INCOG Employment Projection Model

2030 Projections To the Transportation Analysis Zone (TAZ) Level

Prepared by: INCOG

June 30, 2005

The Projections

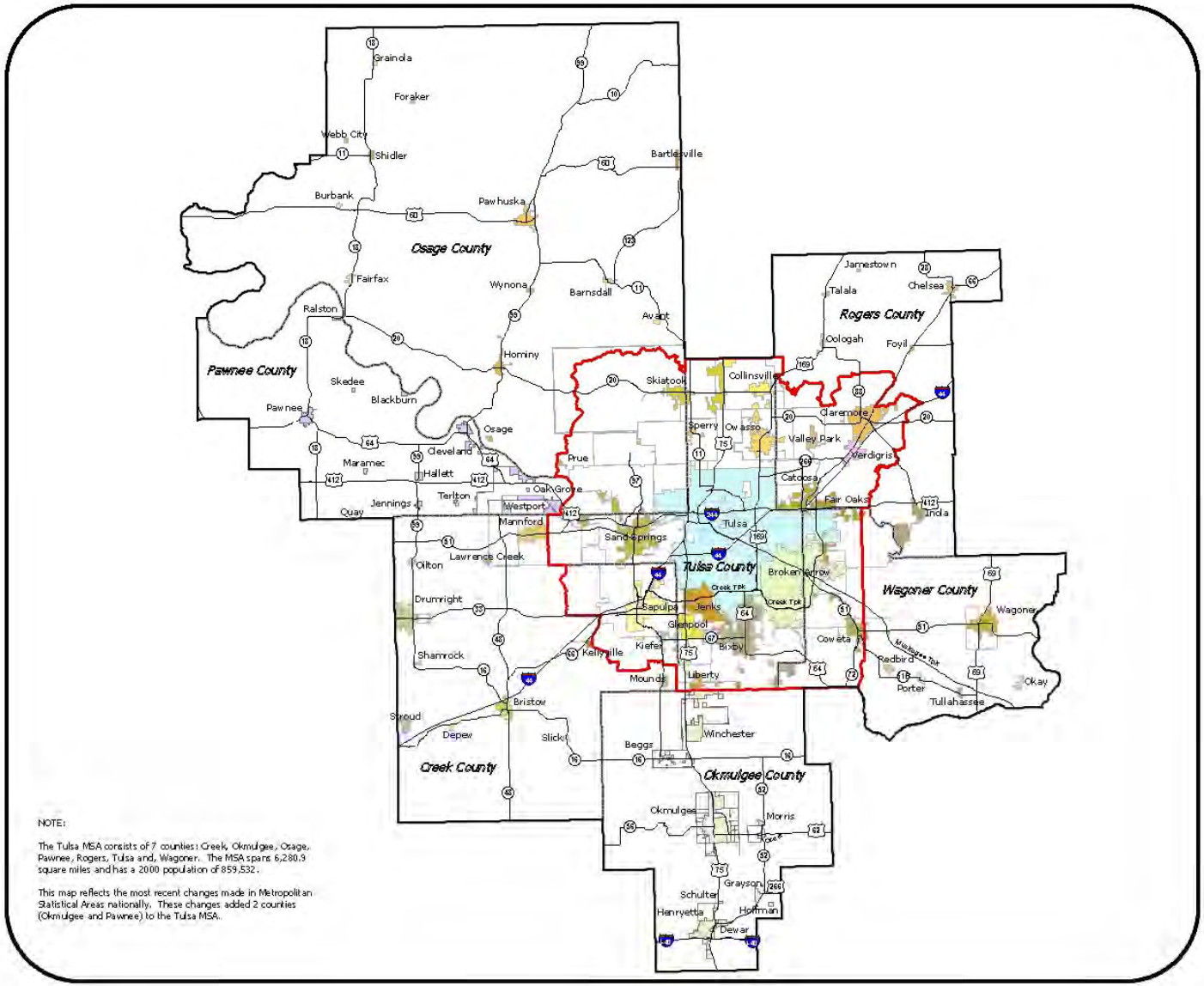
- Two Levels to the question:
  - Overall, total projections for the TMA region
  - Where will the growth occur within the boundaries of the region

TMA Projections

- Regional projections were developed on a constant shift-share basis based upon the U.S. Bureau of Economic Analysis (BEA) Regional Economic Information System (REIS).
- These projections are done at the metropolitan area level.
- The MSA projections are split into the portion located within the TMA for each industrial category. These are the control totals used.
- Other data used was from U.S. Economics and Statistics Administrations County Business Patterns; BEA Regional Economic projections and, Economic Census; Oklahoma Employment Security Commission (OESC) projections and OESC's employment data (ES-202 data file); and the 2000 Decennial Census.

Estimated 2000 and Projected 2030 Employment, Tulsa TMA

Industrial Category:	2000	2030	Change 2000-2030
Farm	3,393	3,393	0
Agriculture, Fishing, & Forestry	3,513	4,062	550
Mining	10,319	9,840	-478
Construction	22,643	26,739	4,096
Manufacturing	45,411	41,814	-3,596
Transportation, Communication, & Utilities	30,009	33,247	3,238
Wholesale Trade	19,451	19,095	-356
Retail Trade	66,894	81,525	14,631
Finance, Insurance, & Real Estate	29,226	31,404	2,178
Services	134,361	213,646	79,285
Government	45,683	48,727	3,044
Total	410,902	513,493	102,591



NOTE:

The Tulsa MSA consists of 7 counties: Creek, Okmulgee, Osage, Pawnee, Rogers, Tulsa and, Wagoner. The MSA spans 6,280.9 square miles and has a 2000 population of 859,532.

This map reflects the most recent changes made in Metropolitan Statistical Areas nationally. These changes added 2 counties (Okmulgee and Pawnee) to the Tulsa MSA.

The Tulsa Metropolitan Area and the Transportation Management Area

Legend

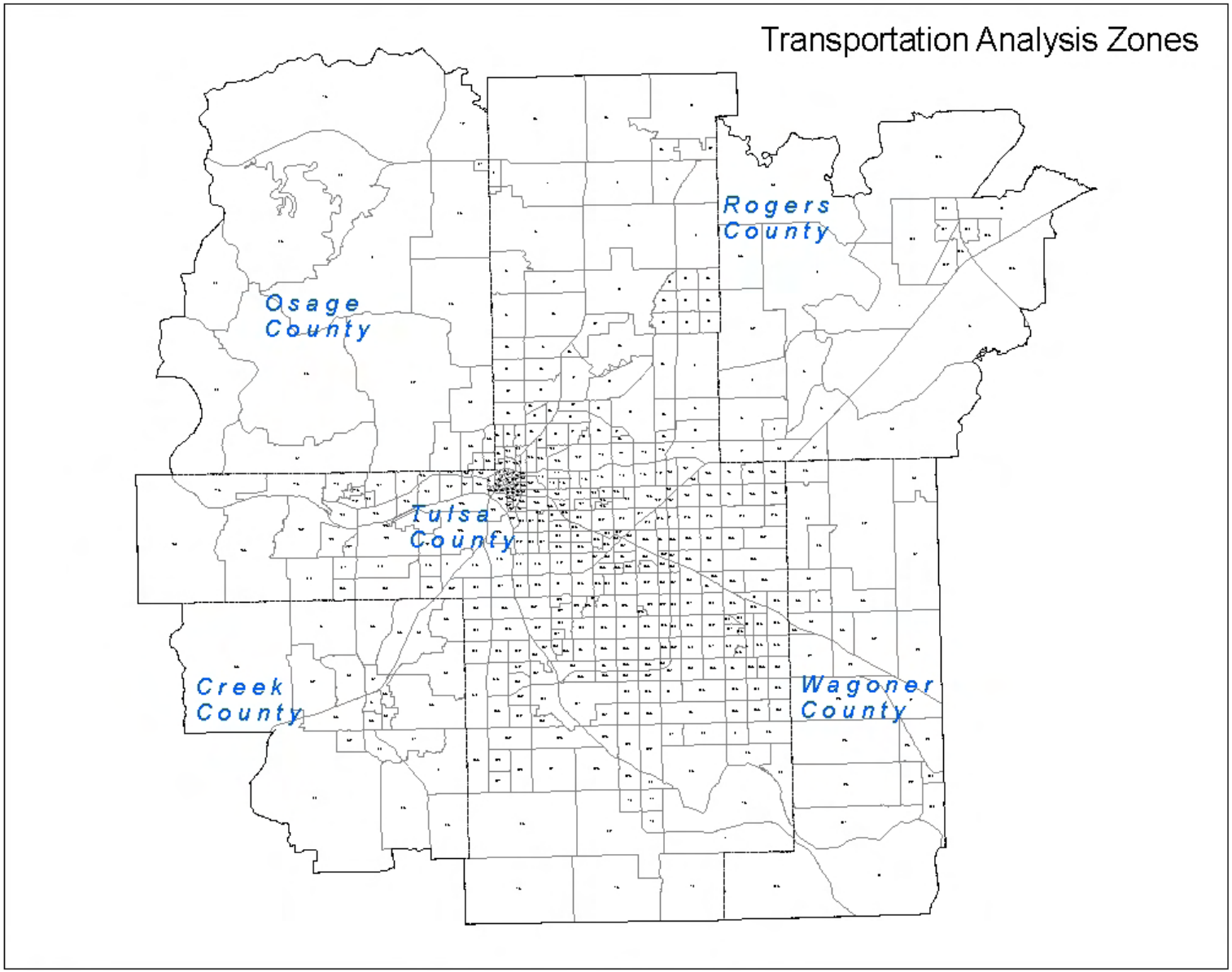
- Transportation Planning Area
- County Boundaries
- Highways
- Cities and Towns

N W E S

Miles

0 5 10 15 20 25

Prepared by: INCOG
2/9/03


Transportation Analysis Zones
Rogers County
Osage County
Tulsa County
Creek County
Wagoner County

Industrial Growth Location is a Function of Two Items:

- Available Land
- The Attractiveness or Desirability of the Land to Industrial Development

Available land is a Function of:

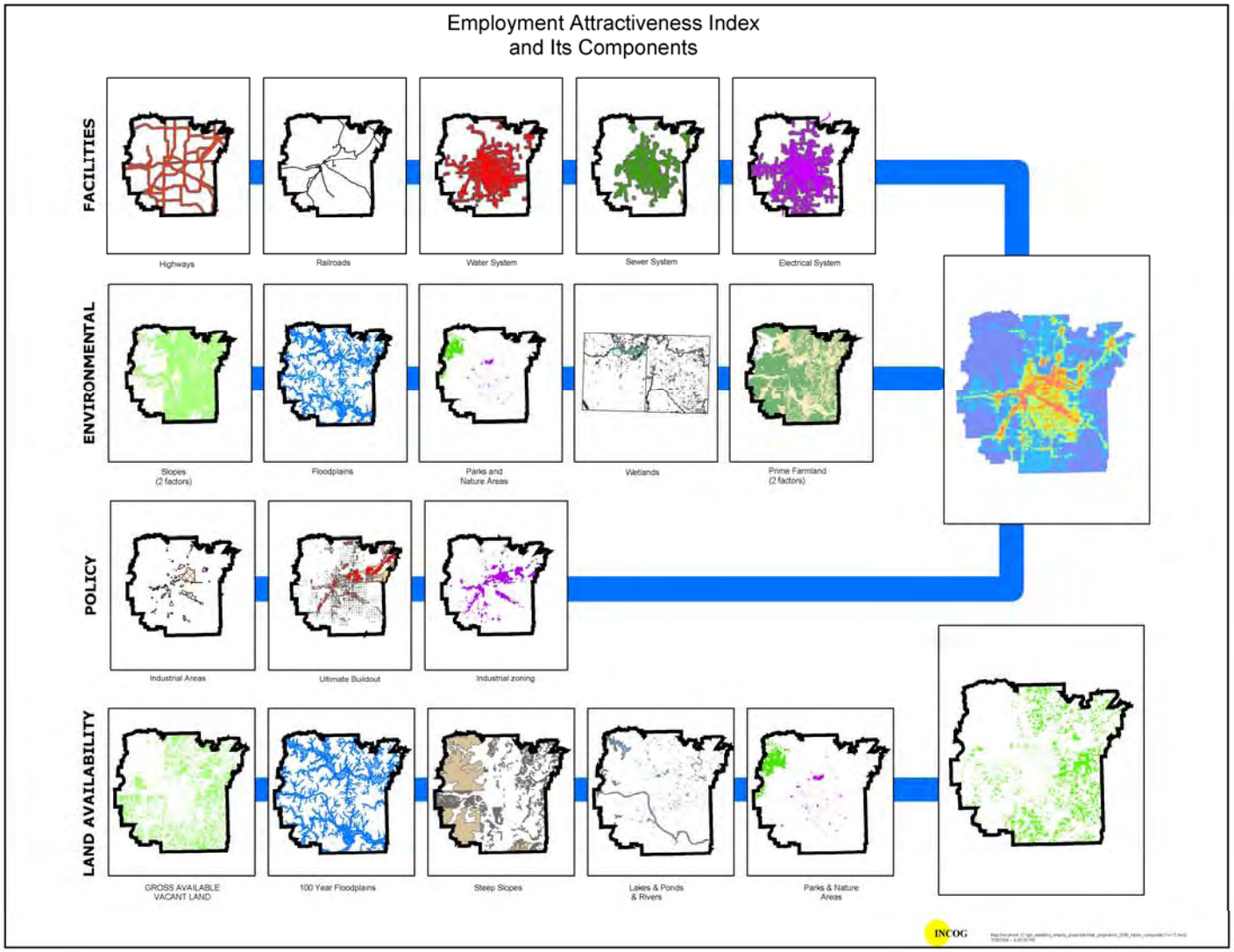
- Not being located in a 100 year floodplain
- Not being located in a river, lake or pond
- Not being located in a park or nature preserve
- Not being located on very steep slopes
- Not being owned by a governmental entity or by a nonprofit organization
- Being vacant - defined as having a total improvement value of zero $
- Not identified as being a residential use

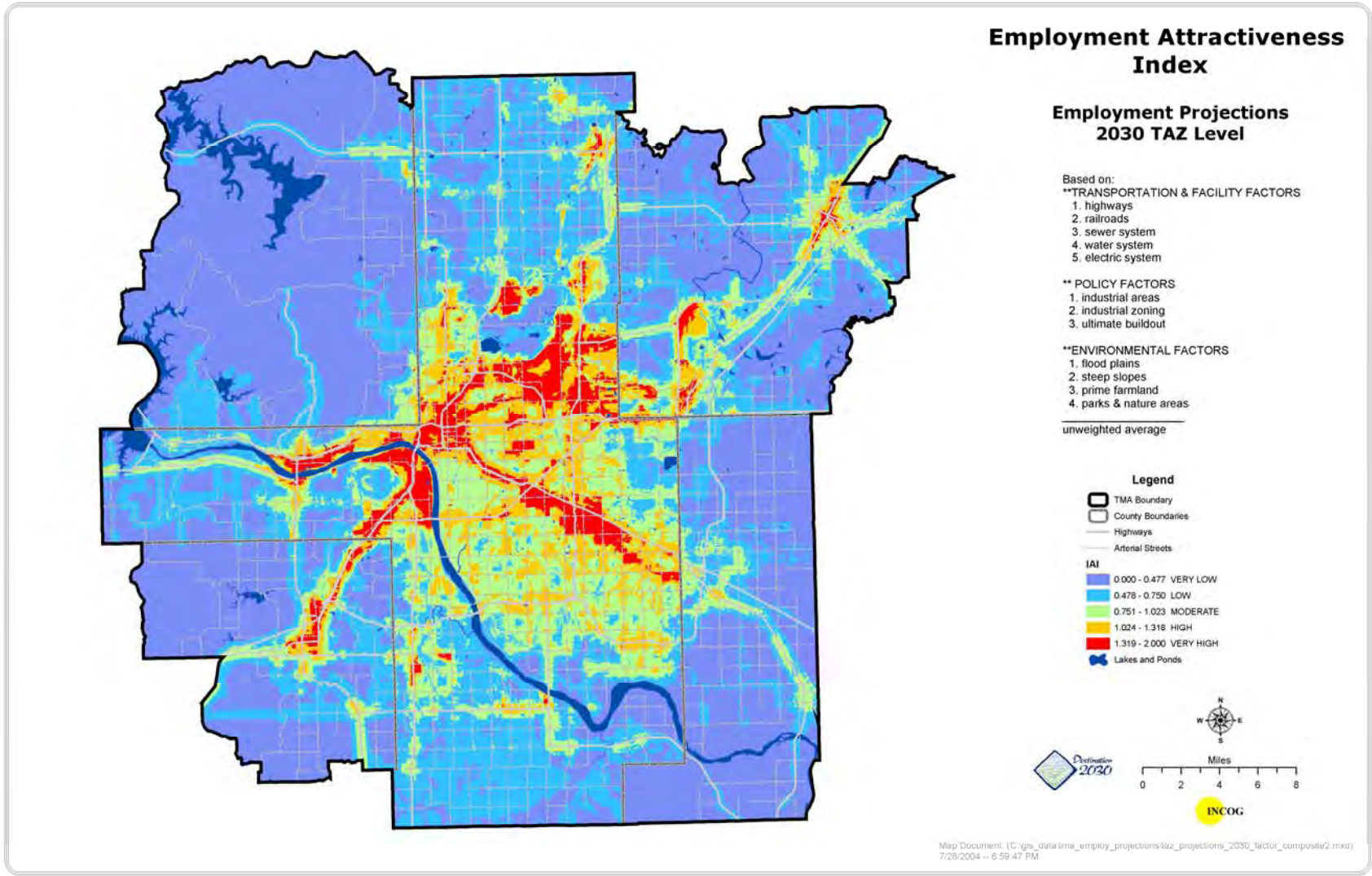
Attractiveness is a Function of:

- **Available Facilities/Services**
  - Adjacent to Highways
  - Close to Railroads
  - Availability of Water Service
  - Availability of Sewer Service
  - Availability of Electrical Service
- **Environmental Factors**
  - Slopes
  - Floodplains
  - Parks and nature Preserves
  - Prime farmland
  - Wetlands
- **Public Policy Issues**
  - In Industrial Areas
  - Industrially Zoned
  - In an Area Identified as being for high or moderate Intensity uses in Comprehensive Plans

The Employment Attractiveness Index (EAI)

- The 12 layers of factors are combined or merged together.
- This process creates unique, irregularly shaped geographic entities covering all locations within the Tulsa Transportation Management Area (TMA).
- The separate factor ratings, or scores, are added together for each individual cell generating a summary rating, or score.
- The average score is calculated. This is the EAI.


Employment Attractiveness Index
and Its Components
FACILITIES
Highways
Railroads
Water System
Sewer System
Electrical System
ENVIRONMENTAL
Slopes
(2 factors)
Floodplains
Parks and
Nature Areas
Wetlands
Prime Farmland
(2 factors)
POLICY
Industrial Areas
Ultimate Buildout
Industrial zoning
LAND AVAILABILITY
GROSS AVAILABLE
VACANT LAND
100 Year Floodplains
Steep Slopes
Lakes & Ponds
& Rivers
Parks & Nature
Areas
INCOG


Employment Attractiveness Index
Employment Projections 2030 TAZ Level
Based on:
**TRANSPORTATION & FACILITY FACTORS
1. highways
2. railroads
3. sewer system
4. water system
5. electric system
** POLICY FACTORS
1. industrial areas
2. industrial zoning
3. ultimate buildout
**ENVIRONMENTAL FACTORS
1. flood plains
2. steep slopes
3. prime farmland
4. parks & nature areas
unweighted average
Legend
TMA Boundary
County Boundaries
Highways
Arterial Streets
IAI
0.000 - 0.477 VERY LOW
0.478 - 0.750 LOW
0.751 - 1.023 MODERATE
1.024 - 1.318 HIGH
1.319 - 2.000 VERY HIGH
Lakes and Ponds
N
W
E
S
Destination 2030
Miles
0
2
4
6
8
INCOG
Map Document: (C:\gis_data\tma_employ_projections\taz_projections_2030_factor_composite2.mxd)
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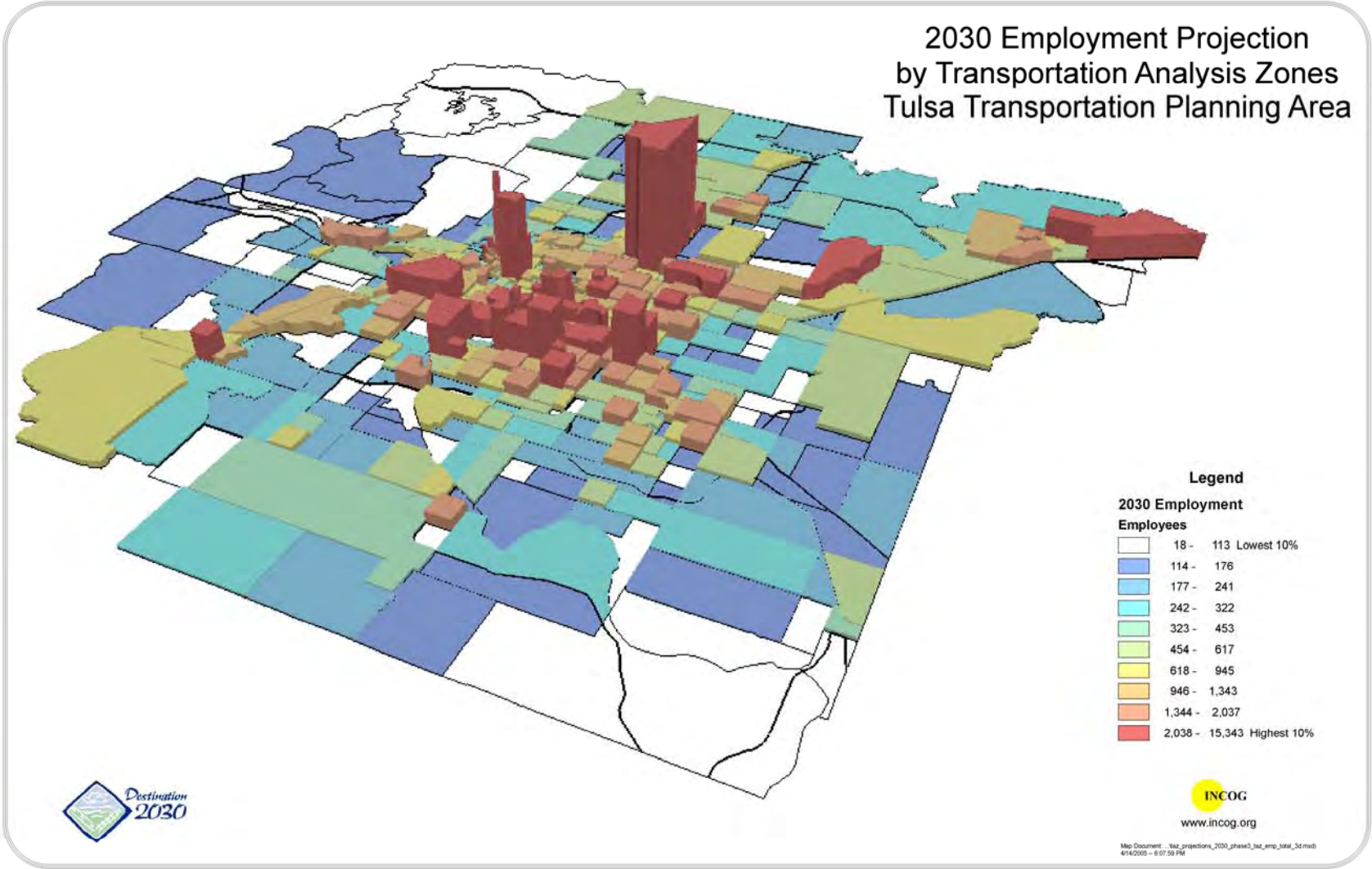
TAZ Projections

- Separate allocations are performed for basic employment and population serving employment.
- Available vacant land in a cell is then multiplied by the Employment Attractiveness Index (EAI) for that cell.
  - Examples:
    - 20 acres vacant * .5 EAI = 1
    - 20 acres vacant * 2 EAI = 40
    - 20 acres vacant * 0 EAI = 0
- The resulting values are aggregated to the TAZ level and then normalized, that is, expressed as a percentage.
- This value is used to allocate the projected employment growth to the TAZs.
- Population serving employment also takes into account the current location of population serving employment.
- The resulting projected employment for each TAZ is adjusted for: (a) growth known to have already occurred; (b) development known to be occurring over the near future and; (c) other local knowledge of local development patterns.


2030 Employment Projection
by Transportation Analysis Zones
Tulsa Transportation Planning Area
Legend
2030 Employment
Employees
18 - 113 Lowest 10%
114 - 176
177 - 241
242 - 322
323 - 453
454 - 617
618 - 945
946 - 1,343
1,344 - 2,037
2,038 - 15,343 Highest 10%
Destination 2030
INCOG
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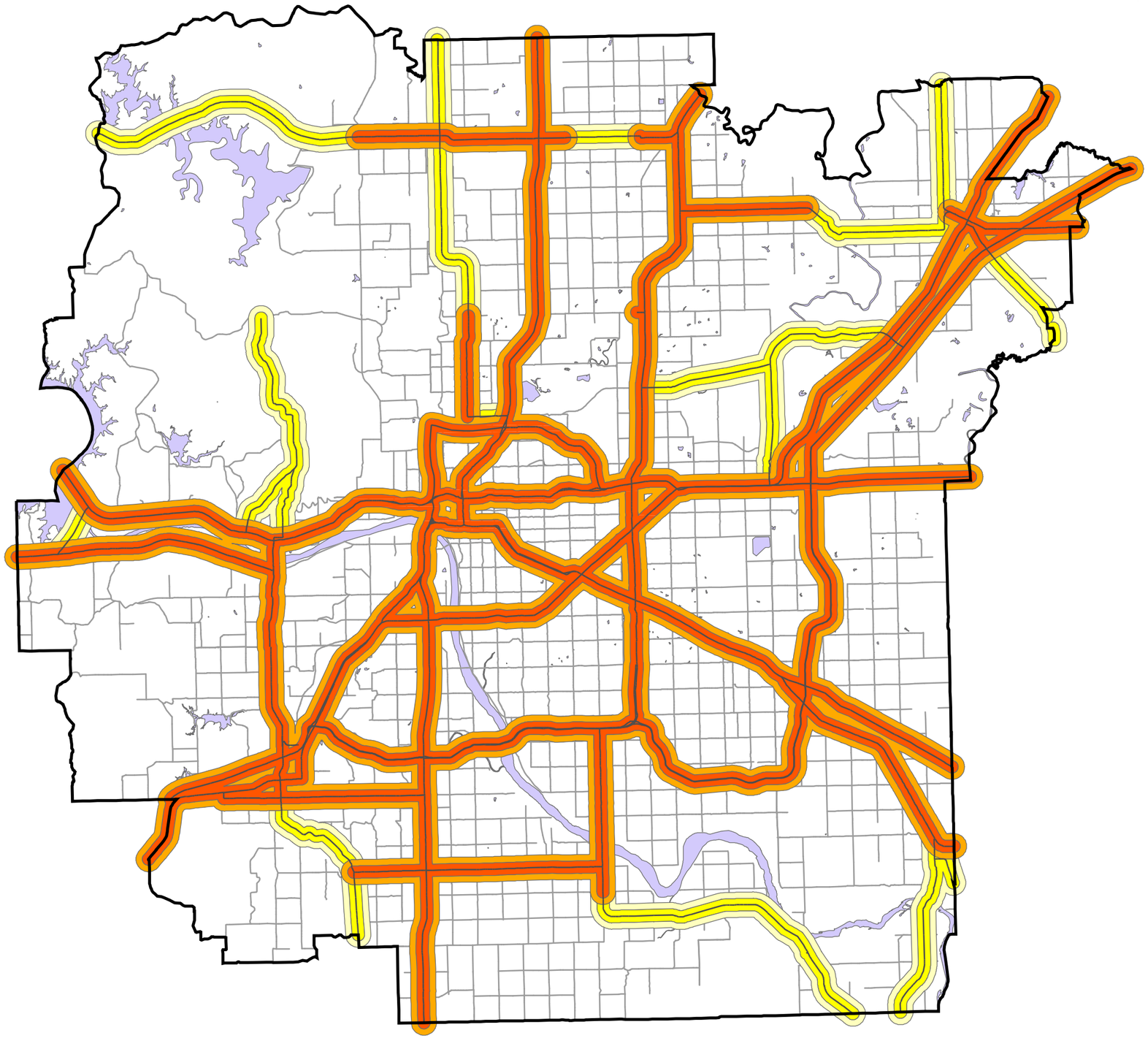
Technical Notes

- The entire projection model is done within the framework of a Geographic Information system (GIS).
- Specifically, ESRI ArcGIS version 9 is used. Both the spatial analyst and 3D spatial analyst extensions are utilized.
- The modeling language provided as part of version 9 is used whenever possible and extensively.

Attractiveness of Land for Industrial Development: Input Variables

Employment Attractiveness Index Factor: Highways



Legend

- Transportation Management Area
- highways Present and Committed
- Arterial Streets
- Lakes and Ponds

1/4 and 1/2 Mile Buffers

- 1/4 mile of 2 lane
- 1/2 mile of 2 lane
- 1/4 mile of 4 or more lanes
- 1/2 mile of 4 or more lanes

N W E S

Miles

0 1 2 3 4 5

Destination 2030

INCOG

Map Document: (C:\gis_data\tma_employ_projections\MAPS2\emp_2030_facility_highways(11x17 size).mxd)
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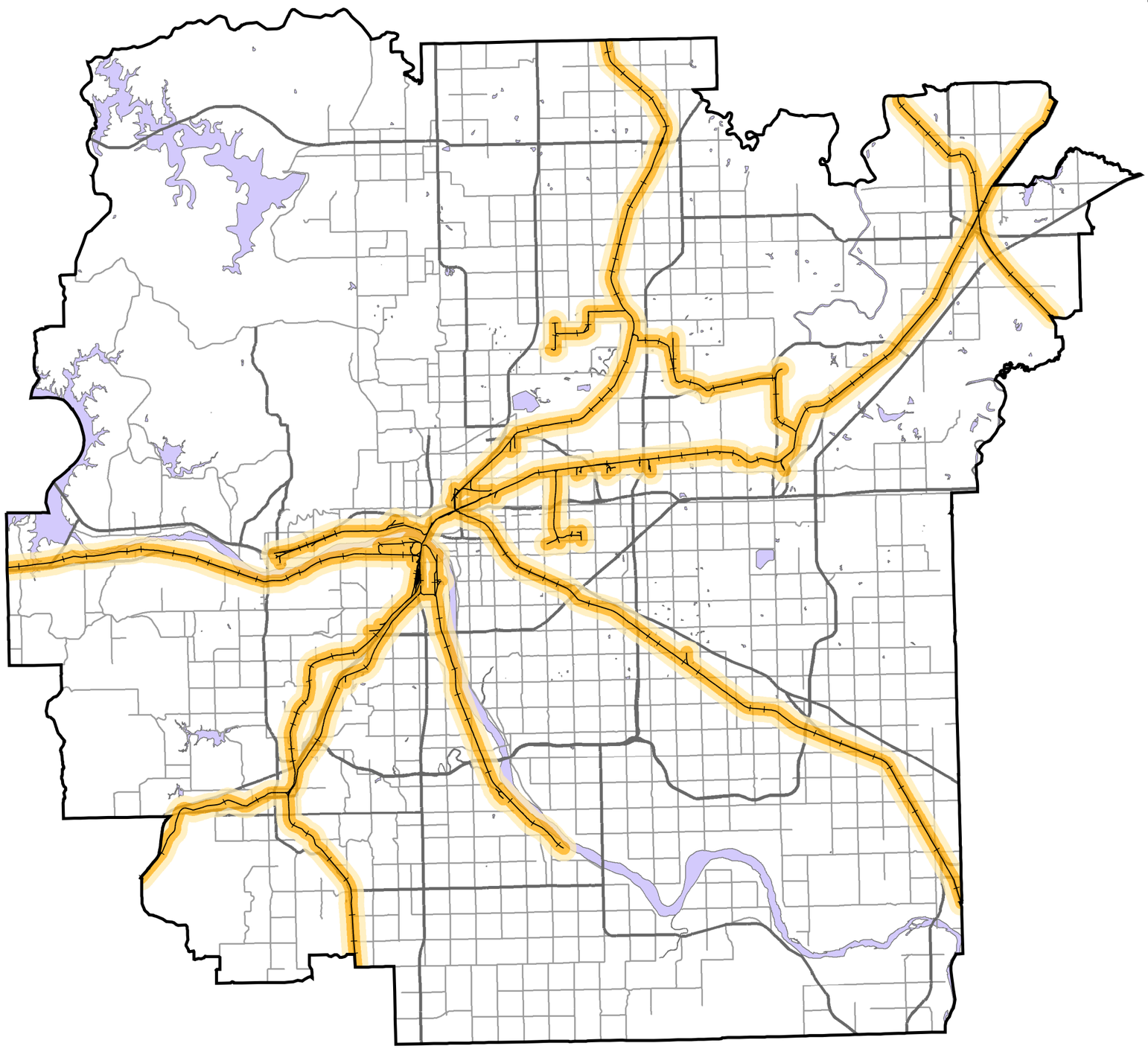
Employment Attractiveness Index Factor: Railroads



Legend

- Transportation Management Area
- Highways
- Arterial Streets
- Lakes and Ponds
- Railroads

1/4 and 1/2 Mile Railroad Buffers

distance

- 1/4 mile
- 1/2 mile

N W E S

Miles

0 1 2 3 4 5

Destination 2030

INCOG

Map Document: (C:\gis_data\tma_employ_projections\MAPS2\emp_2030_facility_railroads(11x17 size).mxd)
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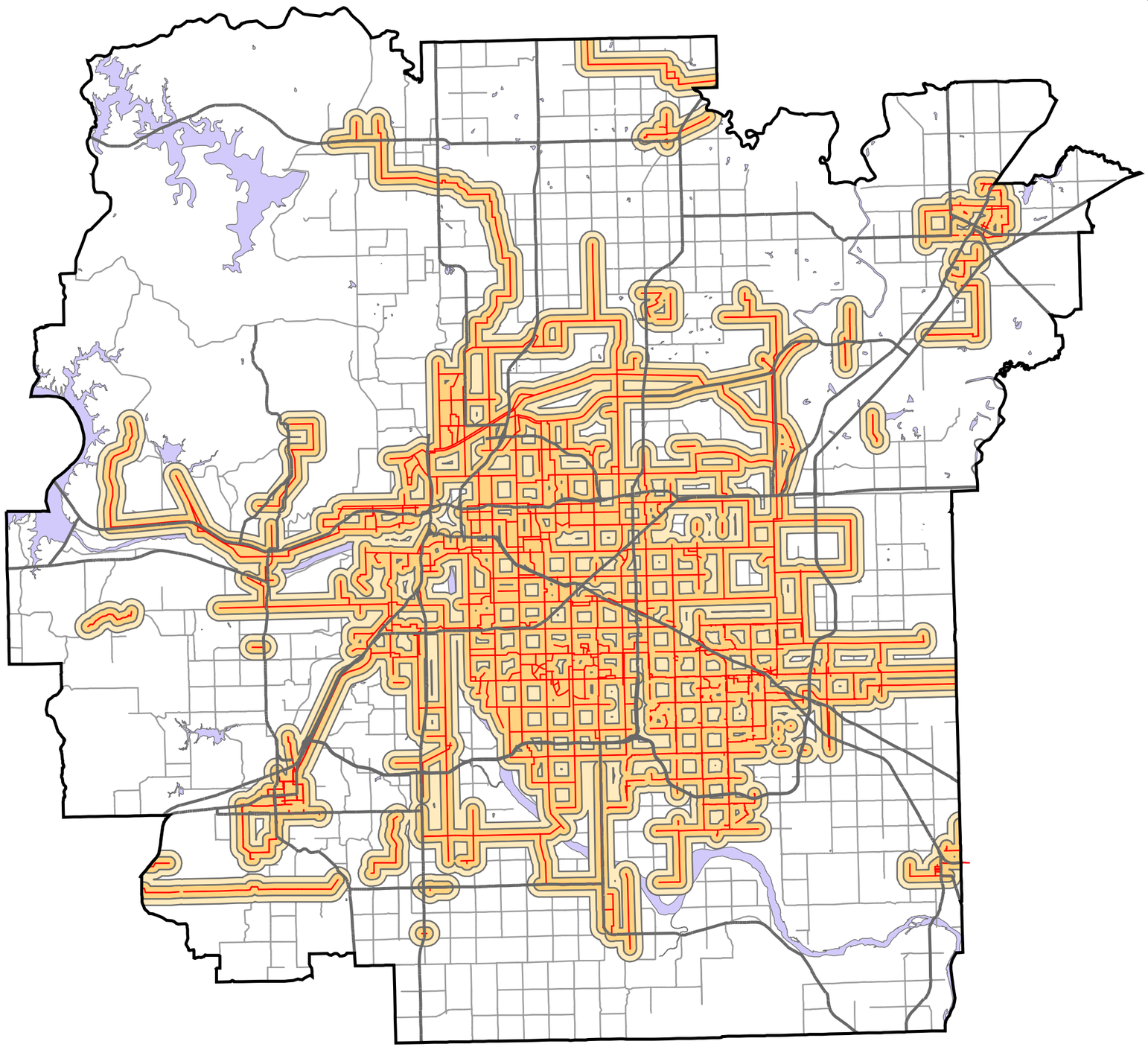
Employment Attractiveness Index Factor: Water System



Legend

- Transportation Management Area
- Highways
- Arterial Streets
- Lakes and Ponds
- Existing and Committed Water Lines

1/4 and 1/2 Mile Buffers

distance

- 1/4 mile
- 1/2 mile

N W E S

Miles

0 1 2 3 4 5

Destination 2030

INCOG

Map Document: (C:\gis_data\tma_employ_projections\MAPS2\emp_2030_facility_water_system(11x17 size).mxd)
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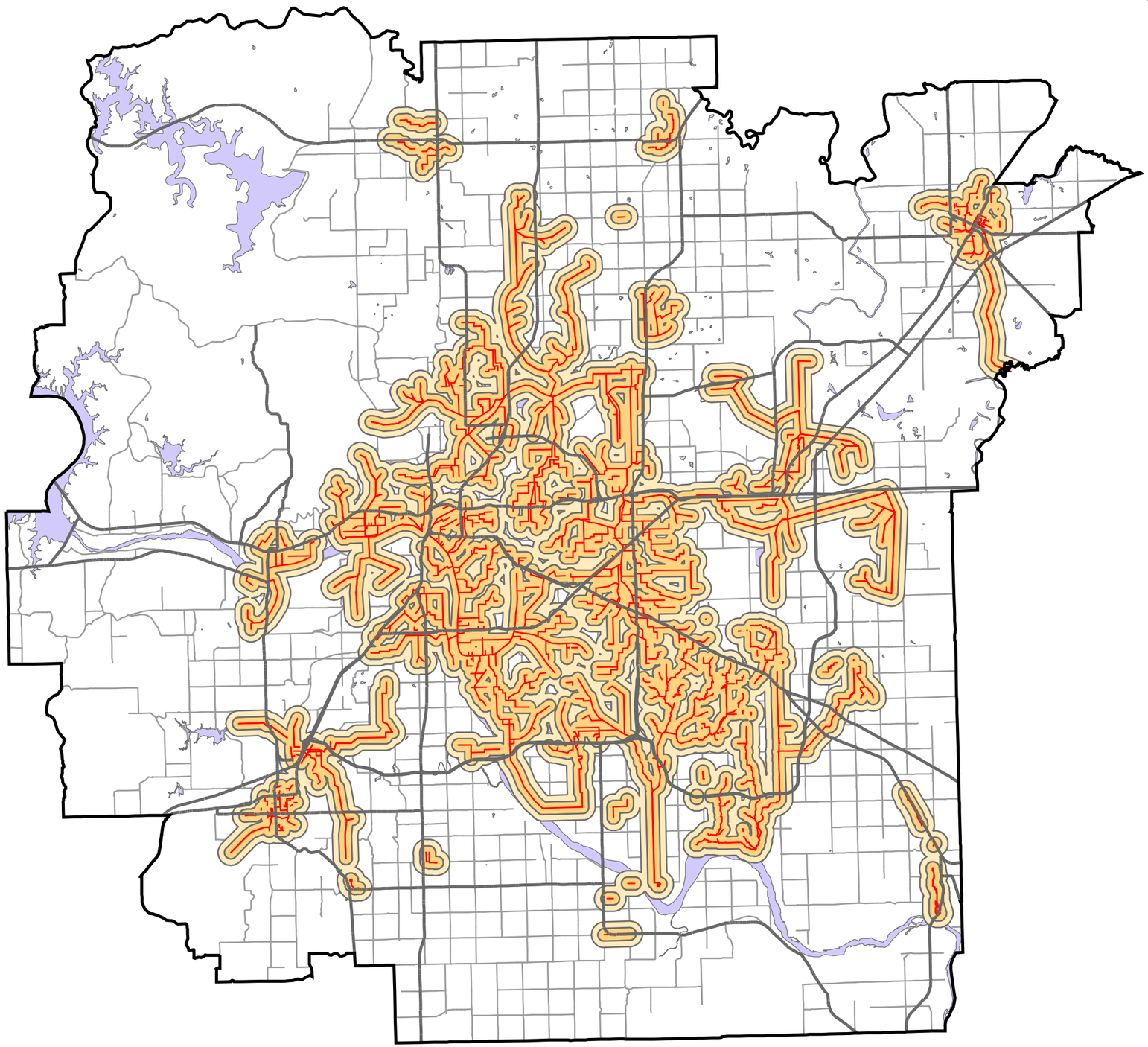
Employment Attractiveness Index Factor: Sewer System



Legend

- Transporation Management Area
- Highways
- Arterial Streets
- Lakes and Ponds
- Existing and Committed Sewer Lines

1/4 and 1/2 Mile Buffers

distance

- 1/4 mile
- 1/2 mile

N W E S

Miles

0 1 2 3 4 5

Destination 2030

INCOG

Map Document: (C:\gis_data\tma_employ_projections\MAPS2\emp_2030_facility_sewer_system(11x17 size).mxd)
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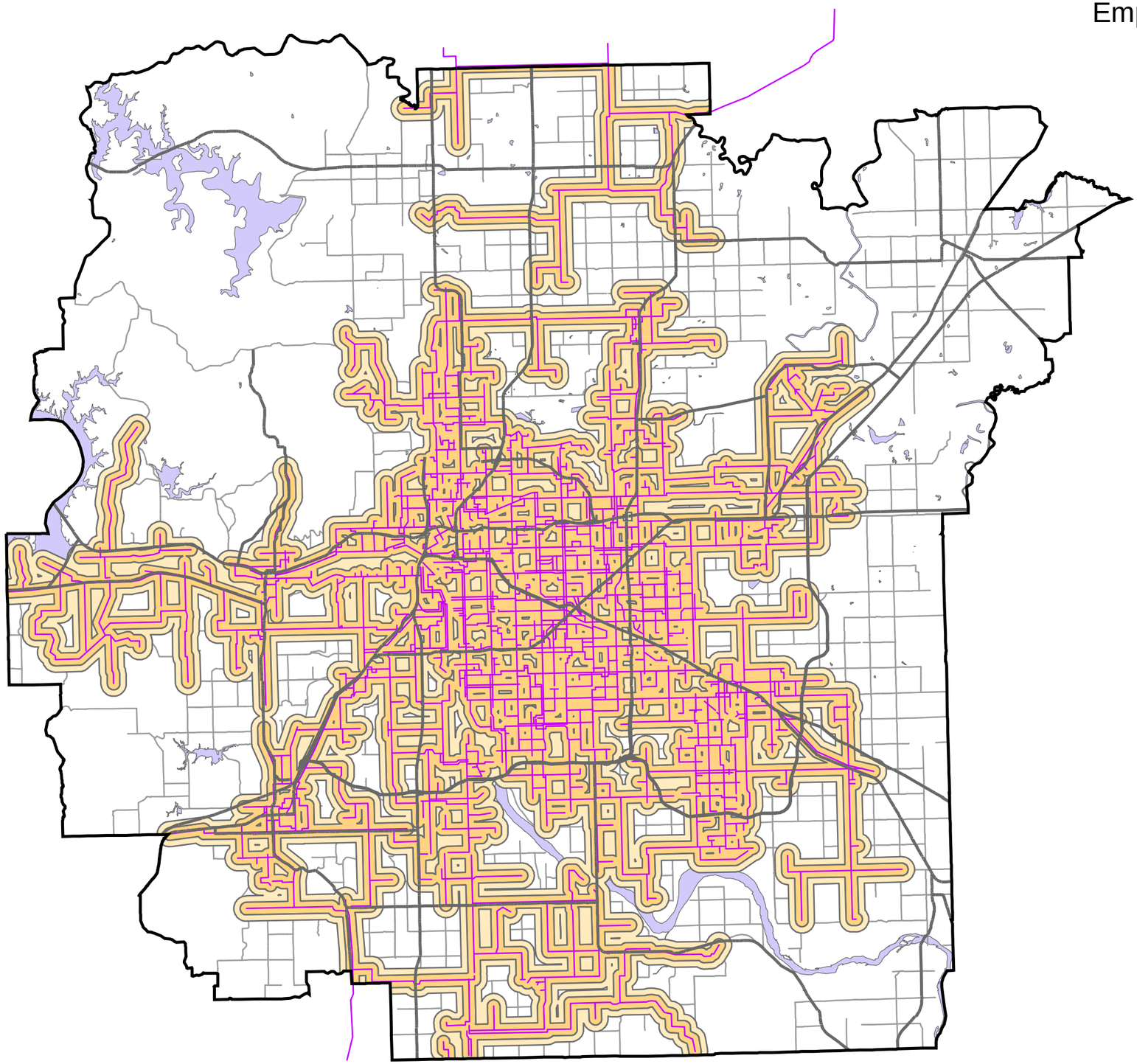
Employment Attractiveness Index Factor: Electrical System



Legend

- Transportation Management Area
- Highways
- Arterial Streets
- Lakes and Ponds
- Electric Lines

1/4 and 1/2 Mile Buffers

distance

- 1/4 mile
- 1/2 mile

N W E S

Miles

0 1 2 3 4 5

Destination 2030

INCOG

Map Document: (C:\gis_data\tma_employ_projections\MAPS2\emp_2030_facility_electrical_system(11x17 size).mxd)
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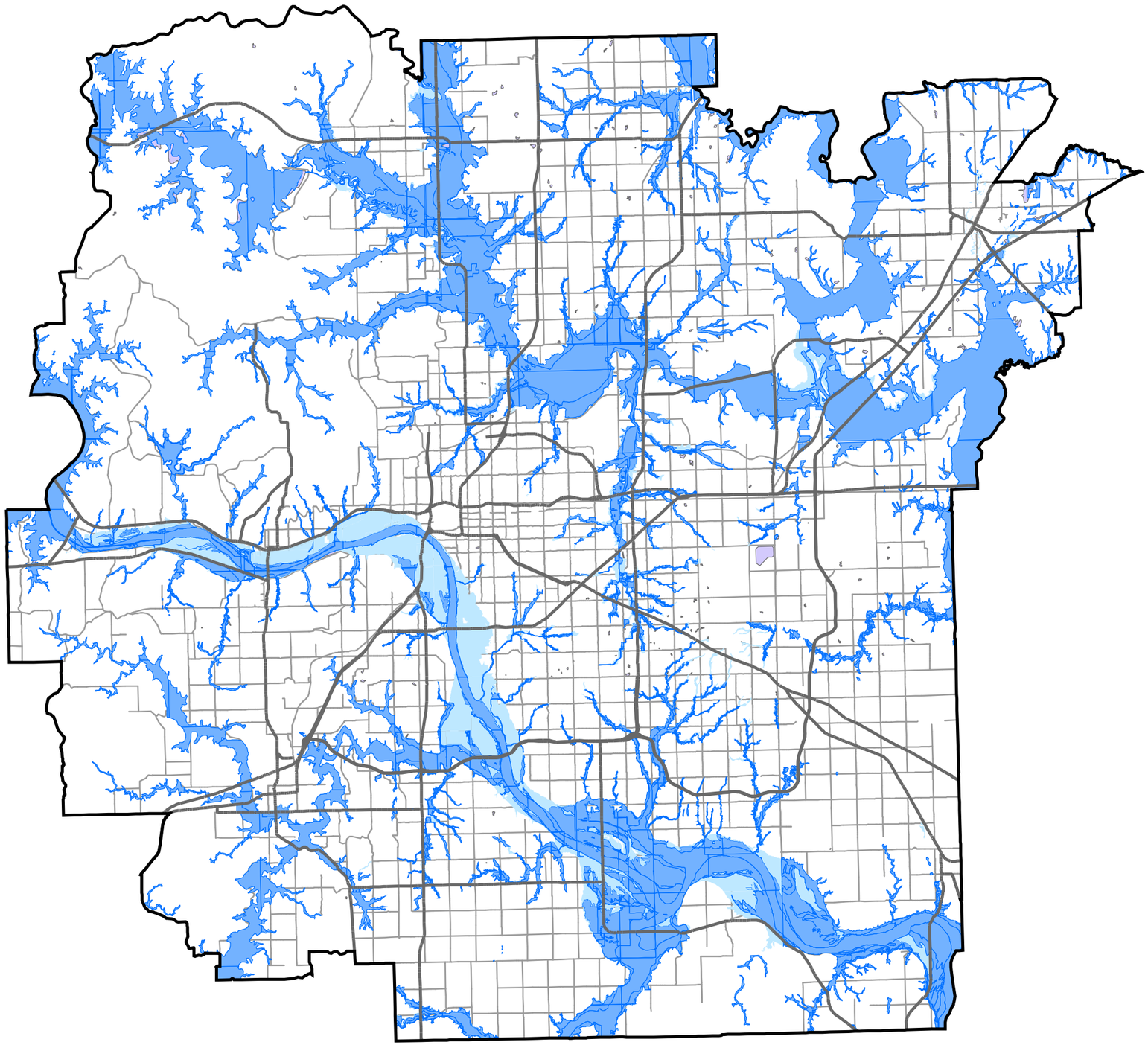
Employment Attractiveness Index Factor: Floodplains



Legend

- Transportation Management Area
- Highways

Floodplains

- 100 Year
- 500 Year
- Out
- Arterial Streets
- Lakes and Ponds

N
W E
S

Miles

0 1 2 3 4 5

Destination 2030

INCOG

Map Document: (C:\gis_data\tma_employ_projections\MAPS2\emp_2030_environ_floodplains(11x17 size).mxd)
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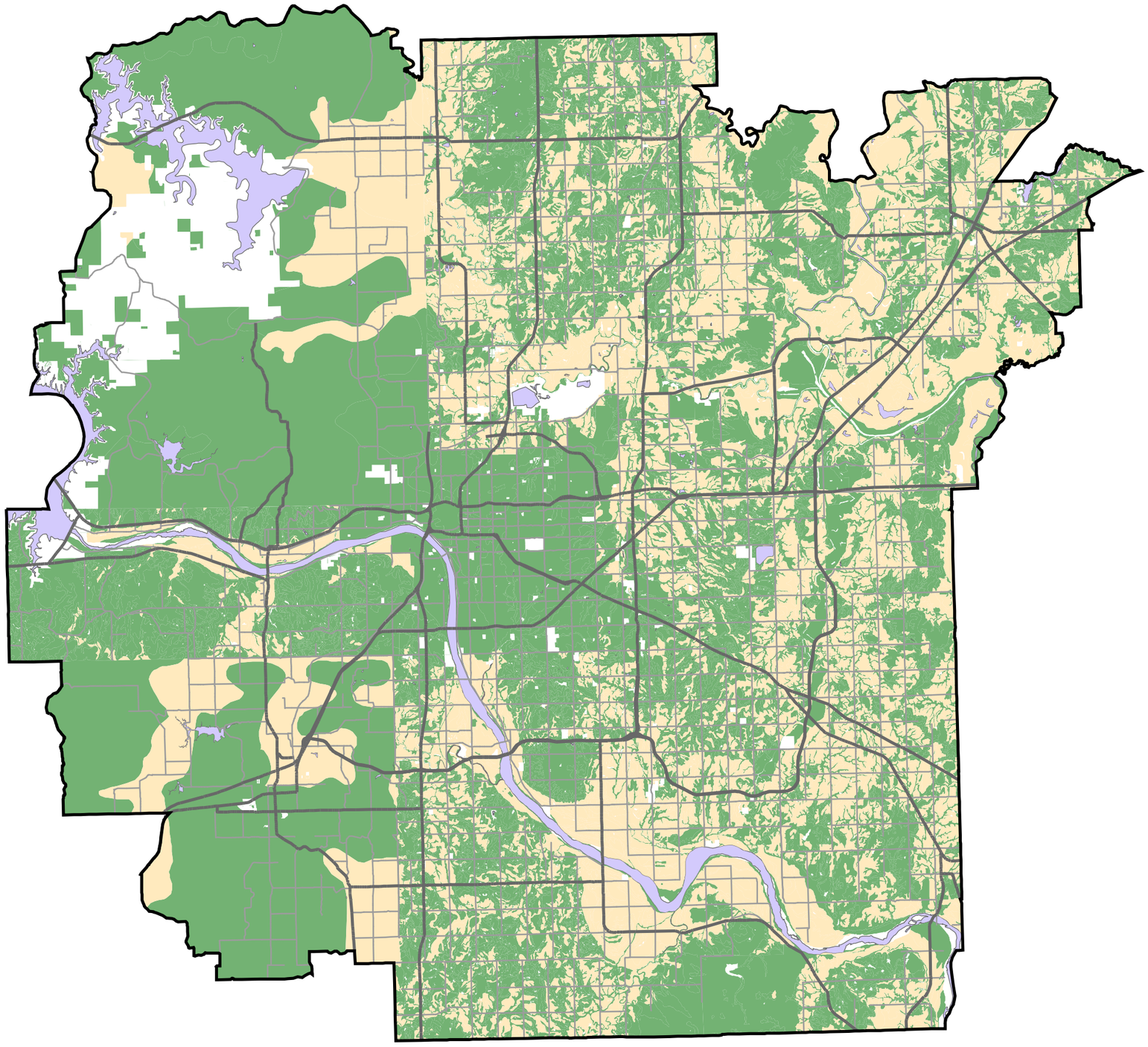
Employment Attractiveness Index Factor: Prime Farmland



Legend

- Transportation Management Area
- Highways
- Arterial Streets
- Lakes and Ponds

Farmland Status

- Not prime farmland
- All areas are prime farmland

N
W E
S

Miles
0 1 2 3 4 5

Destination 2030

INCOG

Map Document: (C:\gis_data\tma_employ_projections\MAPS2\emp_2030_environ_prime_farmland(11x17 size).mxd)
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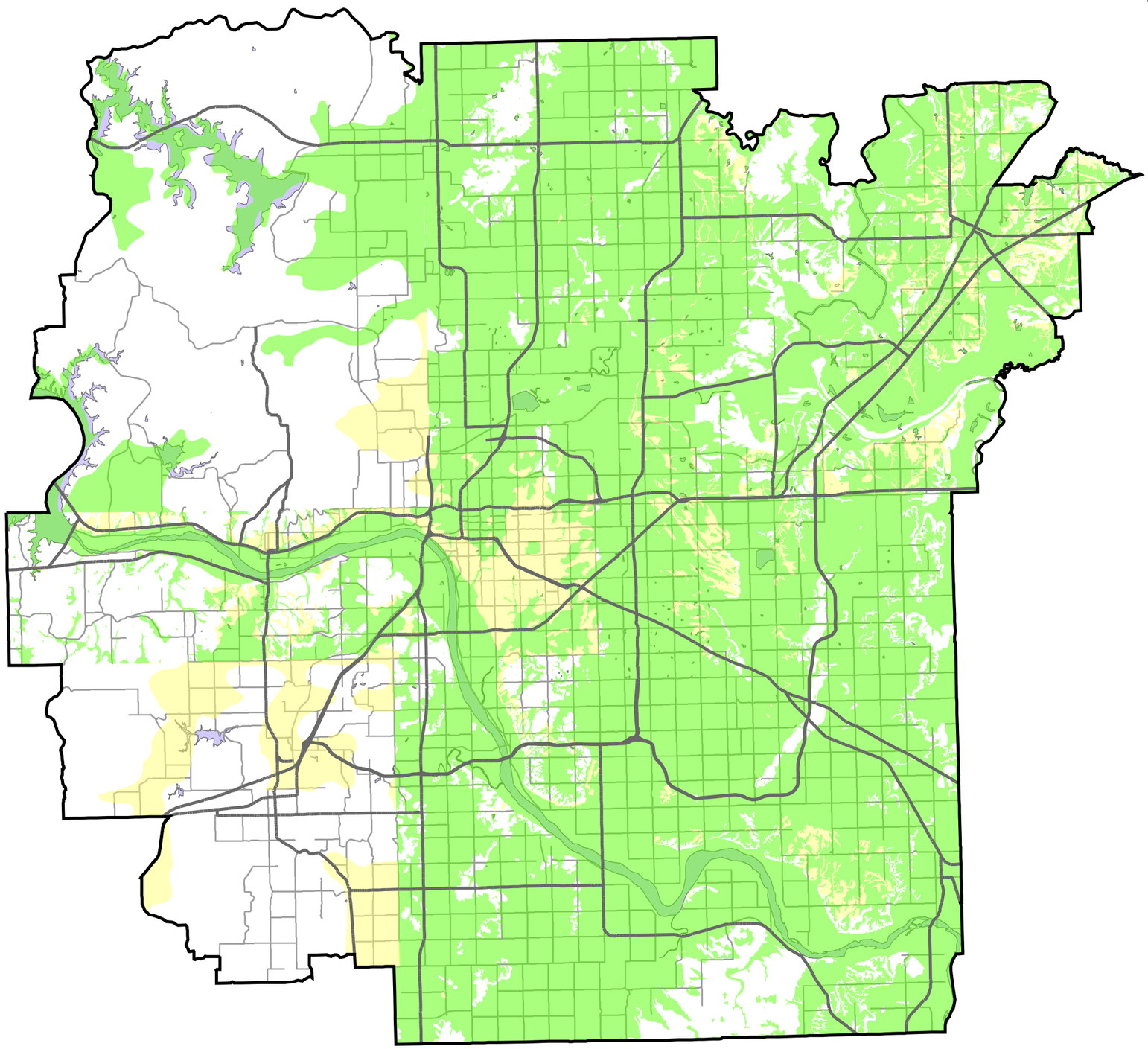
Employment Attractiveness Index Factor: Slopes



Legend

- Transportation Management Area
- Highways
- Arterial Streets
- Lakes and Ponds
- Slopes under 5 percent
- Slopes 5 to 8 percent
- Slopes 8 percent or greater

N
W E
S

Miles
0 1 2 3 4 5

Destination 2030

INCOG

Map Document: (C:\gis_data\tma_employ_projections\MAPS2\emp_2030_environ_slopes(11x17 size).mxd)
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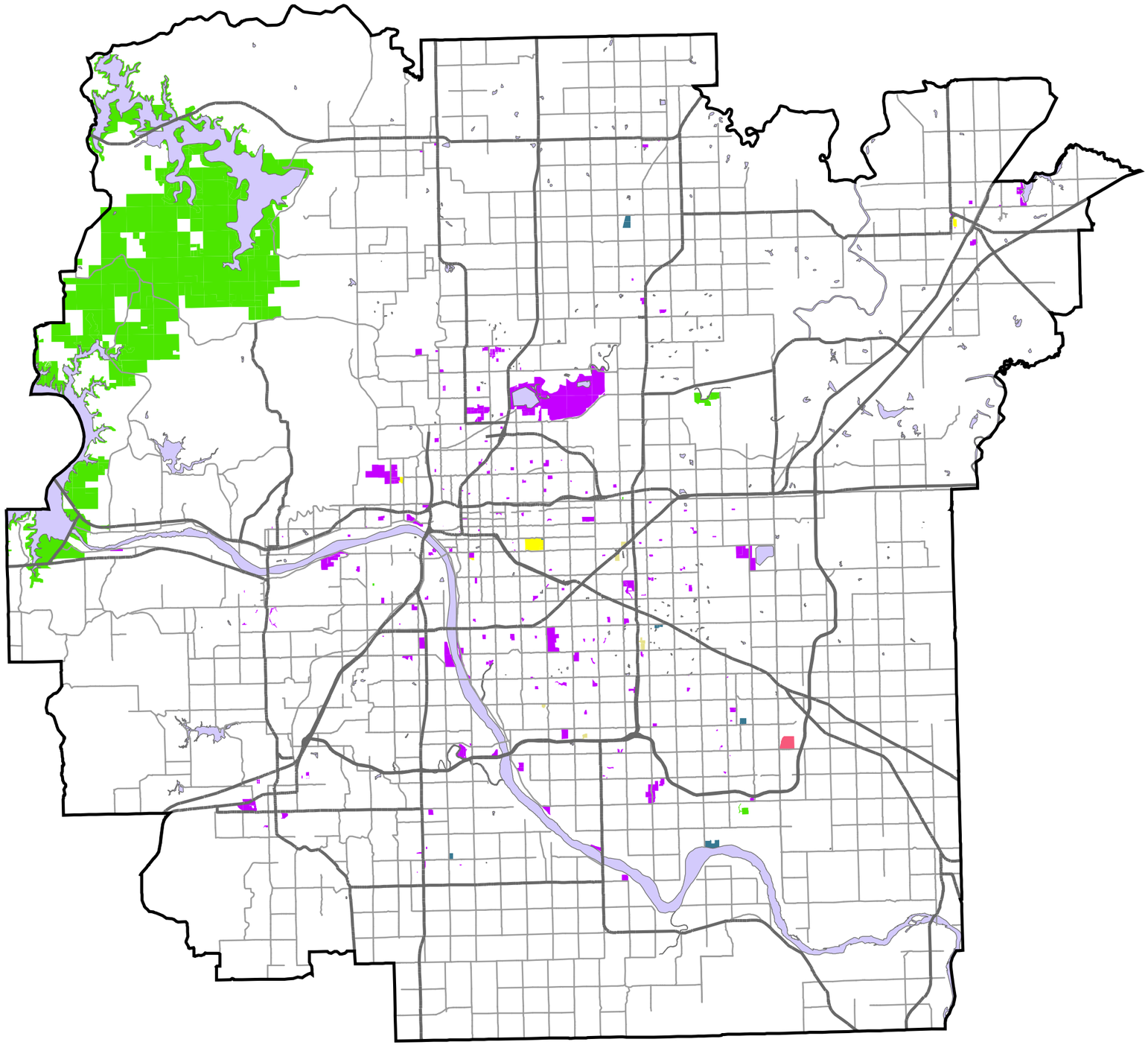
Employment Attractiveness Index Factor: Parks and Nature Areas



Legend

- Transportation Management Area
- Highways
- Arterial Streets
- Lakes and Ponds

tma_parks

Area Type

- 1 Park
- 2 Special Facilities
- 3 Flood Dentention/Recreation
- 4 Nature Preserve
- 5 private/Special
- 6 Sports Complex

N
W E
S

Destination 2030

Miles
0 1 2 3 4 5

INCOG

Map Document: (C:\gis_data\tma_employ_projections\MAPS2\emp_2030_environ_parks(11x17 size).mxd)
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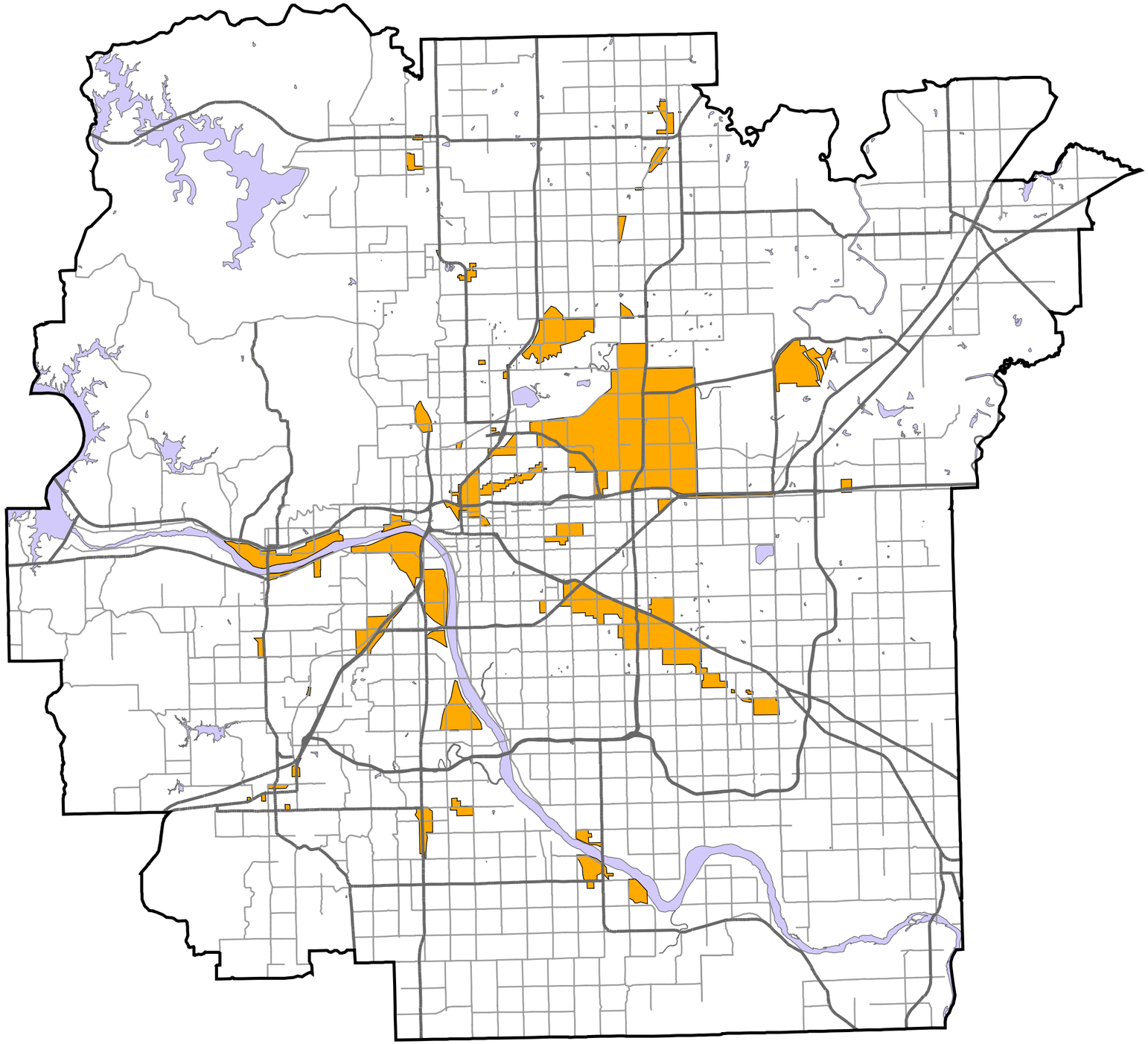
Employment Attractiveness Index Factor: Industrial Areas



Legend

- Transportation Management Area
- Lakes and Ponds
- Highways
- Arterial Streets
- Industrial Areas

N
W E
S

Destination 2030

Miles
0 1 2 3 4 5

INCOG

Map Document: (C:\gis_data\tma_employ_projections\MAPS2\emp_2030_policy_industrial_areas(11x17 size).mxd)
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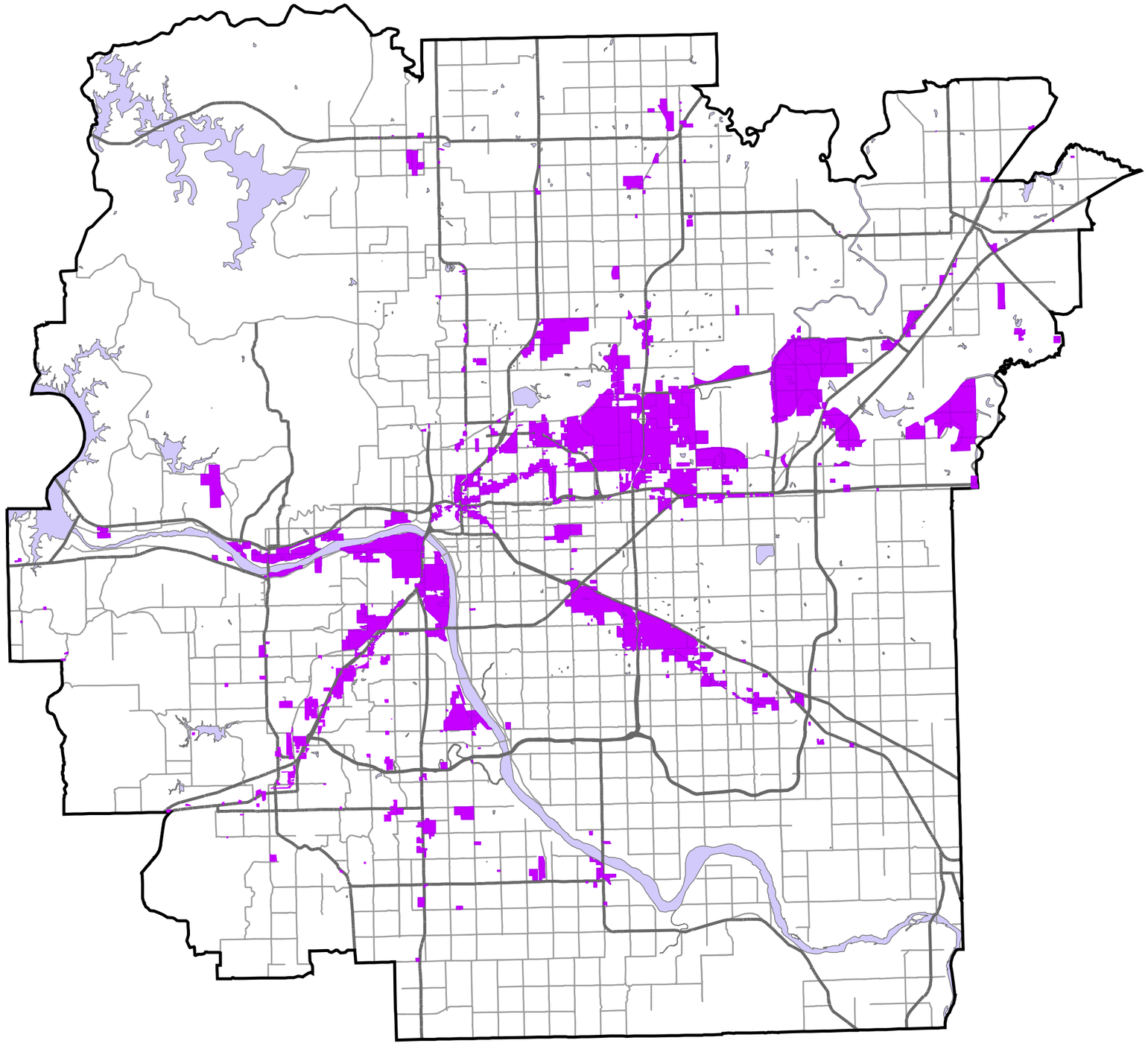
Employment Attractiveness Index Factor: Industrially Zoned Areas



Legend

- Transportation Management Area
- Lakes and Ponds
- Highways
- Arterial Streets
- Zoned Industrial

N
W E
S

Destination 2030

Miles
0 1 2 3 4 5

INCOG

Map Document: (C:\gis_data\tma_employ_projections\MAPS2\emp_2030_policy_industrial_zoning(11x17 size).mxd)
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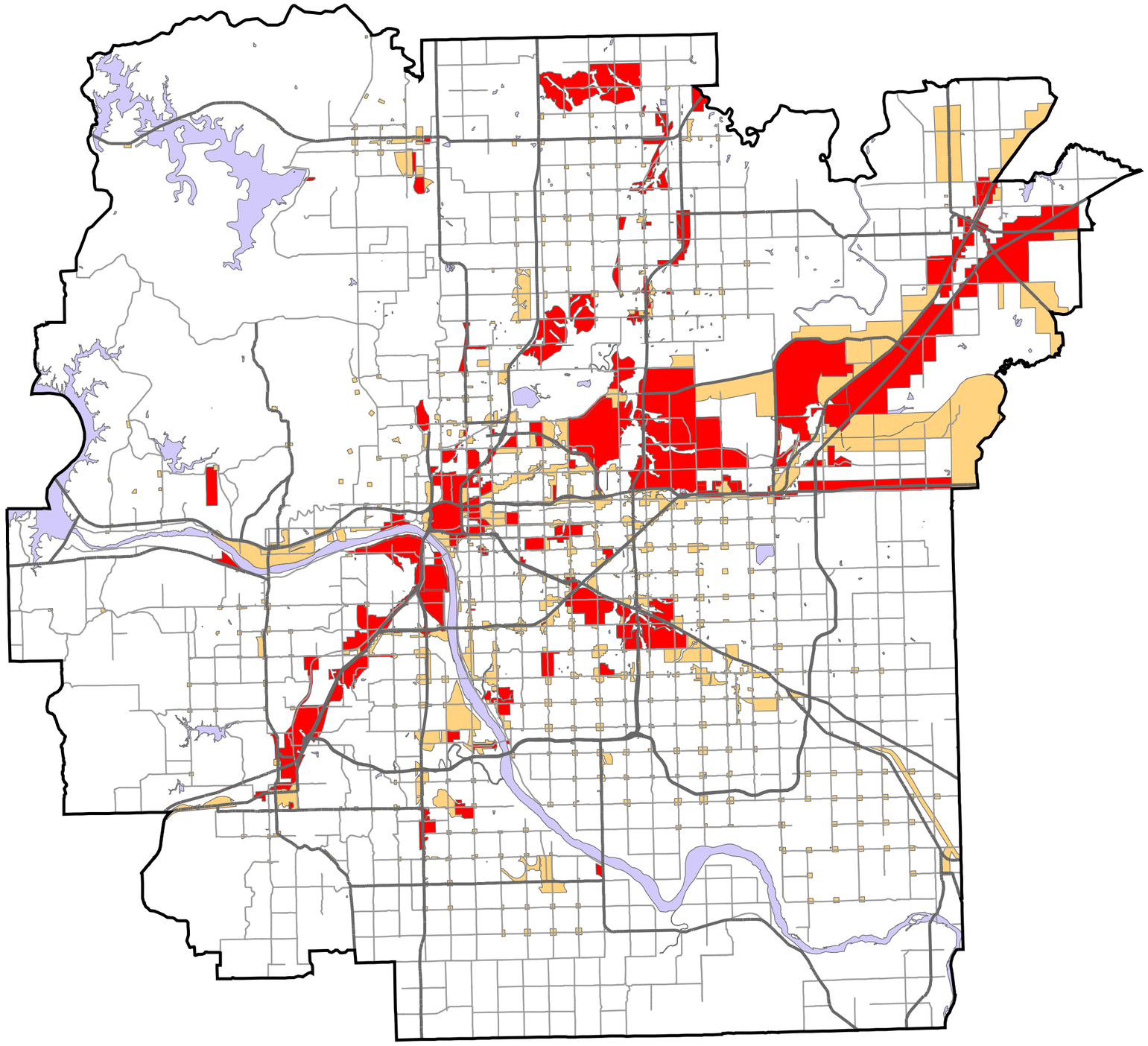
Employment Attractiveness Index Factor: Ultimate Buildout



Legend

- Transportation Management Area
- Lakes and Ponds
- Highways
- Arterial Streets

Ultimate Buildout

INTENSITY

- MEDIUM INTENSITY
- HIGH INTENSITY; CORRIDOR; SPECIAL

N W E S

Destination 2030

Miles

0 1 2 3 4 5

INCOG

Map Document: (C:\gis_data\tma_employ_projections\MAPS2\emp_2030_policy_ultimate_buildout(11x17 size).mxd)
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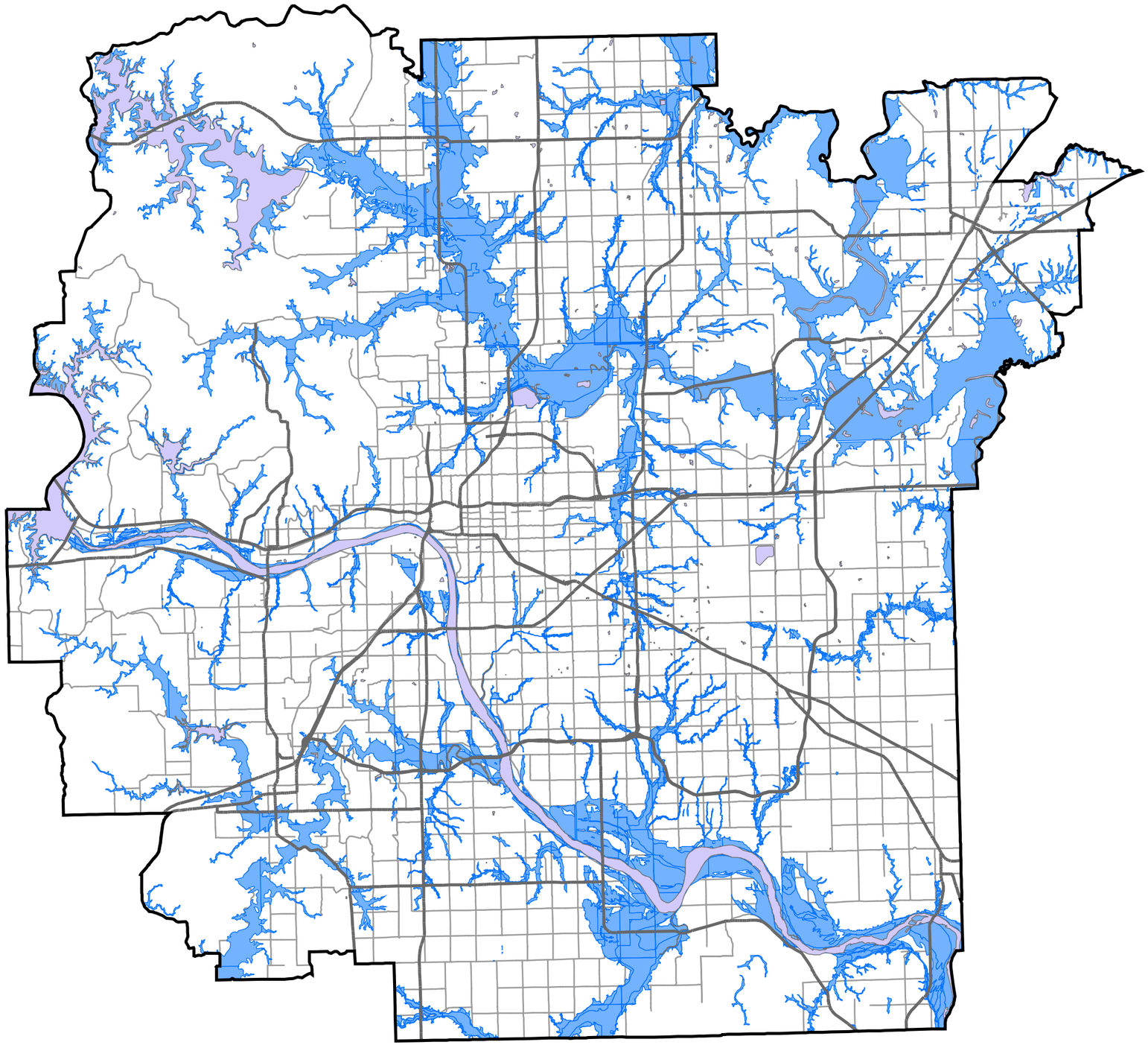
Available Vacant Land for Industrial Development: Input Variables

Employment Vacant Land Factor:
100 Year Floodplains



Legend

- Transportation Management Area
- Highways
- Lakes and Ponds
- Arterial Streets

Floodplains

- 100 Year

N
W E
S

Miles
0 1 2 3 4 5

Destination 2030

INCOG

Map Document: (C:\gis_data\tma_employ_projections\MAPS2\emp_2030_vacant_land_floodplains(11x17 size).mxd)
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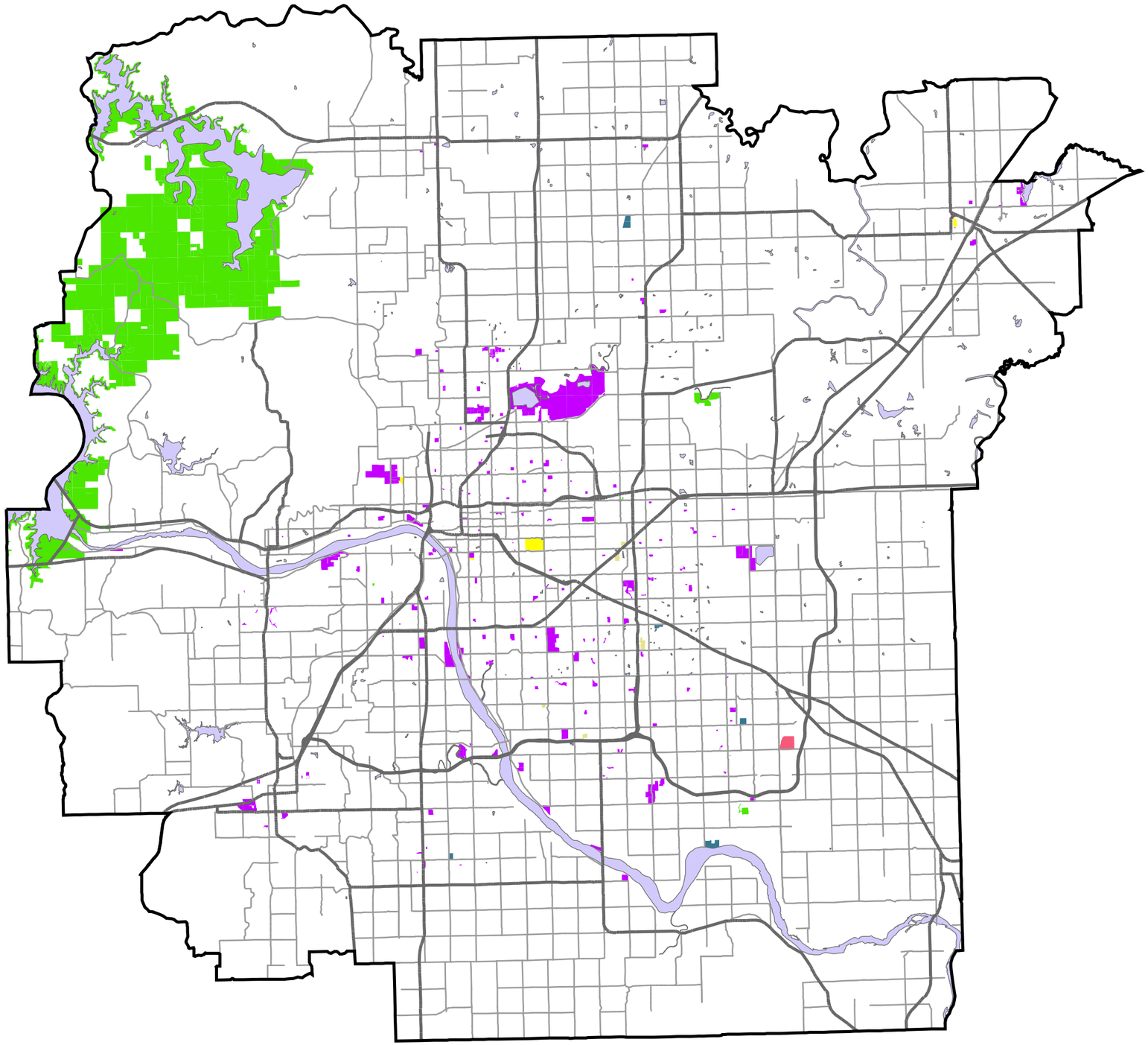
Employment Vacant Land Factor: Parks and Nature Areas



Legend

- Transportation Management Area
- Highways
- Arterial Streets
- Lakes and Ponds

Parks and Nature Areas

Area Type

- 1 Park
- 2 Special Facilities
- 3 Flood Dentention/Recreation
- 4 Nature Preserve
- 5 private/Special
- 6 Sports Complex

N W E S

Destination 2030

Miles

0 1 2 3 4 5

INCOG

Map Document: (C:\gis_data\tma_employ_projections\MAPS2\emp_2030_vacant_land_parks(11x17 size).mxd)
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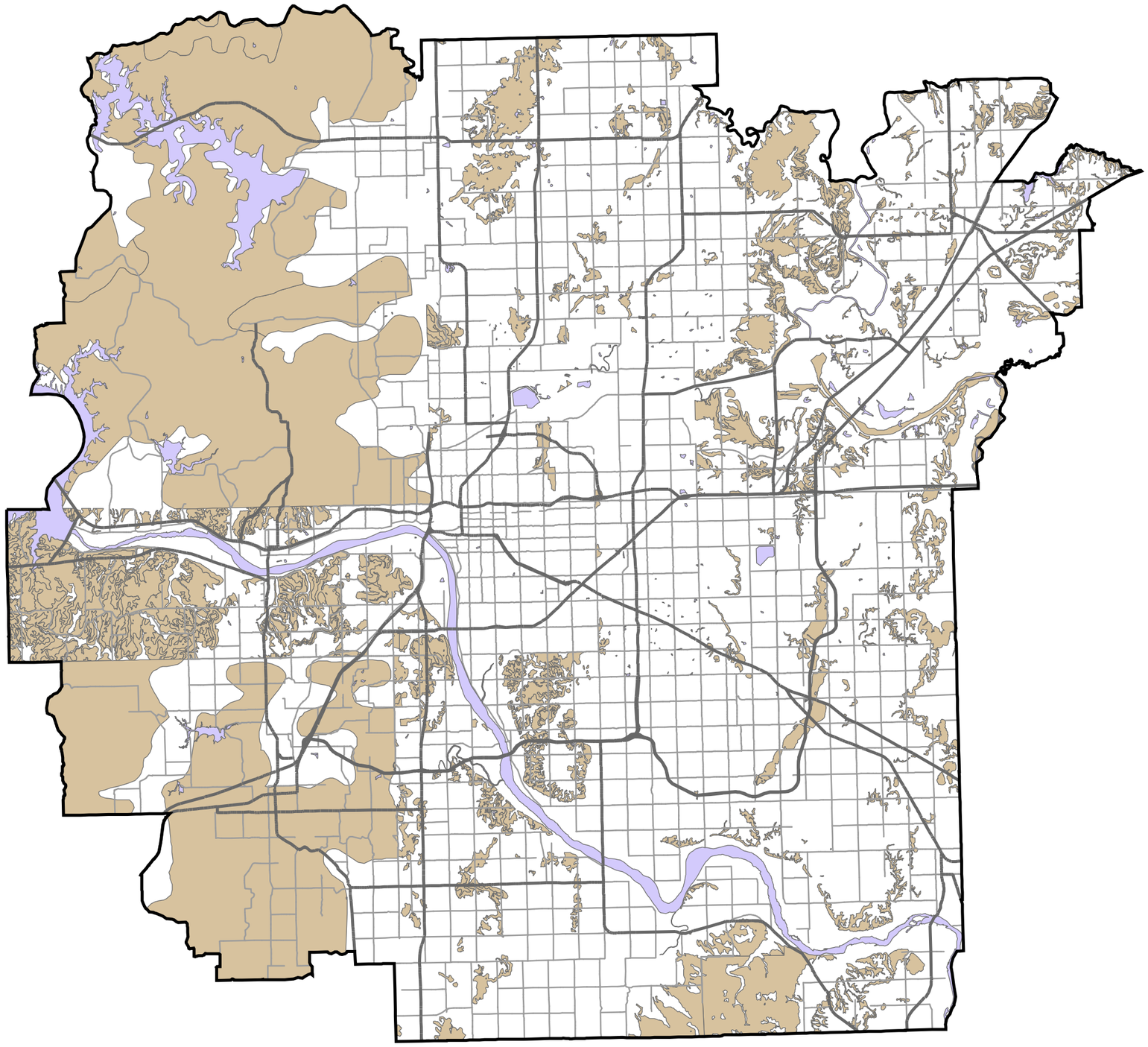
Employment Vacant Land Factor: Steep Slopes



Legend

- Transportation Management Area
- Highways
- Arterial Streets
- Lakes and Ponds
- Slopes 8 Percent or greater

N
W E
S

Miles
0 1 2 3 4 5

Destination 2030

INCOG

Map Document: (C:\gis_data\tma_employ_projections\MAPS2\emp_2030_vacant_land_steep_slopes(11x17 size).mxd)
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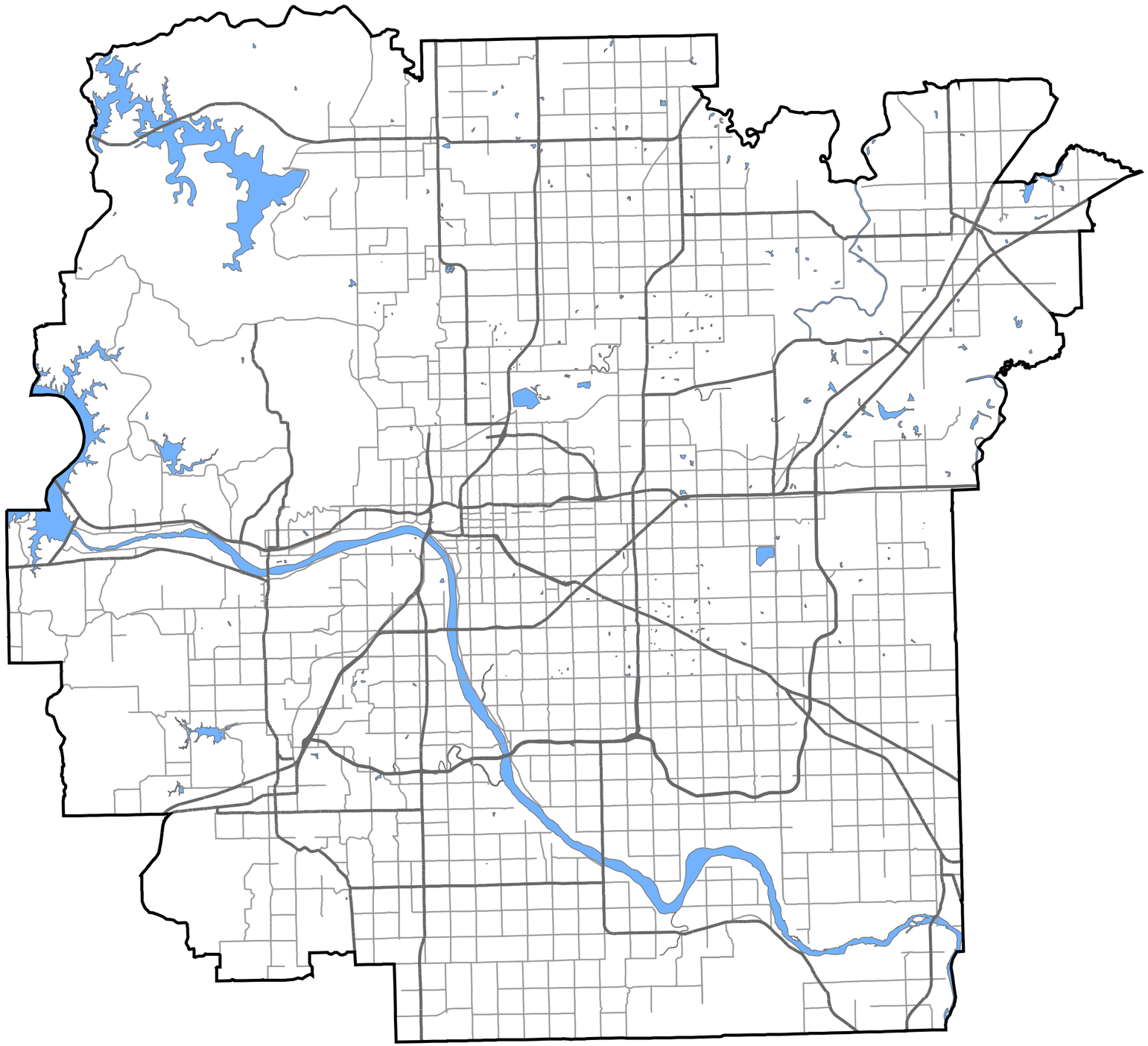
Employment Vacant Land Factor: Lakes and Ponds



Legend

- Transportation Management Area
- Highways
- Arterial Streets
- Lakes and Ponds

N
W E
S

Miles

0 1 2 3 4 5

Destination 2030

INCOG

Map Document: (C:\gis_data\tma_employ_projections\MAPS2\emp_2030_vacant_land_water_bodies(11x17 size).mxd)
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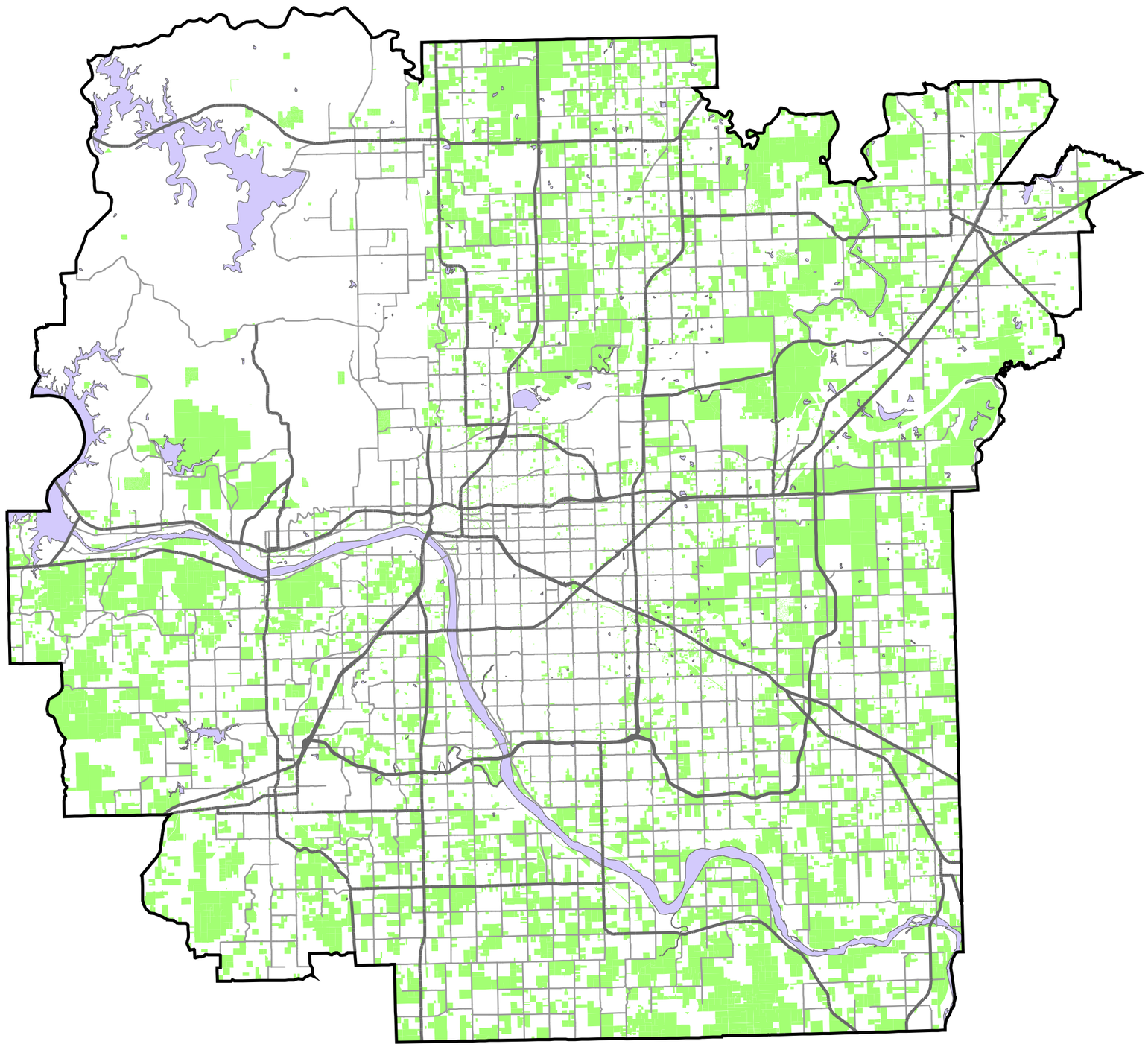
Employment Vacant Land Factor:
Gross Available Vacant Land



Legend

- Transportation Management Area
- Highways
- Arterial Streets
- Lakes and Ponds
- vacant_land_industrial

N
W E
S

Miles
0 1 2 3 4 5

Destination 2030

INCOG

Map Document: (C:\gis_data\tma_employ_projections\MAPS2\emp_2030_vacant_land_gross_avail_land(11x17 size).mxd)
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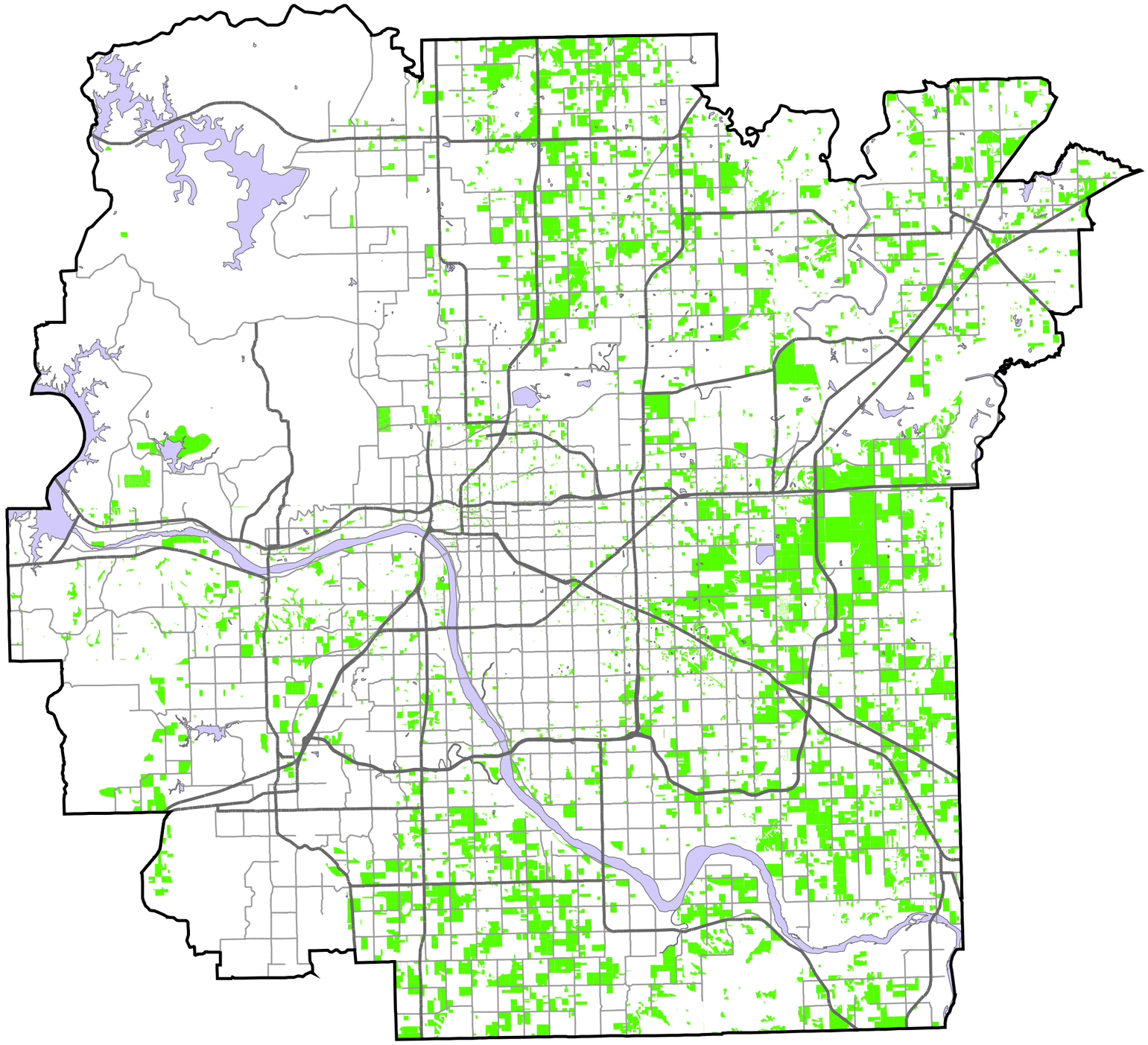
Employment Vacant Land Factor:
Net Available Vacant Land



Legend

- Transportation Management Area
- Highways
- Arterial Streets
- Lakes and Ponds
- Net Available Vacant Land

N
W E
S

Destination 2030

Miles
0 1 2 3 4 5

INCOG

Map Document: (C:\gis_data\tma_employ_projections\MAPS2\emp_2030_vacant_land_net_avail_land(11x17 size).mxd)
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