SPACES OF FLOW
ROAD URBANIZATION

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SPACES OF FLOW
ROAD URBANIZATION

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ROAD URBANIZATION
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Public and Economic Use Embrace Arterials
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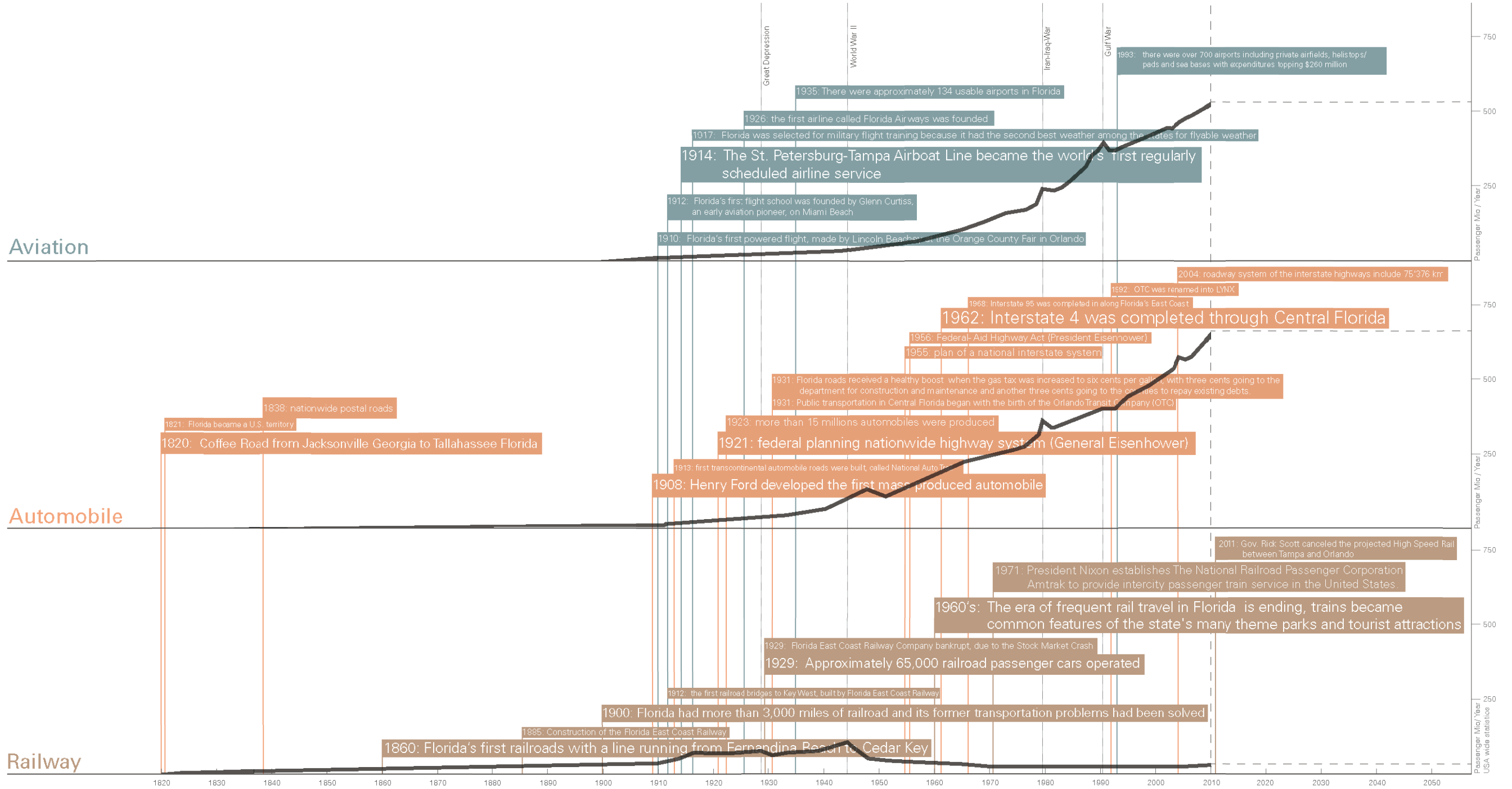**Ingredients of the Road Urbanization**

Spaces of Flow

NETWORKS OF FLOW

Florida possesses a dense network of multiple modalities that allow fast travel and fast freight traction. Besides ship, rail, airway and even a space port, its main transportation network is the road. This dense grid of interstates, arterials and smaller roads has been heavily developed since the federal interstate network was built after the World War II as a strategic military distribution and evacuation system.
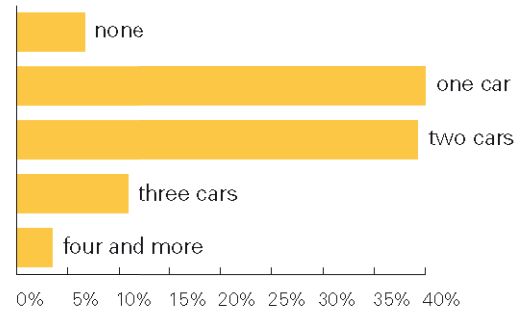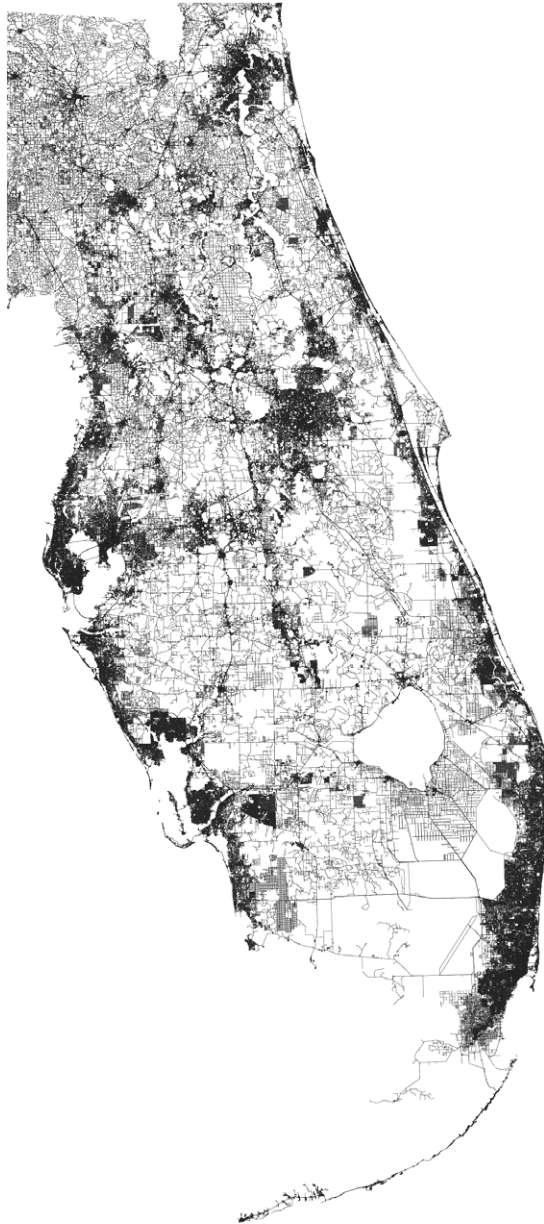
Great Depression

World War II

Iran-Iraq-War

Gulf War

1993:   there were over 700 airports including private airfields, helistops/
pads and sea bases with expenditures topping $260 million

1935: There were approximately 134 usable airports in Florida

1926: the first airline called Florida Airways was founded

1917: Florida was selected for military flight training because it had the second best weather among the states for flyable weather

1914: The St. Petersburg-Tampa Airboat Line became the world's first regularly scheduled airline service

1912: Florida's first flight school was founded by Glenn Curtiss,
an early aviation pioneer, on Miami Beach

1910: Florida's first powered flight, made by Lincoln Beachey at the Orange County Fair in Orlando

Aviation

2004: roadway system of the interstate highways include 75'376 km²

1992: OTC was renamed into LYNX

1968: Interstate 95 was completed in along Florida's East Coast

1962: Interstate 4 was completed through Central Florida

1956: Federal- Aid Highway Act (President Eisenhower)

1955: plan of a national interstate system

1931: Florida roads received a healthy boost when the gas tax was increased to six cents per gallon, with three cents going to the
department for construction and maintenance and another three cents going to the counties to repay existing debts

1931: Public transportation in Central Florida began with the birth of the Orlando Transit Company (OTC)

1838: nationwide postal roads

1923: more than 15 millions automobiles were produced

1821: Florida became a U.S. territory

1921: federal planning nationwide highway system (General Eisenhower)

1820:   Coffee Road from Jacksonville Georgia to Tallahassee Florida

1913: first transcontinental automobile roads were built, called National Auto Trail

1908: Henry Ford developed the first mass produced automobile

Automobile

2011: Gov. Rick Scott canceled the projected High Speed Rail
between Tampa and Orlando

1971: President Nixon establishes The National Railroad Passenger Corporation
Amtrak to provide intercity passenger train service in the United States

**1960's: The era of frequent rail travel in Florida is ending, trains became
common features of the state's many theme parks and tourist attractions**

1929: Florida East Coast Railway Company bankrupt, due to the Stock Market Crash

1929: Approximately 65,000 railroad passenger cars operated

1912: the first railroad bridges to Key West, built by Florida East Coast Railway

1900: Florida had more than 3,000 miles of railroad and its former transportation problems had been solved

1885: Construction of the Florida East Coast Railway

1860: Florida's first railroads with a line running from Fernandina Beach to Cedar Key

Railway

Passenger Mio /Year

Passenger Mio /Year

*Passenger Mio /Year/
USA wide statistics*

750
500
250

1820 1830 1840 1850 1860 1870 1880 1890 1900 1910 1920 1930 1940 1950 1960 1970 1980 1990 2000 2010 2020 2030 2040 2050

Development of the Floridian Transportation Modalities

Florida has been conquered with railroads. However, when the car superseded rail, Floridas ascent towards an automobile dependent society began. Continuous road expansion made the network into an omnipresent infrastructure that shapes the everyday life today.

High Vehicle Availability

According to the U.S. Cencus data 2010, only 5% of residents in Florida own no car. While a driving licence is already attainable for teenagers over 16 years of age, a car is easily bought with a leasing contract. An important step, since your mobility is decreased dramatically without a car.

The Omnipresent Road

The road network is the basis for movement within the urbanized structures. Hence to move for every day needs, for travel or for social interactions, car ownage is essential. Such a high mobility can only be achieved with cheap gasoline prices, which are still available. In that manner the car accessibility is the foundation for the american way of life.

One Man One Car

To travel in Florida you need a car. Without one you are stuck wherever you are.
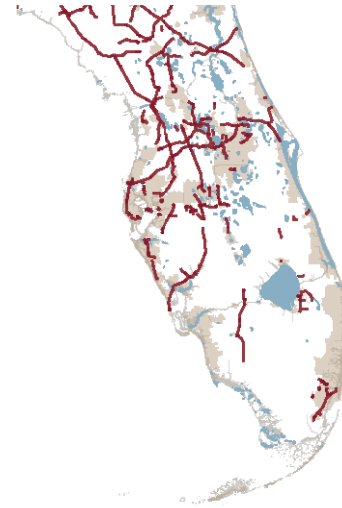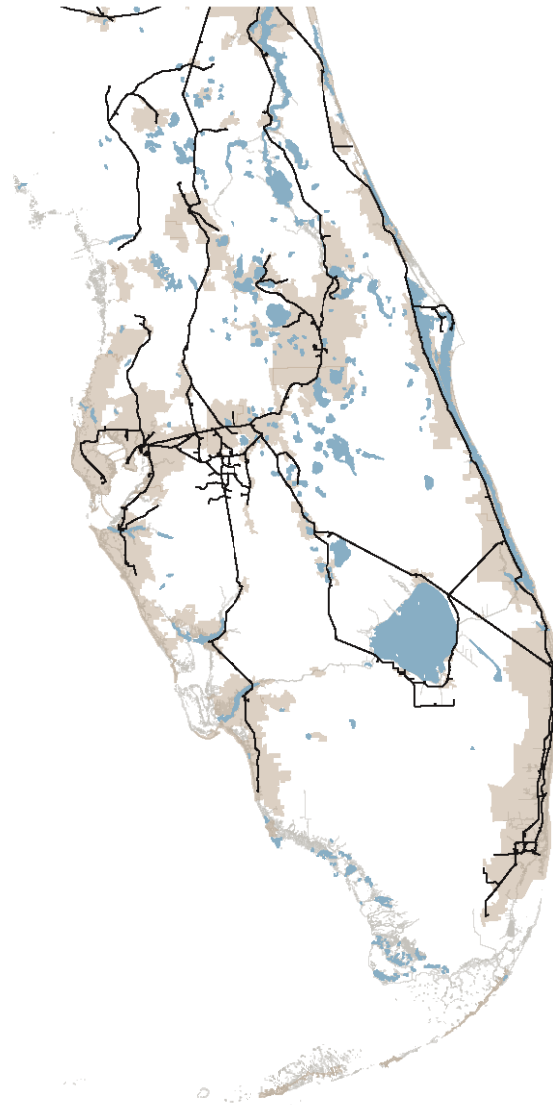
Redundant Railway Tracks

Many tracks are unused and neglected. The aeronautical advance superseeded railway as the fastest modality.
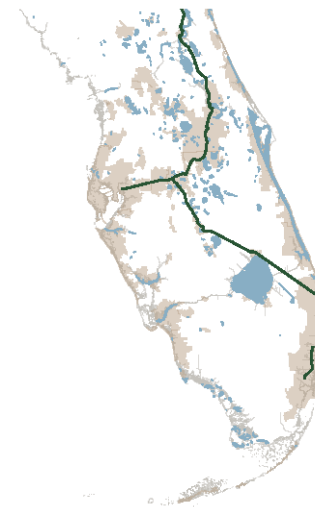
Marginal Public Transport

Amtrak the National Railroad Passenger Corporation offers a scheduled daily train ride from South Florida to New York.

Railway = Cargo

In the 1960's a transition from public transport to freight traction was initiated. Railway has since then grown into an economically efficient modality to traffic great quantities of goods. The only handicap is its speed. It is usually faster to dispatch by truck. Public transport however is on the fringe. Money and time costs deem it to be a gainless business, only maintainable through governmental funding.

Railway a Relict from a Past Age

Railway is outdated and a symbol for the good old times. The glorification of old transportation modalities is a common hobby, and tourist attraction.

A Super Dense Airway Network

During World War II the flight industry was drawn to Floridas favorable yearly climate and military air bases were established. Today Floridas aviation industry is still in a leading role of training pilots and manufacturing flight related products.
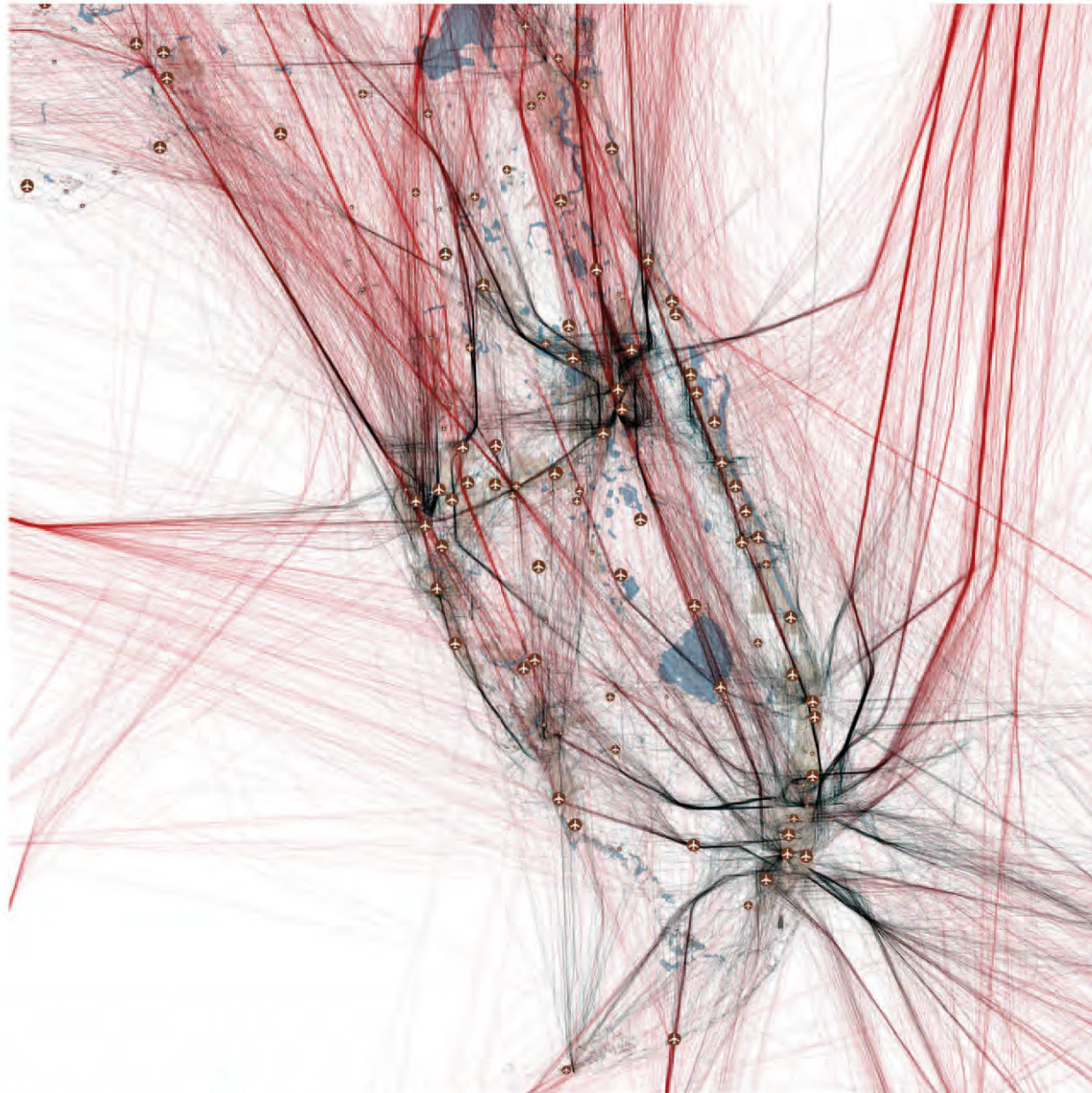
Take Off / Landing — In High Altitude ✈ Airports ▪ Lake ▪ Urbanized Area

Cultural Heritage of Aviation

The state enthusiasm for aviation probaly has its roots in the World War II flight boom, e.g. airshows are still crowd pullers.
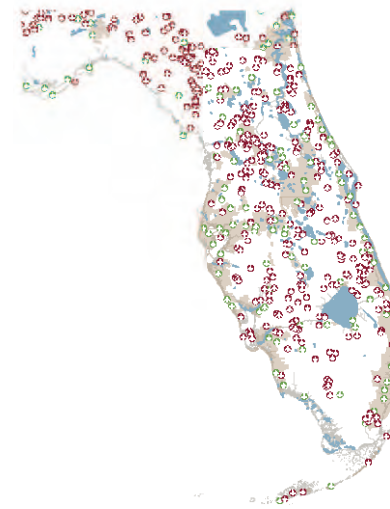
✈ Public Airport   ✈ Privat Airport

Impact of Private and Military Airports

Private airports are used for fast and unbureaucratic travel. Military airports are used as deployment and training facilities.
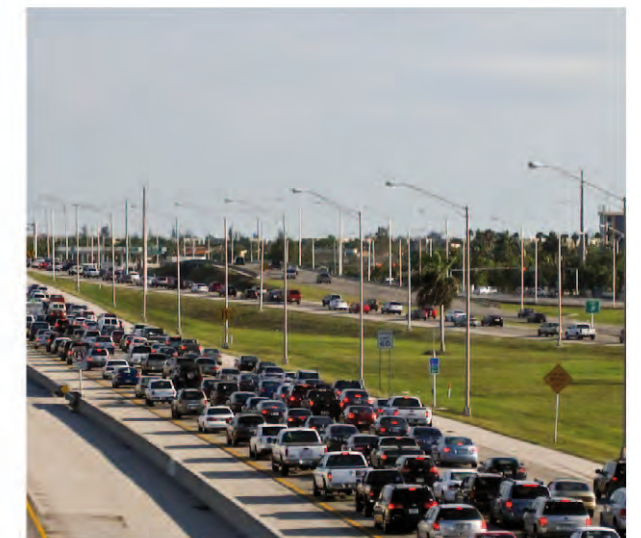
Fly, When Roads Fail

For far distance travel flying is popular, because the road system ist often congested and railway is no alternative.

Liquid bulk	41%
Dry bulk	26%
Break bulk	6%
General cargo	27%
Tonnage per day	56751
TEU per day	2159
Tourists per day	10408

Liquid bulk	54%
Dry bulk	42%
Break bulk	0%
General cargo	4%
Tonnage per day	137425
TEU per day	74
Tourists per day	2112

Liquid bulk	35%
Dry bulk	50%
Break bulk	0%
General cargo	15%
Tonnage per day	12230
TEU per day	6
Tourists per day	12016

Liquid bulk	66%
Dry bulk	22%
Break bulk	11%
General cargo	1%
Tonnage per day	25826
TEU per day	17
Tourists per day	0

Liquid bulk	0%
Dry bulk	0%
Break bulk	1%
General cargo	59%
Tonnage per day	25333
TEU per day	2929
Tourists per day	9371

— Waterway   Port   Lake   Urbanized Area

Ocean Connection to South and East

The ports of Florida operate as a gate to the american domestic market and in combination with the Panama Canal they are an efficient and fast path to Asia and South America. In addition the ports have a central reagional role as employers.

Westcoast: Freight Transport

The westcoast especially the ports of Tampa are important for the freight handling. In future the importance will grow with the extension of the Panama Canal.

Eastcoast: Cruiselines to the Caribic

The Port of Cape Canaveral is the home base for scores of cruise line enterprises and have a crucial role in the tourism market of Florida especially with the Walt Disney Cruise Lines.

🚚 x 304'000   🚚 x 243'000   🚚 x 182'000   🚚 x 121'000   🚚 x 60'800

🚚 x 26'300   🚚 x 10'900   🚚 x 4'600
🚚 x 1'500

🚗 x 287'000   🚗 x 106'000   🚗 x 57'600
🚗 x 29'200   🚗 x 13'200

Passengers per Day

Equall network usage except in the highly urbanized areas.

Everything Connected Through Roads

Like already mentioned roads are the basic infrastructural grid upon which daily movement happens.

Trucks per Day

The truck network usage is concentrated on the north south conncetions, and is an indicator for floridas role as gateway.

Transit Corridor I4

The interstate 4 will further on be abbreviated as I4. The I4 is a workarea connector and a transit corridor for freight traction.
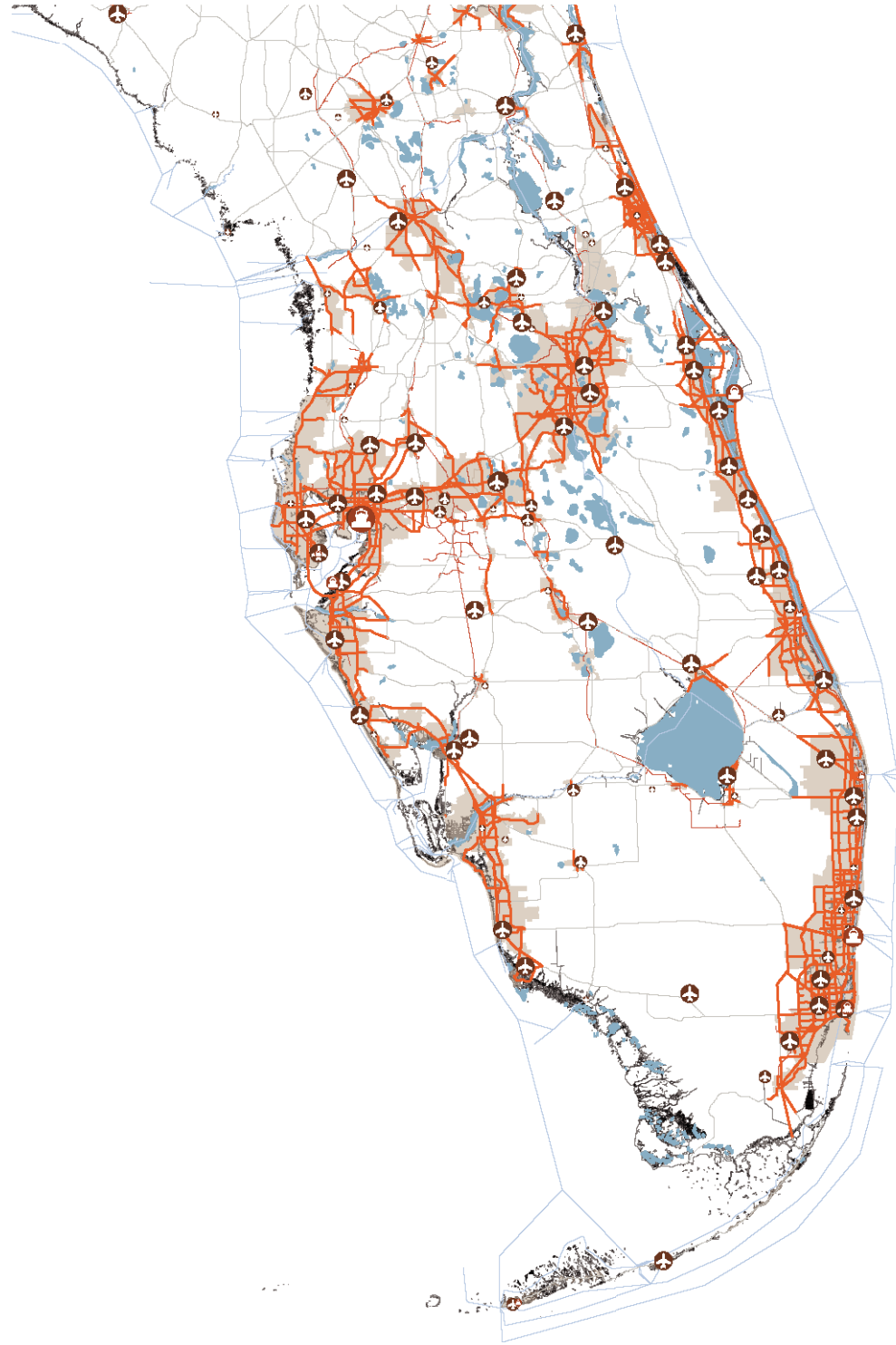
Dense Infrastructure = Urban Areas
The more condense the infrastructure the denser the urbanized area.

Waterway	Port	Lake
Rail track	Airport	Urbanized
Road		
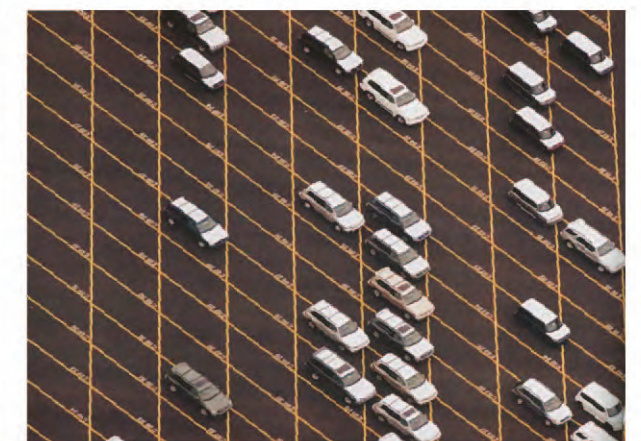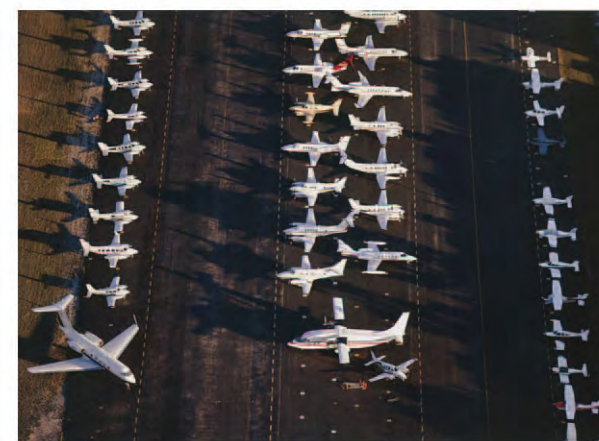
FLOW OF PEOPLE

A region with a heavy commuter impact is dependent on an efficient road system. The Interstate 4 highway allows more spatial distance between working place and living area, and attracts the commuter flows for that reason. To meet these requirements of distance between home, work and daily needs the public transport is no alternative because it develops mainly in the city centers.
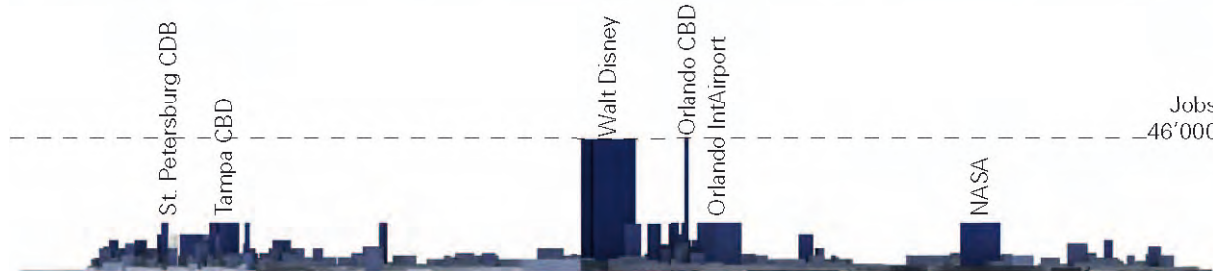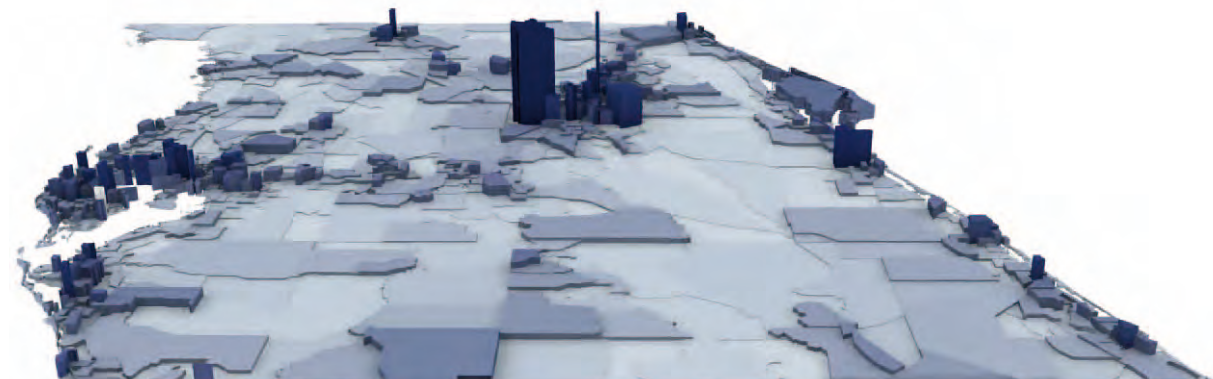
Scattered Living Areas

The low and middle density urban agglomeration spreads over all the I4 area. This type of settlement typically shows single family houses.

Living, Working, Commuting

The usual lack of mixed use in the typical low density settlement of the I4 Corridor leads to numerous commuter flows. Through fast connections on highways the physical distance to the workplace loses importance, time and money becomes the determining factor for choosing the place of living.

Condensed Working Areas

Contrairly to the living areas the working areas are way more clustered. Due to the segregation of living and working areas many of these spots are only populated during worktime.

Saint Petersburg CDB

Tampa CBD

Lakeland Historic Center

Walt Disney World

Orlando CBD

Orlando International Airport
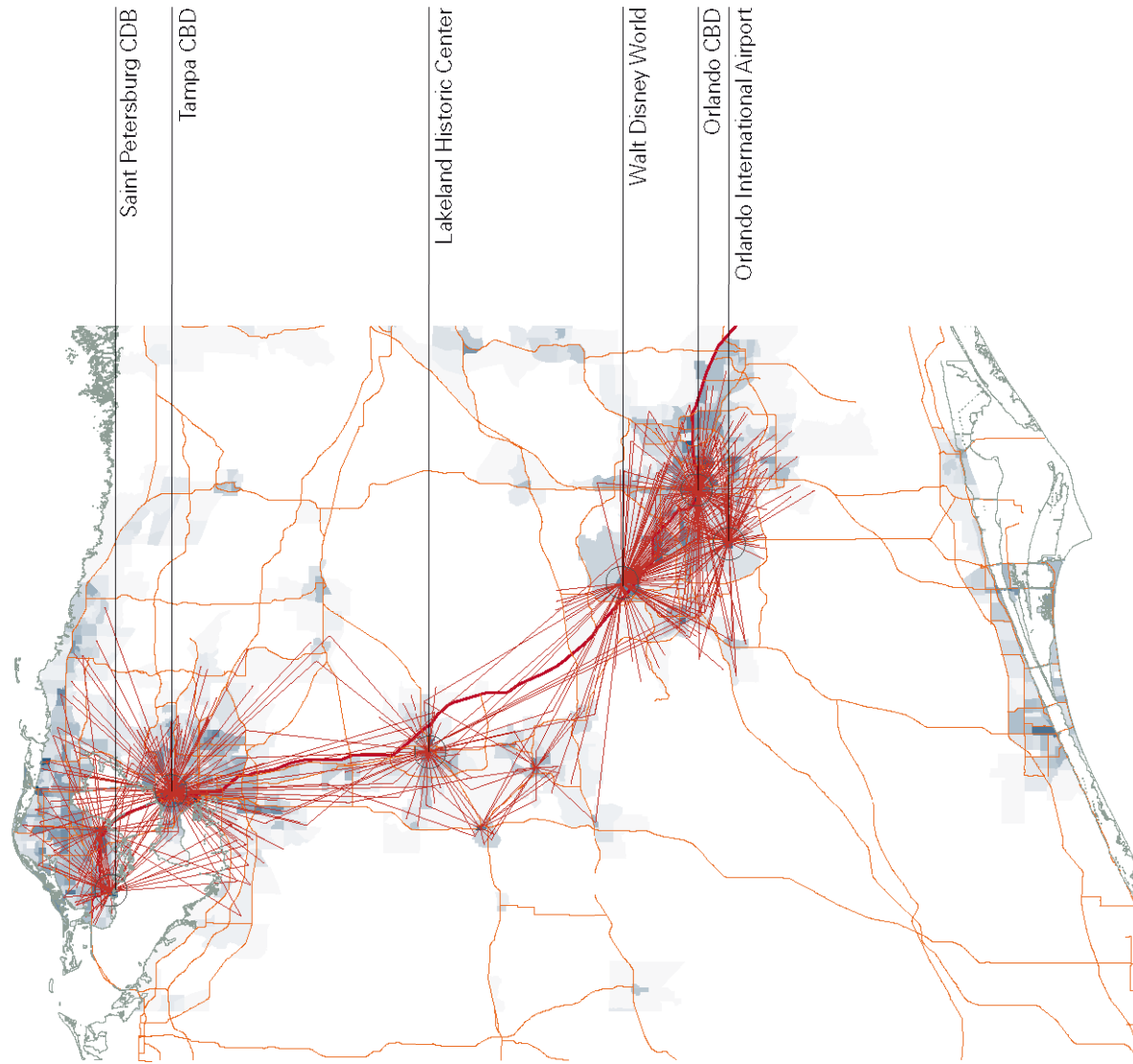
Commuter Flows to Attractions near I4

Important workplaces are all located near the I4 like several Central Business Districts or Walt Disney World. This generates regional and trans-regional commute flows. This flows show that agglomerations do not only focus on their own centralities but create a polycentral network.

■ 46000 Jobs	— Commute flow
■ 17000 Jobs	— Interstate or Arterial
■ 8500 Jobs	
■ 4400 Jobs	
■ 1500 Jobs	

22.8 Minutes

21.6 Minutes

26.4 Minutes

25.3 Minutes
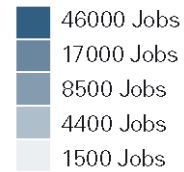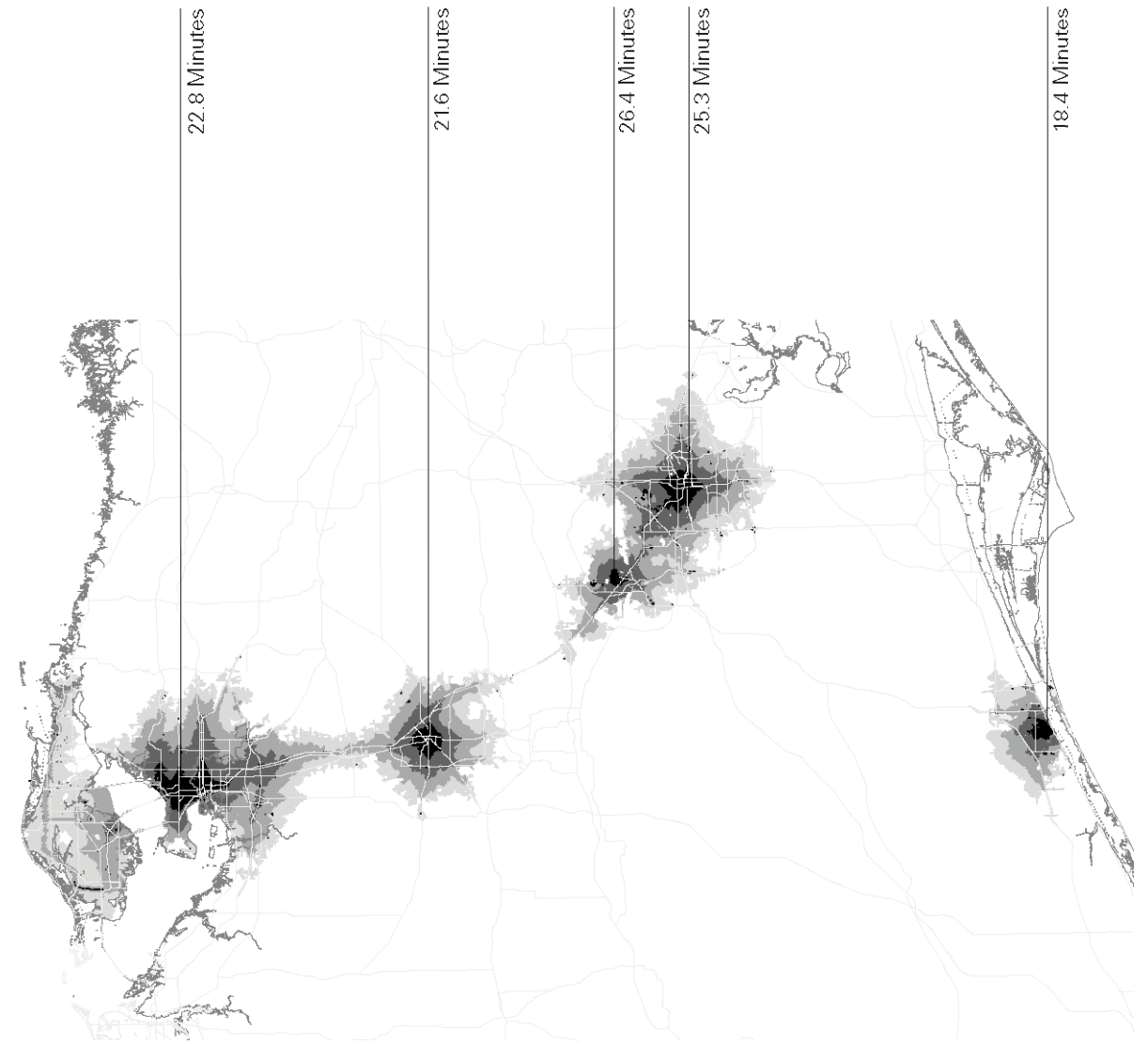
18.4 Minutes

Average Commute Time: 24 Minutes

There are two factors why the commuter flows are concentrating on the I4 and other arterials: the fast connection and the lack of alternative routes to the workplaces.
It is crucial to note that congestion, a consequence of this usage is not included in this estimate of commute time.

■ In 5 minutes reachable
■ In 10 minutes reachable
■ In 15 minutes reachable
■ In 20 minutes reachable
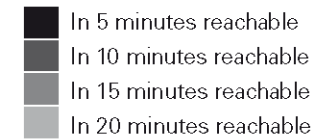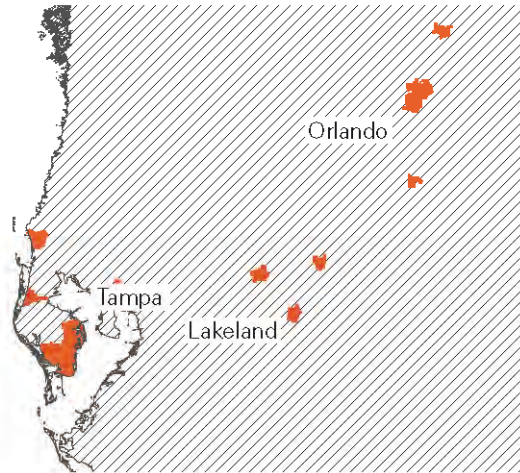
1936: People mostly live in the towncenters
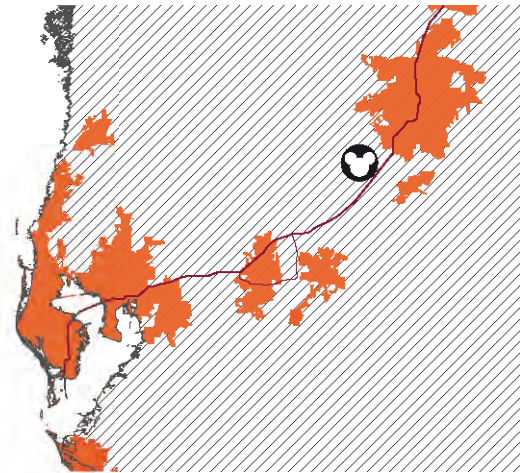
1990: With the I4 and Disney World the growth was encouraged
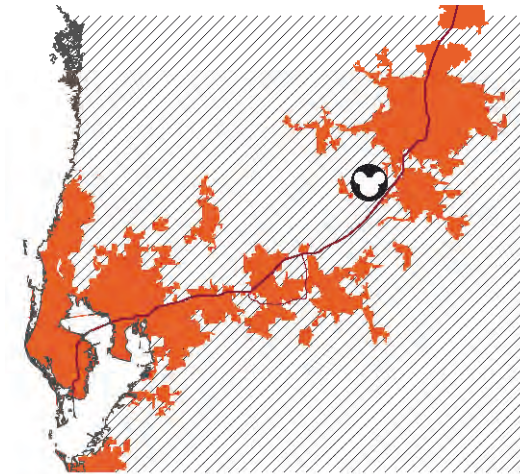
2000: Urban agglomerations are steady growing toward each other
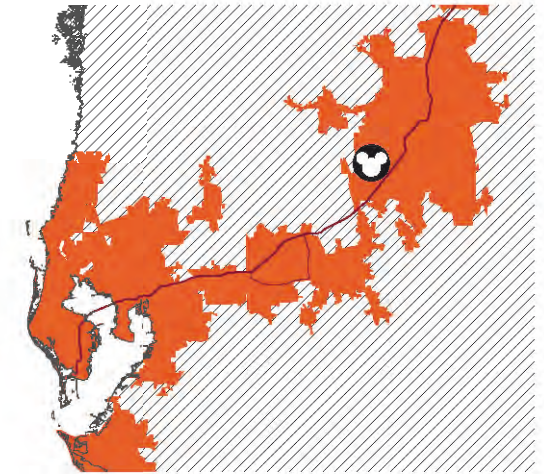
2007: Urban agglomerations are overlapping to a contineous region
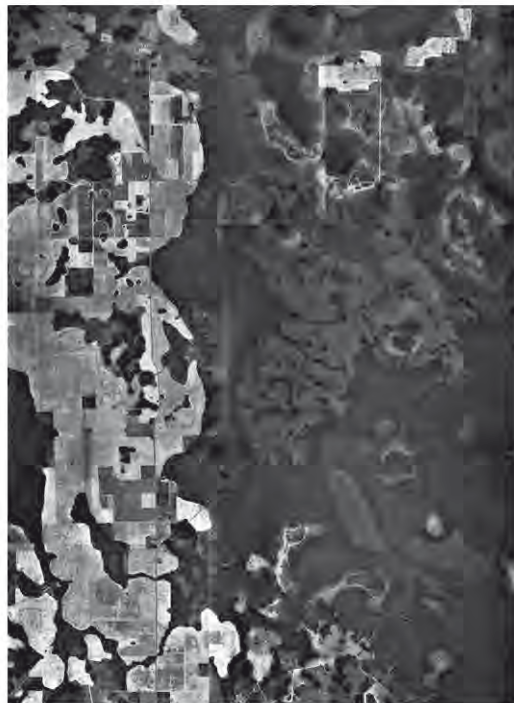
1959: The area near Orlando but belonging to Osceola County is domintated by agricultural use

1989: Disney chose to settle down right after the completition of the I4 when land was cheap to buy

1999: A second exit from the I4 was built for the increasing Walt Disney area, mainly serving tourists
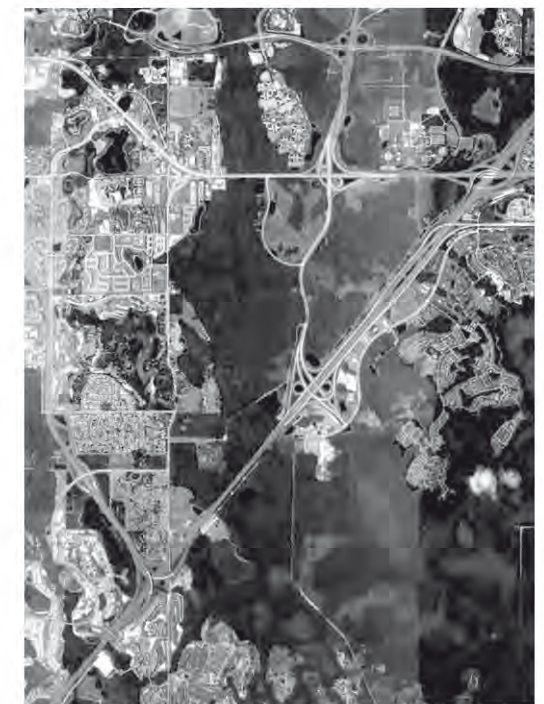
2010: A third exit was built to connect the more and more growing living areas around Walt Disney

Interstate 4: Accelerator and Attractor of Development

The former isolated city centers got connected through the I4 which lead to a growth towards and along the arterial. The cheap land between the centralities attracted as well countless enterprises to settle down. With Disney World as an example tourism and settlement in this area highly increased.

1941: Historic center (1) and agricultural use (2)

1968: I4 (1962) encourages settlement toward it

1994: Merging urbanized areas south of the I4

2010: Constant growth toward northern rural space.

Development of Lakeland
The city's development is primary due to the construction of the I4 and the augmenting importance of the airport.

Motor of growth Disney World
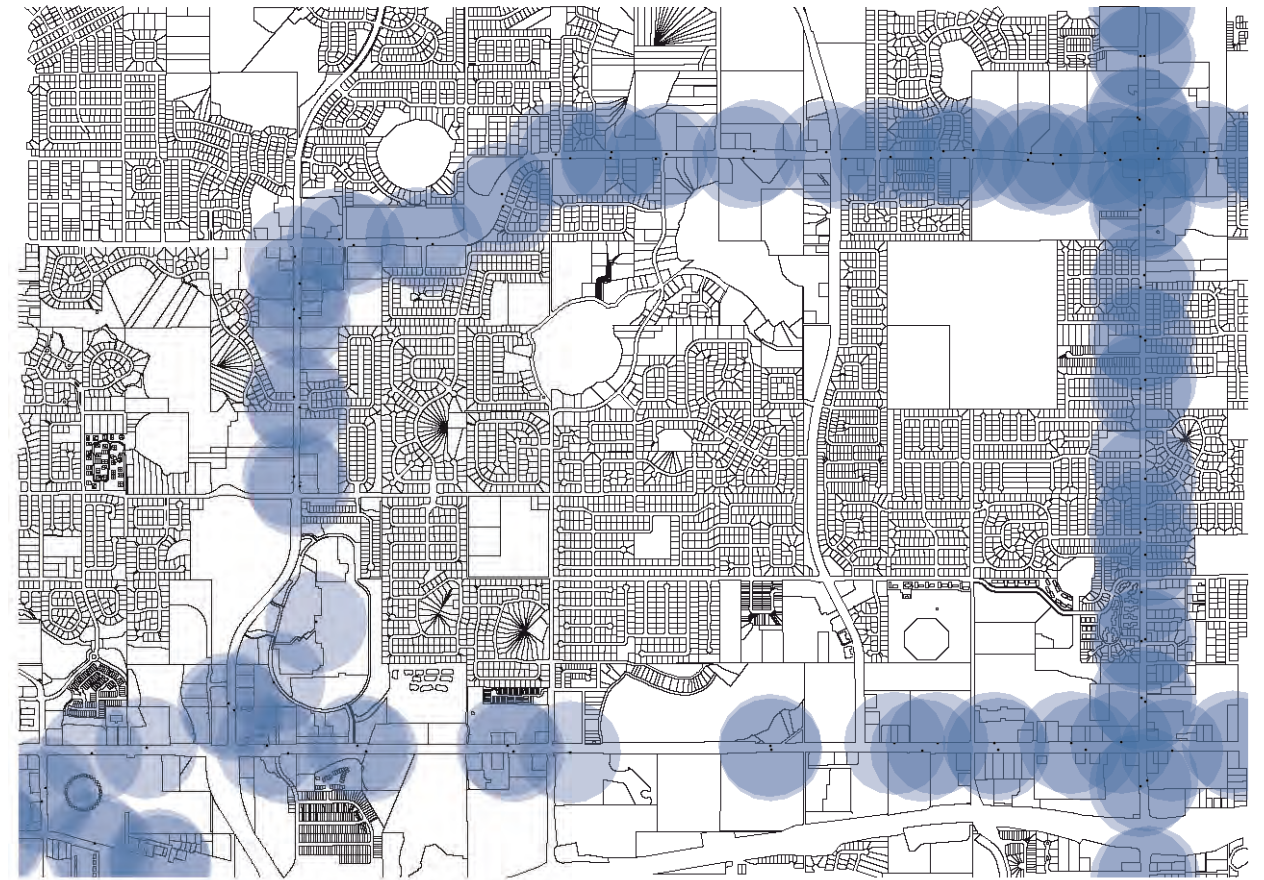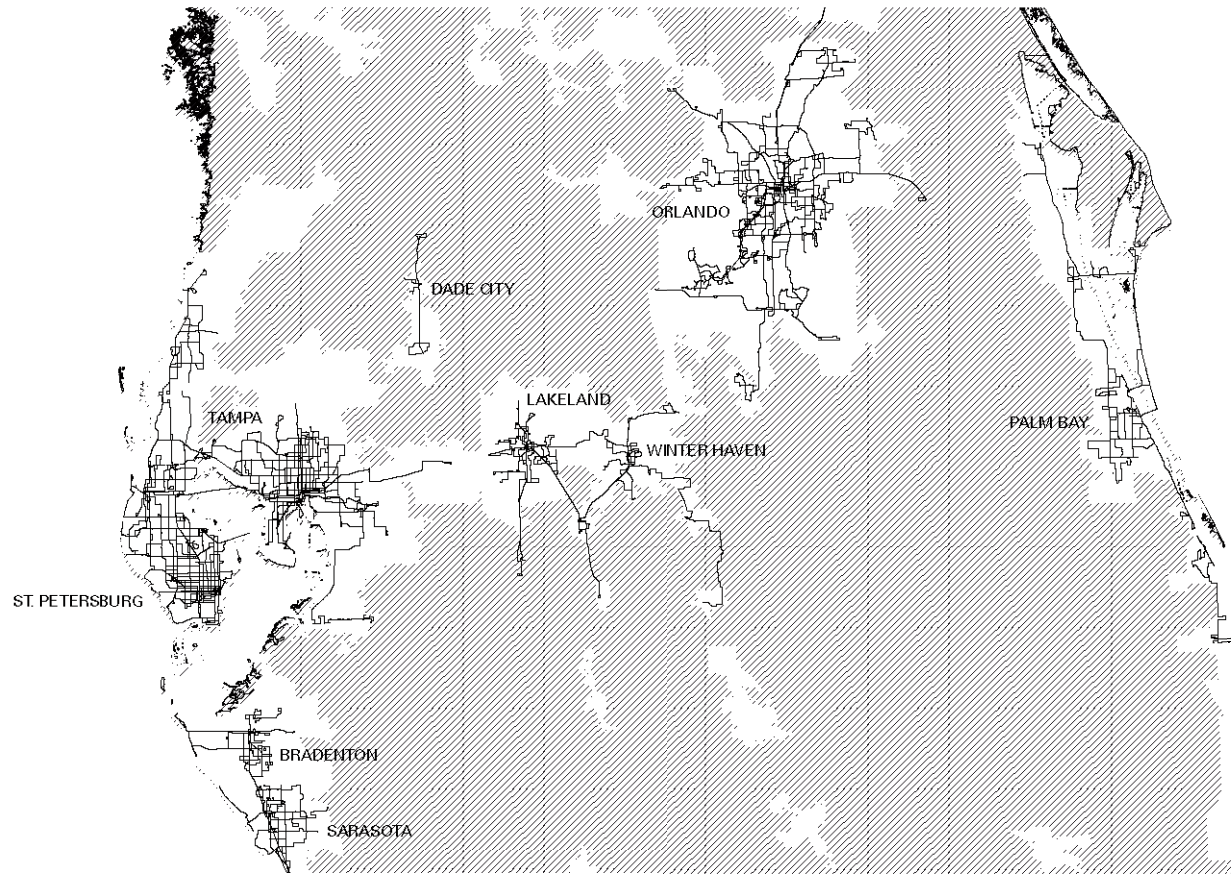
Orlando West, Bus stops diameter of 400 meters equivalent to 5 minutes walk

Missing Connections Between Centralities

To reach Tampa from Orlando by public bus is not possible.

Public Transport: A Burden or Potential?

The public transport network, consisting of few railway lines that only connect several cities and a busnet serving the city cores and its agglomeration, did not manage to keep up with the fast growth of the urban areas. The public busnet is mostly used by low income groups because they can't afford a car. In addition this way of transportation takes time and increases the daily commute time.

Lack of Coverage

The busnet grid is to wide meshed to cover the urban areas.

no network coverage in high income areas

developed network in low income areas

workplace Disney World
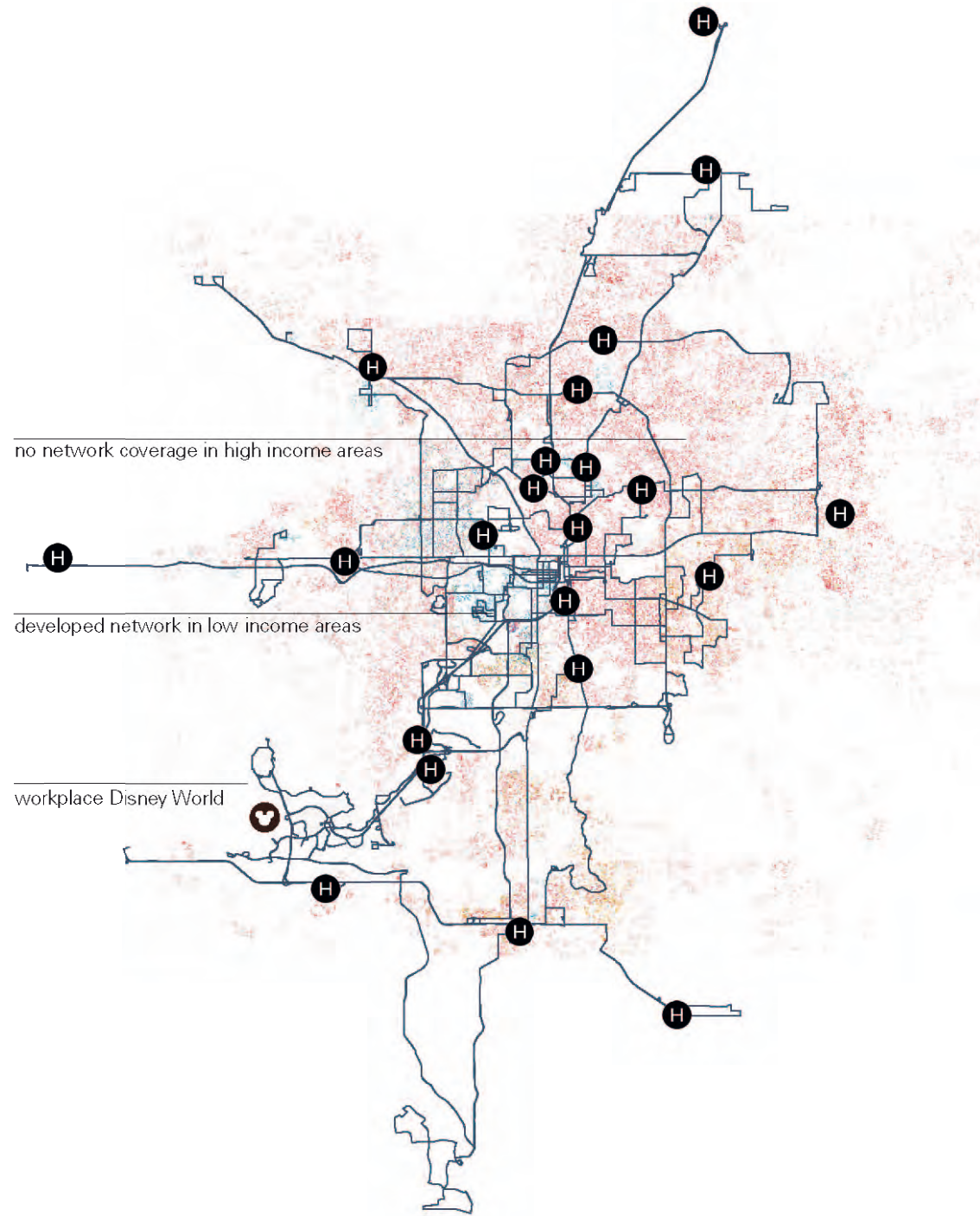
No Money? Take The Bus.

The target group of the bus companies, in this example Lynx in Orlando, are poor people. Their mobility is extremely limited without a car but at least the access to medical care centers is guaranteed by public transportation.

- 🖤 Disney Land
- Ⓗ Healthcare
- Hispanic
- White
- Black
- Asian

1 Dot = 25 People

Public Stations as Empty Places

The missing connections between different public transport providers lead to unused public stations. There are no parking lots available and often the lcoations are not central located.
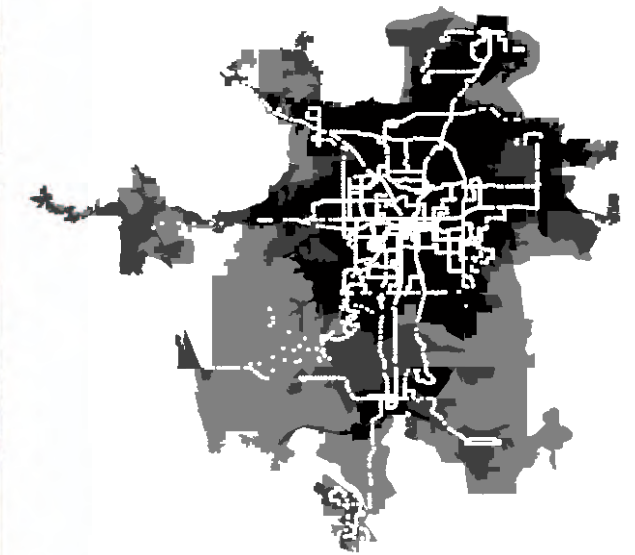
- ⬛ Urban Area 1990
- Urban Area 2000
- Urban Area 2007

Fast Growth = Uncovered Regions

The existing busnetwork is to static and underdeveloped to keep up with the dynamic growth of Orlando's urban area.
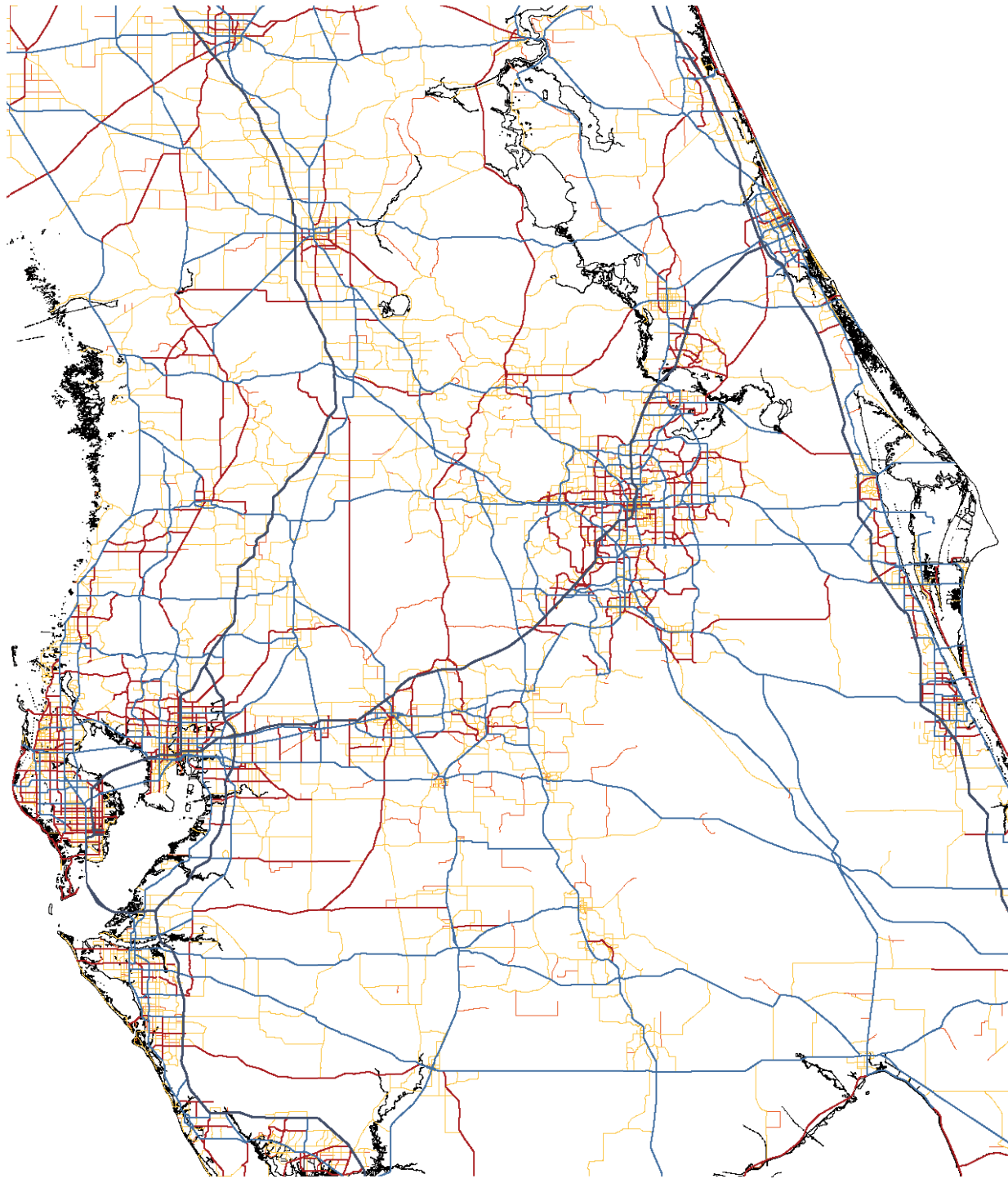
Interstate   Arterial   Connector   Collector

The Road System

The roads are grouped into different categories according to the character of service they are intended to provide. Overall it is important to point out that individual roads and streets do not serve travel independently in any way.
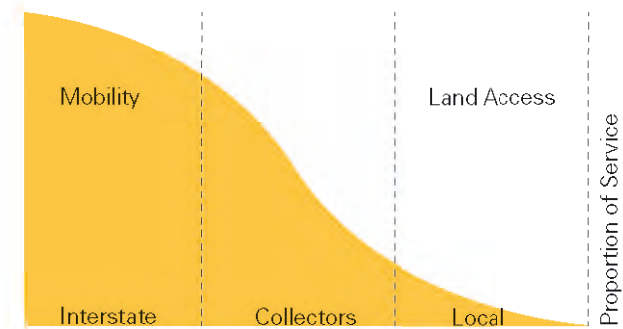
High Mobility = Little Land Access

The assigned function of the different road types is established to generate a functioning roadnetwork.

streets only designed for cars

cul de sac streets make fast connections impossible
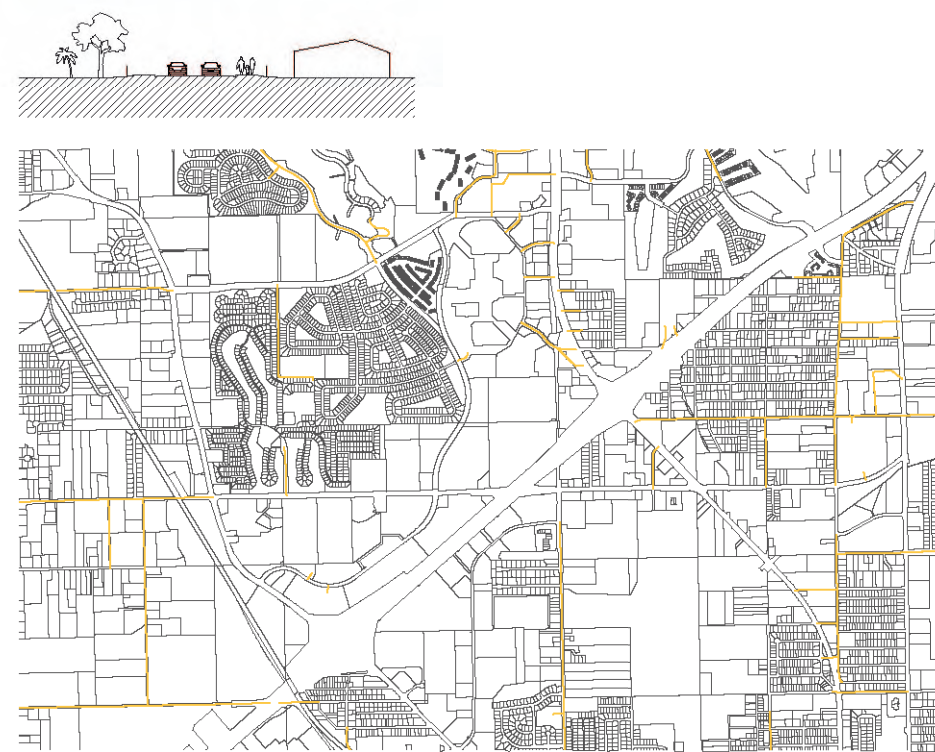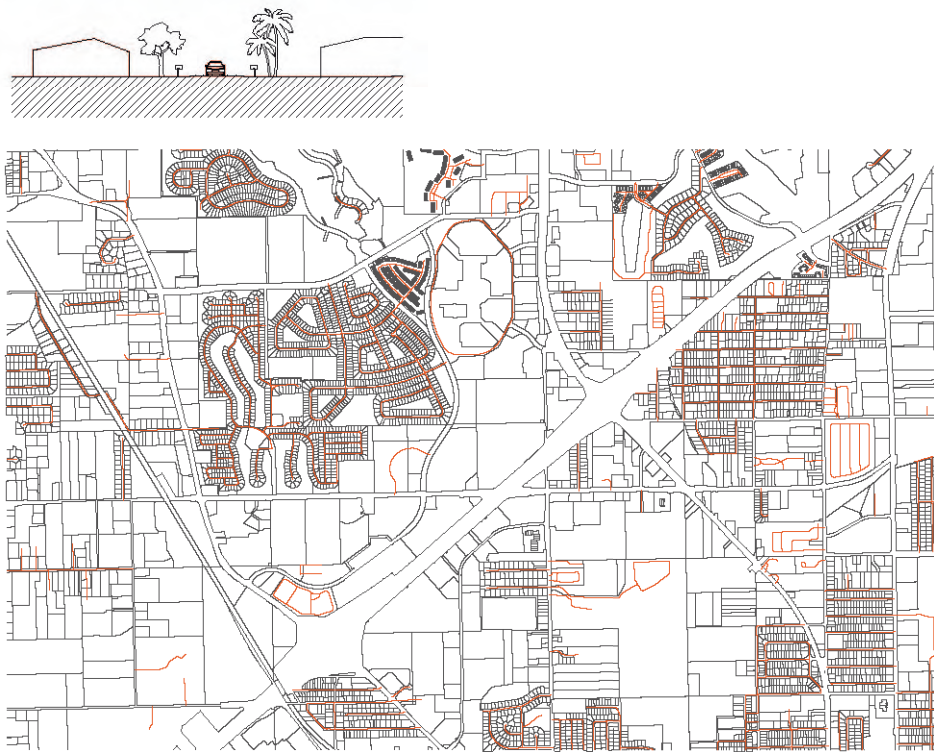
Local Road

The local road provides direct acces to a parcel. It contains one lane and has to be driven very slowly. Local roads are often designed as dead end streets.

Collector Road

The collector road is giving access to districts. They are usually leading to a connector road. It contains two lanes.
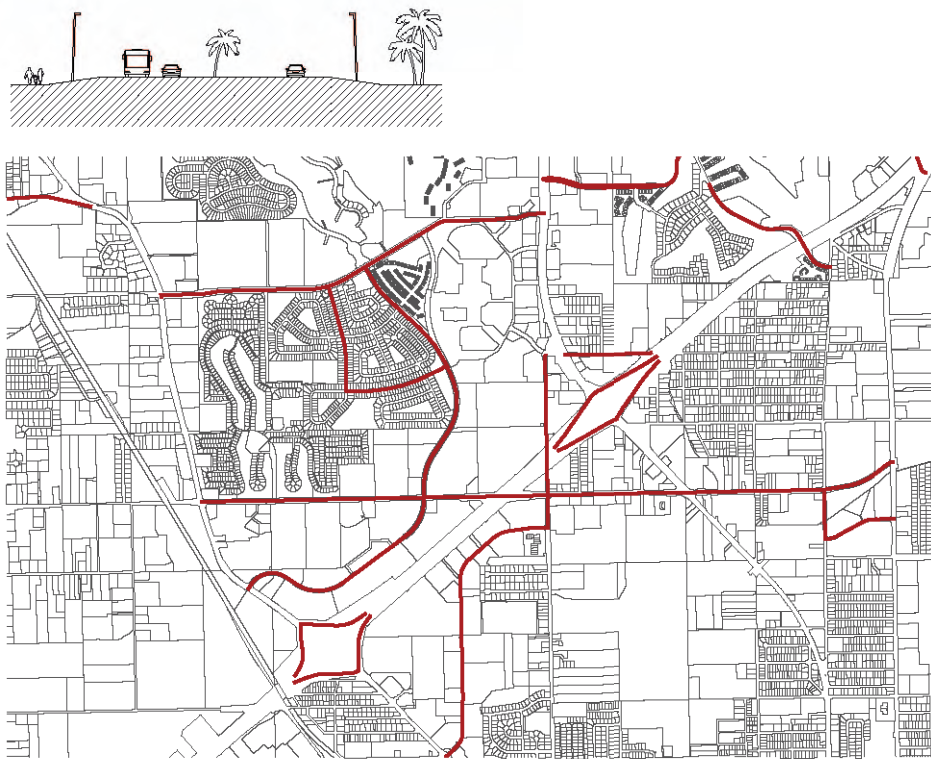
Connector Road

The connector road gives access to superior areas and is connecting arterials. It contains four lanes.
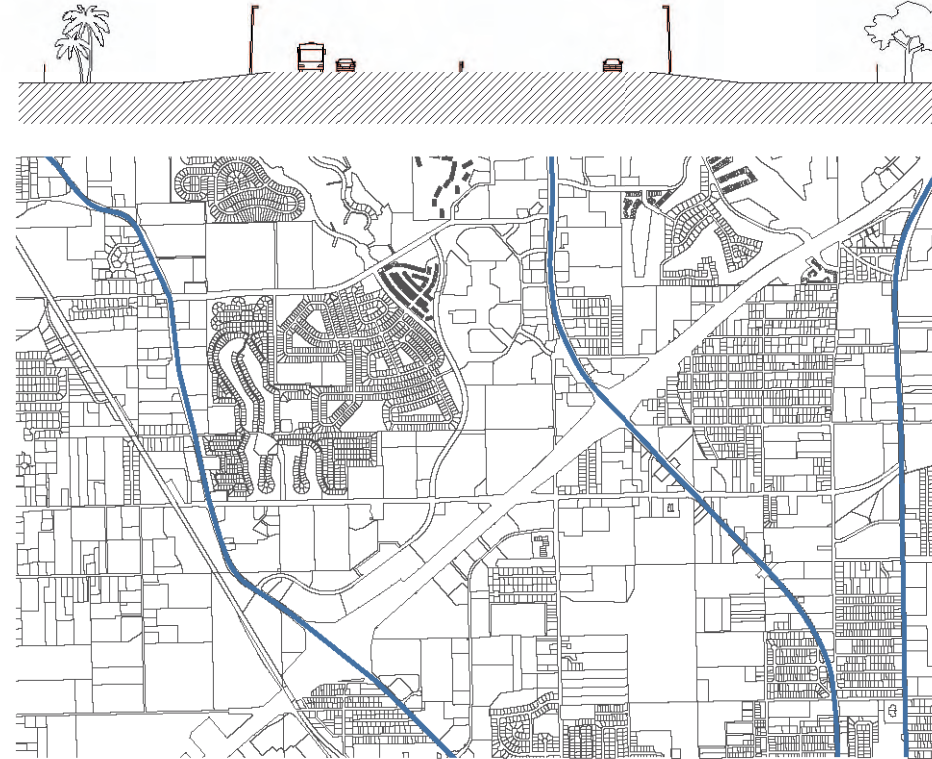
Arterial Road

The arterial road provides higher level of service and is connecting the urban areas. Often commerce and offices are built along arterials. It contains six lanes.
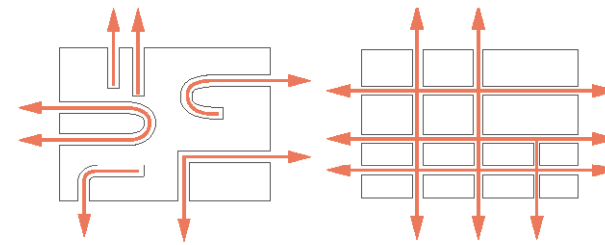
Conventional Street Nework   Connected Street Nework

No Interconnectivity in Districts
Dead end local streets block efficient circulation.

Interstate 4
The interstate road is the connection between bigger cities and is the highest capacity road. In this case I4 connects the major cities Tampa and Orlando. It contains eight lanes.

Road Classification Overview
Generally the local road system is disconnected and does not distribute movement in all directions. This leads to a unefficient connection within the districts. The connection between districts achieved by connector or arterial roads.
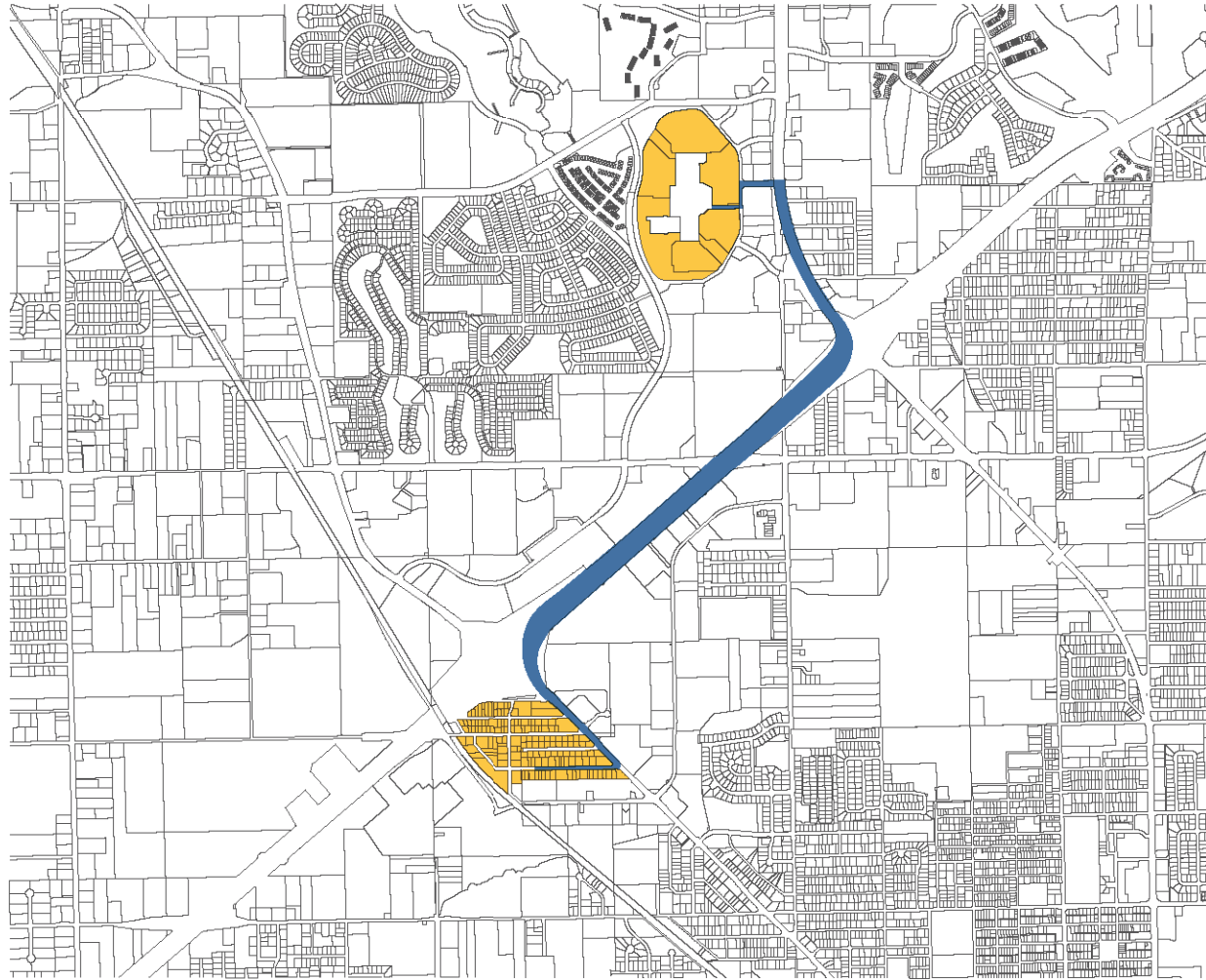
Example way from a living area to the mall

Arterial and Interstate Used as a Connecter

The lack of connectivity within the districts and the often missing connector roads lead to a usage of arterials and the Interstate for short distances.

Importance of the Interstate 4

The high capacity raod I4 shows different usage modes it is not just a long distance link. The dependency of the local urban region on the corridor makes the I4 a crucial aspect of every day transportation.

Congestion due to this usage

Jeff, salesman, 5 trips, 2h drivetime

Eva, housewife, 10 trips, 1h drivetime

Mary, pensioner, 5 trips, 0.5h drivetime

Sam, animator, 6 trips, 1.7h drivetime

Daily Flow Examples
Interviews showed that most people use the I4 daily wether for long, regional or short distances.
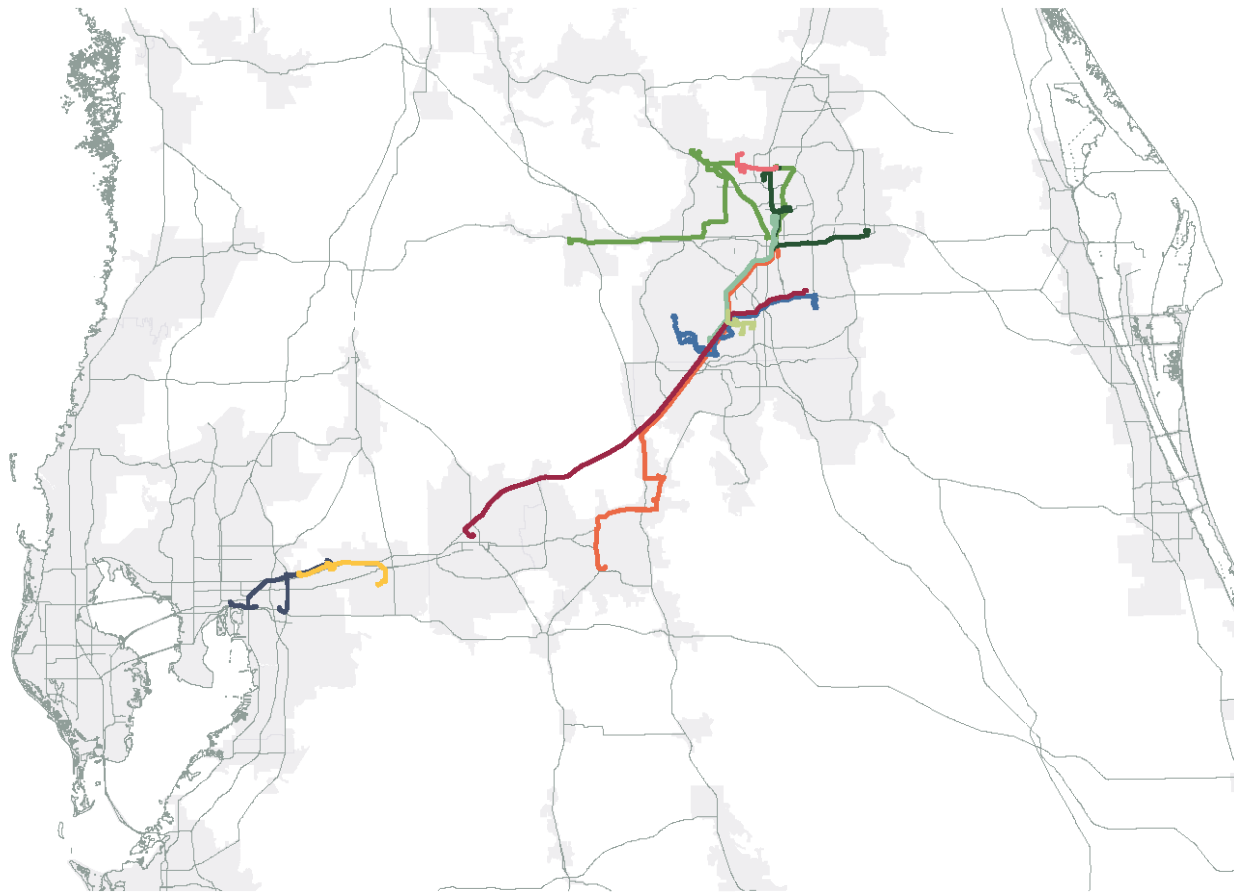
Jennifer, scholar,
2 trips, 0.6h drivetime

Kevin, publisher,
4 trips, 0.5h drivetime

Sandra, secretary,
5 trips, 1.3h drivetime

Daniel, manager,
6 trips, 1.5h drivetime

Michael, barkeeper,
3 trips, 1.5h drivetime

Keira, tourist,
5 trips, 1h drivetime
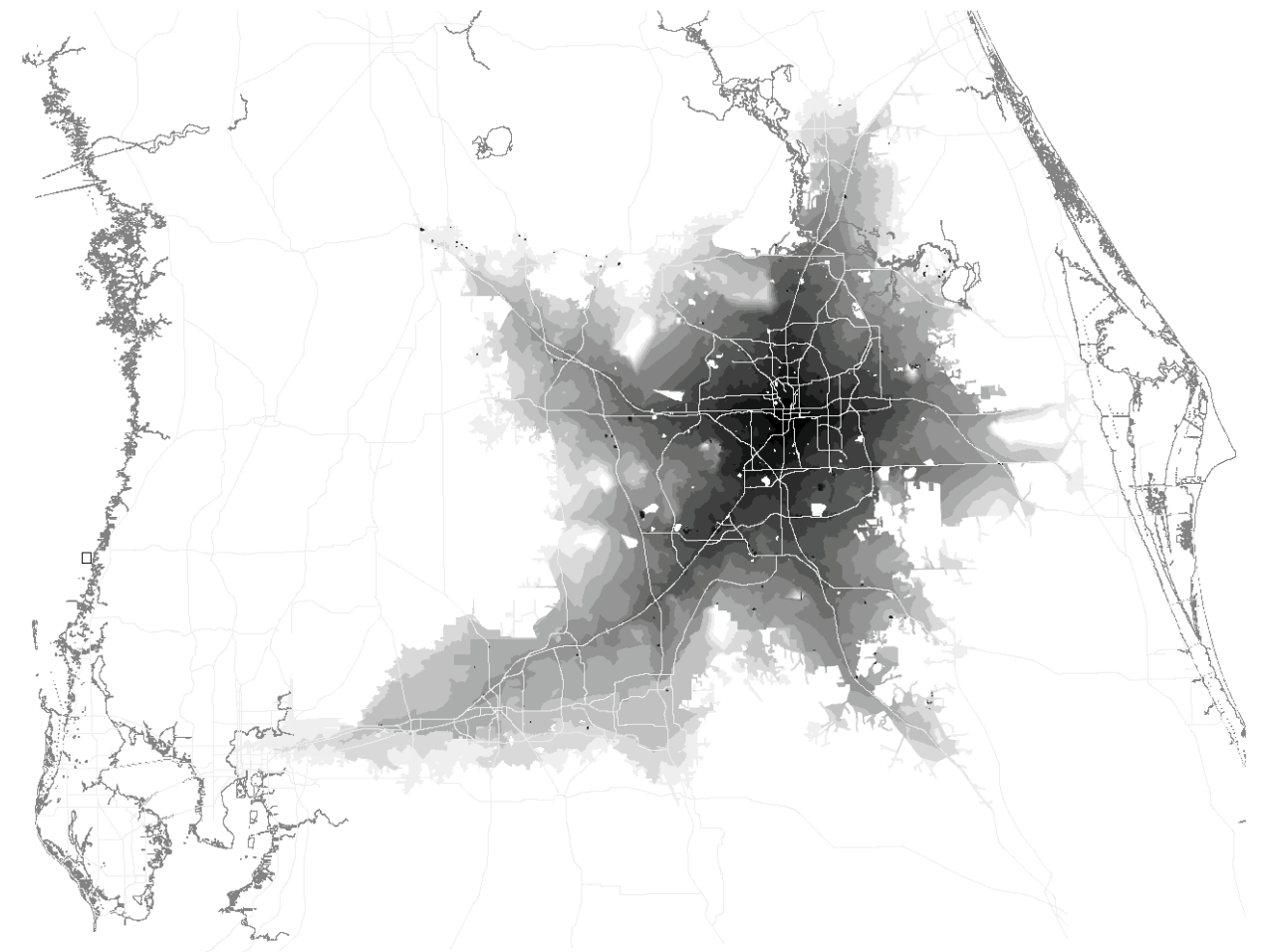
I4 as Transit Corridor
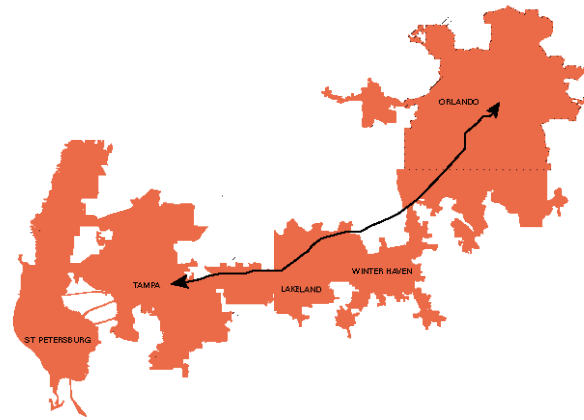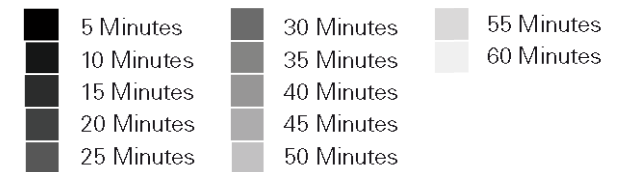

I4 as Region Connector
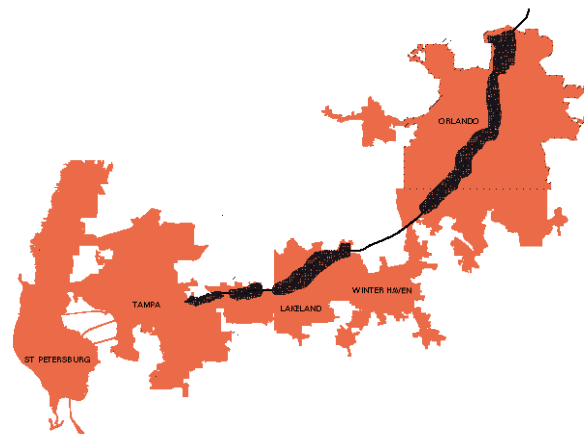
I4 as Local Connector

I4 Usage Modes

The Interstate is not only used for transit and as a region connector, by commuters for example, but also as a fast shortcut on the local scale.

I4: Backbone of Urban Agglomeration

The Interstate 4 enlarges the reachability under the aspect of time and distance. Scattered living is enabled by this fast connection to the different centralities.

5 Minutes	30 Minutes	55 Minutes
10 Minutes	35 Minutes	60 Minutes
15 Minutes	40 Minutes	
20 Minutes	45 Minutes	
25 Minutes	50 Minutes	

ROAD URBANIZATION

The door to door movement pattern in Florida is characterized by walking to your garage, driving and parking right next to your destination. You end up driving your car over the street to the next parking just to visit the opposite shop. The resulting urban landscape of scattered buildings surrounded by parking and road infrastructure is the mundane image. This type of development can partially be traced back to economic and social reasons.
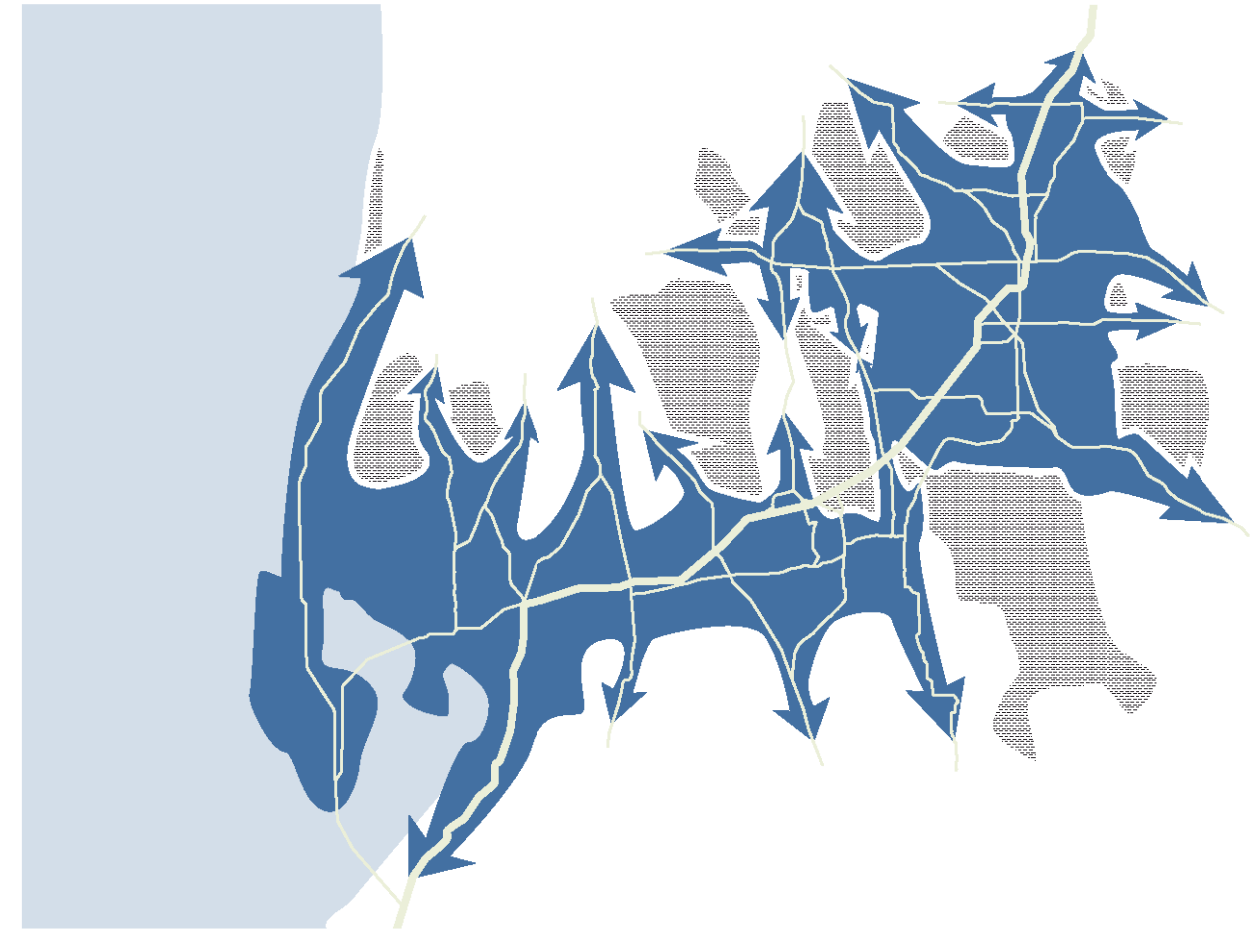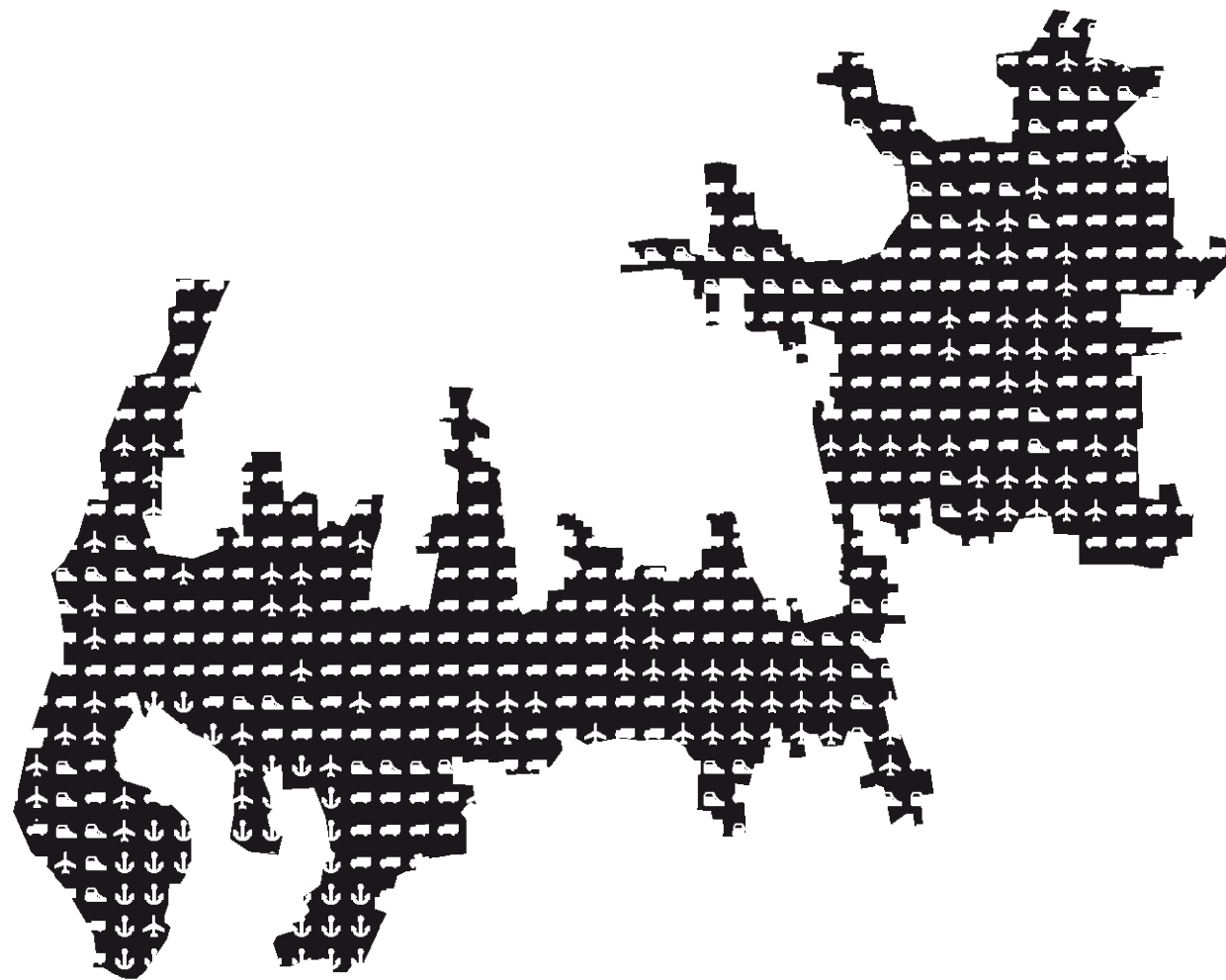
What Defines a Metropolitan Area?

A metropolitan area is a polycentric urban agglomeration. A conurbation that is connected through economic controll centers, innovation and competition and that has access to a multimodal gateway network. Conditions that are met by the metropolitan area along the I4 corridor.

Masked Urbanization

However, the impressions on eye-level may be different.
One is confronted with pictures of open space as well as dense urbanization.

Transnational Corporations in Central Florida

Many global corporations are centered in Orlando or Tampa.

Driving Regional Factors

A wide range of products manufactured on an advanced technological level are key to I4 corridor economy.

A Region With Quadramodal Gateways
The transportation network has a high quality standard, measured by its competitivness to other regions.

- ✈ Airport
- 🚚 Truck
- 🚆 Train
- ⚓ Ship

Growth Occurs Along Arterials
Arterial roads are attractors for growth and shape the urban footprint. The only barrier for growth seems to be of natural occurance: wettlands.

- ■ Metropolitan Region
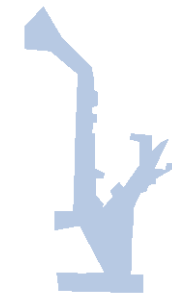- ▦ Wetlands / Agriculture
- ■ Ocean

ORLANDO

WINTER
HAVEN
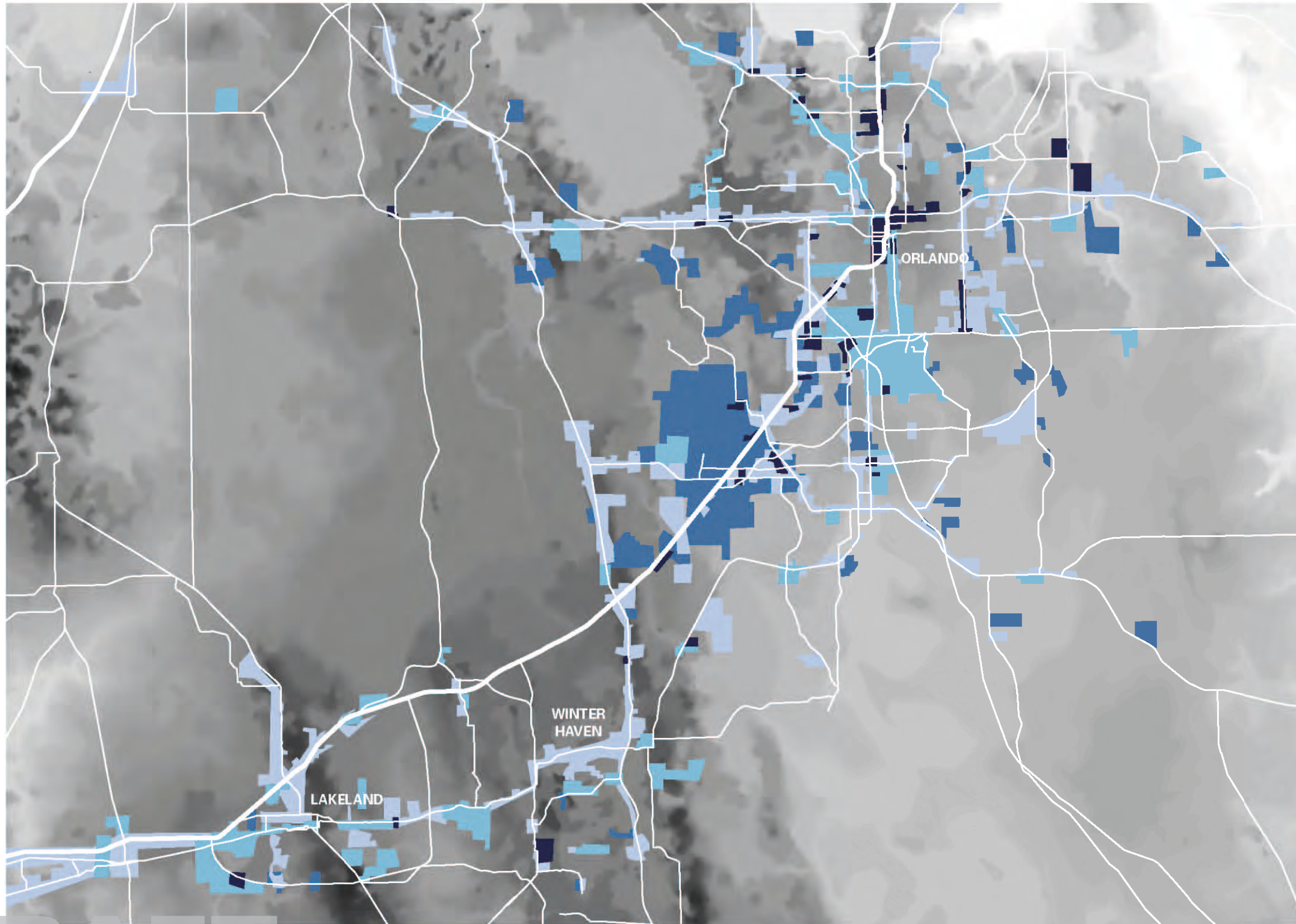
LAKELAND

Financial Center
CDB Orlando

Aviation Area
International Airport Orlando

Freetime Area
Disney Worldv

Food and Shopping Strip
Lakeland

Public and Economic Use Embrace Arterials
Public and economic land use clusters on arterial and interstate roads, while living is more scattered.

Commerce
Tourism and Leisure

Airports and Airfields
Office Parks

Food and shopping strip
Lakeland

Shopping Plaza

Financial Center
CDB Orlando

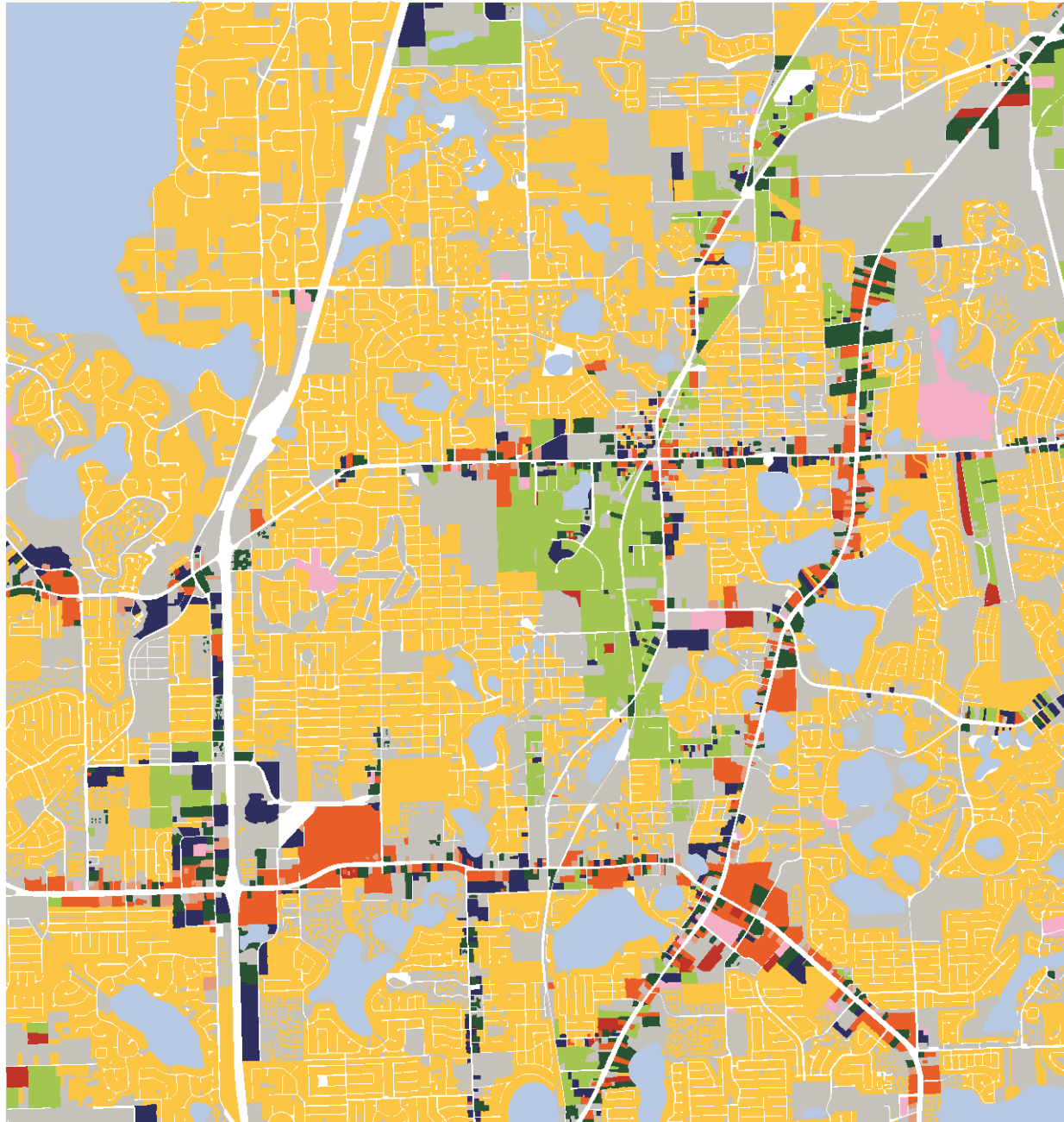Downtown Orlando

Aviation Area
International Airport Orlando
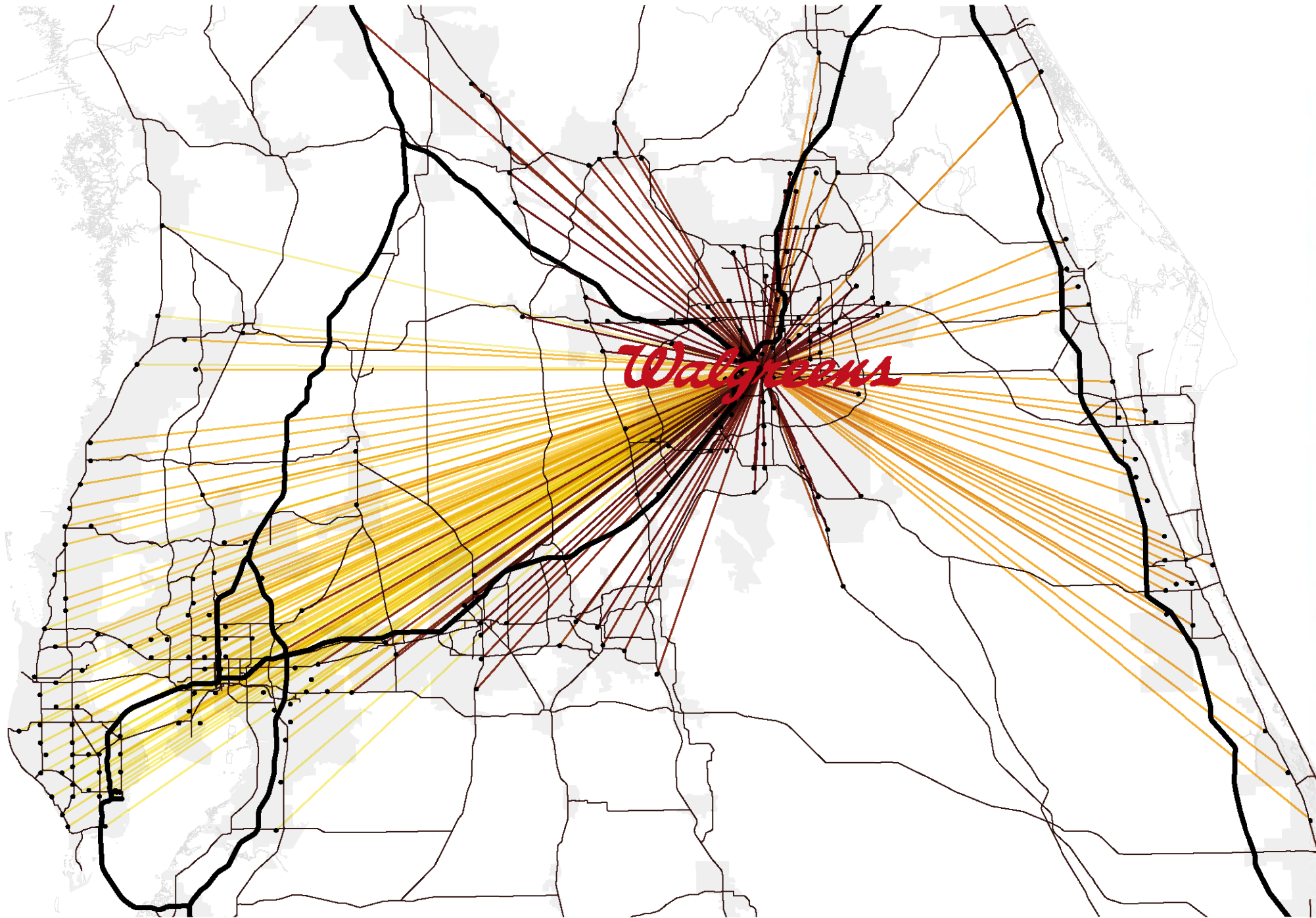
International Airport Orlando

Freetime Area
Disney World

Disney World

Arterial as Linear Centralities

Similar land uses attract each other and create linear strips with adjacent mono uses and scattered living areas in between.

Living area / House	Office parks
Parking	Service Stations
Commerce	Industry
Public meeting points	Not mapped
Restaurant / Food	

Sanlando Springs
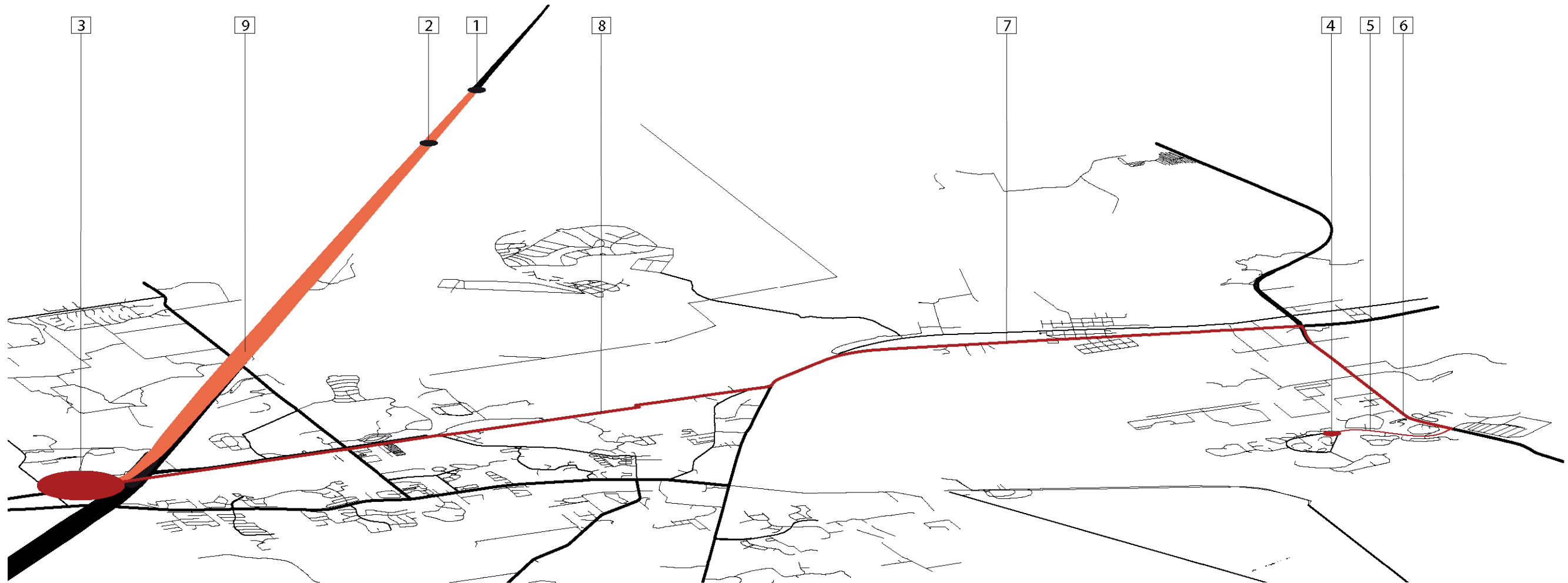
Altamonte Springs

Interstate 4

Large Scale Distribution of Products

The road system in Florida is used efficiently by corporations like Walgreens. With two Distribution Centers – one near Orlando and another near Miami – and all their shopping centers along arterial roads they can distribute their goods economically.

Interstate
Arterial
Walgreens

10 Minutes
1 Hour
2 Hours

Distribution Centers along the I4 corridor.

1 **Production Factory**
Usually along Interstates or Arterials

2 **Distribution Center**
Walgreens uses two distribution centers for Florida. One in Orlando and another near Maiami.

8
9 **Commodity Flow**
The transportation of cargo doesn't need to leave the network of Interstates and Arterials.

3 *Walgreens*
Walgreens are typically scattered along the network of Interstates and Arterials.

21 Minutes in Car
Even if all you need are confectionary goods.

5 Local Road
6 Collector Road
7 Connector Road
8 Arterial Road
9 Interstate Road
Consumer Travel Path
The consumer spends time in the car, due to the scattered way of aranging commercial Land use.

4 **Home, Sweet Home**
Starting point.

3 9 2 1 8 7 4 5 6

Economic Efficiency at the Expense of Consumers Time

With the given road system, and the conventional Economic usage, a small scale distribution targeting neighbourhoods or districts is very uncommon. A fact that leads to even more time spent in car.
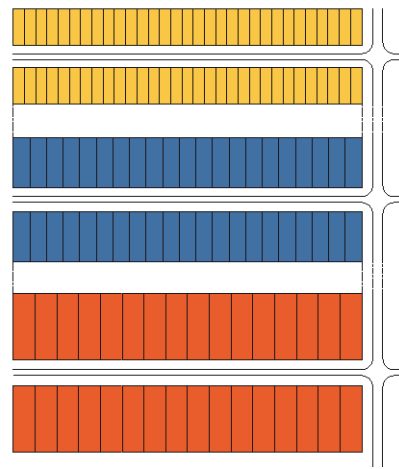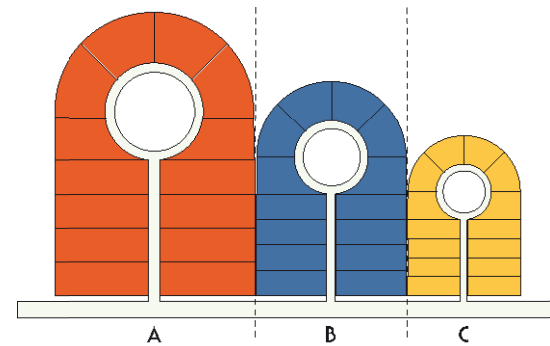
Choose Your Neighborhood!

Since your credit rank defines the affordable lot size, you will have to choose your neighborhood, because same sized lots are usually grouped in districts. This clustering is done for cost effectiveness, but is sold with the argument of social integration, of living together with a like-minded population.

$$$ $$ $
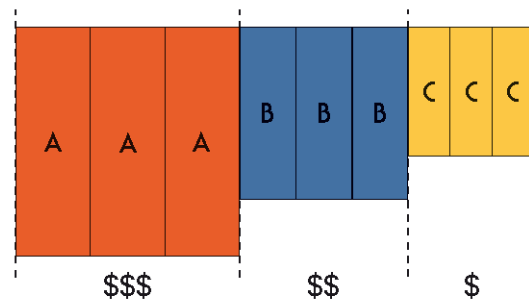
Choose Your Product!

Based on standardised lot sizes and categorized by income avarages a house products palette is offered. Depending on your credit rating, your bank offers you a house mortage on one product.

Choose Your Neighbor!

The social segregation itself is created by physically not connecting the different lot sizes.

## Standardized Planing Guarantees Social Segregation

Cost effective mass-production was invented during the World War II for Military housings. A concept further developed in Levittown, New York, as the first and one of the largest mass-produced postwar suburbs. Growth along these patterns and ideas was and still is very much encouraged in USA and Florida.
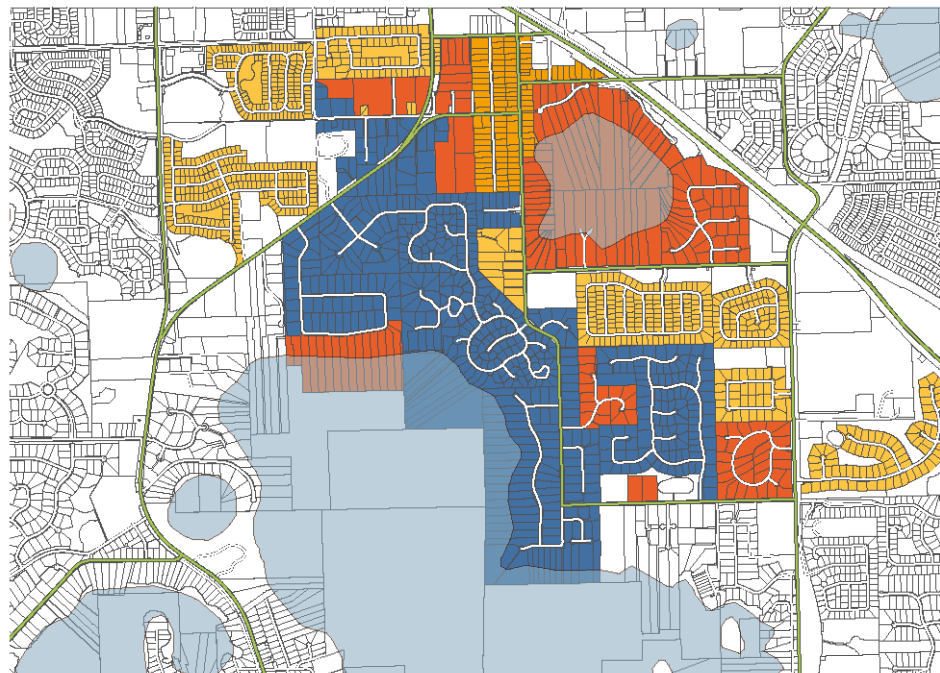
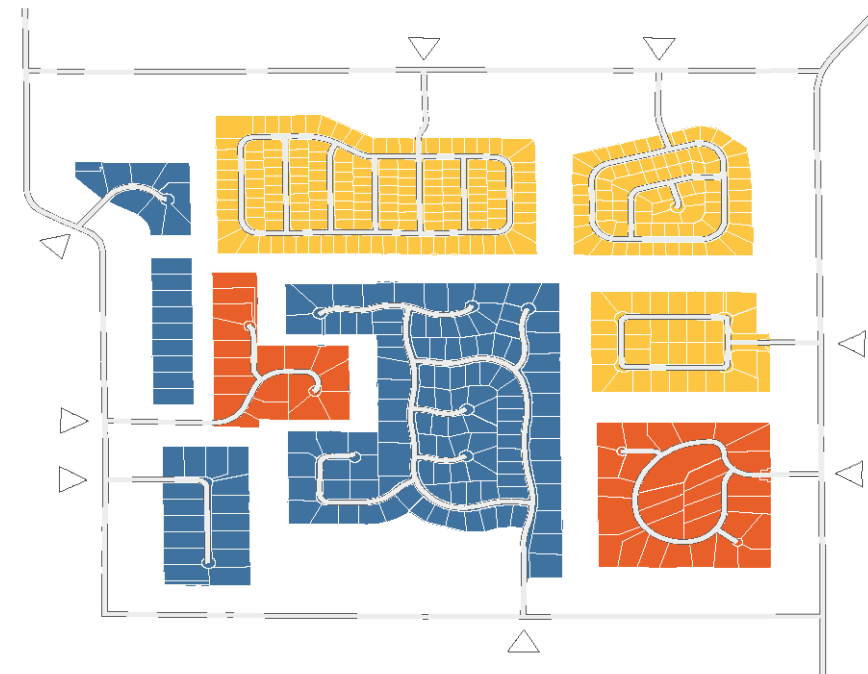Grouped lot sizes

Community in construction
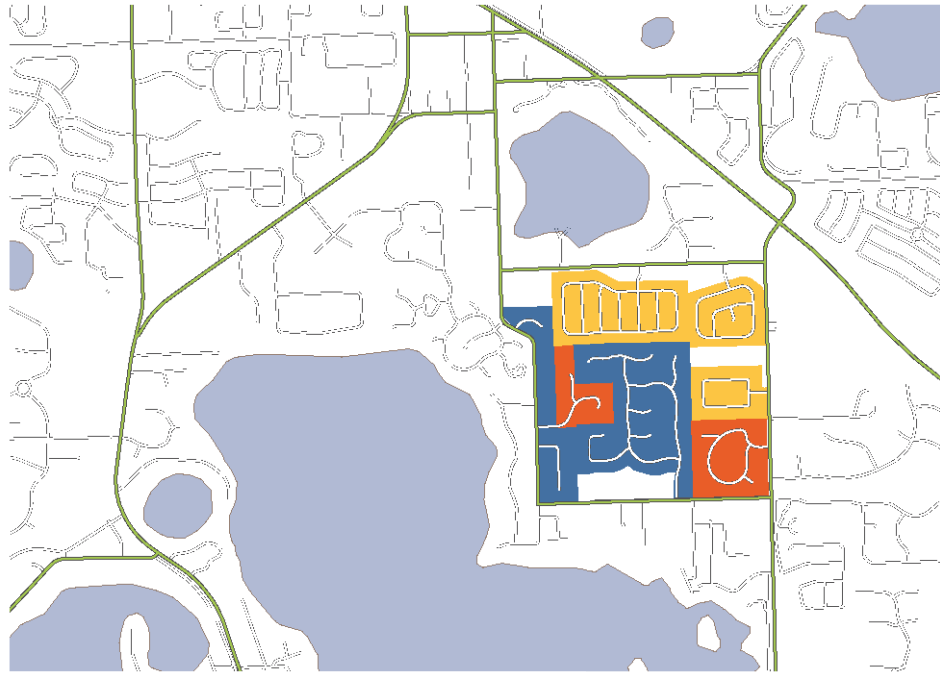
Typical district

Grouping of same sized lots, Gotha west of Orlando

Segregation of Lot Groups
While different lot size groups are located next to eacho-
ther, they are still separated.

Missing Street Connections

Ingredients of the Road Urbanization

The main ingredient is the car. It is the center and main dependency upon which this form of urbanism is built.

Your friendly neighbourhood
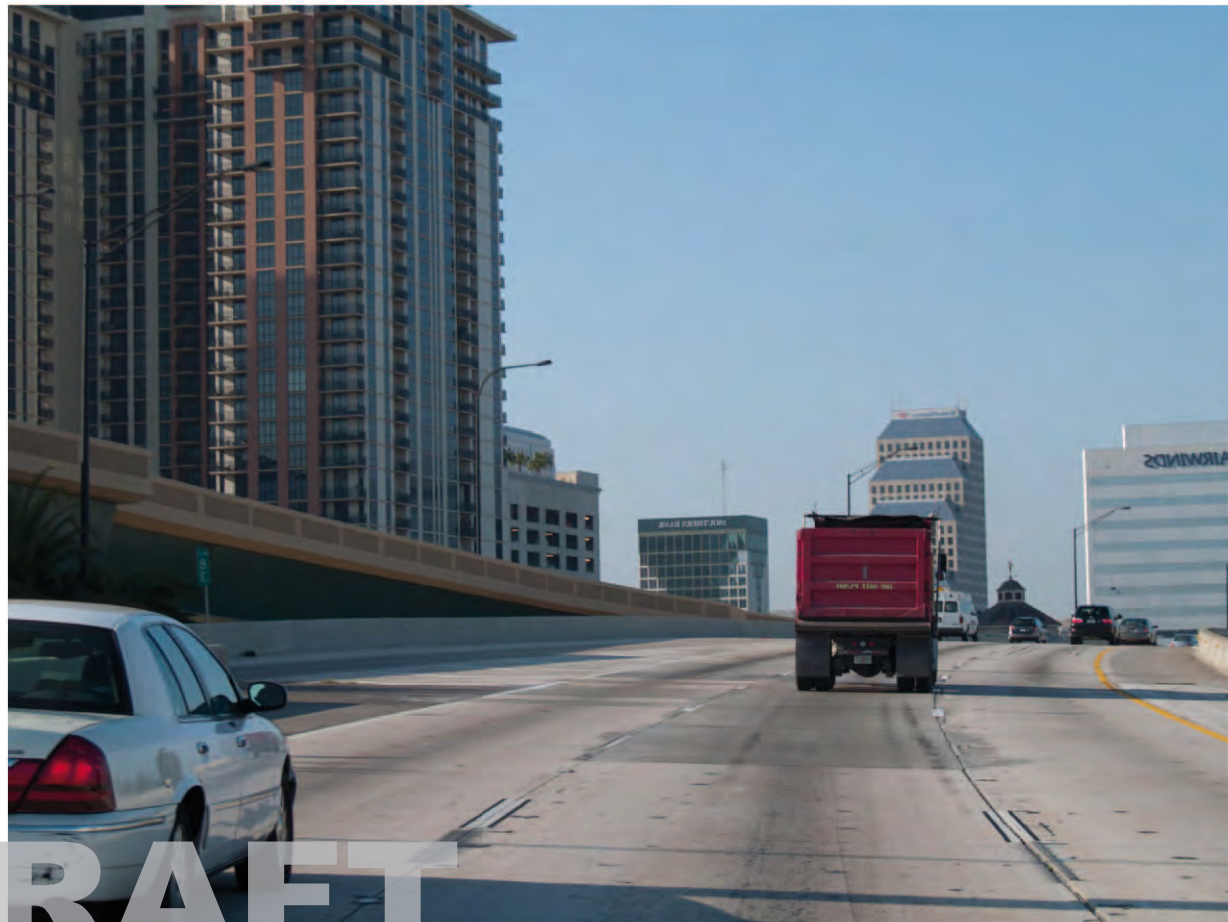
Big parking lots are a common sight

Drive through life

Car friendly design

Home, sweet home

Daily life on the road

"
The freeways could be the real monuments of the future, the places set aside
for special celebrations by people able to experience space and light and mo-
tion and relationships to other people and things at a speed that so far only
this century has allowed.
Here are structures big enough and strong enough, once they are regarded as
part of the city, to re-excite the public imagination about the city.
This is no shame to be covered by suburban bushes or quarantined behind
cyclone fences. It is the marker for a place set in motion, transforming itself
to another place.

Charles Moore
1965

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IMAGE CREDITS

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