MODELING HOUSING CAPACITY

Fregonese Associates – Tuesday, August 8, 2017

CODE NEXT

SHAPING THE AUSTIN WE IMAGINE

TODAY'S GOALS

1. Explain the differences between housing capacity models used during the CodeNEXT process
2. Share updated model results for Existing Zoning & CodeNEXT Draft 1

CODE NEXT
SHAPING THE AUSTIN WE IMAGINE

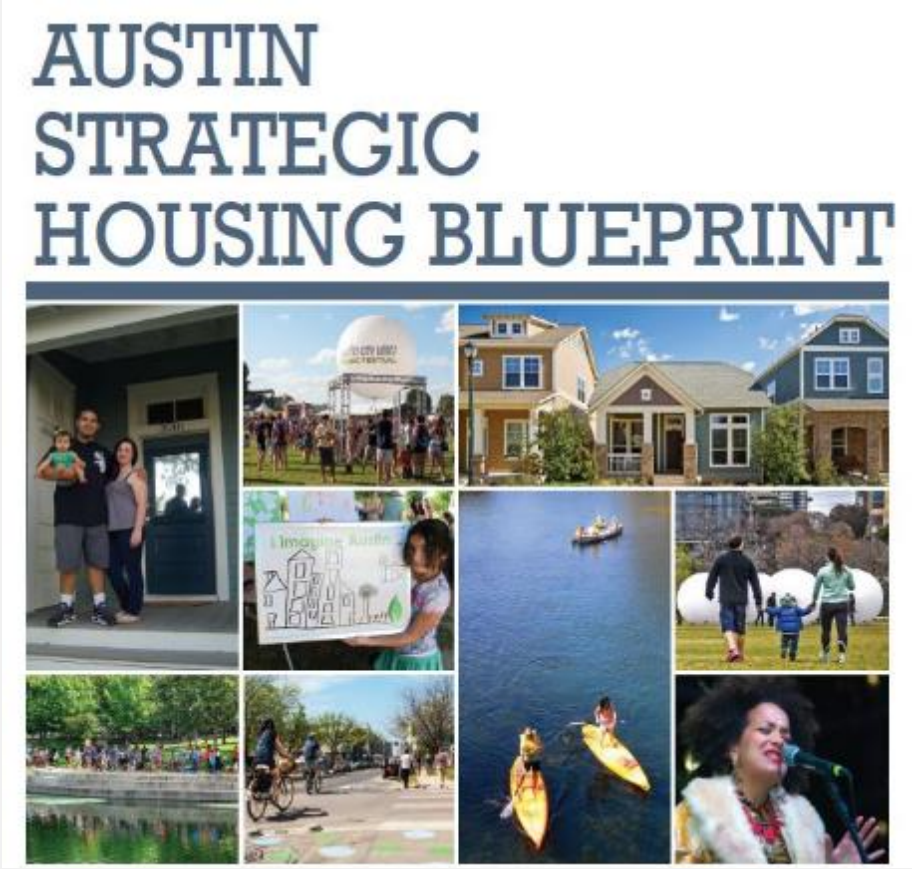
Discuss next steps:

3. Analysis & indicators expected for mid-September Draft 2 roll out
4. Strategies for Draft 2 revisions

MODELING HOUSING CAPACITY

Answer the question:

Is there enough capacity to meet the Strategic Housing Blueprint goal of 135,000 new units



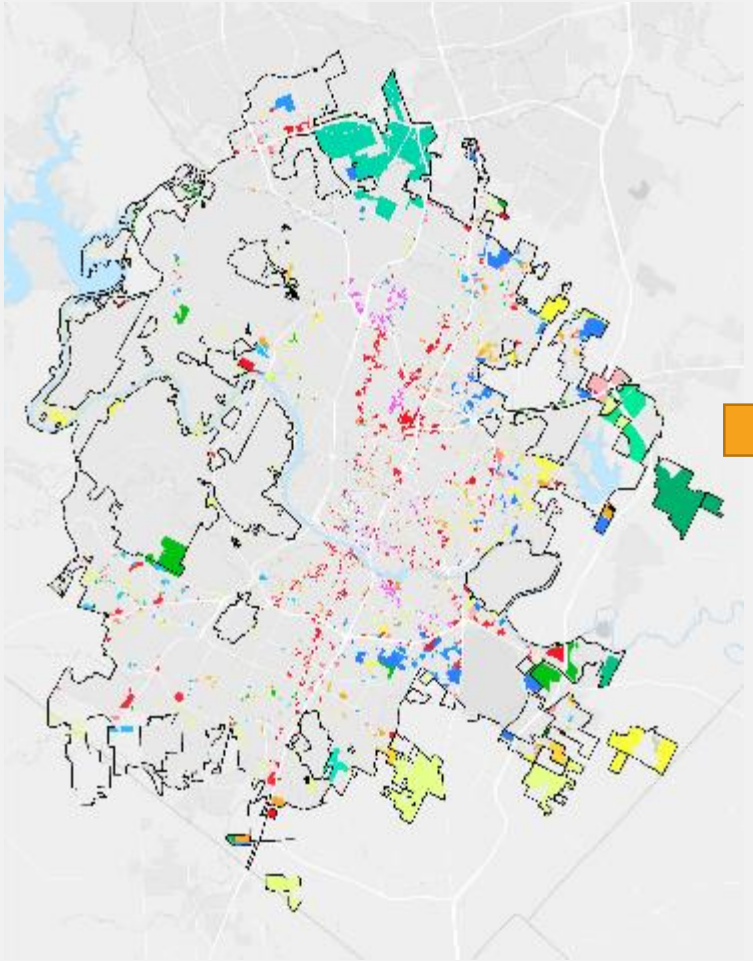
MODELING HOUSING CAPACITY

- Results of any future zoning analysis are estimates – Never 100% accurate
- Modeling driven by standards in the code, as well as assumptions
- Helps form a basis of informed discussions and decision making – not meant to decide or dictate policy

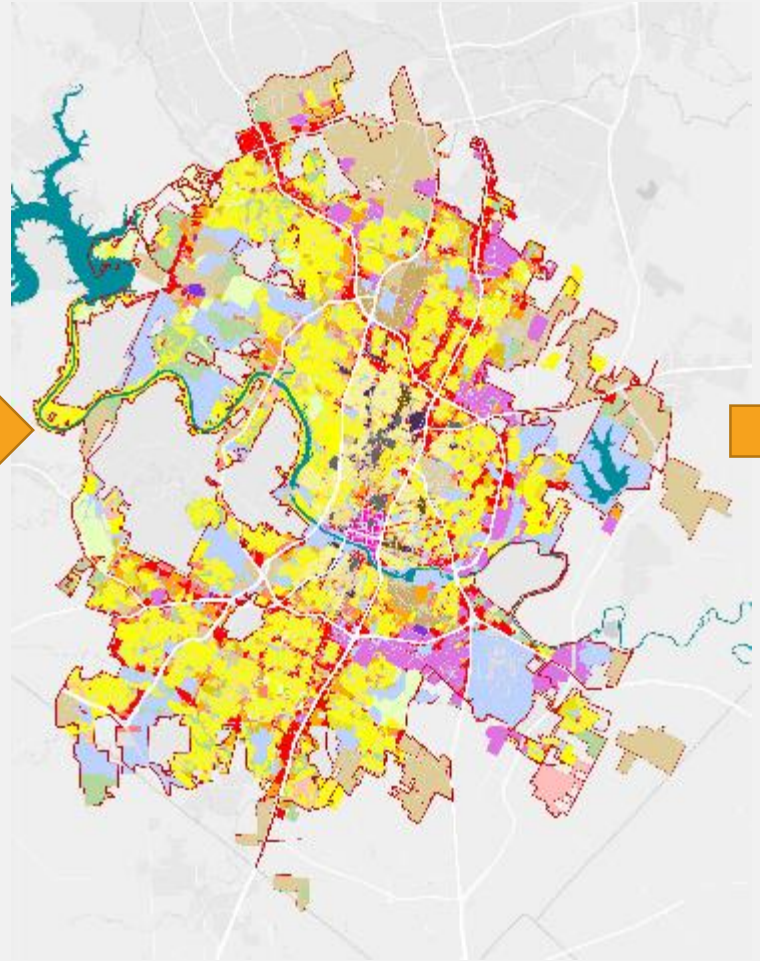
CODE NEXT
SHAPING THE AUSTIN WE IMAGINE

EXPLAINING THE DIFFERENCES

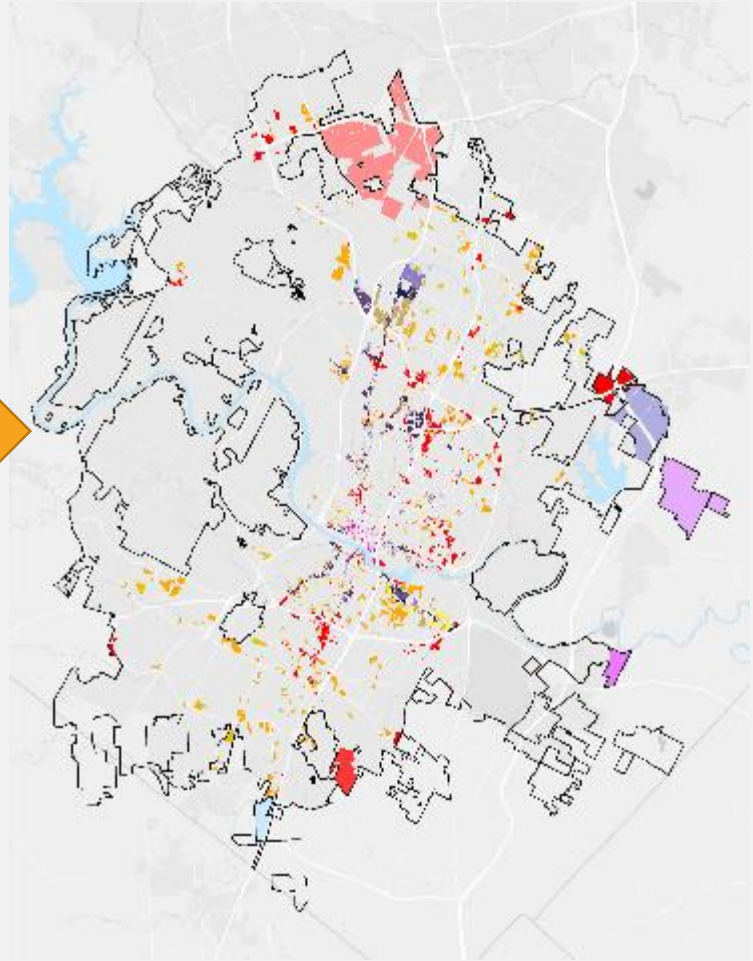
2015 – Existing Zoning Model



May 2017 – Draft 1 Model

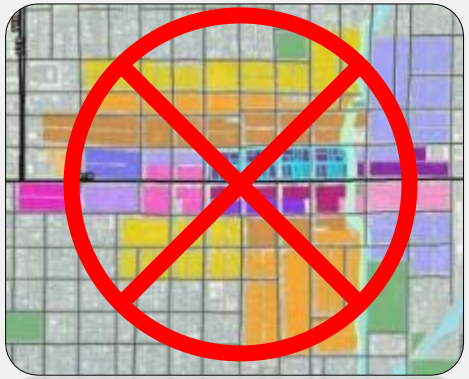


August 2017 – Updated Model



WHAT'S THE SAME?

The Envision Tomorrow Scenario Building Process

SAME	SAME	DIFFERENT	DIFFERENT
			
Create Building Types	Create Development Types	Scenario Development	Evaluate

New Building & Development Types Created for CodeNEXT zones – Process of creation the same

WHAT'S THE SAME?

Use Buildings Calibrated to Austin Market

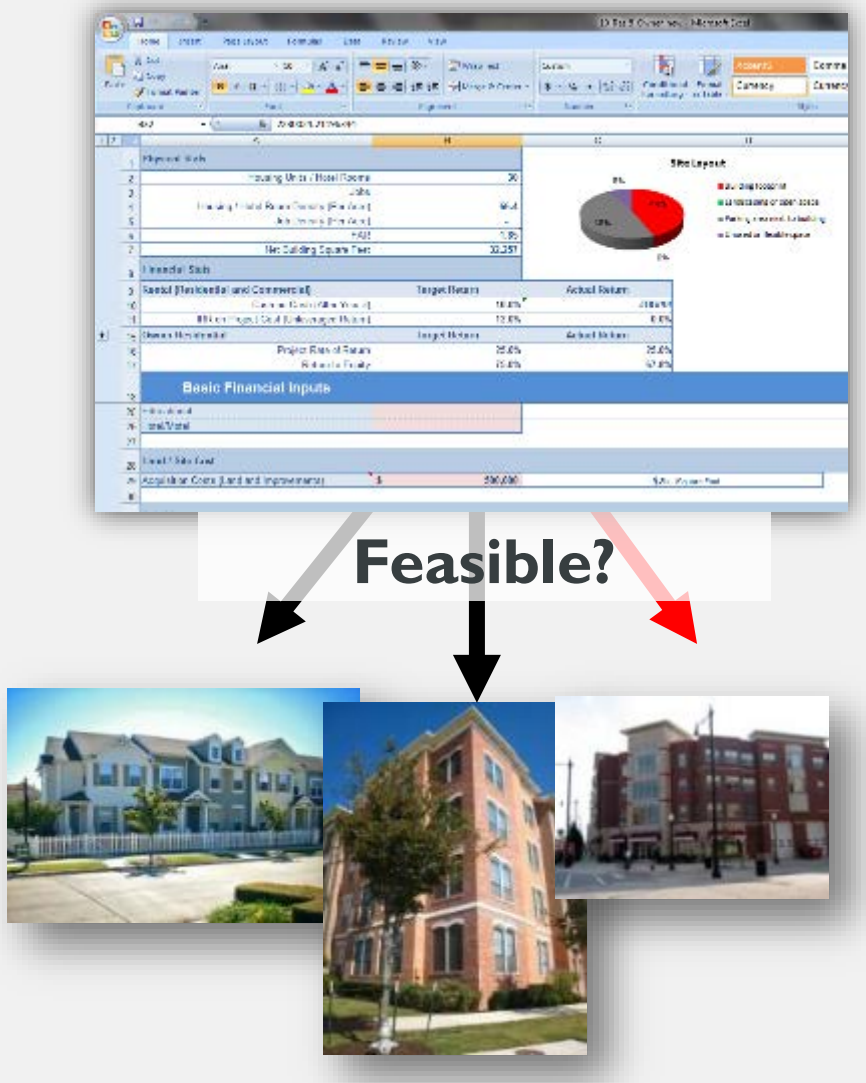
Total of 81 Buildings used in Analysis

Physical Form

- Height
- Unit sizes
- Parking configurations

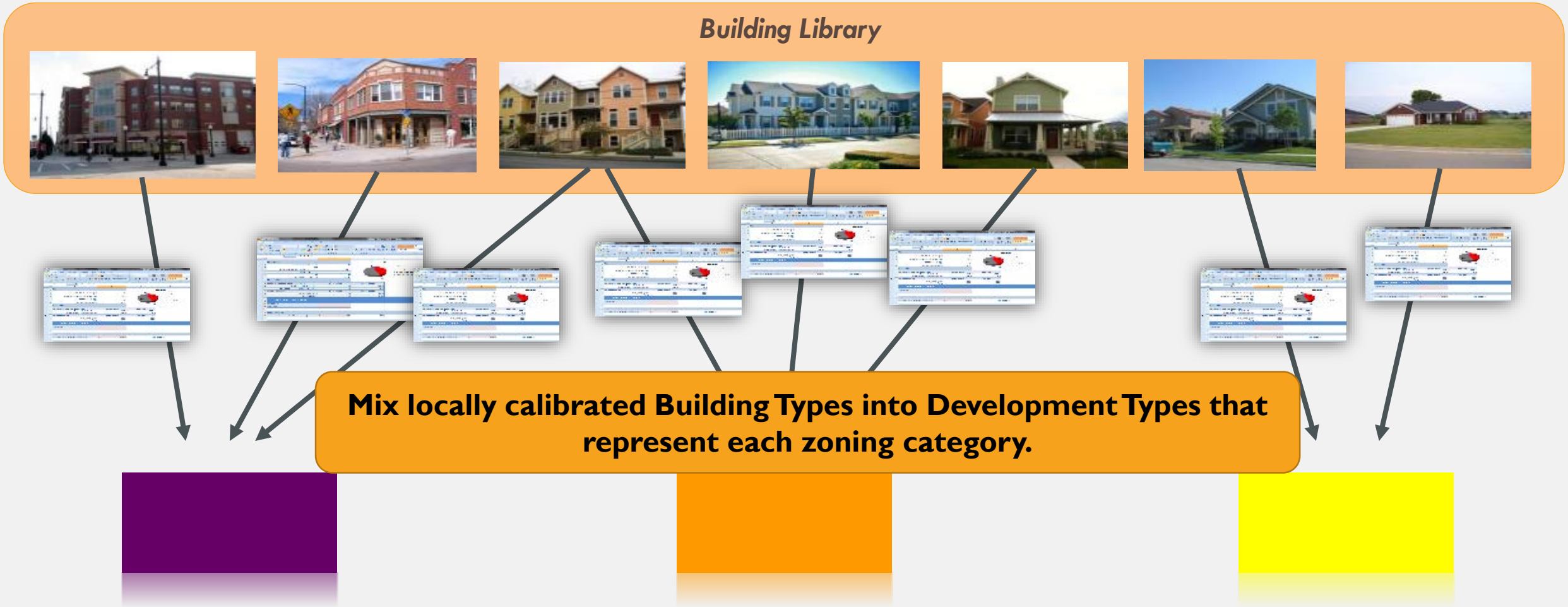
Financial Reality

- Rents / sales prices
- Construction costs
- Land costs

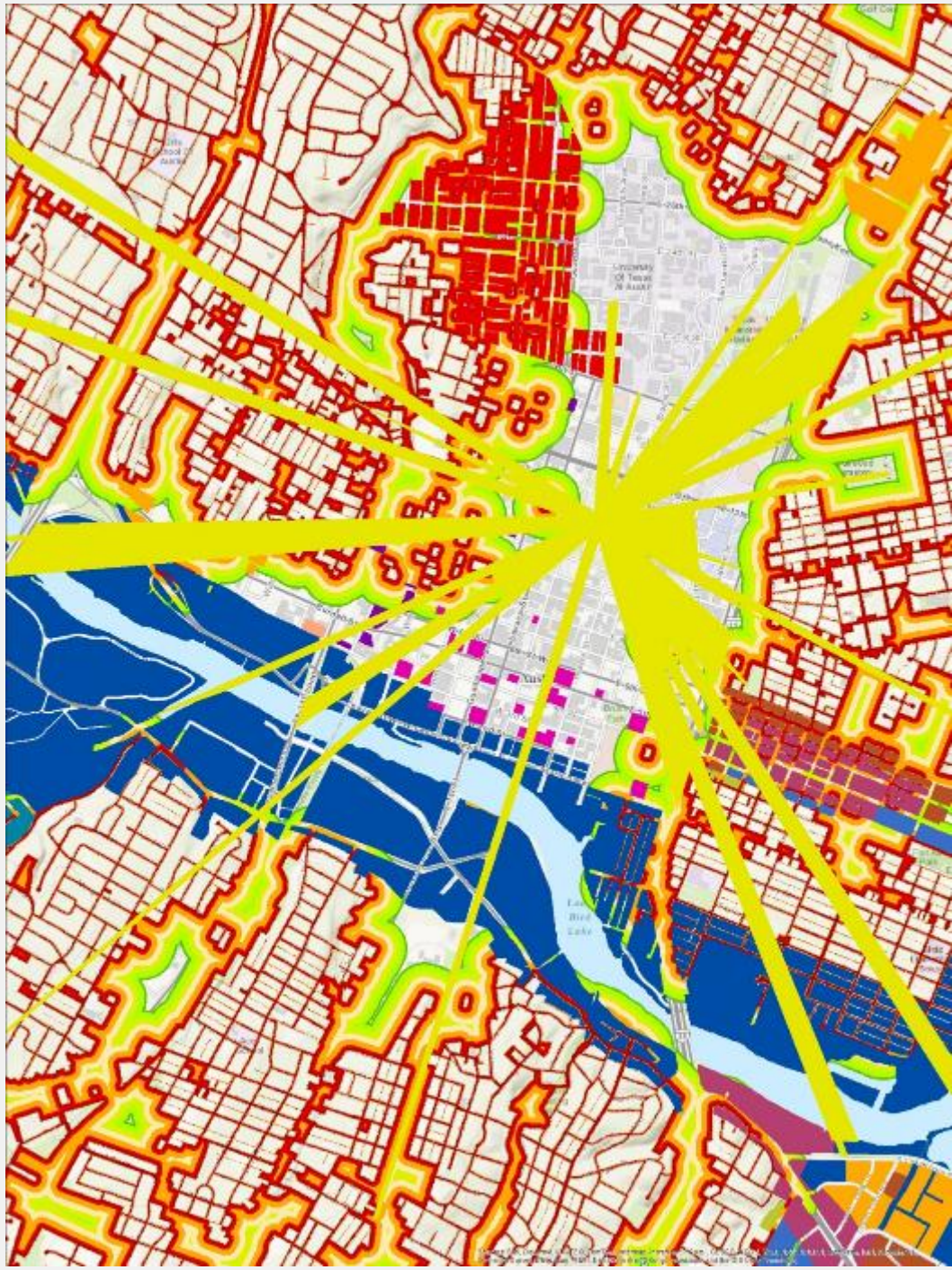


WHAT'S THE SAME?

Construct Zone Types with Calibrated Buildings

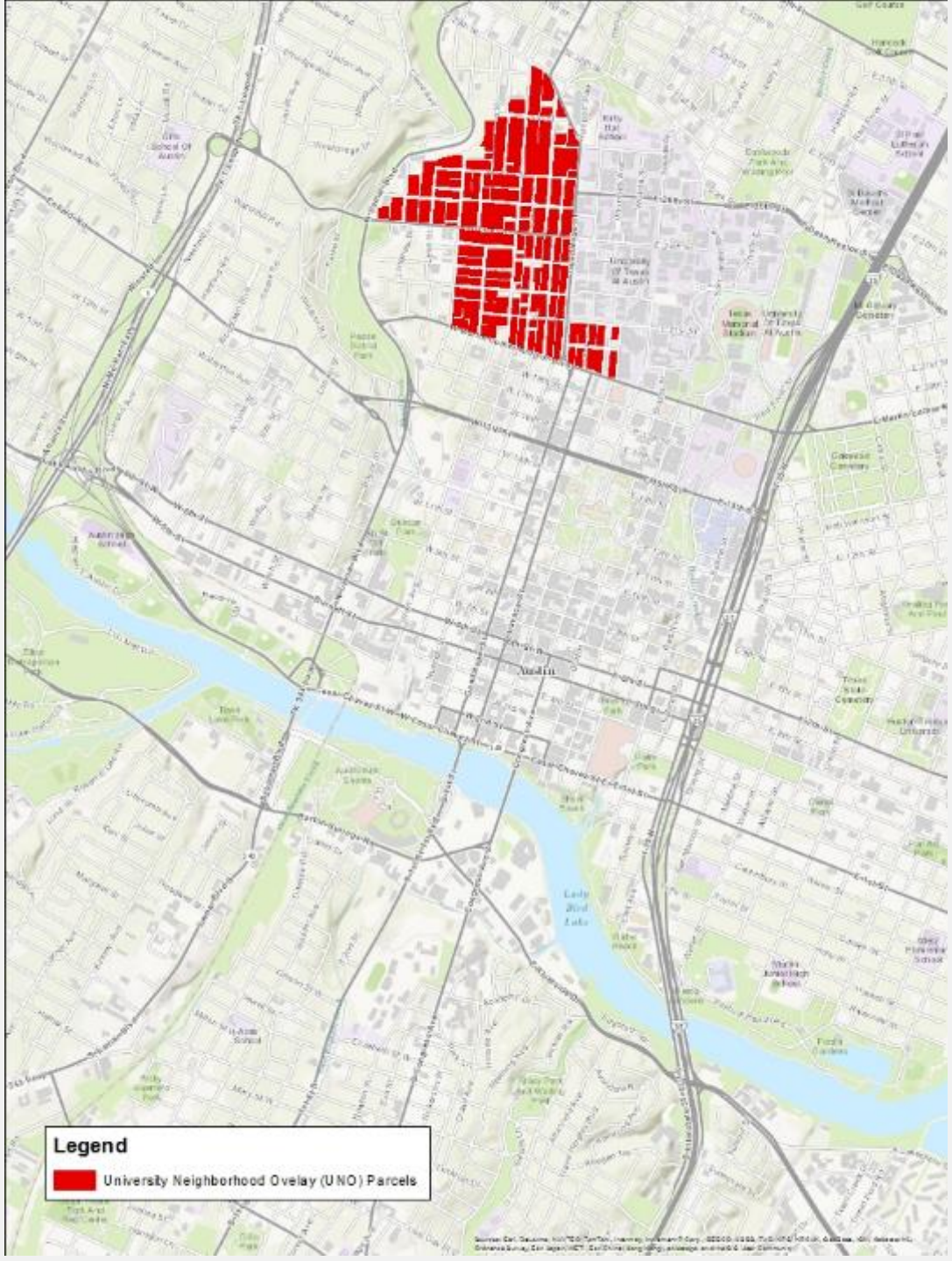


ADDITIONAL OVERLAYS AND DEV. REGS.



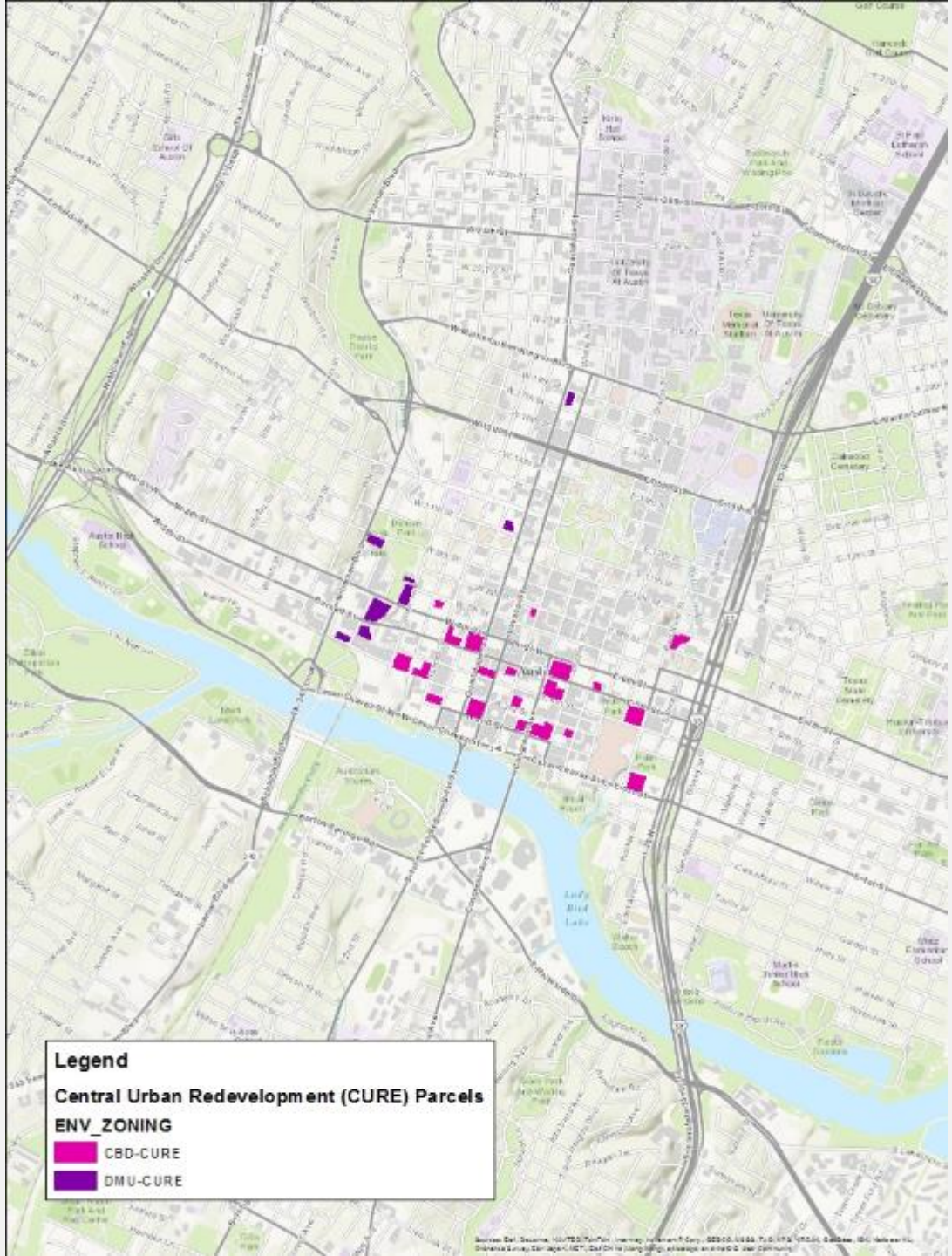
UNIVERSITY NEIGHBORHOOD OVERLAY (UNO)

- Discrete geographic area
- Handled like base zoning
- Density & FAR result of average from recent projects
- ***Modeling: unique ET place type***



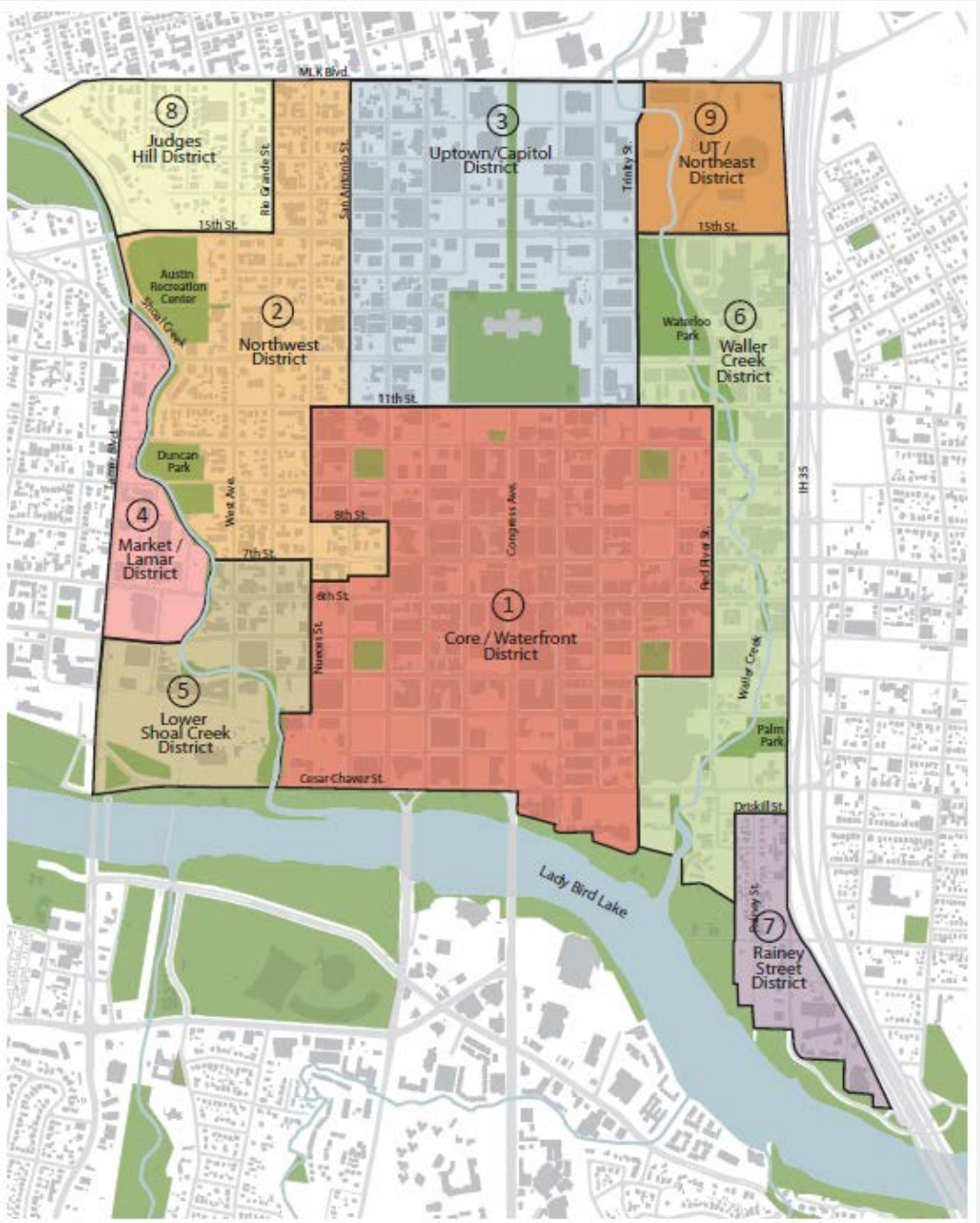
CENTRAL URBAN REDEVELOPMENT (CURE)

- Discrete geographic area
- Superseded by Downtown Plan, however some parcels have grandfathered status
- Staff identified parcels with grandfathered CURE zoning
- Impact is uncertain since base zones in downtown already allow 5-8 FAR…
- ***Modeling: Use higher intensity development type on parcels identified as having secured CURE development rights.***



DOWNTOWN PLAN

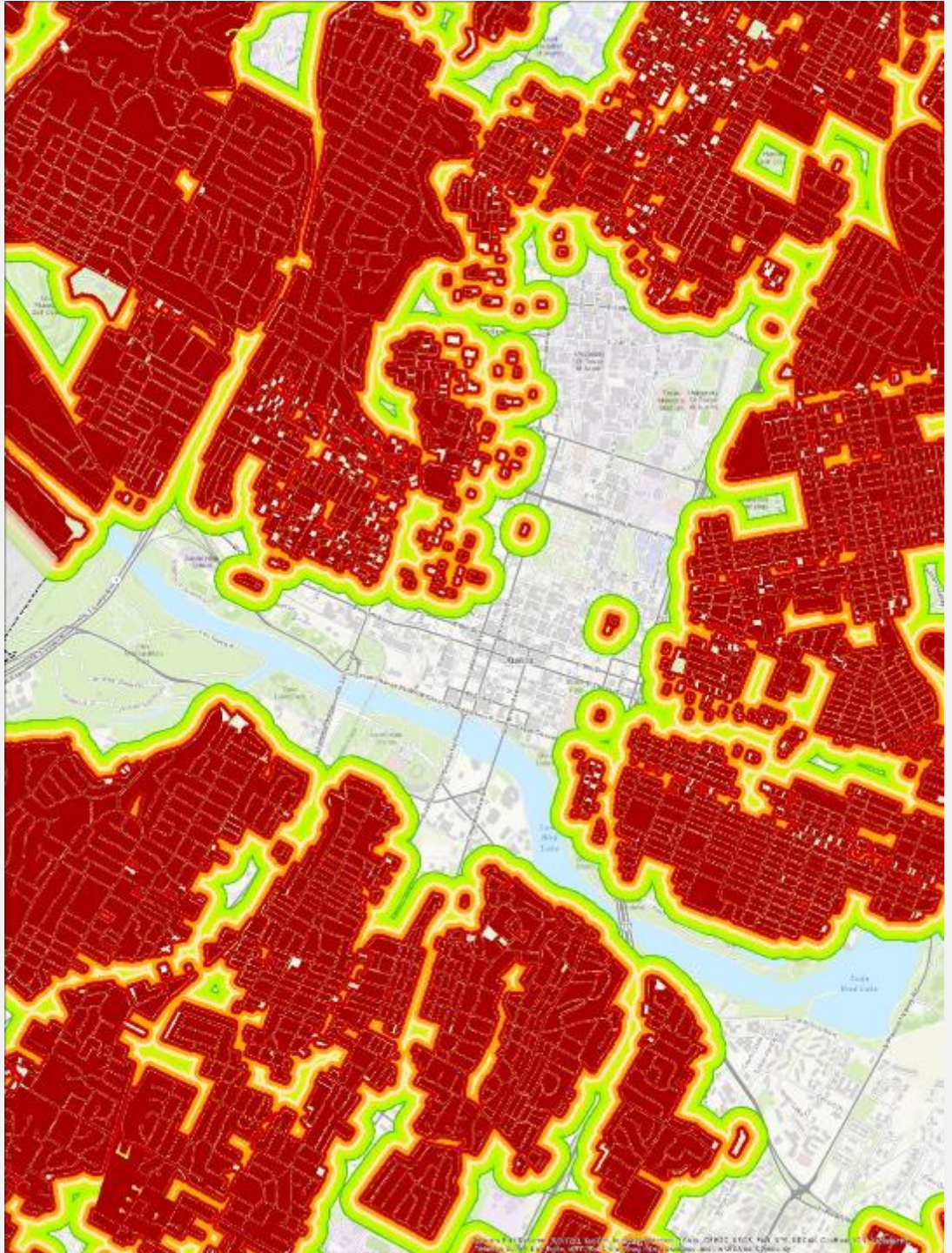
- Discrete geographic area
- Replaces CURE, but some parcels have grandfathered CURE zoning
- Increased density allowances over base zones if affordability targets are achieved
- Impact is uncertain since base zones in downtown already allow 5-8 FAR already…
- ***Modeling: impact above base zoning limited, use base zone***



Downtown Districts Map

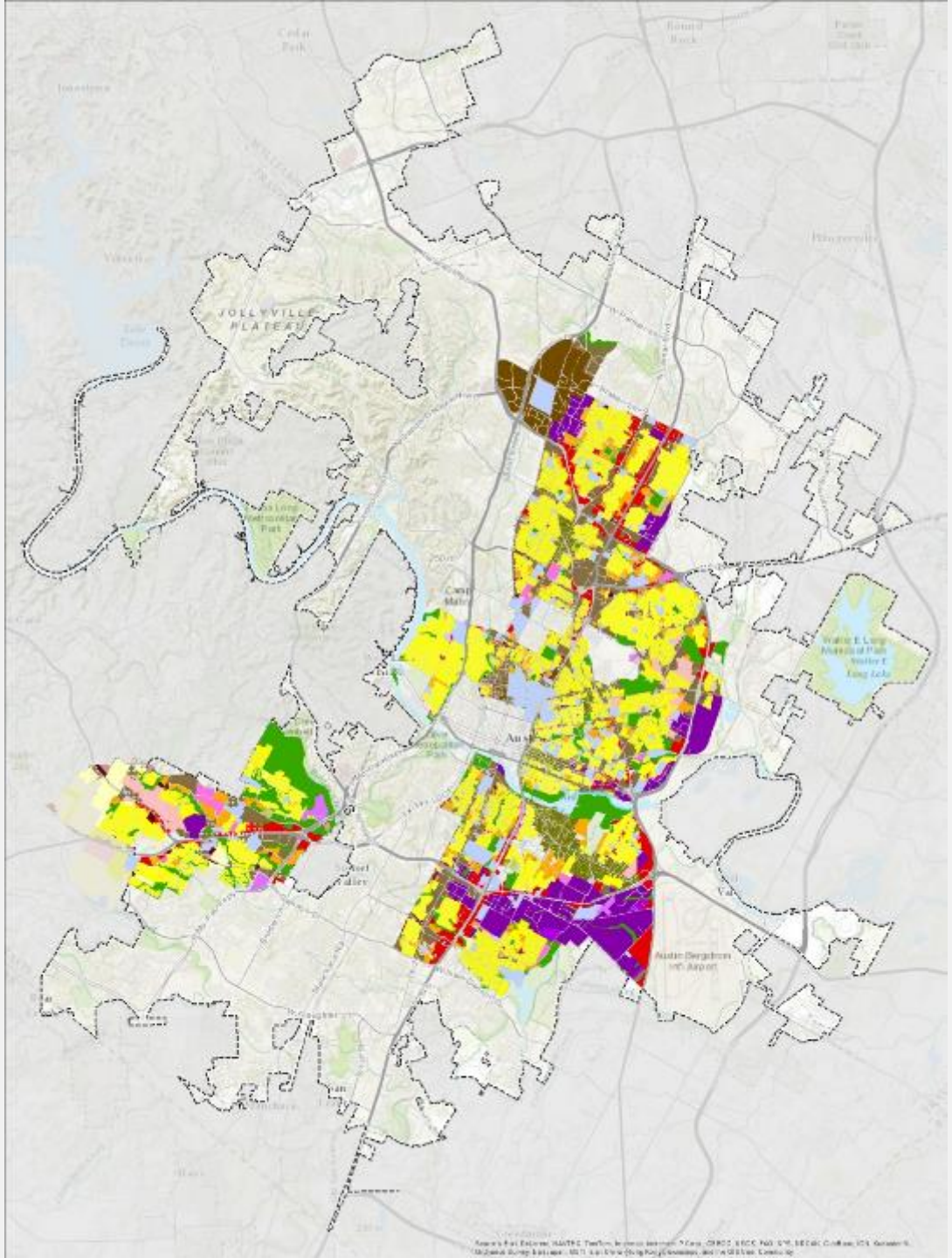
SINGLE FAMILY COMPATIBILITY

- Not a discrete geographic area, but broad policy
- Possible to identify potentially impacted parcels
- ***Modeling: GIS post process to reduce development using concentric rings of height restriction***



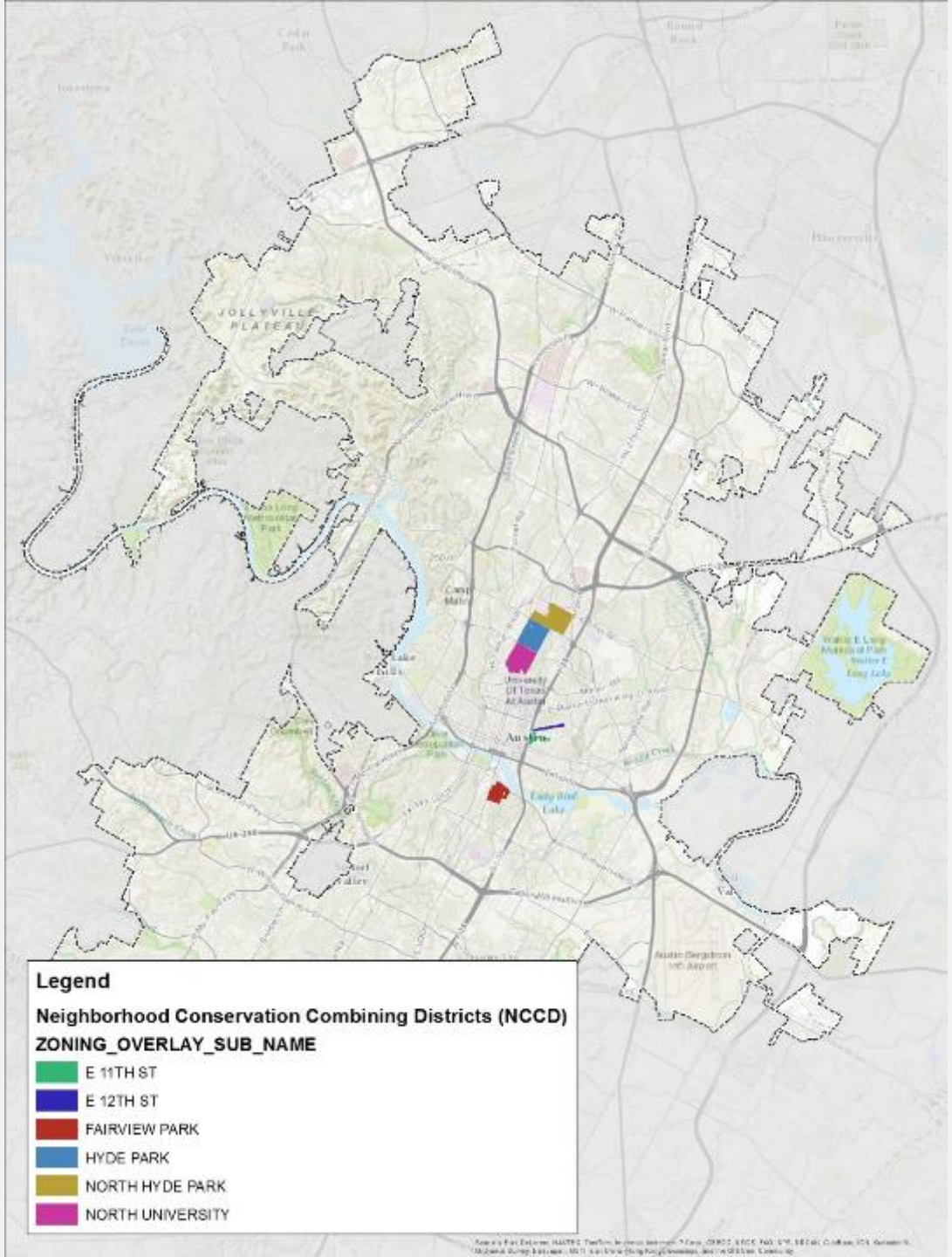
NEIGHBORHOOD PLAN FUTURE LAND USE MAPS (FLUM)

- Discrete geographic areas
- Base zones consistent with FLUM
- ***Modeling: use effective zone***



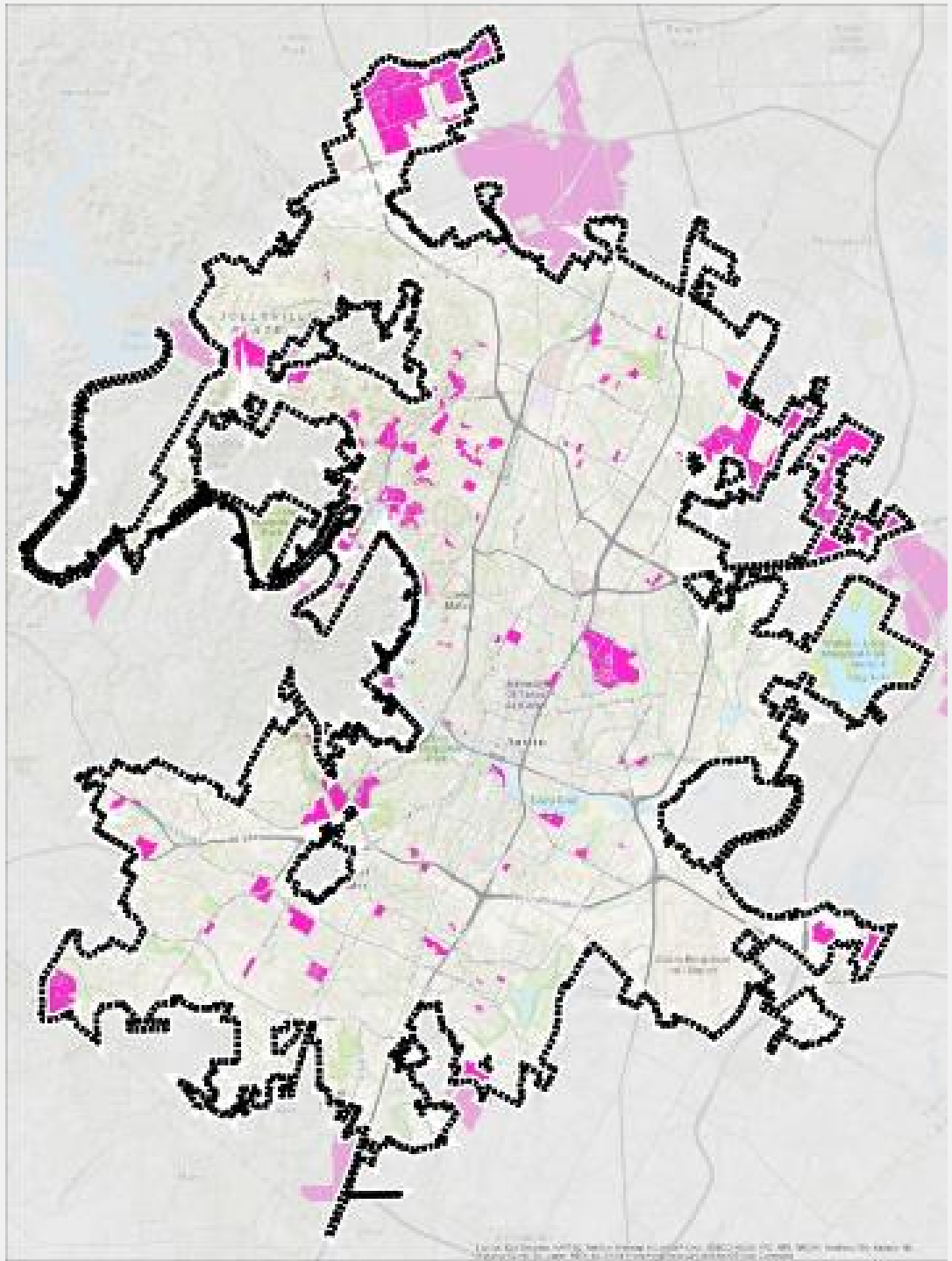
NEIGHBORHOOD CONSERVATION COMBINING DISTRICTS (NCCD)

- Discrete geographic areas
- Highly detailed plans with parcel-specific use restrictions
- Area of impact is fairly small
- ***Modeling: use effective zone***



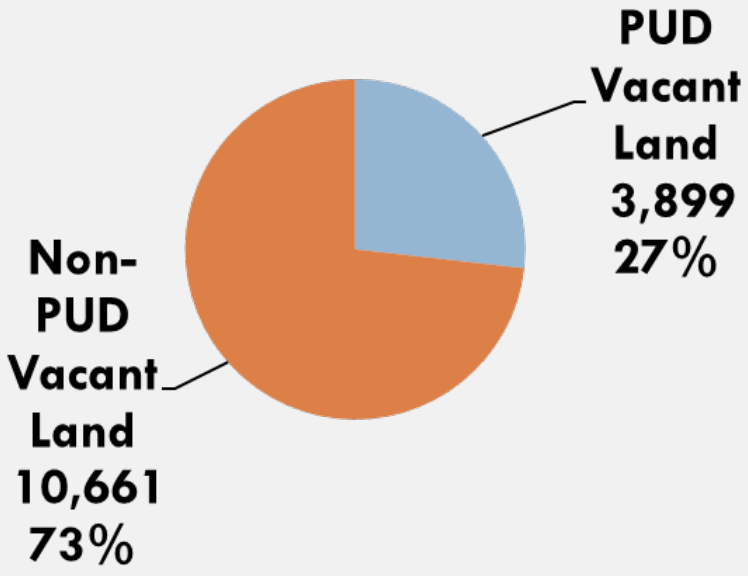
PLANNED UNIT DEVELOPMENTS (PUDS)

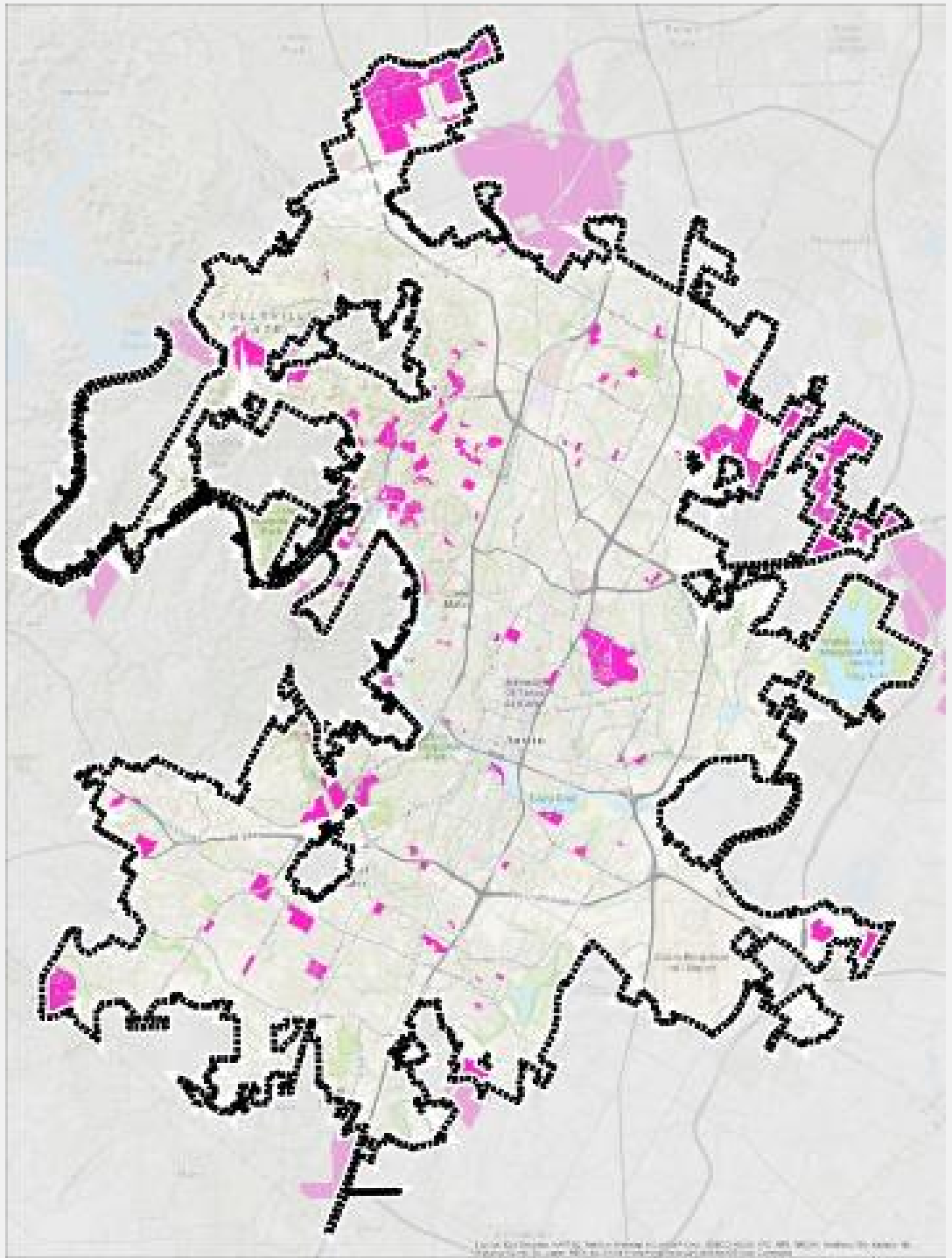
- Discrete geographic areas
- Not a unique place type
- ***Modeling: two strategies:***
- Effective Zoning
  - Staff examined plans with undeveloped parcels, and assigned a new "effective zone" category reflecting the allowed uses and intensities.
- Hard Code Development Program
  - A few do not have "effective zone" so development programs are hard-coded into ET scenario layer based on submitted plans



PUD STATS

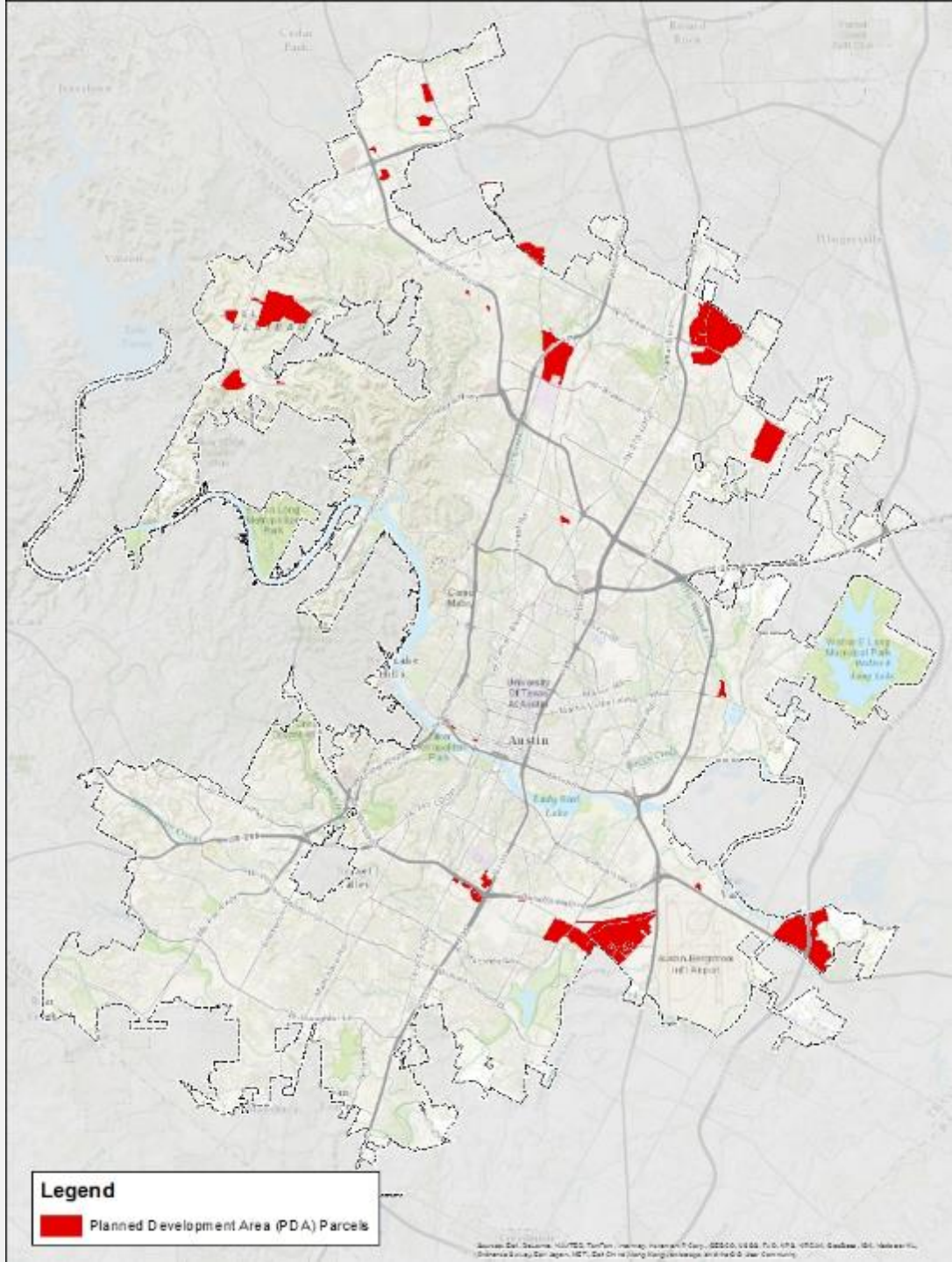
- 1/3rd of all vacant land is in PUDs
- 60% of vacant land in large parcels (>50 acres) are in PUDs





PLANNED DEVELOPMENT AREAS (PDAS)

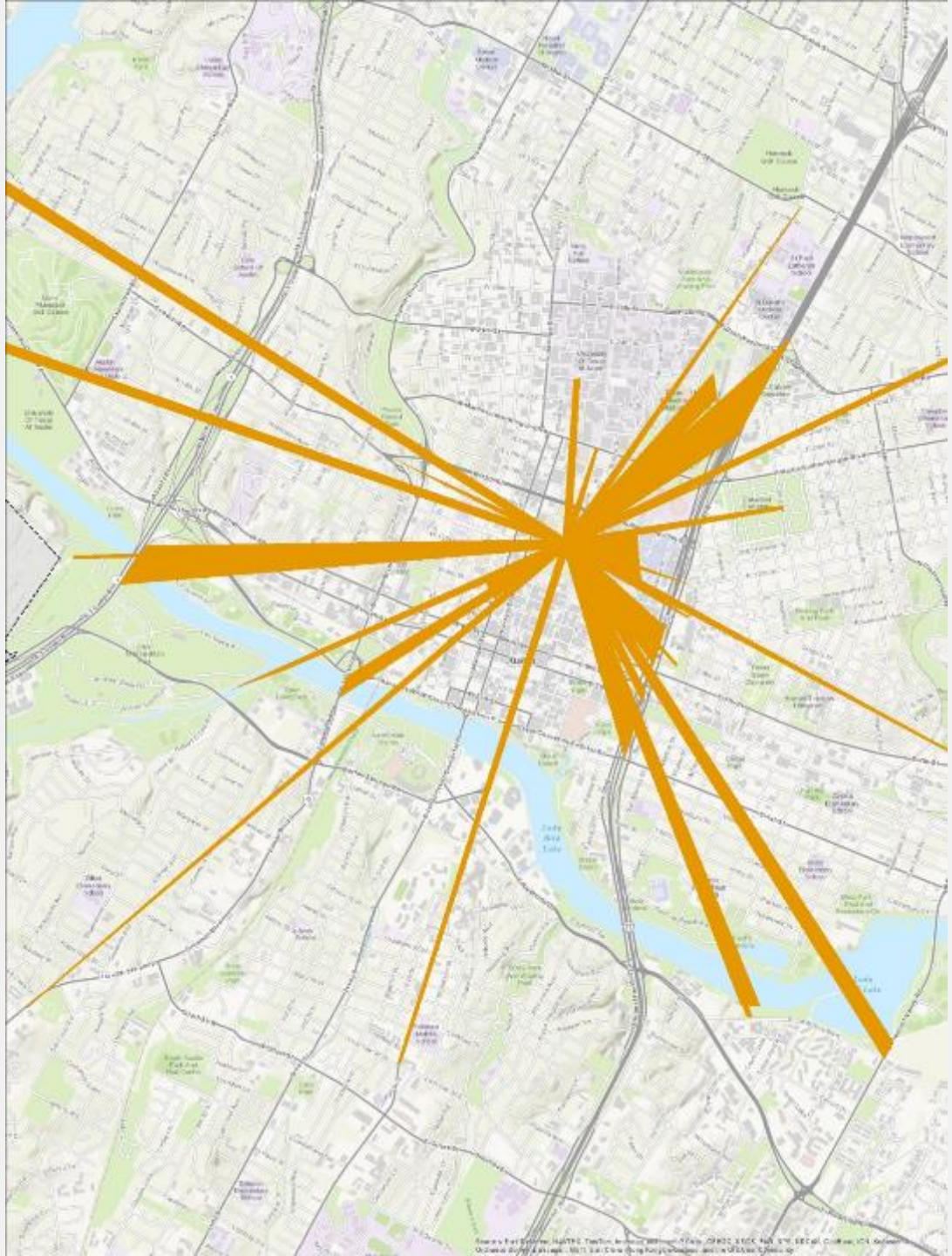
- Discrete geographic areas
- Generally in industrial base zoned areas
  - Some allow residential uses
- Staff examined plans with undeveloped parcels, assigned a new "effective zone" category reflecting the allowed uses and intensities
- ***Modeling: parcels coded with "effective zoning"***



CAPITAL VIEW CORRIDORS

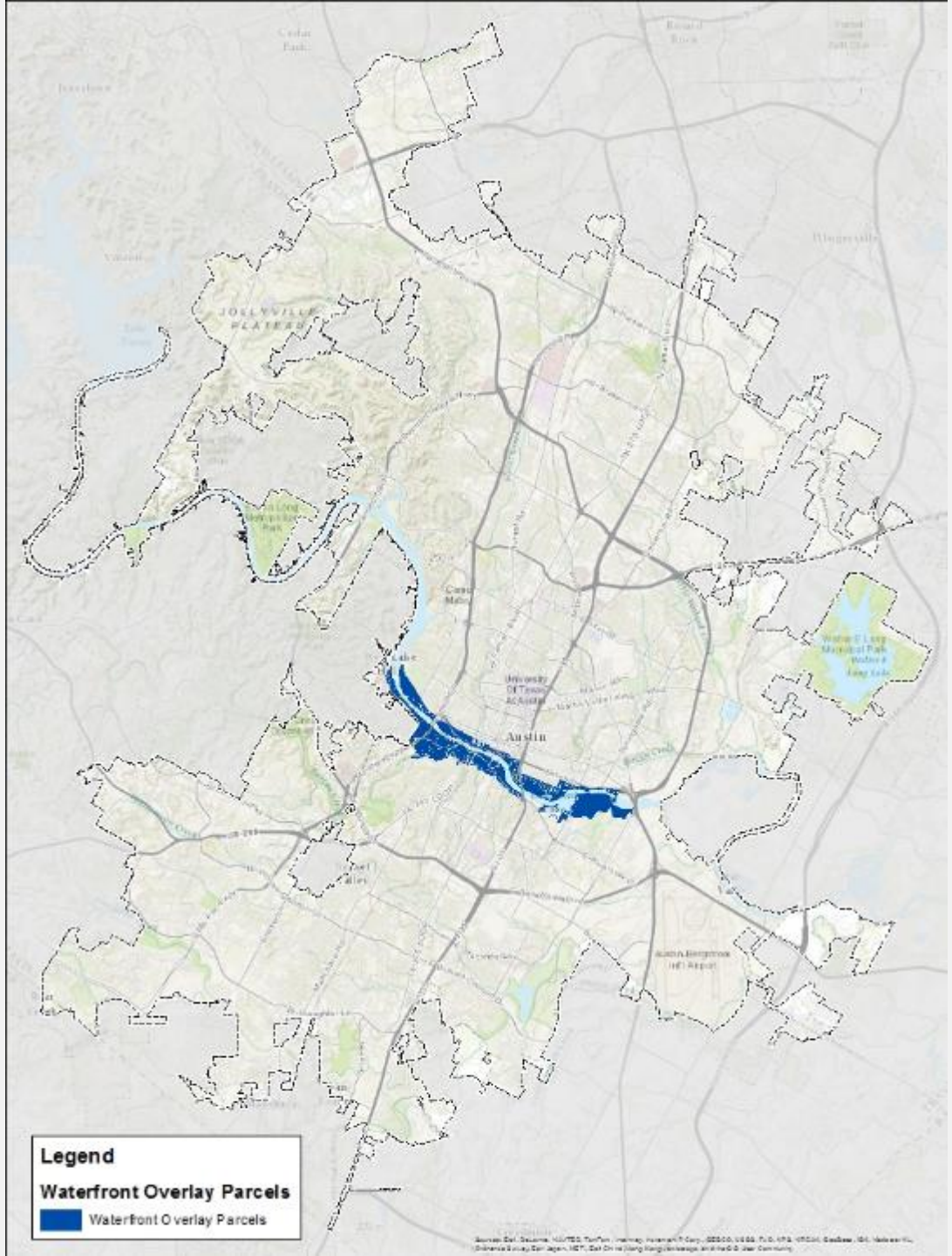
- Limits building height and regulates setbacks along key streets and view corridors

- ***Modeling: GIS post process to reduce development intensity of impacted parcels***



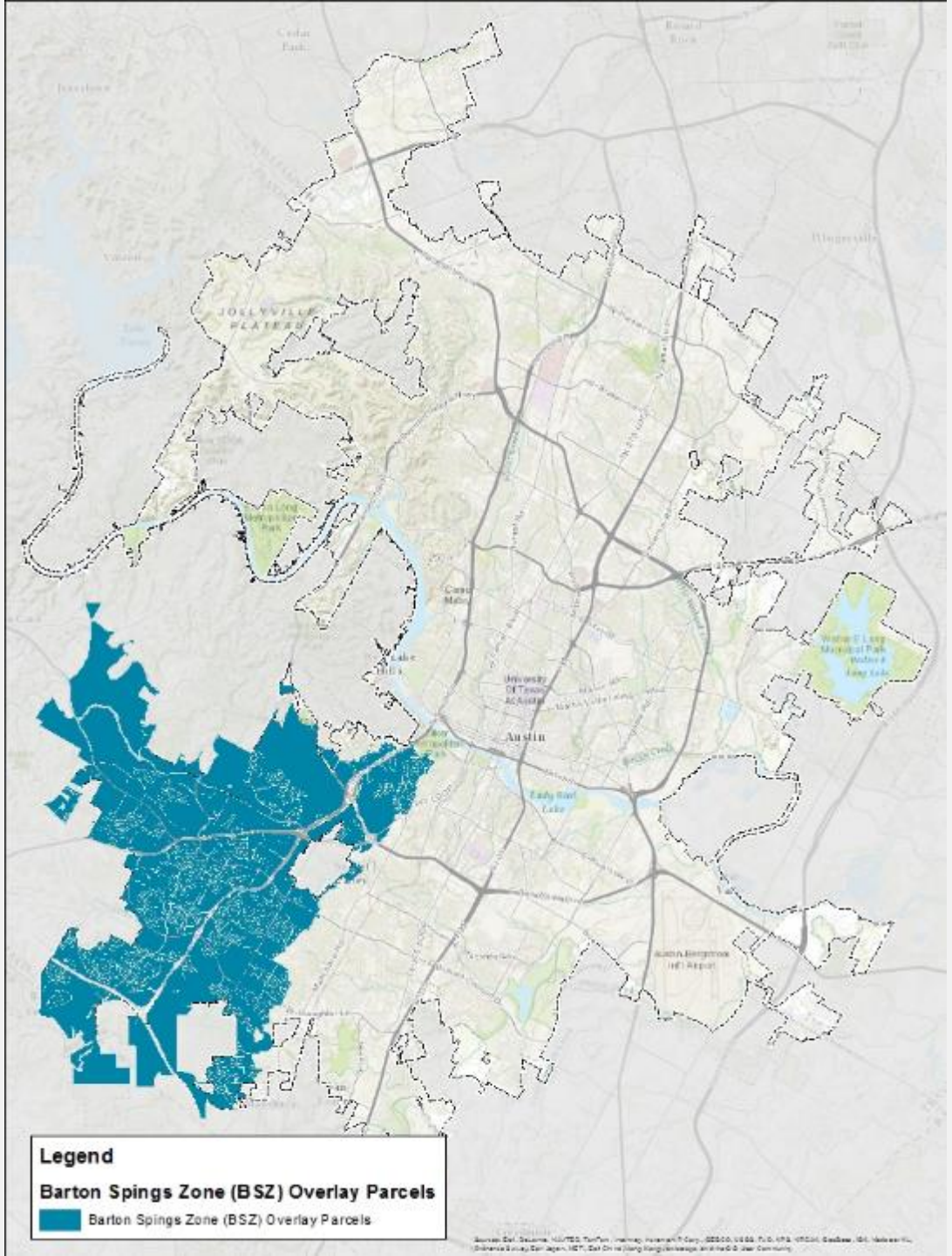
WATERFRONT OVERLAY

- Discrete geographic area
- Restrictions on impervious cover, set backs, height and other elements
- Additional residential allowances
- ***Modeling: restrict development in setbacks, treat as VMU development type if base zone is commercial, otherwise go with base zone***



BARTON SPRINGS ZONE OVERLAY (BSZ)

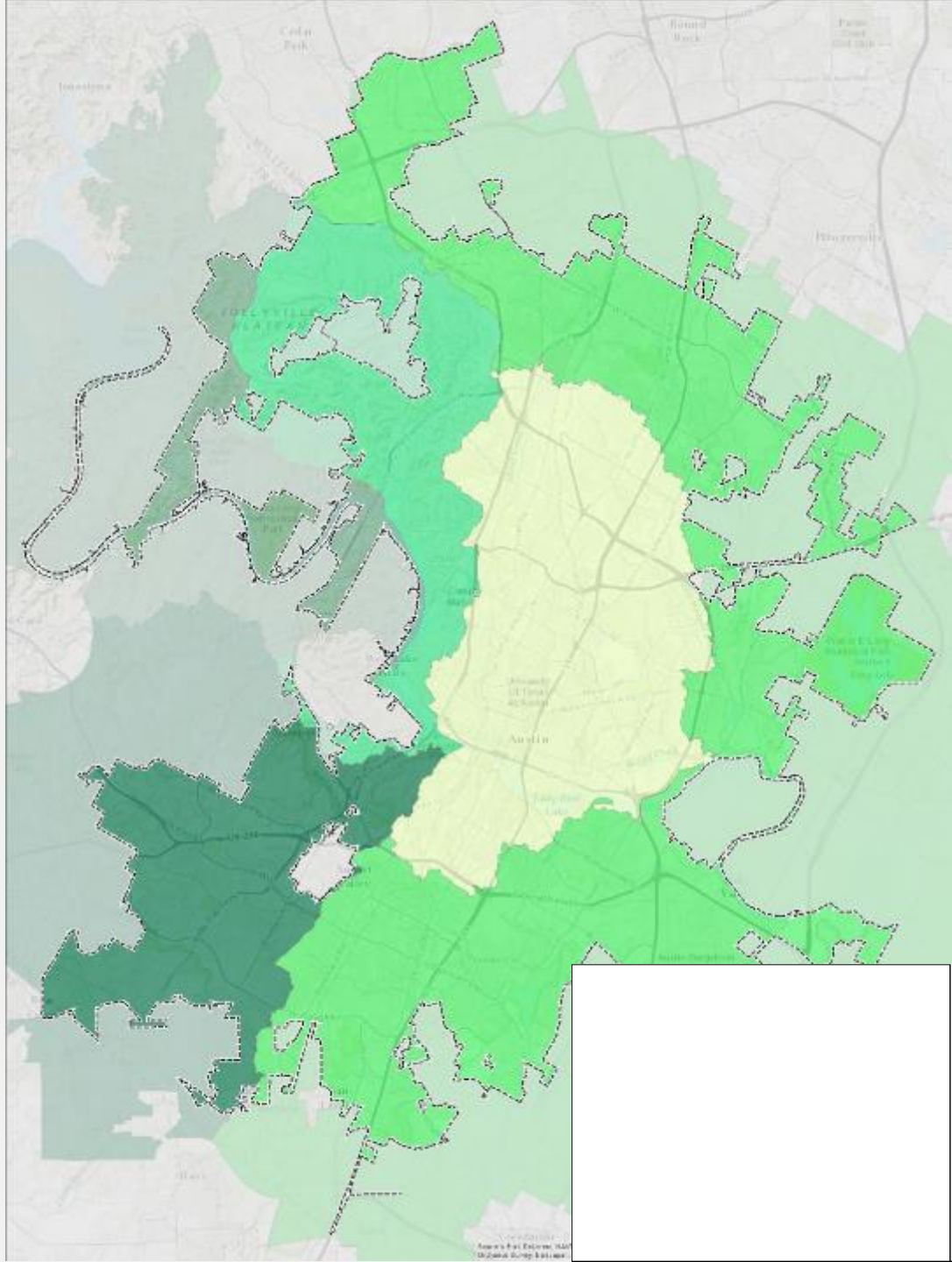
- Discrete geographic area, significant portion of southwest
- Effectively prohibits big box retail
- ***Modeling: prohibit big box retail.***



WATERSHED PROTECTION ORDINANCE REGULATIONS

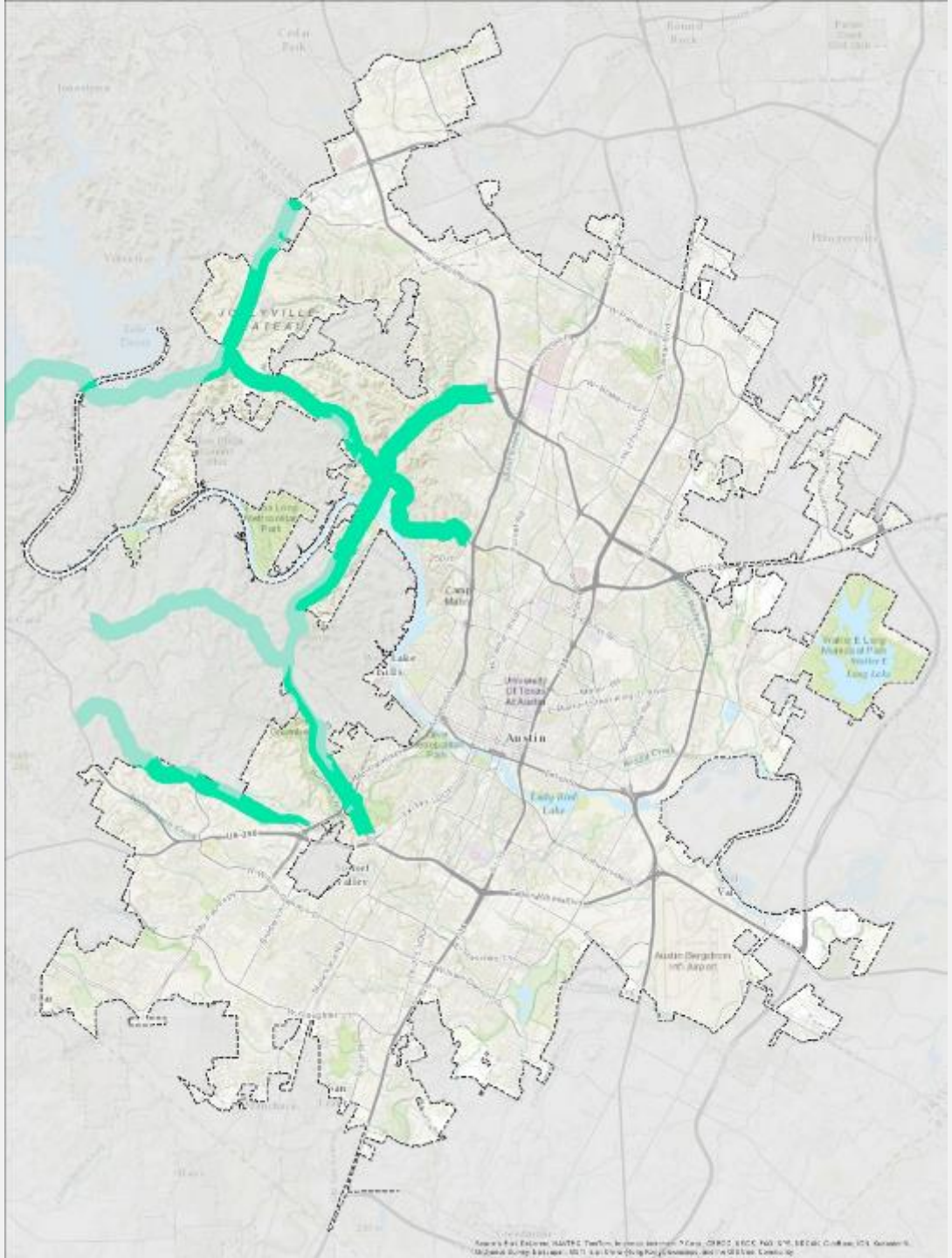
- Restrictions on impervious cover below base zones (except in urban watershed)

- ***Modeling: GIS post process to reduce development based on impervious cover limits for commercial, multifamily***



HILL COUNTRY ROADWAY ORDINANCE

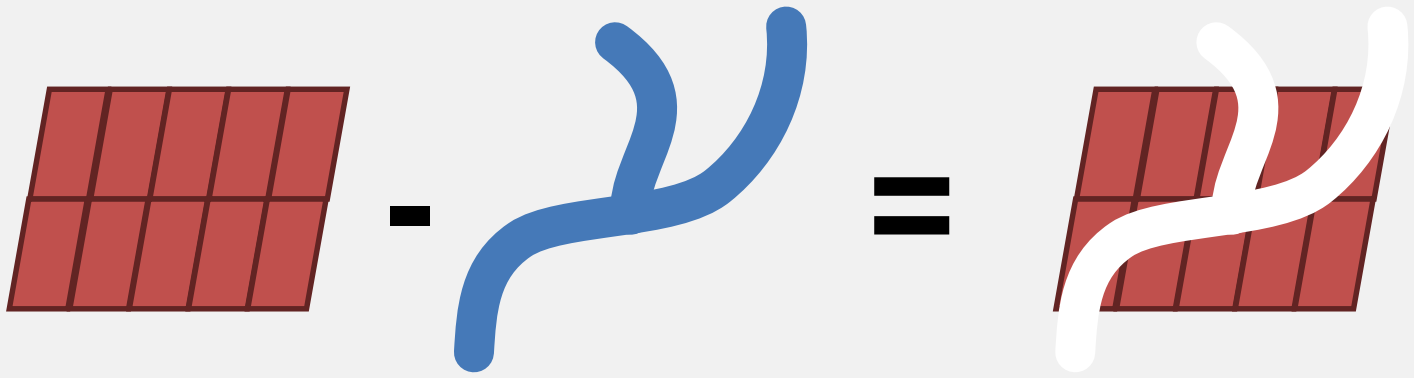
- Discrete geographic area
- Intensity Zones limit FAR
- ***Modeling: GIS post process to cap FAR within Intensity Zones***



CONSTRUCT BUILDABLE LANDS LAYER

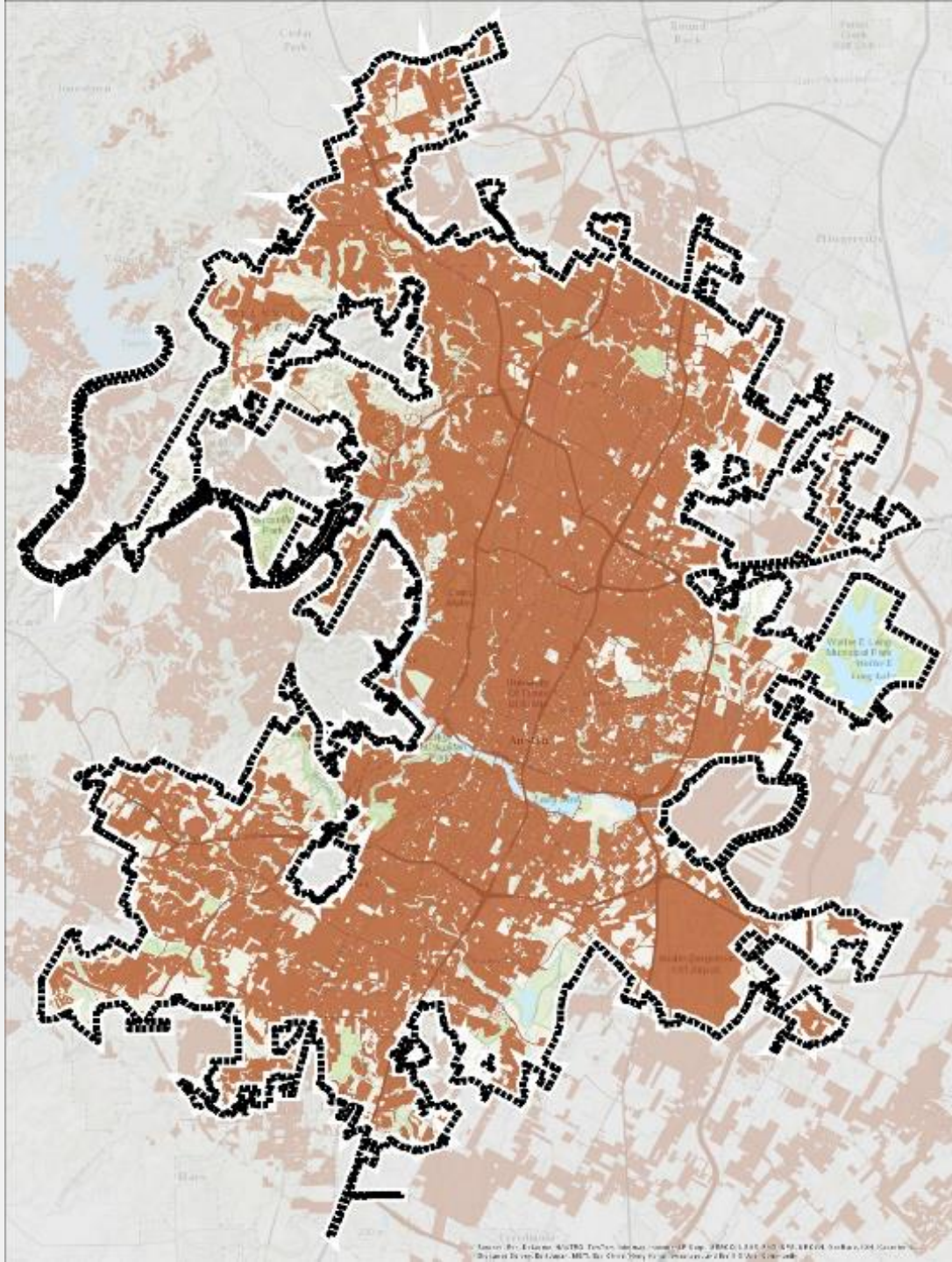
- Buildable Lands =
- Land Supply – Constraints (Environmental & Policy)

Land Supply **Constraints** **Buildable Land**



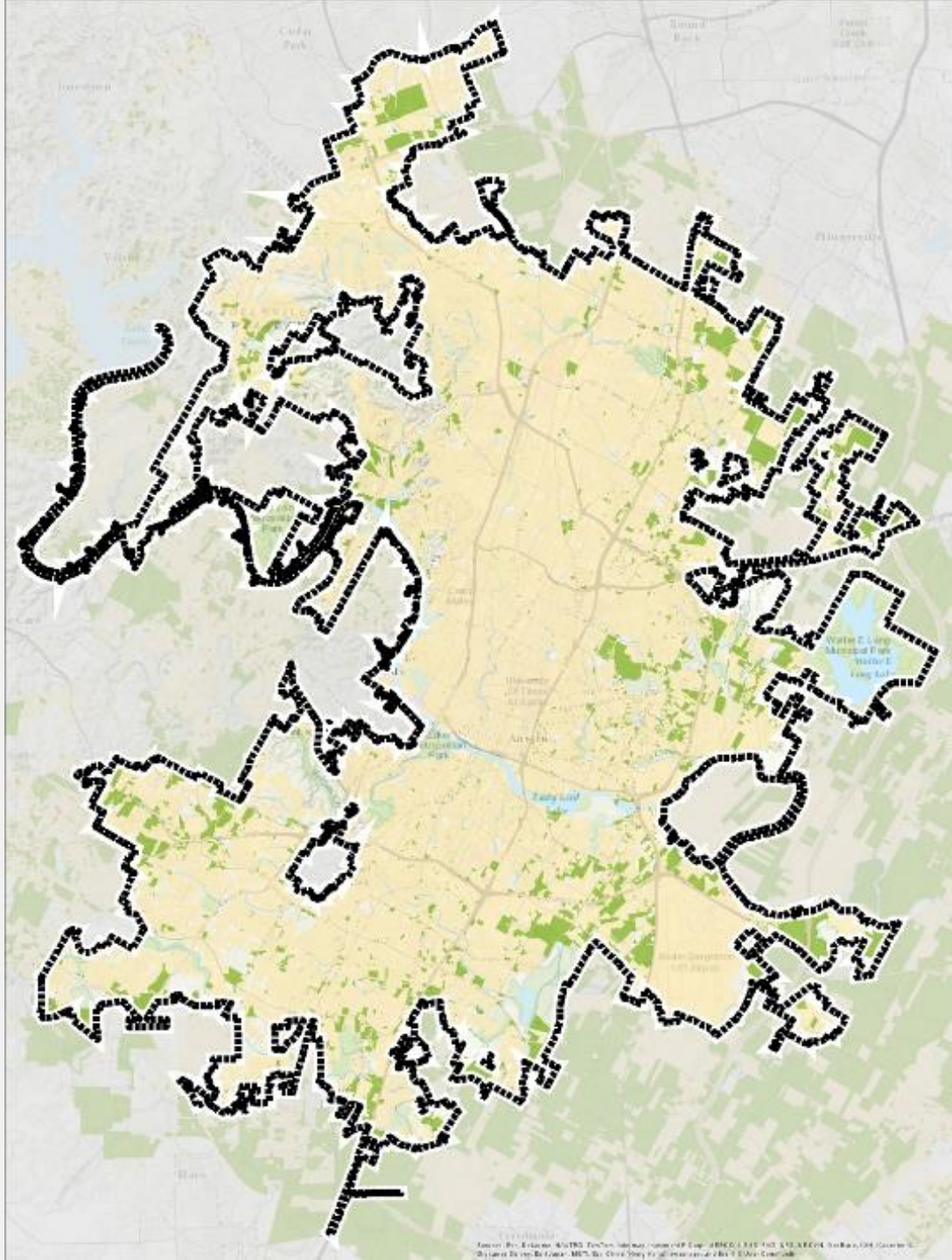
BUILT PARCELS

- 114,063 developed acres
- 178 square miles



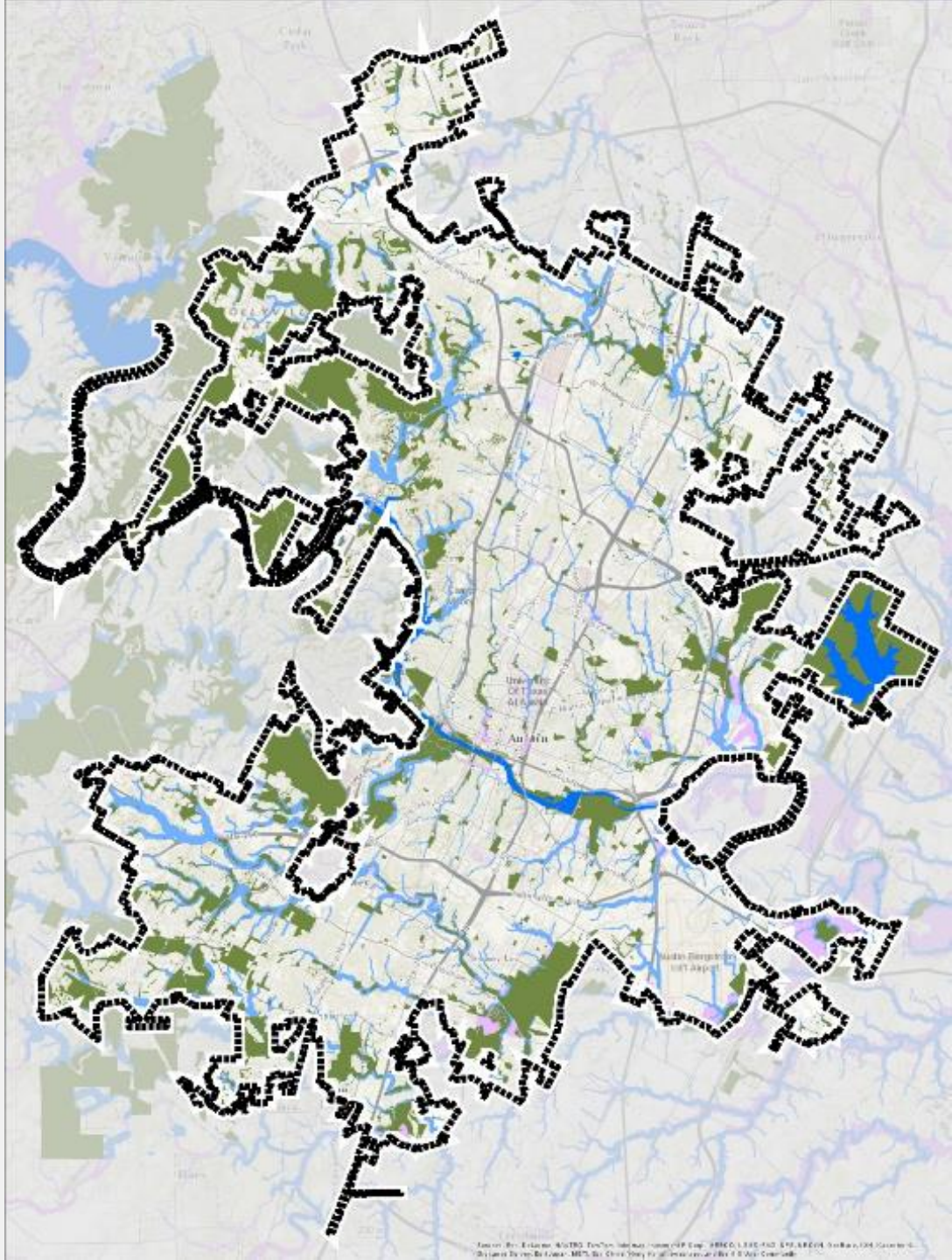
VACANT PARCELS

- 14,560 remaining vacant acres
  - 23 square miles
- 13% of the current developed area

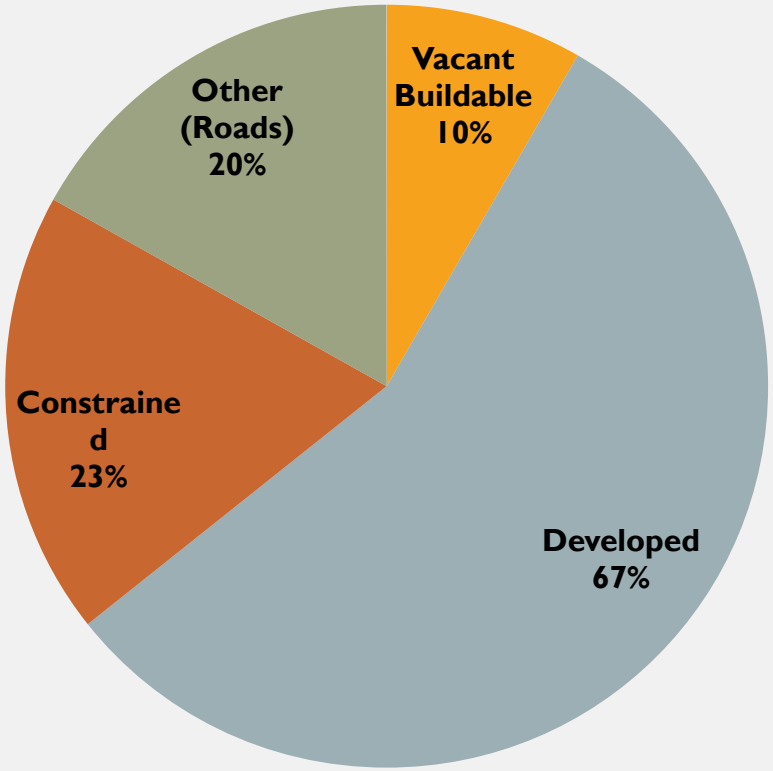


ENVIRONMENTAL CONSTRAINTS

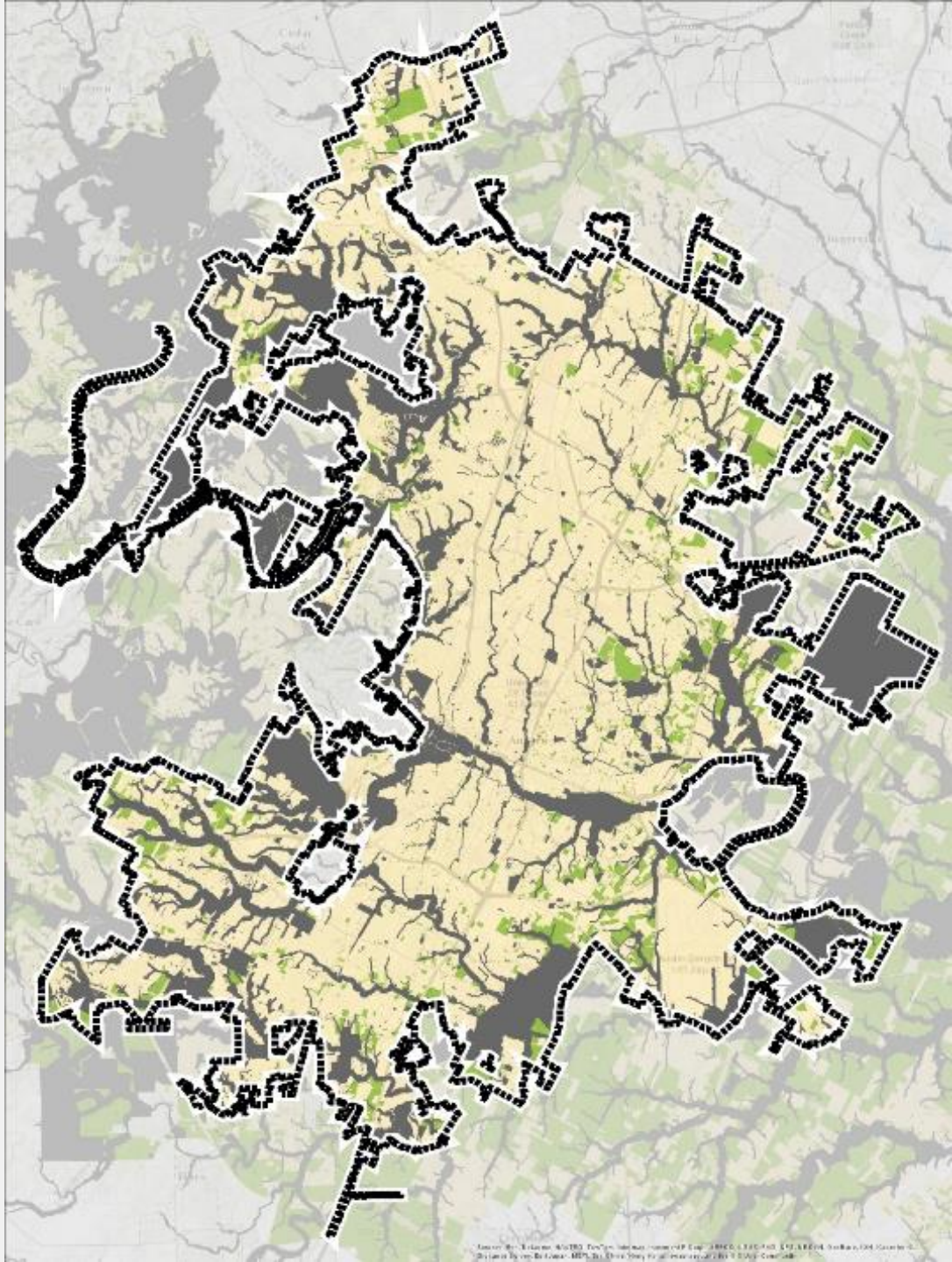
- **Open Space and Parks**
- **Open Water**
- **Critical Water Quality Zones**
- **Flood Zones**
- **Steep Slopes**



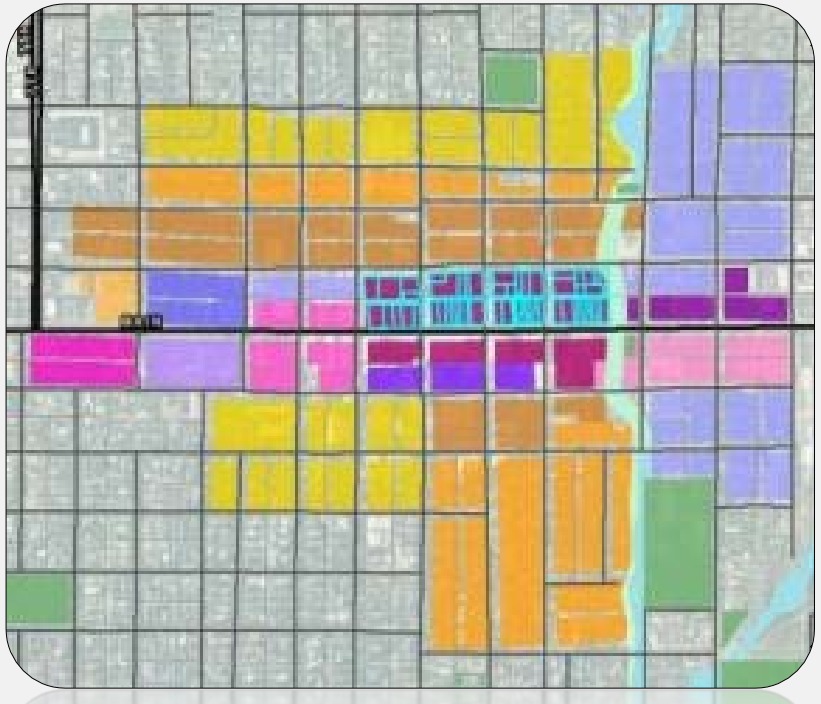
VACANT & UNCONSTRAINED



- 14,560 acres of vacant, buildable land in city boundary
- ~3,500 of the vacant acres are constrained
  - 19% of vacant & ag land



WHAT'S DIFFERENT?



Scenario Development

Where is growth expected to occur? Which parcels?

WHAT'S DIFFERENT?

2015 – Existing Zoning Model

- 11,500 parcels analyzed

➢ **Major Driver:** "Attractiveness" Index

May 2017 – Draft 1 Model

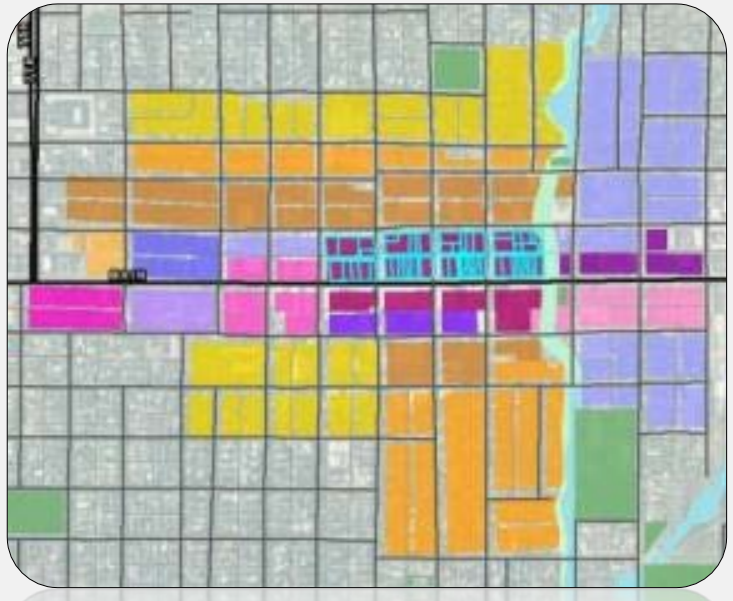
- Not parcel specific

➢ **Major Driver:** Redevelopment rates

August 2017 Updated Model

- 5,710 parcels analyzed

➢ **Major Driver:** "Tipping point" analysis



Scenario Development

Where is growth expected to occur? Which parcels?

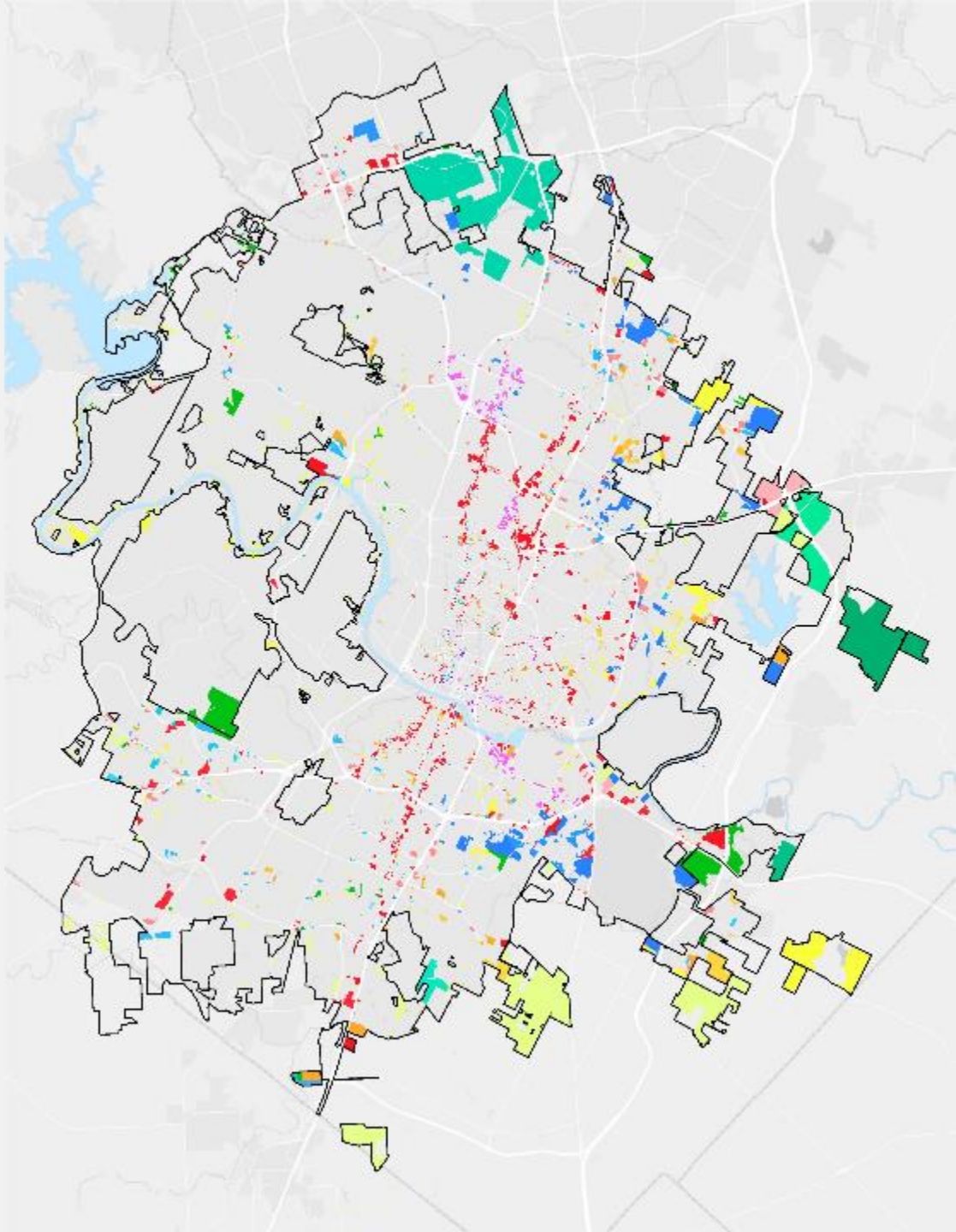
2015 – EXISTING ZONING MODEL

2015 – EXISTING ZONING MODEL

11,500 parcels analyzed

- **Major Driver:** "Attractiveness" Index
  - 25% of city limits land *considered* in model
  - ~4,200 acres *considered* for redevelopment
    - Only ~1,900 acres "redeveloped" due to redev rates
    - Primarily used in house

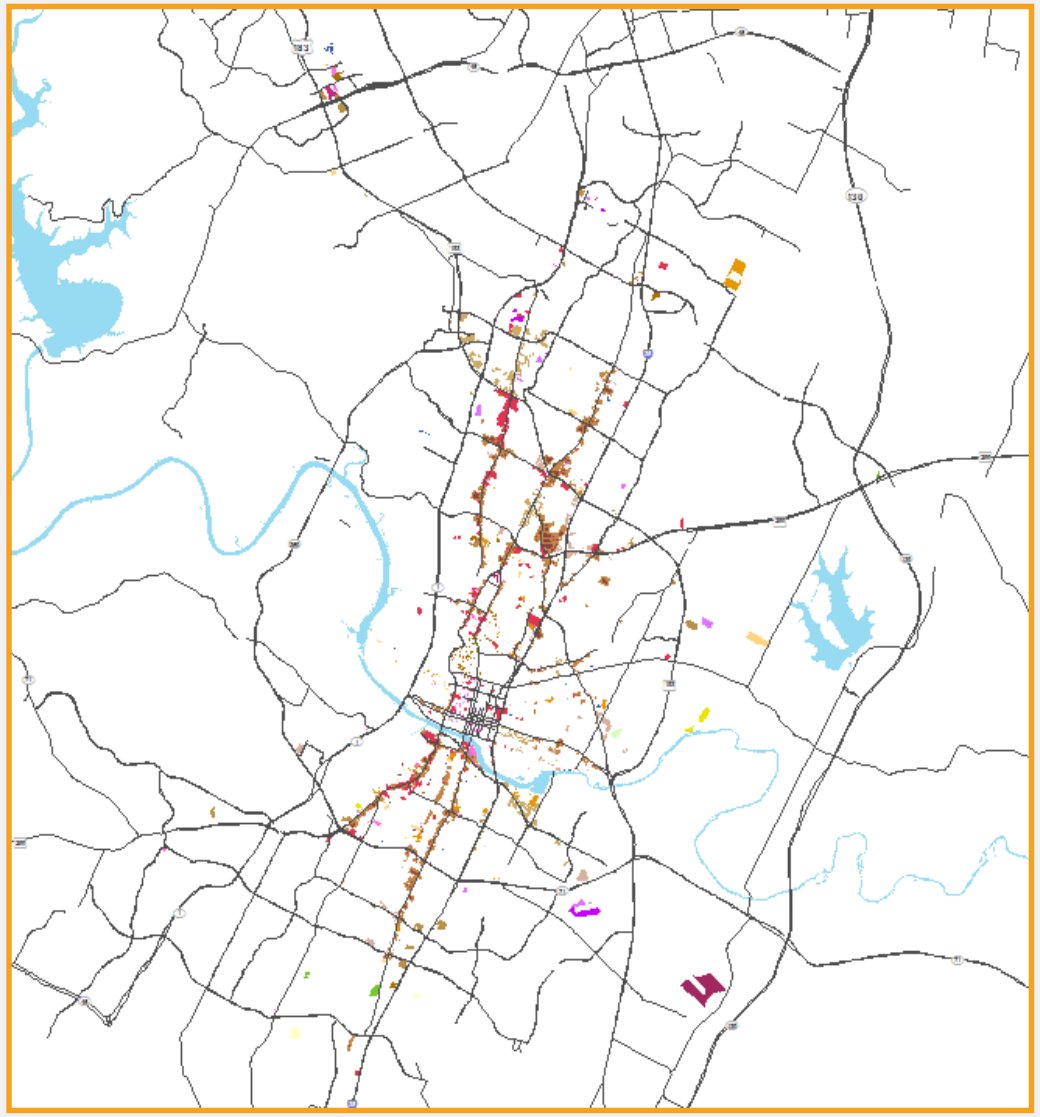
- Does not address market differences from one part of the City to the other
- Does not assume a 10-year time horizon



2015 – EXISTING ZONING MODEL

Step 1: Create "Attractiveness Index" that determines development attractiveness of undeveloped & developed parcels

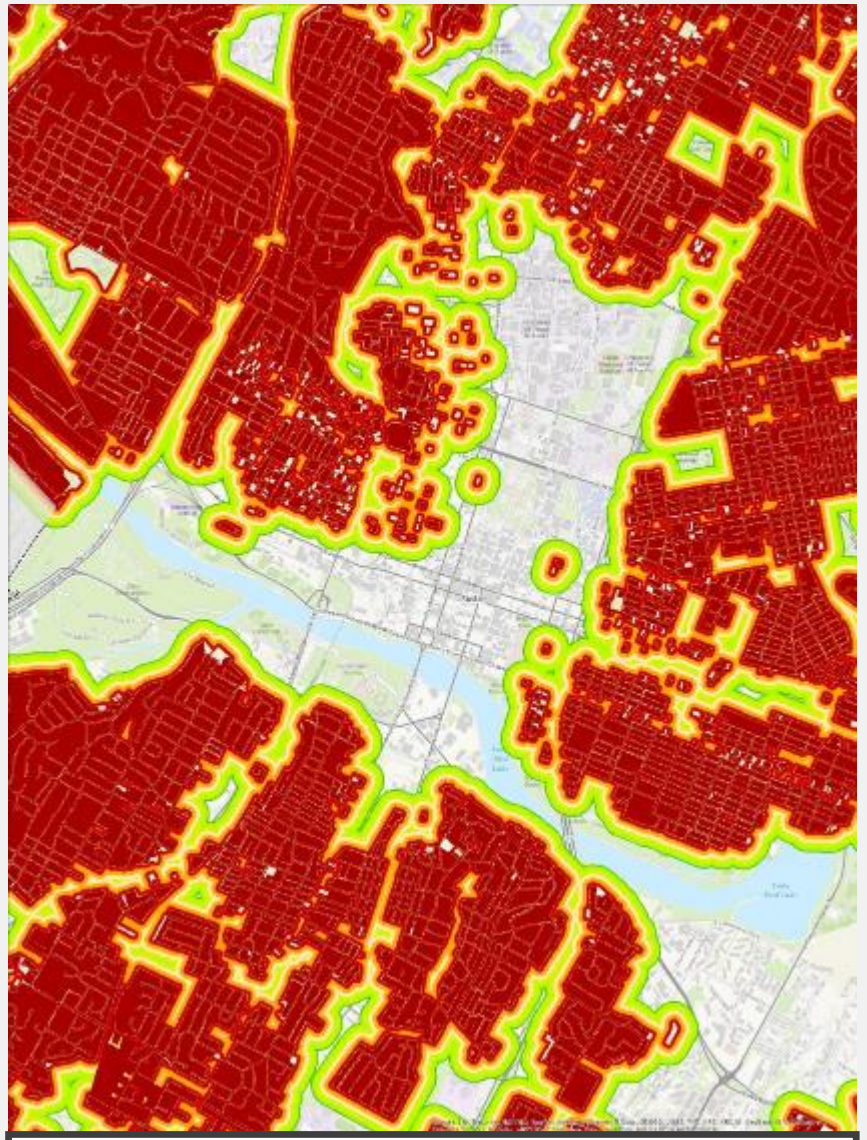
- "Attractiveness Analysis" based on:
  - Site plan status
  - Building permit status
  - Auto and transit accessibility
  - Parcel size
  - Improvement to land value ratio
  - Year built



2015 – EXISTING ZONING MODEL

Step 2: Remove "unattractive" parcels

- Single-family or commercial that would not add net units or commercial space to Austin
- Public lands, open space, educational, roads/utilities, environmentally constrained land
- Historic districts



SINGLE FAMILY COMPATIBILITY MAP

2015 – EXISTING ZONING MODEL

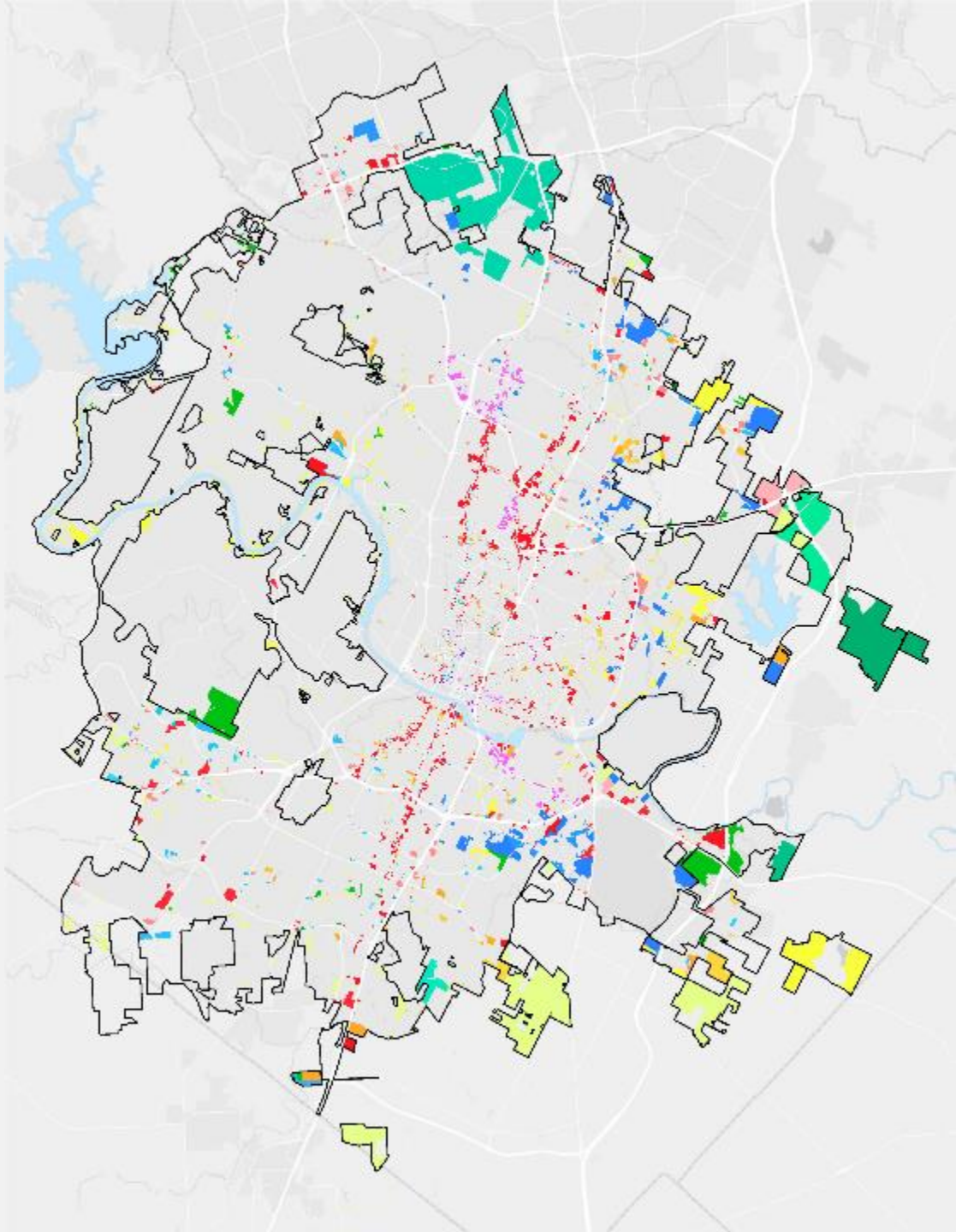
Step 3: Assign redevelopment rates to ET Development (zone) types

- Staff researched development that had occurred over the past several years and determined what percentage of it was redevelopment versus new "greenfield" development.
- Percentages assigned to developments based on trend data

Development Type Name	FAR	Net UPA	Housing Units / Gross Acre	Jobs / Gross Acre	Mixed Use Score (Entropy)	Building Cheo	Population Factor	Redevelopment Rate
Central Business District	8.3	157.7	109.8	149.8	62%	100%		90%
Commercial Highway	0.7	-	5.5	39.3	0%	100%		5%
Commercial Highway with VMU	1.5	42.3	35.2	10.8	45%	100%		90%
Commercial Recreation	0.3	-	-	10.6	0%	100%		2%
Commercial Services	0.3	-	-	8.1	0%	100%		2%
Commercial, Office Vertical Mixed Use	1.5	28.5	18.6	47.1	49%	100%		90%
Commercial, Office with Mixed Use	1.0	26.9	17.6	20.8	63%	100%		65%
Development Reserve	0.0	0.1	0.1	0.7	2%	100%		0%
Downtown Mixed Use	6.0	158.6	88.5	120.8	43%	100%		90%
Family Residence	0.3	6.8	4.4	-	0%	100%		2%
General Office	1.0	-	-	87.5	0%	100%		7%
Industrial Park, Research and Developme	0.4	-	-	25.9	0%	100%		3%
Lake Austin Residence District	0.1	1.6	1.2	-	0%	100.0%		1%
Lake Commercial	0.3	-	-	9.5	0%	100%		2%
Lake Commercial with VMU	1.7	43.1	28.2	1.2	16%	100%		80%
Limited Industrial Services	0.4	-	-	22.0	0%	100%		3%
Limited Office	0.4	-	-	52.6	0%	100%		3%
Limited Office, Commercial with MU	0.5	9.1	6.1	9.2	38%	100%		65%
Limited Office, Commercial with VMU	0.7	19.0	12.6	10.1	45%	100%		90%
Mobile Home Residence	-	-	-	-	0%	0%		0%
Multi-Family - Highest Density	1.9	66.4	41.0	-	0%	100%		75%
Multi-Family - Low Density	0.6	16.3	11.6	-	0%	100%		55%
Multi-Family - Medium Density	0.8	24.5	19.0	-	0%	100%		6%
Multi-Family - Moderate Density	1.1	37.3	27.9	-	0%	100%		8%
Neighborhood and Community Commerc	0.3	-	-	11.3	0%	100%		2%
Neighborhood Office	0.2	-	-	21.2	0%	100%		1%
Neighborhood Office with MU	0.5	15.6	10.7	7.4	46%	100%		65%
Neighborhood Office with VMU	0.6	20.1	13.8	20.0	50%	100%		90%
North Burnet/Gateway District	1.8	50.9	37.4	36.8	44%	100%		90%

2015 – EXISTING ZONING MODEL

Step 4: Apply Envision Tomorrow development types (zones) to parcels



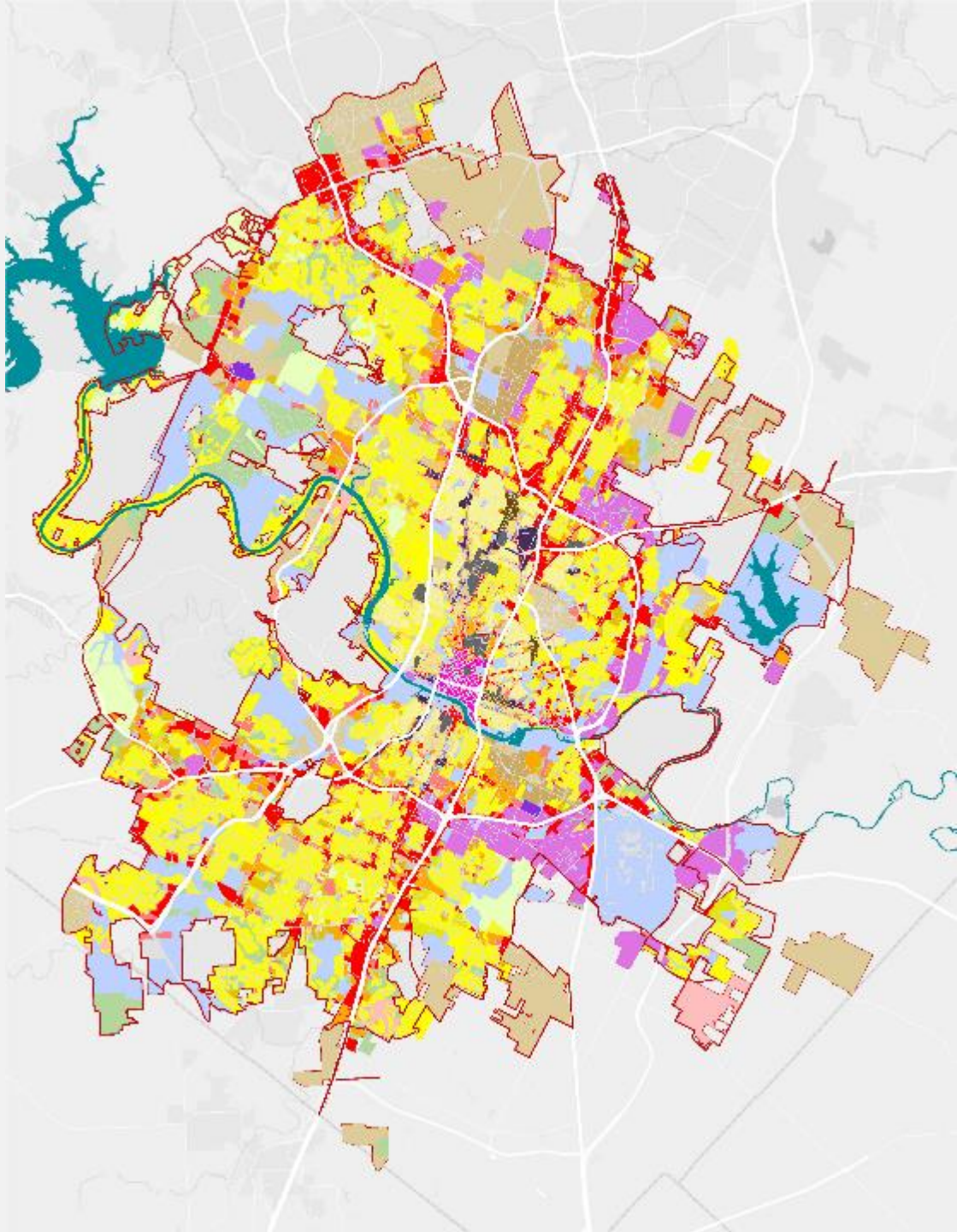
MAY 2017 - DRAFT 1 MODEL

MAY 2017 - DRAFT 1 MODEL

Not parcel specific – All parcels included in model

- **Major Driver:** Redevelopment rates
  - Answer the question: Is there enough capacity to reach the **Strategic Housing Blueprint ~135,000 new housing units** in 10 years
  - **Quick estimation:** Test and refine draft code in a short amount of time

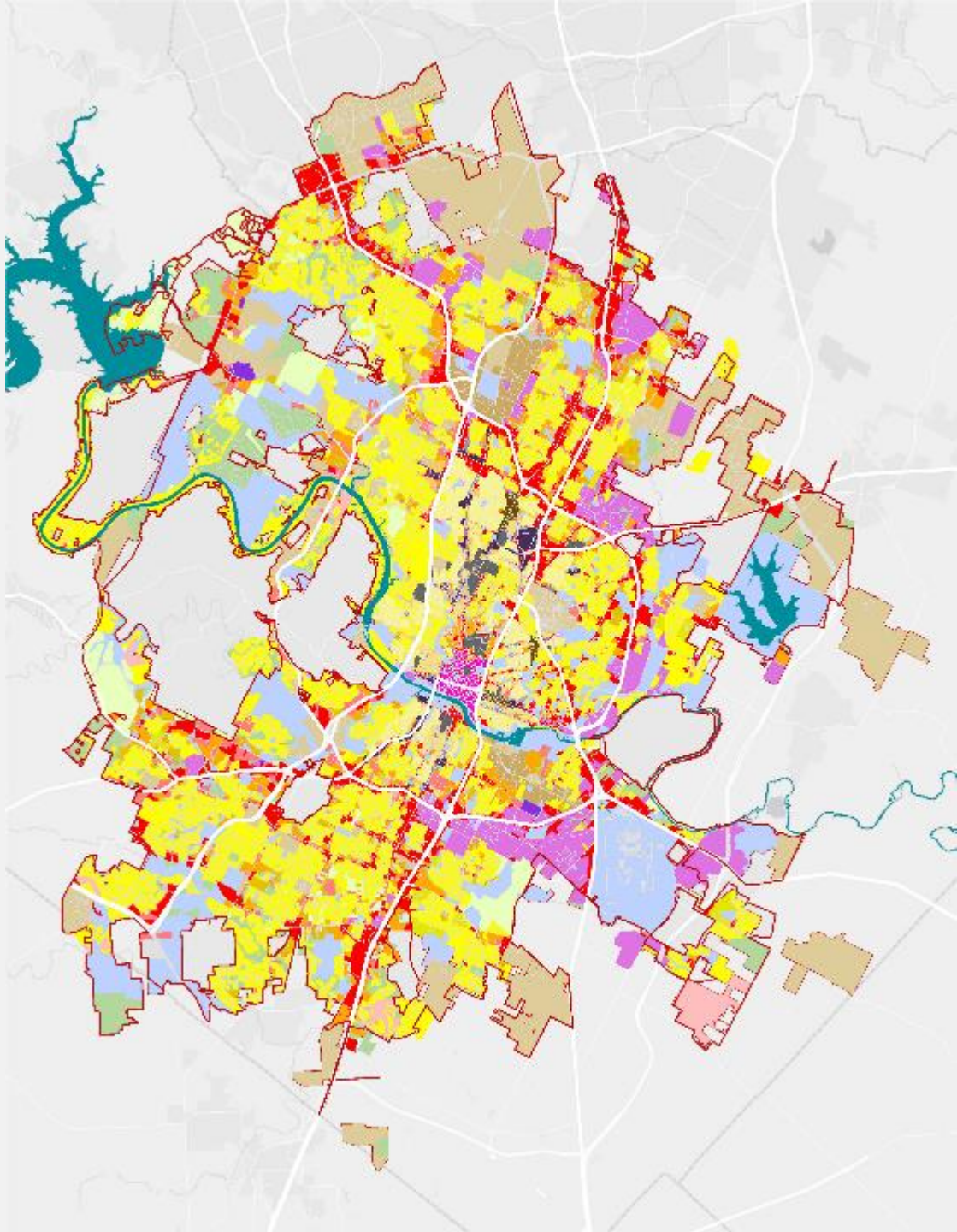
  - Too high-level to accurately model redevelopment
  - Does not address market differences from one part of the City to the other.



MAY 2017 - DRAFT 1 MODEL

Step 1: Determine land area to be modeled

- Development types with calibrated building types assigned to **every parcel in the city**
- **Removed:** Public lands, open space, educational, roads/utilities, environmentally constrained land, and historic districts from scenario layer



MAY 2017 - DRAFT 1 MODEL

Step 2: Assign redevelopment rates

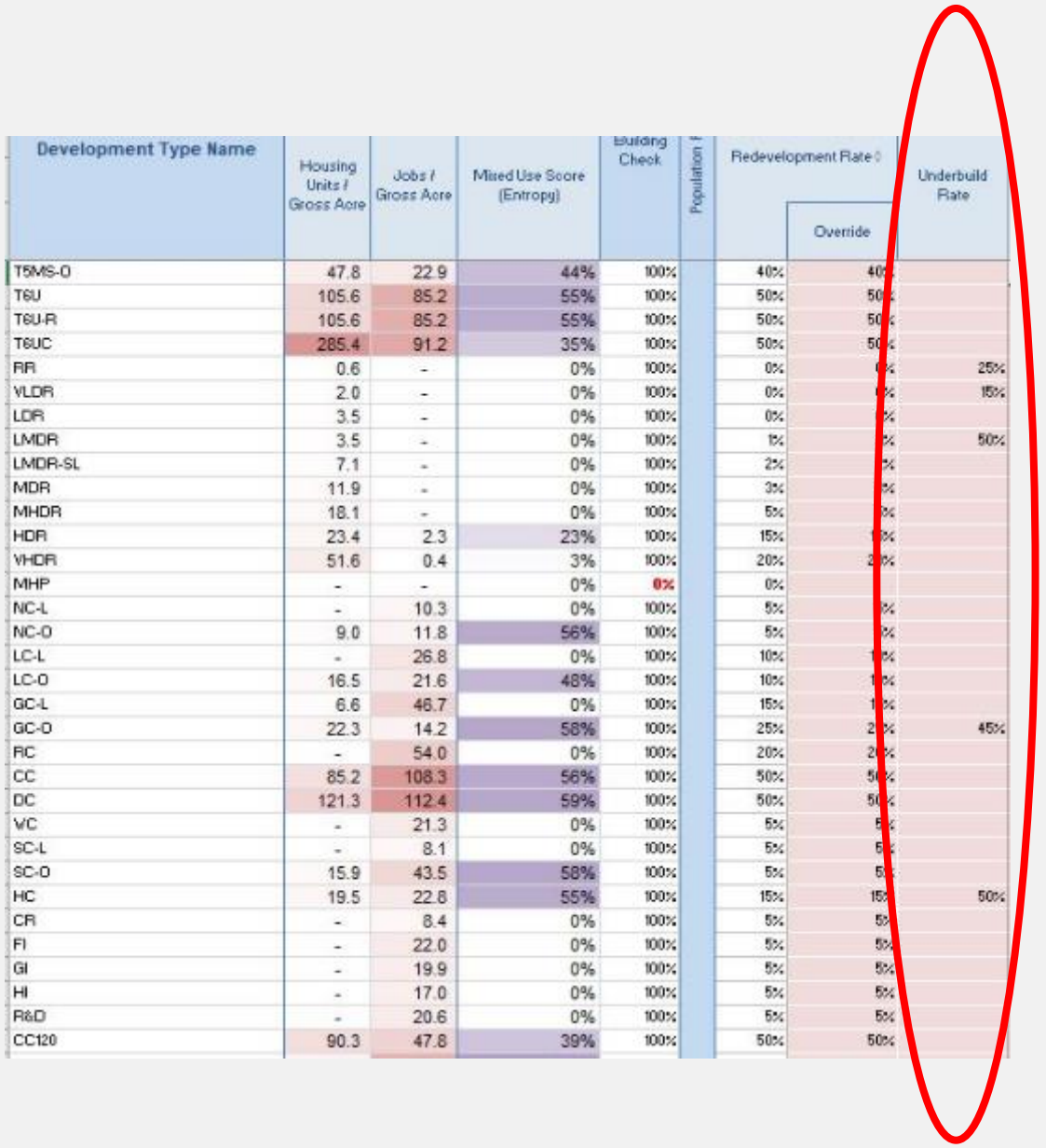
- Rates estimated by examining permit data for the last 6 years to determine where, and how intensive, new development has been over that time period.
- All parcels (except for RR, VLDR & LDR) received some degree of estimated redevelopment

Development Type Name	Housing Units / Gross Acre	Jobs / Gross Acre	Mixed Use Score (Entropy)	Building Check	Redevelopment Rate ◊	Override
T5N.SS-O	20.9	-	0%	100%	35%	35%
T5U.SS	54.9	-	0%	100%	35%	35%
T5U.SS-O	54.9	-	0%	100%	35%	35%
T5U	54.7	-	0%	100%	40%	40%
T5U-O	54.7	-	0%	100%	40%	40%
T5MS	45.8	25.6	49%	100%	40%	40%
T5MS-O	47.8	22.9	44%	100%	40%	40%
T6U	105.6	85.2	55%	100%	50%	50%
T6U-R	105.6	85.2	55%	100%	50%	50%
T6UC	285.4	91.2	35%	100%	50%	50%
RR	0.6	-	0%	100%	0%	0%
VLDR	2.0	-	0%	100%	0%	0%
LDR	3.5	-	0%	100%	0%	0%
LMDR	3.5	-	0%	100%	1%	1%
LMDR-SL	7.1	-	0%	100%	2%	2%
MDR	11.9	-	0%	100%	3%	3%
MHDR	18.1	-	0%	100%	5%	5%
HDR	23.4	2.3	23%	100%	15%	15%
VHDR	51.6	0.4	3%	100%	20%	20%
MHP	-	-	0%	0%	0%	
NC-L	-	10.3	0%	100%	5%	5%
NC-O	9.0	11.8	56%	100%	5%	5%
LC-L	-	26.8	0%	100%	10%	10%
LC-O	16.5	21.6	48%	100%	10%	10%
GC-L	6.6	46.7	0%	100%	15%	15%

MAY 2017 - DRAFT 1 MODEL

Step 3: Assign "underbuild" rates

- For zones that are applied in areas with significant acreage of vacant lands, assumptions were made about the quantity of land that could be developed within 10 years.
  - Only assigned to zones with significant vacant land
- The "underbuild" rate is the percentage of land not assumed to be developed within the 10 year period.



Development Type Name	Housing Units / Gross Acre	Jobs / Gross Acre	Mixed Use Score (Entropy)	Building Check	Population	Redevelopment Rate	Override	Underbuild Rate
T5MS-O	47.8	22.9	44%	100%		40%	40%	
T6U	105.6	85.2	55%	100%		50%	50%	
T6U-R	105.6	85.2	55%	100%		50%	50%	
T6UC	285.4	91.2	35%	100%		50%	50%	
RR	0.6	-	0%	100%		0%	0%	25%
VLDR	2.0	-	0%	100%		0%	0%	15%
LDR	3.5	-	0%	100%		0%	0%	
LMDR	3.5	-	0%	100%		1%	1%	50%
LMDR-SL	7.1	-	0%	100%		2%	2%	
MDR	11.9	-	0%	100%		3%	3%	
MHDR	18.1	-	0%	100%		5%	5%	
HDR	23.4	2.3	23%	100%		15%	15%	
VHDR	51.6	0.4	3%	100%		20%	20%	
MHP	-	-	0%	0%		0%		
NC-L	-	10.3	0%	100%		5%	5%	
NC-O	9.0	11.8	56%	100%		5%	5%	
LC-L	-	26.8	0%	100%		10%	10%	
LC-O	16.5	21.6	48%	100%		10%	10%	
GC-L	6.6	46.7	0%	100%		15%	15%	
GC-O	22.3	14.2	58%	100%		25%	25%	45%
RC	-	54.0	0%	100%		20%	20%	
CC	85.2	108.3	56%	100%		50%	50%	
DC	121.3	112.4	59%	100%		50%	50%	
VC	-	21.3	0%	100%		5%	5%	
SC-L	-	8.1	0%	100%		5%	5%	
SC-O	15.9	43.5	58%	100%		5%	5%	
HC	19.5	22.8	55%	100%		15%	15%	50%
CR	-	8.4	0%	100%		5%	5%	
FI	-	22.0	0%	100%		5%	5%	
GI	-	19.9	0%	100%		5%	5%	
HI	-	17.0	0%	100%		5%	5%	
R&D	-	20.6	0%	100%		5%	5%	
CC120	90.3	47.8	39%	100%		50%	50%	

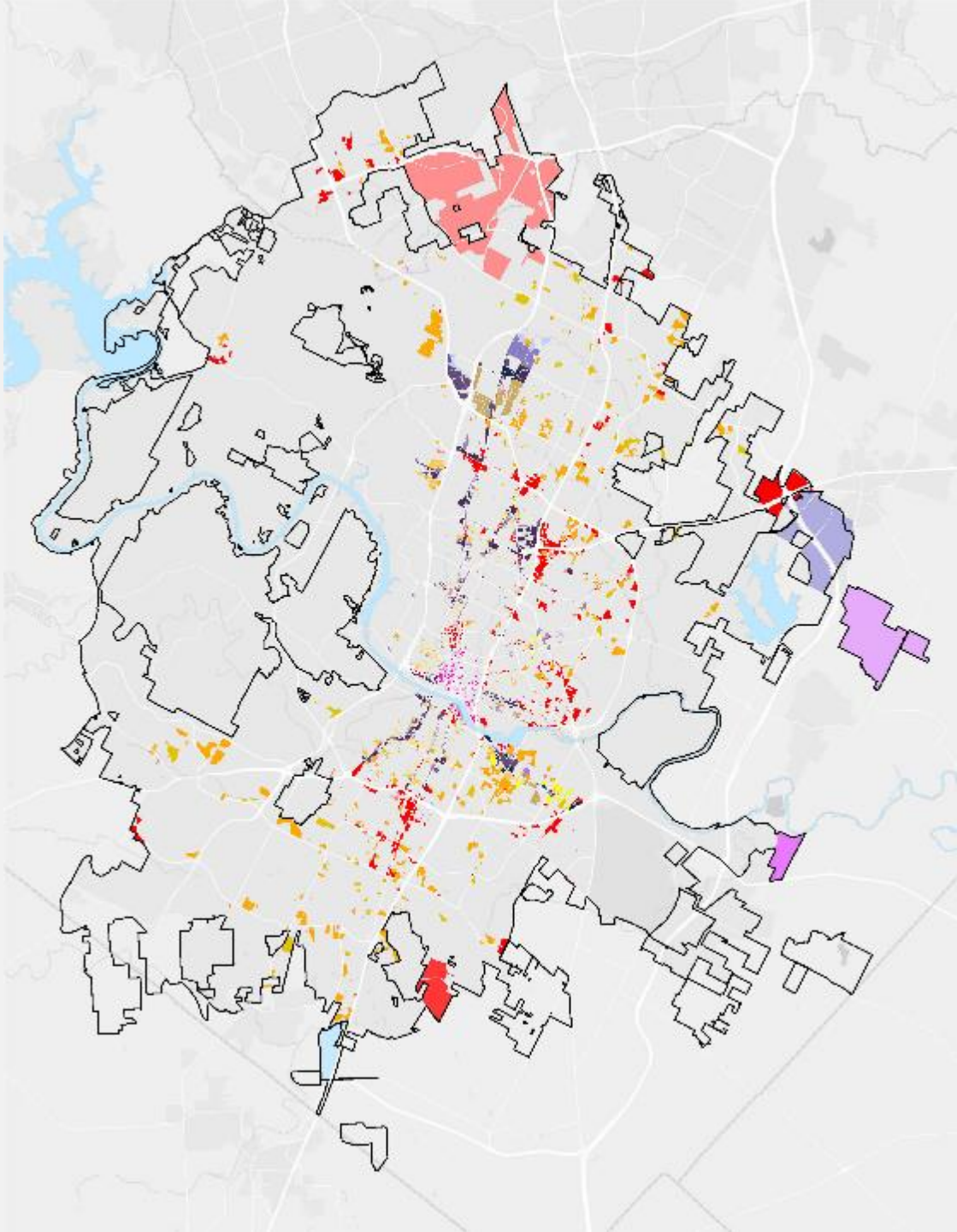
AUGUST 2017 - UPDATED MODEL

AUGUST 2017 - UPDATED MODEL

5,710 parcels analyzed

- **Major Driver:** "Tipping point" analysis
  - Parcels with near-medium term development potential
  - Evaluate zoning frameworks with wider range of indicators

Final results expected with mid-September Draft 2 roll out



AUGUST 2017 - UPDATED MODEL

Step 1: Remove recently developed parcels based on permits

- Ensure recently developed land is no longer "vacant" in dataset
- Permit data recent through May 2017

Data source: City's 2014 land database inventory; Development Services permit database – May 2017

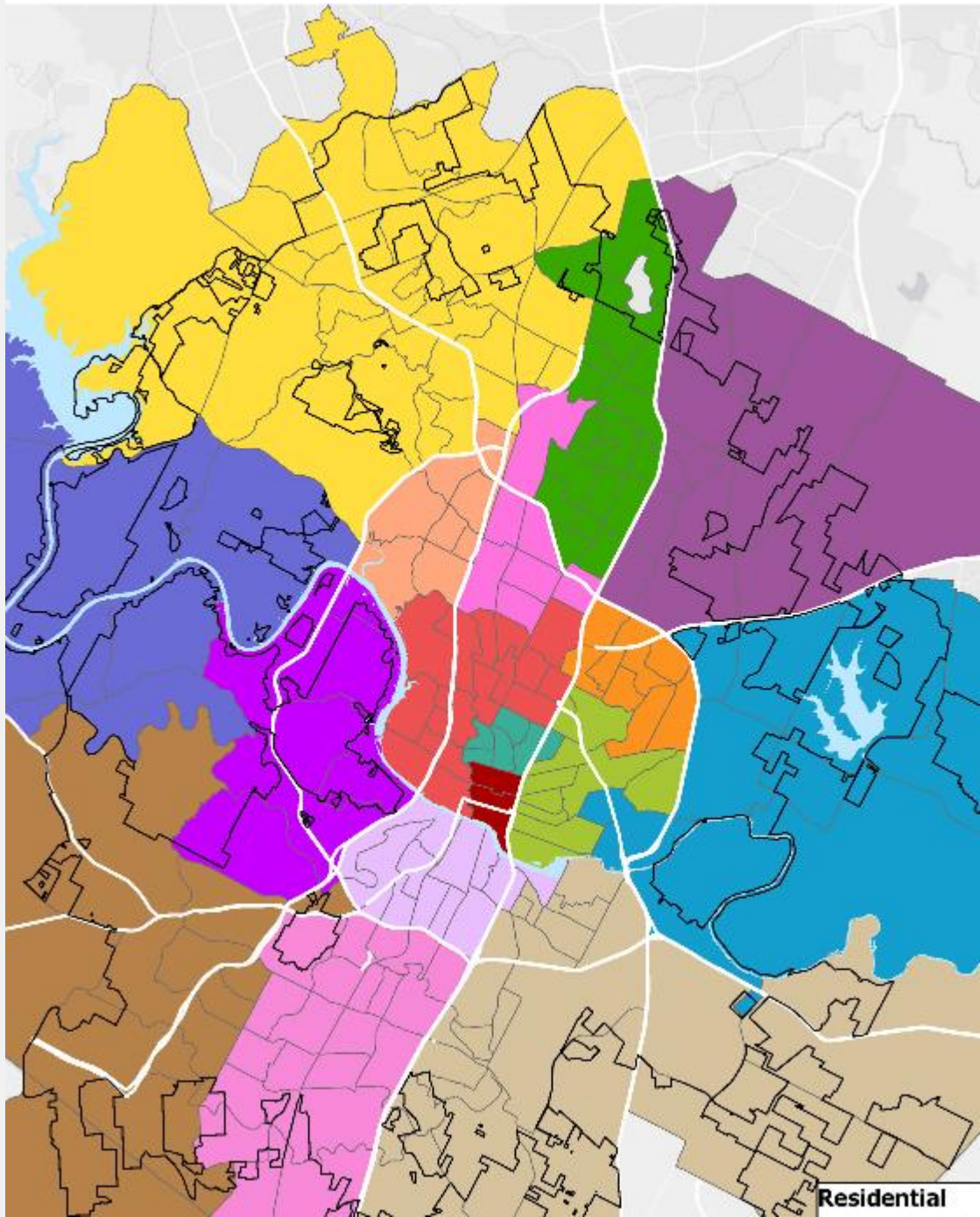
Example: New Mixed Use Development on E 5th St

AUGUST 2017 - UPDATED MODEL

Step 2: Calculate average rents by Austin submarkets to understand building feasibility

- Aggregated from Census Tract average rents – CoStar data
- Austin submarkets more easily understood geography for analysis

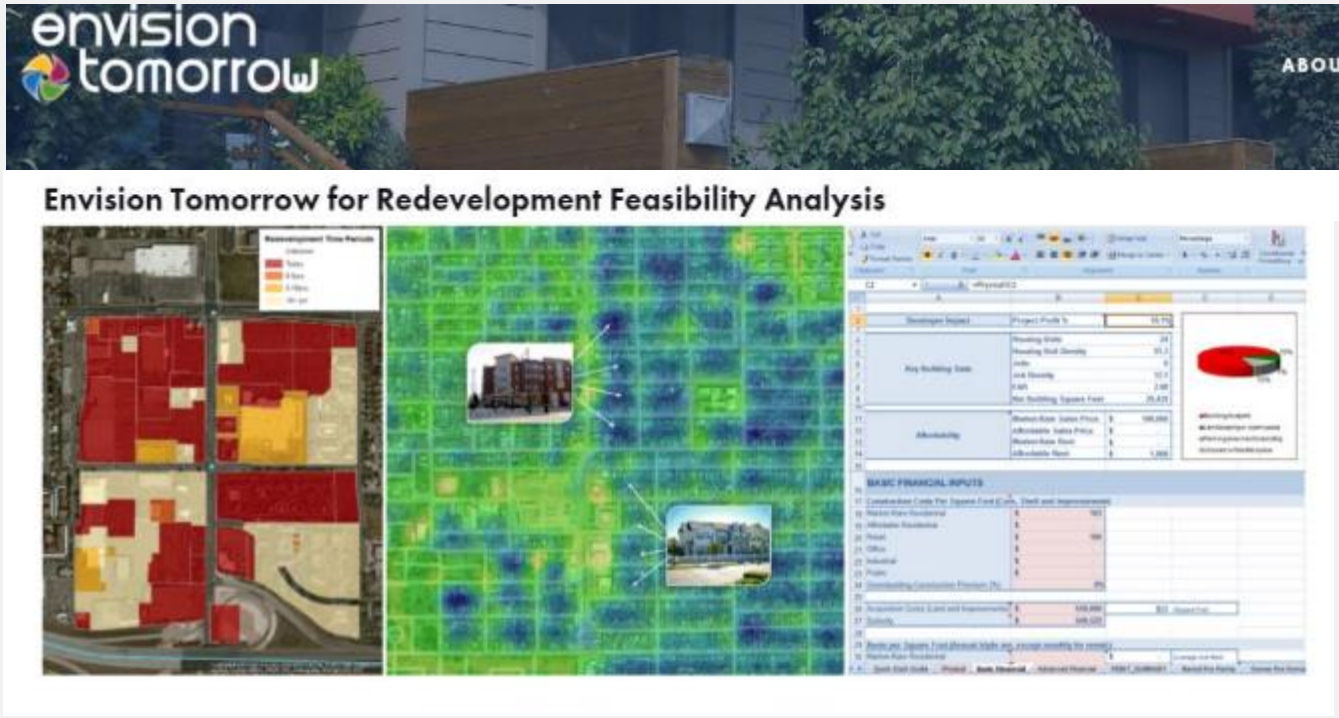
- Data Source: ApartmentTrends.com
  - http://www.apartmenttrends.com/html/maps/areaaus.cfm



AUGUST 2017 - UPDATED MODEL

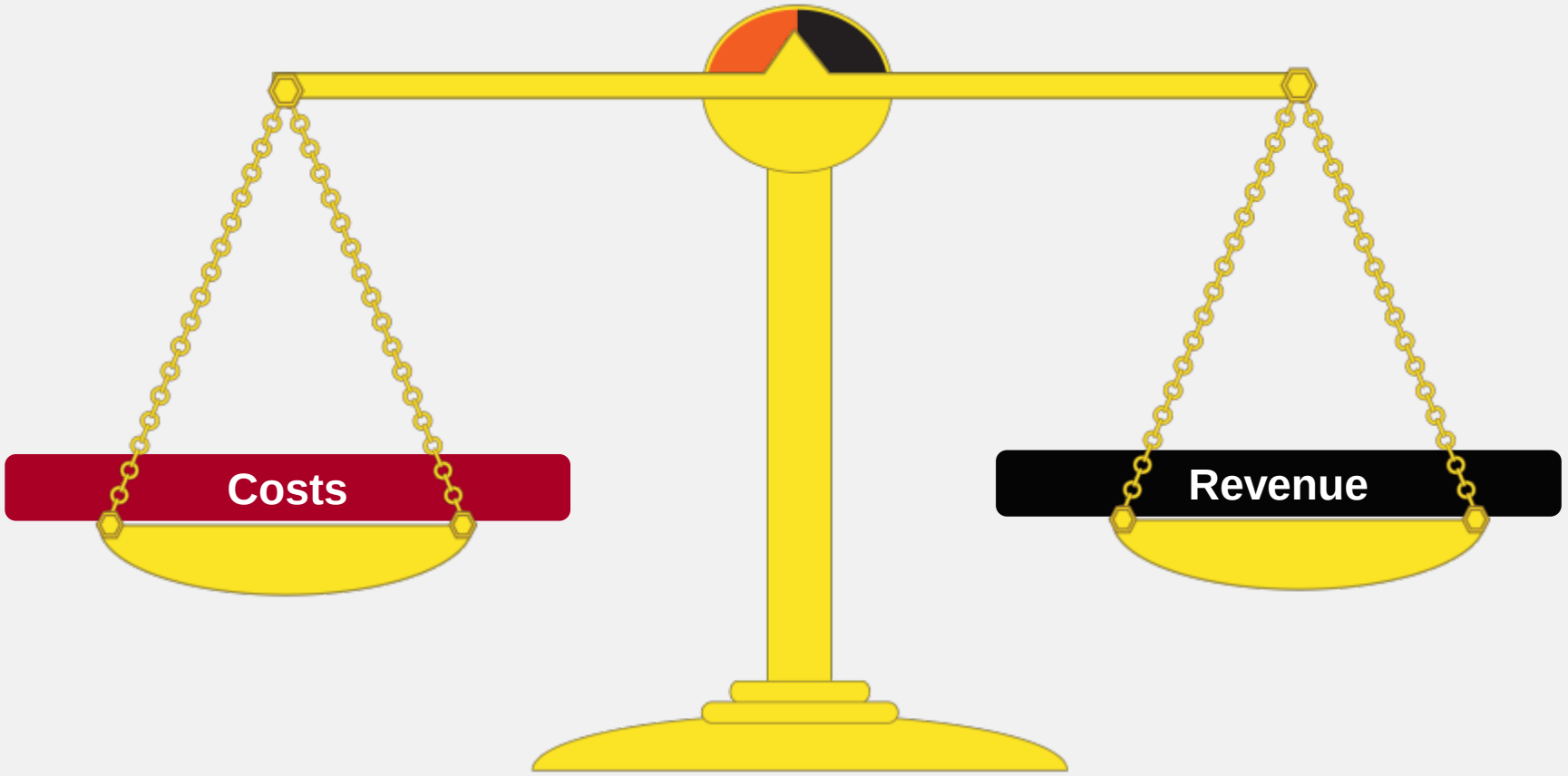
Step 3: Run Envision Tomorrow Development Feasibility Tool

- "Achievable rent" determined for **every parcel in Austin**
- Analysis done for 7 common building types in Austin:
  - SF Home
  - Duplex
  - Rowhouse
  - Multiplex
  - Low Rise Apartment (3 stories)
  - Mid Rise Apartment (4 stories)
  - Main Street Mixed Use (4-over-1)



TIPPING POINT

Not Feasible **Feasible**

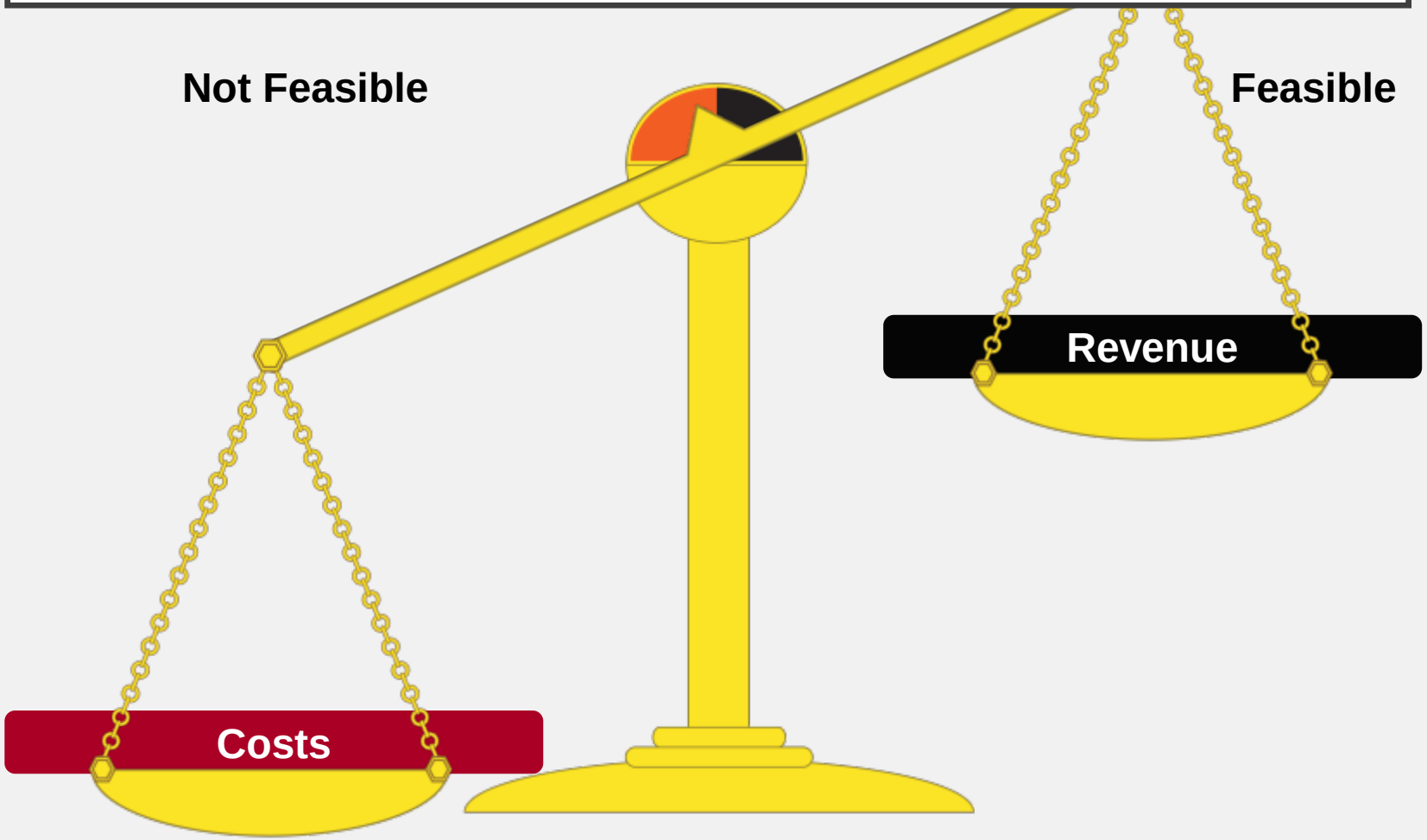


adjustable settings and tools

Building form **Revenues**

Costs **Gap tools**

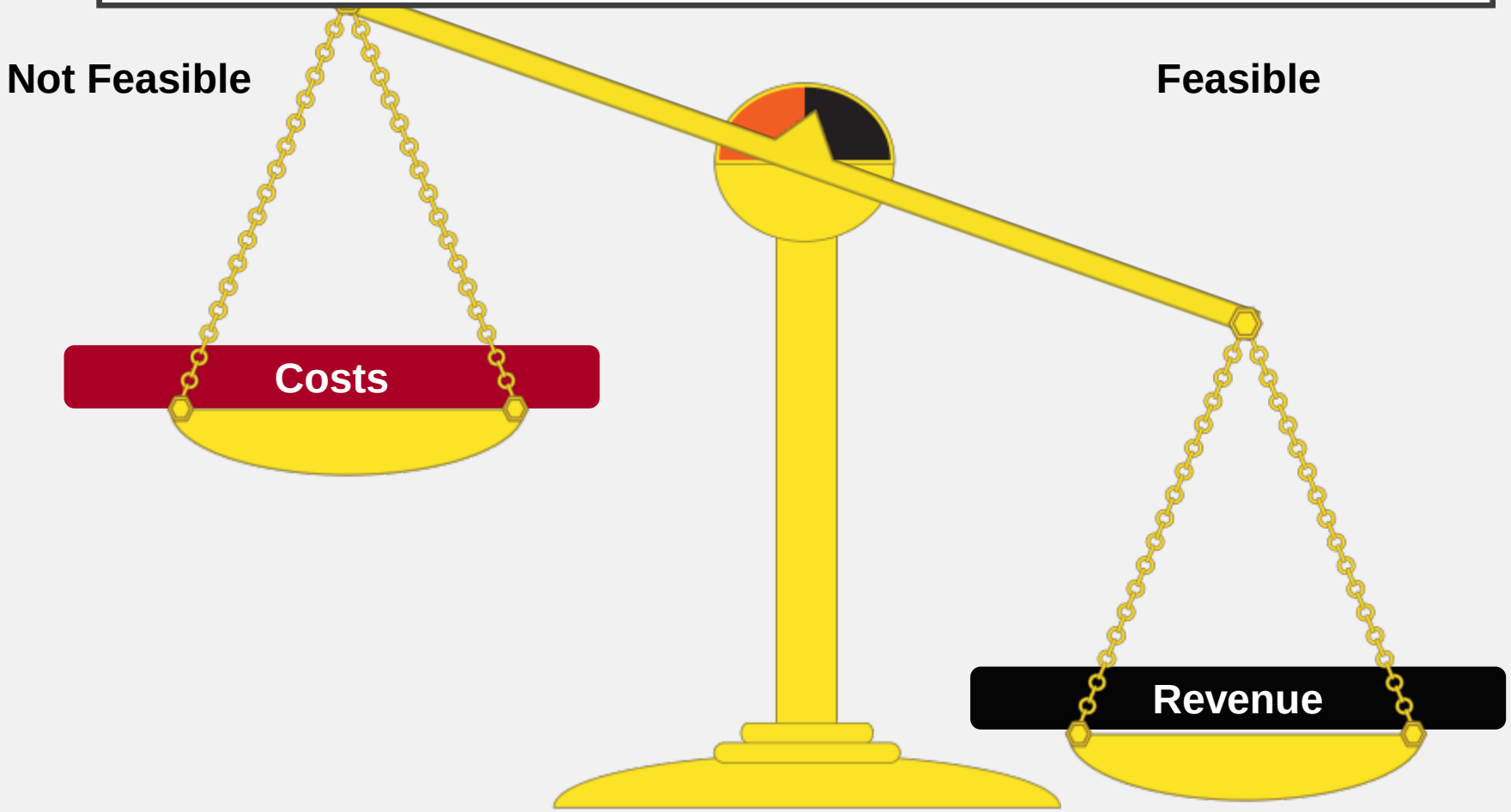
TIPPING POINT



adjustable settings and tools

Building form **Costs** **Revenues** **Gap tools**

TIPPING POINT



adjustable settings and tools

Building form **Costs** **Revenues** **Gap tools**

affordable

Building form

- Height
- Set back
- Landscaping
- Parking Ratios

Costs

- $$$ Hard
- $ Soft
- $$$ Taxes
- $$ Fees

tuck under

Parking

structured surface

Revenues

- $$$ Rent 1
- $ Rent 2
- $$$ Rent 3
- $$ Parking

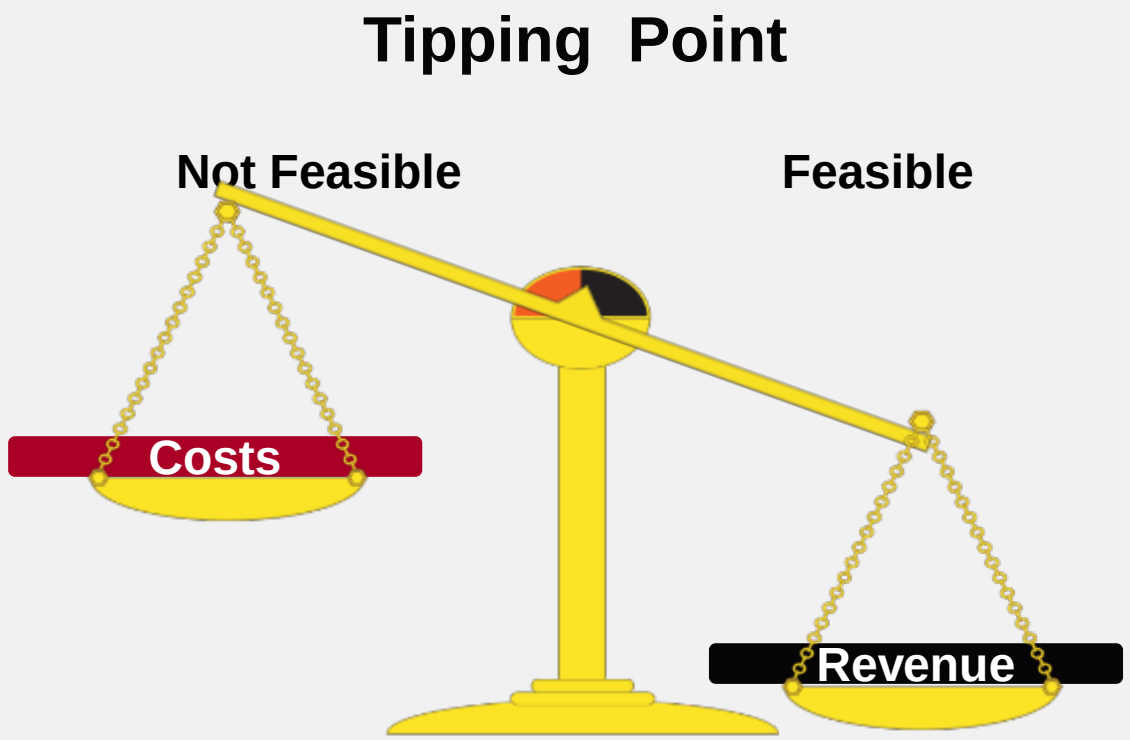
AUGUST 2017 - UPDATED MODEL

Step 4: Determine Market Feasibility Ratio on every parcel by building type

Market Ratio =

Achievable Rent / Submarket Average Rent

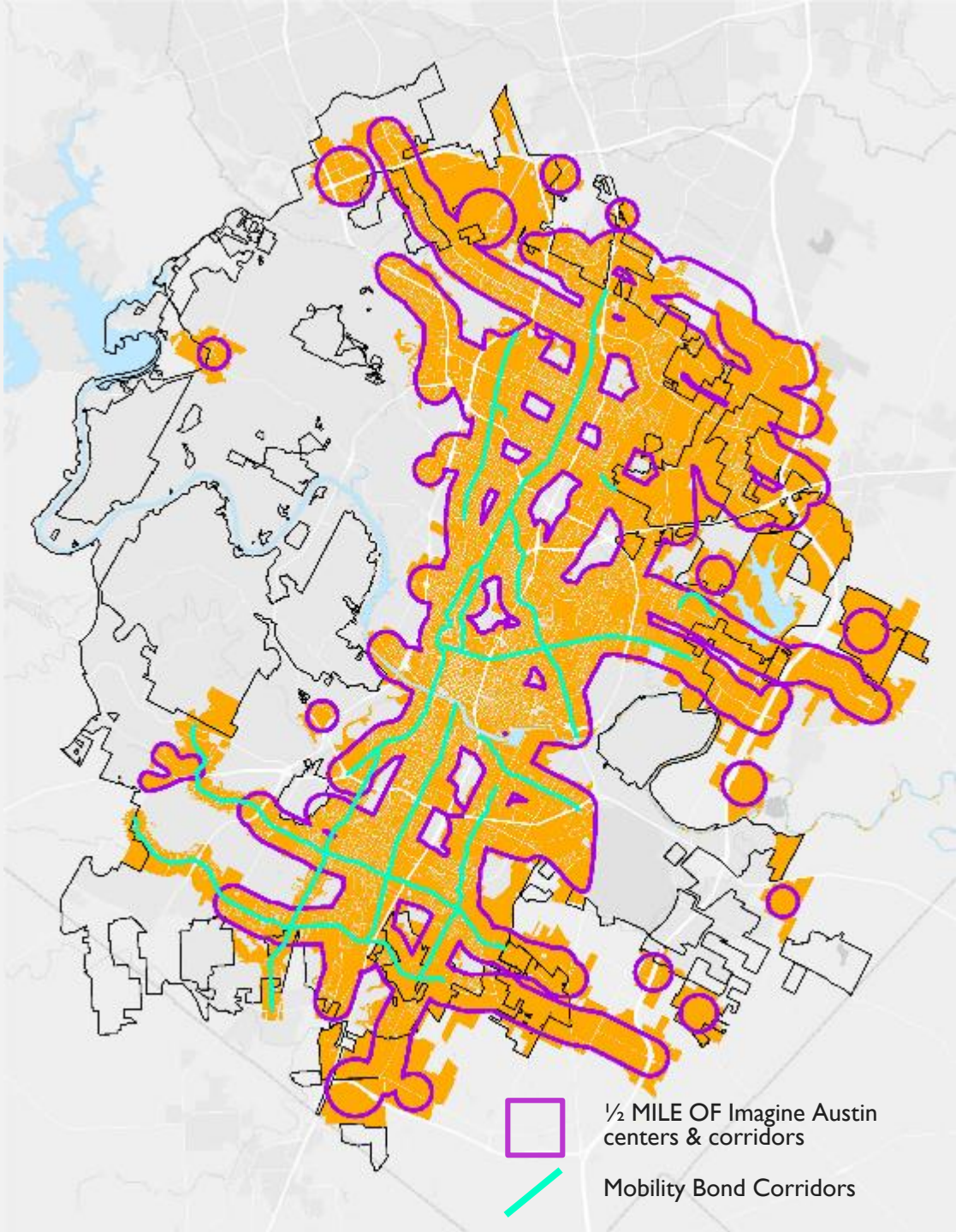
- Parcel is "market feasible" *today* when ratio = 1
  - Ratio >= 1 means achievable rent is equal to or above submarket rents
  - Building is feasible when it is able to achieve rents equal to market



AUGUST 2017 - UPDATED MODEL

Step 5: Determine parcels with high potential for (re)development

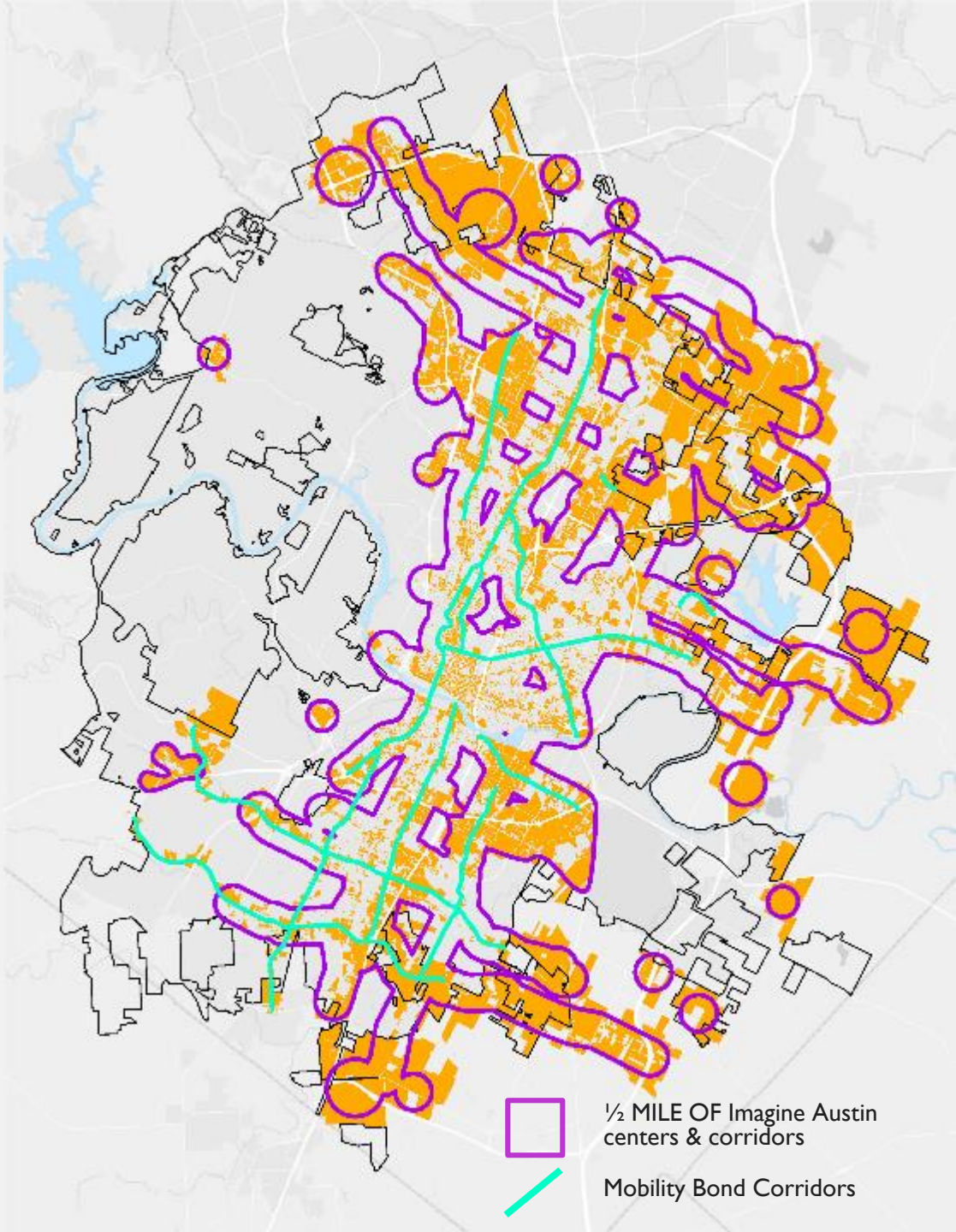
- <u>Included:</u>
  - Parcels within ½ mile of **Imagine Austin centers & corridors**
  - Parcels within ¼ mile of **mobility bond corridors**
  - **PUDs**



AUGUST 2017 - UPDATED MODEL

Step 5: Determine parcels with high potential for (re)development

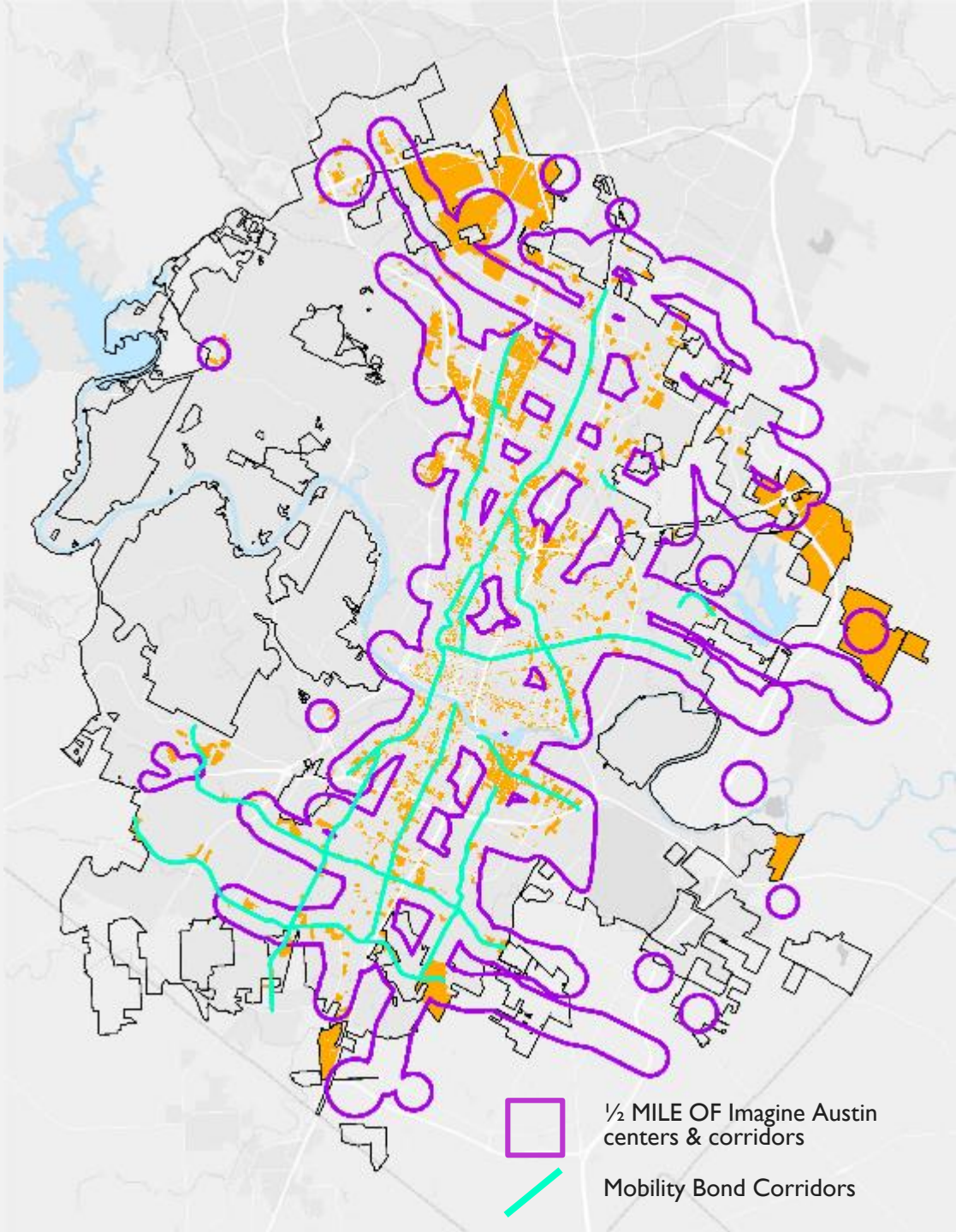
- <u>Removed:</u>
  - Stable single family
  - Public lands, open space, educational, roads/utilities, environmentally constrained land
  - Historic districts
  - Developed parcels < 10,000 sqft
  - Parcels developed after 2010



AUGUST 2017 - UPDATED MODEL

Step 5: Determine parcels with high potential for (re)development

- Removed:
  - Parcels with market feasibility ratio less than 0.75
    - 0.75 and above captures parcels with longer term potential (i.e., beyond 10 years)

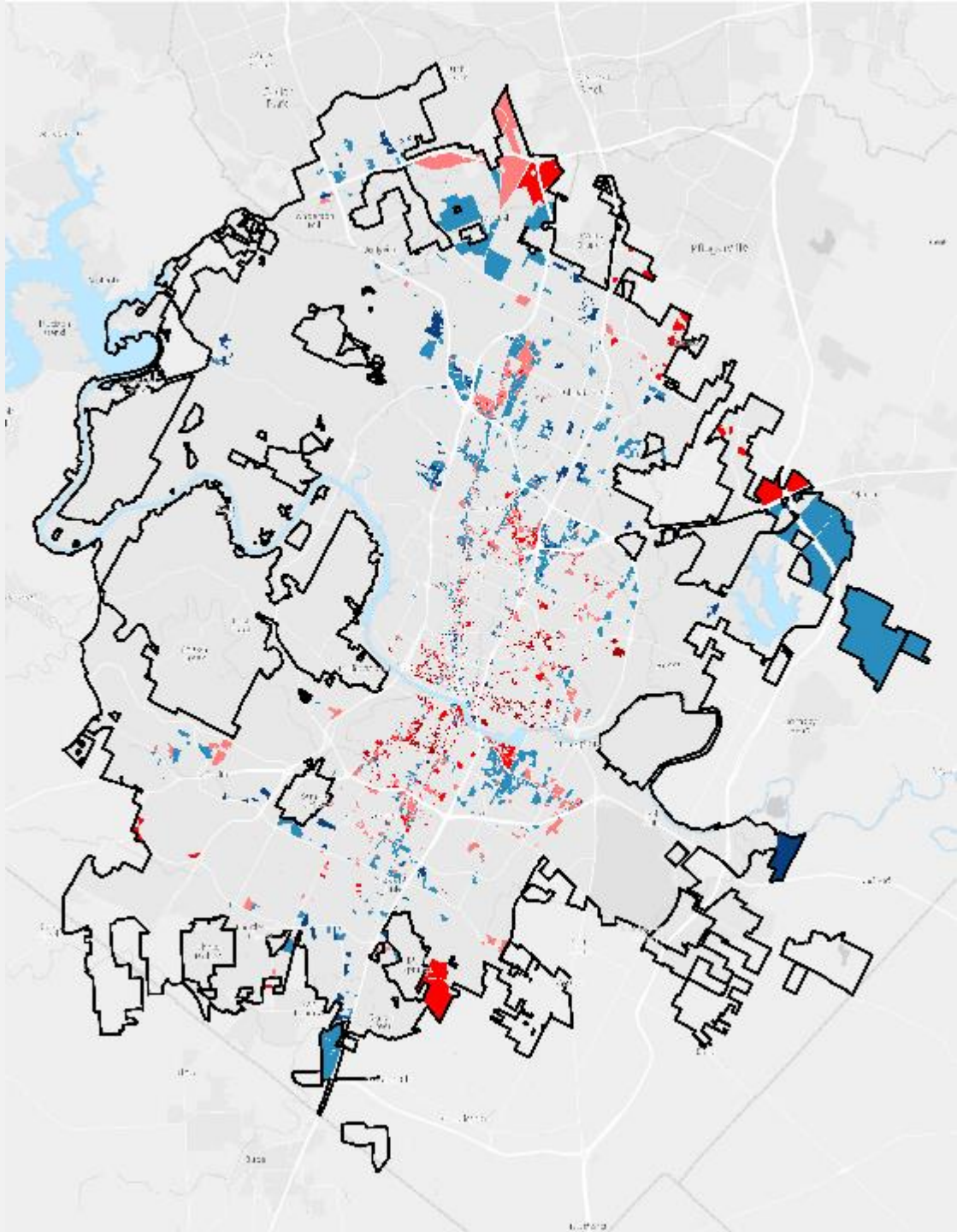


AUGUST 2017 - UPDATED MODEL

"Buildable Lands" of parcels with potential for development

Not all parcels are created equal:

- 0.75 Market Ratio
- Less than or equal to 0.9 Market Ratio
- Less than or equal to 0.99 Market Ratio
- Less than or equal to 1.15 Market Ratio
- Greater than 1.15 Market Ratio

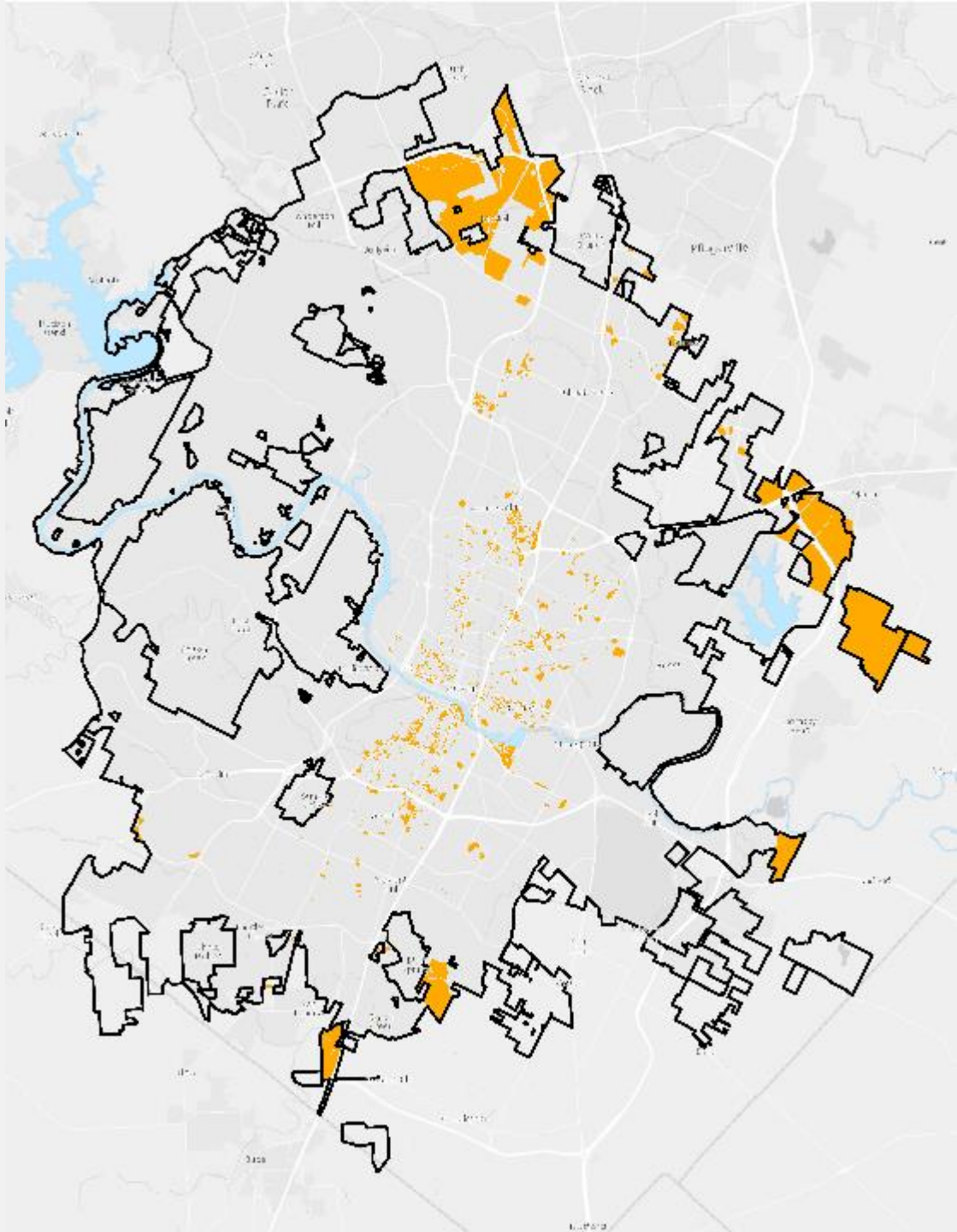


AUGUST 2017 - UPDATED MODEL

Step 6: Market Demand Model - Determine parcels to develop in order to meet market demand

- Strategic Housing Blueprint
- ~135,000 new units needed over the next 10 years

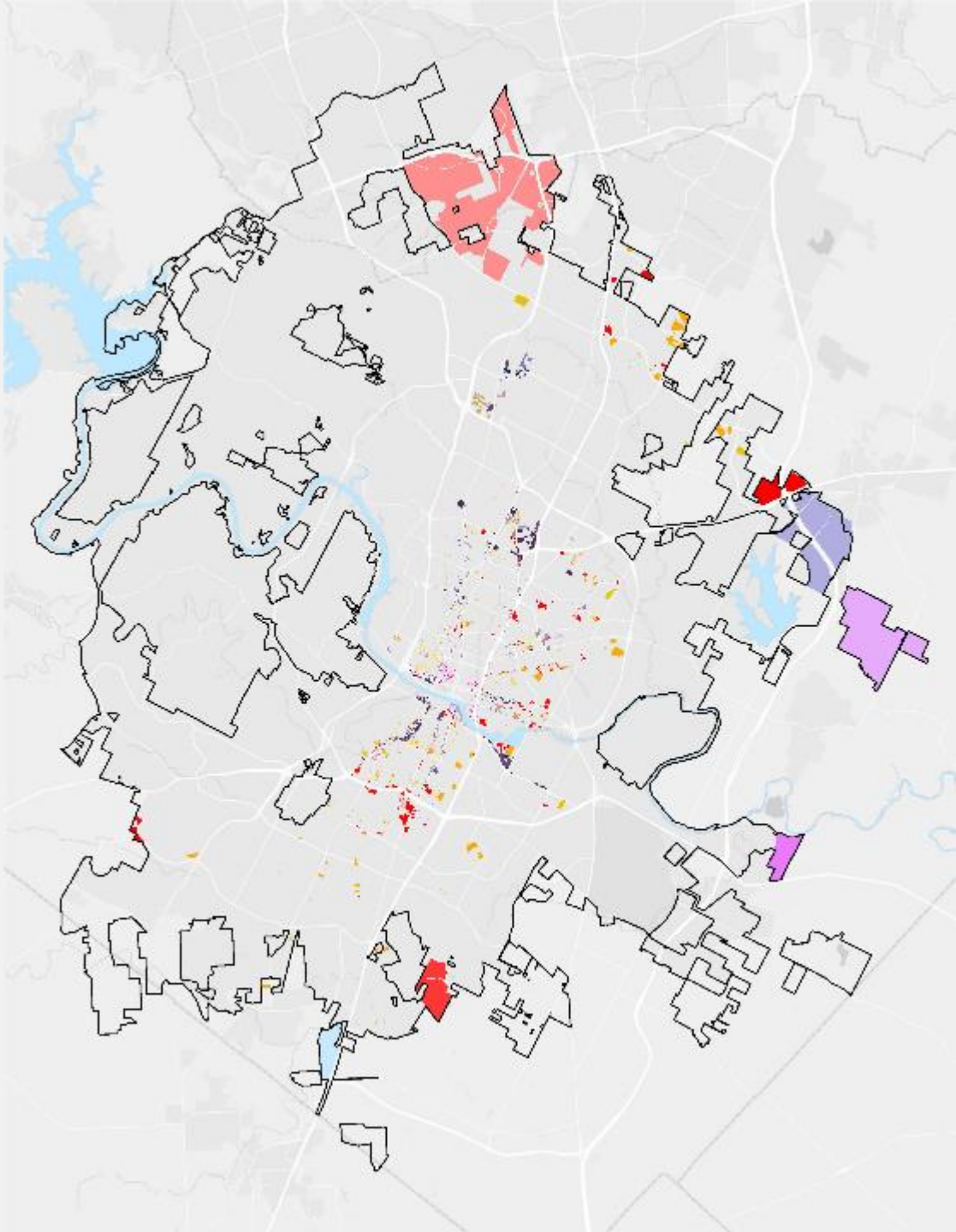
Those with highest potential return (ROI) most likely to develop



AUGUST 2017 - UPDATED MODEL

Step 7: Apply Envision Tomorrow development types (zones) to parcels

- Existing Zoning
- CodeNEXT Draft 1
- CodeNEXT Draft 2
  - **Mid-September**



ENVISION TOMORROW INDICATORS

Updated Model Results

ENVISION TOMORROW INDICATORS

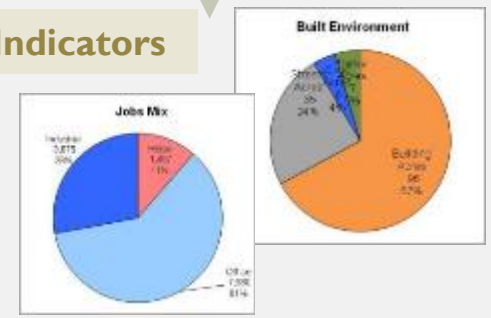
- ☑ Development Characteristics (acreage, infill vs vac, etc.)
- ☑ Housing mix & Population
- ☑ Housing costs and rents, affordability
- ☑ Housing supply compared to housing demand by type and income
- ☑ Employment mix
- ☒ Assumed income from employment by type
- ☒ Affordable housing at risk for redevelopment from 120% MFI to 40% MFI
- ☒ Transportation Indicators (VMT, Mode of travel, walkability, health indicators)
- ☒ Impervious cover
- ☒ Single-Family Demolition/Infill Risk Assessment

Expected with mid-September Draft 2 roll out

Buildings

Scenarios

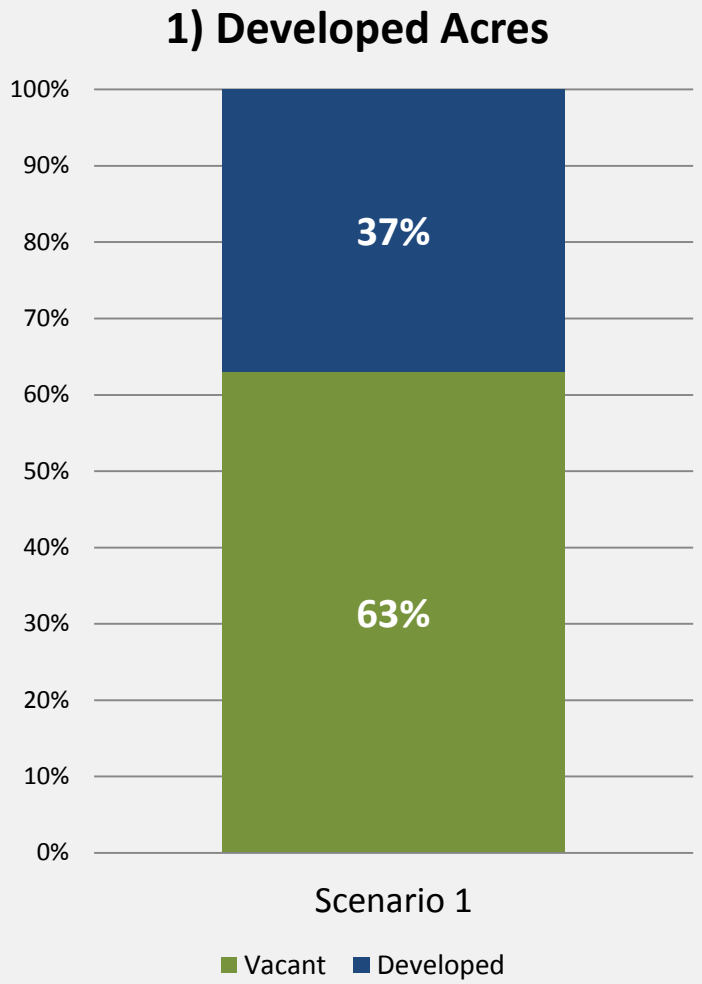
Indicators

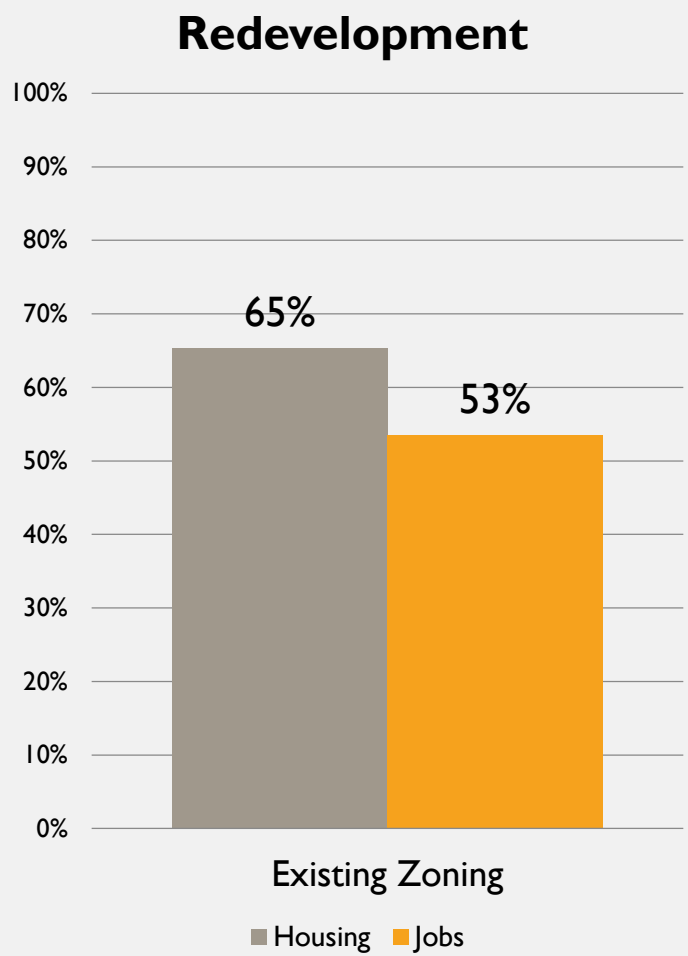


DEVELOPMENT CHARACTERISTICS

Existing Zoning

1) % of new development that occurs on vacant vs. developed (infill) land
2) % of new housing units and jobs that are a product of infill redevelopment

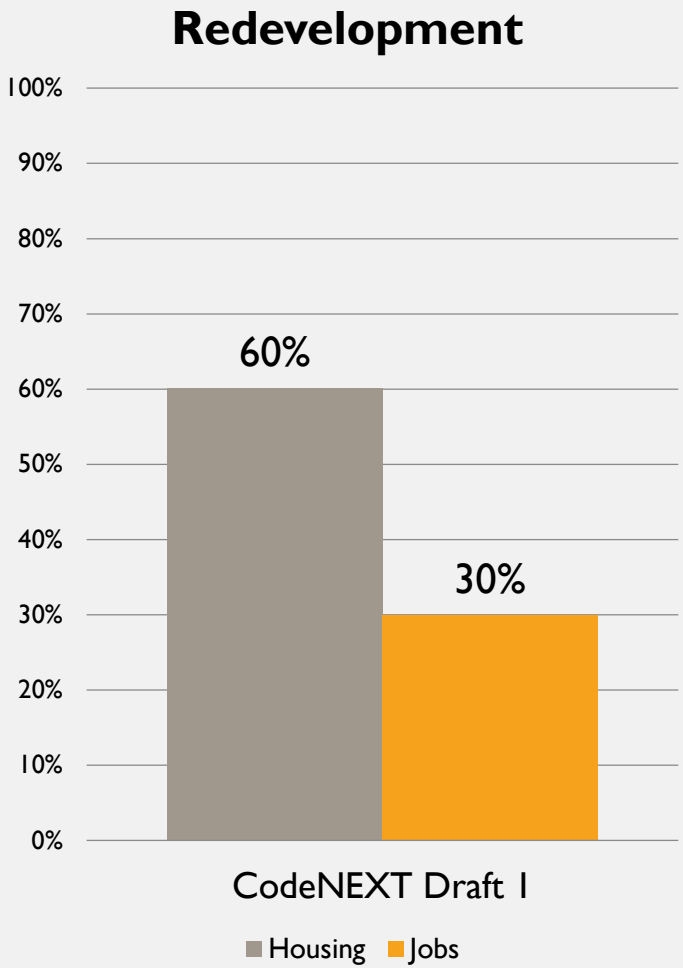




DEVELOPMENT CHARACTERISTICS

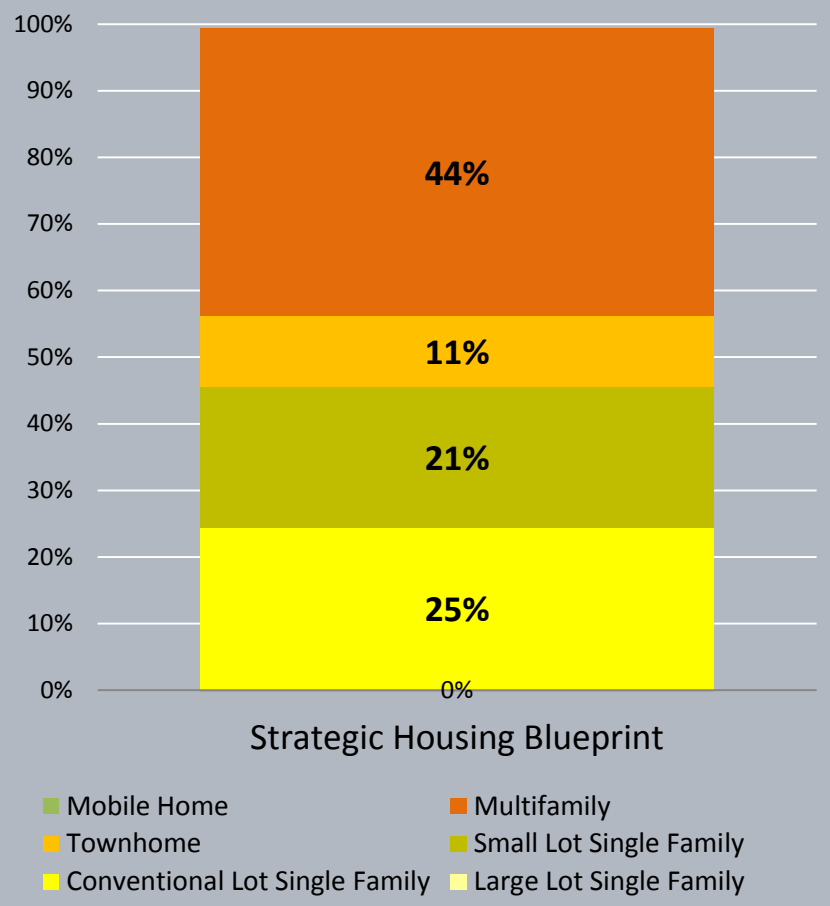
CodeNEXT Draft 1

1) % of new development that occurs on vacant vs. developed (infill) land
2) % of new housing units and jobs that are a product of infill redevelopment

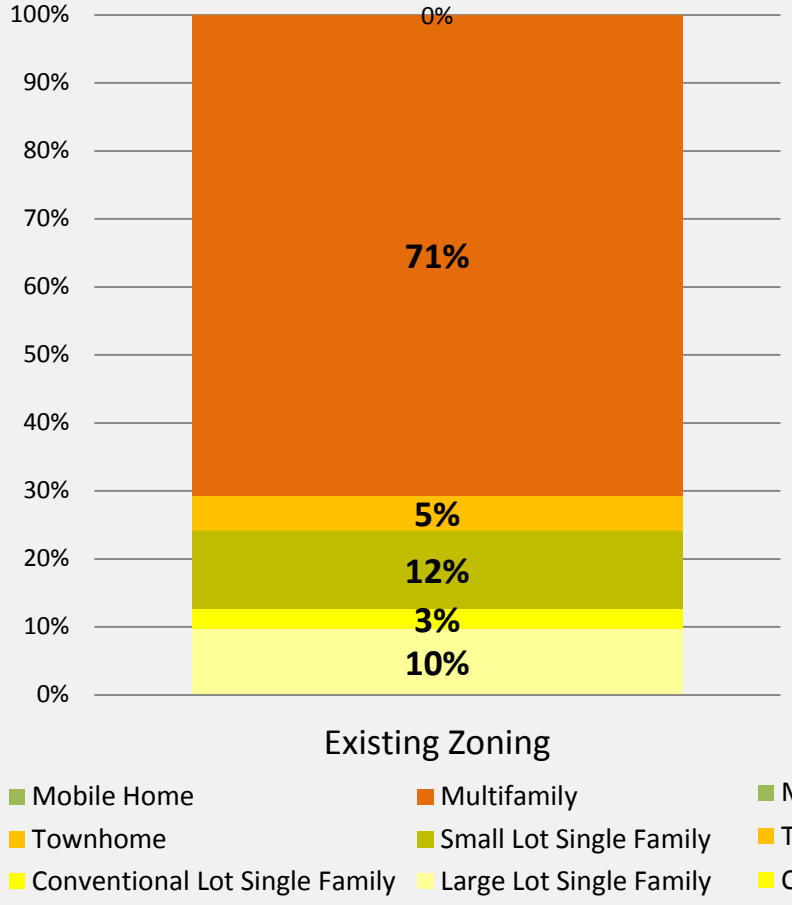


HOUSING INDICATORS – NEW HOUSING

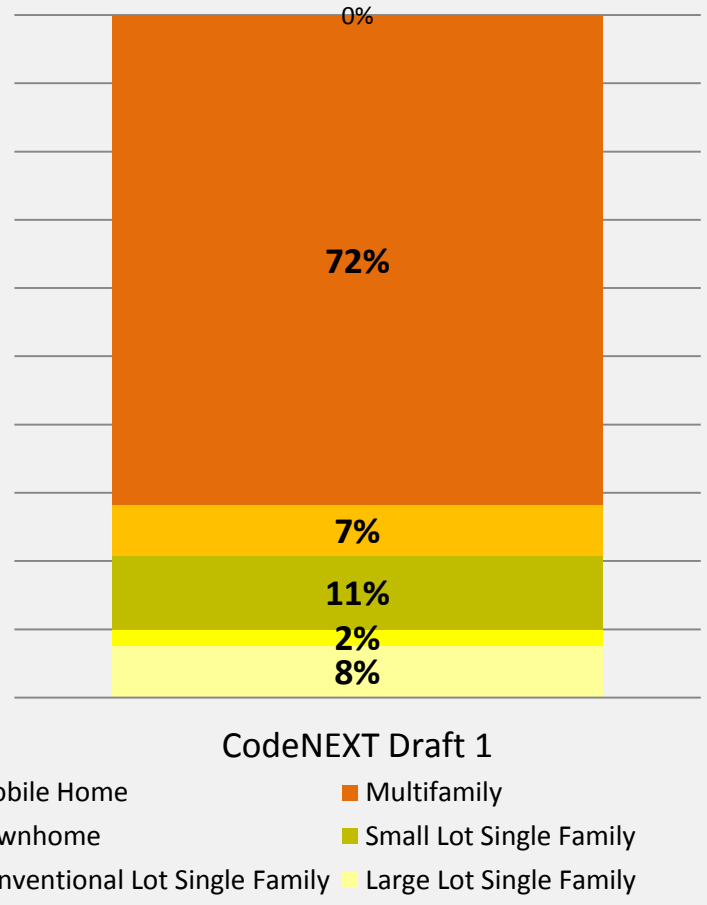
Strategic Housing Blueprint



Existing Zoning

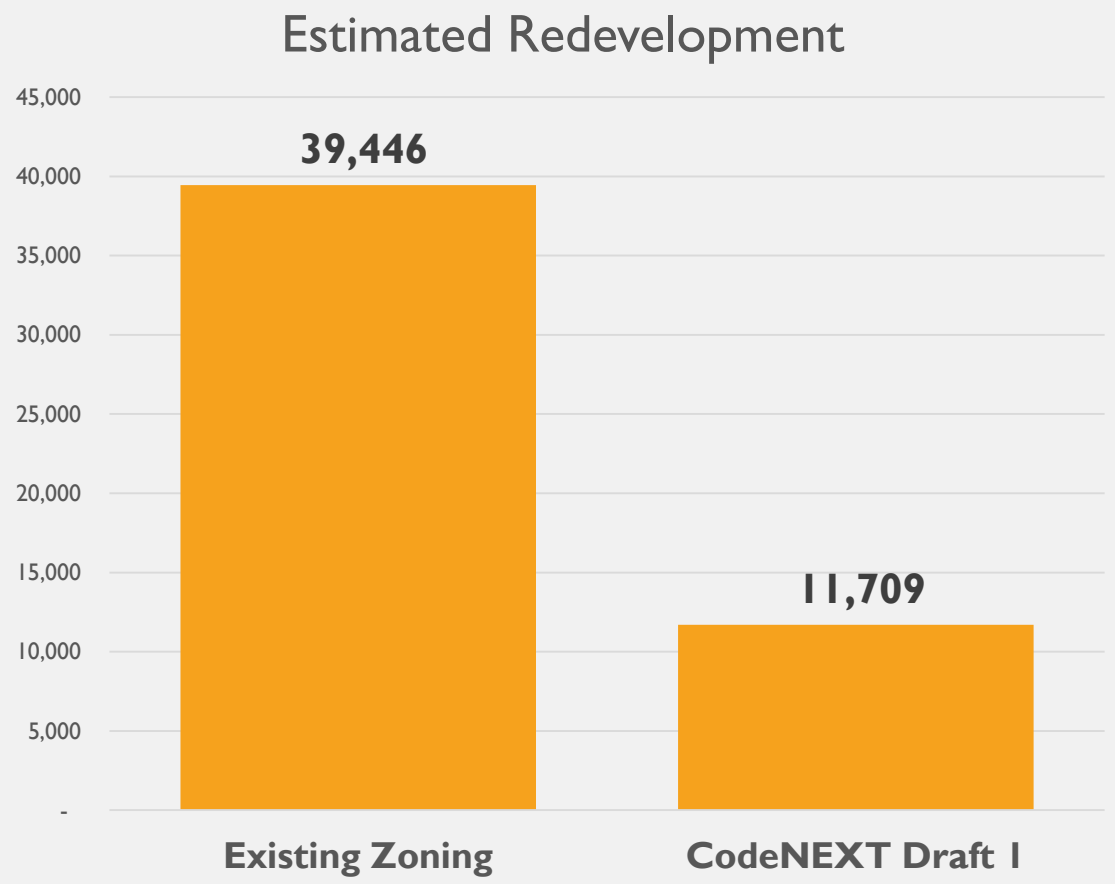


CodeNEXT Draft I



HOUSING INDICATORS – REDEVELOPMENT

Amount of redevelopment estimated to occur in order to meet market demand of ~135,000 net new housing units



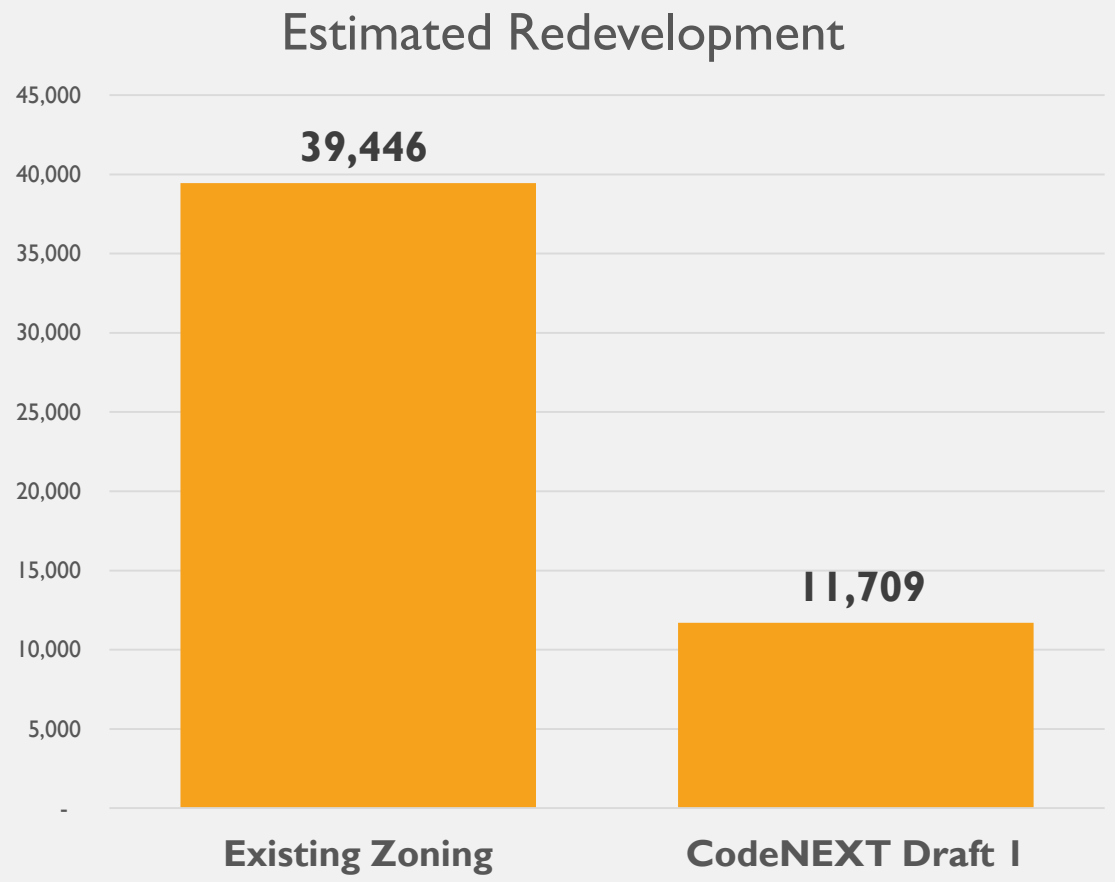
HOUSING INDICATORS – REDEVELOPMENT

Both Zoning Frameworks achieve

~135,000 new housing units

However, **under existing zoning** more redevelopment of existing housing estimated in order to meet housing demand, due to:

- Lower density allowances
- Fewer zones allowing residential

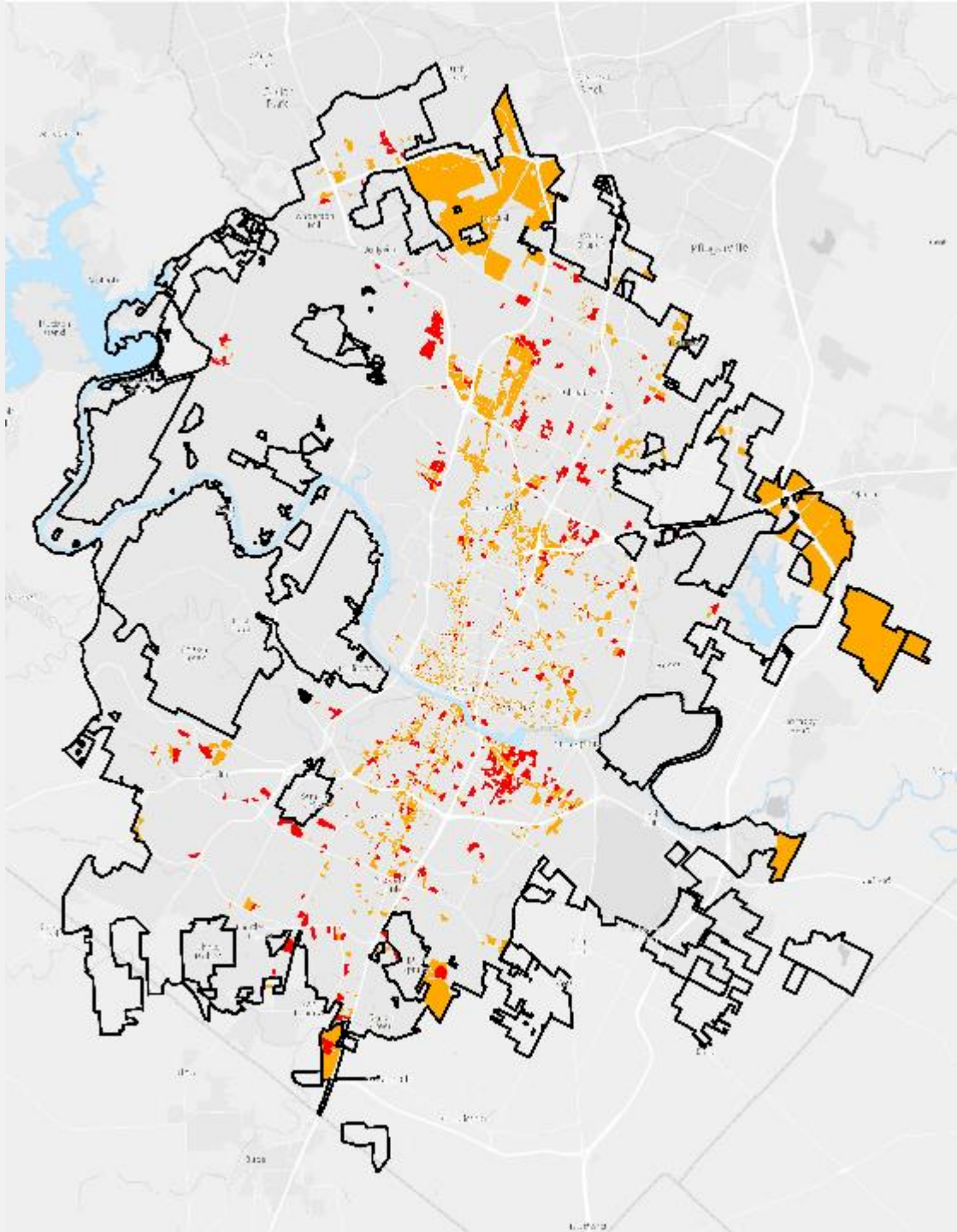


REDEVELOPMENT

Where would this redevelopment occur?

Lower-value apartments at risk of redevelopment in RED

More low-value apartments estimated to redevelop under Existing Zoning



LOWER-VALUE APARTMENTS

Lexington Hills off of East Riverside Dr

River Crossing Townhomes off East Riverside Dr

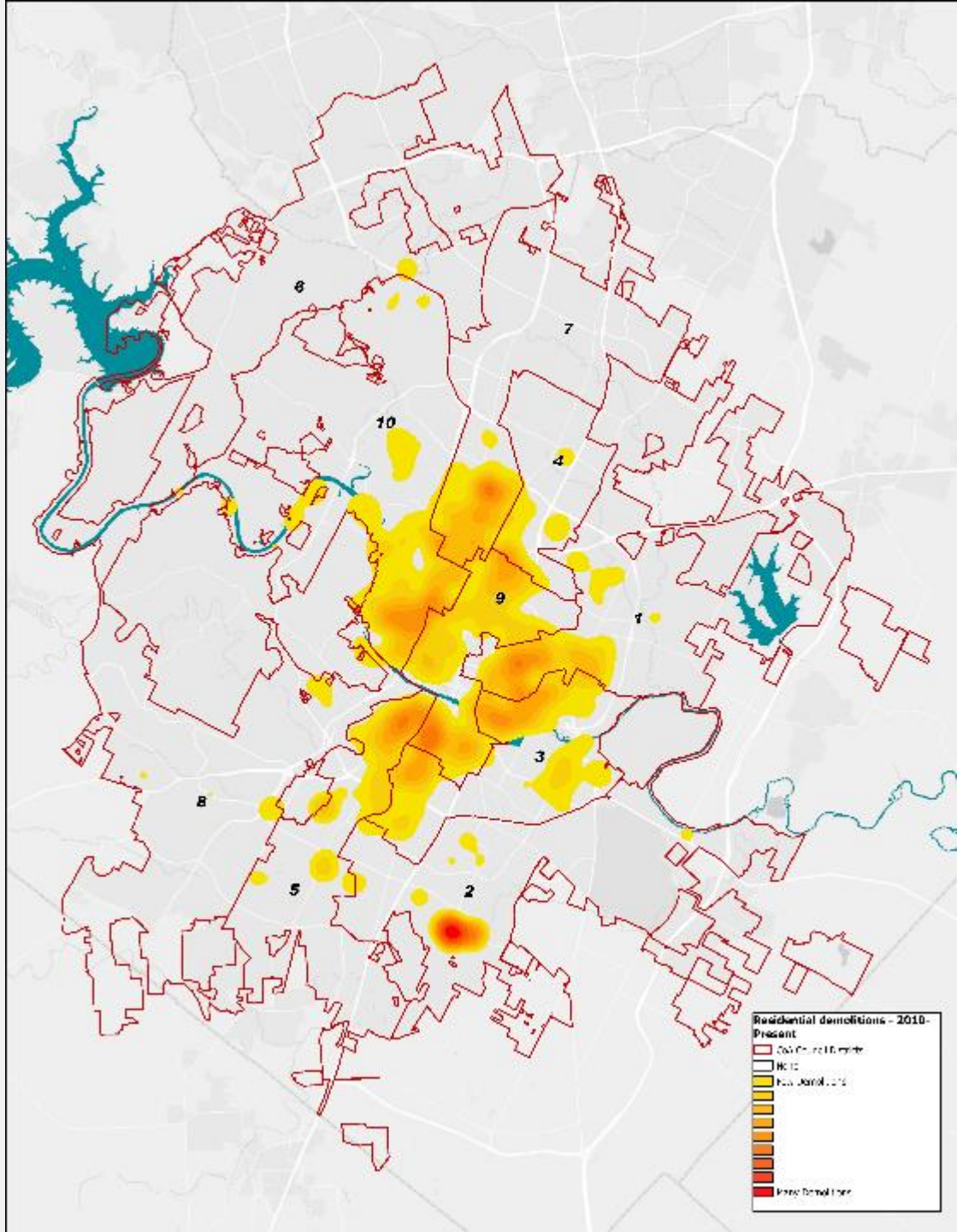
Mueller Flats off E Koenig Ln

WHAT'S NEXT?

Single-Family Redevelopment & Demolition Assessment

Identify single family parcels at risk of redevelopment

Compare demolition risk under existing zoning and CodeNEXT

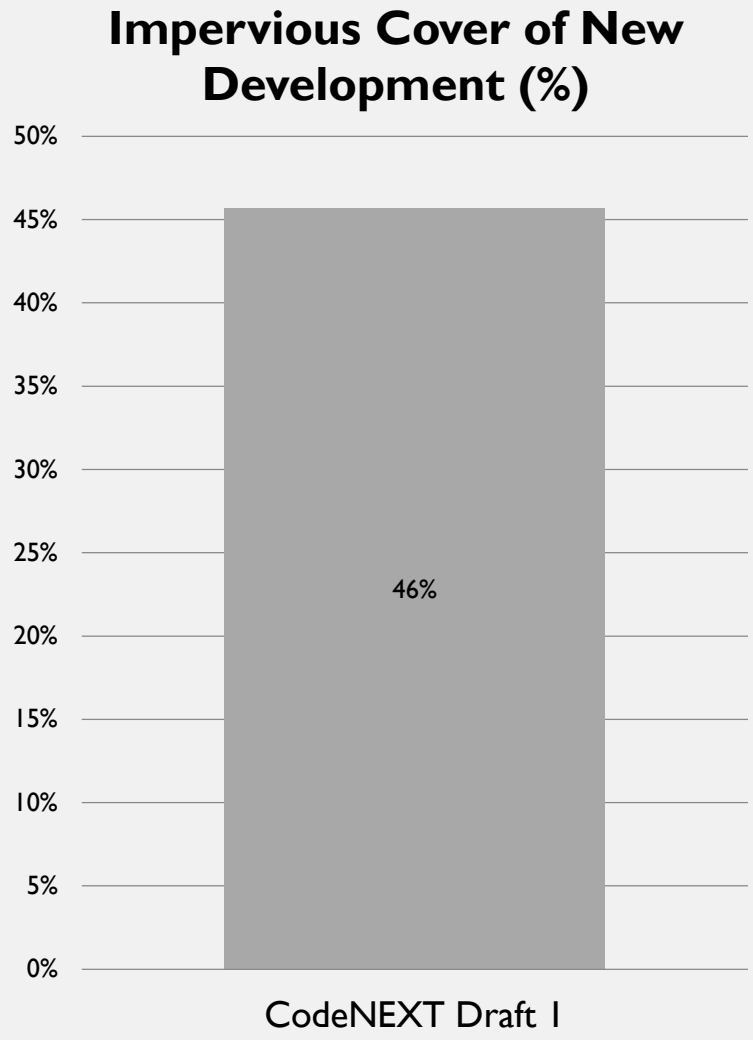


WHAT'S NEXT?

Change in Impervious Cover

Calibrate Envision Tomorrow with existing impervious cover data

Compare estimated change in impervious cover under existing zoning and CodeNEXT

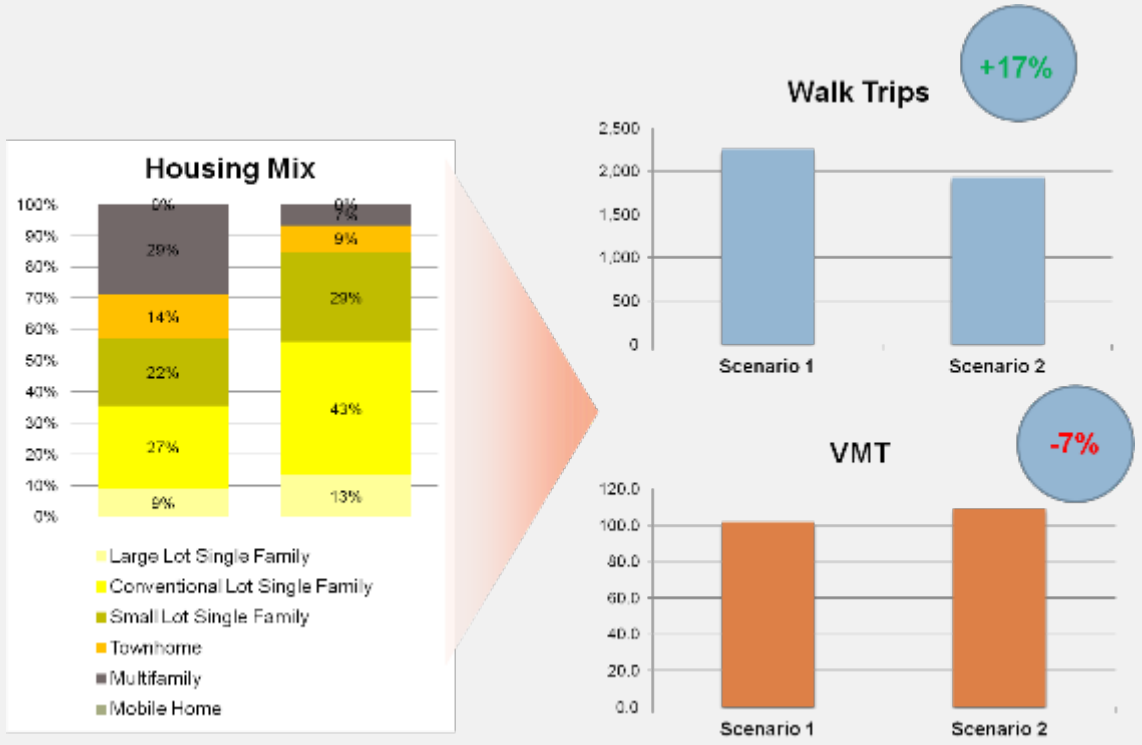


WHAT'S NEXT?

Transportation Indicators

Calibrate Envision Tomorrow "Household 7Ds" model

Compare estimated change in: Vehicle Miles Traveled (VMT), Mode of travel, "walkability", transportation cost

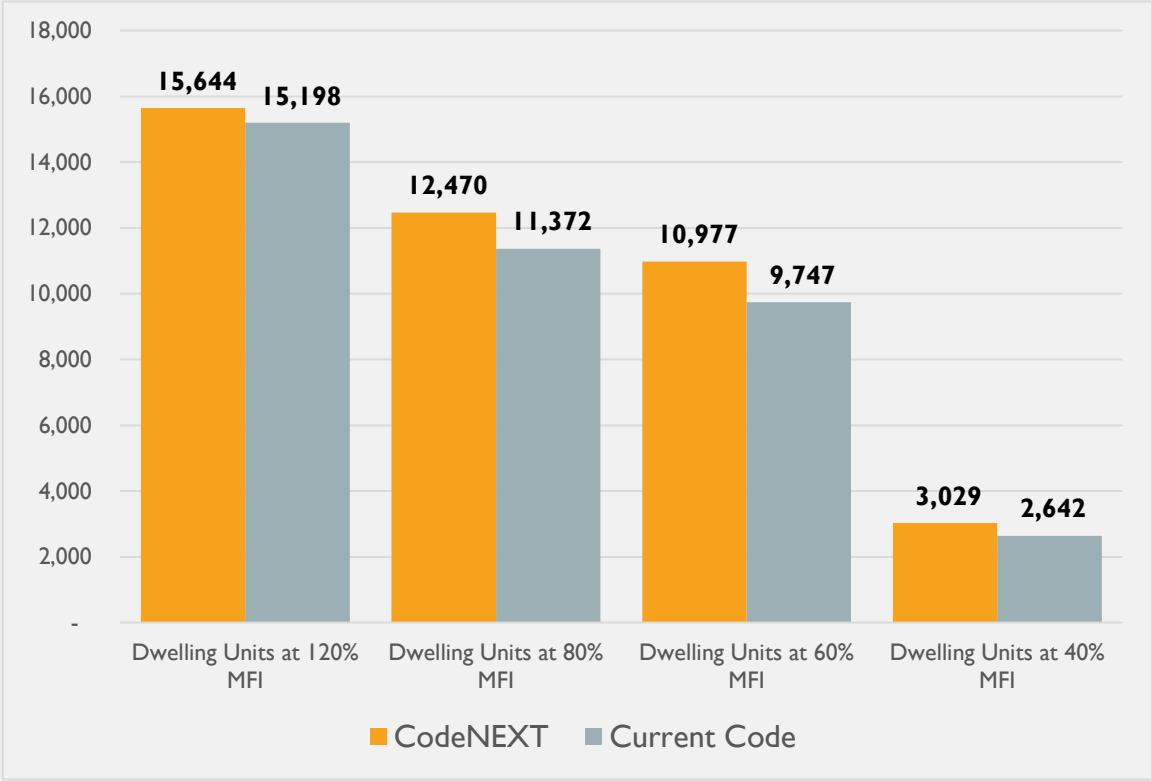


WHAT'S NEXT?

Affordable Housing Redevelopment Risk

Replicate risk assessment from June based on updated model

Utilize University of Texas professor Elizabeth Mueller's Corridor Housing Preservation research

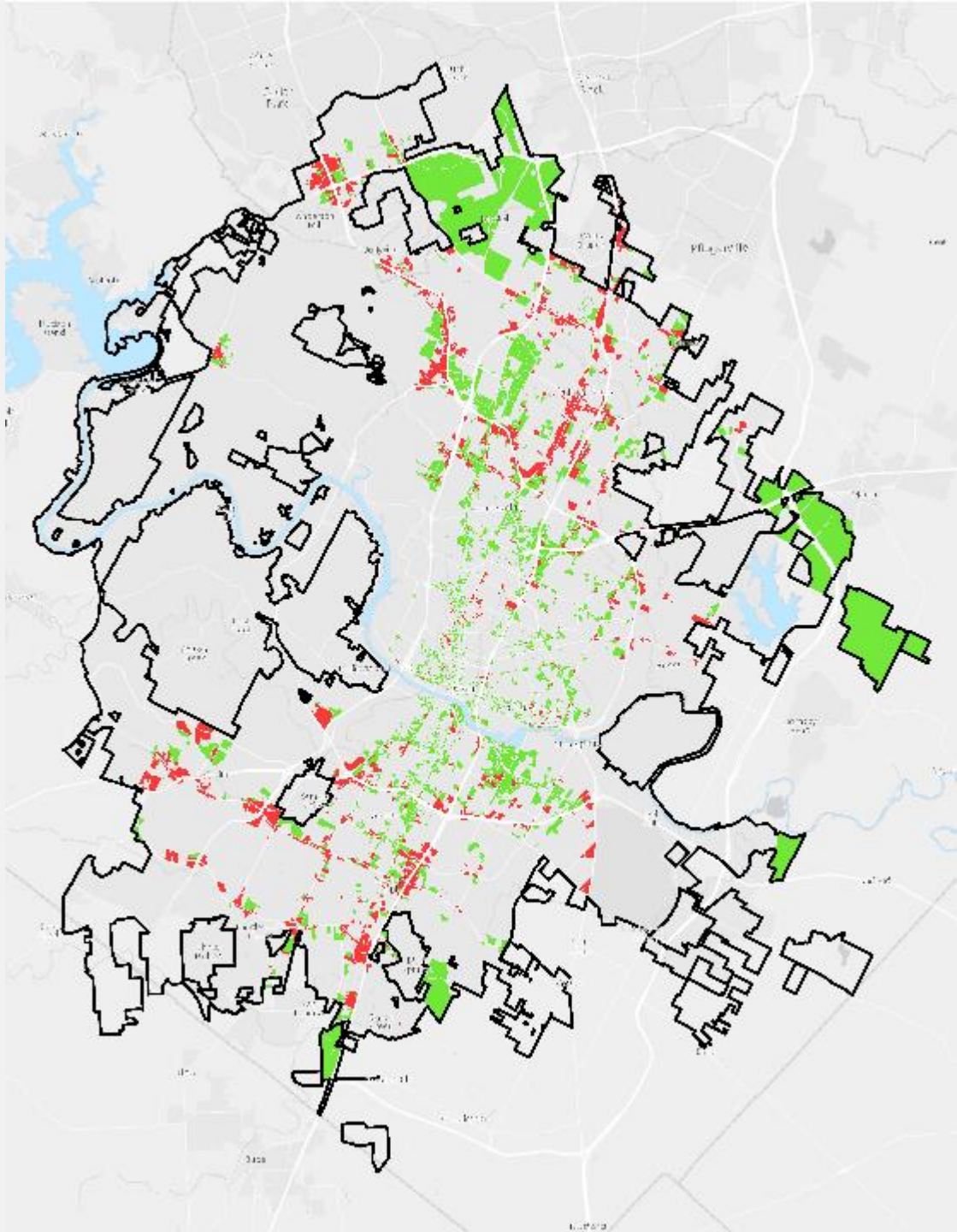


WHAT'S NEXT?

Commercial zone residential opportunity analysis

Housing potential under zones that currently allow residential (Existing Zoning & CodeNEXT Draft 1) in **GREEN**

Housing potential in commercial zones if they allowed residential in **RED**



WHAT'S NEXT?

A Strategy for CodeNEXT Draft 2

1. Reduce Redevelopment of affordable units
2. Strategically allow housing in commercial zones
3. Allow additional density throughout Imagine Austin & Mobility Bond Corridors
4. Encourage mixed-use and walkable designs outside of core – even if not traditional stacked MU