

A Geodesign Approach to Better Understand the Resiliency of Urban Form in the State of Florida

Senior Capstone Project
Final Presentation
Spring 2019

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Guiding Question

Will Floridian cities be able to adapt their urban form to become more sustainable?

Cities in Florida must be able to adapt to:

- climate change
- population growth
- new mobility paradigms
- new urban development standards

Key Terms

City

Several definitions based on population density, total population, character and totality of manmade structures, absence of farm labor, or availability of opportunity.

Sustainability

“...the aim has been to **anticipate the needs of the future** as well as to provide for the **necessities of the present**: in short, to direct the development of the city towards an end that must seem ideal, but is practical.” Daniel H. Burnham - **1909 Plan of Chicago**

Urban Resiliency

Resilient urban form is “**dense**, inclusive of a **diversity of building types**, founded on coordinated and **robust movement infrastructure** and accommodating of multipurpose or ‘**flexible**’ open spaces.”

Methodology

Literature Review

Measures, Indicators and Parameters

Geospatial Analysis

Density

Benefits

Lower consumption of resources

Higher asset utilization

Frequent physical interactions

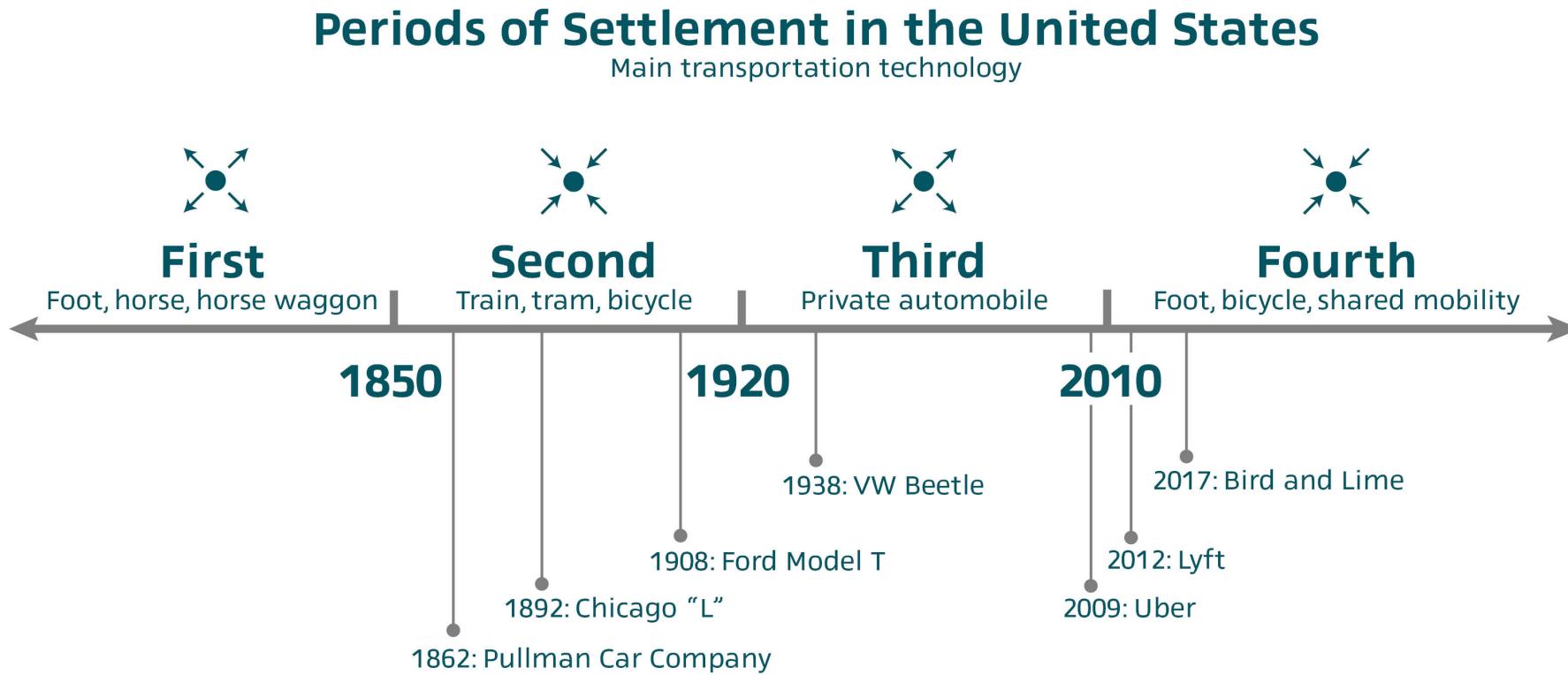
Costs

Reliance on central systems

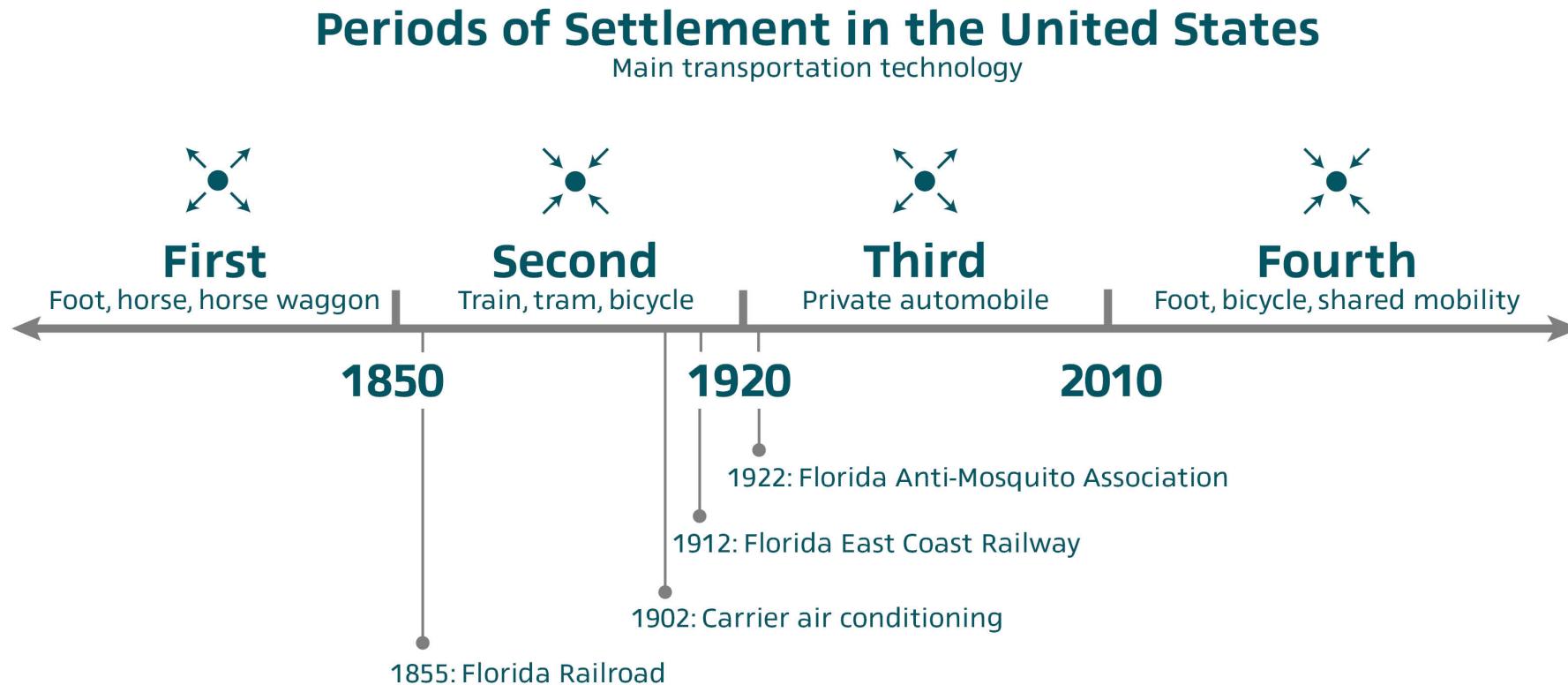
Need for courtesy and trust

Coordination and negotiation

Urban History of the United States



Urban History of the State of Florida



State of Florida Today

20.9M
Florida's Population

U.S. Census Bureau, 2017



Buildings



State of Florida Today

8.6M

Residential Units

7.7M

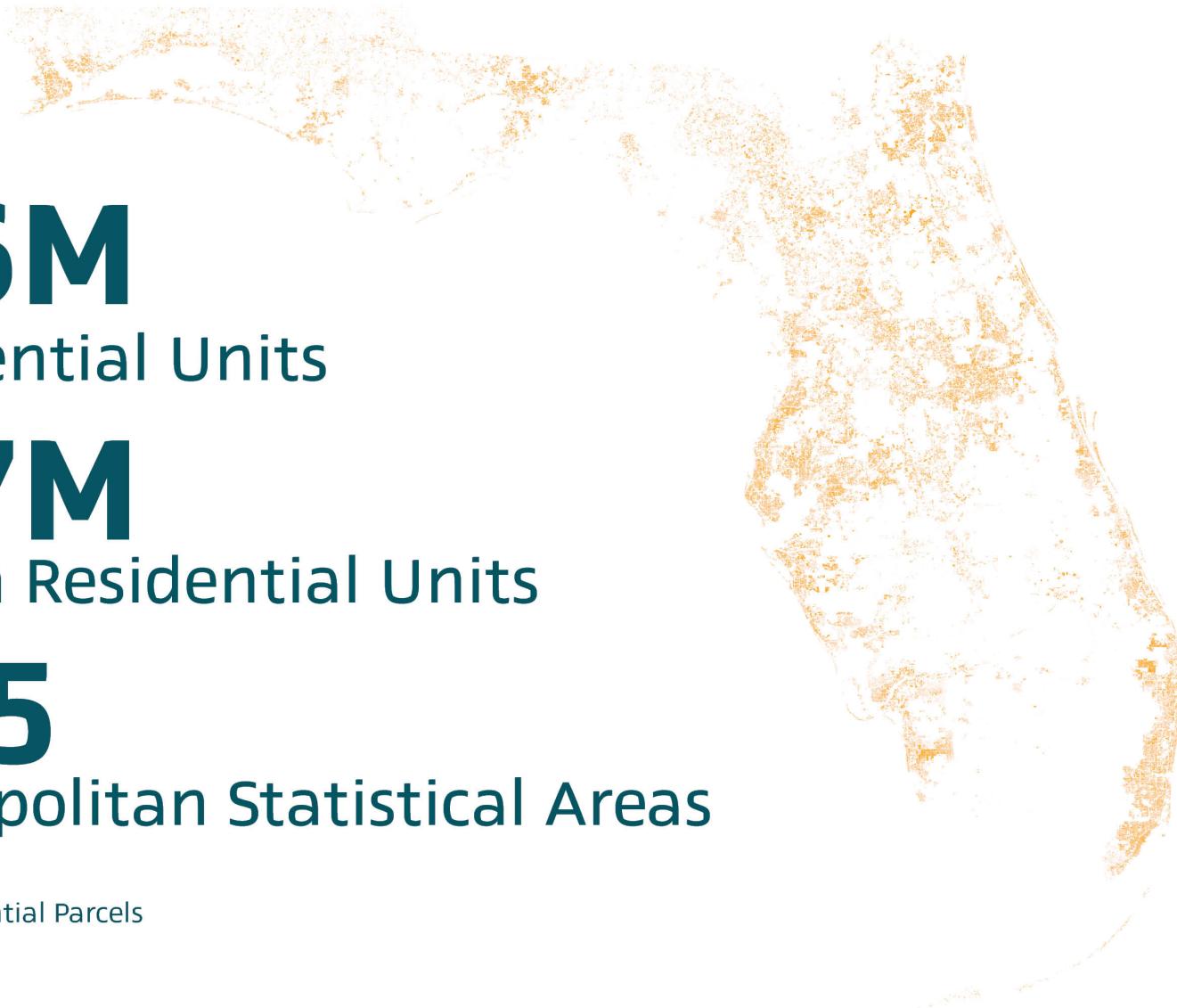
Urban Residential Units

105

Metropolitan Statistical Areas

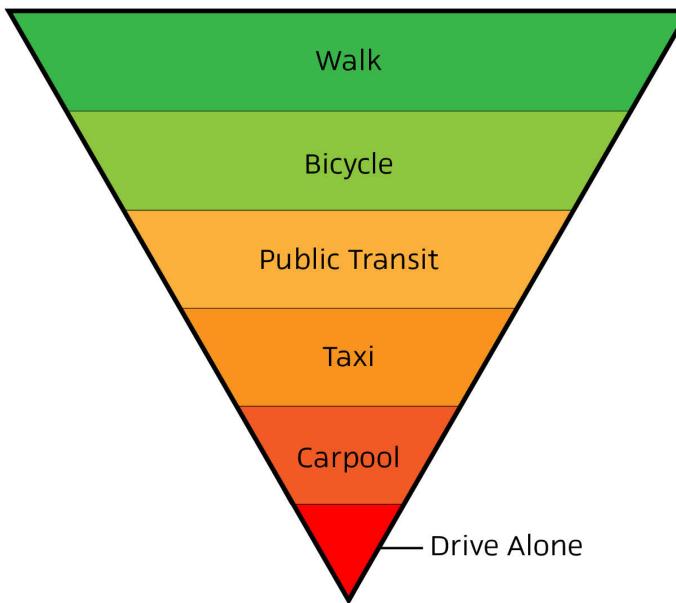


Residential Parcels

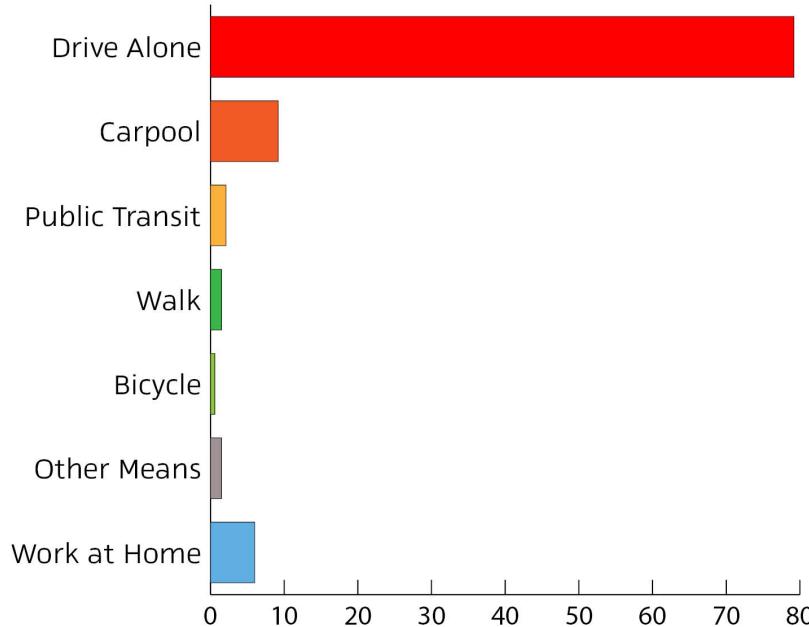


State of Florida Today

Ideal Sustainable Mode-Share



Actual Mode-Share (2016)



THE TOP 20 Most Dangerous Metropolitan Areas for Pedestrians (2008-2017)

Top 1-10 Top 11-20



Measures, Indicators and Parameters

Physical Resiliency

1. Residential Density

Parcels with a density greater than 100 units per acre

2. Density of Built Form

Parcels with a lot coverage of 80% or more

Environmental Resiliency

3. Frequent Transit Service Accessibility

Parcels within a 15-minute walk from stops

4. Green Space Accessibility

Parcels within a 15-minute walk from parks

5. School Accessibility

Parcels within a 20-minute walk from public high schools

6. Food Accessibility

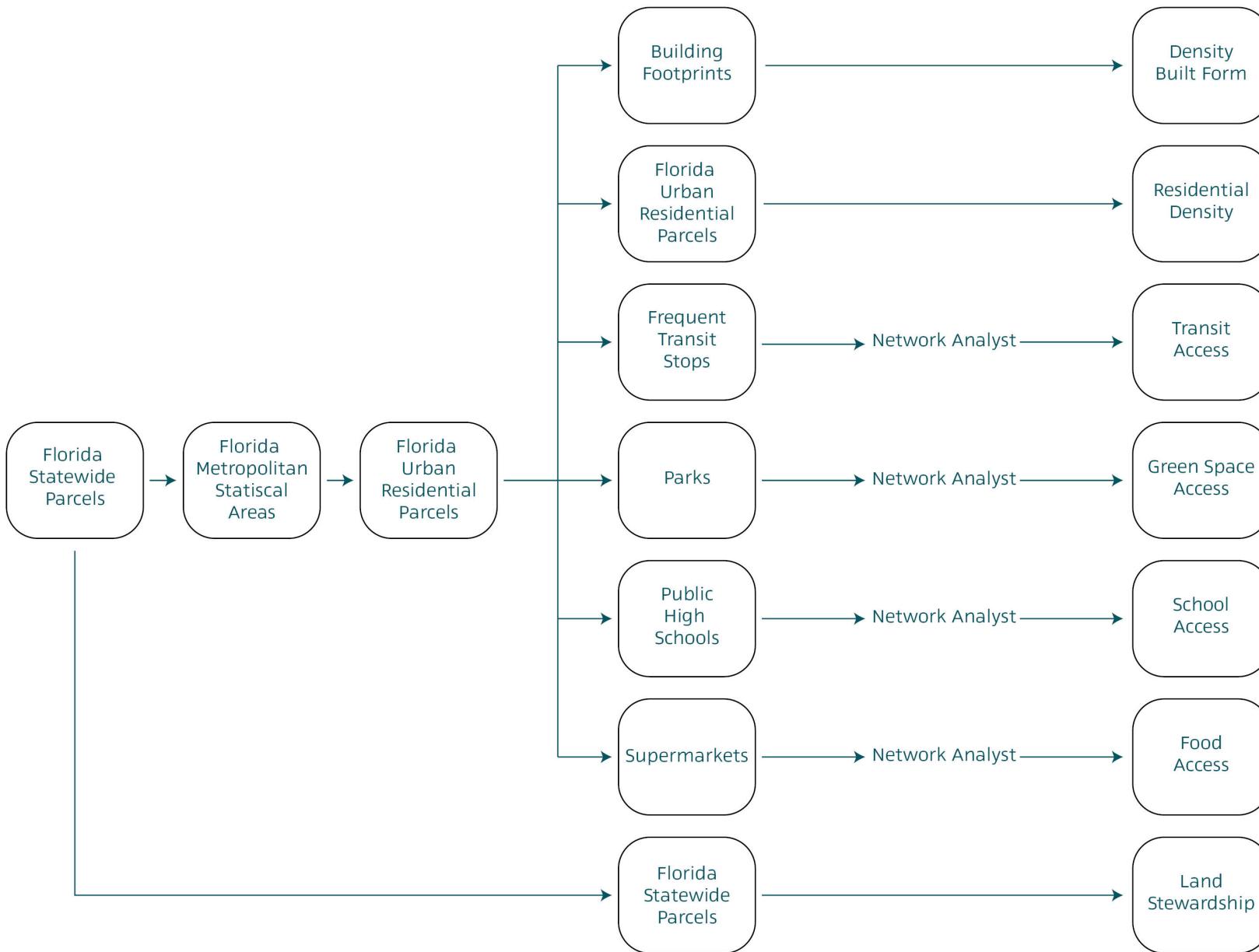
Parcels within a 15-minute walk from supermarkets and regional shopping centers

Land Stewardship

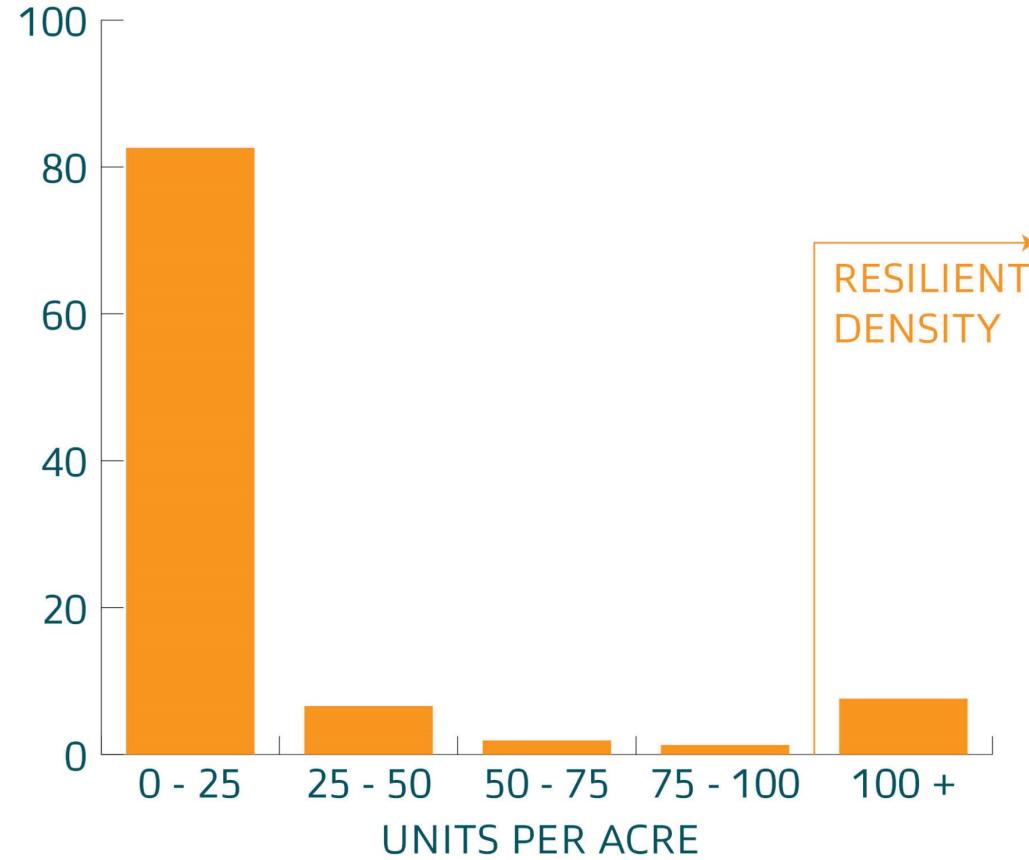
7. Local vs. foreign land ownership

More acreage owned by residents than non-residents

Geospatial Analysis

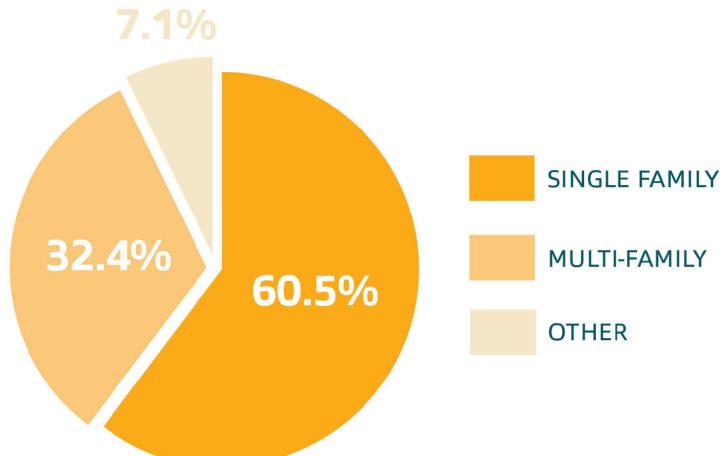


Residential Density

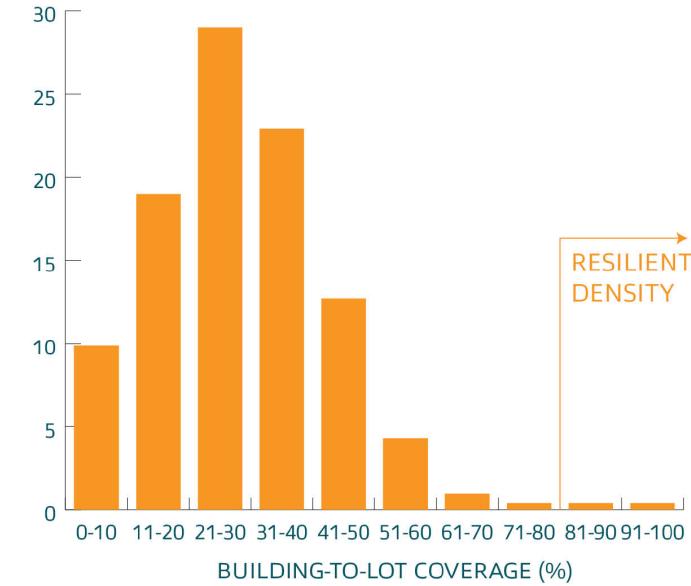


Density of Built Form

Residential Units by Type



Residential Parcels by Building Coverage



Density of Built Form

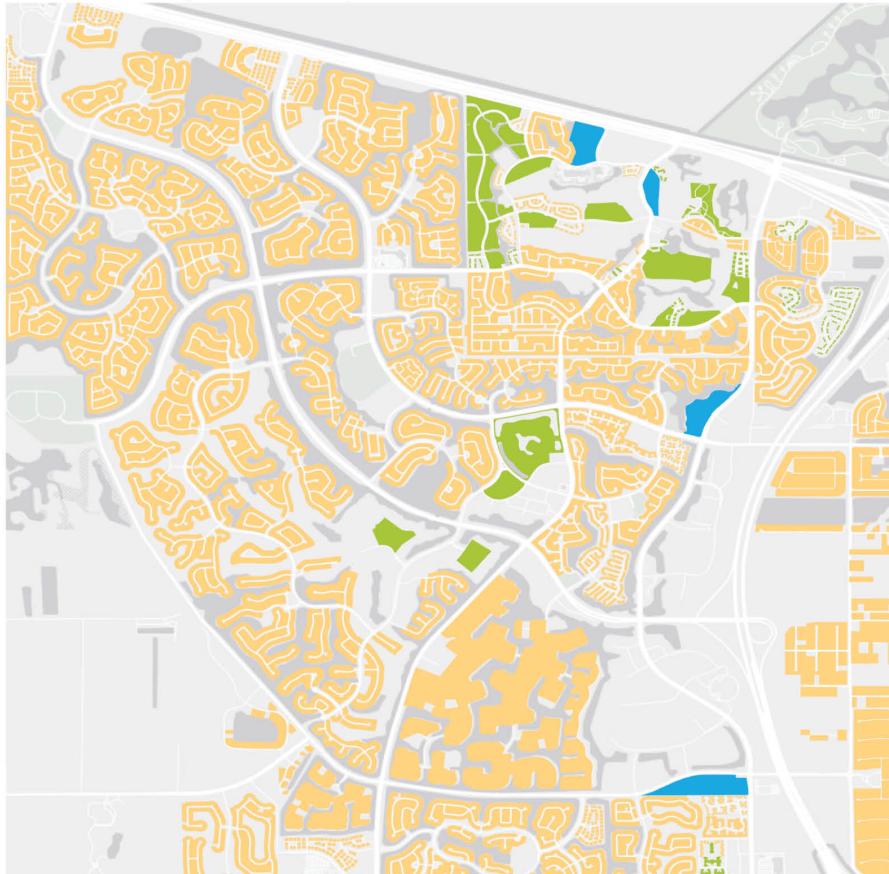
Single Family

Multi-Family

Condominiums

Cooperatives

Weston, FL (suburban)



Miami Beach, FL (urban)



Frequent Transit Service Accessibility

"transit service headways in at least one direction of 15 minutes or less for at least 12 hours per day, 6 days per week."

676

total fixed-route transit lines

4%

of transit lines are frequent

50min
median waiting time



666 bus lines



1 streetcar line



4 people-mover lines



2 metrorail lines



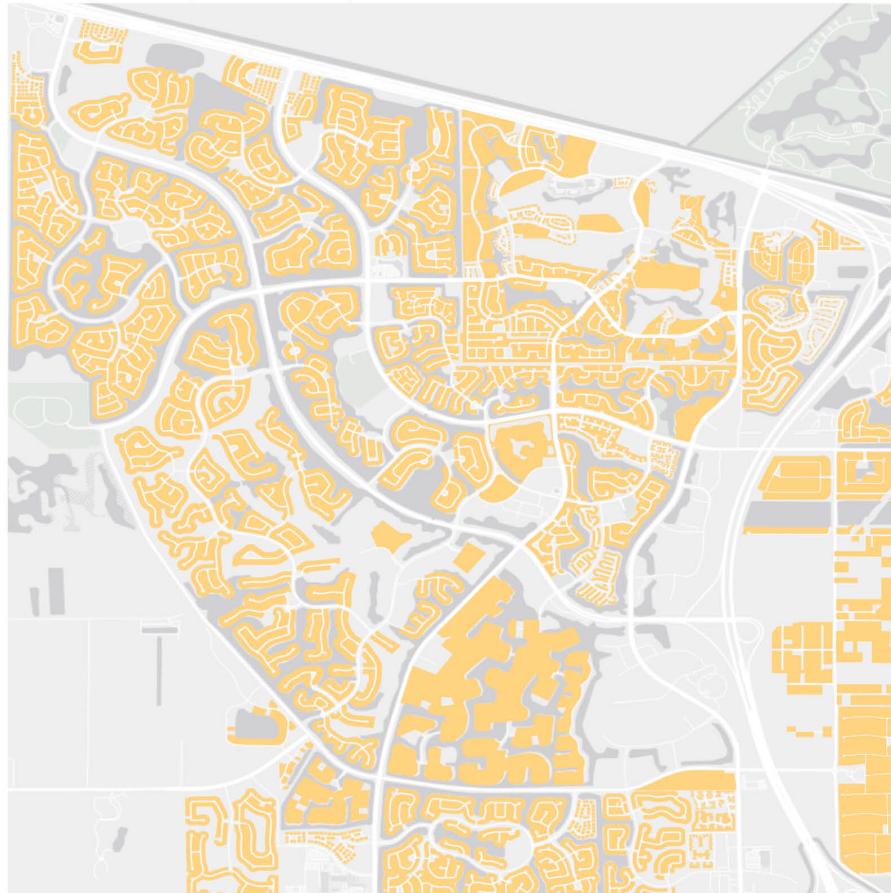
3 commuter rail lines

Frequent Transit Service Accessibility

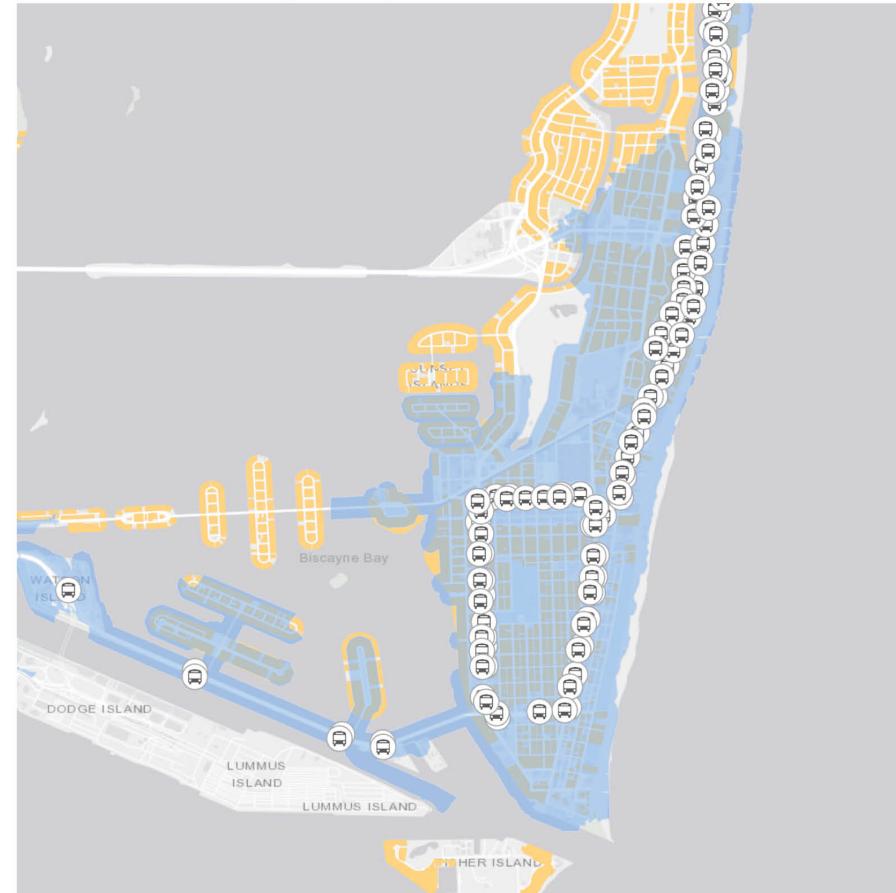
6%

residential units within a 15-minute walk to frequent transit services

Weston, FL (suburban)



Miami Beach, FL (urban)

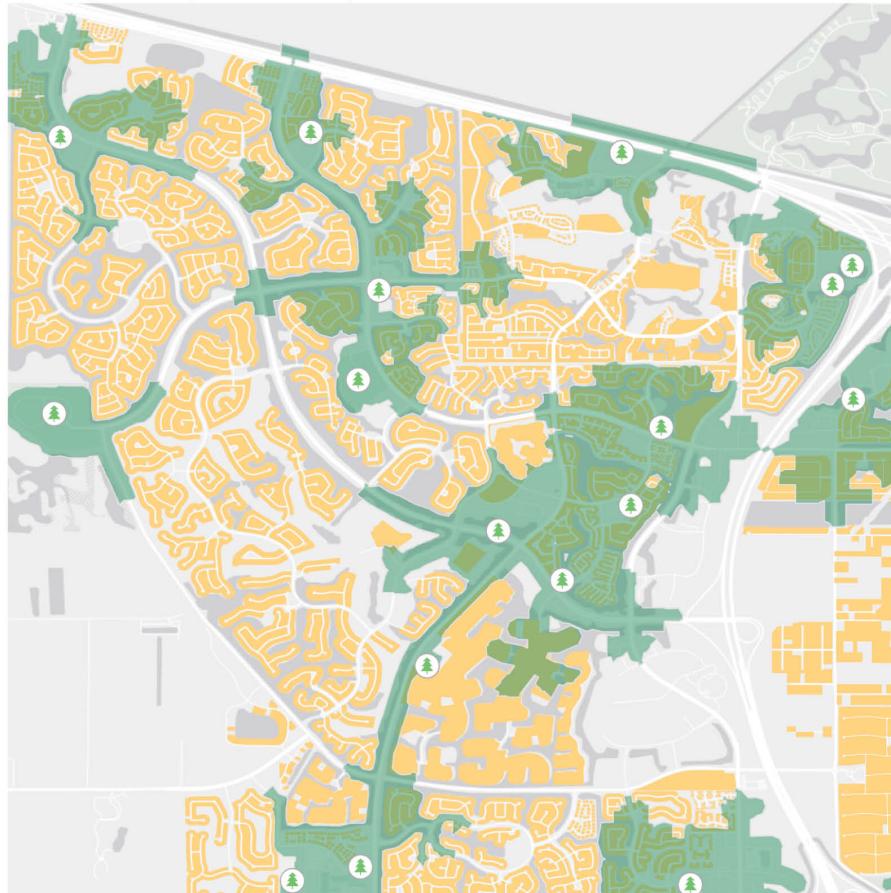


Green Space Accessibility

51%

residential units within a 15-minute walk to parks or beach access points

Weston, FL (suburban)



Miami Beach, FL (urban)

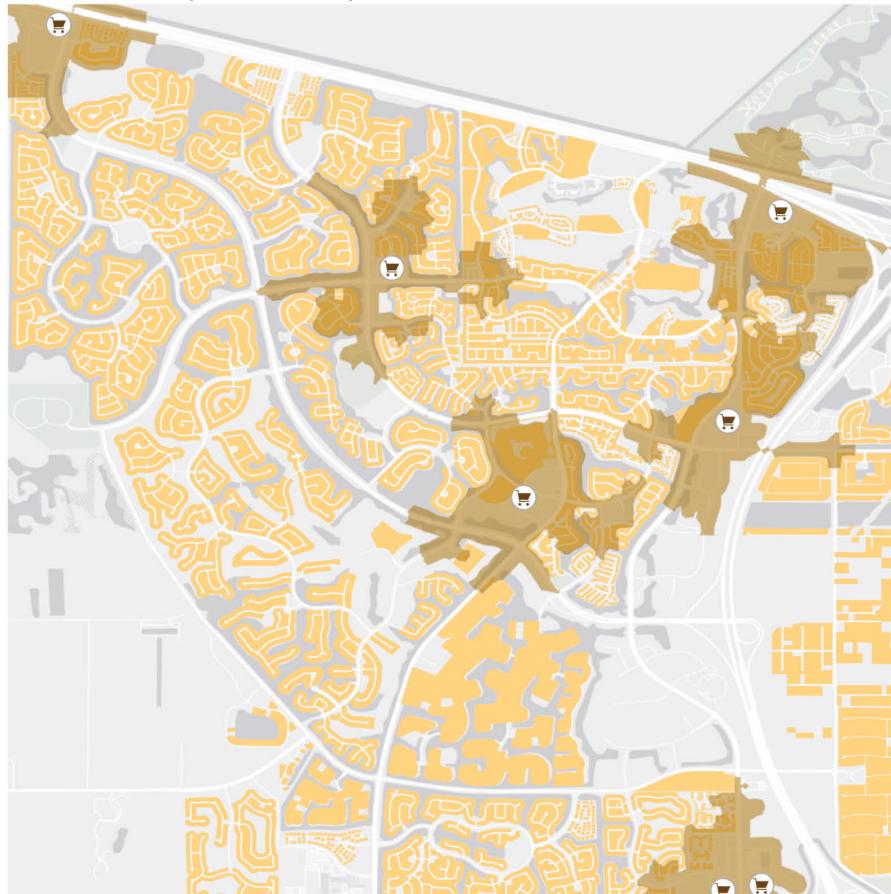


Food Accessibility

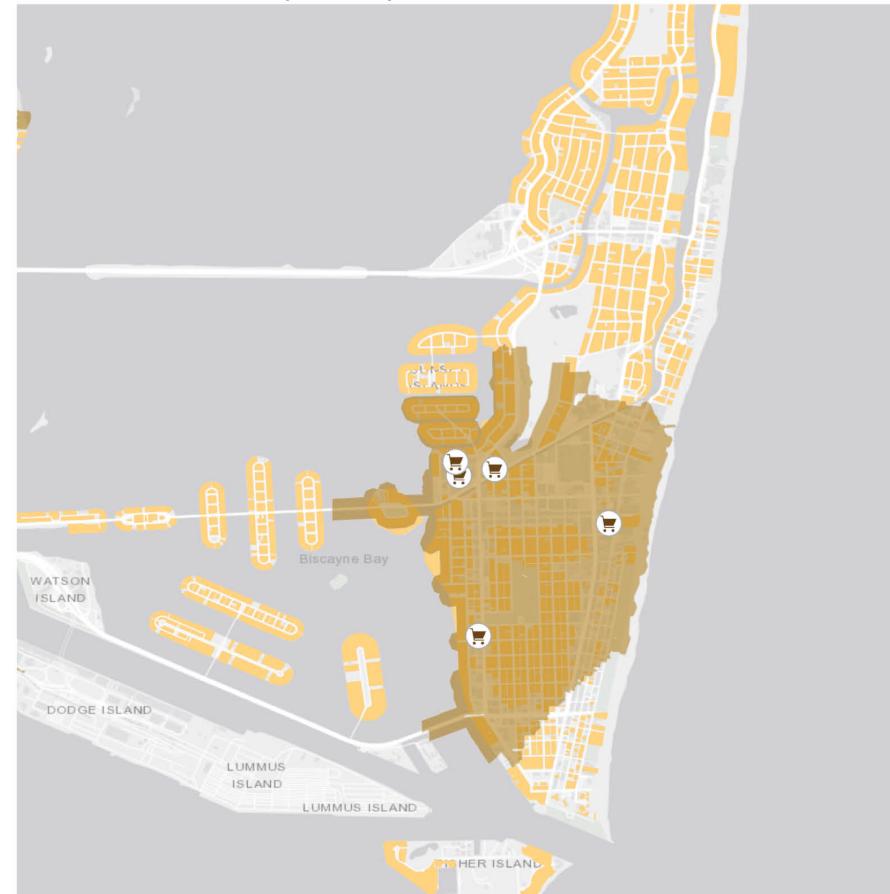
37%

residential units within a 15-minute walk to supermarkets

Weston, FL (suburban)



Miami Beach, FL (urban)

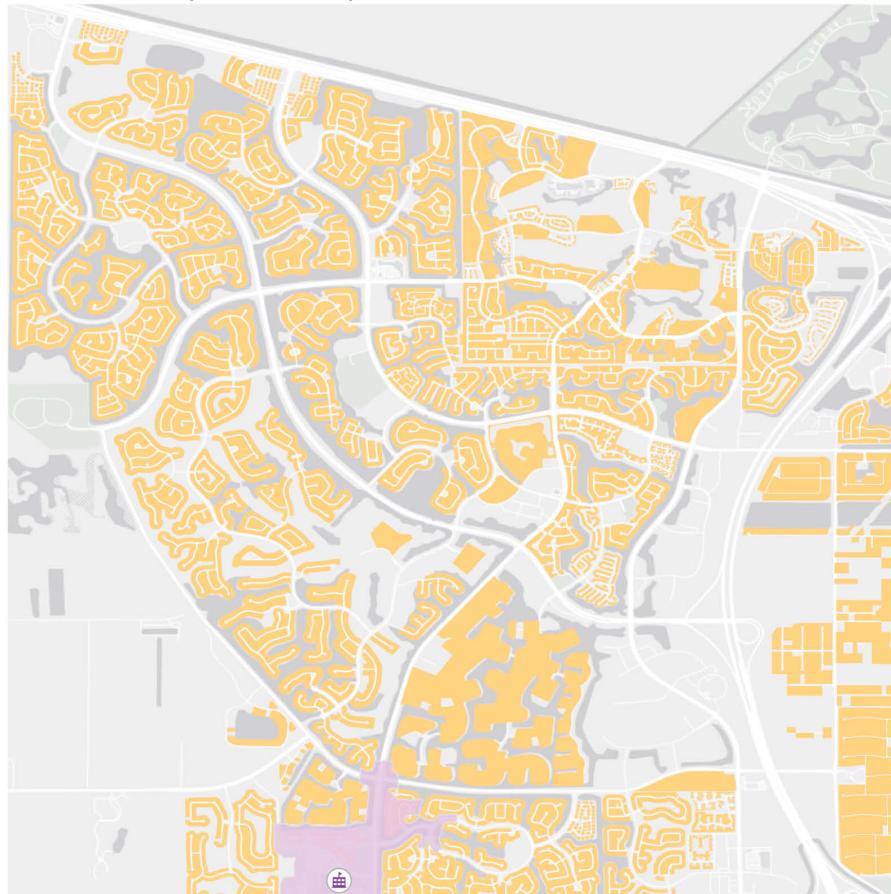


School Accessibility

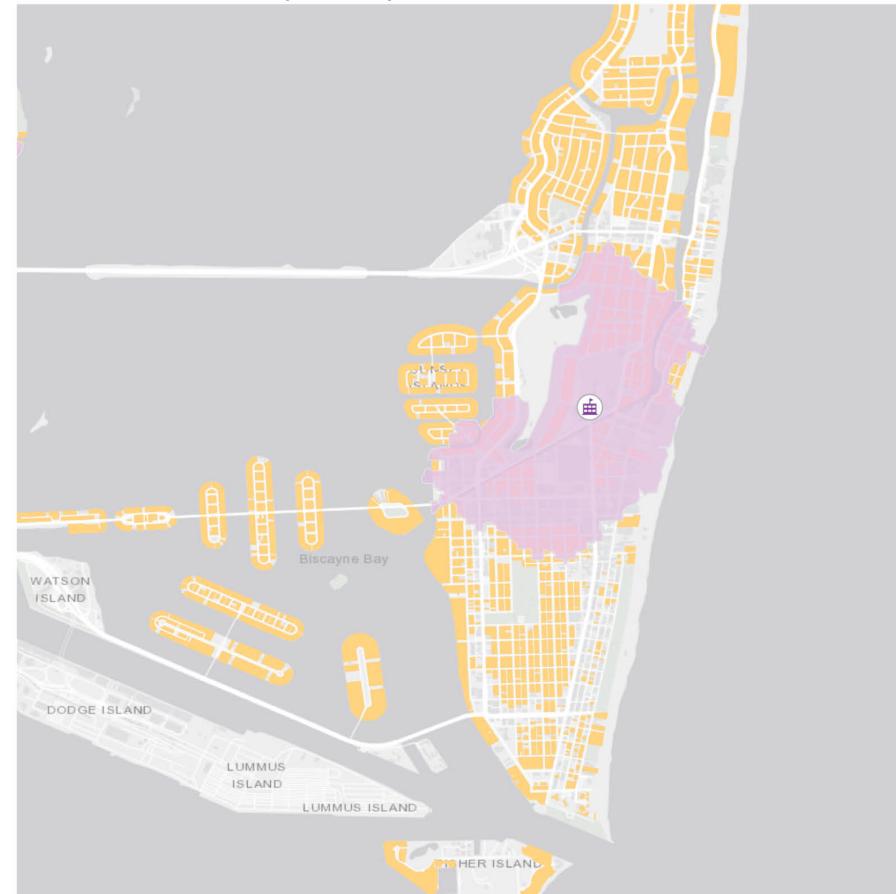
14%

residential units within a 20-minute walk to public high schools

Weston, FL (suburban)



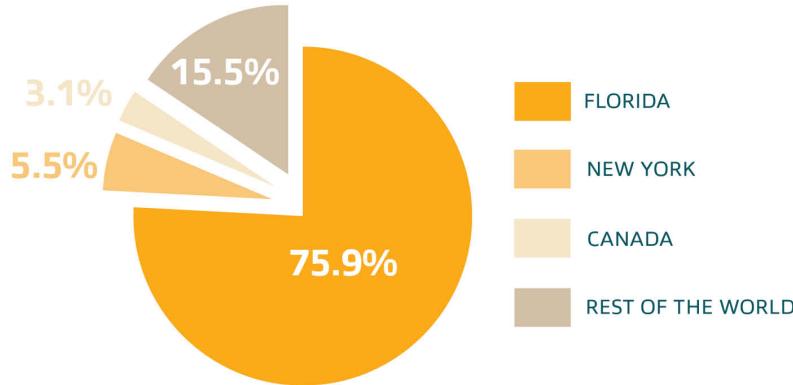
Miami Beach, FL (urban)



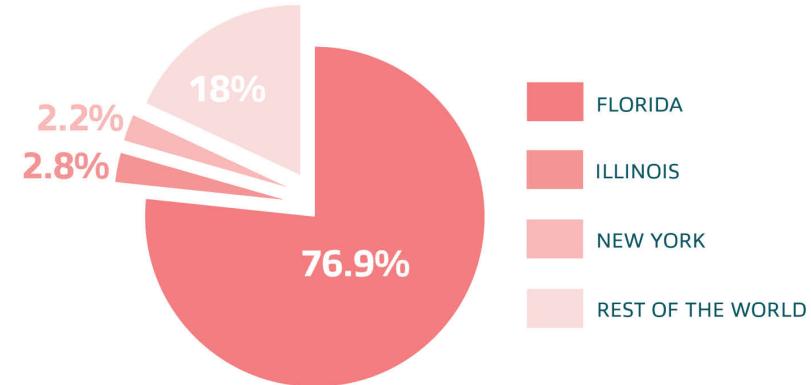
Land Stewardship

Percentage of total acreage

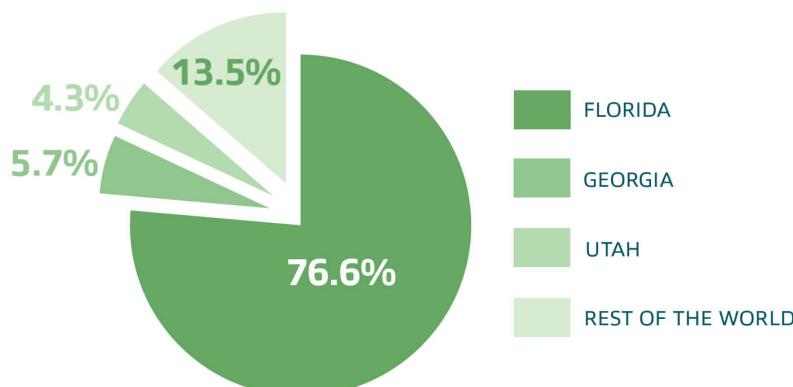
Residential



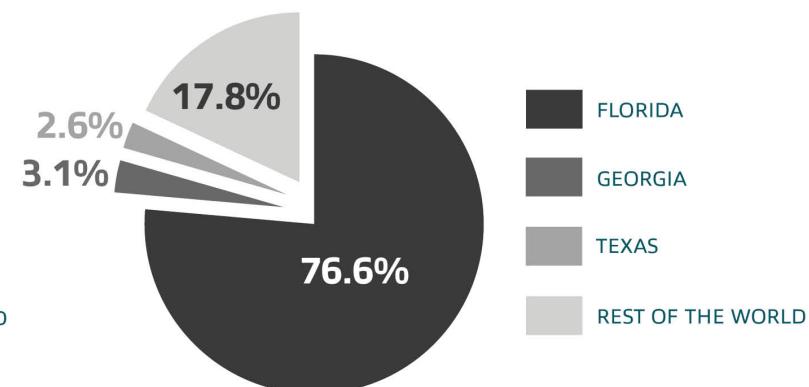
Commercial



Agricultural



Industrial



Implications & Applications

1. Florida needs to:
 - **densify** its urban form
 - **invest** in non-vehicular mobility infrastructure
2. It will cost Florida plenty of time, financial resources and effort to accomplish a sustainable urban form

Data Sources

Florida Parcel Data Statewide - FGDL, 2017

Parks & Recreational Facilities in the State of Florida - FGDL, 2018

Schools (Private & Public) in Florida - FGDL, 2018

Florida Transit Routes & Stops - Florida Transit Data Exchange, 2019

Metropolitan Statistical Areas - Esri Business Analyst Extension, 2018

U.S. Building Footprints - Microsoft, 2018



Thank you

Questions?