

NSF Proposal

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## Table of Contents

<b><i>Research Question:</i></b> .....	<b><i>1</i></b>
<b><i>Background</i></b> .....	<b><i>1</i></b>
<b><i>Model Setup</i></b> .....	<b><i>1</i></b>
<b><i>Data</i></b> .....	<b><i>2</i></b>
<b><i>Potential Confounders and Other Issues</i></b> .....	<b><i>3</i></b>
<b>Changing Neighborhood Composition</b> .....	<b>3</b>
<b>Obsolete Case Study</b> .....	<b>3</b>
<b>The Limits of a Case Study</b> .....	<b>3</b>

**Research Question:** How does increased access to public transportation affect homeownership and the local credit landscape?

### Background

The Chicago Transit Authority (CTA) runs the country's second-largest public transportation system, with 1.6 million rides per weekday on average servicing Chicago and 35 of its suburbs. Its rail system incorporates eight lines, 1,492 rail cars, and 224.1 miles of railroad tracks as of 2017. ("CTA Facts at a Glance" n.d.)

In 1993, the CTA added an entirely new rail line to the system. While other stations have been constructed or remodeled since then, this was the most recent wholesale route addition to the entire transit system. The Orange Line, as it is called, operates 16 stations from the downtown Loop region to Midway International Airport, providing service to an average of 15,382 riders per weekday and at least 7 neighborhoods which lacked direct rail access before the policy change (Chicago Transit Authority 2022). The area covers a large swath of southwest Chicago.

I want to treat the creation of the Orange Line as a policy change and measure its effects on the residential housing and mortgage markets in the affected areas.

### Model Setup

In answering my research question, I am interested in observing three potential outcome parameters of a change in public transit accessibility:

- The rate of mortgage application denials in the affected area
- The rate of mortgage delinquency in the affected area
- The homeownership rate in the affected area

I intend to use create a synthetic cohort to compare to the areas affected by the creation of the Orange Line. The following parameters are some I'm considering to create such a synthetic cohort on a census-tract level:

- Wealth indicators:
  - o Income (average)
  - o DTI ratio (average)
  - o LTV ratio (average)
  - o Other assets (average # lines of credit, average # of properties owned per person, etc.)
- Local banking environment:
  - o Number of bank/mortgage originator branches within 3 miles of each tract (this is an arbitrary number; upon further research I'll pick a specific one or pick a better measure)
  - o Herfindahl-Hirschman index for the banking industry for that tract (again, I may revise how I measure this)
  - o Number or percentage of each type of mortgage originator – commercial bank, credit union, mortgage broker, etc. The aim of this parameter is to capture the number of predatory institutions which may be in an area
- Local credit health
  - o FICO score
  - o % of residents delinquent on any line of credit
- Local employment characteristics
  - o Most common industry in a census tract (I'm not sure how useful this will be)
  - o LFPR
  - o Unemployment rate
- Pre-Orange-Line matching:
  - o Pre-1993 homeownership rate
  - o Pre-'93 mortgage approval rate
  - o Pre-'93 delinquency rate

## Data

Given that this is going to be used for an NSF application, I won't focus too much on the feasibility of getting access to the data I would need to complete this project. Instead, I will simply use what I already know exists and operate under the assumption that I can somehow get the data that I need.

- Applicant characteristics:
  - o HMDA
  - o McDash (since the additional line opened in 1993, it predates the HMDA-McDash crosswalk, as far as I know).
  - o Equifax Consumer Credit Panel
- Neighborhood characteristics:
  - o Nationwide Mortgage Licensing System (for locations of all mortgage originators)
  - o Census for employment characteristics (ACS?)

## Potential Confounders and Other Issues

**Changing Neighborhood Composition** The principal obstacle in my mind when approaching this question is how to observe the effect of the policy change (opening of transit line) on existing homeowners. There is a chance that an increase in wealth, homeownership rates, and credit health in the neighborhoods affected are actually due to an influx of new, wealthier, likely younger residents who have access to a number of neighborhoods they didn't before. With that said, in my anecdotal understanding of the neighborhoods affected, gentrification did not begin in earnest until the aughts or 2010s, so it may not be a massive issue. This merits further research.

**Obsolete Case Study** There is a chance that a reviewer may take issue with the time period used. The opening of the Orange line in 1993 certainly predated widespread use of the internet for banking and mortgage purposes, particularly in underdeveloped neighborhoods. A criticism of this project might be that it has little bearing on today's mortgage application and banking environment, as many applicants now conduct parts of their application and credit maintenance online. My response to this is twofold.

First, there is evidence that, despite widespread use of the internet to both apply for and pay existing mortgages, applicant interaction with mortgage originators directly impacts the likelihood of approval for applicants on the margin, i.e., in "high-discretion" applications (Frame et al. 2022). The components of the mortgage application process that exists on the internet does not yet mean that problems of accessibility and discrimination in the market have been completely excised.

Second, I think that understanding the effect of public transportation on the financial composition of a region is highly relevant to modern policymaking, regardless of this drawback. Despite the fact that individuals in this study may not have had access to the internet, a boon for accessibility, at the time of the policy change, my findings will be able to inform policymakers on the magnitude of the benefit to local communities from such transit access. The internet is often considered an excellent tool for showing the user exactly what she asked for – often, nothing more and nothing less. Increased mobility and access to different areas of the city provide not simply physical access to new mortgage markets, but information networks that may not exist in a Chicago resident's own neighborhood. Demonstrating the effect of public transit to provide access to that information will be extremely informative for policymakers in the future when considering how to increase wealth saturation in areas geographically distant from centers of commerce (like the Loop).

**The Limits of a Case Study** The final criticism I anticipate is the limited scope of this project. Not only is the synthetic cohort analysis necessarily limiting (a case study is not necessarily easily generalizable), but my focus uses a specific event in a particular city, one that is unique in many ways, from its intense historical racial segregation to its size (Cunningham 2021; Moore 2019). This is a criticism to which I feel I don't yet have a sufficient response. It's true, this idea is limited. But I think it could be a good jumping-off point for further study, and at the very least is extremely informative for Chicago-specific policy work.

## References

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