



# Visualizing Data for Transit Planners

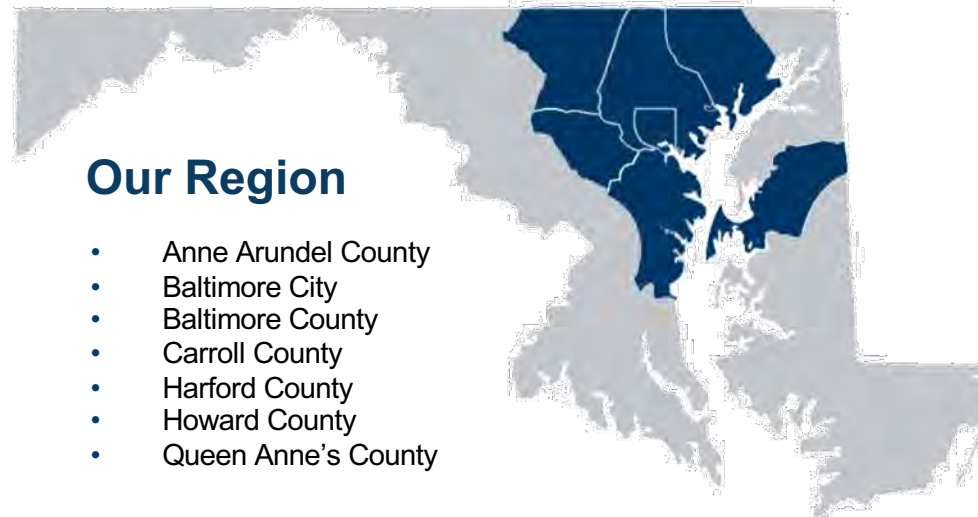
National Center for Applied Transit Technology / Community  
Transportation Association of America

*November 7, 2023*



# Baltimore Metropolitan Council

Baltimore Metropolitan Council is a trusted group of experts who help guide the future of the Baltimore region, working with people and policy makers to make our communities more accessible, livable and prosperous for all. We evaluate needs and trends to develop and implement programs and projects as the Baltimore region is emerging from decades of disinvestment and capitalizing on many strengths to forge a vibrant economy and build a sustainable quality of life for future generations.



# Baltimore Metropolitan Council

- Provide resources to our member jurisdictions in:
  - Transportation
    - Demographics
    - Travel Demand Modeling: Road & Transit
  - Environmental
    - Air Quality Conformity
    - Reservoir Protection/Agreements
  - Cooperative Purchasing
    - School and Government Purchasing
  - Preparedness
    - Security Grants
    - Emergency/Disaster Response
  - Housing
    - Voucher Program
    - Fair Housing Support

# Using Data on Transit Service Decisions



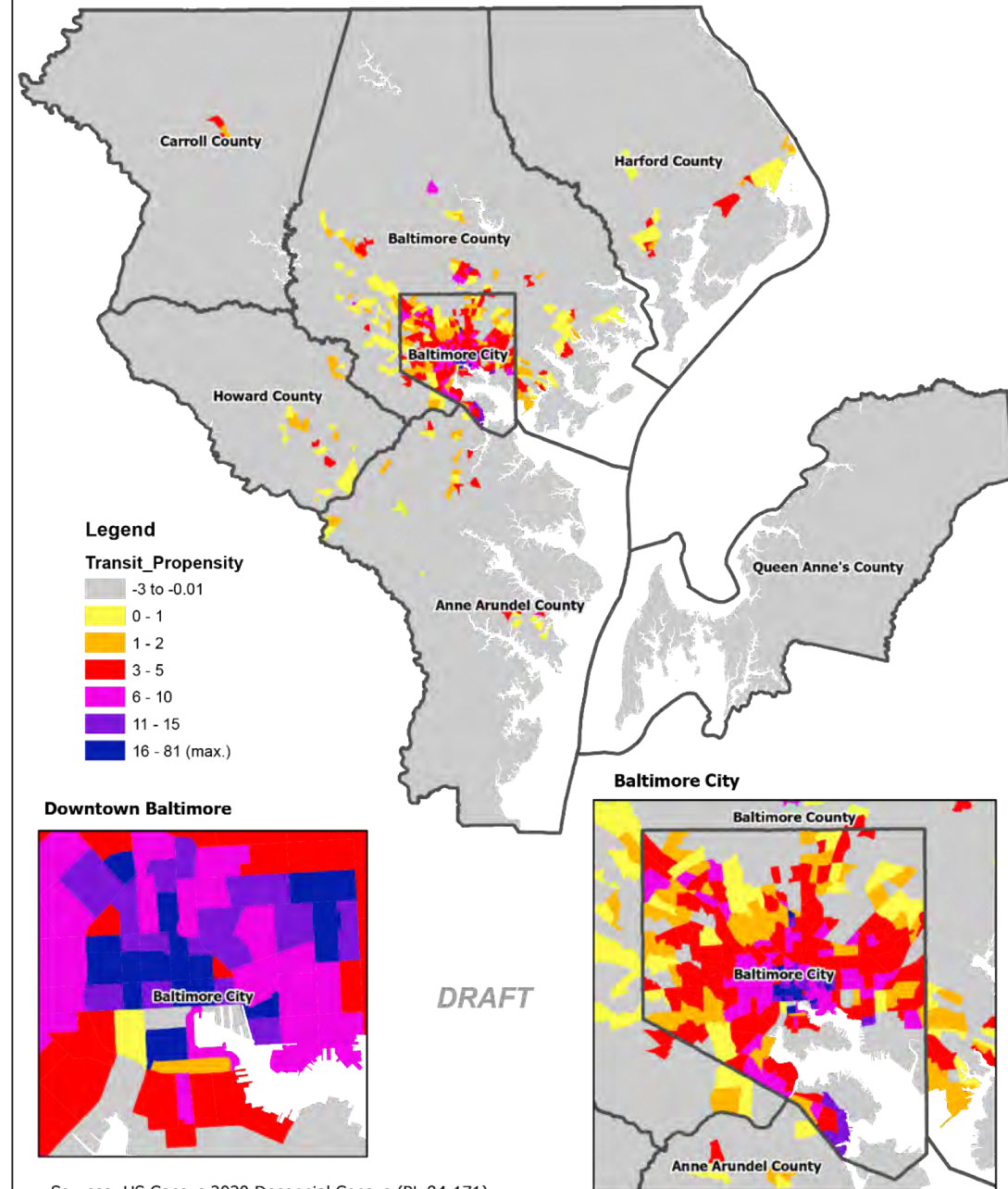
- Provide data to members' staff and consultants
- Transit Analysis
  - Demographics
    - location/densities
    - person and worker characteristics
  - Model Output
    - productions/attractions
    - ridership projections
  - GIS Services
    - mapping demographic trends by TAZ
    - mapping road and transit route volumes/ridership



# A Map for the Baltimore Region

- Transit Propensity Index
  - Used training from N-CATT
  - Calculated:
    - population and job densities
    - percentage of zero car and low-income households
    - Z-scores
  - Mapped using Block Groups
  - Translated to BMC's Transportation Analysis Zones (TAZs)

Baltimore Region Transit Propensity Index 2021



Sources: US Census 2020 Decennial Census (PL 94-171), LEHD (2019), ACS 2021 5-Year (B25044 & C17002)

Baltimore Metropolitan Council, June 2023

# TPI Calculations by Block Group or TAZ

Indicator	Calculation	Source
Population per acre	2020 population / acre	2020 Census (PL 94-171)
Jobs per acre	2019 jobs / acre	2019 LEHD
Population per acre & jobs per acre	population per acre + jobs per acre	
Percentage of zero car households	sum number of occupied housing units without access to vehicle / total number of housing units	ACS (ACSDT5Y202 1.B25044)
Percentage of low-income households	sum number of households earning under 50%, between 50% & 99%, between 100% & 124% and between 125% & 149% of fed poverty line / total households	ACS (ACSDT5Y202 1.B17002)
Z-Score	each indicator above receives a z-score normalization	N-CATT
Transit Propensity Index	sum z-scores	

# Additional TPI Indicators



- Age
  - Elderly Populations
  - Young Populations
- Mobility
  - Persons with a disability
- Visitors
  - Work travel
  - Leisure travel

# Applications



- Easy-to-Use maps of the entire region
- Preliminary Understanding of Where Transit Demand *could* exist
- Transit Route Alternative Selection
  - A jurisdiction is currently using the TPI as part of a larger analysis of proposed transit routes

# For More Information

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SAN MIGUEL AUTHORITY  
FOR REGIONAL  
TRANSPORTATION

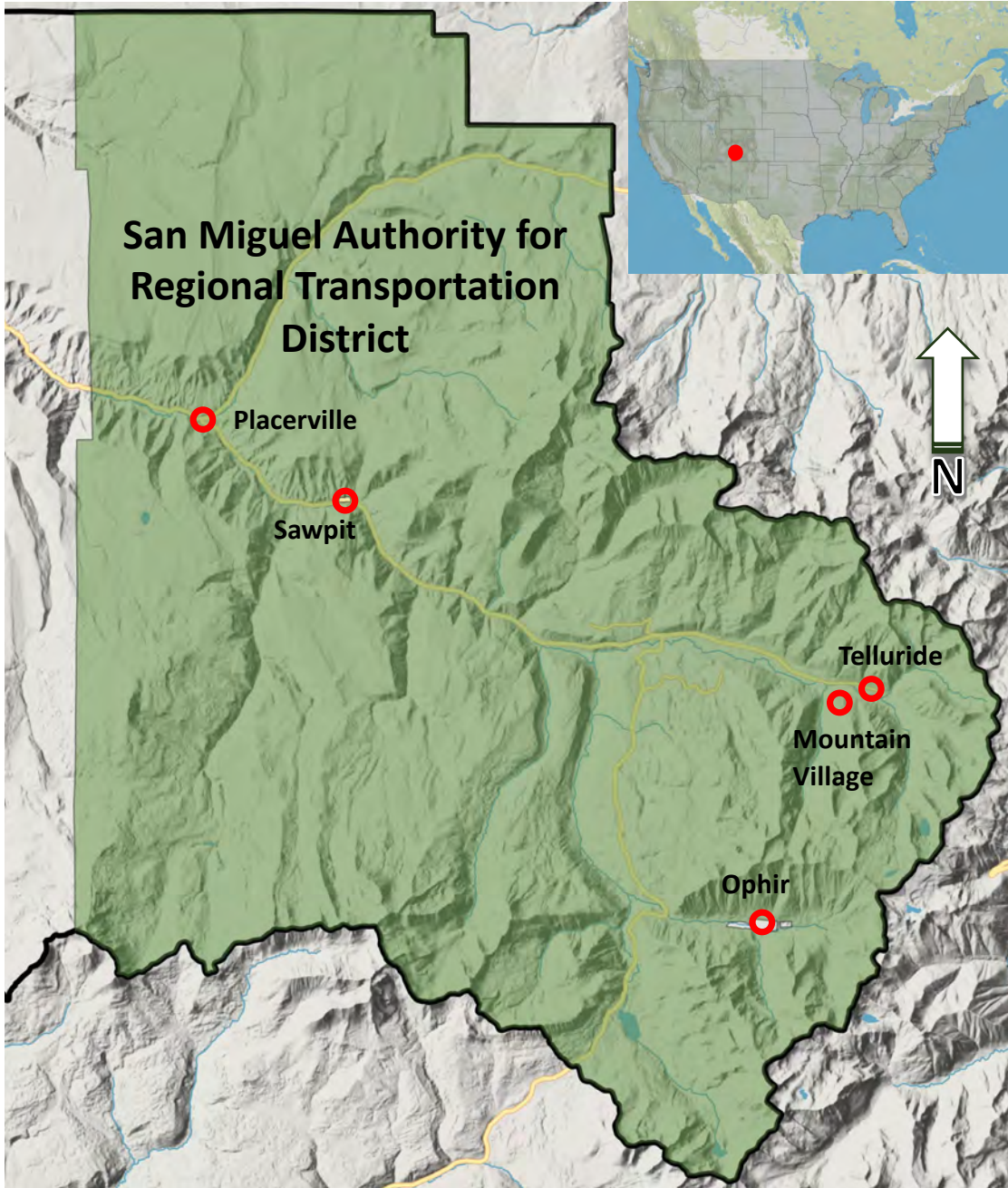
**SMART Mission:** The San Miguel Authority for Regional Transportation strives to deliver safe and reliable transit services and to consistently advocate and promote the use of multi-modal transit systems.

RIDE  
SMART

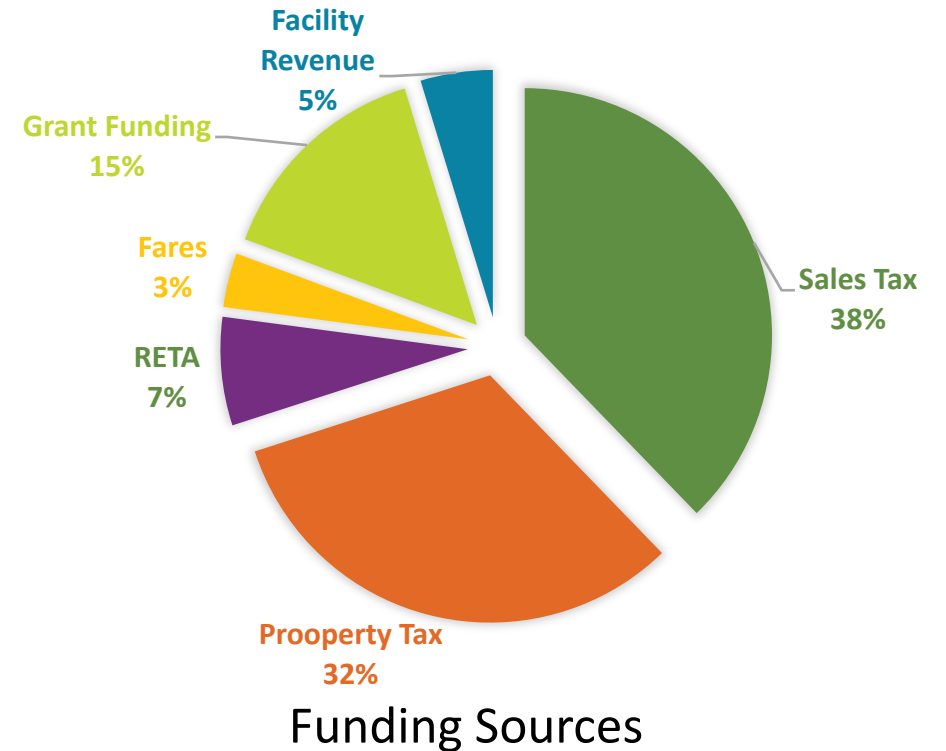


Photography by Abie Livesay





- SMART is located in South West Colorado
- SMART is classified as a Regional Transportation Authority under Colorado law.
- SMART was approved by the voters of the Towns of Telluride, Mountain Village and the San Miguel County R-1 School District in 2016. In 2019, the Town of Rico joined the district.





## Elements of Transit Propensity:

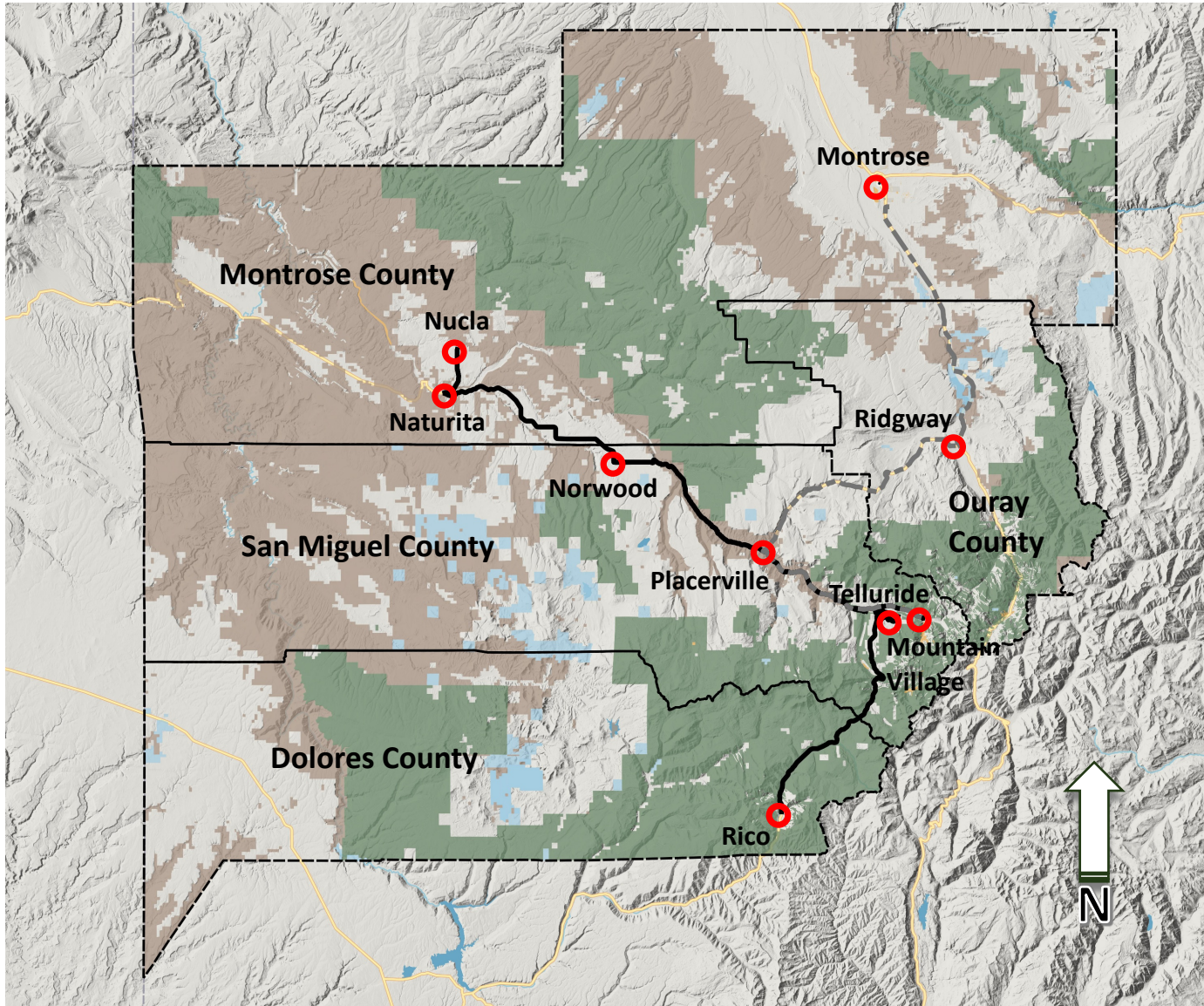
- Population Density
- Income
- Vehicle Availability
- Age
- Disabilities
- Job Density

## Challenges:

- **The rural nature of our community**
  - Population distribution
  - Small data samples from the U. S. Census Bureau
  - Undercounting immigrant populations
  - Large areas of public and agricultural lands that skew population density calculations
- **The economy of our community**
  - Tourism related jobs
  - High costs of living
  - Housing



# SMART Service Area



## Notes:

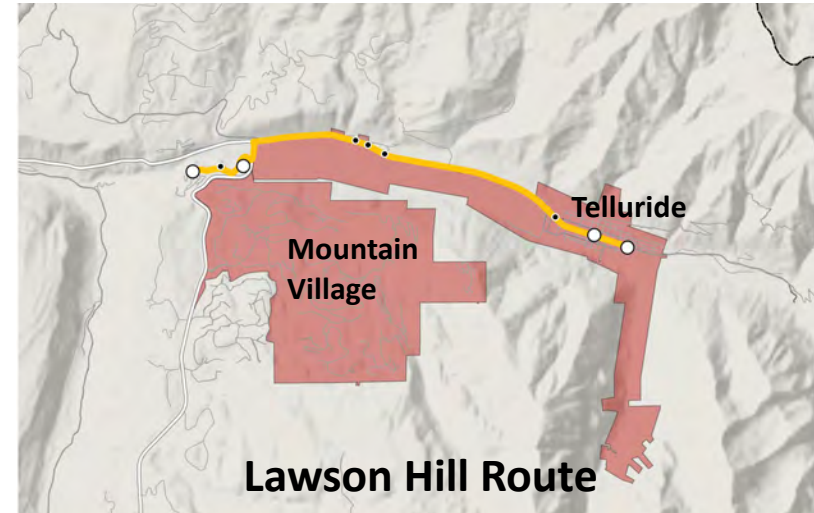
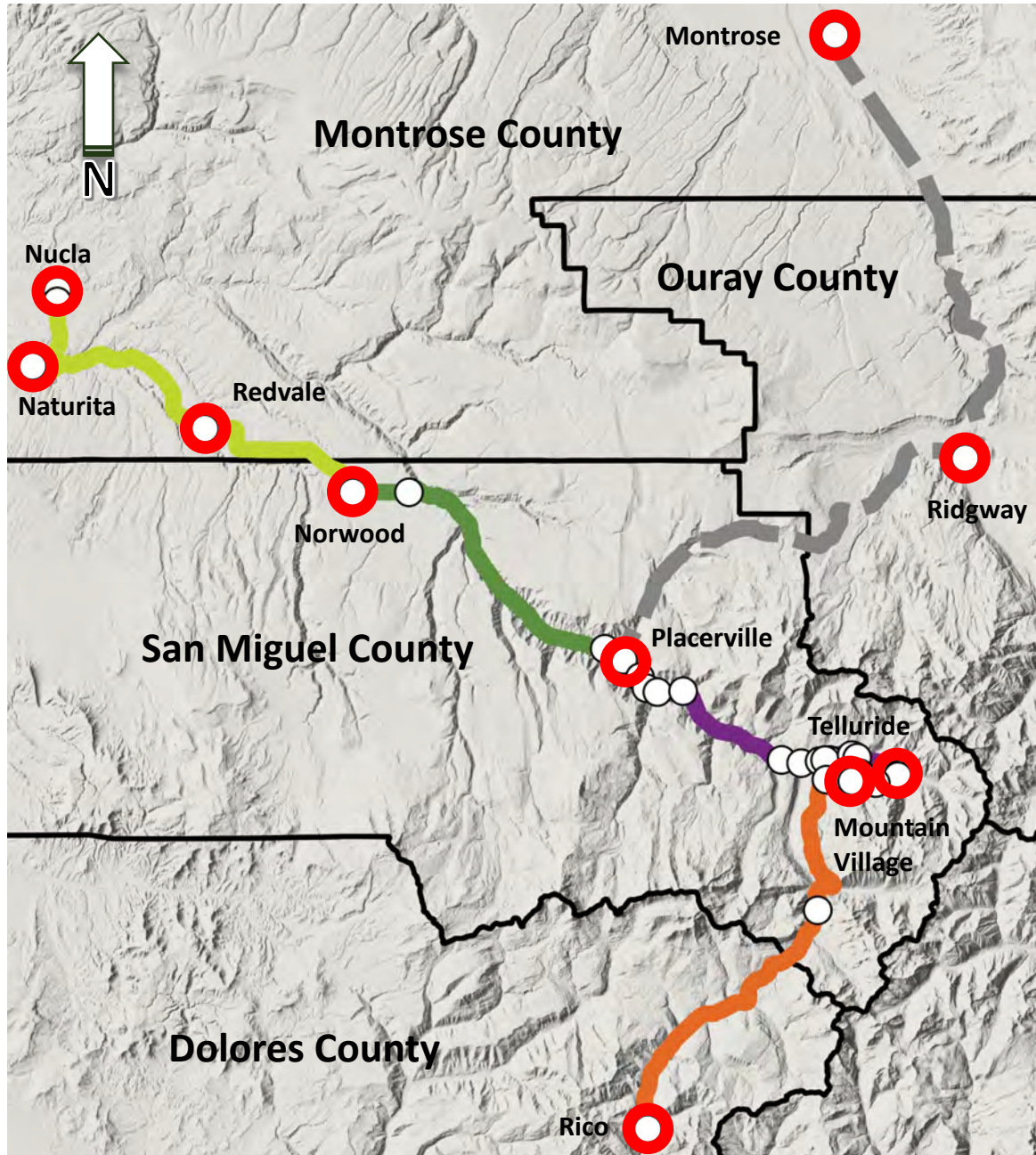
- Populations estimates are from the Census Bureau – July 1<sup>st</sup> , 2022
- Public Land Area estimates are from USGS - Colorado Ownership, Management and Protection (COMaP)
- Agricultural Lands estimates are from the 2017 Census of Agriculture provided by the USDA

County	Population	% Public Lands	% Agricultural Lands
Montrose	43,811	69%	23%
Ouray	5,100	47%	25%
San Miguel	8,003	64%	16%
Dolores	2,455	64%	23%

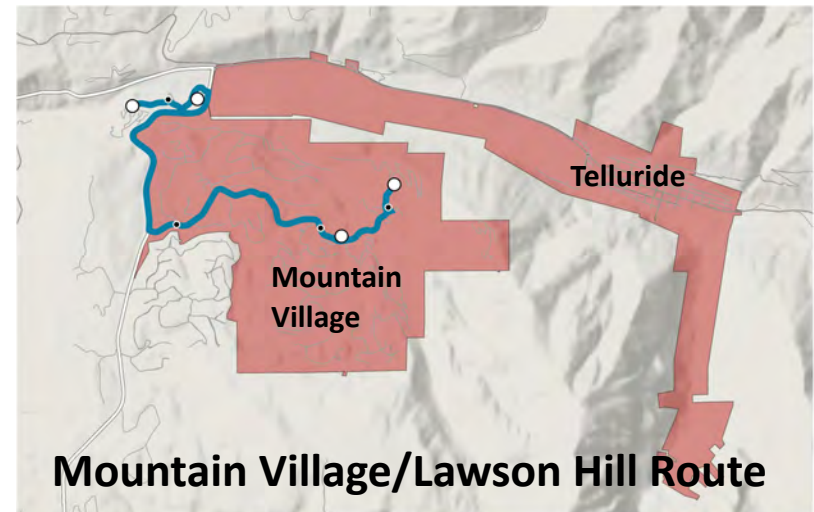
## Legend:

- BLM Land
- USFS Land
- State Owned Land
- Private Land
- Other Conserved Lands
- SMART Bus Routes
- - - Vanpools Routes

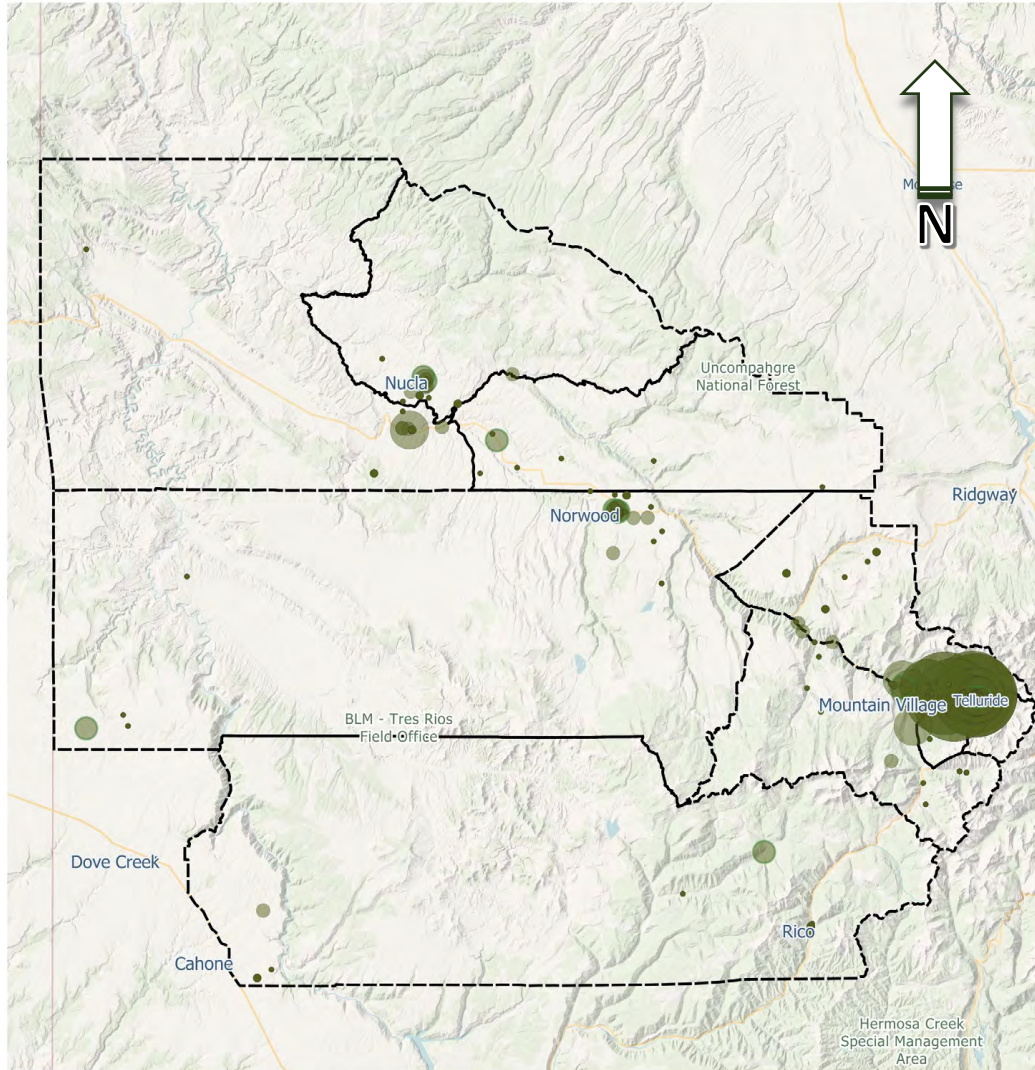




## SMART Regular Bus Routes



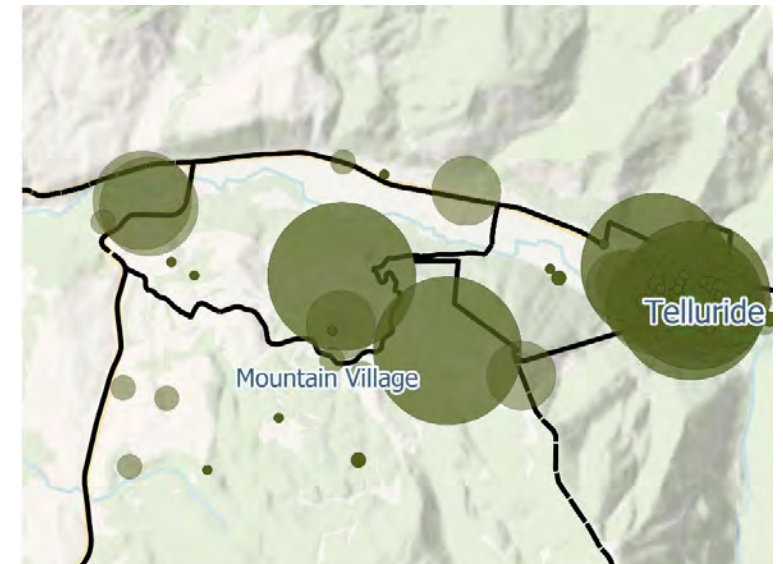




**Notes:**

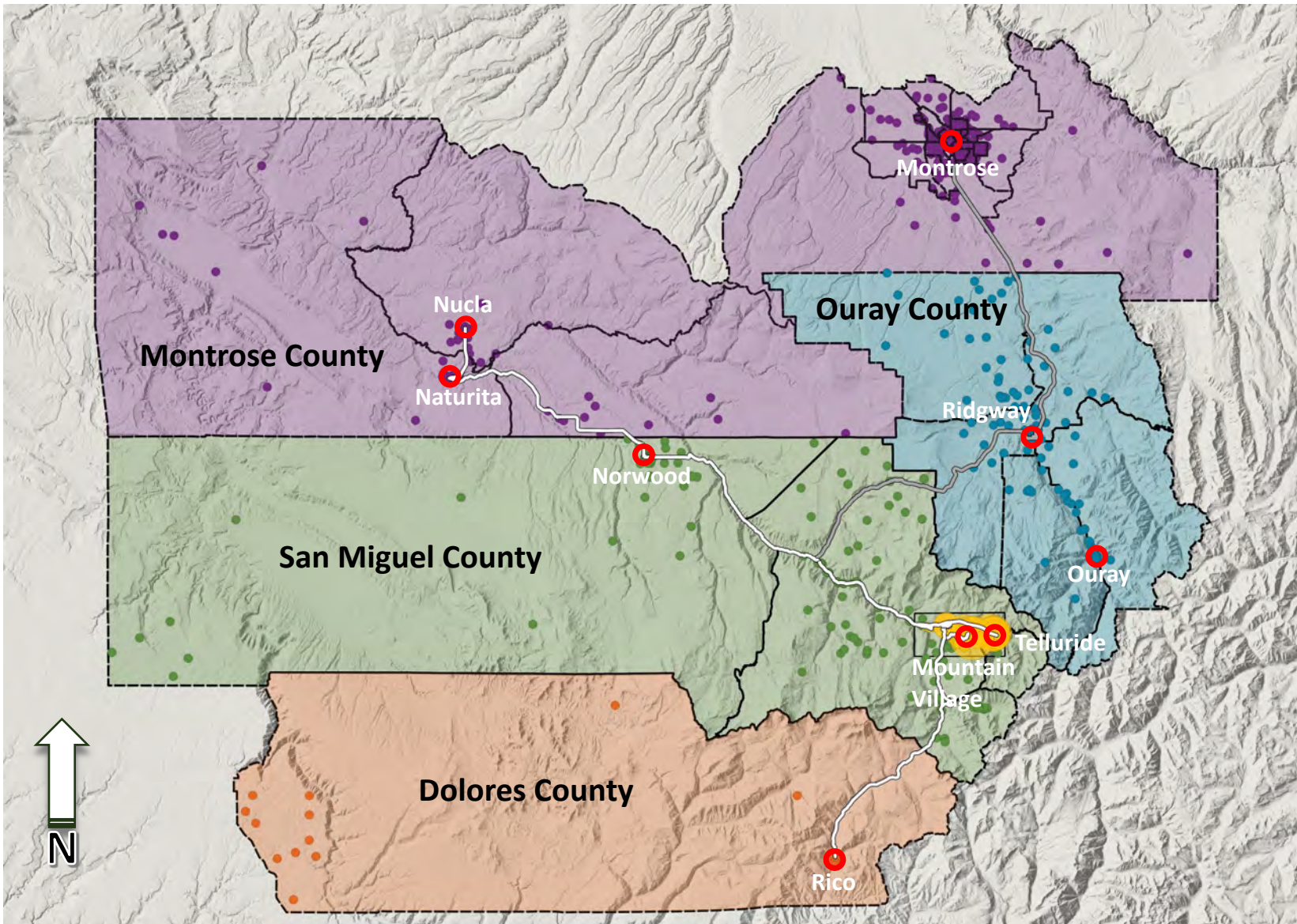
- Job related data comes from the U.S. Census Bureau “On the Map Tool”
- Service related jobs represent 87.8% of the jobs in the east end of San Miguel County
- 50.3% of jobs in the east end of San Miguel County pay \$1,250 per month or less.
- The median cost of a house in the east end of San Miguel County is 3.1 million dollars (realtor.com)

- 1 to 5 Employees
- 6 to 10 Employees
- 11 to 25 Employees
- 26 to 50 Employees
- 51 to 100 Employees
- 101 to 200 Employees
- 200 plus Employees
- Served by SMART



Job Distribution in the SMART Bus Service Area

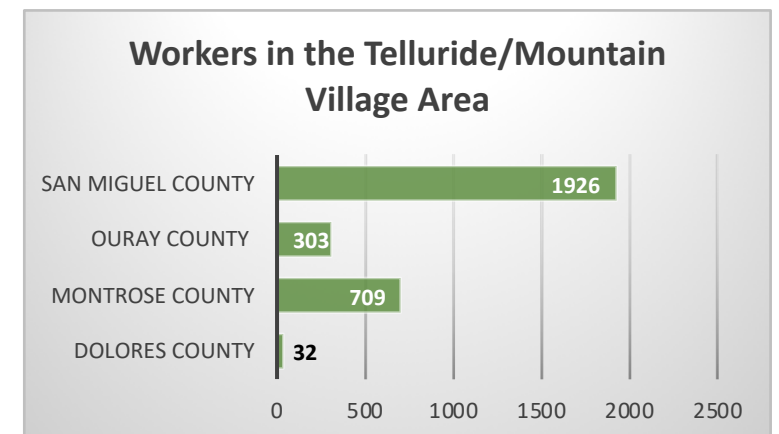




Paired Data Analysis

### Notes:

- Data is from the Paired Analysis Tool that is on the “On the Map” website provided by the U.S. Census Bureau.
- The smaller dots represent data points from “On the Map” of commuters in the illustrated census blocks that commute to the East End of San Miguel County for work.
- The larger yellow dots represent jobs in the Telluride/Mountain Village area.







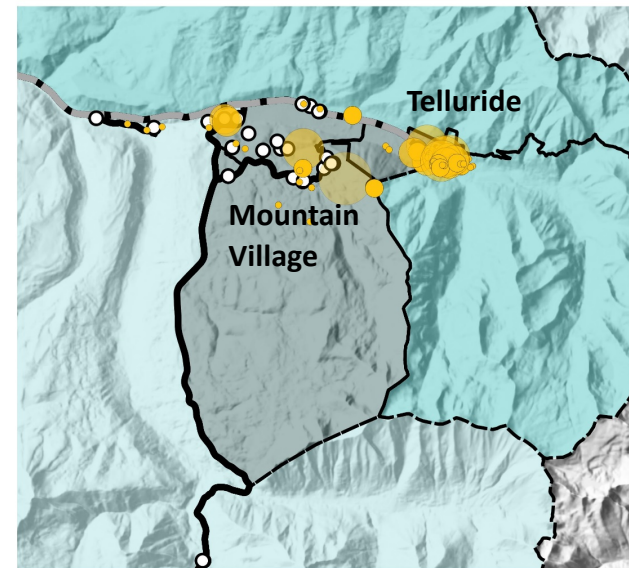
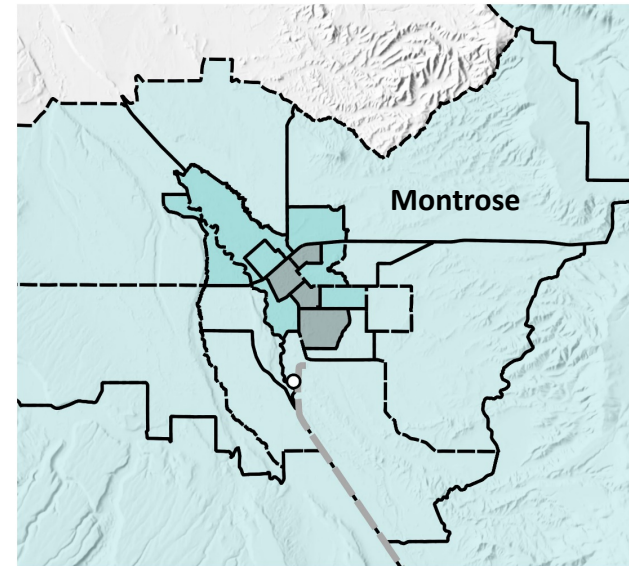
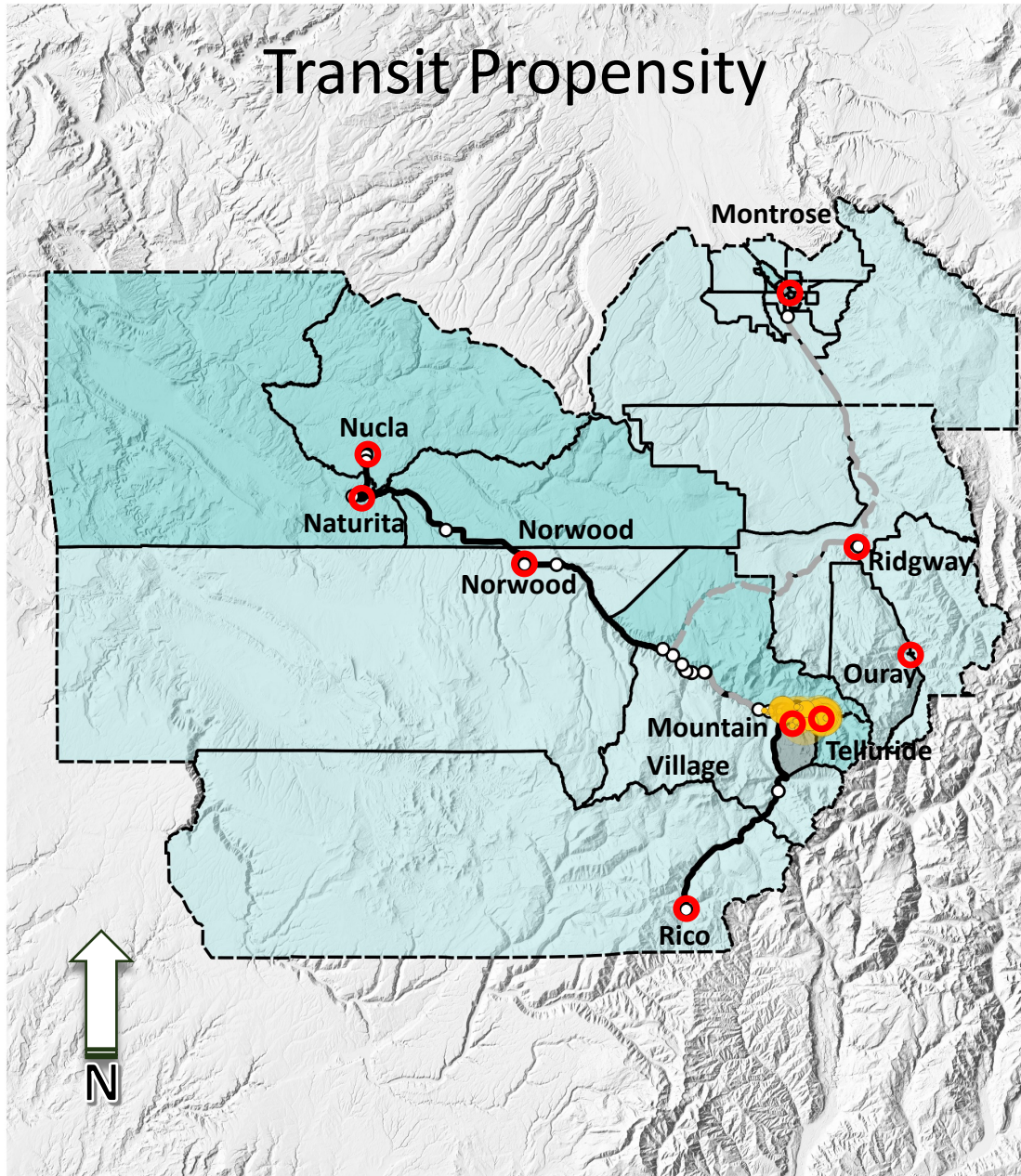
## Data Downloads:

- B01001 - Population ([data.census.gov/advanced](https://data.census.gov/advanced))
- C17002 – Income Levels
- B25044 - Vehicle Availability
- C21007 - Age and Disability
- On the Map - Job Density (<https://onthemap.ces.census.gov/>)
- Public Lands (<https://www.sciencebase.gov/catalog/item/4f4e483ce4b07f02db4f1ba3>)
- Parcel data from Montrose and San Miguel County GIS webpages.

## Changes to the Microtransit Service Design Methodology:

- Removed Public Land Acreage from the population density calculation.
- Used Paired Analysis Tool to determine how many people are traveling to San Miguel County East End for work added that to the transit propensity equation.





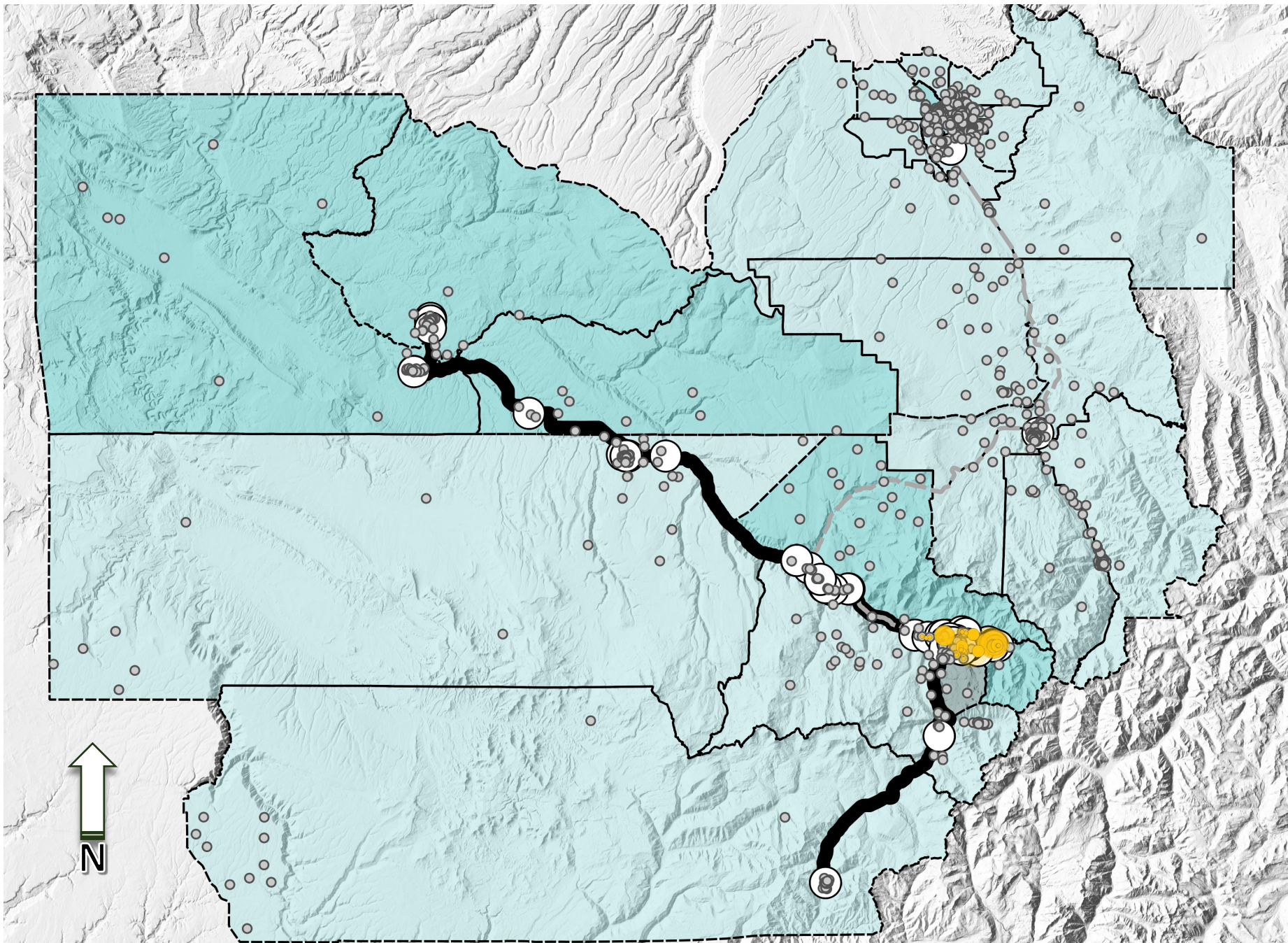
### Legend:

- Low Transit Propensity
- Moderate Transit Propensity
- High Transit Propensity
- SMART Bus Routes
- Vanpools Routes
- Jobs around Telluride/MV
- SMART Bus Stops

### Weighting:

- Population Density – 3
- Income Levels – 3
- No car per household – 5
- One car per household – 3
- Percent of people traveling to the East End of San Miguel County – 10
- Disabled and over 65 percent population - 1.

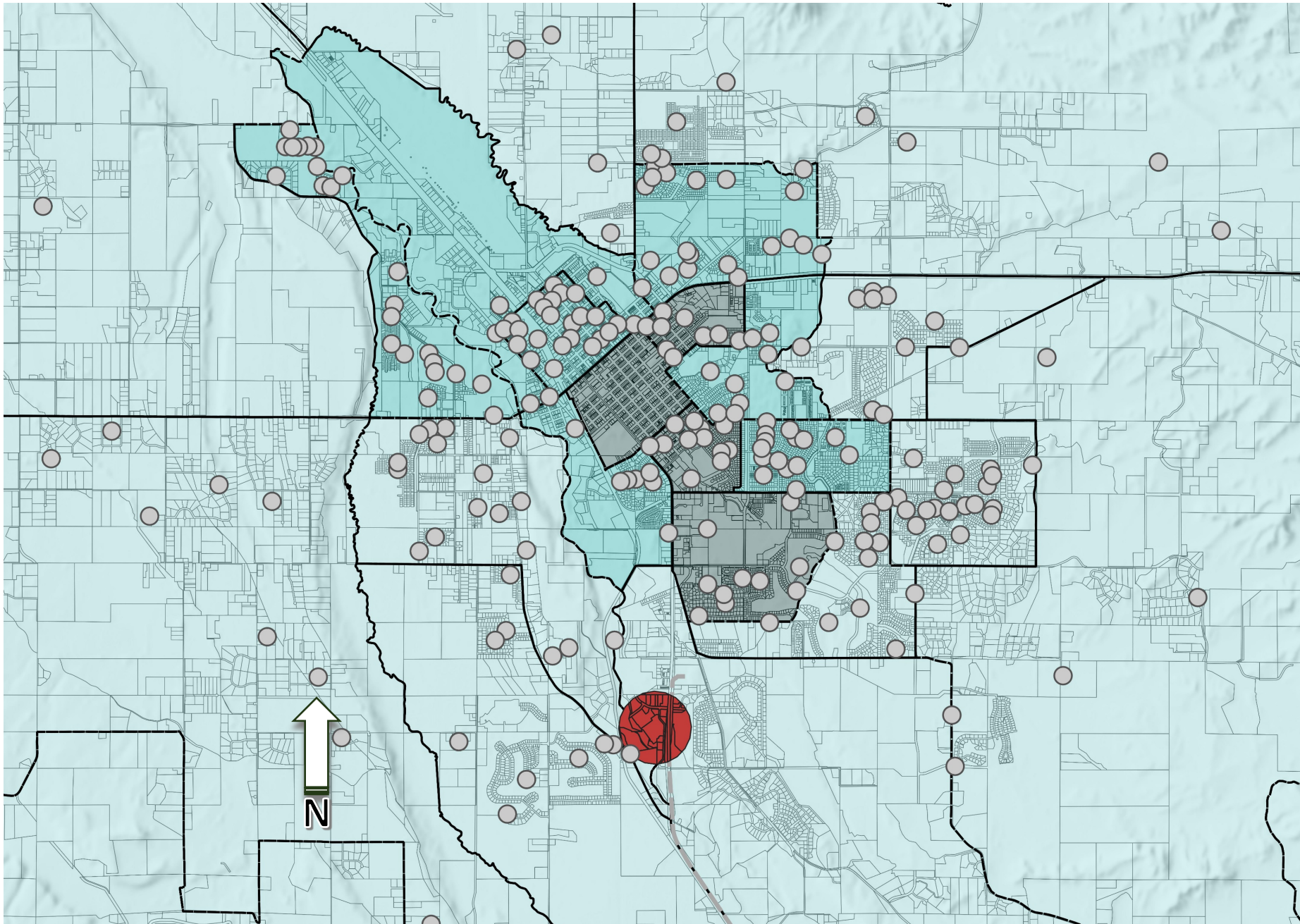




**Legend:**

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- Jobs in the Telluride/MV Area
- Data points of commuters to the east end of San Miguel County

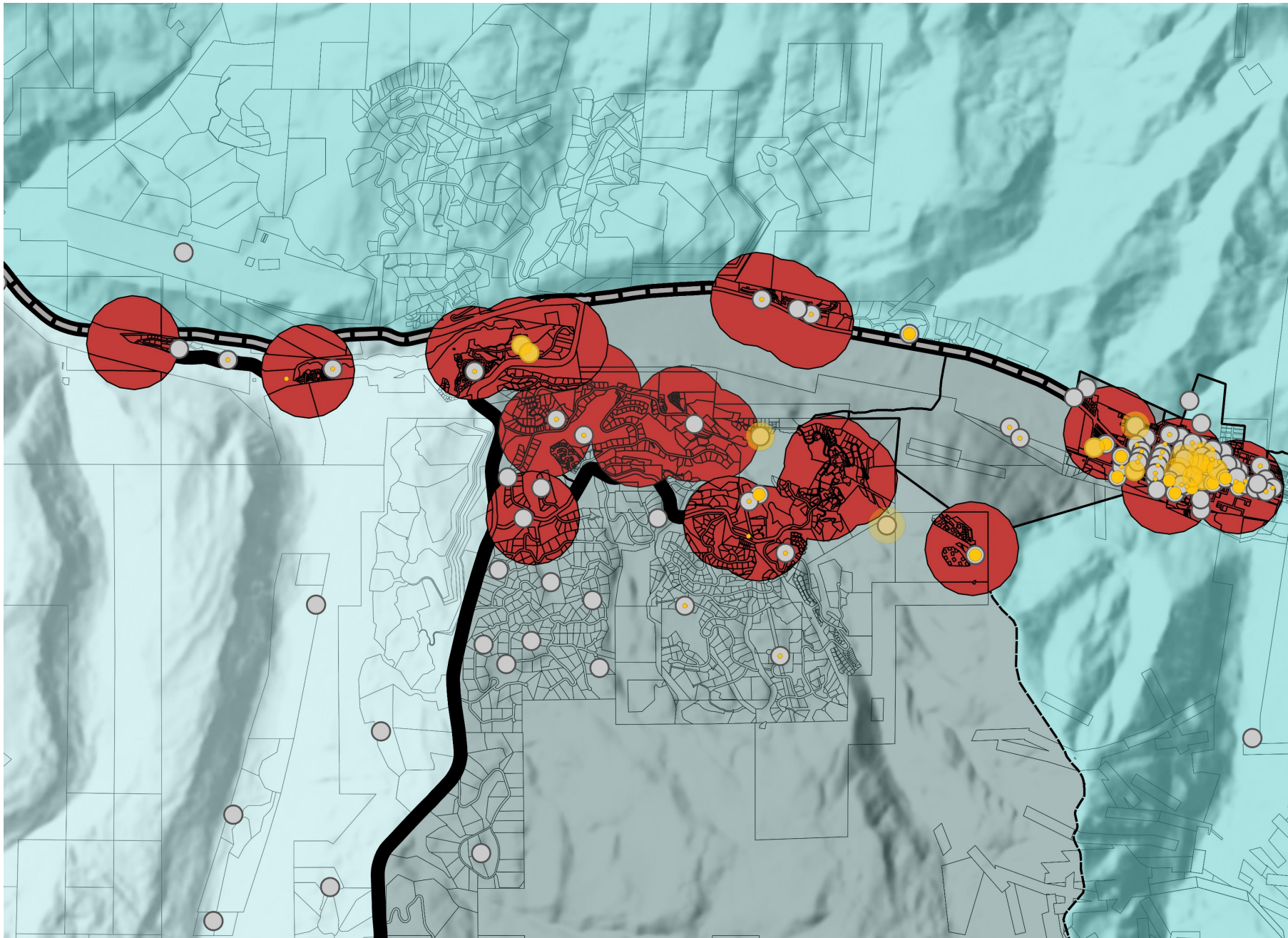




**Legend:**

- Low Transit Propensity
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- SMART Bus or Vanpool Stops
- Jobs in the Telluride/MV Area
- Area within 1/4 mile of a stop
- Data points of commuters to the east end of San Miguel County





**Legend:**

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Questions?