

Statewide Bicycle/Pedestrian Suitability Analysis

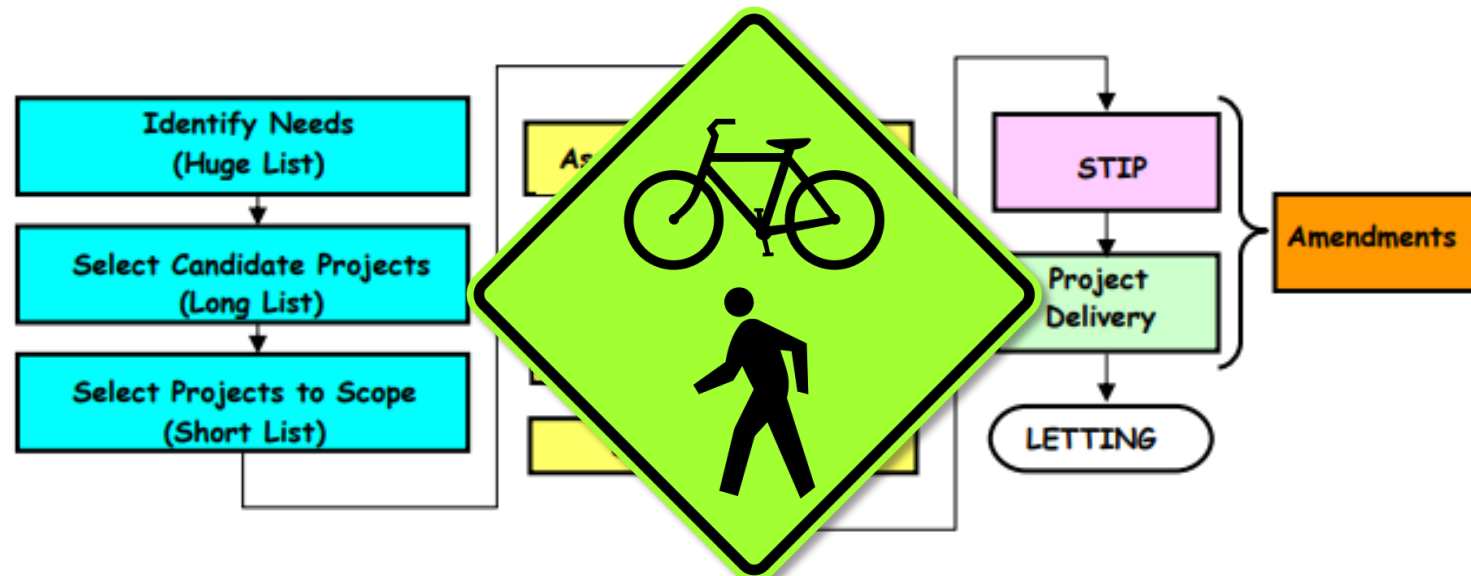
Eric DeVoe

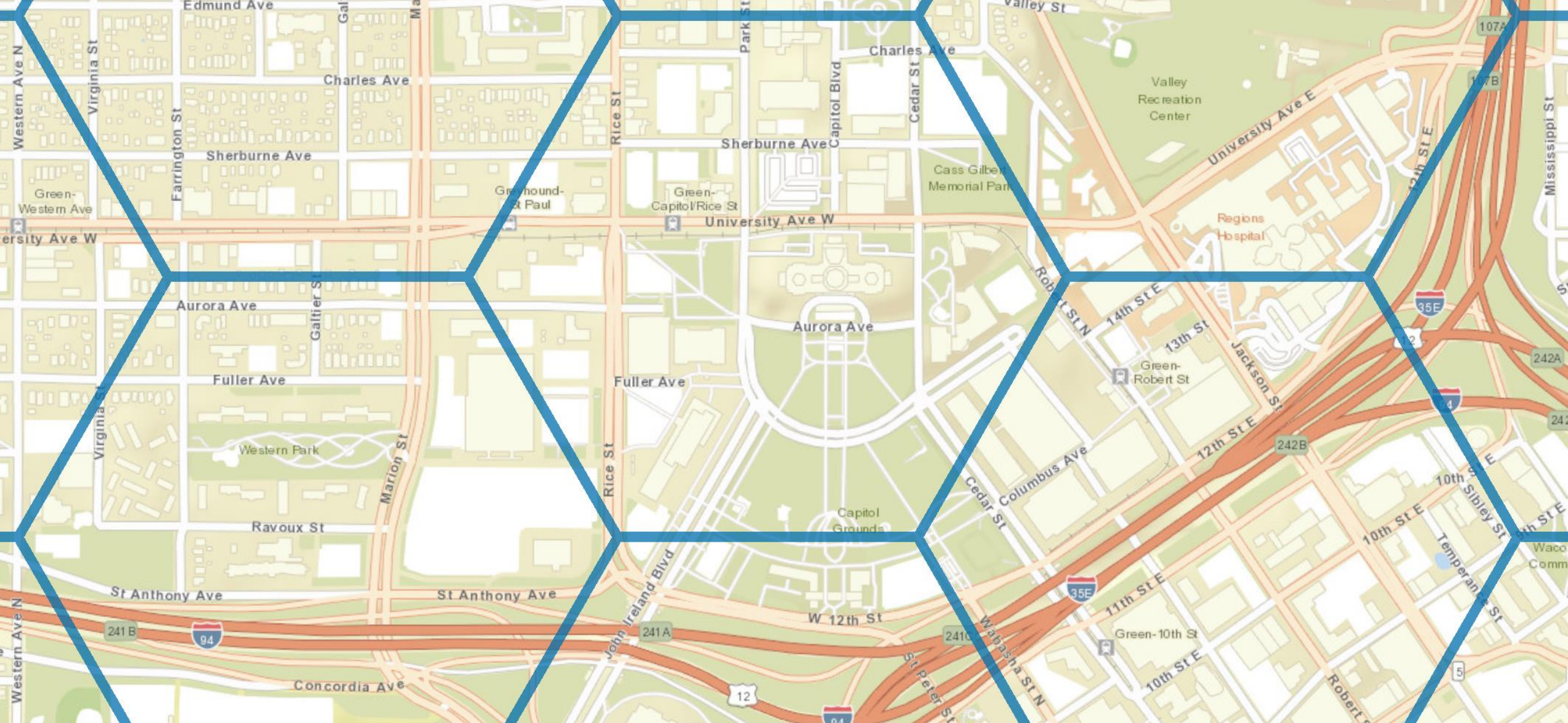
Office of Traffic Engineering

April 22, 2018

Anticipating Needs

- How can we provide timely, actionable feedback?
- Provide feedback for non-motorists safety considerations earlier in scoping





Standardized Grid

0.25 mi

- Screening Criteria
 - ✓ Spatially represented
 - ✓ Consistent across entire state
 - ✓ Localized, i.e. smallest area possible
- Preferences
 - a. Non-roadway attribute(s)
 - b. Regularly updated service



Combing for Data



Bike Routes
Bus Stops
CHIP

Safety Plans
Traffic Volume
Tribal Boundaries



Age
Disability Status
Ethnic Background
Foreign Born



Schools (MDE)
Trails (DNR)
Urban Areas (MDA)



Access to Vehicle(s)
Commute Characteristics
Poverty Status
Unemployment Rate

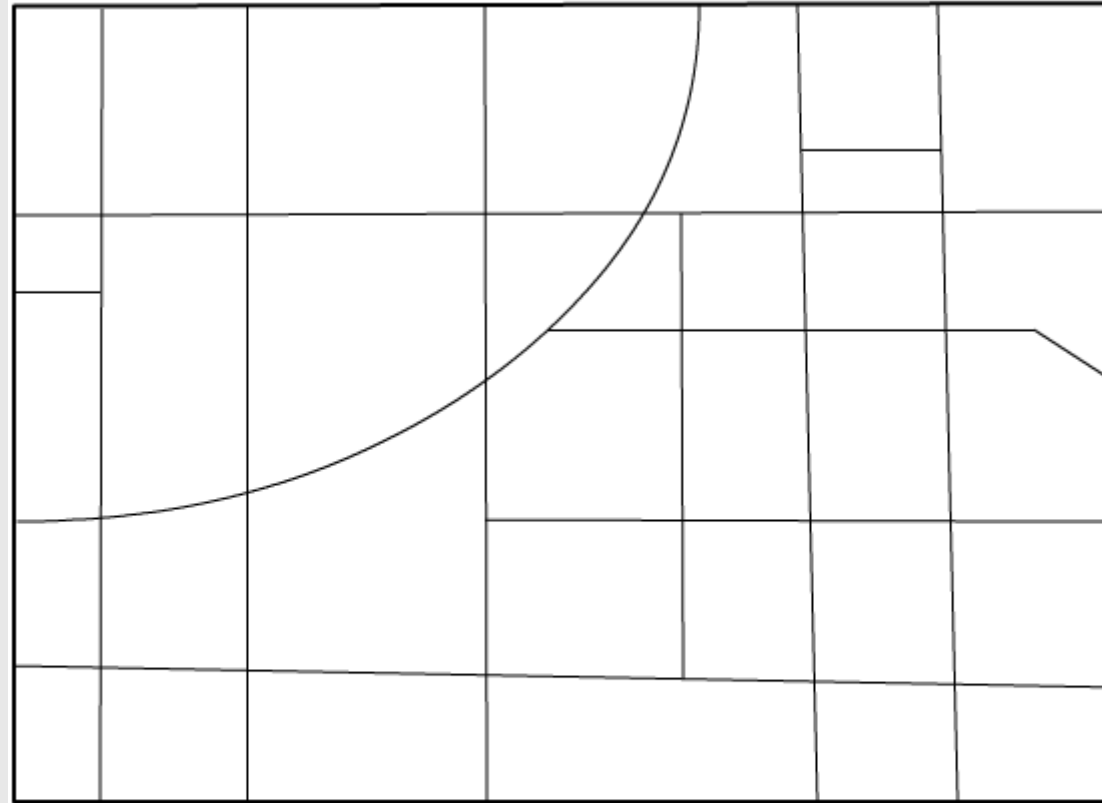


Bus/Transit Stops



Food Access / Food Desert

ZIP Code Tabulation Areas (ZCTAs)

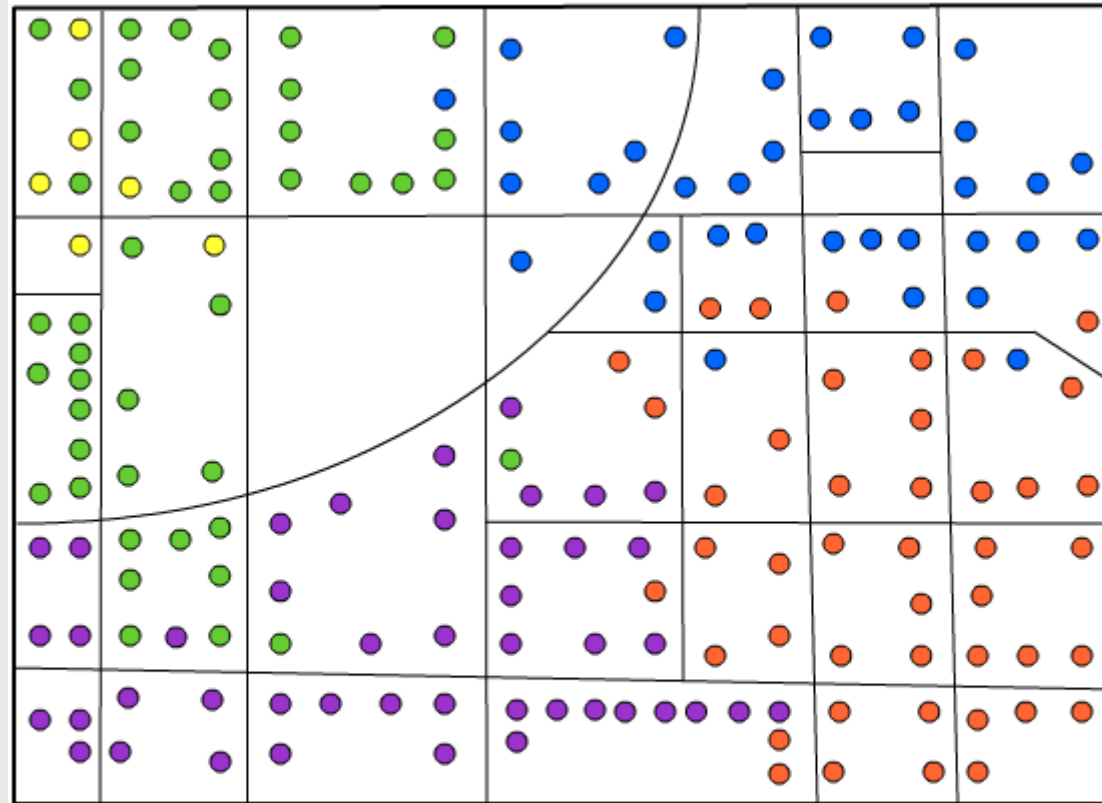


www.census.gov/geo/reference/zcta/zcta_delin_anim.html

Census block boundaries

Census block boundaries are created primarily from geographic entity boundaries, roads, and rivers.
Census blocks are the building blocks of ZCTAs.

ZIP Code Tabulation Areas (ZCTAs)

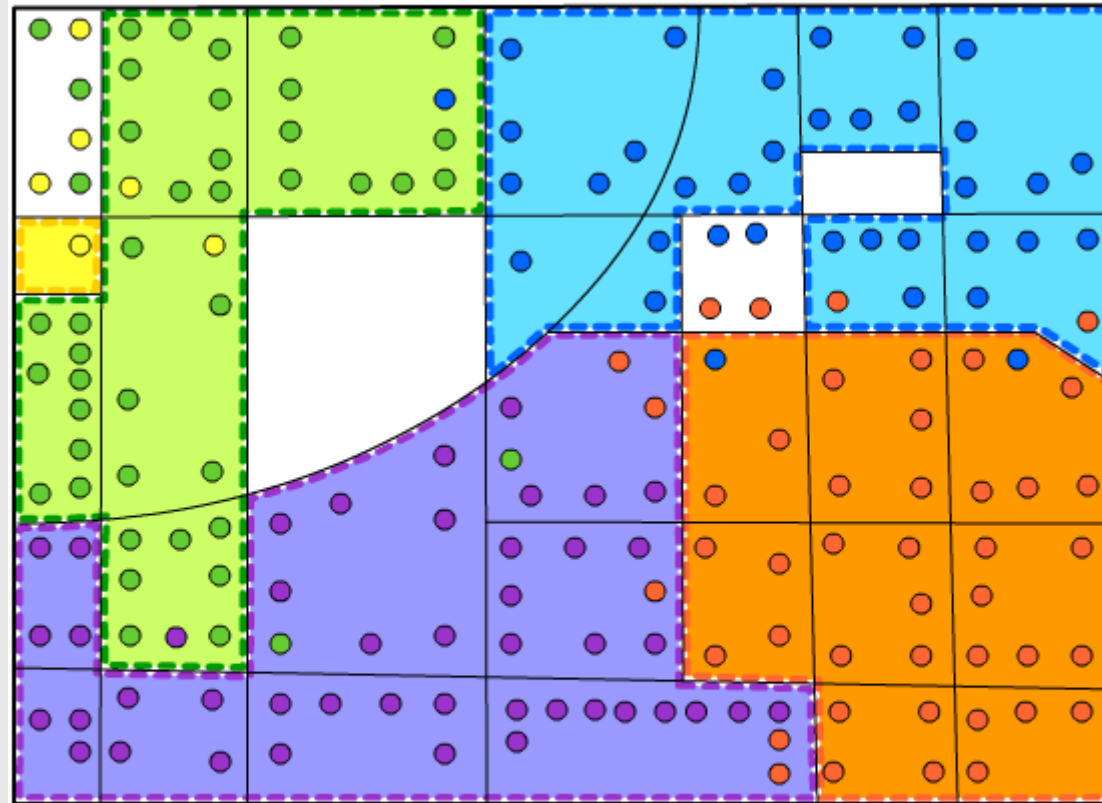


www.census.gov/geo/reference/zcta/zcta_delin_anim.html

Blocks and addresses

In this presentation, each dot represents an address and each color represents a different ZIP Code.

ZIP Code Tabulation Areas (ZCTAs)

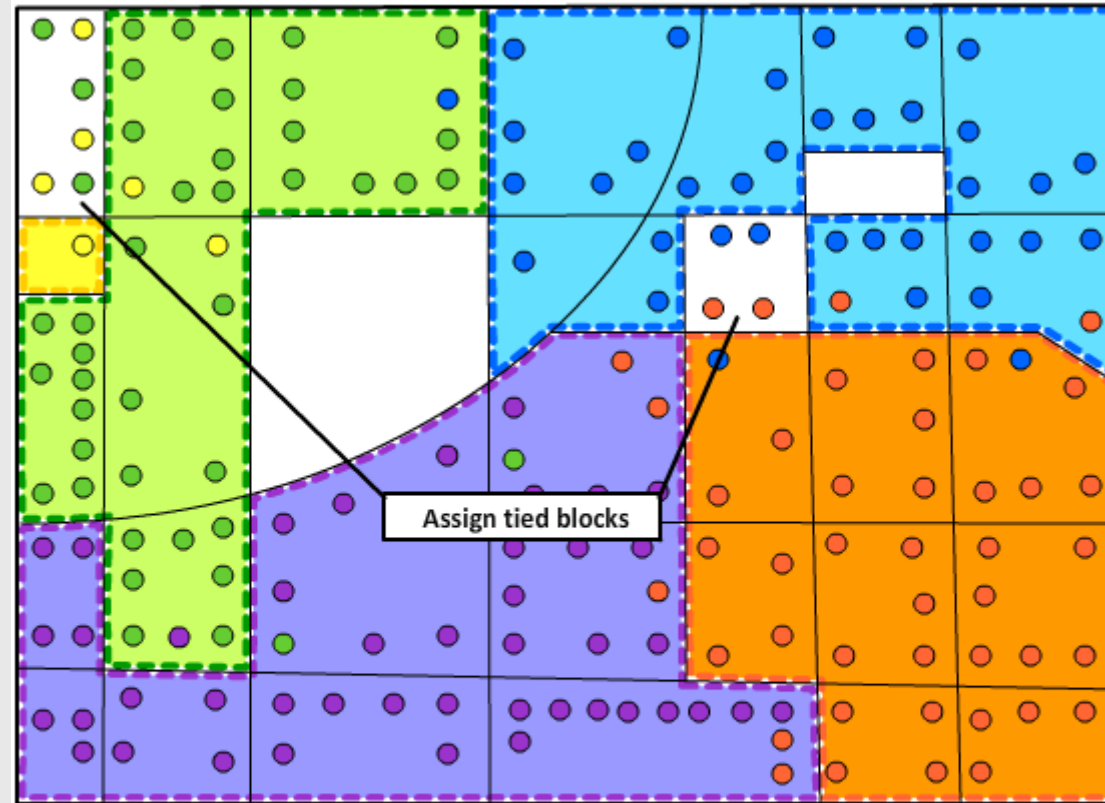


www.census.gov/geo/reference/zcta/zcta_delin_anim.html

Assign blocks with a ZIP Code plurality

The first step in ZCTA delineation was to determine the most frequently occurring ZIP Code within each block. This ZIP Code was then assigned to the corresponding ZCTA.

ZIP Code Tabulation Areas (ZCTAs)

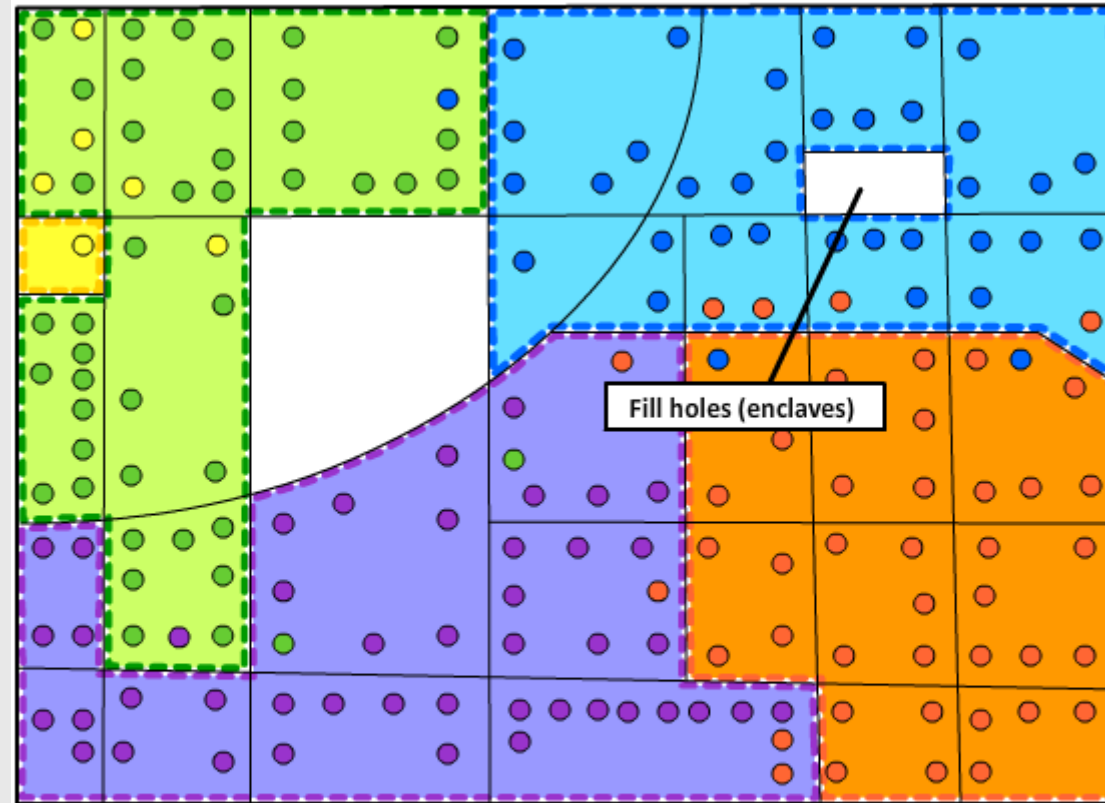


www.census.gov/geo/reference/zcta/zcta_delin_anim.html

Assign tied blocks

Blocks with ties were assigned to a ZCTA based on the longest adjacent boundary shared with a neighboring preliminary ZCTA that was represented in the tie.

ZIP Code Tabulation Areas (ZCTAs)

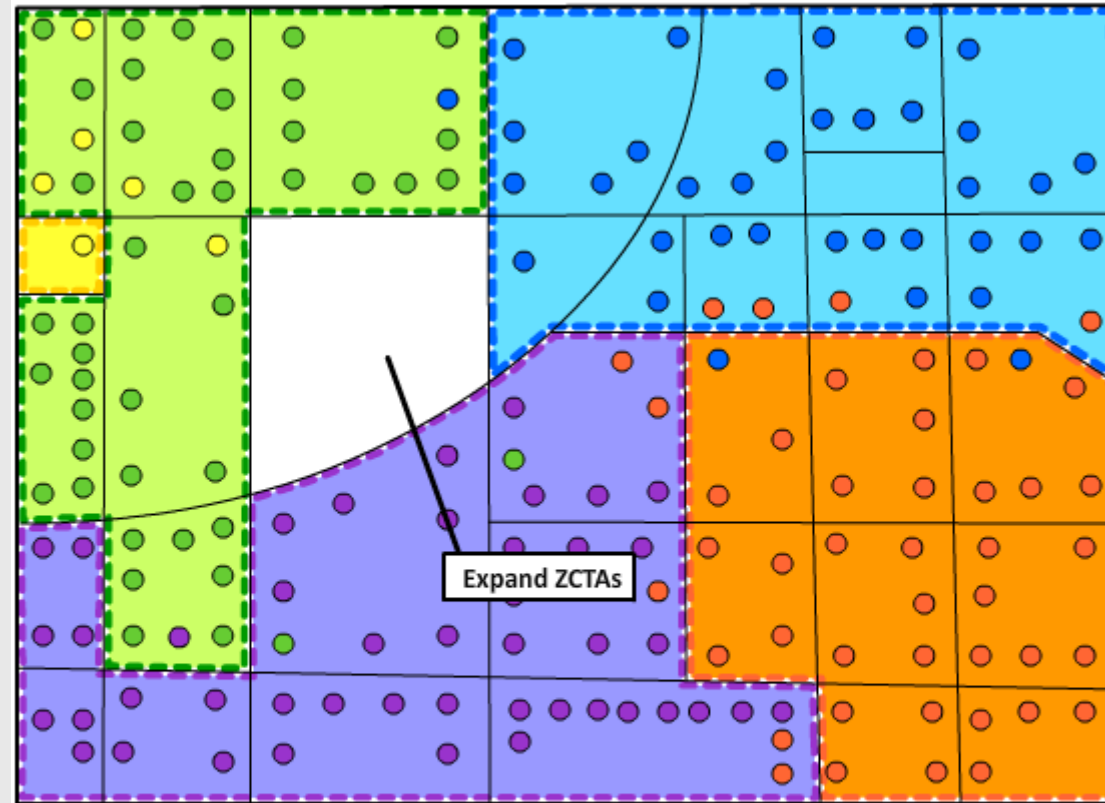


www.census.gov/geo/reference/zcta/zcta_delin_anim.html

Fill holes (enclaves)

If the area of an enclave was less than two square miles, it was assigned to the surrounding ZCTA.

ZIP Code Tabulation Areas (ZCTAs)



www.census.gov/geo/reference/zcta/zcta_delin_anim.html

Expand ZCTAs

All unassigned blocks adjacent to at least one assigned block within the same block group were assigned to the surrounding ZCTA with the longest shared boundary.

ZIP Code Tabulation Areas (ZCTAs)

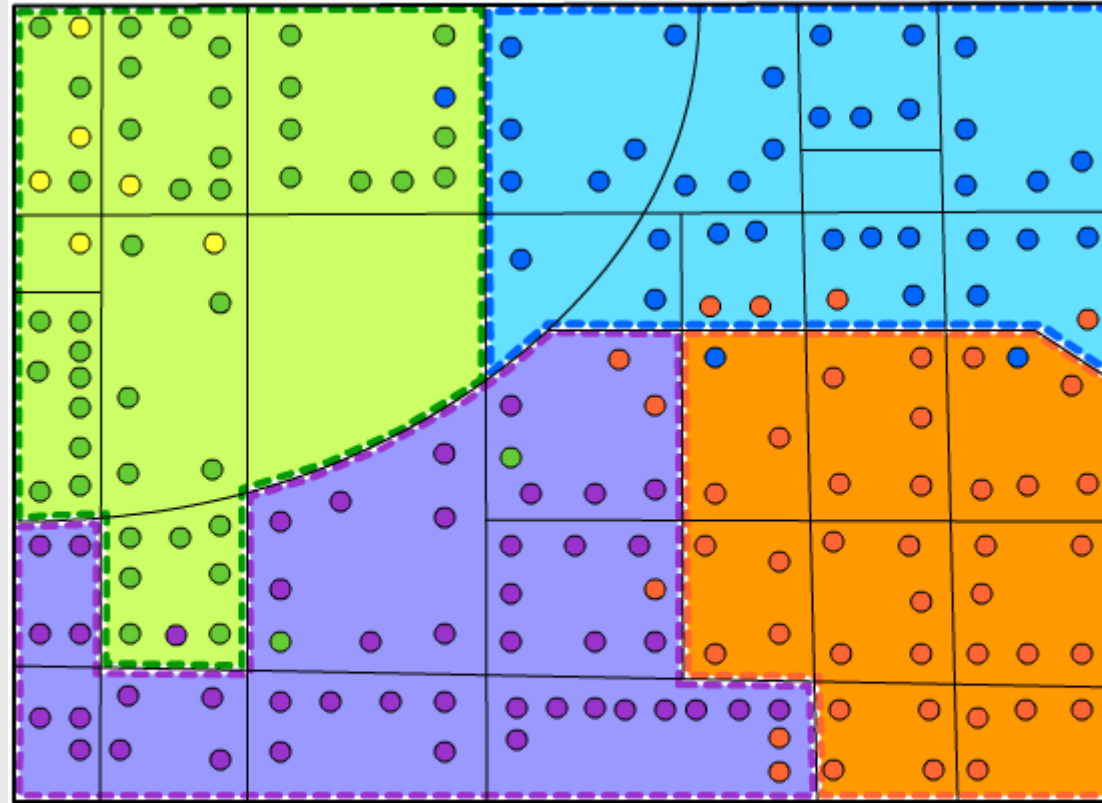


www.census.gov/geo/reference/zcta/zcta_delin_anim.html

Evaluate ZCTAs with low address counts

ZCTAs with few addresses within them were flagged for further interactive review.

ZIP Code Tabulation Areas (ZCTAs)



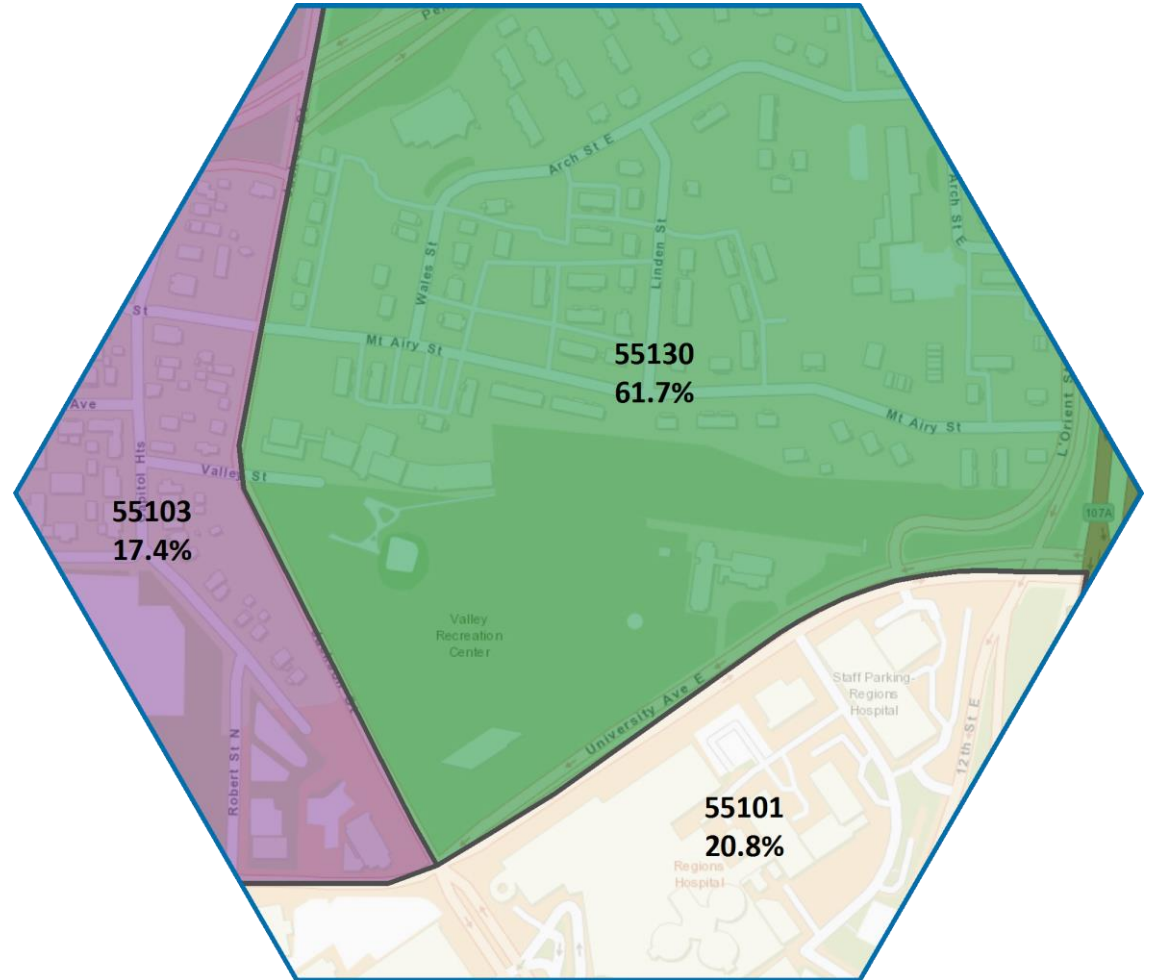
www.census.gov/geo/reference/zcta/zcta_delin_anim.html

Interactive review

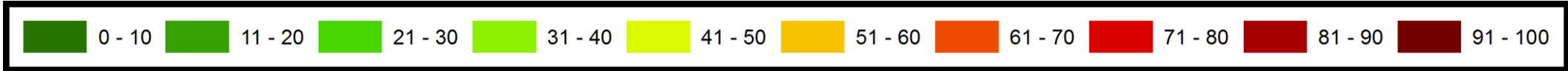
During the interactive review, the following steps were performed: evaluation of the overall shape of the ZCTAs, removal of erroneous and invalid ZCTAs, evaluation of sliver geography, expansion or reduction of large unpopulated areas larger than two square miles, and verification of cross state ZCTAs.

Aggregating

- Weighted average by percent of area
- Assumed uniform distribution across geography
- Not unreasonable if data at relatively fine grain



Aggregating Across Datasets



- Scoring
 - Most effective when not all geographies overlap
 - Allows a single summary for comparing across numerous categories
- Measuring
 - Identify the priority population first
 - If the characteristics accurately measure your population, the scores will work

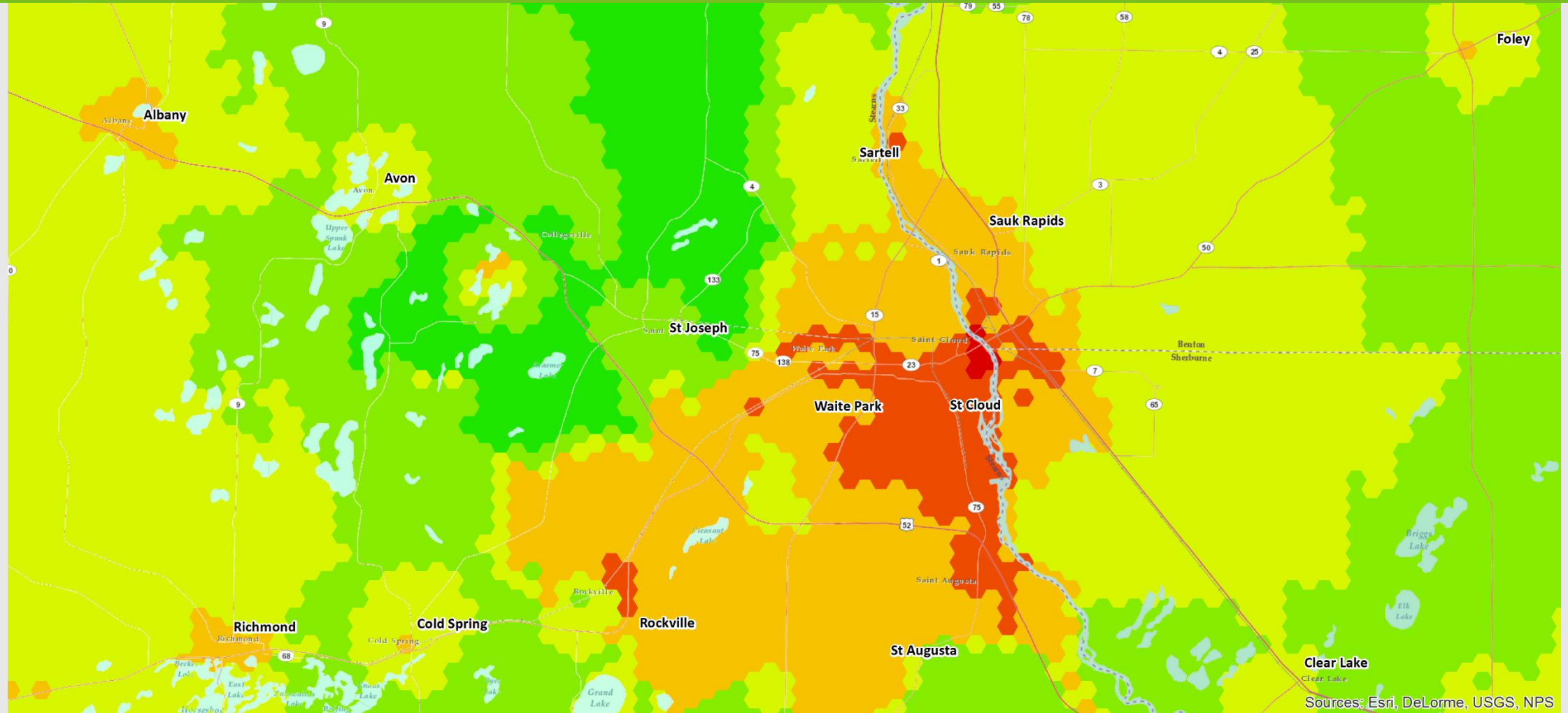
SPACE Scoring

1 point	Within 500 feet of bus stop	BUSSTOP = YES
1 point	Within 1 mile of a K-12 school	SCHOOL = YES
1 point	Within an urban area	URBAN in (RURAL DOWNTOWN, METRO, METRO - GREATER MN)
1 point	Percent of population less than 0.5 mile from supermarket ≥ 25.0	FOOD_05MI < 75.0
1 point	Defined as an "area of concern" by MPCA environmental justice	EJ_MPCA = YES
1 point	Contains a state bicycle trail	TRAIL in (DNR, USBR41, USBR45)
1 point	Percent of population age 5-17 \geq MN average	PCT_0517 ≥ 17.1
1 point	Percent of population age 65+ \geq MN average	PCT_65UP ≥ 14.3
1 point	Percent of population with disability \geq MN average	PCT_DABLE ≥ 10.6
1 point	Percent of population Native American \geq MN average	PCT_NAI ≥ 1.0

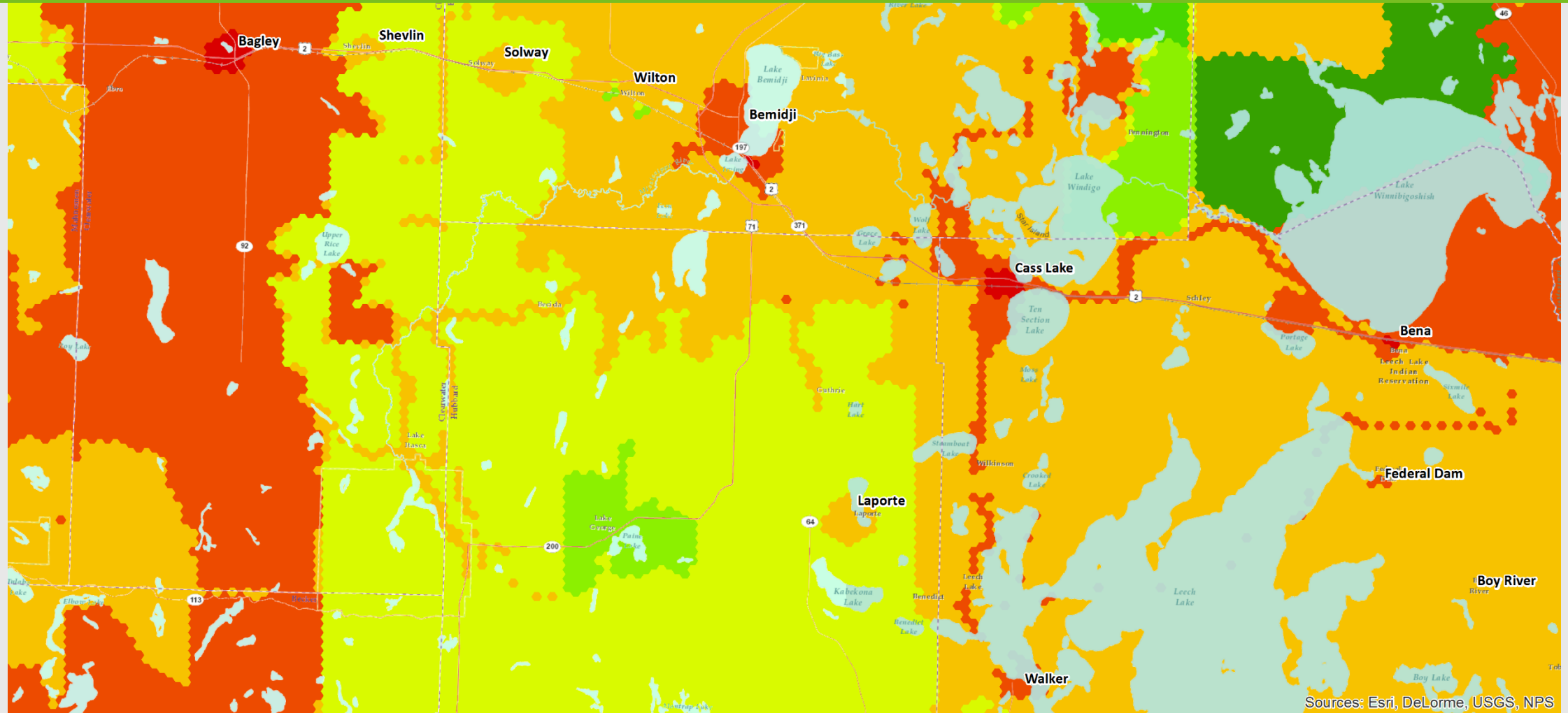
1 point	Percent of population foreign born \geq MN average	PCT_NCIT ≥ 4.0
1 point	Within an urban area, percent of total population in poverty ≥ 25.0	URBAN \neq RURAL and POV_ALL ≥ 25.0
1 point	Unemployment rate \geq MN average	UNEMPLOY ≥ 4.9
1 point	Percent of workers with access to zero vehicles ≥ 0.0	PCT_VEH0 ≥ 0.0
1 point	Percent of workers commuting by bicycle ≥ 0.0	PCT_BIKE ≥ 0.0
1 point	Percent of workers commuting by transit ≥ 0.0	PCT_TRNST ≥ 0.0
1 point	Percent of workers commuting by walking ≥ 0.0	PCT_WALK ≥ 0.0
1 point	Percent of workers with a commute less than 15 minutes \geq MN average	MIN_0014 ≥ 31.3
1 point	Contains a high risk intersection for non-motorists identified in District Safety Plan	DSP_RISK ≥ 4

$$\text{SPACE_SCORE} = 100 \times \frac{1}{19} \times \sum \text{points}$$

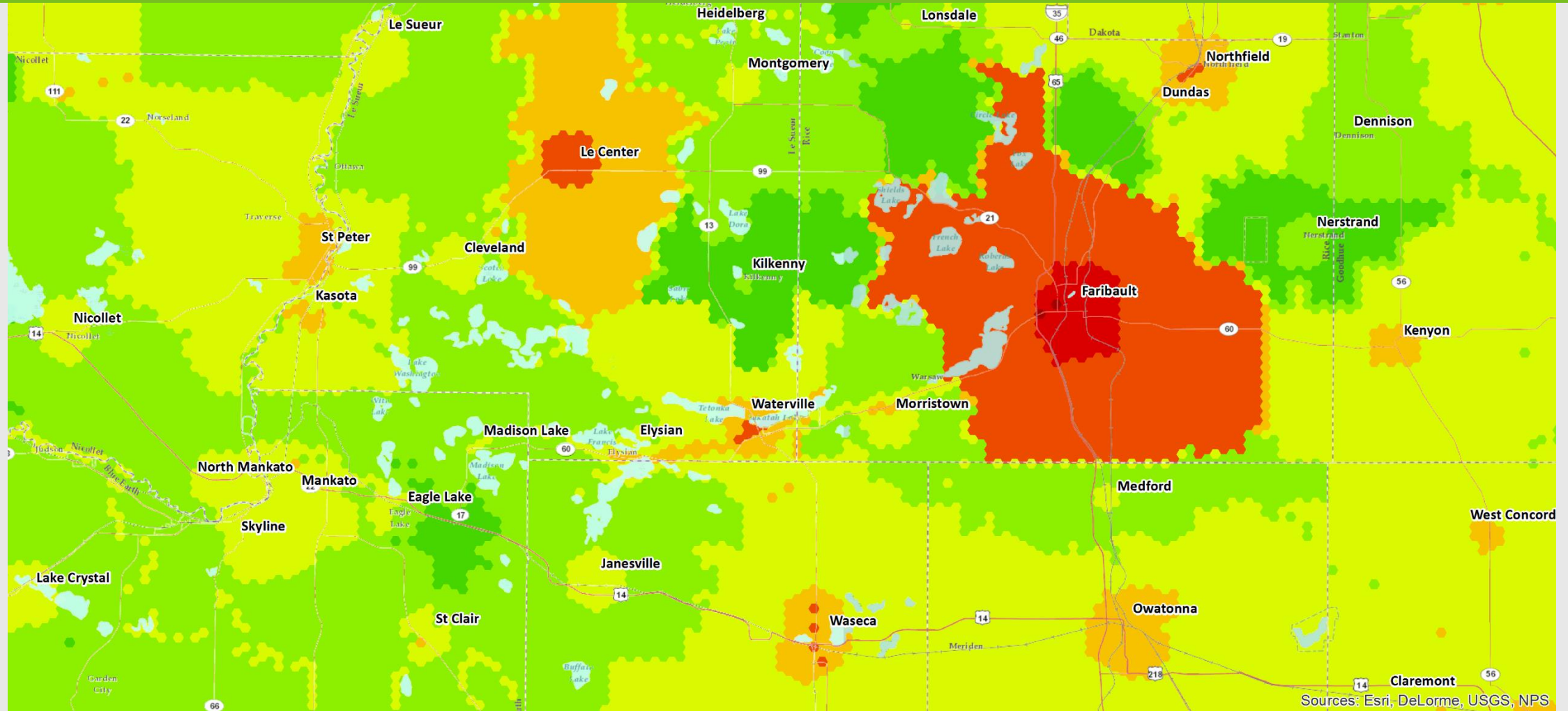
Saint Cloud, Full Output [1]



Bemidji, Full Output [2]



Mankato, Full Output [3]



10YearCHIP

Overview

Data

Visualization



This map shows MnDOT capital projects from 2019 to 2028. The projects follow investment guidance established in Mn DOT's 20-Year State Highway Investment Plan (MnSHIP).

Feature Layer by [brad.utecht](#)

Created: Jun 22, 2018 Updated: Nov 30, 2018 View Count: 2,248

Open in Map Viewer

Open in Scene Viewer

Open in ArcGIS Desktop

Description

This map shows MnDOT capital projects from 2019 to 2028. The projects follow investment guidance established in Mn DOT's 20-Year State Highway Investment Plan (MnSHIP).

Layers

STIP Bridge Projects

Open In Service URL

CHIP Bridge Projects

Open In Service URL

STIP Pavement and Other Projects

Open In Service URL

CHIP Pavement and Other Projects

Open In Service URL

Details

Source: [Feature Service](#)

Created from: [10YearCHIP](#), Service Definition

Data Last Updated: Nov 30, 2018, 9:03:18 AM

Size: 4 MB



Owner

brad.utecht

Tags

CHIP; Capital Highway Investment Plan; MnDOT

Credits (Attribution)

Output for Prioritizing Field Reviews

ATP	DISTRICT	LIST NUM	YEAR	PROJECT DESCRIPTION	PROJECT NUMBER	BRIDGE	SEGMENT
1	1	40	2024	I-35, NB AND SB, IN DULUTH, LAKE AVENUE TO MN 61, MAJOR CPR AND GRIND	6982-XXX	0	73
6	6	56	2026	I 35 NB AND SB FROM CSAH-48 TO 0.1 MI N MN-21, CONCRETE UNBONDED OVERLAY	NEW	0	73
1	1	46	2024	MN 194, NB AND SB, IN DULUTH, EAST JCT OF US 53 (TRINITY ROAD) TO 200 FEET NORTH OF MESABA AVENUE, MEDIUM MILL/OVERLAY	6933-XXX	0	72
2	2	48	2025	MN 72 FROM US 71 TO 1 MI NORTH OF US 71, BITUMINOUS MILL & OVERLAY		0	72
8	8	20	2023	1.2 MILES E. OF CSAH 5 (E. END OF BRIDGE 5526) TO 6TH STREET (WILLMAR), MAJOR CPR	3403-	0	69
3	3	37	2023	MN 95, IN CAMBRIDGE, URBAN RECONSTRUCTION	3006-XX	0	68
3	2	49	2024	US 2, FROM HUBBARD/CASS CO LINE TO END OF 4 LANE, MILL AND OVERLAY	1101-XX	0	67
3	3	4	2021	MN 210, IN CROSBY/IRONTON, MILL AND OVERLAY (ASSOCIATED WITH DRMP FUNDED RECONSTRUCTION PROJECT WITH ADA)	1806-XX	0	67

- Trade Offs
 - Less data preparation
 - More input/oversight from analysts
- Scores and Characteristics
 - Committee identify the target(s)
 - Data will point where to go

