TAHOE REGIONAL PLANNING AGENCY x UCLA Geospatial

Tahoe Regional Planning Agency
Lake Tahoe Regional Plan
Regional Transportation Plan: Update 2025

TRANSPORTATION EQUITY STUDY

This report begins an investigation into the progress of TRPA's Regional Transportation Plan (RTP), giving special consideration to the development of RTP projects which expand transportation access, especially in 5 key Community Priority Zones (CPZ). These CPZs have populations with an unusually high percentage of residents who have been identified as likely to rely on public transit.

Statistics

i. Of the **43** 2020 RTP Projects in the 'Active Transportation' category, **15** or **34.9%** of projects will intersect a CPZ. The total estimated cost of these projects, not including those with varied costs, is **$36,742,801.00**.

ii. Of the **15** 2020 RTP Projects identified above, **6** projects were expected to be completed before 2025. The costliest of these projects is the **Tahoe Valley Greenbelt** project, which will serve the **Tahoe Verde** CPZ. **6** transit stops are located within a ¼-mile walk of this project.

iii. The table below lists the percentages of each CPZ that fall within a ¼-mile walk of a transit stop:

CPZ No.	CPZ Name	% ¼-mi. Walkshed
CPZ1	Tahoe Verde	45.550%
CPZ2	Sierra Tract	8.720%
CPZ3	Bijou	65.021%
CPZ4	Incline Village	57.018%
CPZ5	Kings Beach	57.175%

By this metric of transit access, *CPZ2* Sierra Tract has the least access by a wide margin.

iv. Of the **117** proposed bike trail projects, **35** or **29.9%** of projects will pass through a CPZ. **11.5 new miles** of bike trails will be constructed in CPZs, contributing to a total of **30.3** miles of CPZ bike trails upon completion. These **11.5** new miles constitute a **61.167% increase** in total CPZ bike trail length. Of the **35** proposed, **5** bike trail projects have begun implementation.

 # / Active Transportation Projects serving a CPZ
15

% / Active Transportation Projects serving a CPZ
34.9%

Estimated Total Cost
$36,742,801

Projects due for Completion by 2025
6

Costliest
Tahoe Valley Greenbelt: $8,550,000

Highest Transit Access
CPZ3 Bijou
65%

Lowest Transit Access
CPZ2 Sierra Tract
9%

Length of Existing Bike Trails
18.8 mi

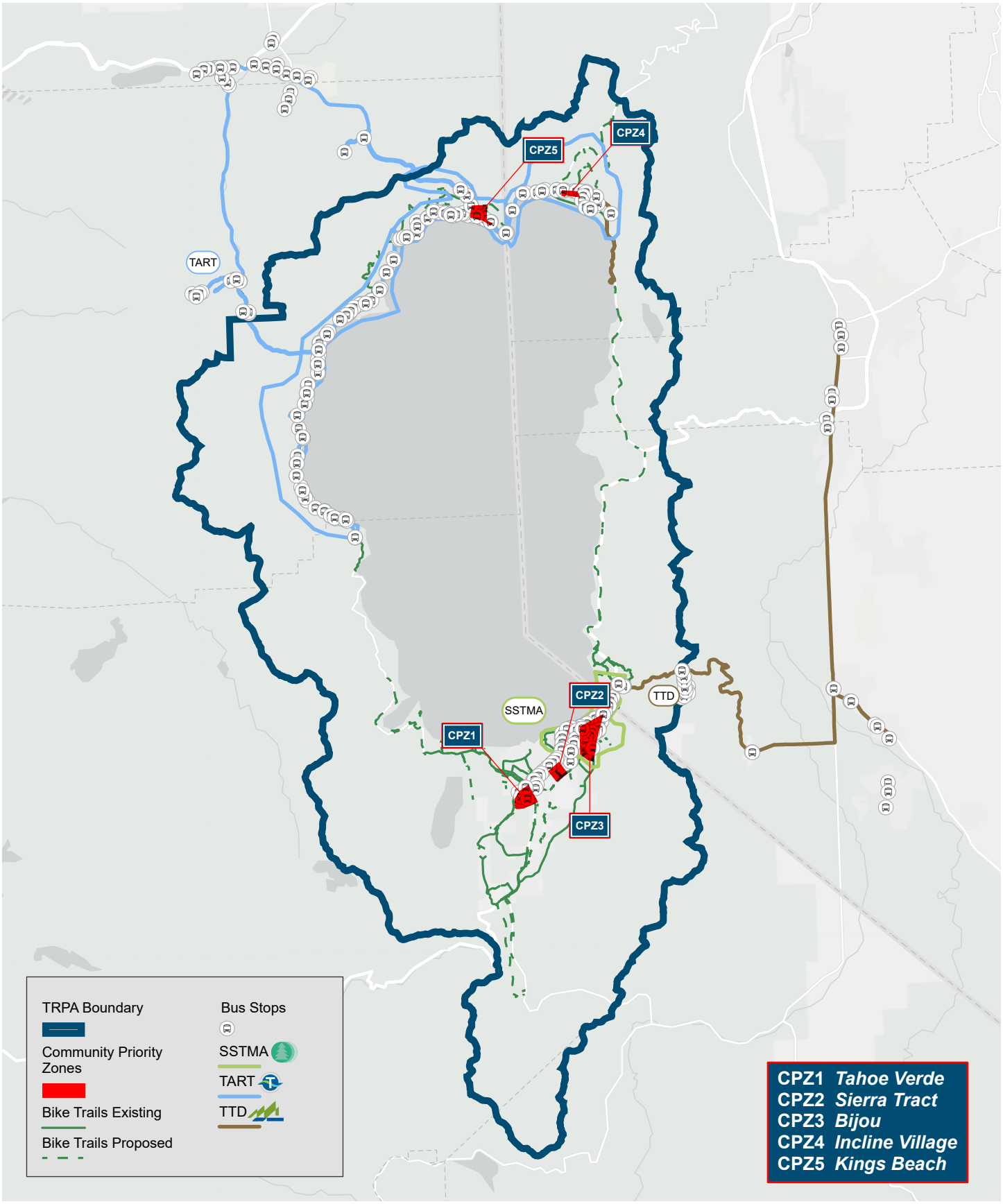
Length of Proposed Bike Trails
11.5 mi

Aaron Goodman
UCLA GEOG 498 Unit 2

Map 1. Lake Tahoe Region

0 4.75 9.5 19 Miles

Scale: 1:330,000
Spatial Reference: NAD 1983 UTM Zone 10N
Projection: Transverse Mercator



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pp. 2

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community; ©TRPA, tahoeopendata.org (see Appendix for a full list of services used)

Map 2. Census Block Groups: *% Household without a Vehicle*

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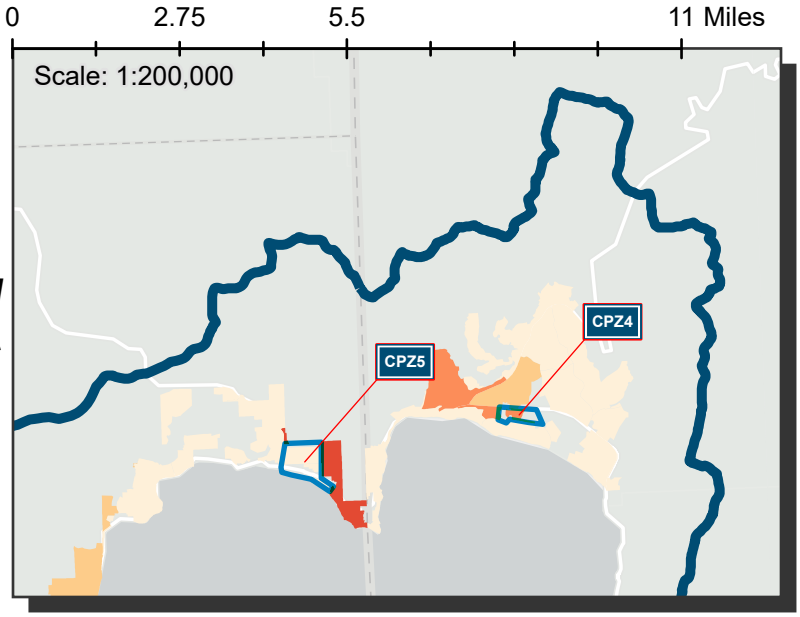
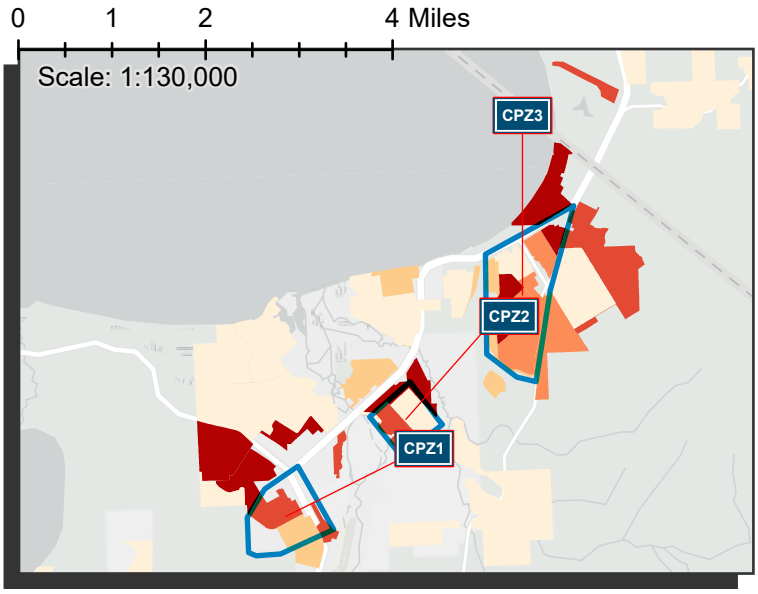
Spatial Reference: NAD 1983 UTM Zone 10N
Projection: Transverse Mercator

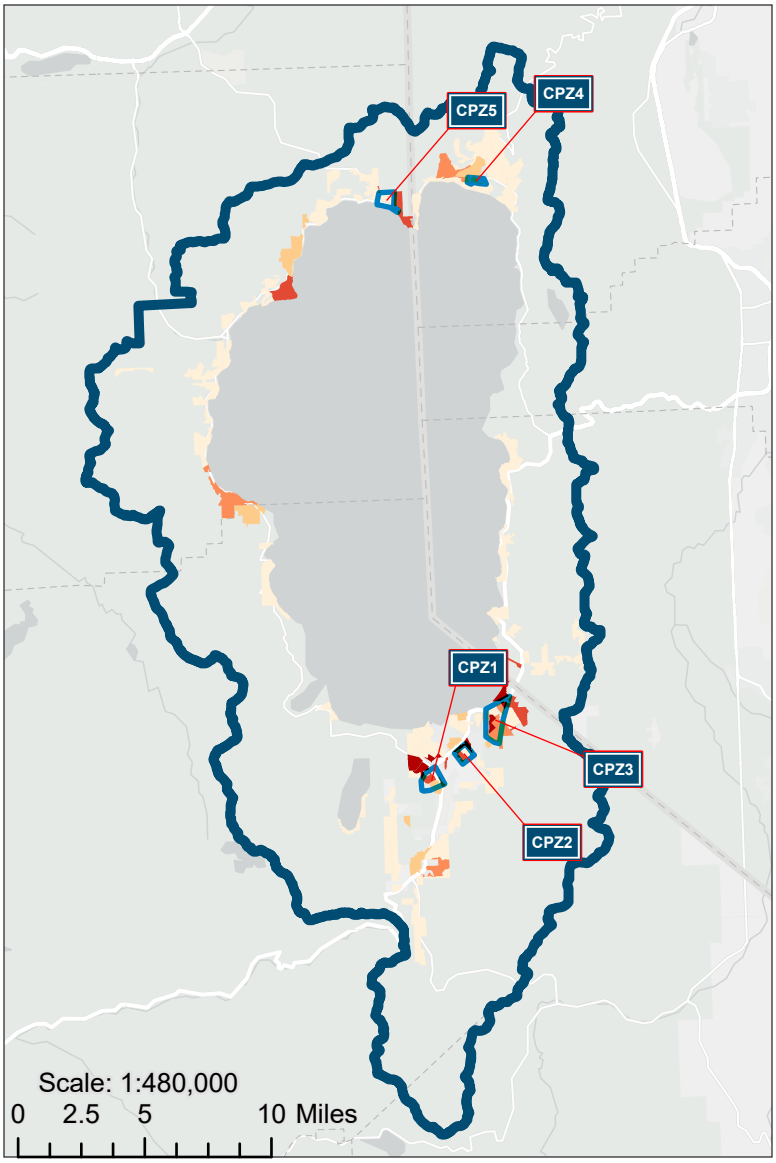
29/77 or 37.7% of Tahoe Block Groups have households without a vehicle



Incline Village and Kings Beach CPZs



Tahoe Verde, Sierra Tract, and Bijou CPZs



% Household without a Vehicle

- 0
- <= Q1 (3.0030%)
- <= Q2 (6.3604%)
- <= Q3 (13.3970%)
- > Q3

Community Priority Zones

CPZ1 *Tahoe Verde*
CPZ2 *Sierra Tract*
CPZ3 *Bijou*
CPZ4 *Incline Village*
CPZ5 *Kings Beach*

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community; ©TRPA, tahoeopendata.org (see Appendix for a full list of services used)

Map 3. Census Block Groups: *% Population under Poverty Line*

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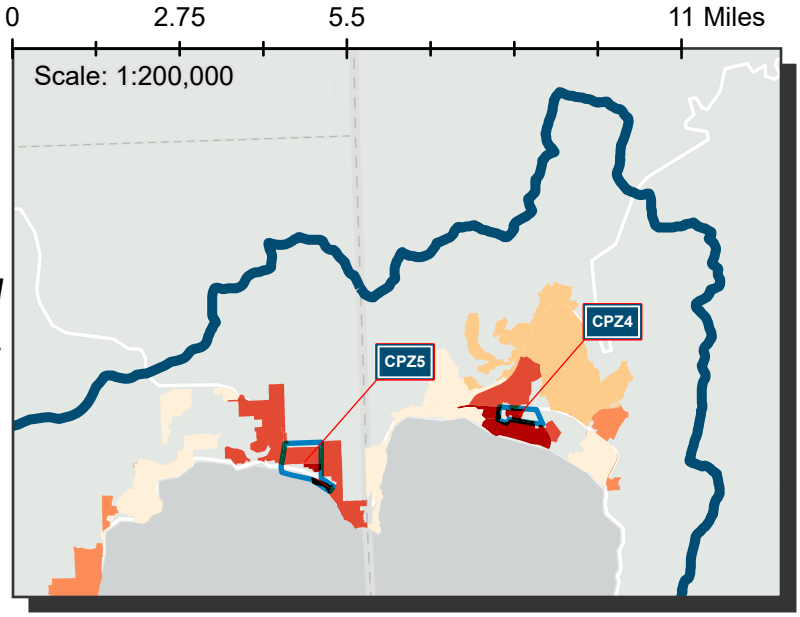
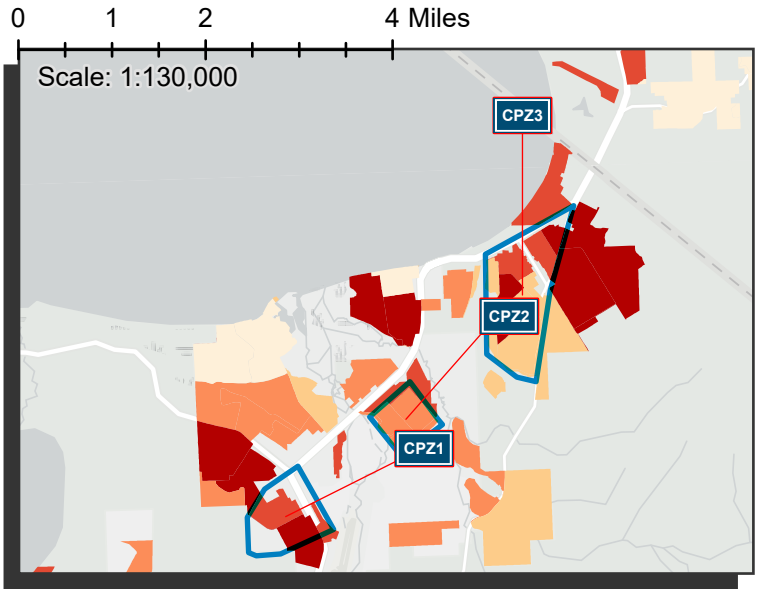
Spatial Reference: NAD 1983 UTM Zone 10N
Projection: Transverse Mercator

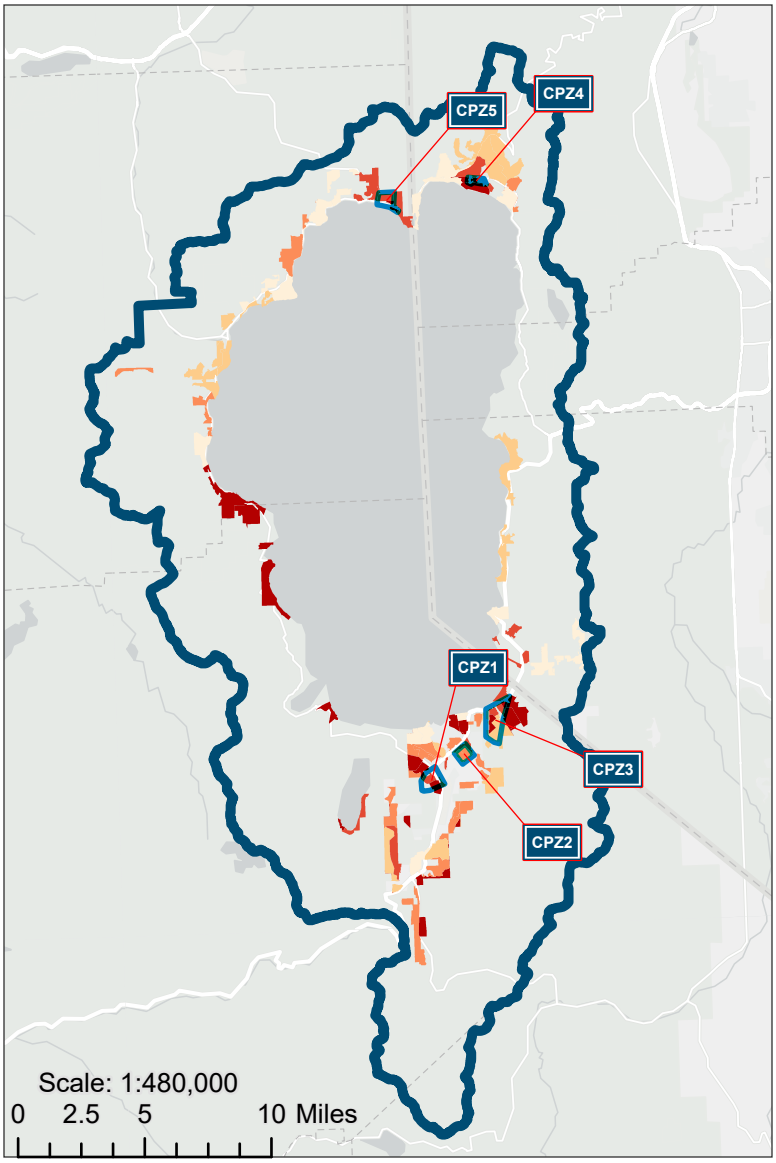
62/77 or 80.5% of Tahoe Block Groups have populations under the poverty line



Incline Village and Kings Beach CPZs



Tahoe Verde, Sierra Tract, and Bijou CPZs



% Population under Poverty Line

- 0
- <= Q1 (3.3290%)
- <= Q2 (9.6569%)
- <= Q3 (14.2465%)
- > Q3

Community Priority Zones

CPZ1 *Tahoe Verde*
CPZ2 *Sierra Tract*
CPZ3 *Bijou*
CPZ4 *Incline Village*
CPZ5 *Kings Beach*

Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community; ©TRPA, tahoeopendata.org (see Appendix for a full list of services used)

Map 4. Census Block Groups: *% Population with a Disability*

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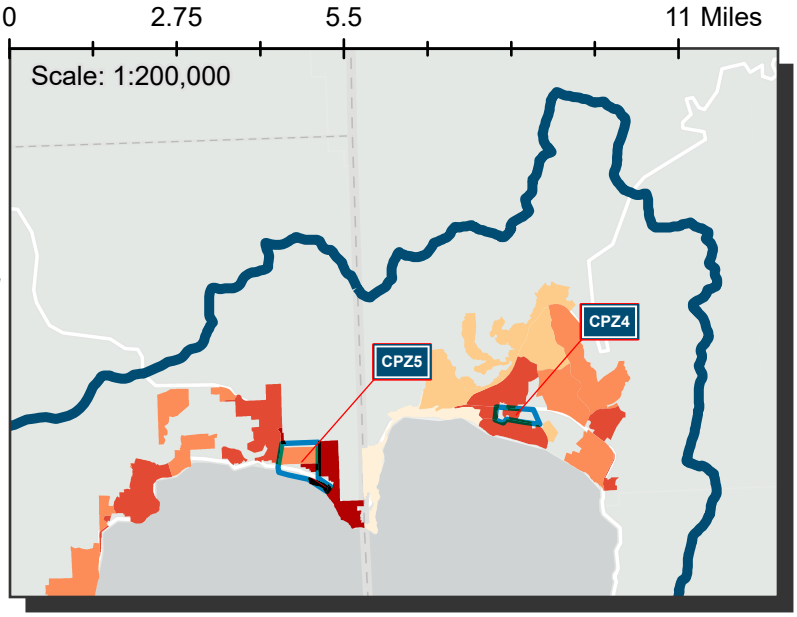
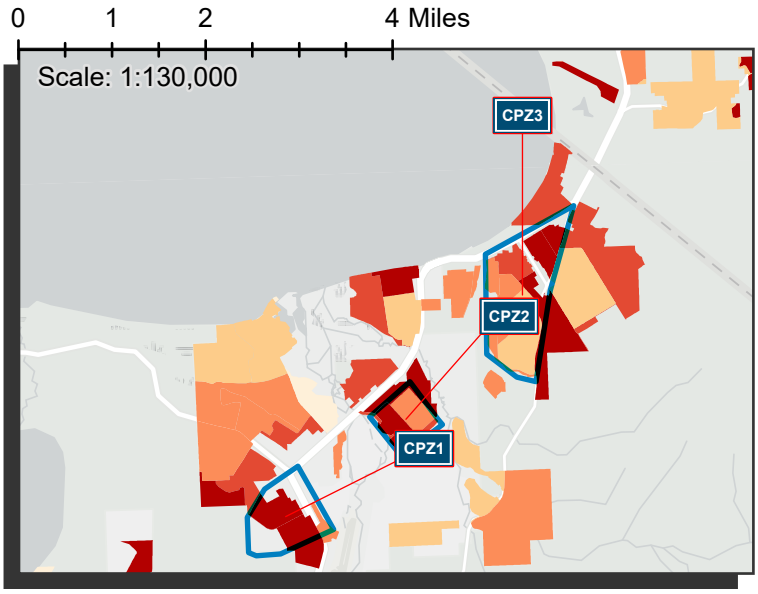
Spatial Reference: NAD 1983 UTM Zone 10N
Projection: Transverse Mercator

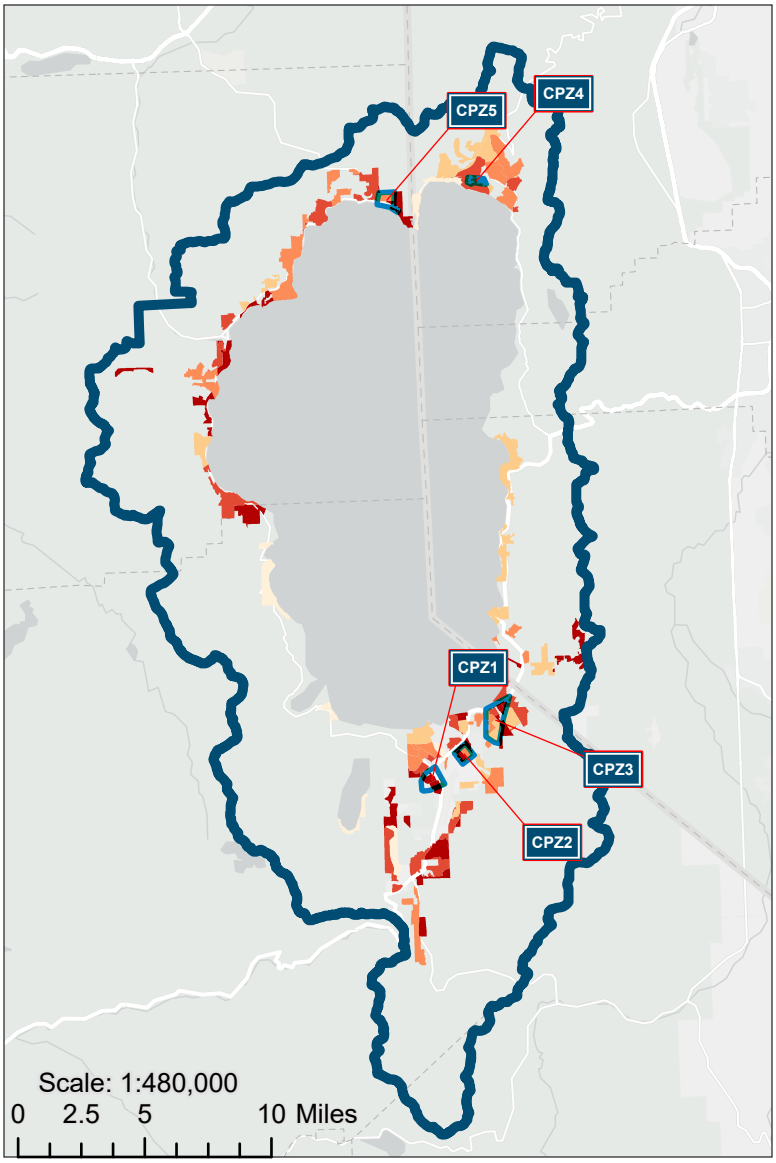
77/77 or 100% of Tahoe Block Groups have populations with disabilities



Incline Village and Kings Beach CPZs



Tahoe Verde, Sierra Tract, and Bijou CPZs



% Population with a Disability

- <= 40%
- <= Q1 (55.0633%)
- <= Q2 (60.8952%)
- <= Q3 (69.3694%)
- > Q3

Community Priority Zones

CPZ1 *Tahoe Verde*
CPZ2 *Sierra Tract*
CPZ3 *Bijou*
CPZ4 *Incline Village*
CPZ5 *Kings Beach*

Map 5. Census Block Groups: *% Population BIPOC Identity*

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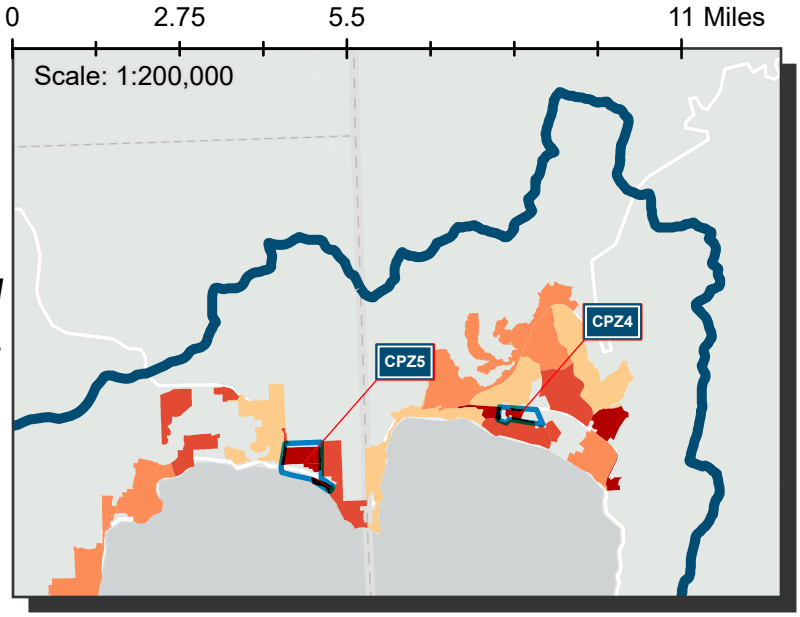
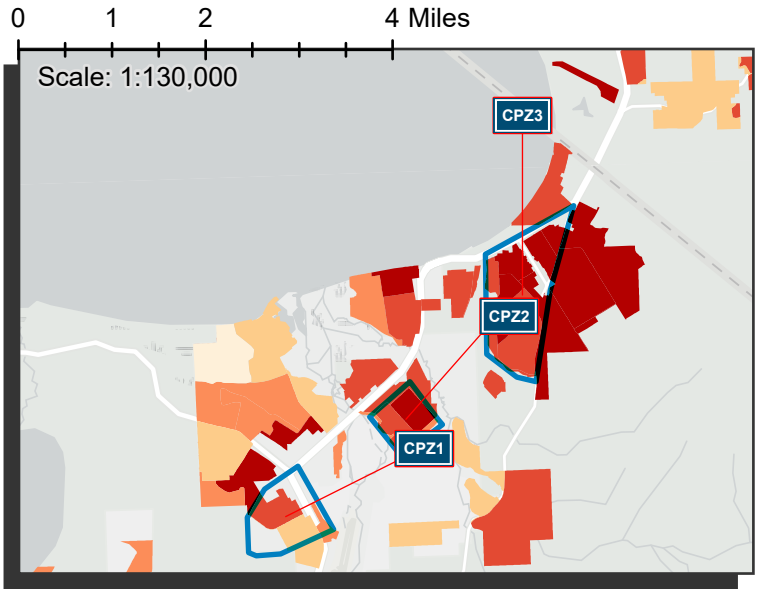
Spatial Reference: NAD 1983 UTM Zone 10N
Projection: Transverse Mercator

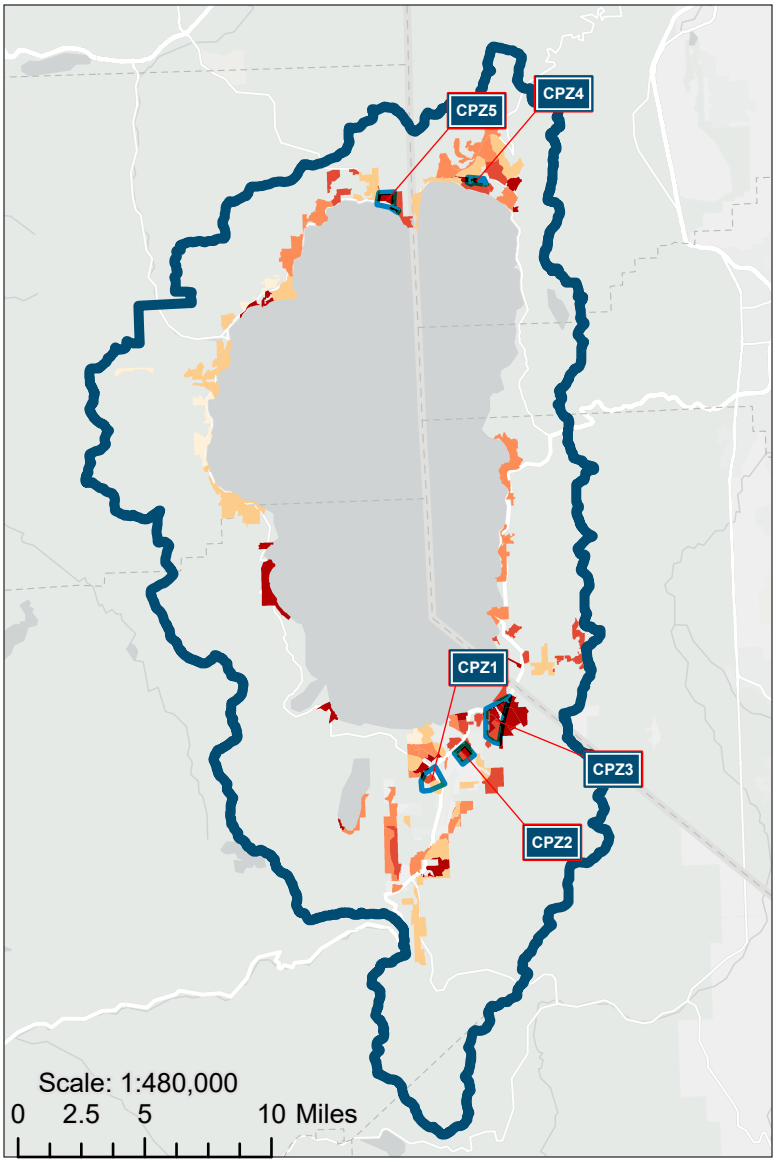
73/77 or 94.8% of Tahoe Block Groups have populations that identify as BIPOC



Incline Village and Kings Beach CPZs



Tahoe Verde, Sierra Tract, and Bijou CPZs



% Population BIPOC Identity

- 0
- <= Q1 (15.5496%)
- <= Q2 (28.7729%)
- <= Q3 (41.5194%)
- > Q3

Community Priority Zones

CPZ1 *Tahoe Verde*
CPZ2 *Sierra Tract*
CPZ3 *Bijou*
CPZ4 *Incline Village*
CPZ5 *Kings Beach*

Map 6. Census Block Groups: *% Population Age 65 and older*

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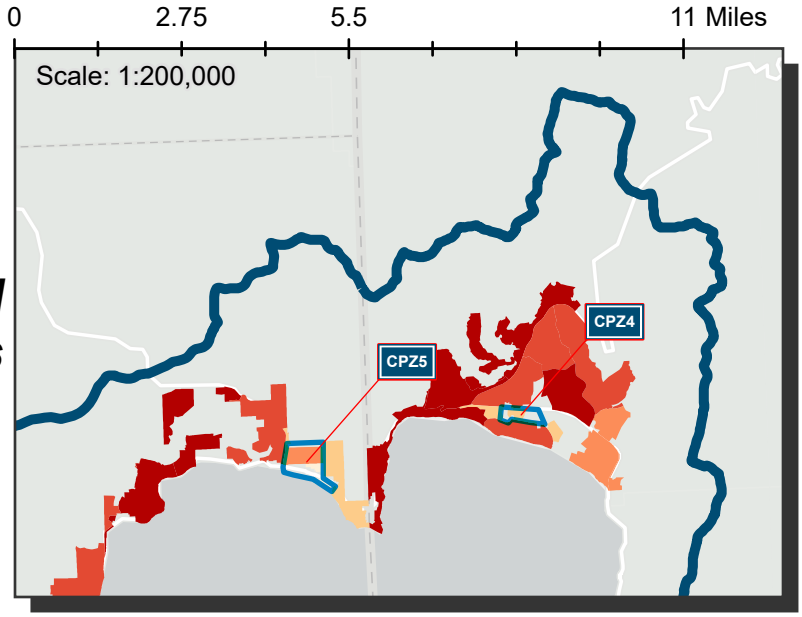
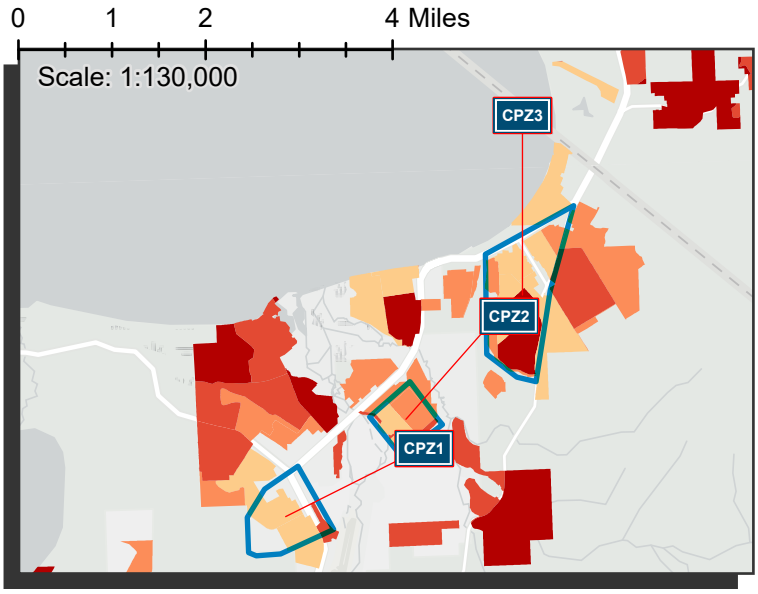
Spatial Reference: NAD 1983 UTM Zone 10N
Projection: Transverse Mercator

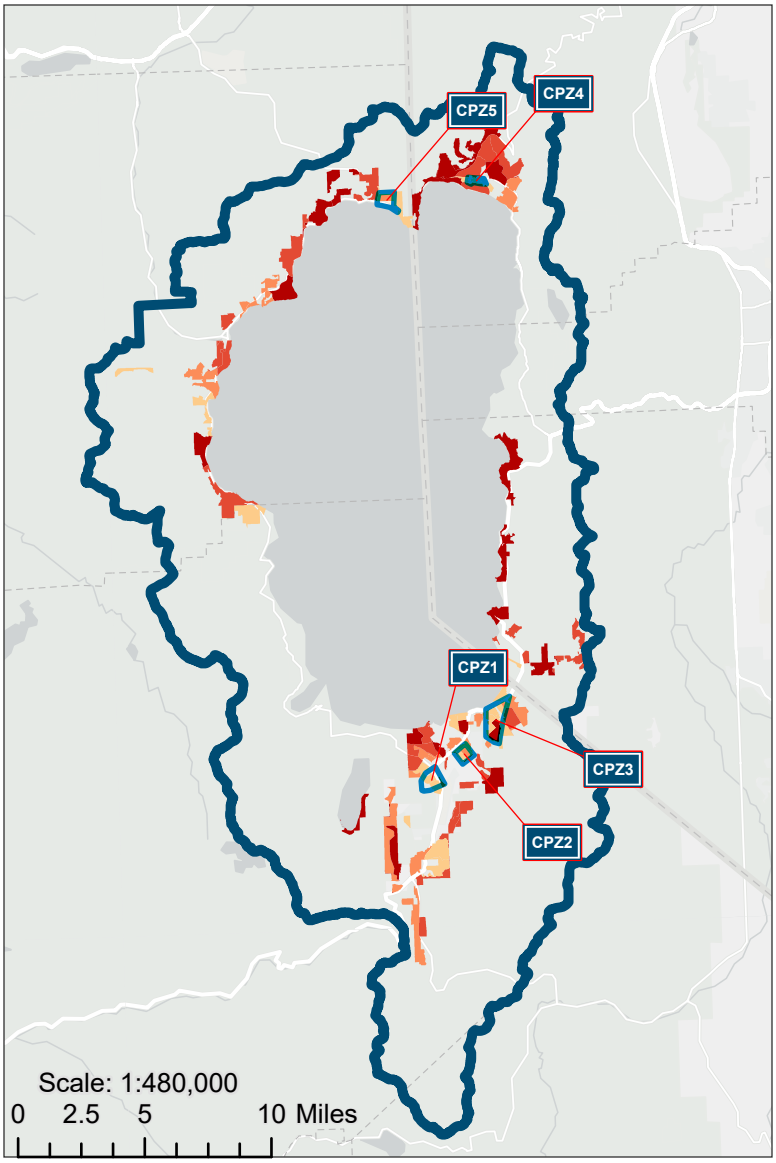
76/77 or 98.7% of Tahoe Block Groups have populations with "seniors" of age 65+



Incline Village and Kings Beach CPZs



Tahoe Verde, Sierra Tract, and Bijou CPZs



% Population Age 65 and older

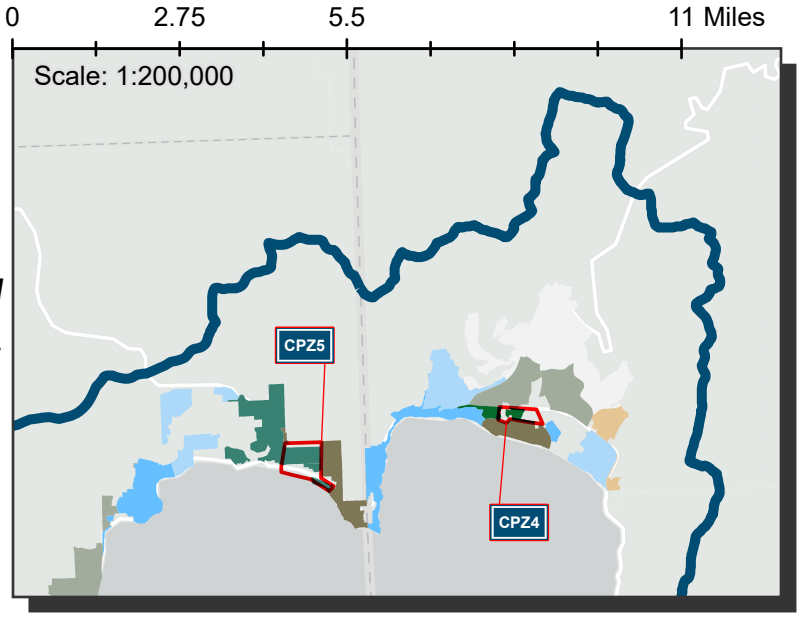
- 0
- <= Q1 (12.0307%)
- <= Q2 (19.7723%)
- <= Q3 (26.4060%)
- > Q3

Community Priority Zones

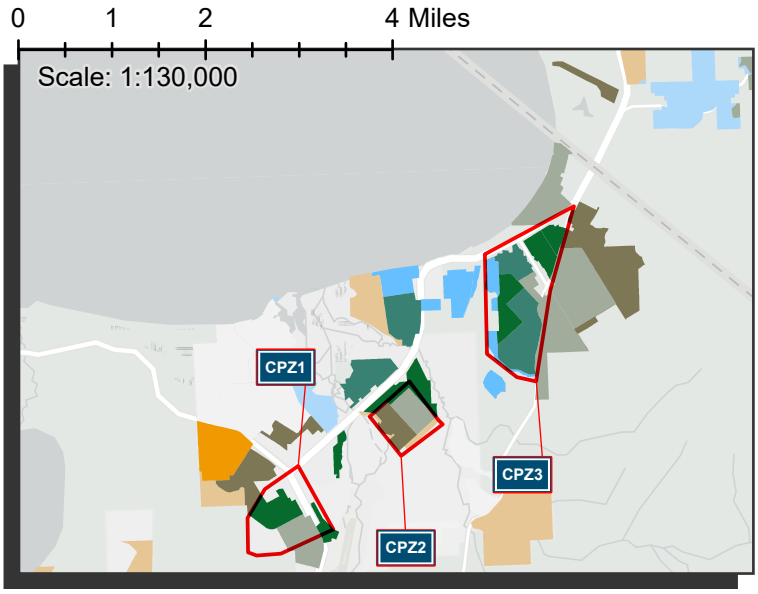
CPZ1 *Tahoe Verde*
CPZ2 *Sierra Tract*
CPZ3 *Bijou*
CPZ4 *Incline Village*
CPZ5 *Kings Beach*

Map 7. Lake Tahoe Transit: *Access and Need (bivariate)*

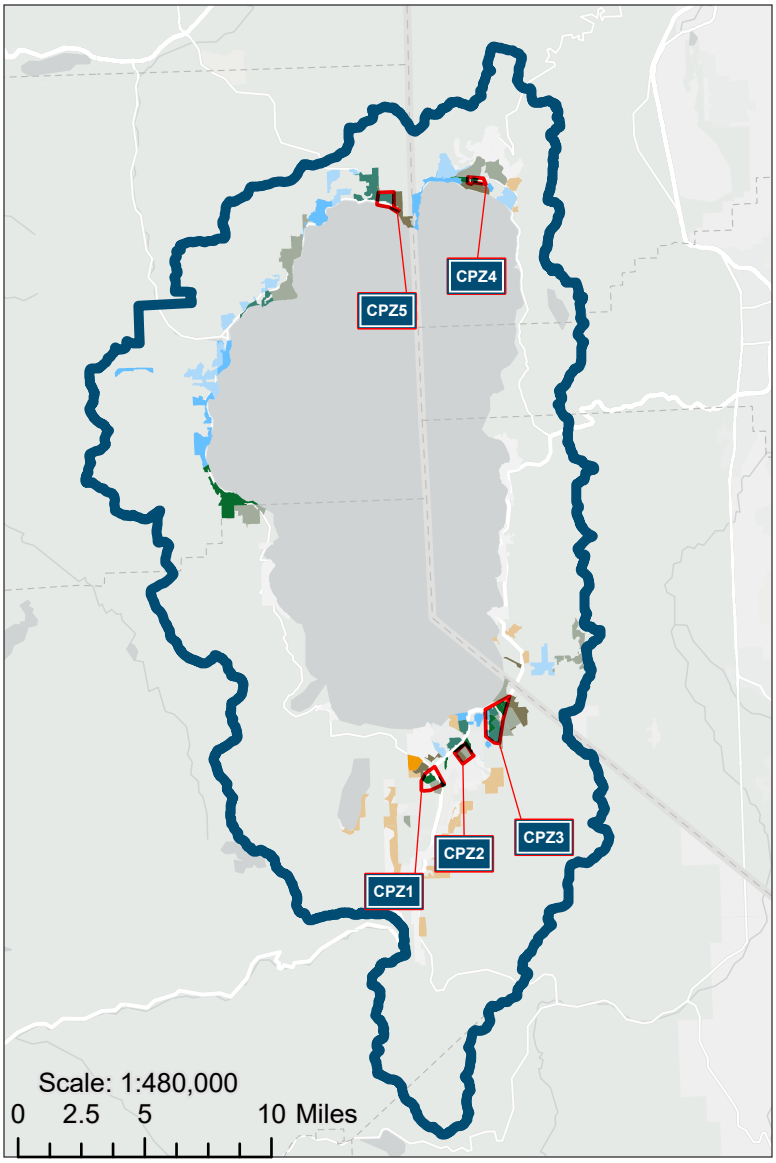
Spatial Reference: NAD 1983 UTM Zone 10N
Projection: Transverse Mercator



Incline Village and Kings Beach CPZs



Tahoe Verde, Sierra Tract, and Bijou CPZs

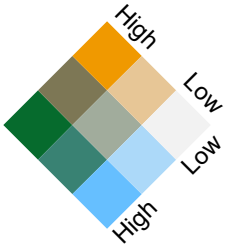


Community Priority Zones

Block Groups

Transit Access*

Transit Need**



CPZ1 ***Tahoe Verde***
CPZ2 ***Sierra Tract***
CPZ3 ***Bijou***
CPZ4 ***Incline Village***
CPZ5 ***Kings Beach***

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Transit Access vs. Transit Need in the Lake Tahoe Region

Definitions

***Transit Access*:** the percentage of Census Block Groups' residential zones that fall within a 500-meter walking distance of a transit stop.

***Transit Need*:** an index scored out of 20, where relevant Census Block Group variables are **individually reclassified and their scores summed. The reclassification scheme, listed** below, is followed by a list of the 5 individual variables used for this index.

Pop. Value	Score
0	0
<= Q1	1
<= Q2	2
<= Q3	3
> Q3	4

Dataset:Demographics, Layer:`Tahoe BlockGroup 2022 TDC Values`, $fields:
$pctHousehold0Vehicle, $pctPopPoverty, $pctPopDisability, $pctPopBIPOC, $pctPop65up

See the **Methods** section for more information about the calculation of these metrics.

Summary

- Many BGs on the west coast of the lake, where there are no CPZs, enjoy *High Transit Access* where there is relatively *Low Transit Need*. The convergences of *High Access* and *Low Need* appear as sky blue in **Map 7**.
- South Lake Tahoe has the most BGs where *Transit Need* exceeds their levels of *Access*. The BGs around *CPZ1* Tahoe Verde and *CPZ2* Sierra Tract exhibit *High Transit Need* and relatively *Low Transit Access*. One BG northwest of *CPZ1* Tahoe Verde, in particular, sticks out with *Very High Transit Need* and *Very Low Transit Access* (dandelion yellow in the *CPZ1:3* inset map of **Map 7**.)

- Besides the aforementioned outlier northwest of ***CPZ1* Tahoe Verde**, this CPZ's BG's levels of *Transit Need* are met with equal levels of *Transit Access*.
- BGs in ***CPZ2* Sierra Tract** have *Transit Needs* slightly greater than their level of *Transit Access*.
- BGs in ***CPZ3* Bijou** have *High Transit Needs* that are met or exceeded by their level of *Transit Access*.
- BGs in ***CPZ4* Incline Village** have *High Transit Needs* met by *High Transit Access*.
- BGs in ***CPZ5* Kings Beach** have *Moderate Transit Needs* met by *High Transit Access*.

Discussion

These definitions of ***Transit Access*** and ***Transit Need*** pose some limitations. For example, all variables considered in calculation of *Transit Need* were given equal weight in the summing of reclassified scores. Some variables, like *$pctHousehold0Vehicle* or *$pctPopDisability*, may deserve greater weight than the others considered.

In light of these findings, I think one clear path of development for the TRPA is the expansion of transit services in peripheral residential regions of South Lake Tahoe. The *High Transit Needs* of the South Lake Tahoe region have been more or less met in the CPZs (*1,2,3)*, while BGs to the south and in Douglas County, NV have *Need* exceeding their levels of *Access*, according to these metrics.

Methods

Format: `layer`$field; The key for abbreviations (`1a`) is the **Materials** section. Note: this is not valid SQL. Use of existing or calculated walkshed layers is not indicated.

 # Statistics: Queries

i. `3e`$CATEGORY = 'Active Transportation' ➔ $ESTIMATED_COST DOES NOT CONTAIN 'var' ➔ sum($ESTIMATE_COST)

ii. Create Field (LONG): `3e`$complt_yr_n = $COMPLETE_YEAR ➔ $complt_yr_n < 2025

 # Calculations

Transit Access

Service Area: facilities: `3a`; mode: Walking Distance; direction: Away; cutoff: 0.5 (km) ➔ `w500mService`

Pairwise Clip: input: `4b`; clip: `w500mService` ➔ `bg500bus`

Left Join: `bg500bus` to `4b` on $GEOID; Create/Calc Field: `4b`$bg500area = `bg500bus`$Shape_Area

Create/Calc Field: **`4b`$transitaccess** = ((`4b`$Shape_Area)/(`4b`$bg500area))*100

Transit Need

[vars = {*$pctHousehold0Vehicle*, *$pctPopPoverty*, *$pctPopDisability*, *$pctPopBIPOC*, *$pctPop65up*}]

Definition Query: `4b`${vars} <> 0

Calculate Statistics: Q1, Q2 (Median), Q3, Maximum [record values **'X'**]

[indexes = {$household0Vehicle_i, $popPoverty_i, $popDisability_i, $popBIPOC_i, $pop65up_i}]

Reclassify Field: `4b`${vars}; manual interval:[plug in values **'X'**] ➔ `4b`${indexes}

Create/Calc Field: **`4b`$transitneed** = sum(`4b`${indexes})

Materials / Data Source

Datasets

1. Tahoe Regional Planning Agency. 2019. *Boundaries* [Data set]. TRPA GIS. maps.trpa.org/server/rest/services/Boundaries/MapServer
2. Tahoe Regional Planning Agency. 2021. *Datadownloader_PlanningandJurisdictions* [Data set]. TRPA GIS. maps.trpa.org/server/rest/services/Datadownloader_PlanningandJurisdictions/MapServer
3. Tahoe Regional Planning Agency. 2021. *DataDownloader_Transportation* [Data set]. TRPA GIS. maps.trpa.org/server/rest/services/DataDownloader_Transportation/MapServer
4. Tahoe Regional Planning Agency. 2022. *Demographics* [Data set]. TRPA GIS. maps.trpa.org/server/rest/services/Demographics/MapServer
5. Tahoe Regional Planning Agency. 2023. *LTinfo Climate Resilience Dashboard* [Data set]. TRPA GIS. maps.trpa.org/server/rest/services/LTinfo_Climate_Resilience_Dashboard/MapServer

Layers

1. *Boundaries:*
   a. `TRPA Boundary` ./Boundaries/MapServer/4
2. *Datadownloader_PlanningandJurisdictions:*
   a. `Regional Land Use` ./Datadownloader_PlanningandJurisdictions/MapServer/9
3. *DataDownloader_Transportation:*
   a. `Tahoe Bus Stops` ./DataDownloader_Transportation/MapServer/14
   b. `Tahoe Transit Routes (Consolidated)` ./DataDownloader_Transportation/MapServer/7
   c. `Bike Routes Existing` ./DataDownloader_Transportation/MapServer/3
   d. `Bike Routes Proposed` ./DataDownloader_Transportation/MapServer/4
   e. `2020 Regional Transportation Plan Projects` ./DataDownloader_Transportation/MapServer/19
4. *Demographics:*
   a. `Community Priority Zones` ./Demographics/MapServer/19
   b. `Tahoe BlockGroup 2022 TDC Values` ./Demographics/MapServer/1
5. *LTinfo Climate Resilience Dashboard:*
   a. `Transit Stop Walkshed Quarter Mile` ./LTinfo_Climate_Resilience_Dashboard/MapServer/28