1. Statement of Problem: To identify how the development of affordable housing opportunities has panned out in high opportunity neighborhoods, the hurdles the development of such facilities might face, and how to enable the less capable neighborhoods to catch up with the high opportunity neighborhoods
2. Data needed:
   1. Income data distributed across Dallas and adjacent counties
   2. Age distribution data – workforce estimations
   3. Public transportation route system/distribution
   4. Map of jobs availability and their pay distribution
   5. Property tax distribution map
   6. Map of distribution of school districts with ranking
   7. Housing rent/cost data
   8. Poverty map
   9. Availability of units for rent
   10. Map showing new housing/apartment constructions
   11. Crime rate data
   12. Healthcare facility
   13. WIC centers
3. Some questions to be answered:
   1. Where are high opportunity neighborhoods located in North Texas, and how have these changed over the last 40 years?
      * **Define high opportunity neighborhoods**:

Opportunity360 measures the following five criteria to define opportunity within a community:

i. Housing Stability a. Home Ownership b. Housing Cost Burden c. Housing Affordability

ii. Education a. High School Completion b. Higher Education Attainment

iii. Health & Well-Being a. Access and Affordability of Health Care b. Health status

iv. Economic Security a. Income, Wealth and Savings b. Poverty Rate c. Employment

v. Mobility a. Transit and Vehicle Access b. Commute Time

* + - **Define which area in (Dallas, Collin, Denton and Tarrant counties) fall under low opportunity neighborhoods, and how they have changed over time. (Maybe explore possible reasons for this change)**

Source: <https://dallascityhall.com/departments/sustainabledevelopment/buildinginspection/Pages/permit_reports2.aspx>

Sample sources : Permits in jan ( HON classification)

* 1. How do mortgage approvals and denials relate to factors underlying high opportunity neighborhoods?

Once the parameters that define ‘high opportunity’ have been identified, locations/regions which meet these criteria can be shortlisted. These regions can then be checked for the number of loans approved, the number of permits given for affordable housing, and the average income of the residents.

Given that we can access historical data we can also check how these aspects have changed over time.

* + - **Current ethnicities residing in High opportunity area, and explore if there are any discrimination against minorities to obtain mortgage approvals in these areas**
    - **Discrimination against gender for mortgage approvals (relevance to single mothers)**
    - **Discrimination against low income families**
  1. Are there disparities in mortgage approval and denials based on race or ethnicity in Dallas? Where do these occur, and how do these disparities relate to opportunity?

-**Explore Zip codes with high approval rate (denial rate on the contrary) and how this effected low income people (in terms of transit to work, education and healthcare)**

Sample source:

1. list of cases where the loan was rejected along with their ethnicities : <https://www.consumerfinance.gov/data-research/hmda/explore#!/as_of_year=2017,2016,2015&state_code-1=48&county_code-1=085,113&property_type=1,2,3&owner_occupancy=2&action_taken=3&loan_purpose=1,2&section=filters>
2. list of observations where the loan was approved, ethnicities included

<https://www.consumerfinance.gov/data-research/hmda/explore#!/as_of_year=2017,2016,2015&state_code-1=48&county_code-1=085,113&property_type=1,2,3&owner_occupancy=2&action_taken=1&loan_purpose=1,2&section=filters>

* 1. How many units, or units per capita, have been built in high opportunity neighborhoods since 2011? Of those units, what is the breakdown of unit type (single family, apartment, duplex, condo, townhome), and where are they located.

**Sample sources: Permits in Jan (HON classification)**

**From the data (2011- 2018), we filter out HON based on classification in question a, we explore different types of units permitted ( condos, single family units, multifamily units, 3 storey buildings etc.)**

1. Roadmap to be considered:

9/11/2019 – Data collection and cleaning

9/25/2019- Exploration, preprocessing and feature engineering

10/9/2019 - Classification of HON based on the definition

10/23/2019 – Mortgage approval and denials based on race, ethnicity, gender and income and

how this discrimination affects opportunity

11/6/2019- Number of units per capita built in HON since 2011

11/20/2019- Visualization, Evaluations and Documentation

12/4/2019- Presentation

1. Methodology/Technology:
   1. Data collection
   2. Data Analysis using python, R, SQL, Tableau
   3. Visualizations – GIS/Tableau
2. Team member roles

Bharat Banjade –Modelling (Python)

Rinda Sai Kiran Gunjala - Modelling (Python)

Sindhu Nagaraj – Visualization & Report

Siva Tejaswini Kandimalla - Visualization

Sruthi Theddu – Modelling & Visualization

Venkata Satya Prakash Reddy - Modelling (Python)