Parcel Based Allocation

Midwest Travel Model Users Group
April 2019

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Project Timeline

- January - April 2018 - Parcel Data Development
  - Reviewed parcel data for consistency and existing use
  - Assigned universal coding to all parcels for regional analysis
- May - July 2018 - Developed Control Totals
  - Worked with State Data Centers in NE and IA
  - Developed projections in five year intervals for MAPA counties
  - Derived labor force numbers from population
- August 2018 - Present - Future Land Use Allocation
  - Developed grid system for future land use
  - Coded grids using local future land use plans and Heartland 2050 preferences
  - Developed alternative land use scenarios

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Control Totals

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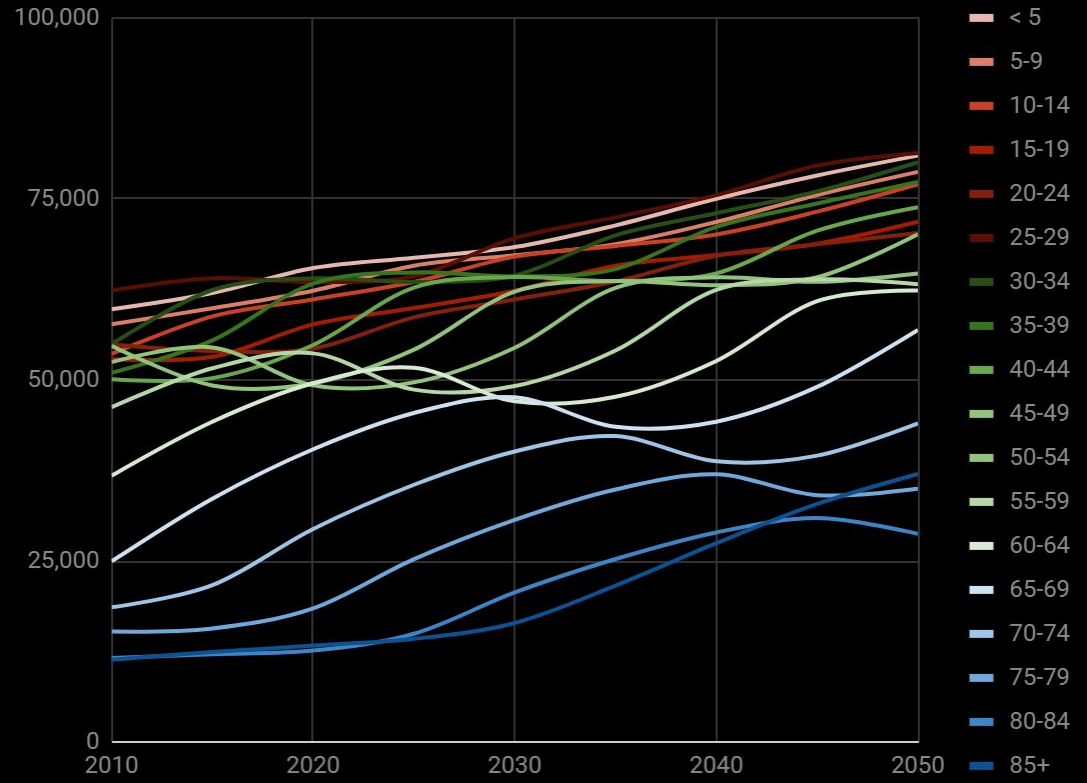
Control Total Methodology



- Cohort Forecasting Process
- TMA
  - 2010 - 756,459
  - 2050 - 1,139,922
- 5 County Region
  - 2010 - 804,610
  - 2050 - 1,189,253
- Labor force derived from labor force participation rate and forecasting from Congressional Budget Office

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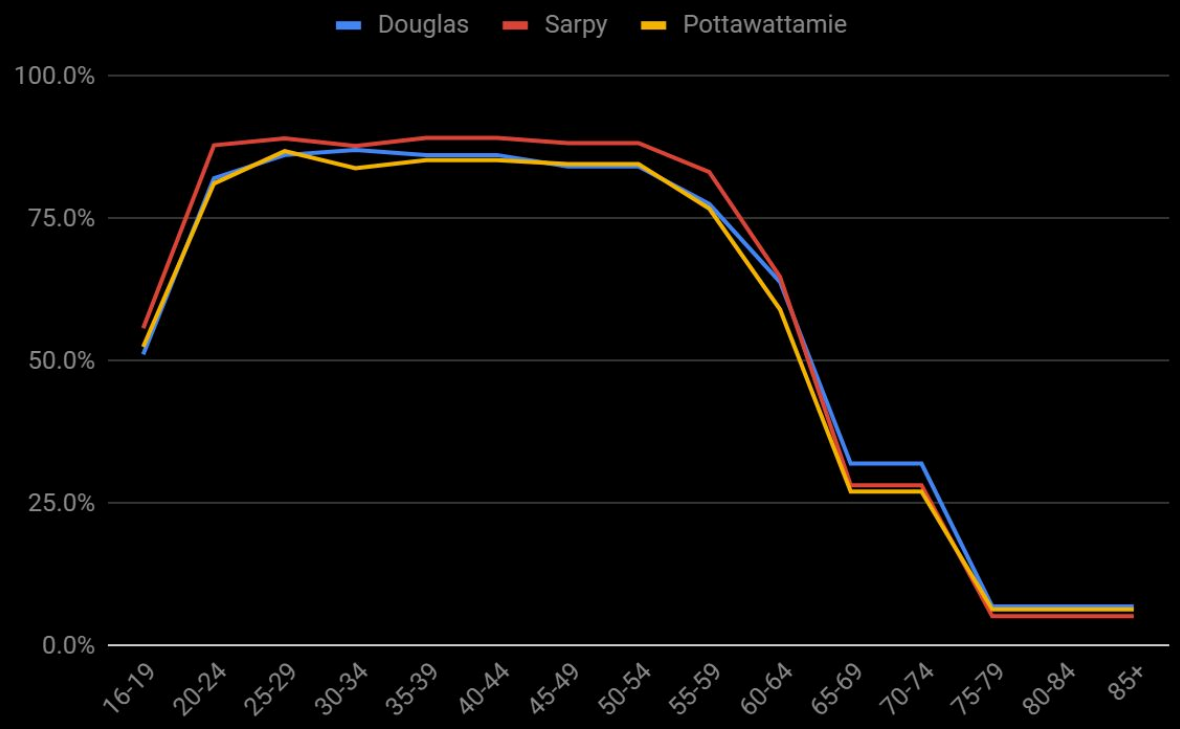
Labor Force Participation Rate



- Labor Force Participation Rate derived from Census data
- Forecasted using national estimates from Congressional Budgeting Office
- Converts population into number of workers - where they live!

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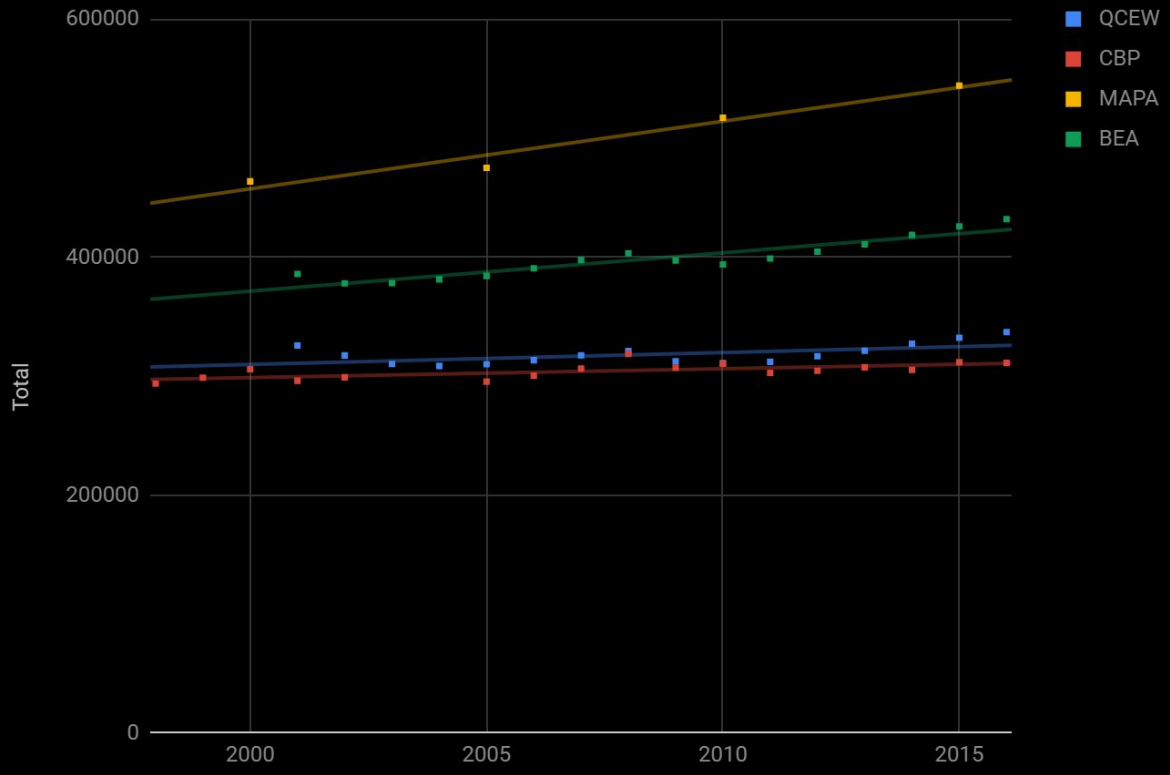
Employment Data Sources



- Where do they work?
- ~~Infogroup~~
- BLS - Quarterly Census of Employment and Wages
- County Business Patterns
- Bureau of Economic Analysis
- MAPA Historical data

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Classification

NAICS		
Industrial	22.15%	
Office	50.79%	
Commercial	27.06%	
Forecast	445,032	Adjusted to TMA
	382,036	Minus special categories
Industrial	84,617	
Office	194,025	
Commercial	103,394	
School	23,248	Derived from OPS data
Hospital	13,016	Derived from NAICS
Hotel	5360	Derived from NAICS
Boys Town	400	
Data Center	609	KSF * 0.1545 derived emp/ksf factor
Offutt	10,257	
Eppley	2,800	
UNO	2,194	
UNMC	5,112	

- Weighted employment data to match regional industry breakdown
- Included “special use” data categories based on unique development situations
- Used Longitudinal Employment-Household Dynamics (QCEW) to derive share of employment by county

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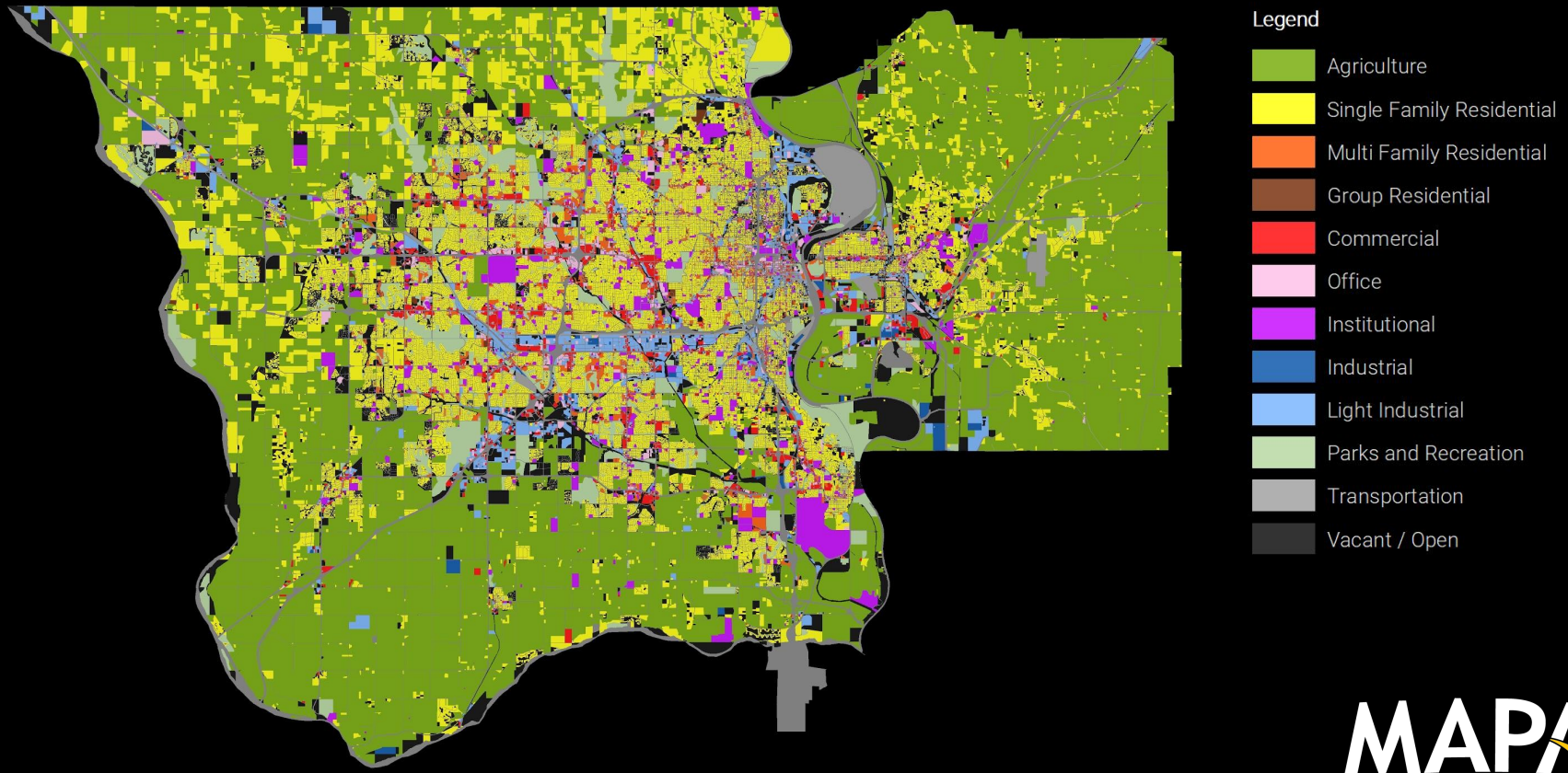
Existing Land Use

Parcel Data



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Crosswalk Development

Proposed Existing Land Use Categories							
Proposed Categories	Iowa DOT Cod	Iowa DOT Labe	Iowa DOT Description	Iowa DOT Definition	DCAACCTYPE or BLDG_DESC	Qualifier	Proposed Omaha Definition
Agriculture	95	IAG	Intensive Agriculture	Intensive agriculture uses are rare, including nurseries and seed farms with few if any structures.	Nursery/Greenhouse	Site by Site analysis	The use of land for agricultural activities, such as farming, seeding, cultivating, and harvesting for the production of food and fiber products. Also includes sod production, seed farms, and orchards. Residential and storage uses are incidental to the agricultural use.
	96	AG	Agriculture	Agricultural and farming uses are common in outlying parts of planning areas. Uses can include crop land, barns, out buildings and farm houses.	Agricultural > 20 (DCAACCTYPE)		
					Grbt Par Ex		
Residential - Single Family	11	SFD	Single-Family Detached	Single family detached housing units are the most common residential use.	1 1/2 Story Fin	Unless DCAACCTYPE = Agricultural > 20	A single-family residential use with no physical or structural connection to any other dwelling unit.
					1 1/2 Story Unfin	Unless DCAACCTYPE = Agricultural > 20	
					2 1/2 Story Fin	Unless DCAACCTYPE = Agricultural > 20	
					2 1/2 Story Unfin	Unless DCAACCTYPE = Agricultural > 20	
					2 Story	Unless DCAACCTYPE = Agricultural > 20	
					3 Story	Unless DCAACCTYPE = Agricultural > 20	
					A Frame	Unless DCAACCTYPE = Agricultural > 20	
					Cabin	Unless DCAACCTYPE = Agricultural > 20	
					Dome	Unless DCAACCTYPE = Agricultural > 20	
					Double Wide	Unless DCAACCTYPE = Agricultural > 20	
					Earth Sheltered	Unless DCAACCTYPE = Agricultural > 20	
					Mult Level	Unless DCAACCTYPE = Agricultural > 20	
					Raised Ranch	Unless DCAACCTYPE = Agricultural > 20	
					Ranch	Unless DCAACCTYPE = Agricultural > 20	
					Split Entry	Unless DCAACCTYPE = Agricultural > 20	
					Tri Level	Unless DCAACCTYPE = Agricultural > 20	
					Modular	Unless DCAACCTYPE = Agricultural > 20	
					Self Service Booth	if DCAACCTYPE Residential	
					Single Wide	Unless DCAACCTYPE = Agricultural > 20	
	19	MHP	Mobile Home Park	Mobile home park or manufactured home housing units are usually clustered in a single development with multiple units per parcel. These units are usually missing from parcel dwelling unit counts.	Mobile Home Parks *CODE		Use of a site for one or more mobile home units.
Residential - Single Family Attached / Duplex / Triplex / Fourplex	20	SFA	Single Family Attached	Single family attached housing units include duplexes where 2-3 units are on a single parcel; and condominium units which are multi-unit developments in a multi-story building, or single story buildings with shared common walls or buildings grouped around common areas.	Duplex 1 1/2 Story		The use of a site for two to four attached dwelling units, each occupied by one family, sharing at least one common wall, and not defined as a Townhouse.
					Duplex One Story		
					Duplex Split Entry		
					Duplex Split Level		
					Duplex Tri Level		
					Duplex Two Story		
					Triplex One Story		
					Triplex Two Story		
					Fourplex One Story		
					Fourplex Split Level		
					Fourplex Two Story		
idential - /nhouse	20	SFA	Single Family Attached	Single family attached housing units include duplexes where 2-3 units are on a single parcel; and condominium units which are multi-unit developments in a multi-story building, or single	Townhouse 1 1/2 Story		The use of a site for three or more attached dwelling units, each occupied by one family and separated by vertical side walls extending from foundation through roof
					Townhouse One Story		
					Townhouse Split Entry		
					Townhouse Split Level		

- Worked with local jurisdictions to develop land use coding from parcel data
- All three counties used different classification systems
- Used aerial photography to verify vacant parcels - good intern task :(

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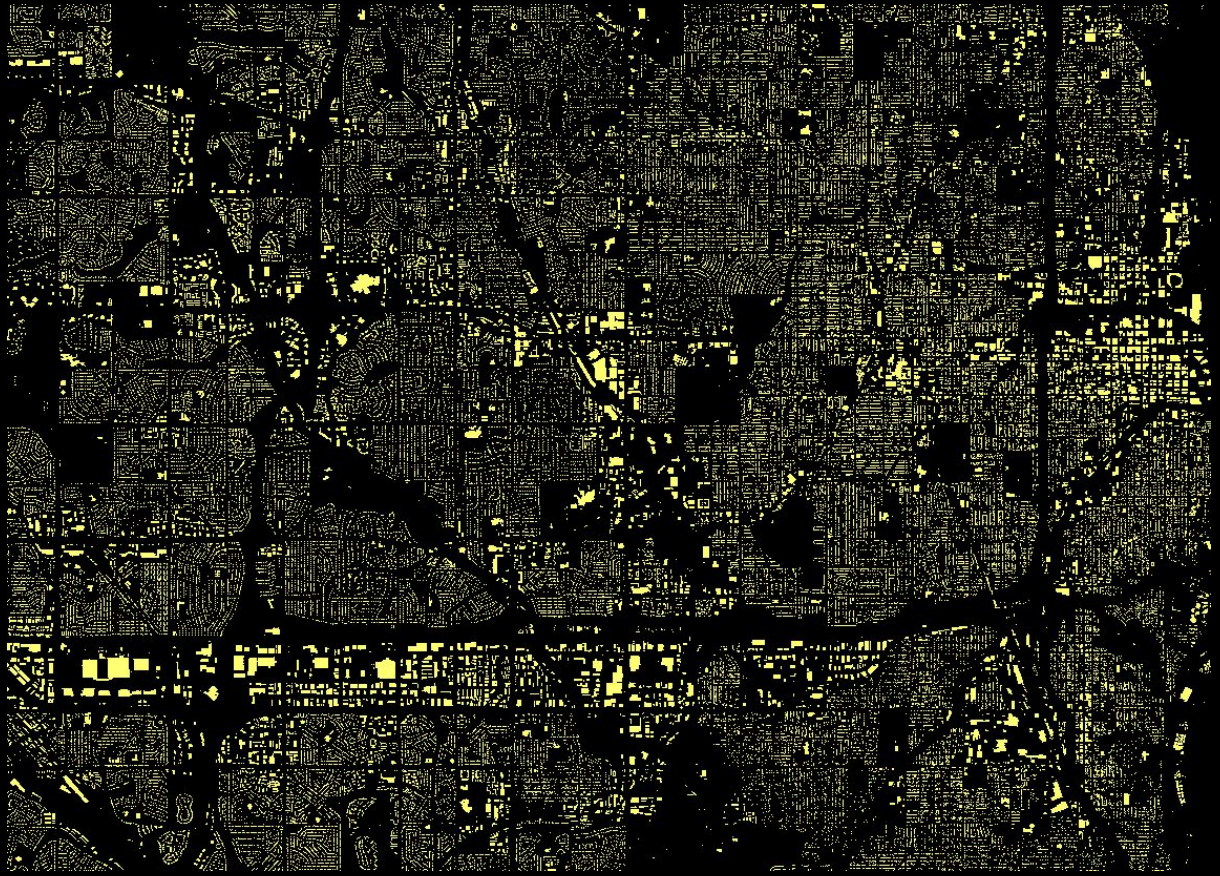
Data Inconsistencies



- Housing unit and building square footage data was incomplete
- Where building size data is unavailable building footprints were used as a proxy - relationship between known land use/ksf and footprint size
- Where both footprint and KSF unavailable used land use code factor

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Microsoft USBuildingFootprints

- MS developed algorithm for nationwide building footprints
- https://github.com/Microsoft/USBuildingFootprints
- Not as accurate as local data but good enough for most purposes
- Available as vector tile and GeoJSON

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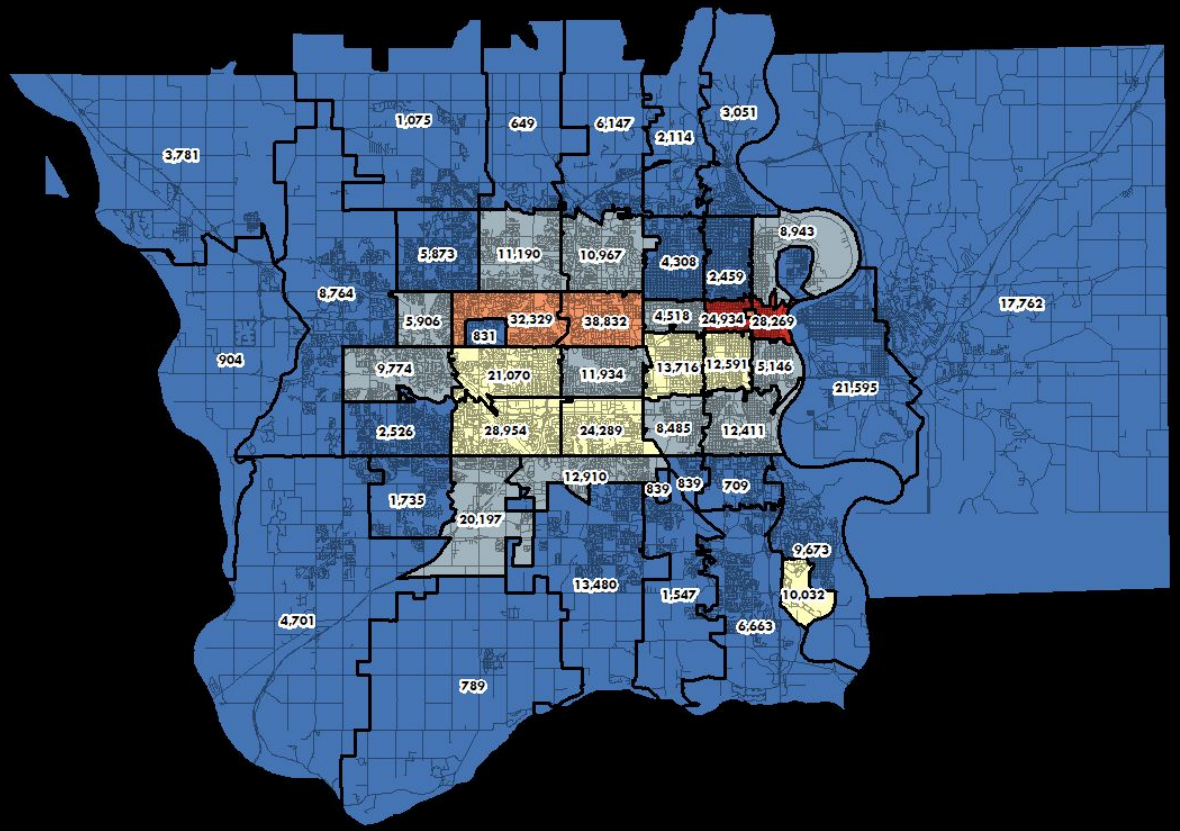
Validation



- Once data assumptions were finalized they needed to be validated with some sort of control
- Subtracted “special use” employment and then rebalanced proportionally to QCEW zip code data
- Also reviewed by local jurisdictions

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Final Checks

- ISMS Coding
- Duplicates
- Residence without HU
- Emp without KSF
- Generalized Classification
- Special Employment
  - Military, University, Hospital
- Year Built Data
- Park/Open Space/Vacant coding
- KSF and Employment Interoperability
  - Should be proportional

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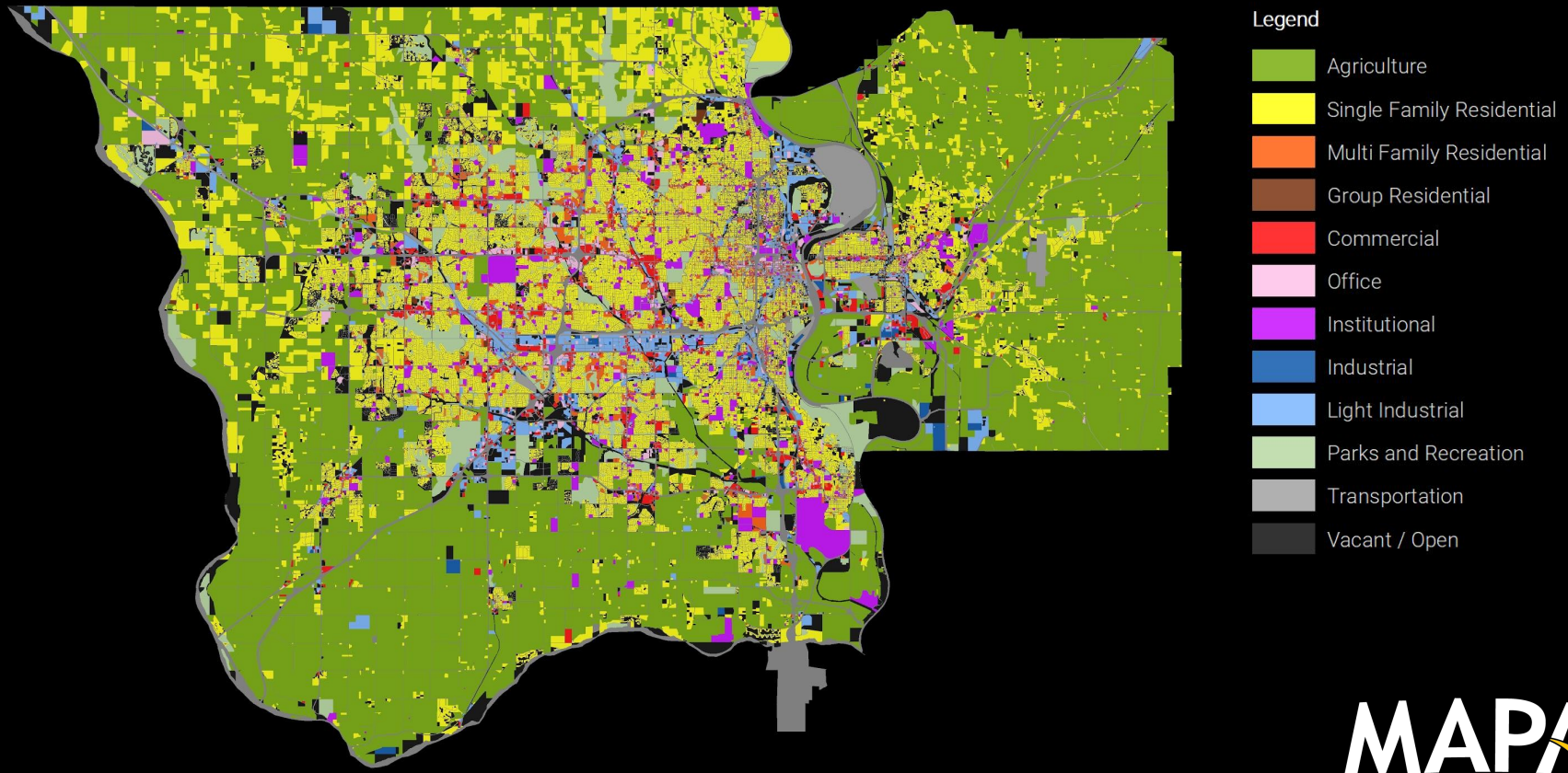
Future Land Use

Parcel Data



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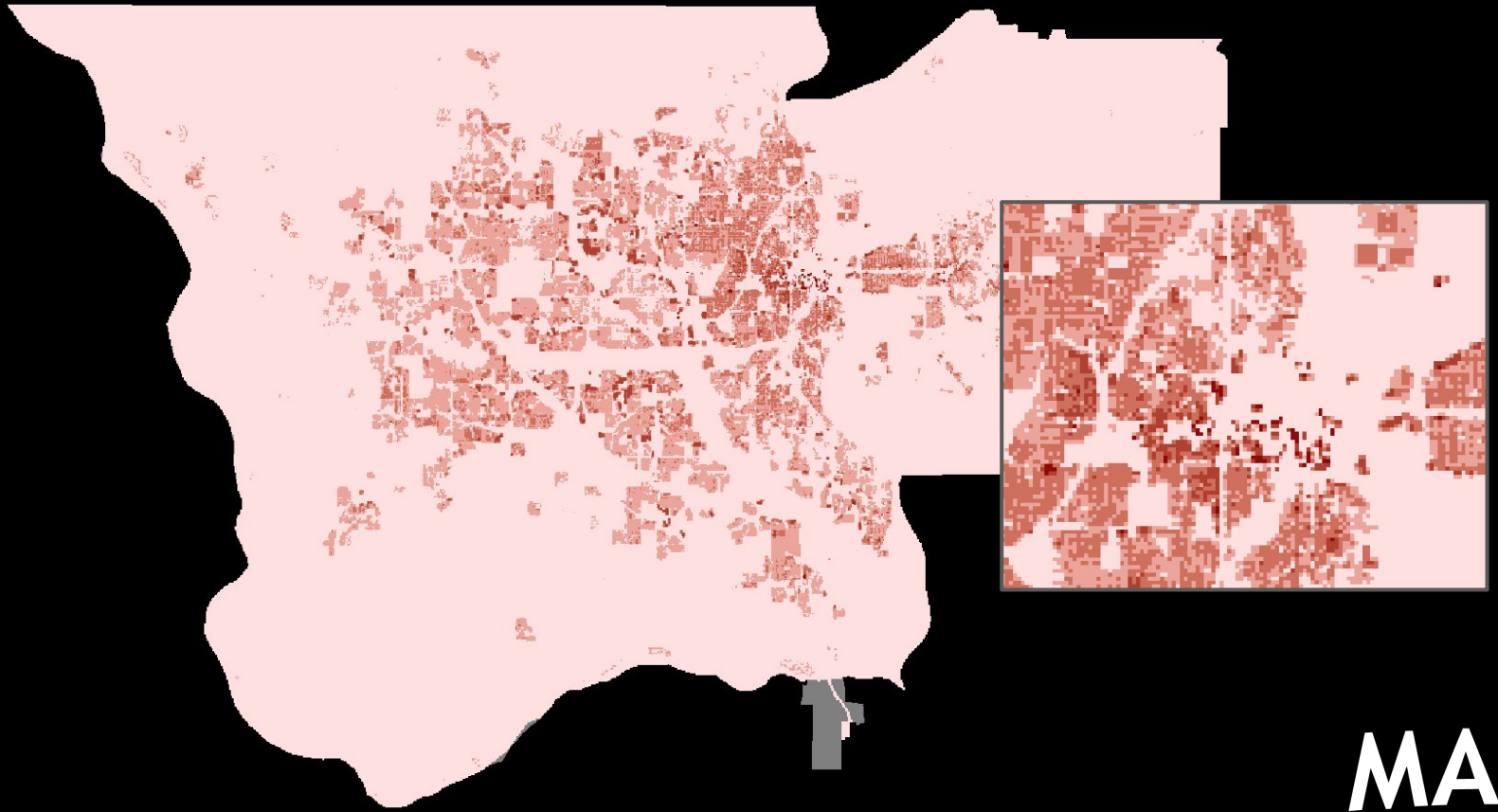
Grid Conversion - Housing Units



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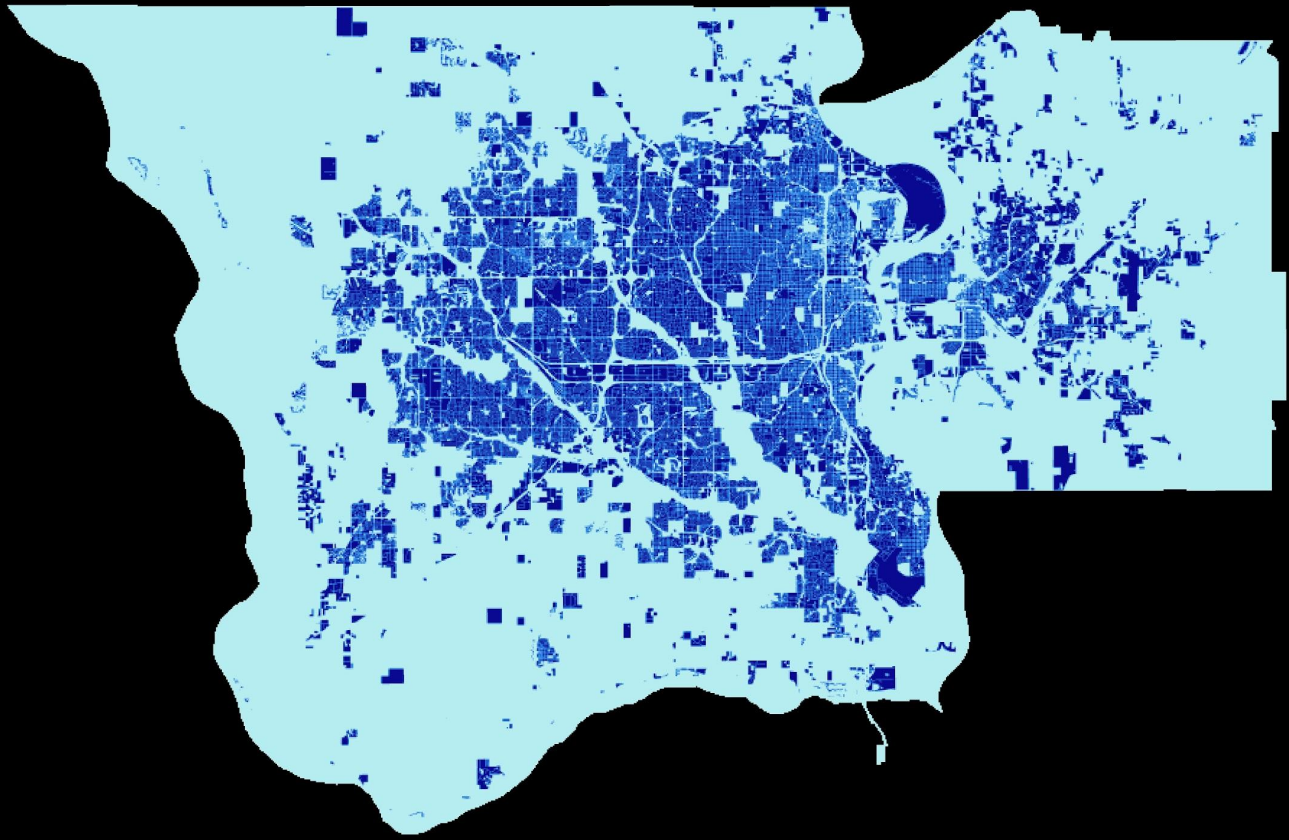
Future Grid - Existing Development



- Development converted to consistent ~1.5 acre grid
- Overlapping parcel data used to calculate amount of development in each grid

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Future Grid - Constraints

- Amount of constrained development calculated for each grid
- Floodways, historical and cultural resources, parks, environmental resources

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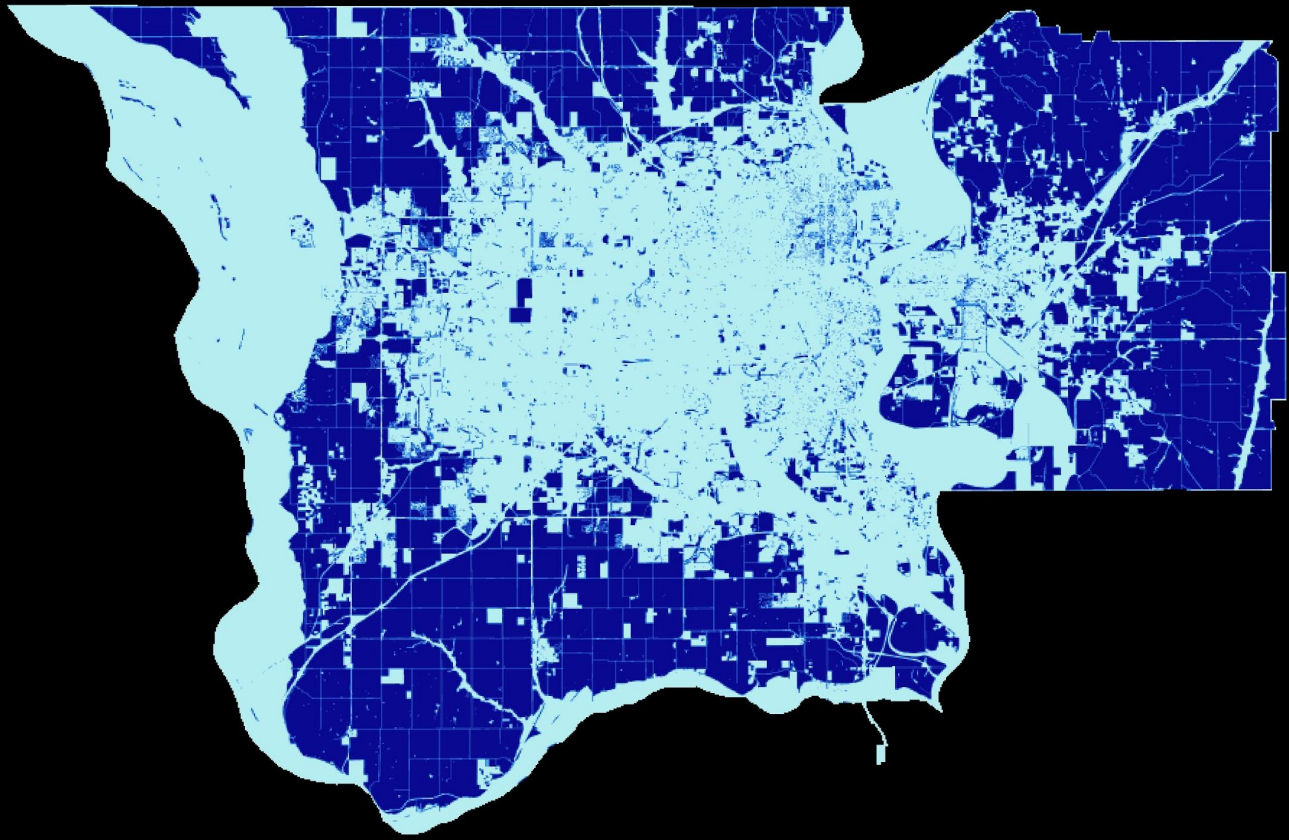
Future Grid - Available Acreage



- “Developable” land is leftover and available for future allocation
- Roadways and other infrastructure areas omitted

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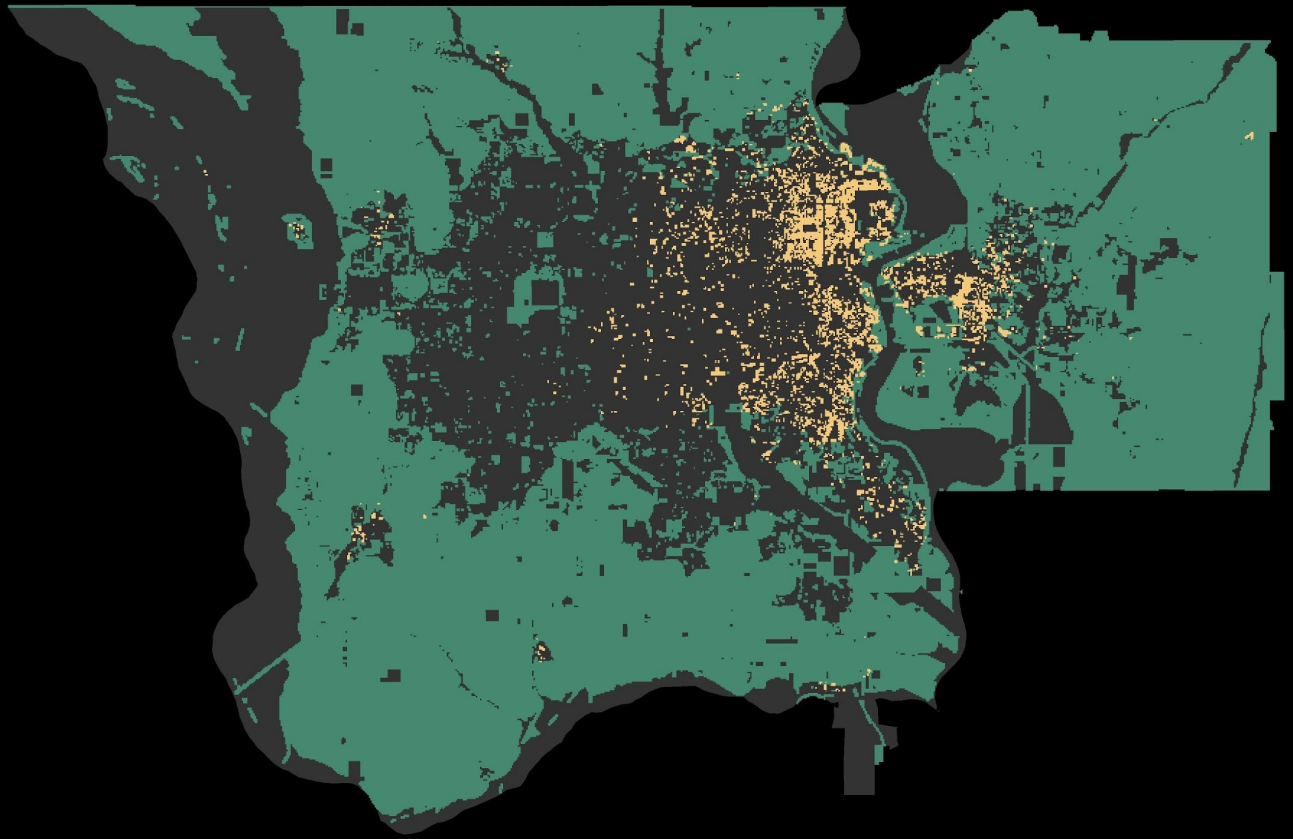
Future Grid - Greenfield vs Infill



- Infill and greenfield are identified for scenario development
- USDA Cropland Data Layer used to determine greenfield areas

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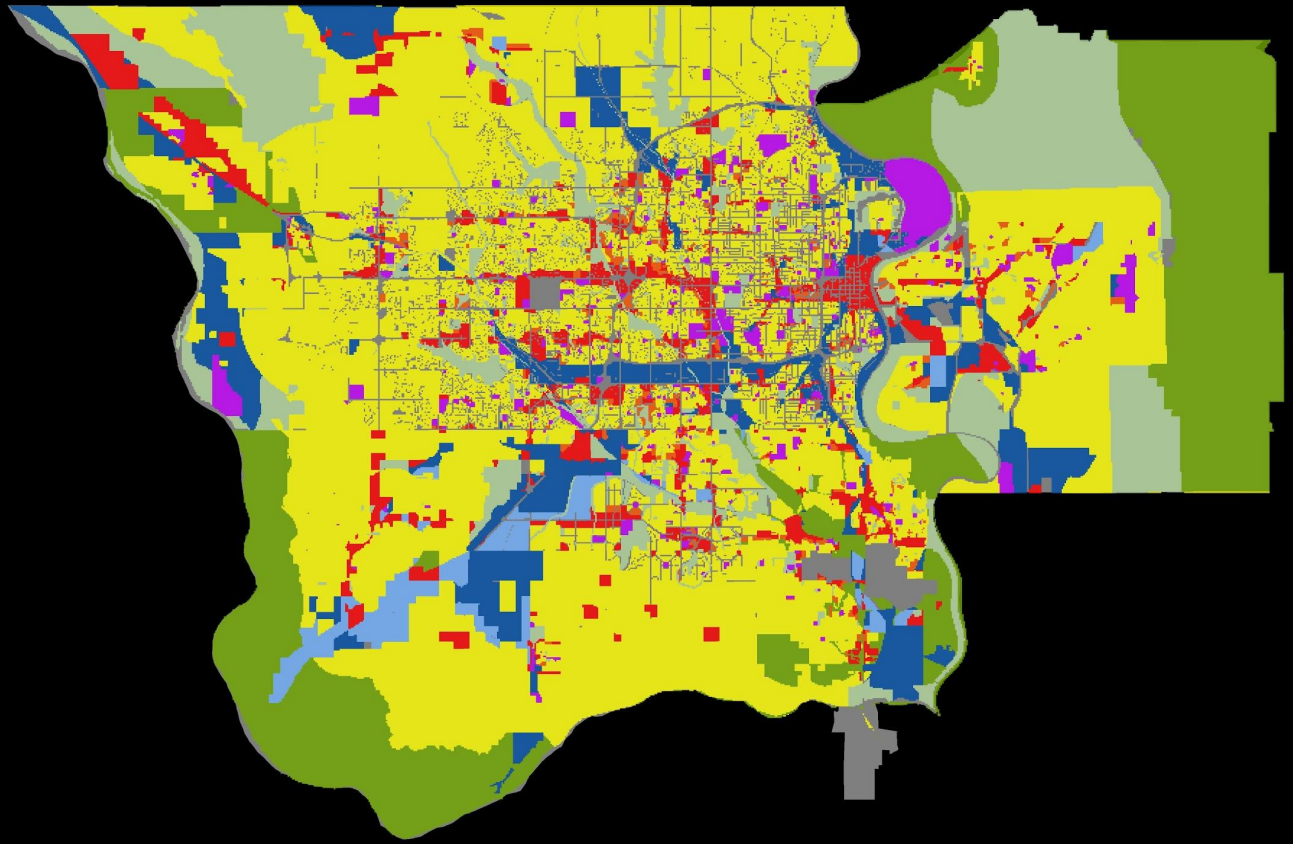
Future Grid - Land Use Plans



- Local land use plans used to code potential future land uses
- Matched to factors derived from existing data to determine amount of activity by type

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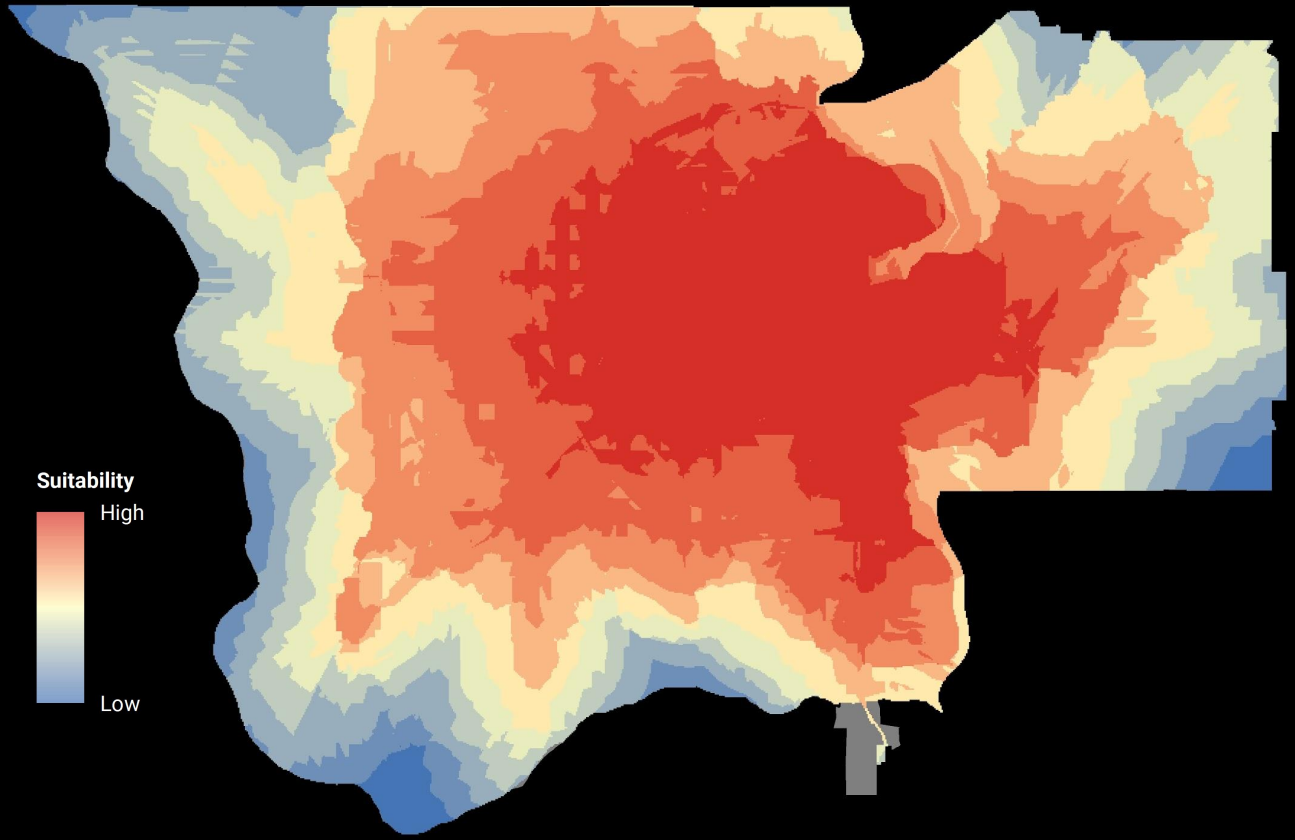
Future Grid - Suitability



- Suitability calculated to prioritize allocation
- Proximity to infrastructure, economic activity, existing development

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Scenarios

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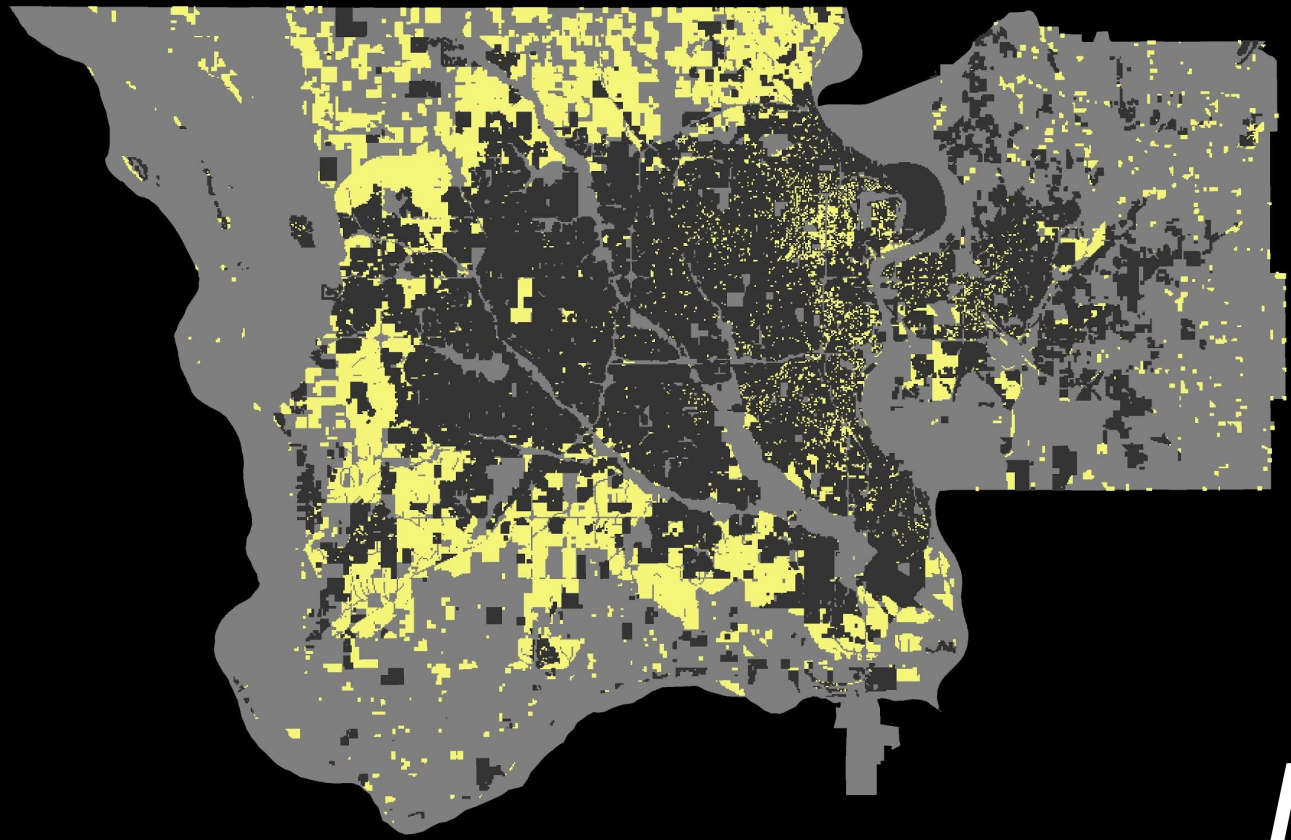
Future Grid - Preferred Scenario



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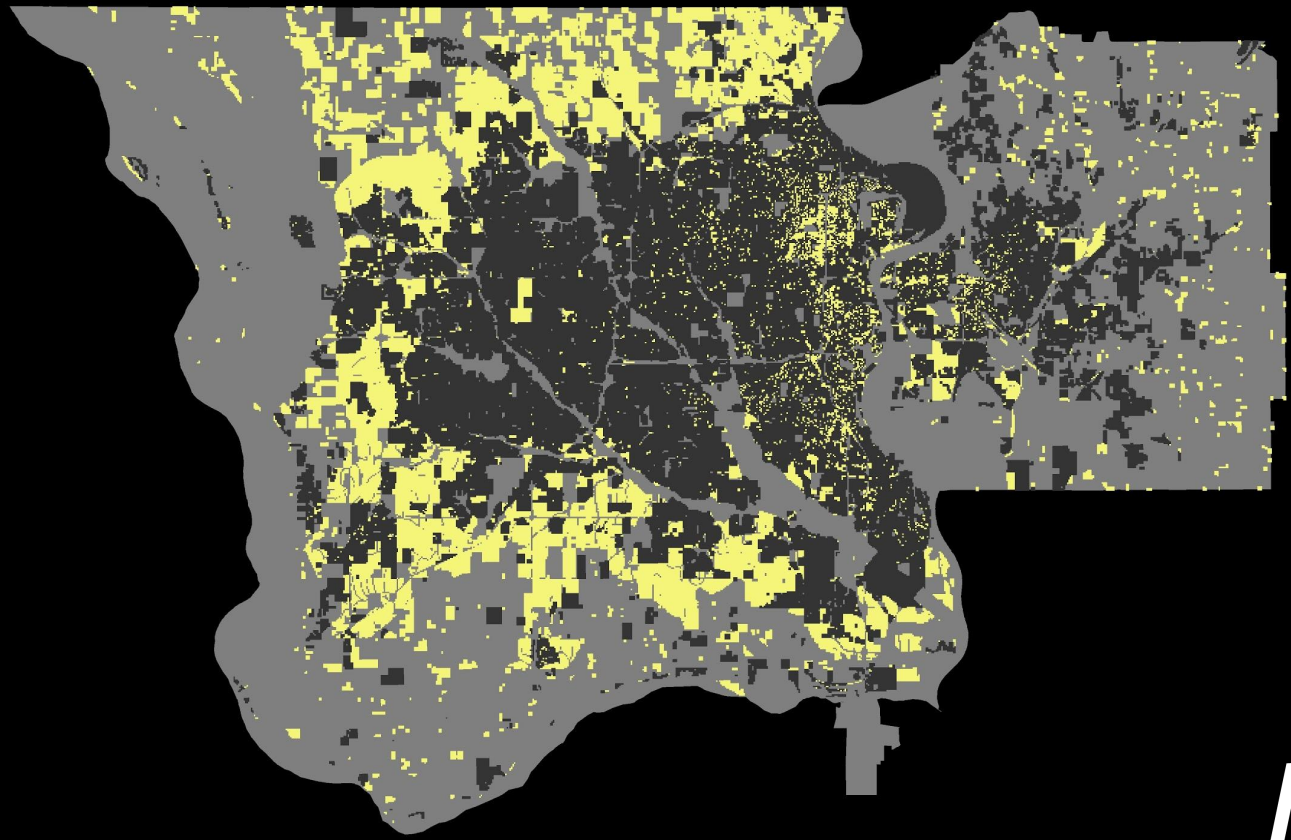
Future Grid - High Density Alternative



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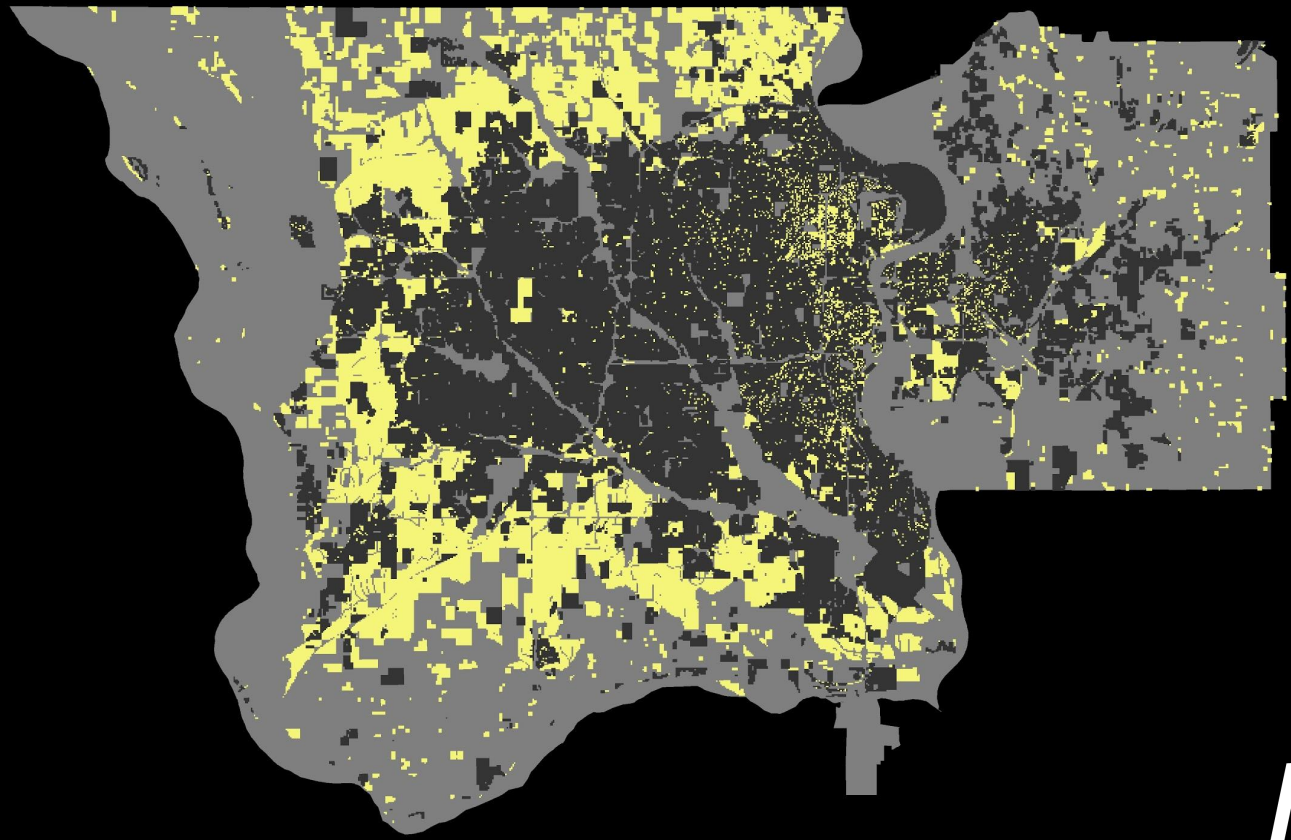
Future Grid - Low Density Alternative



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Questions/Discussion?

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