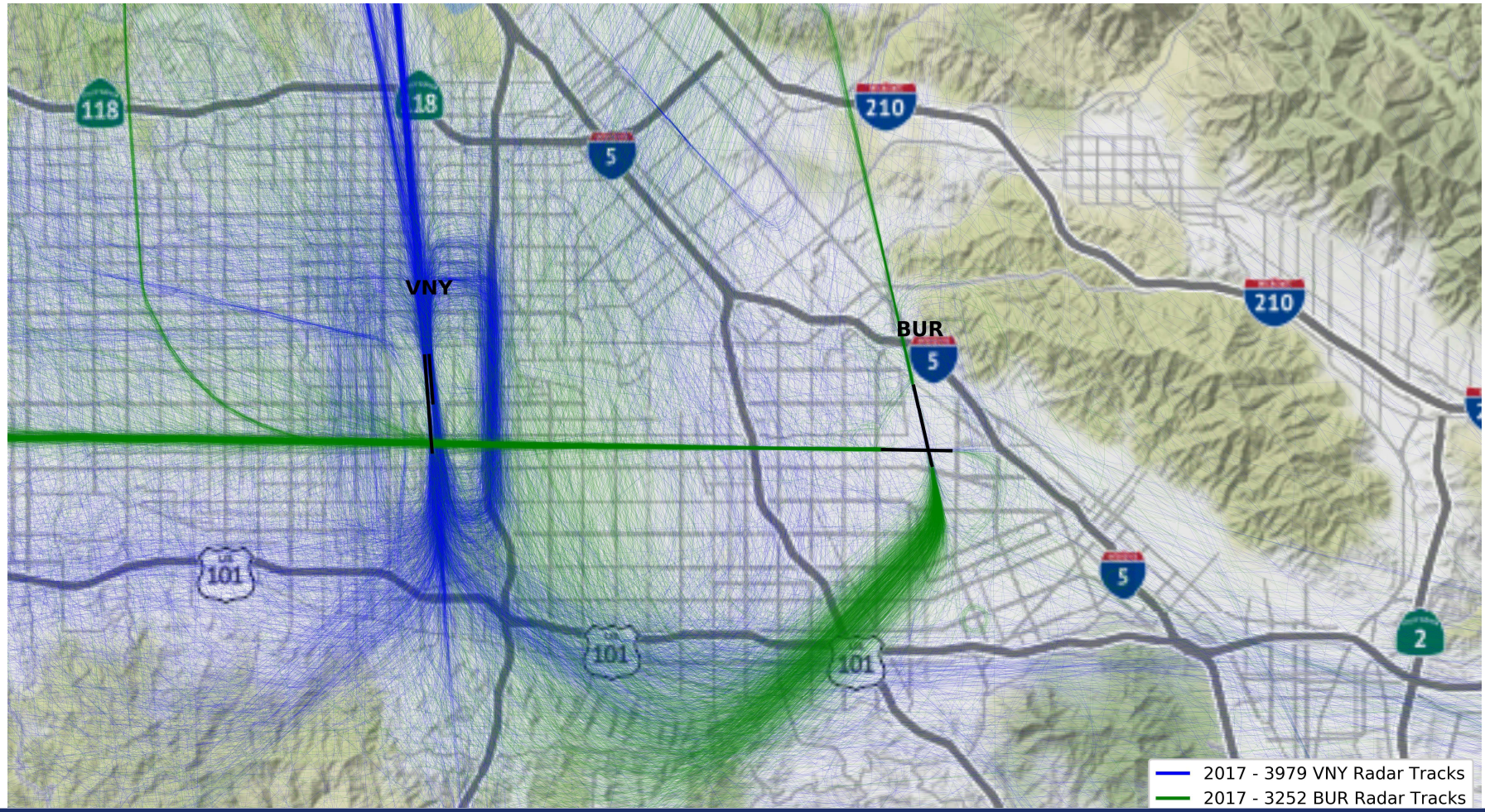
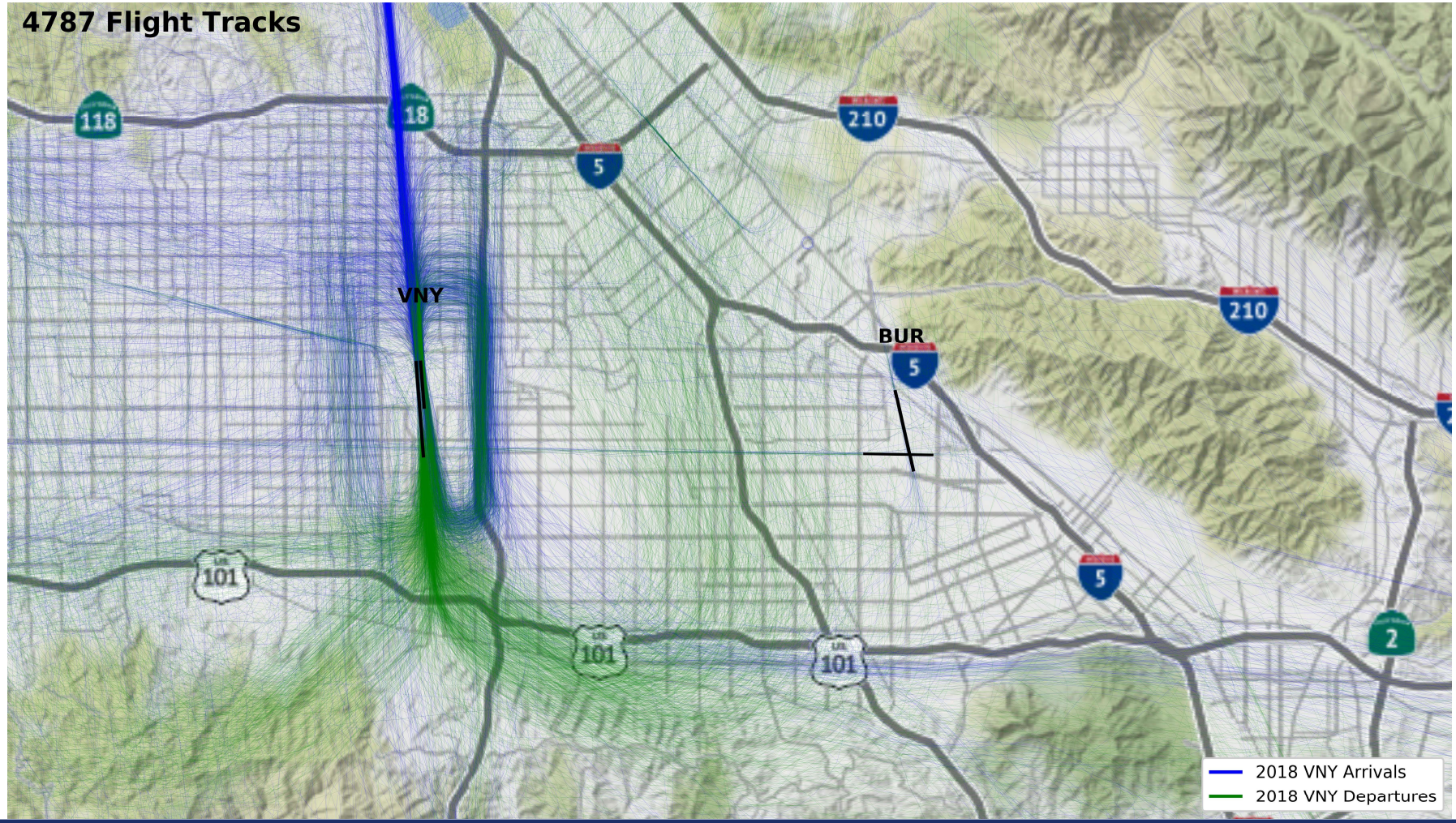


VNY Flight Tracks 2018



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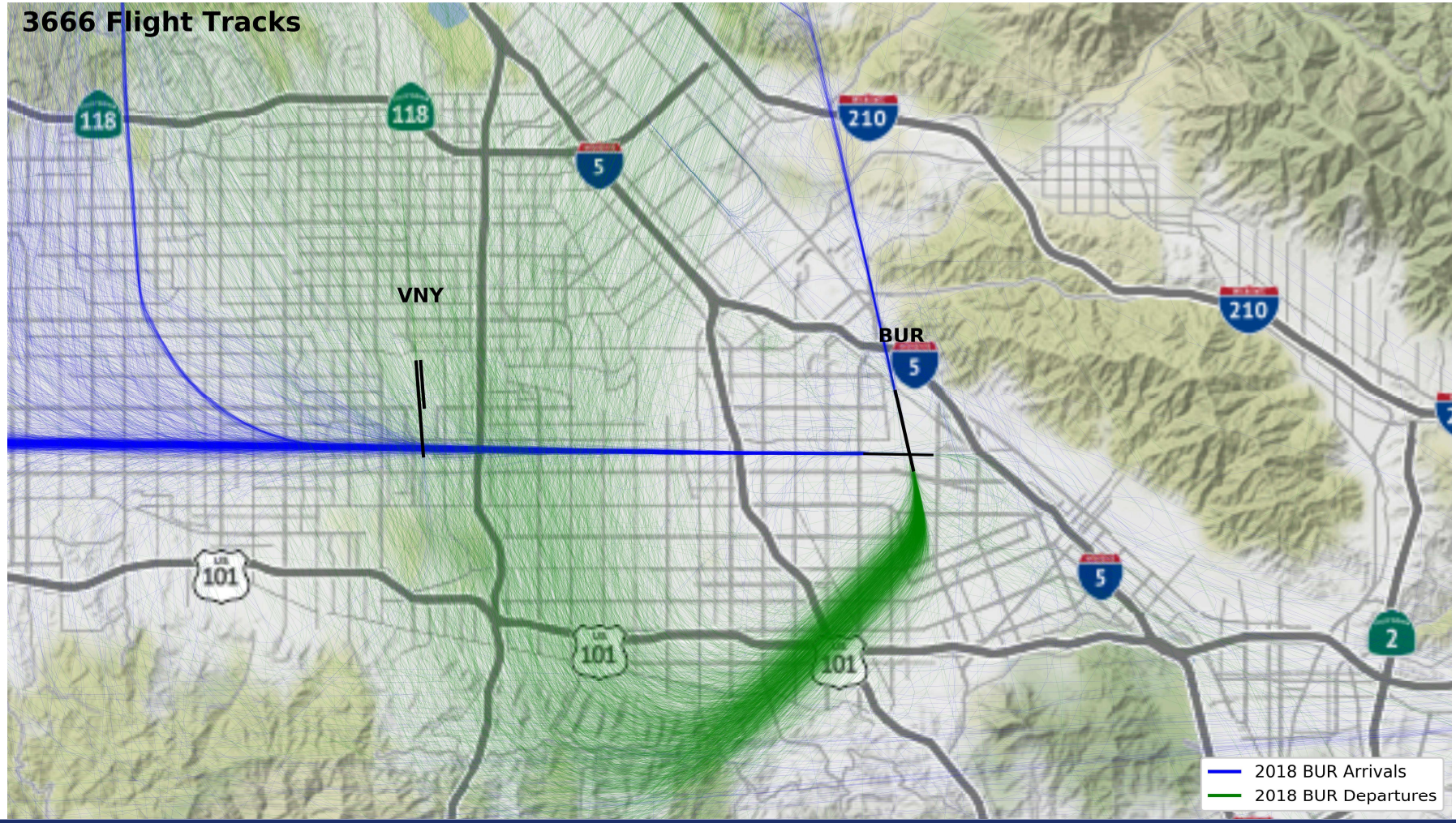

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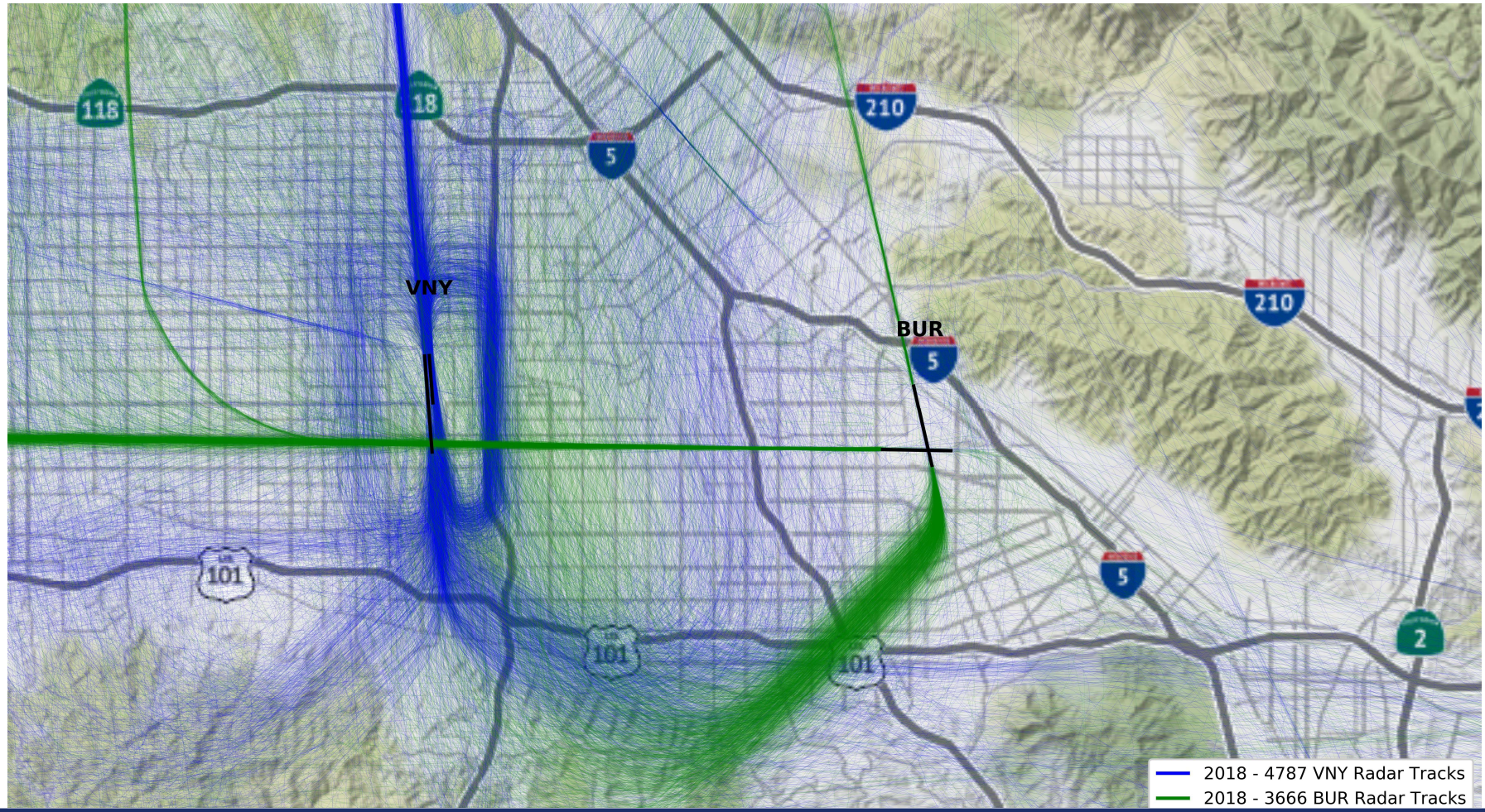
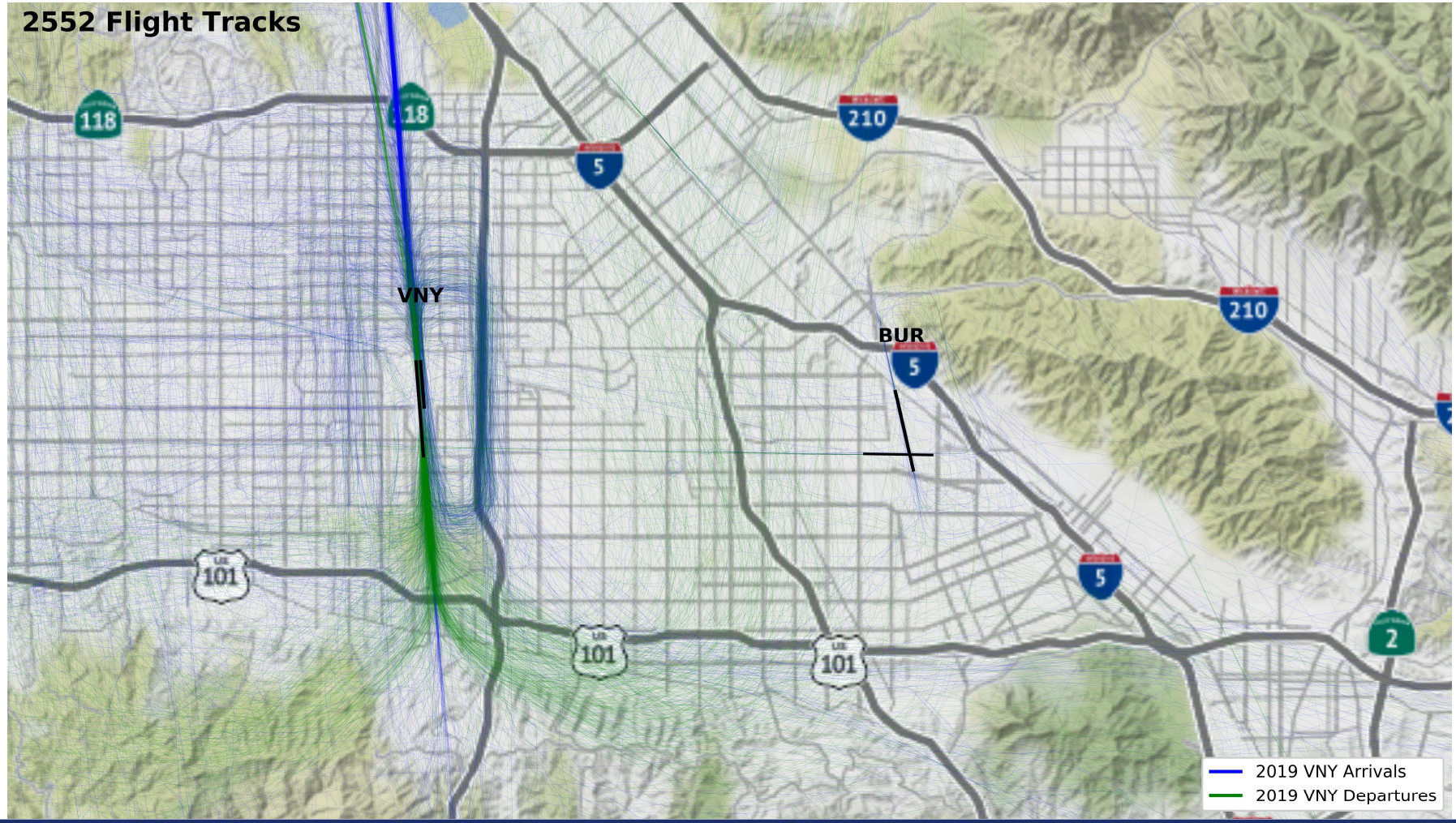
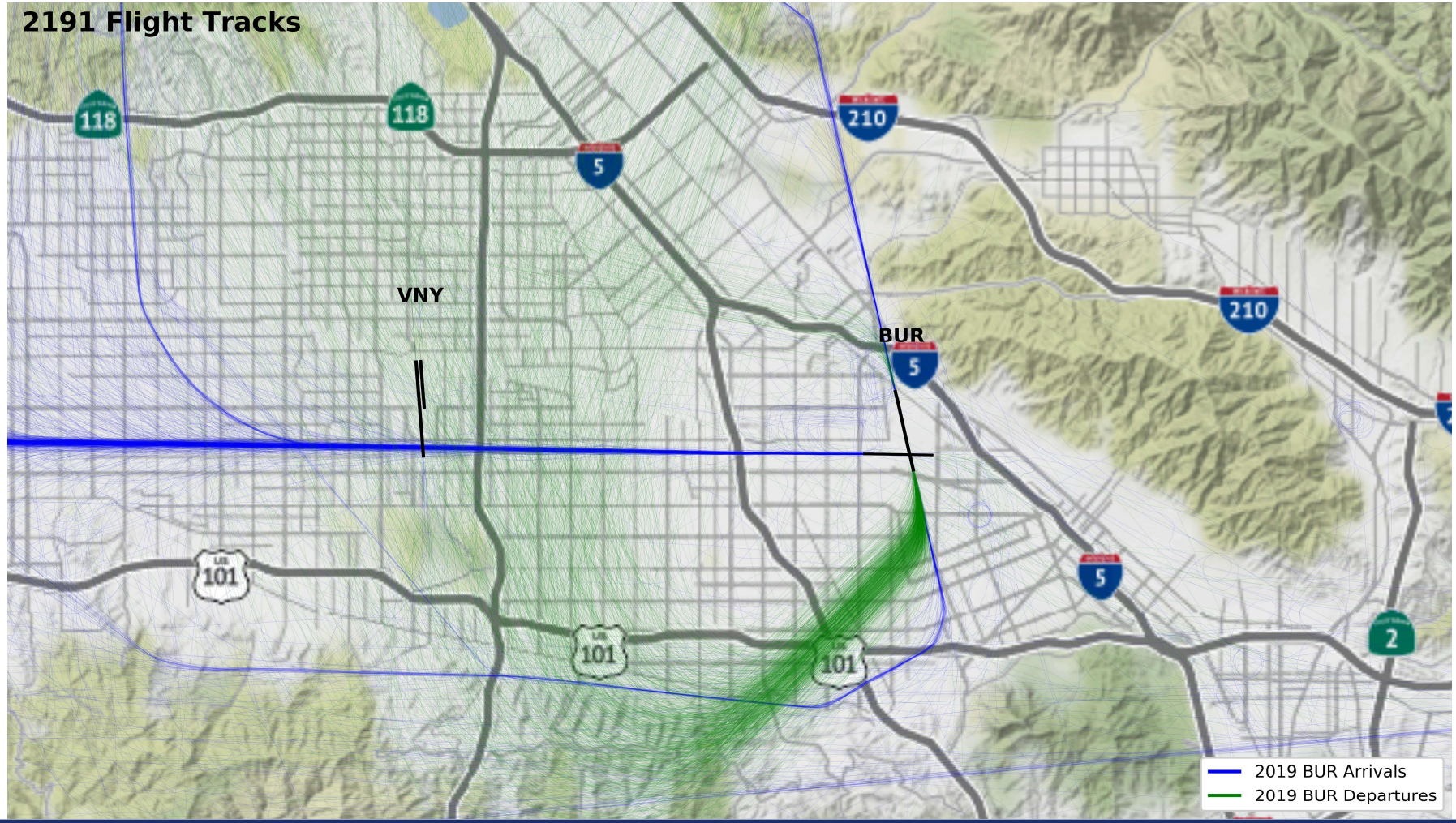


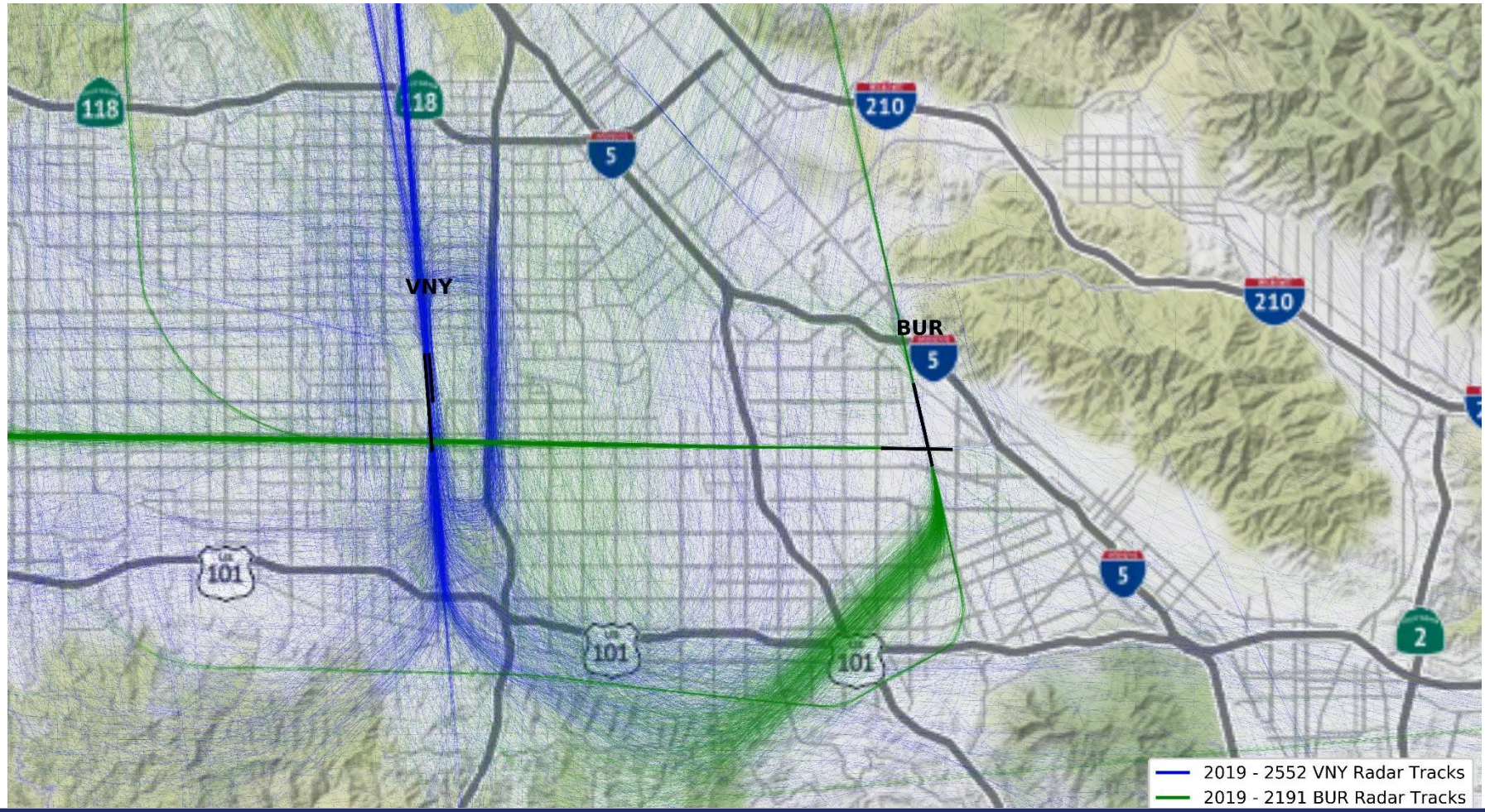
VNY Flight Tracks 2019 (7 days of flight tracks)



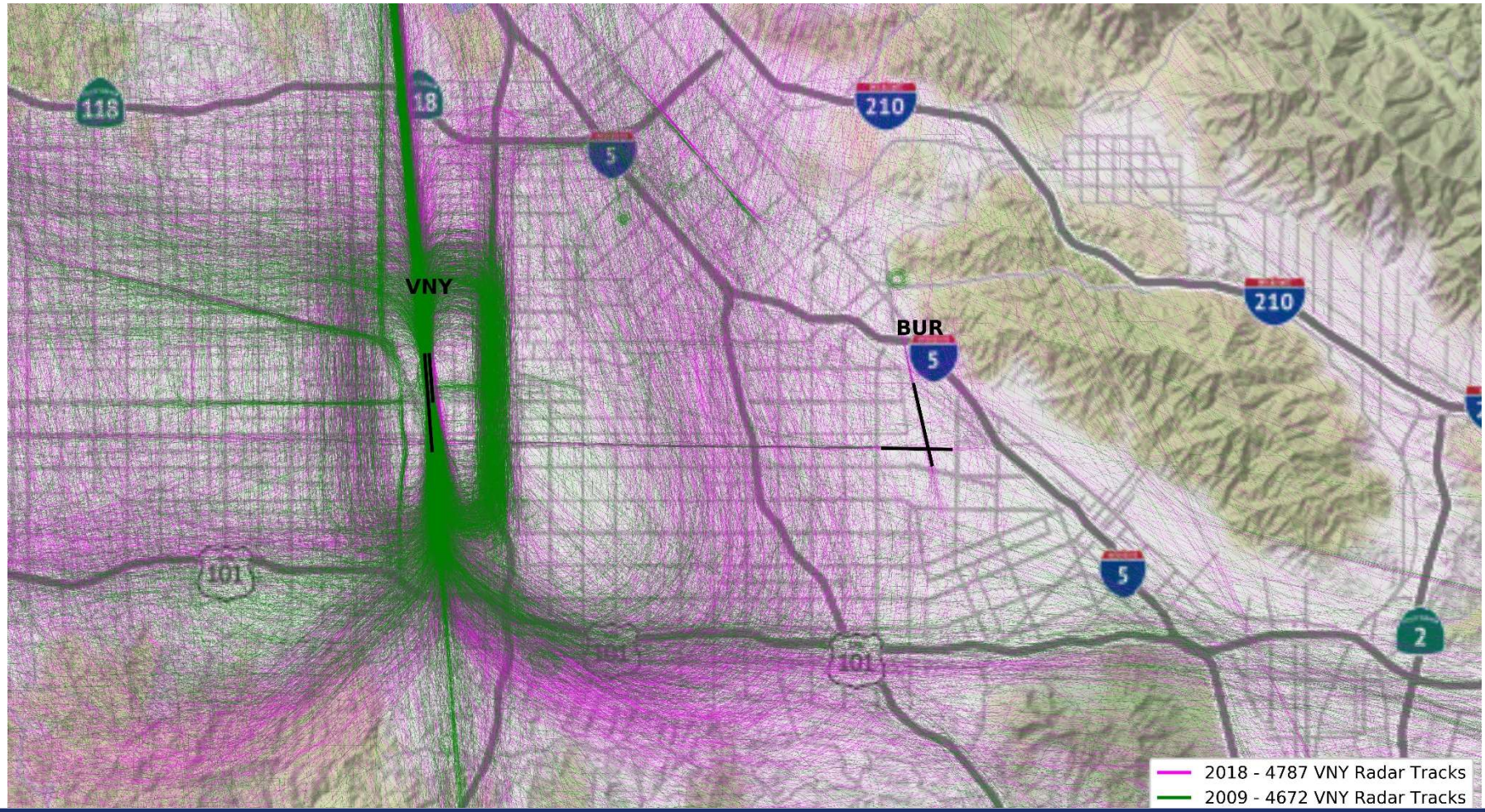
BUR Flight Tracks 2019 (7 days of flight tracks)



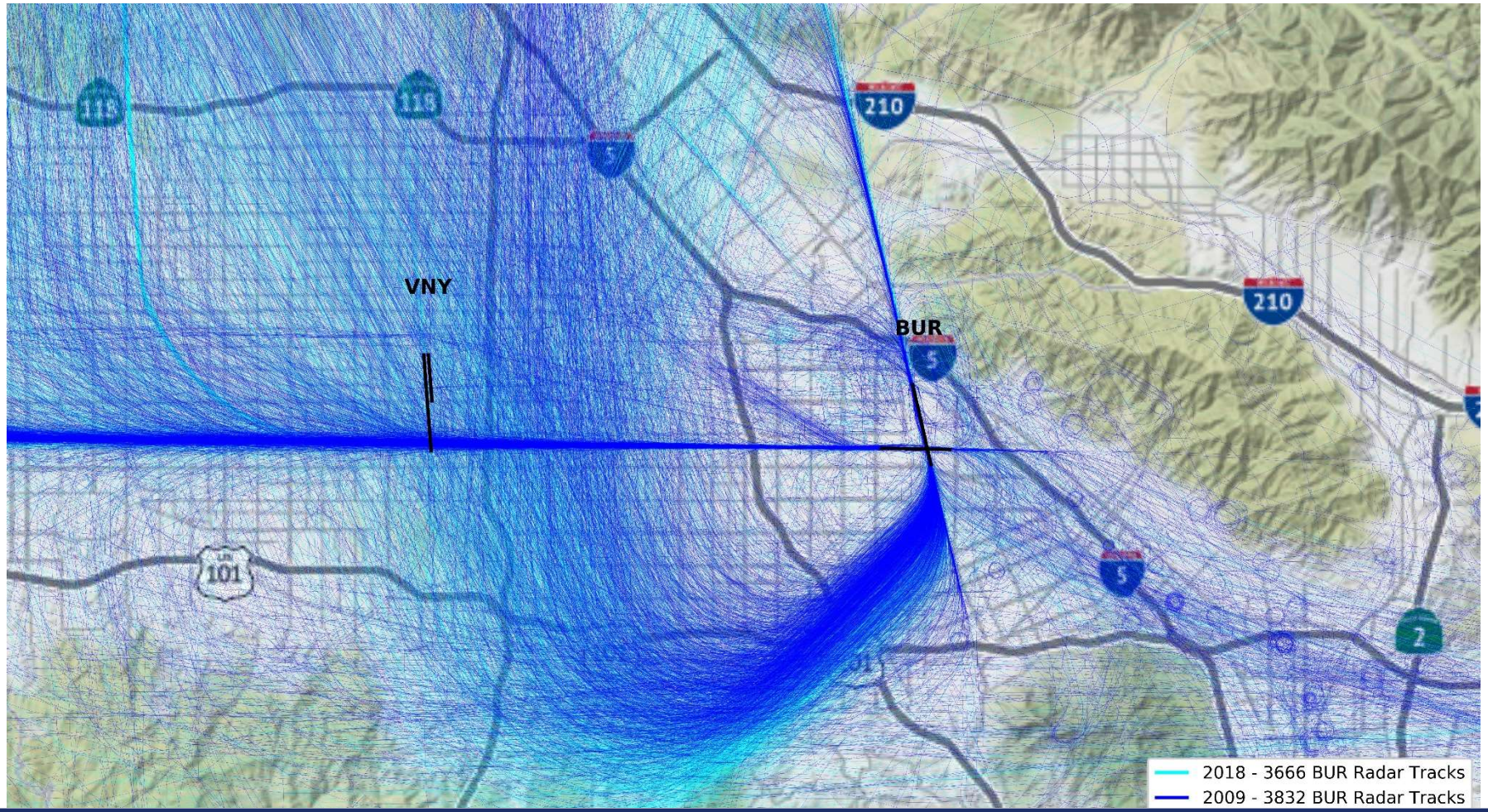
VNY and BUR Flight Tracks Combined 2019 (7 days of flight tracks each airport)



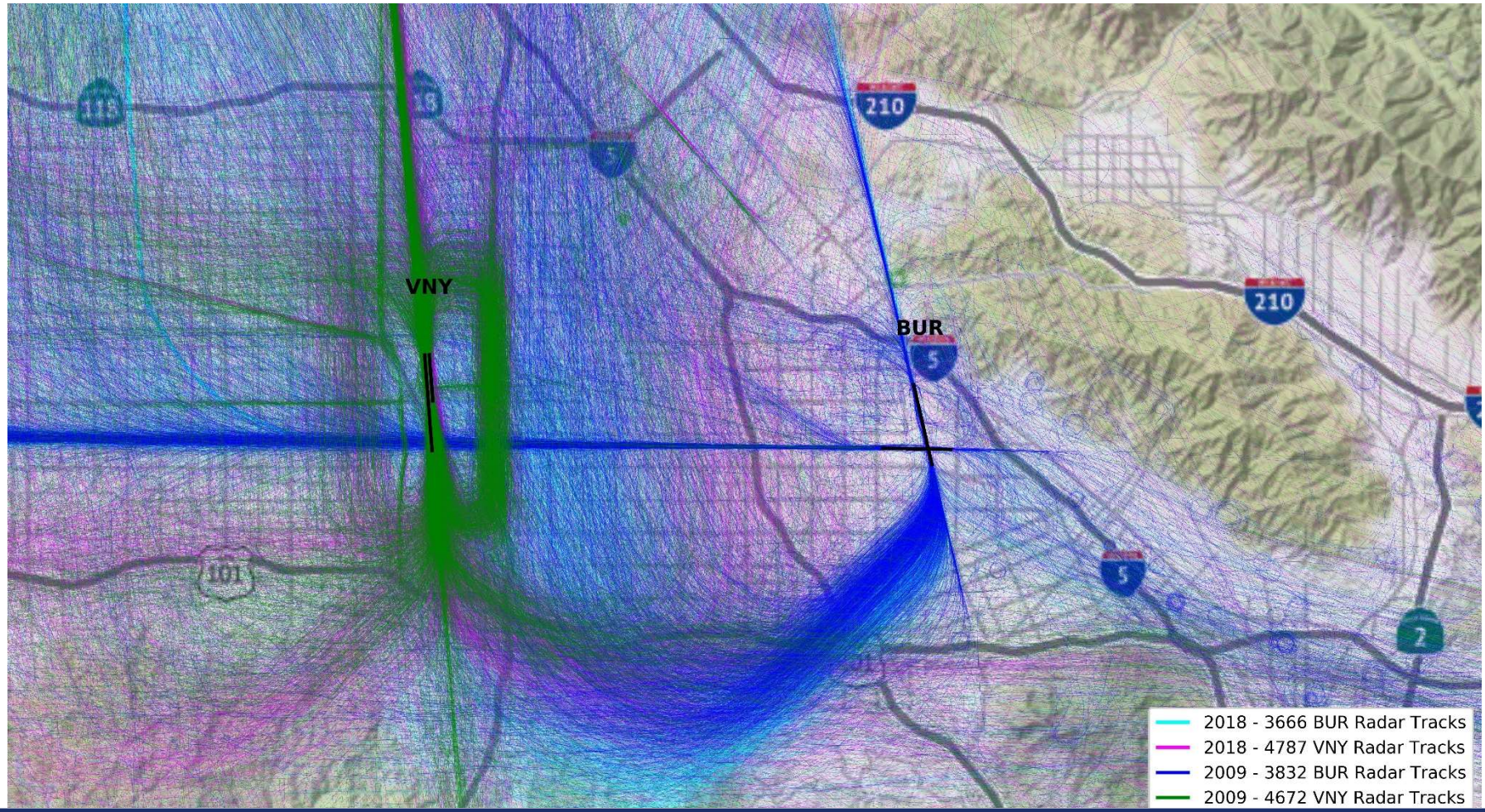
VNY 2009 versus 2018



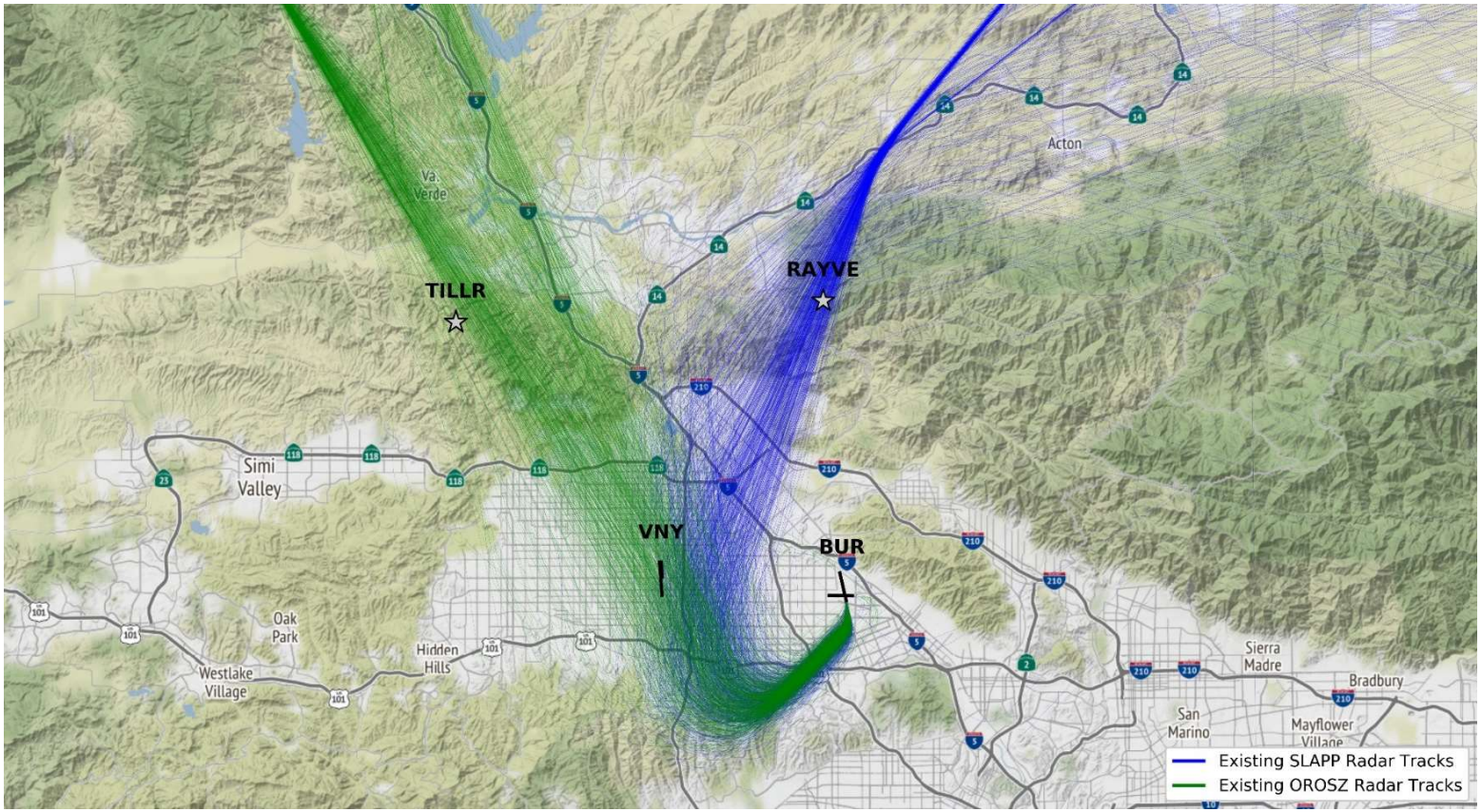
BUR 2009 versus 2018



VNY and BUR 2009 versus 2018 combined



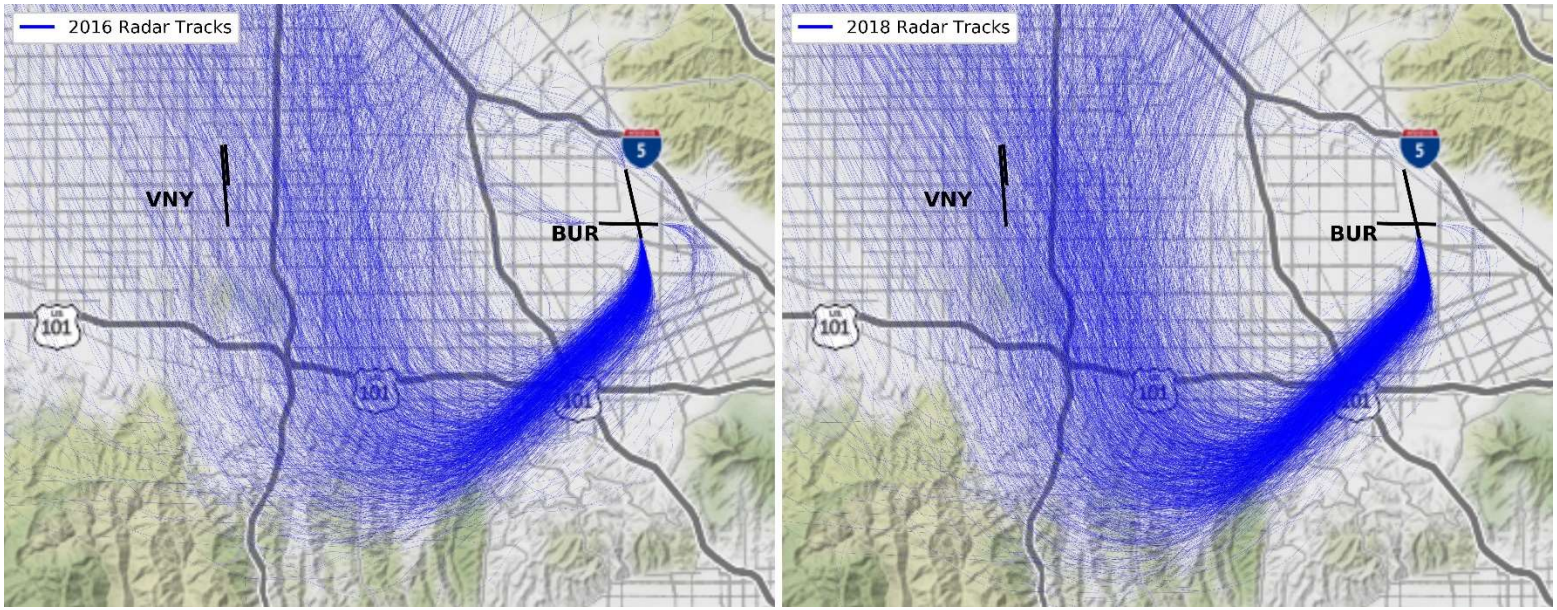
Current Flight Tracks for SLAPP and OROSZ Departure Routes



- 2018 flight tracks for the OROSZ and SLAPP procedures
- 14 random days totaling 1,574 flight tracks .

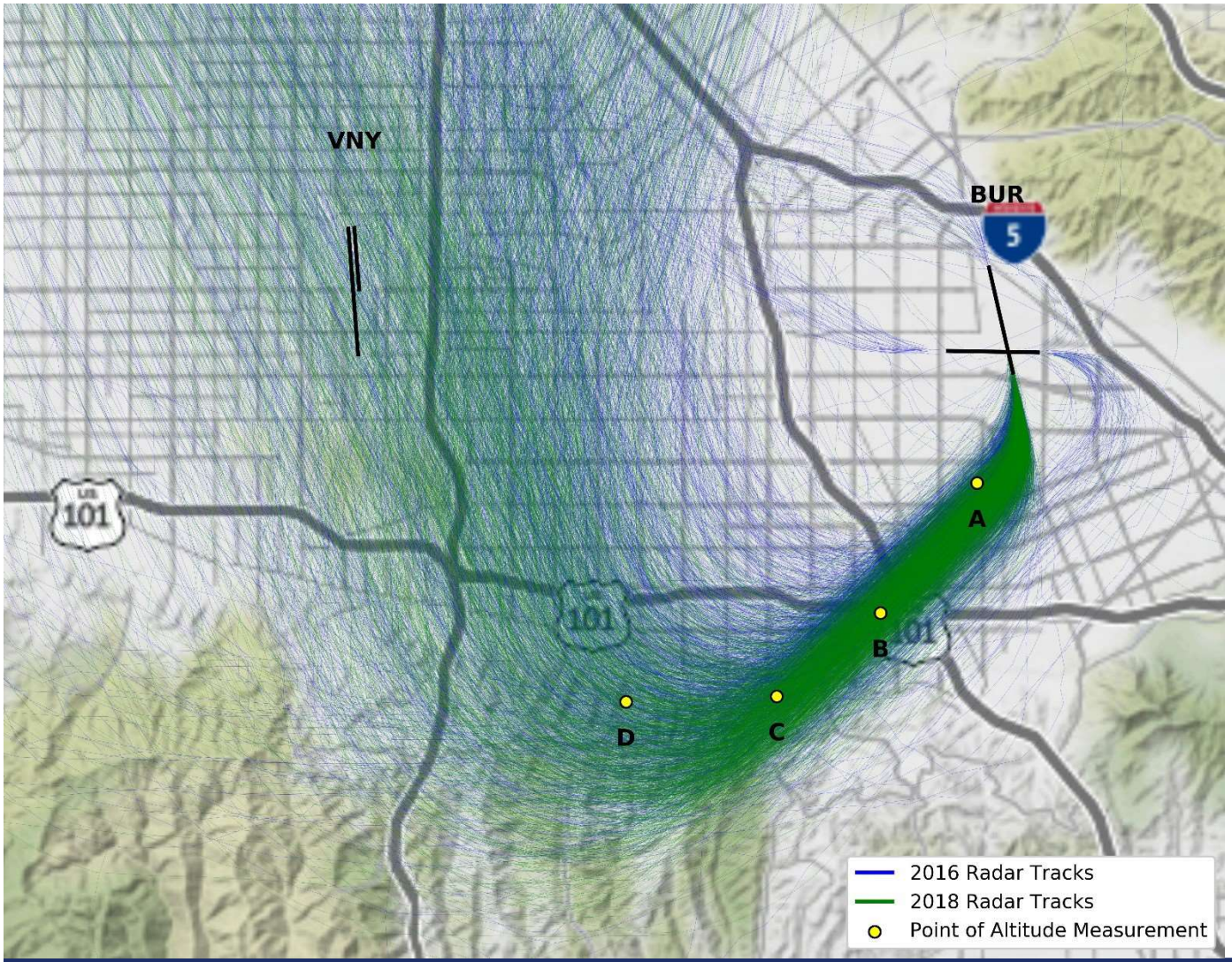
- As part of the Southern California Metroplex Project, the FAA created two new satellite-based departure routes for BUR.
- These routes, which the FAA implemented in March 2017, are called the SLAPP and the OROSZ.
- The satellite-based portions of the routes begin significantly north and northwest of the airport, at the RAYVE and TILLR waypoints. They do not begin in the immediate airport environment.

Pre- and Post-Metroplex Flight Tracks

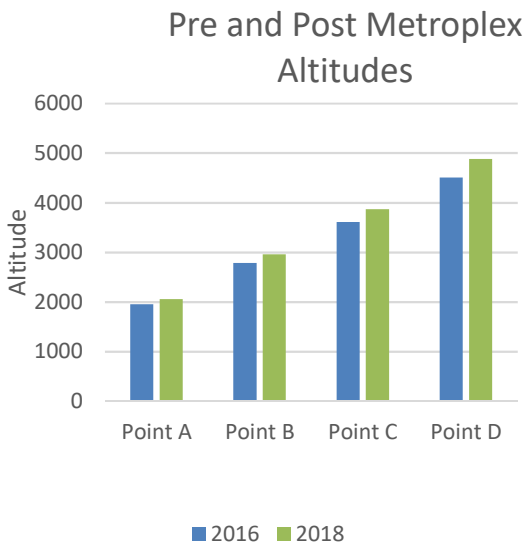


- **Air traffic controllers today handle BUR departures the same way after takeoff as they did before the implementation of the SLAPP and OROSZ in March 2017.**
- **This slide shows pre- and post-Metroplex flight tracks of departures off Runway 15 at BUR.**
- **The FAA has not implemented any satellite-based route segments in the immediate airport environment.**

Locations of the Four Points



- The FAA selected four locaitons under the BUR departure path to compare pre- and post-Metroplex altitudes
- Post-Metroplex average altitudes are higher than pre-Metroplex average altitudes over each of the four points



BUR Runway 15 Departures

- **The FAA has made no changes that would cause aircraft to fly further south off runway 15.**
- **Potential reasons for aircraft flying further south off runway 15:**
  - Increased temperatures
  - Aircraft weight
  - Aircraft characteristics
  - Traffic in the area

Addressing Community Concerns

Developing Our National Strategy

Beth White

Noise Challenge Today

- As we modernize the system, more aircraft are flying and the fleet mix at airports continually changes to meet passenger demand.
- Communities are much more sensitive to changes in flight paths —but it is difficult to pinpoint the exact drivers.
- The public is more sophisticated and seeks better information from the FAA when discussing these issues.
- We are implementing a strategy to address these complex and interrelated issues. Because issues vary from community to community there is no single answer to this challenge.

Developing a National Strategy

- **We needed to rejoin the conversation**
- **We need everyone at the table to address the challenges**
- **We need to be honest about what we can and cannot do – there are tradeoffs in our society for accessibility and commerce.**

We are working together

- **Community concerns about aviation is an aviation industry and community issue. No one group – Airport, Air Carrier, Industry Representation or municipality - can singlehandedly eliminate community frustration**
- **We are also all here because there is a shared willingness to have conversations and discuss the options**
- **We need to work in a collaborative fashion with all entities to find the balance for the system, the users and the community**

What is being done to address concerns?

- **Noise Research – The FAA, Airlines and manufacturers have been working for decades to reduce noise at the source.**
- **MIT/Massport Research – The FAA, Massport and the Airlines are continuing to do operational research – what are the benefits to managing speed, thrust and configuration?**
- **Enhanced Engagement Strategy – Keep issues regional, broaden the discussion to include all stakeholders and industry partners. Engage with Airport or Airport sponsored/affiliated roundtables, minimize frustration by managing expectations, education and communication on how and why we need to make changes.**
- **Nationwide, since 1982, FAA has provided $6.5 billion in Airport Improvement Program (AIP) funding to help airports mitigate noise in communities within the 65 DNL noise contours. In addition, FAA has approved about $3.3 billion nationally in Passenger Facility Charge funding to supplement AIP funding for noise mitigation since that program began in 1992.**

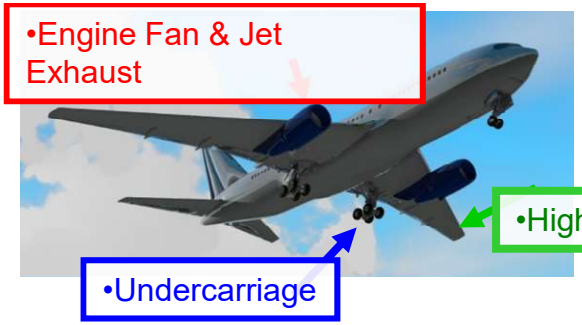
Noise is a shared responsibility

- **You are seeing a great example of that collaboration in this meeting today**
- **A collective/comprehensive effort is necessary to address impacts generated by aircraft noise**
- **Any effort will require support from:**
  - Airport Sponsors
  - Airlines Industry, and Other System Users
  - Elected Officials
  - Community Members
  - Aircraft and Engine Manufacturers
  - FAA

Noise and Emissions

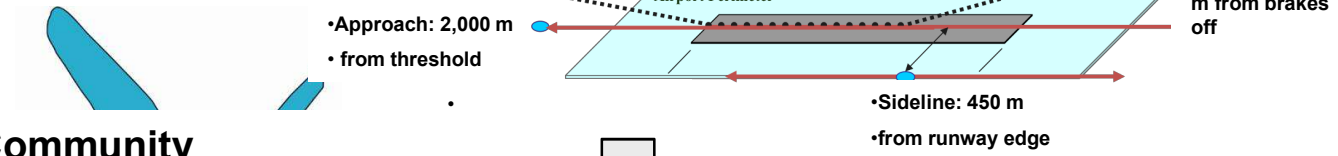
Aircraft Noise Sources

•**Aircraft Noise**



All noise sources contribute to acoustic signature – both at takeoff and during landing

•**Landing Takeoff Cycle**

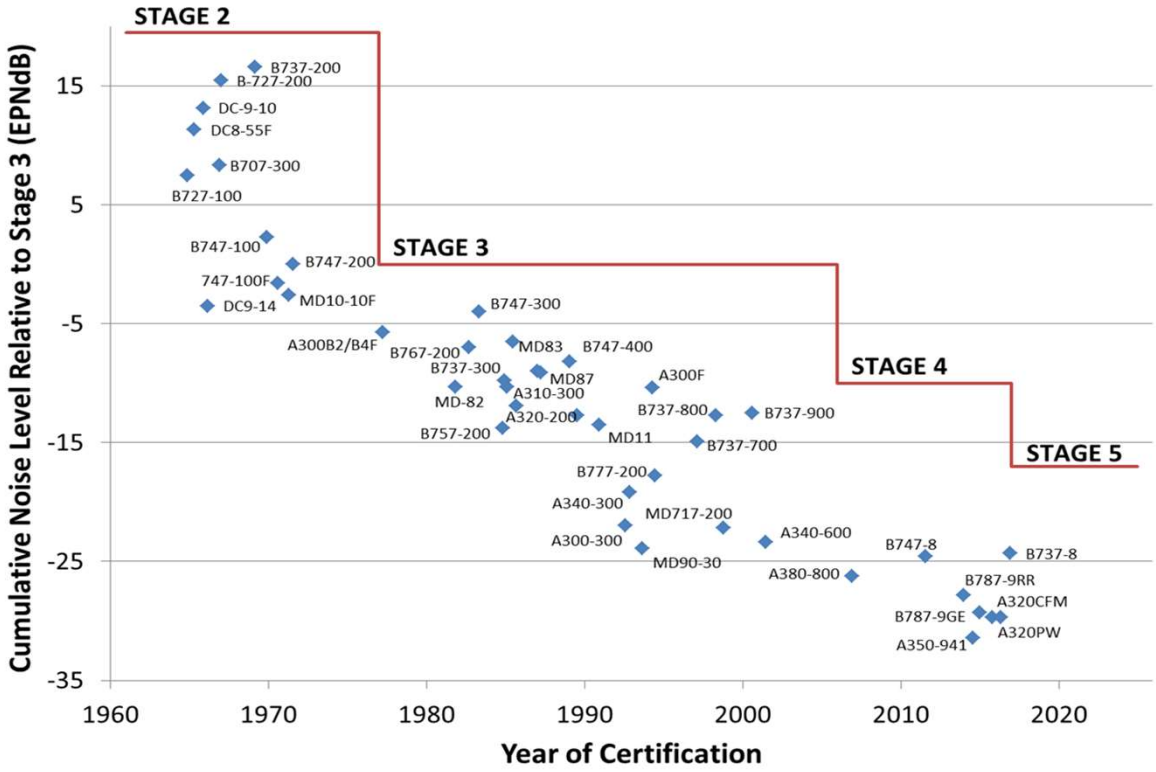


•**Community Exposure**

Community exposure set by aircraft types and operational tempo over day and night

Historical Trends in Aviation Noise

- Community noise exposure reduction primarily a result of dramatic decrease in aircraft source over time
- We see the reduction of source noise as the primary solution to addressing noise issues
- Historically, technologies that reduce noise have also resulted in fuel burn reductions
- Achieving additional reductions in aircraft source noise is possible, but challenging

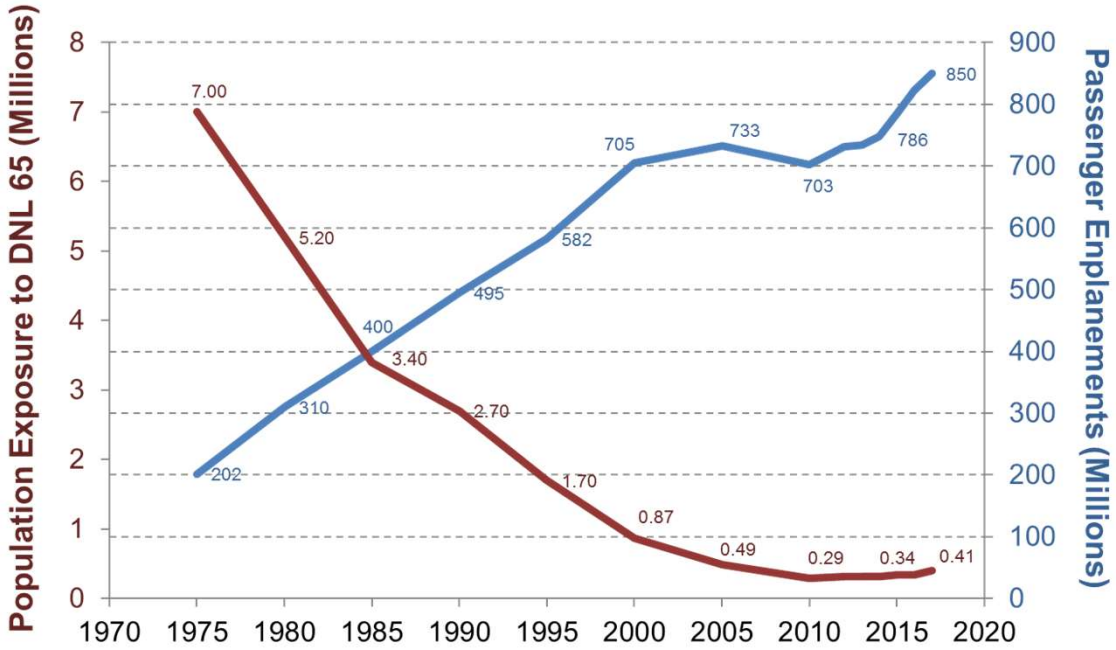


Noise Reduction through Technology

- **Noise improvements have come with fuel efficiency gains**
- **Increased engine bypass ratio**

- **Simplified high lift systems**

Historical Trends in Noise Exposure and Enplanements

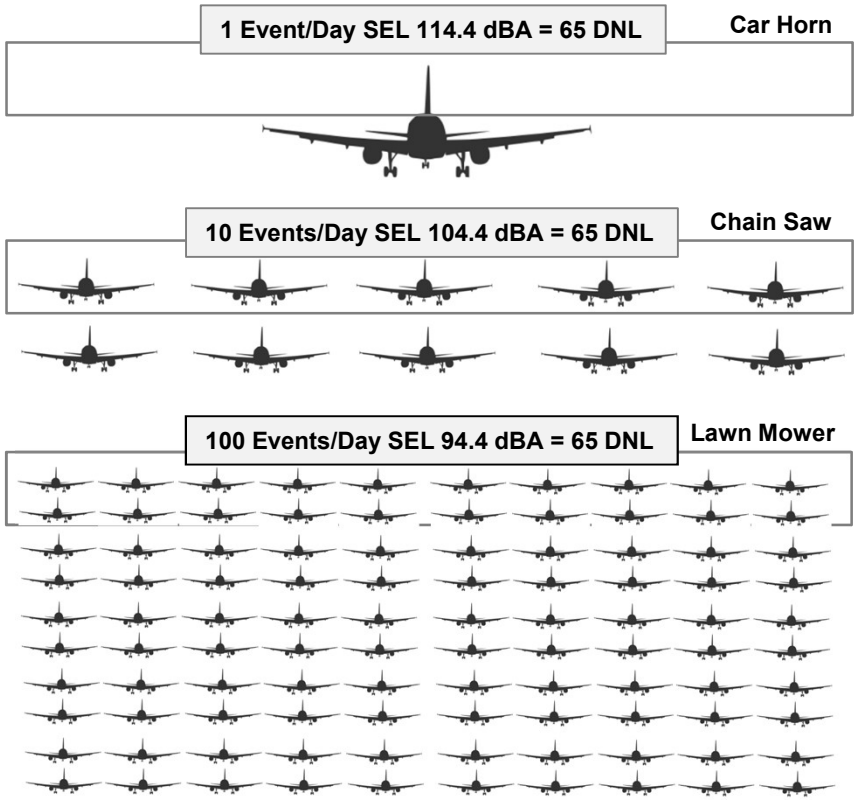


A 93 percent decrease in community noise exposure while increasing enplanements by 340 percent – the noise experience is very different today than decades past and we expect it to continue to evolve

Today's Situation

- Aircraft noise from 1970's is different from aircraft noise today. Aircraft from 1970s produced the same acoustic energy as 10 to 30 aircraft operations today.

- Unlike in the 1970's when a few aircraft operations would produce noise at or above DNL 65 dB, today a much greater number of quieter aircraft operations produce noise at or above DNL 65 dB. However, noise experience would be very different.



Environment and Energy (E&E) Research Programs

•Continuous Lower Energy, Emissions and Noise (CLEEN)

- Reduce aircraft fuel burn, emissions and noise through technology & advance alternative jet fuels
- Cost share partnership with industry

•ASCENT Center of Excellence (COE)

- COE for Alternative Jet Fuel and Environment
- Cost share research with universities

•Additional Efforts

- Commercial Aviation Alternative Fuels Initiative (CAAFI)

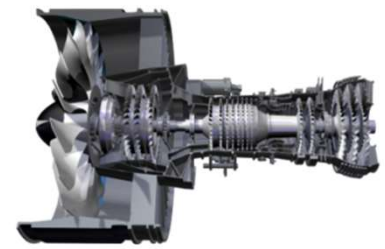
- Volpe Transportation Center

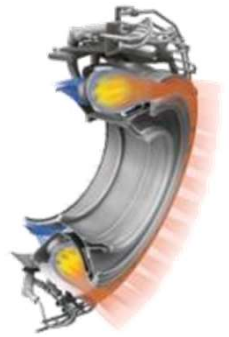
FAA Efforts to Address Noise

Continuous Lower Energy, Emissions & Noise (CLEEN)

- FAA led public-private partnership with 50-50 cost share from industry
- Reducing fuel burn, emissions and noise via aircraft and engine technologies and alternative jet fuels
- Conducting ground and/or flight test demonstrations to accelerate maturation of certifiable aircraft and engine technologies

	Phase I	Phase II	Phase III*
Time Frame	2010-2015	2016-2020	2021-2025
FAA Budget	~$125M	~$100M	TBD
Noise Reduction Goal	25 dB cumulative noise reduction cumulative to Stage 5 ***and/or reduces community noise exposure (new goal for Phase III)***		
NO_X Emissions Reduction Goal	60% landing/take-off NO_X emissions	75% landing/take-off NO_X emissions (-70% re: CAEP/8)	
Fuel Burn Goal	33% reduction	40% reduction	-20% re: CAEP/10 Std.
Entry into Service	2018	2026	2031
*Notional			





For more information on CLEEN program: http://www.faa.gov/go/cleen

CLEEN III Industry Day: https://faaco.faa.gov/index.cfm/announcement/view/32134

CLEEN III Solicitation: https://faaco.faa.gov/index.cfm/announcement/view/31885

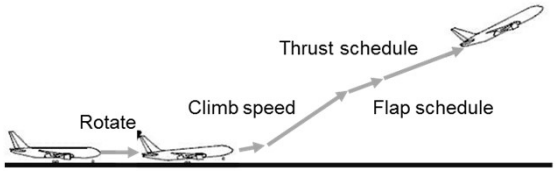
FAA R&D Efforts Relating to Aircraft Operations

Opportunities for noise reduction:

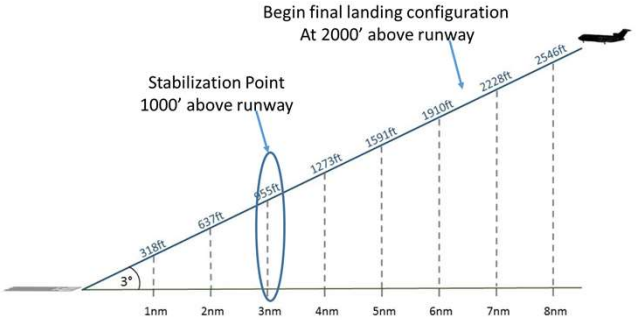
- Airlines determine *what* aircraft fly and *when*
- There might be opportunities to change *where* aircraft fly (through precision navigation) and *how* aircraft are flown

Concepts being evaluated:

- **Route changes**
- **Thrust / speed management**
  - Noise abatement procedures
  - Manage thrust and configuration to lower noise on takeoff and approach
- **Vertical profile**
  - Continuous climb operations
  - Continuous descent arrival
  - Modified approach angles
  - Staggered or displaced landing thresholds
- **Introduction of systematic dispersion**



•***Takeoff Profile***



•***Approach Profile***

Other Noise Related History

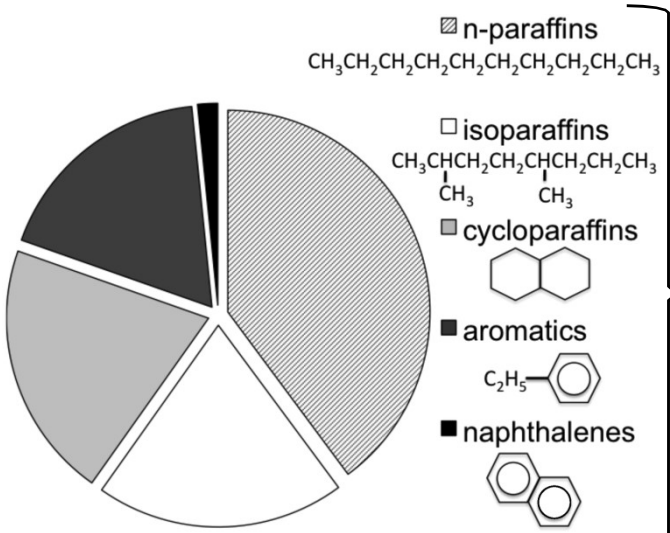
Hollywood Burbank Airport

- First airport in the country to be all Stage III air carrier aircraft (1978)
- The Noise Impact Area as defined by the State of California has shrunk from 403 acres (70 dB) of incompatible land use in 1978 to under 20 acres today, a 95% reduction.
- 2445 homes have been acoustically treated through the Part 150 Study process.

Van Nuys Airport

- Fly Friendly/Quiet Departure Program to phase out stage II aircraft and set noise limits – 1970s
- Part 150 study – 1987 through 2009
- Active Noise Monitoring and Response Program

Aircraft Emissions and Air Quality

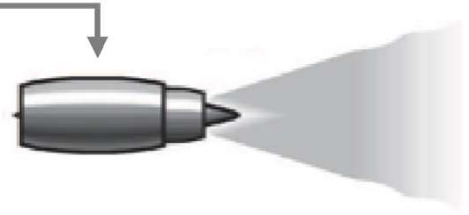


Weighted Mean Fuel Sulfur Content (PPM)		
	2006	2007
US East	446	321
US Gulf	858	800
US West	240	395
Nationwide	709	677

Fuel composition and engine design determine emissions

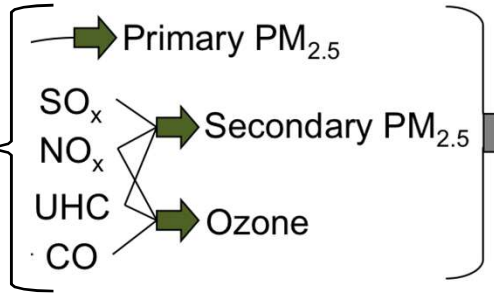
Fuel: $C_nH_m + S$

Air: $N_2 + O_2$



Tank-to-Wake Actual Combustion Emissions

$CO_2 + H_2O + NO_X + SO_X + soot + CO + HC + N_2 + O_2$



Population Exposure and Health Impacts

Atmospheric transformation, dispersion and removal determine pollutant concentration

Aircraft Emissions in Perspective

- Based on analysis of top 66 airports in the U.S., aircraft operations contribute less than 1% of all ambient $PM_{2.5}$ in metropolitan areas.
  - UNC research - Boone, S. S. Penn, J. Levy and S. Arunachalam (2015). Calculation of sensitivity coefficients for individual airport emissions in the continental United States using CMAQ-DDM3D/PM, In Proceedings of the 34th International Technical Meeting on Air Pollution, Montpellier, France, May 2015.

- Aircraft activities contributes to 0.3% of the health impacts of combustion emissions in the U.S.
  - MIT research - Dedoussi and Barrett, "Air pollution and early deaths in the United States. Part II: Attribution of PM2.5 exposure to emissions species, time, location and sector," Atmospheric Environment 99 (2014). http://dx.doi.org/10.1016/j.atmosenv.2014.10.033
  - MIT research - Yim et al., "Global, regional and local health impacts of civil aviation emissions," Environ. Res. Lett. 10 (2015). doi:10.1088/1748-9326/10/3/034001

- Based on measurements in Seattle area, road traffic produces more PM, relative to aviation, at all sizes down to 20 nm. Aircraft produce more PM, relative to emissions, at sizes from 10 to 20 nm.
  - $PM_{0.1}$ is 100 nm and road traffic PM
  - U. Washington research - Preliminary findings presented by Prof. E. Austin of U.W. to 2019 Aviation Emissions Characterization Roadmap meeting available for download at https://deohs.washington.edu/mov-mobile-observations-ultrafine-particles-study

Efforts Relating to Jet Fuel and Emissions

Testing and Modeling

- Measure emissions from engines using conventional and alternative jet fuels
- Improve atmospheric impact modeling capabilities
- Support and improve Certification/Qualification testing to ensure alternative jet fuels are safe for use
- Analysis to understand environmental and economic sustainability of alt fuels

Reducing Emissions

- ICAO Carbon Offsetting and Reduction Scheme (CORSIA)
- Engine standard (NOx and PM standards)
- Modifications to fuel composition
- Aircraft technologies
- Vehicle operations

Coordinate Activities

- Public-private partnerships
- State, regional, interagency, and international

Technology & Emissions Reduction

- Visible smoke emissions have been eliminated

DC-8, 1958

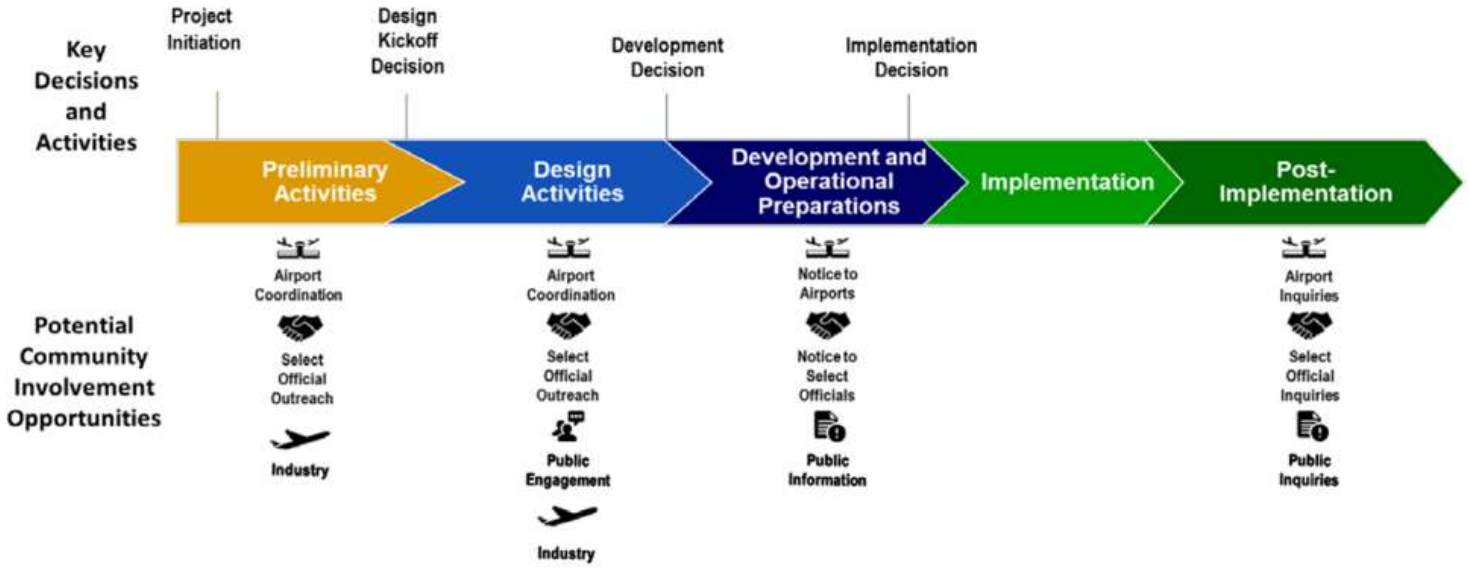
Boeing 787, 2012

- 50% reduction in CAEP Nitrogen Oxides (NOx) emissions standard since 1995
- CAEP/11 agreement on a particulate matter standard for aircraft engines – limits on both particle number and mass
- CLEEN Program - Low Emissions Combustors
  - GE TAPS II Combustor,
    LTO Nox: 55% below most recent CAEP std
    PM: 90% below CAEP visibility smoke limit
  - CLEEN combustor development ongoing with GE, Honeywell, Rolls Royce

Ongoing Engagement

- **BUR Procedures Environmental Assessment**
- **Potential VNY Procedure Change Request**
- **Stakeholders come together to develop implementable solutions – e.g., Joint Task Force**

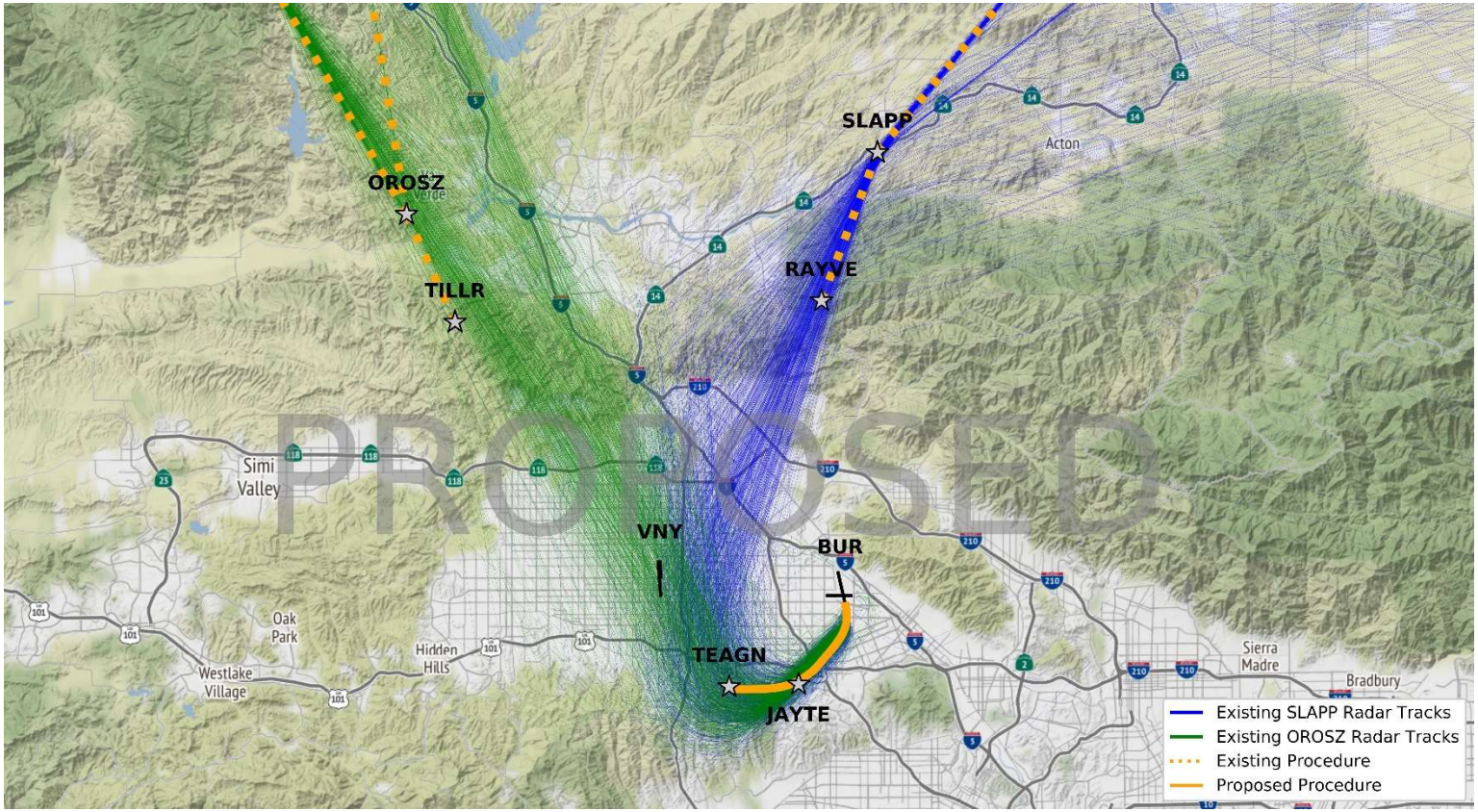
Performance Based Navigation Process Timeline



Note: The need for and level of engagement will vary based on project circumstances

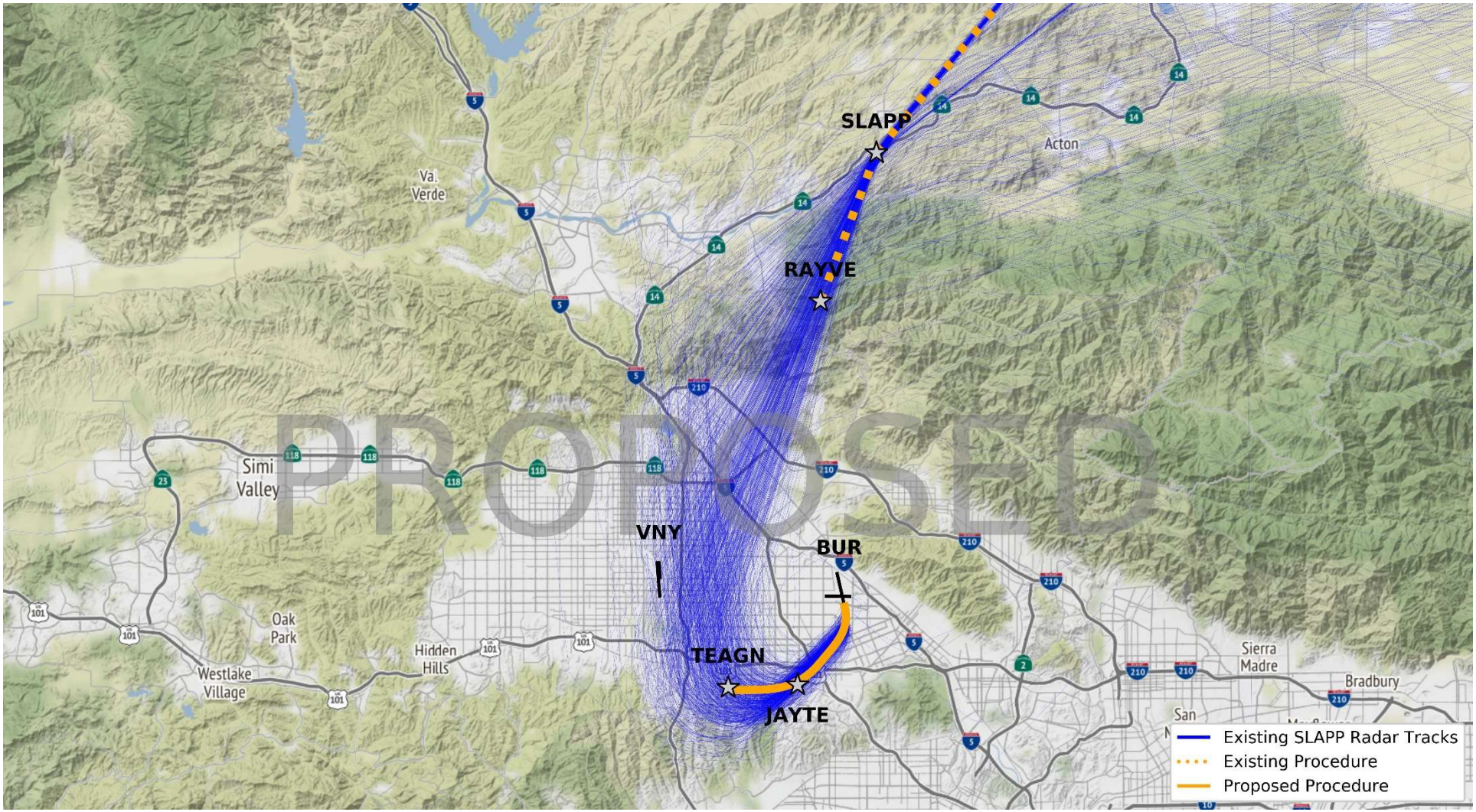
- Any changes made to RNAV procedures are contingent upon successful completion of the JO 7100.41 Performance Based Navigation (PBN) process.

Proposed SLAPP and OROSZ Procedure Amendments

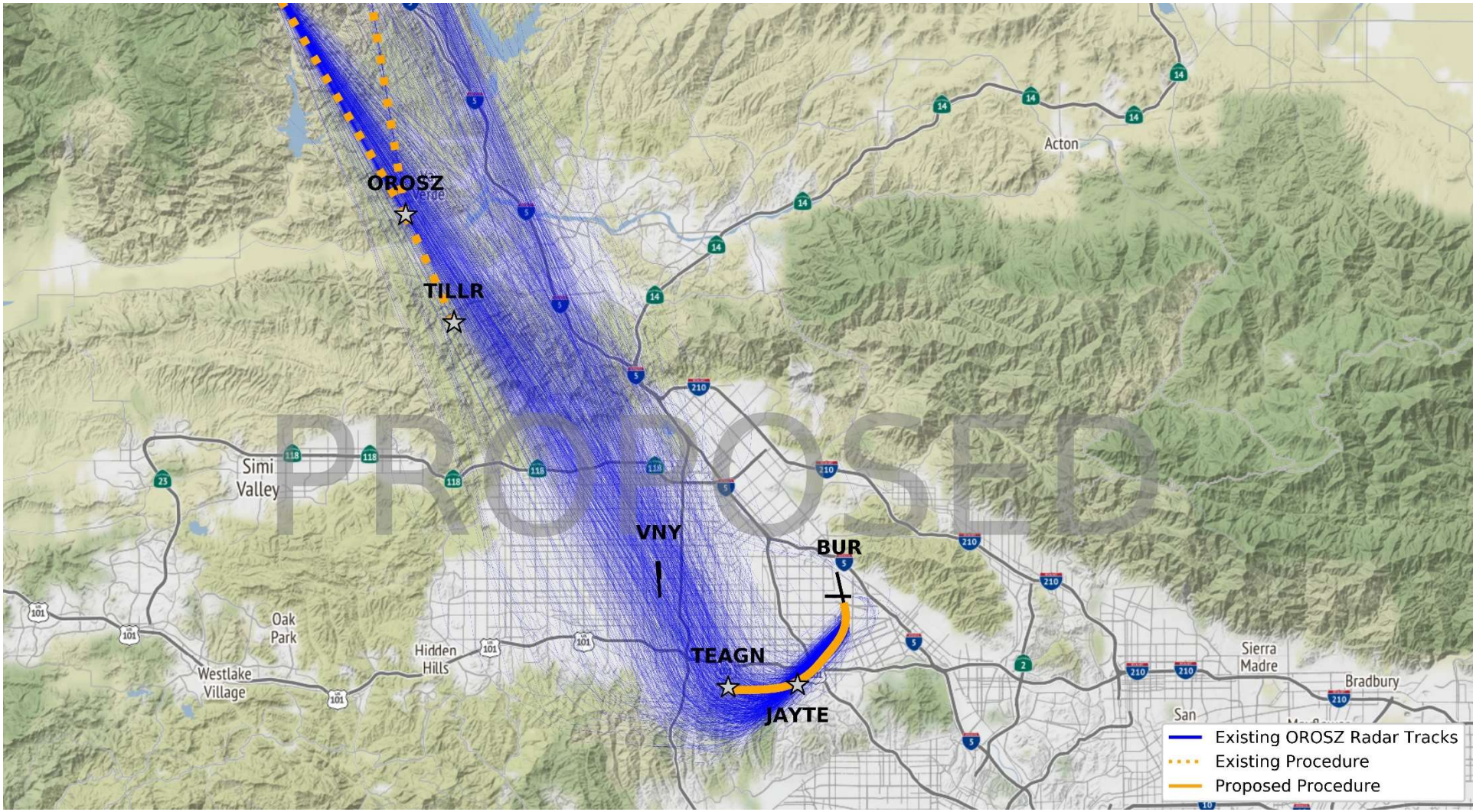


- **Today, aircraft departing from BUR on the SLAPP and OROSZ fly an initial compass heading before controllers turn them toward RAYVE and TILLR.**
- **The FAA is proposing to amend the SLAPP and the OROSZ.**
- **The proposed amendments would create an initial satellite-based route segment that aircraft on both routes would follow.**
- **Aircraft would fly this segment automatically, without receiving instructions from air traffic controllers.**
- **Aircraft would fly over the JAYTE waypoint at or above 2,400 feet MSL. Controllers would then turn the aircraft north or northwest before they reach the TEAGN waypoint.**
- **Controllers would vector aircraft until they reach the RAYVE or TILLR waypoints, where they would resume flying satellite-based segments.**

Proposed SLAPP Procedure



Proposed OROSZ Procedure



Status of the Proposed Amendments

- **The FAA has not implemented the proposed amendments to the SLAPP and OROSZ.**

- **The FAA will prepare an Environmental Assessment of the proposed amendments. The agency made this decision following two FAA workshops about the proposal held in Burbank in November 2018.**

- **The Environmental Assessment will evaluate the potential environmental impacts of the proposed amendments to the OROSZ and SLAPP, and any reasonable alternatives to the proposed amendments.**

- **The FAA is in the process of a developing a timeline for preparing the Environmental Assessment. The agency will provide Environmental Assessment updates on its Burbank Community Involvement website: https://www.faa.gov/nextgen/nextgen_near_you/community_involvement/bur**

Questions

Thank You

Community Involvement links:

- https://www.faa.gov/nextgen/nextgen_near_you/community_involvement/

- https://www.faa.gov/nextgen/nextgen_near_you/community_involvement/bur/