

Urban Freeways and Urban Mobility



Case Studies of Vancouver, Seattle and San Francisco

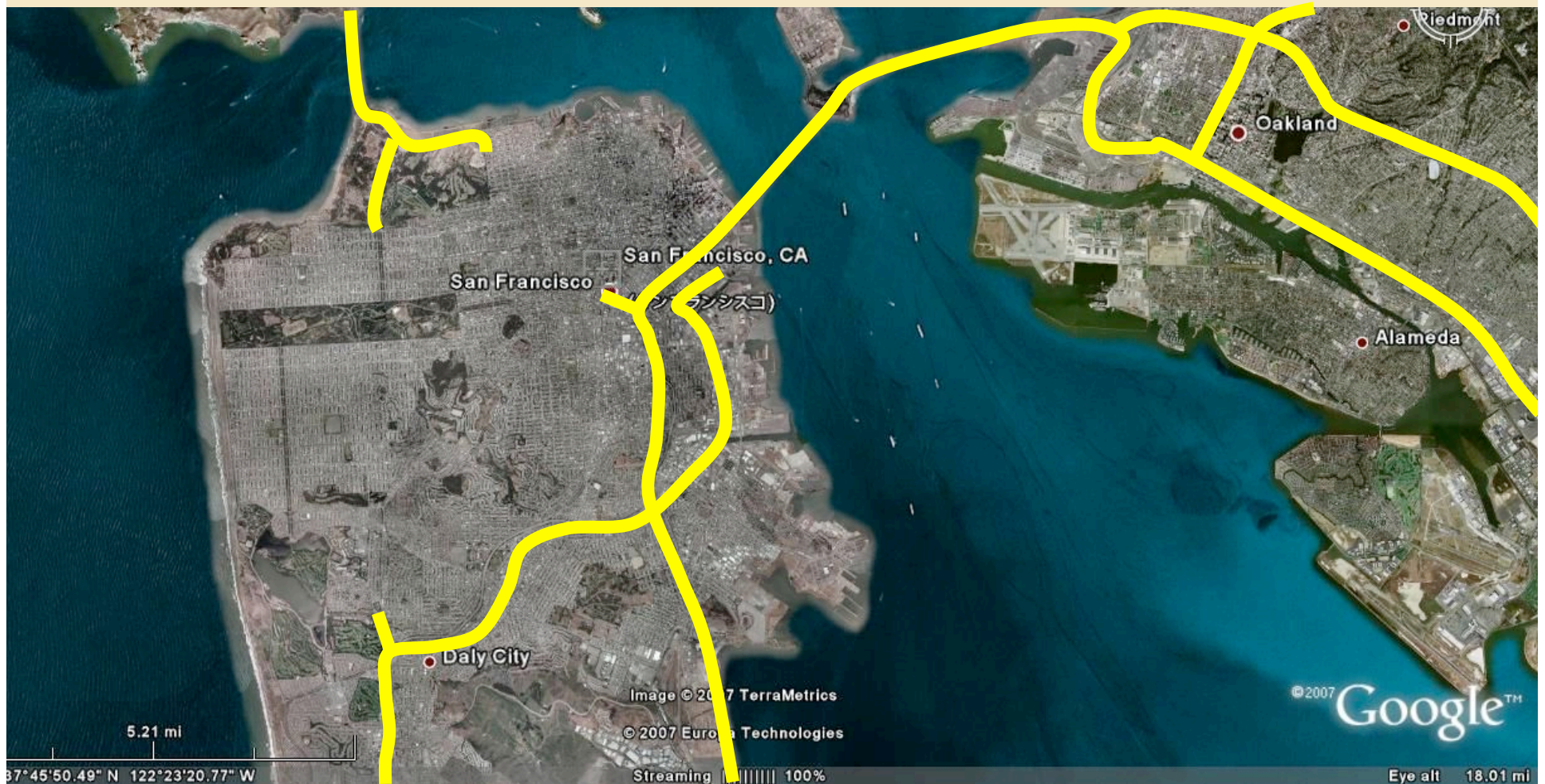
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CNU May 18, 2007

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Agenda

- San Francisco
- Vancouver
- How Urban Freeways Work
- Lessons for Seattle

San Francisco Freeway Network



Vancouver Freeway Network



Seattle Freeway Network

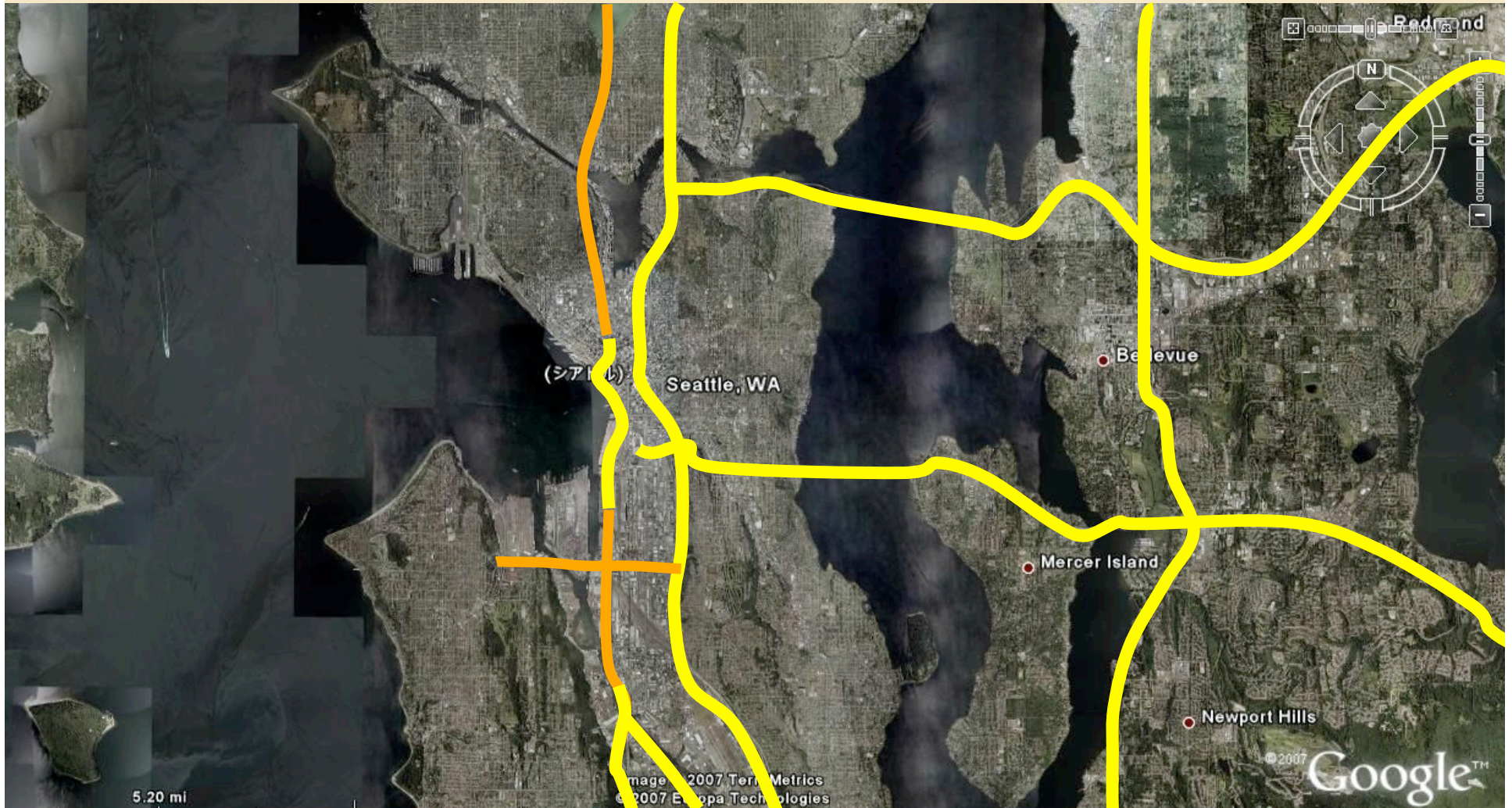




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● Daly City

Streaming 100%

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Eye



San Francisco, CA

(サンフランシスコ)

San Francisco

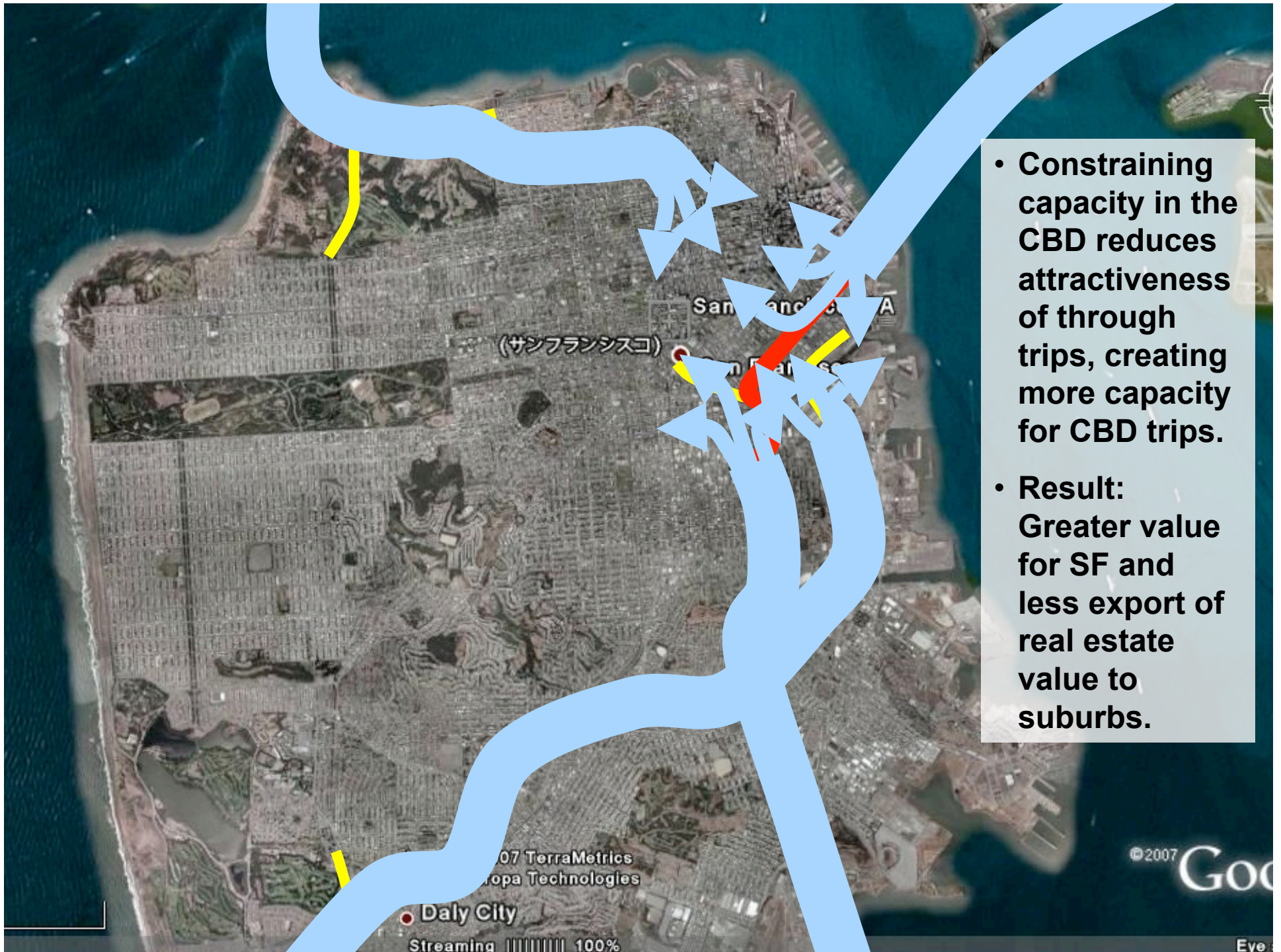
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Daly City

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Eye



- **Constraining capacity in the CBD reduces attractiveness of through trips, creating more capacity for CBD trips.**
- **Result: Greater value for SF and less export of real estate value to suburbs.**

Photo: San Francisco Transportation Authority







Photos: Public Copy from Flickr.com



Photo: San Francisco Transportation

Central Freeway Today



Photos: Public Copy from Flickr.com. Left ehoyer.
Right Dannebrog.



Case Study City: Vancouver



Thanks to Lon LaClair City of Vancouver

Freeways = Lost Capacity

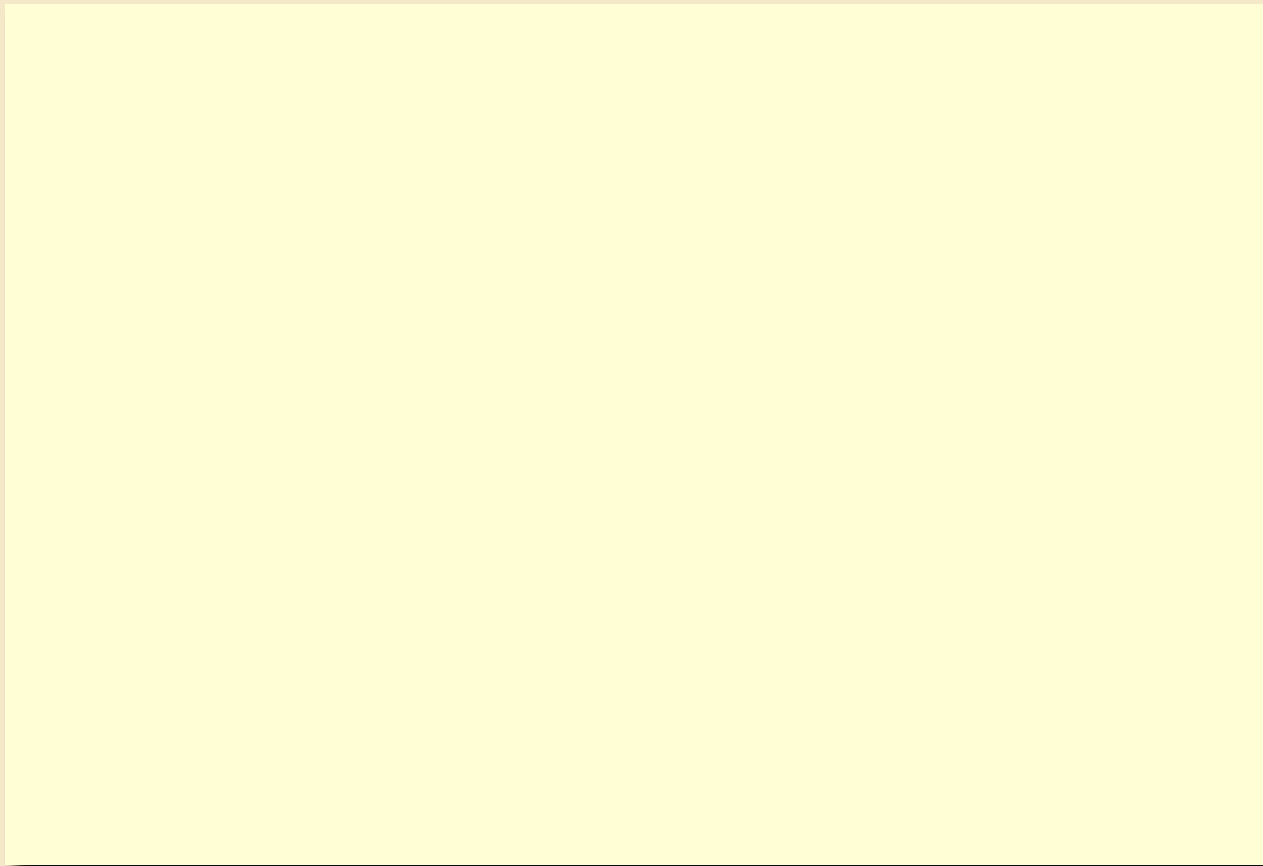
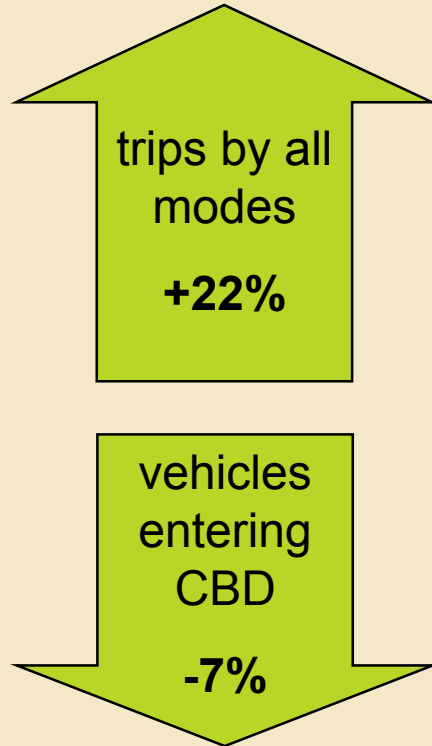


High Connectivity = High Capacity



Trips Up, Vehicle Count Down

Vehicle trips to CBD are declining.

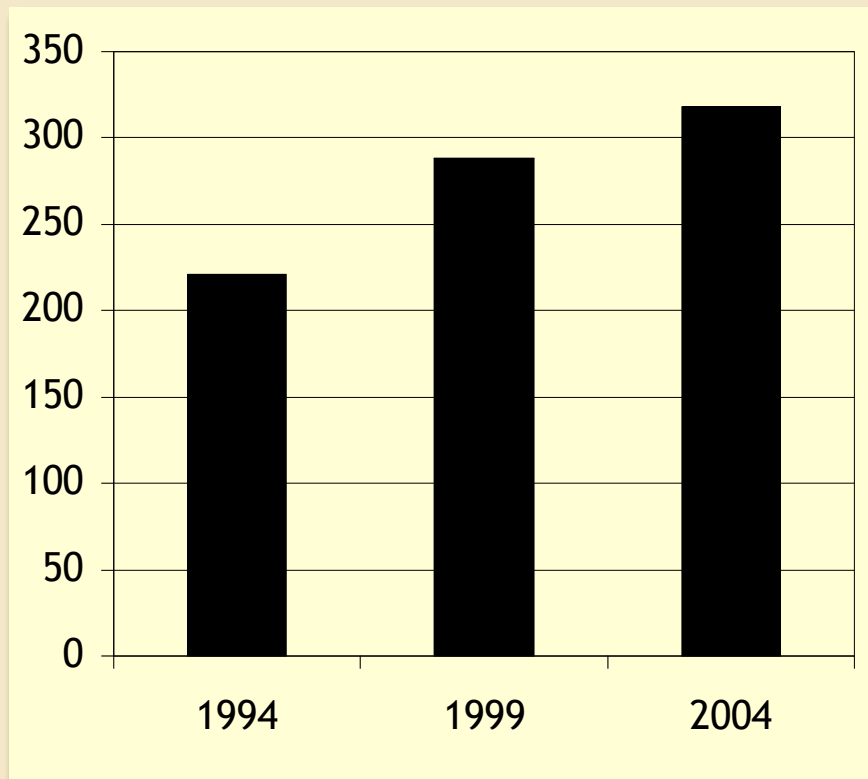


Thanks to Lon LaClair City of Vancouver

Walk Trips Growing

Second fastest growing transportation mode.

Walk trips to & within Vancouver (24 hour); (thousands per day)



Source: TransLink Trip Diary

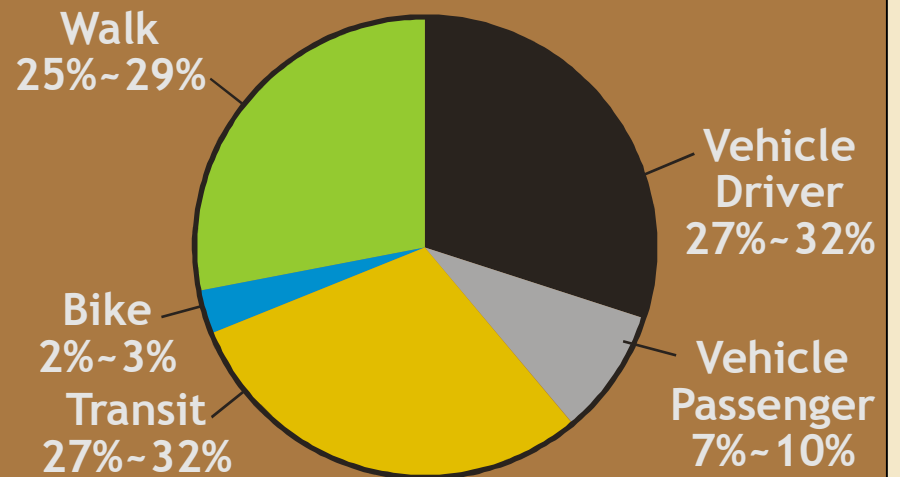


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Trips to Downtown



Trips to and within Downtown
in a 24 hour period

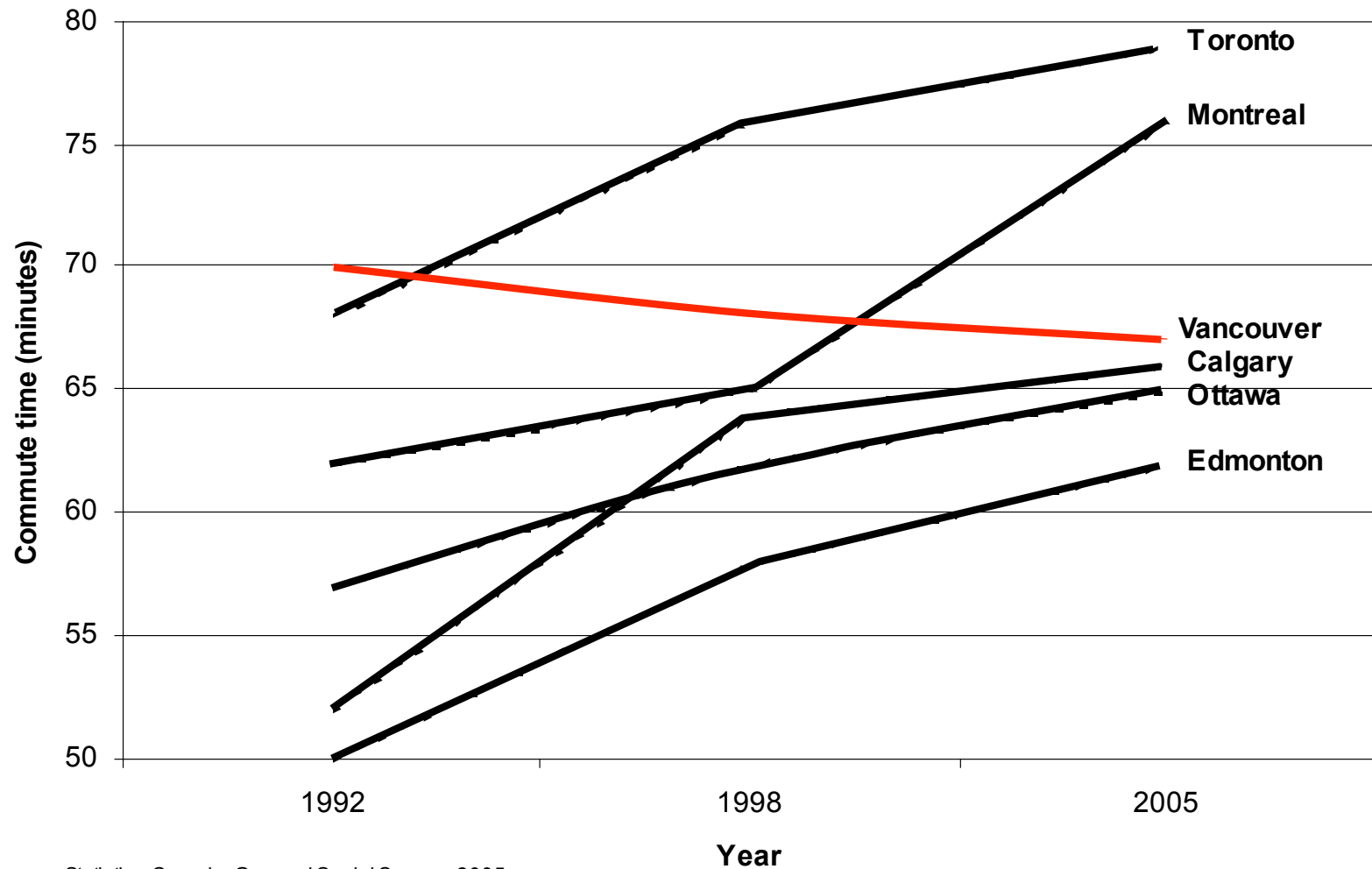


Source: Translink Trip Diary, 2004

Thanks to Lon LaClair City of Vancouver

Time Spent Commuting

Change in average round-trip home-to-work commute times
in major Canadian cities (1992-2005)



Source: Statistics Canada, General Social Survey, 2005

Key Lessons: Land Use Policy

- ✓ Higher densities.
- ✓ Complete neighborhoods – mixed use.
- ✓ Urban design that contributes positively to the pedestrian environment.



Thanks to Lon LaClair City of Vancouver

Key Lessons: Higher Densities



Thanks to Lon LaClair City of Vancouver

Key Lessons: Mixed Use



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Key Lessons: Pedestrian Level Interest



Thanks to Lon LaClair City of Vancouver

Freeway Challenges

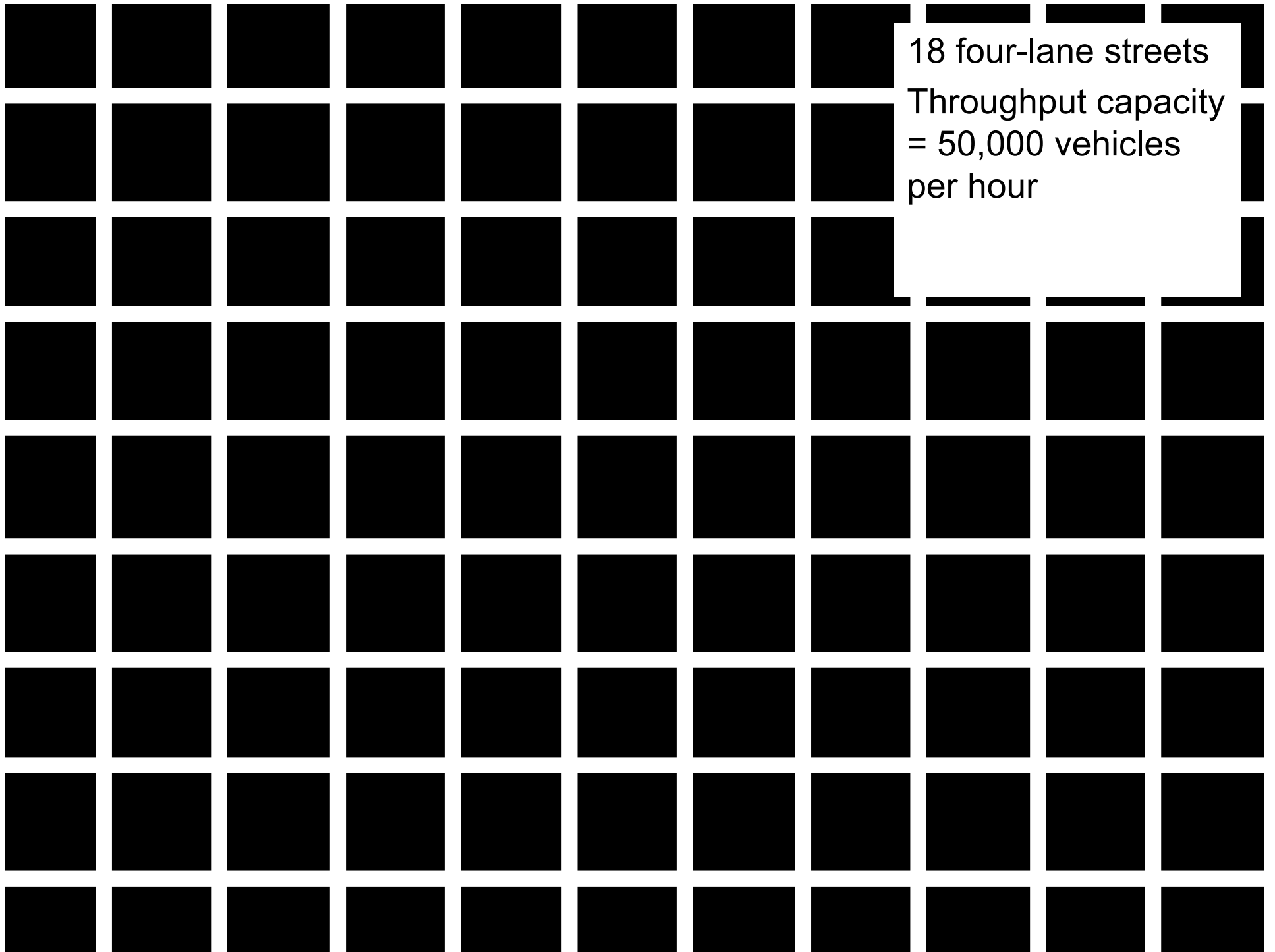
- Major Advantage: Speed, Especially for Long Distance Travel
- Major Disadvantage: Local Access Constraint
 - Freeway capacity limited by capacity of ramps where freeway meets city grid.
 - Freeways don't always increase network capacity – they may simply move the traffic bottleneck from one place to another.
 - If freeways interrupt the city street grid, they may remove as much network capacity as they create

Freeway Challenges

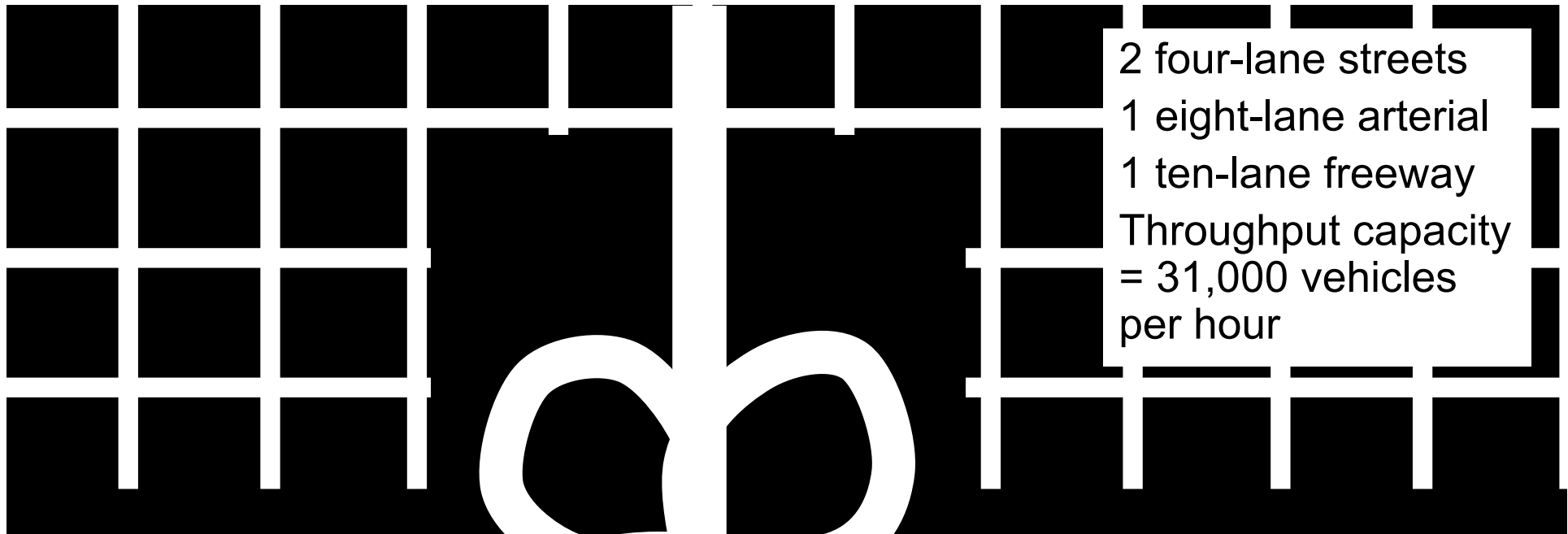
- Major Advantage: Real Estate Value
 - Freeways create real estate value for auto dependent, far away places but providing speedy access to jobs and services
- Major Disadvantage: Real Estate Value
 - Freeways reduce real estate value around them by eliminating direct access and increasing noise
 - Typically, urban freeways cut adjacent real estate value by half and removing freeways doubles adjacent real estate value (Milwaukee, San Francisco data);

Freeway Challenges

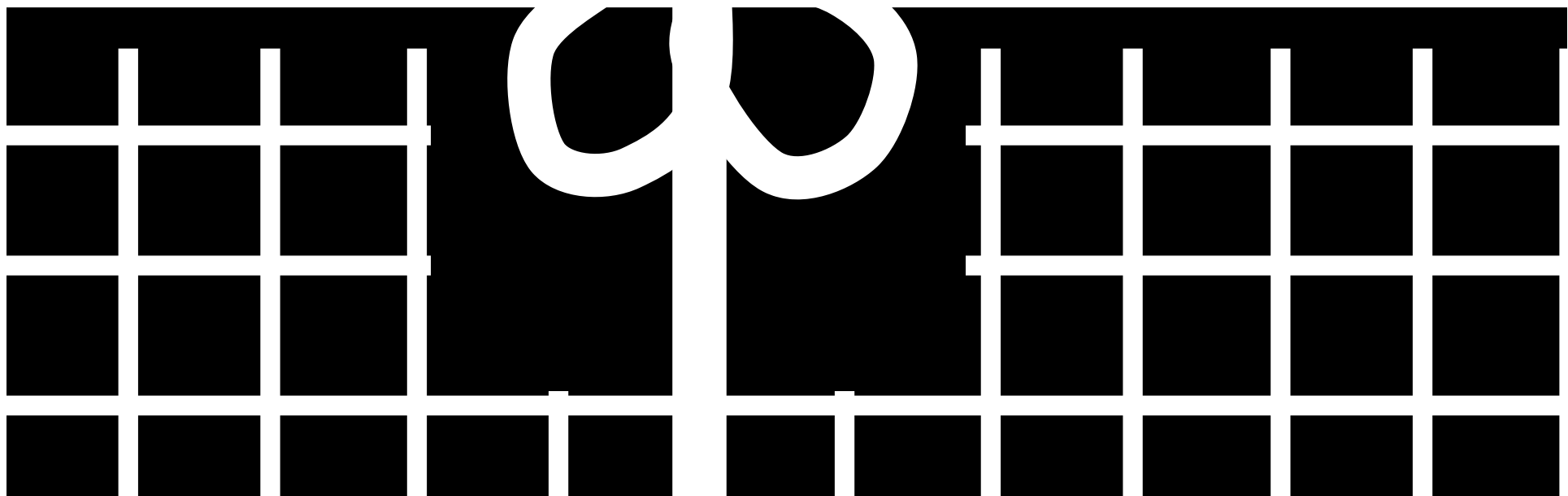
- Major Advantage: Convenience for Cars
 - High speed, simple connections for cars
- Major Disadvantage: All other Modes
 - Urban freeways make walking uncomfortable, dangerous and/or impossible
 - If passengers can't cross the street, transit does not work
 - By excluding other modes, freeways increase the auto trip generation rate, meaning new capacity may be filled because more people must drive.

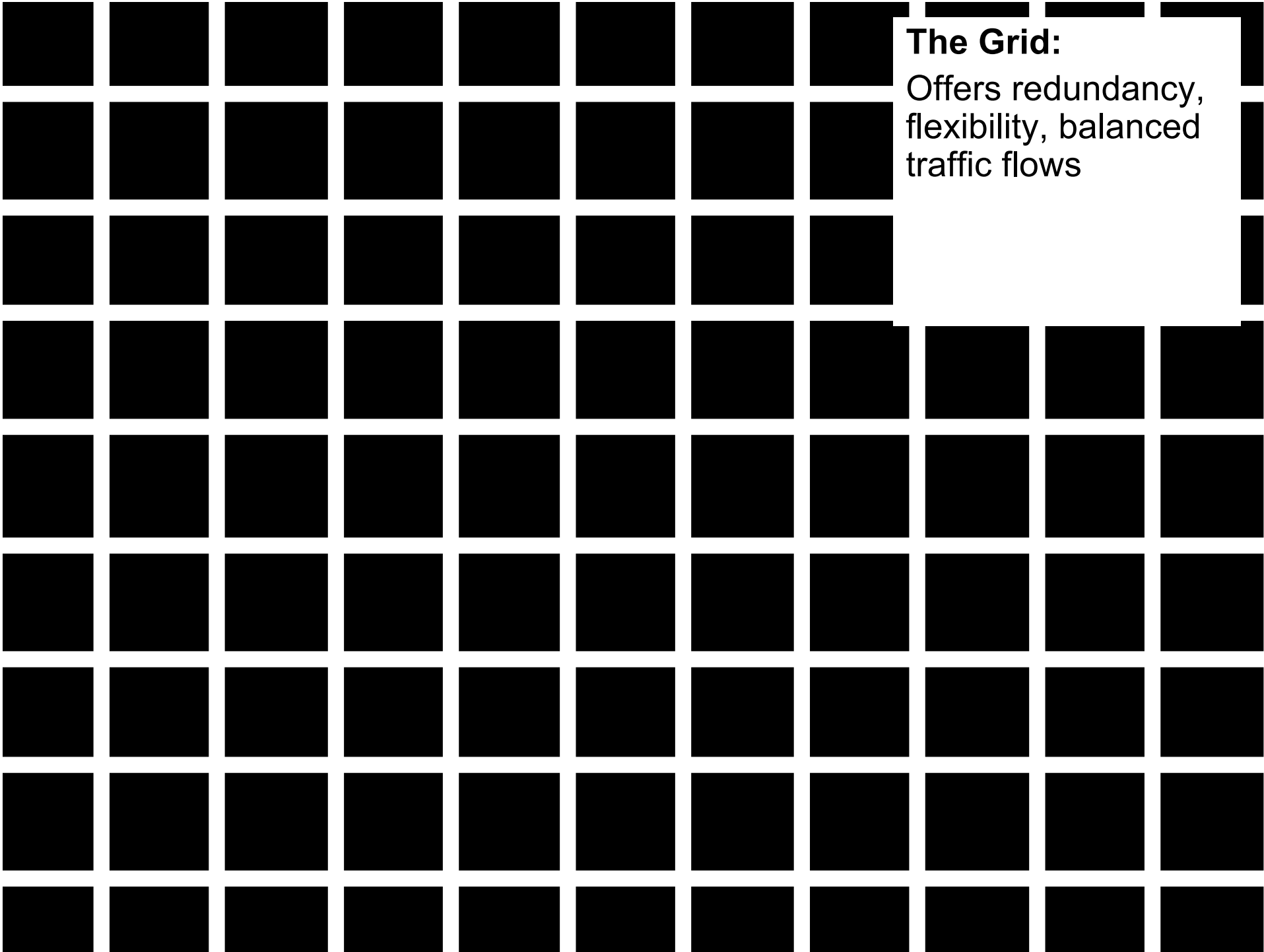


18 four-lane streets
Throughput capacity
= 50,000 vehicles
per hour



2 four-lane streets
1 eight-lane arterial
1 ten-lane freeway
Throughput capacity
= 31,000 vehicles
per hour



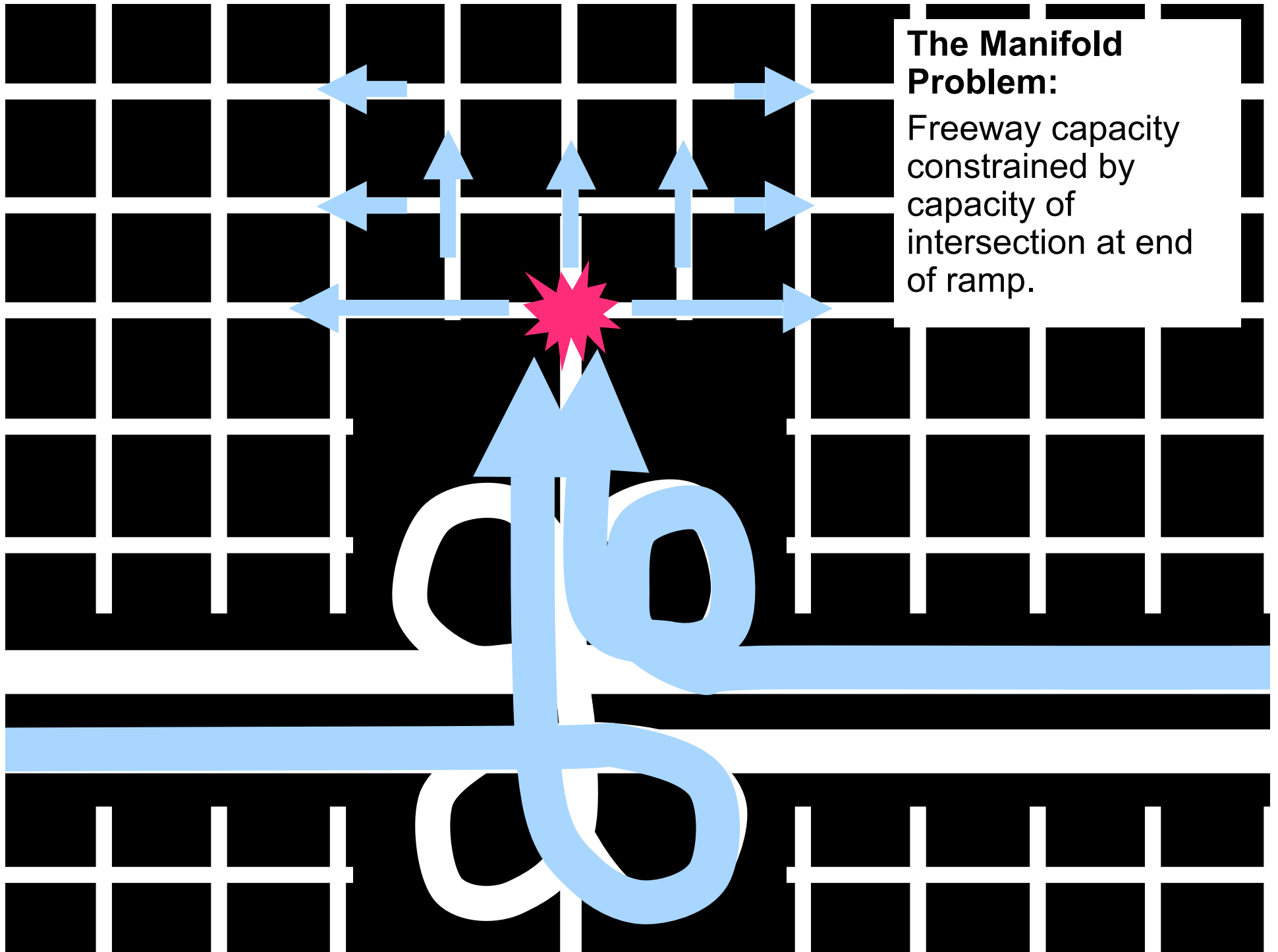


The Grid:

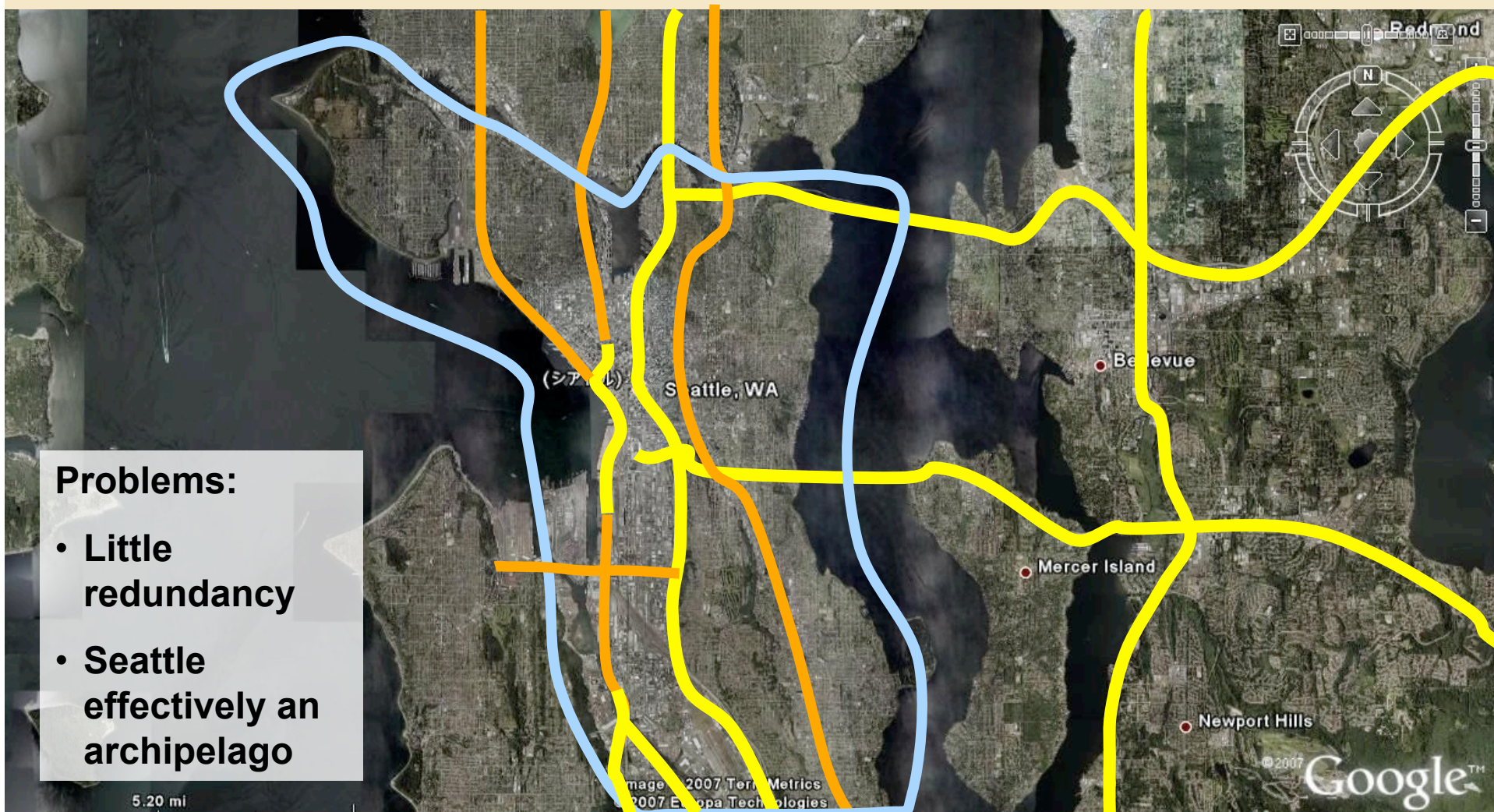
Offers redundancy,
flexibility, balanced
traffic flows

The Manifold Problem:

Freeway capacity constrained by capacity of intersection at end of ramp.



Seattle Freeway Network

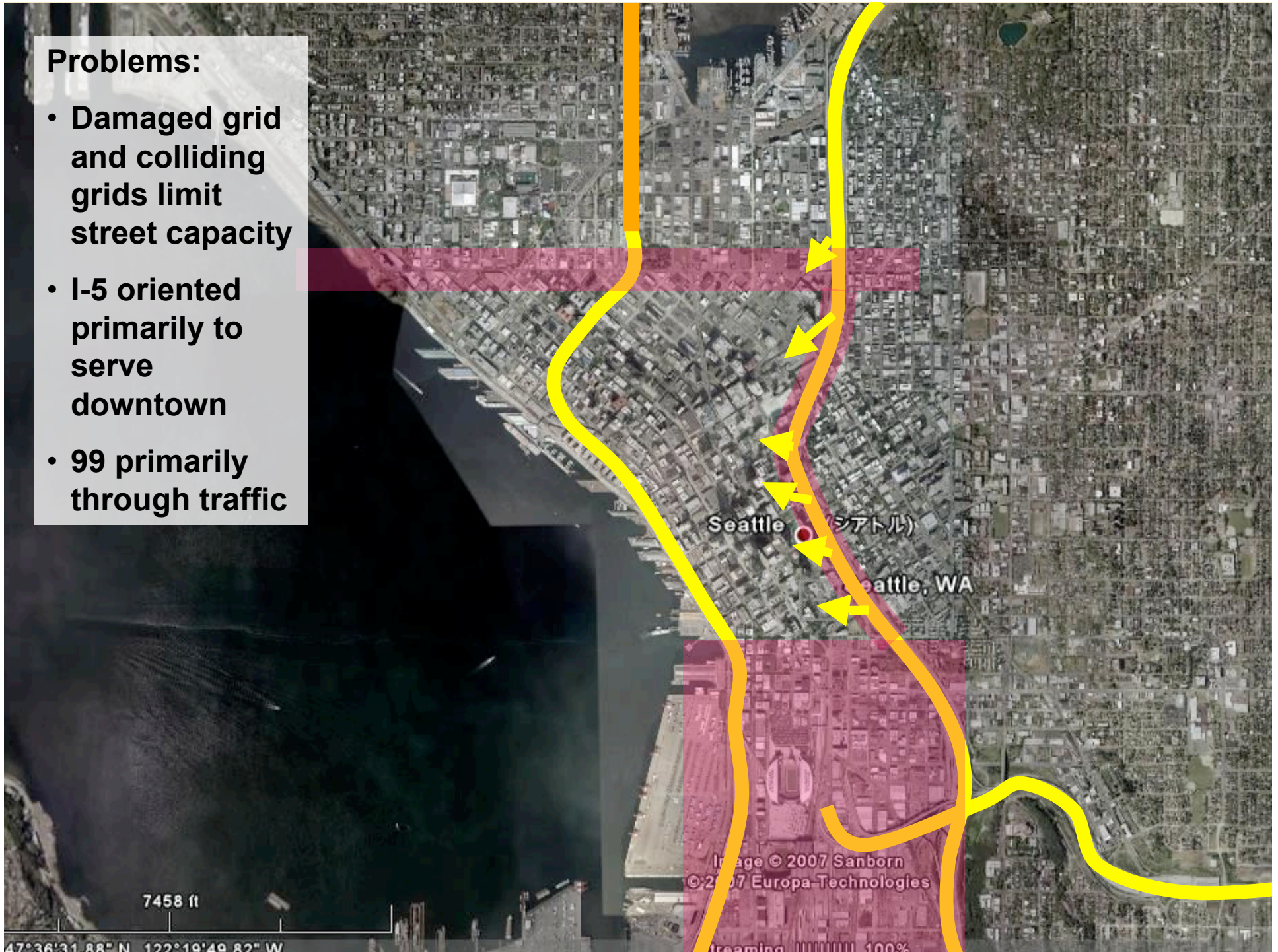


Problems:

- Little redundancy
- Seattle effectively an archipelago

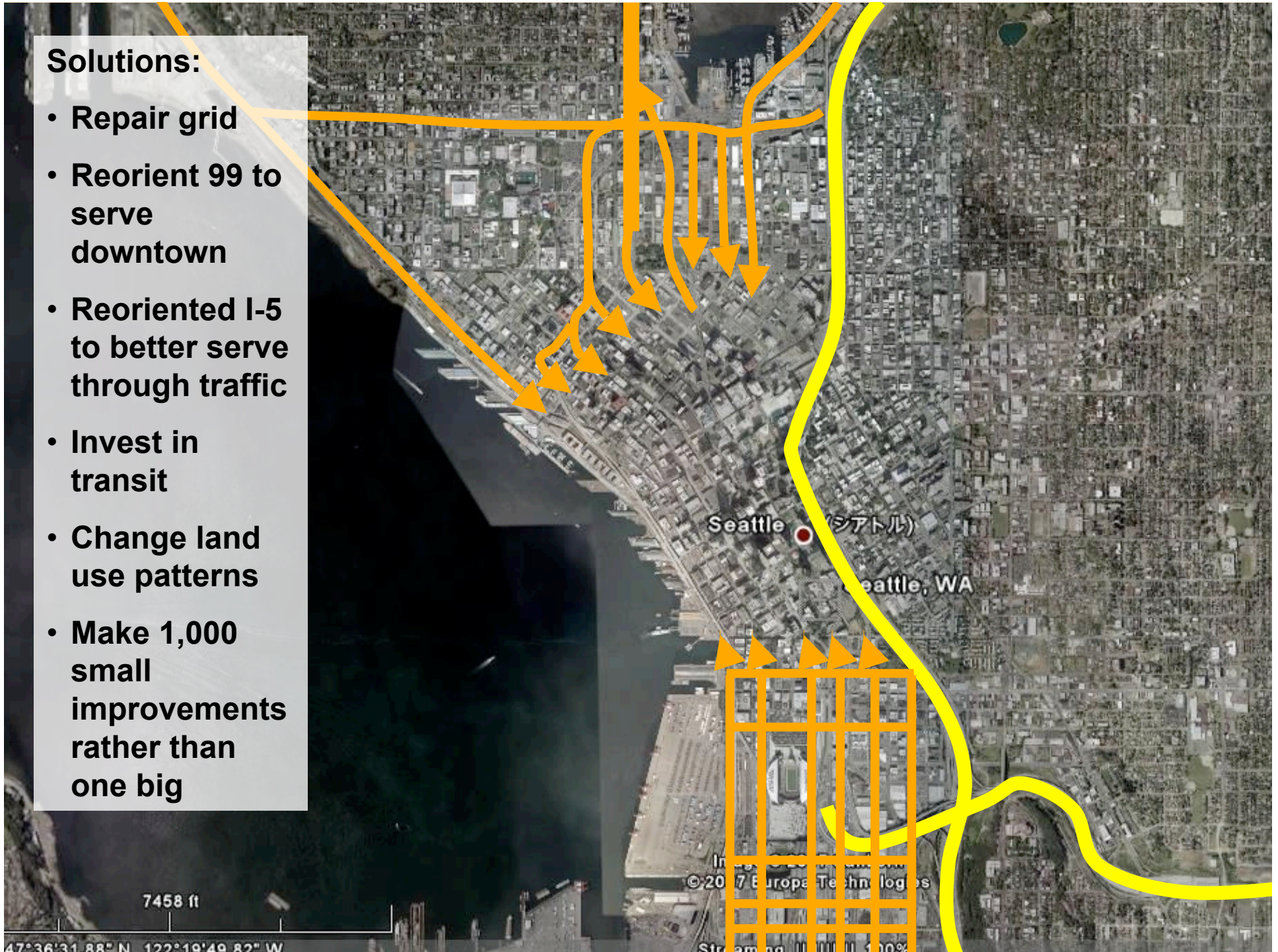
Problems:

- Damaged grid and colliding grids limit street capacity
- I-5 oriented primarily to serve downtown
- 99 primarily through traffic



Solutions:

- Repair grid
- Reorient 99 to serve downtown
- Reoriented I-5 to better serve through traffic
- Invest in transit
- Change land use patterns
- Make 1,000 small improvements rather than one big



For More Information

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Thanks also to Charles Siegel:

<http://www.preservenet.com/freeways/>

[FreewaysCentral.html](http://www.preservenet.com/freeways/FreewaysCentral.html)

Photo montage by Steve Price

