# Twin Cities Metro City Engineers: Public or Private?

Submitted under the supervision of Dr. Randal J. Barnes to the University Honors Program at the University of Minnesota-Twin Cities in partial fulfillment of the requirements for the degree of Bachelor of Civil Engineer, magna cum laude.

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# Executive Summary

The cities within the Twin Cities Metro all have important engineering work and projects. To complete them, cities will hire a city engineer as a part of their staff. However, a city may choose to hire a public in-house staff engineer, or they may consult out a private engineer instead. There is no clear existing rule-of-thumb that cities follow in making this decision. As such, this thesis seeks to provide insight into why cities would choose to structure their engineering departments in specific ways, and why they would hire an in-house engineer or a consultant. To do this, nine city engineers from a diverse set of metro cities were interviewed, and profiles of their cities were explored. Data analysis on MnDOT Metro State Aid cities was performed, analyzing the influence of population size, income, population growth, population density, location, and consultant companies on their decision-making process.

From analysis in this report, population size and locational proximity to the central cities of Minneapolis and St. Paul play the biggest role in whether a city has a public or private engineer. Cities with populations lower than 15000 are more likely than not to have a public engineer, as are exurban communities outside the typical suburban rings of MSP. This report also concludes that the comparison of extremely low density or population size can almost always cause a city to go private. Other factors play much less influence in the greater picture, although each city does have to make their own choices based on unique histories.

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# Introduction

Cities are like people; each has special characteristics, flairs, and processes that make them each unique. Local government takes countless forms nationwide, which often makes it difficult to teach and learn the way of things in unfamiliar places. However, it seems intuitive that cities in the same region might share certain traits that would make them much easier to navigate, compared to cities across the country. Therefore, performing region-specific research can provide great insight into local governments and how they function.

The purpose of this honors thesis project is to investigate the field of municipal engineering, and how it applies to local government in the Twin Cities Metropolitan Area. Due to the diversity of the cities in the area, it can be difficult to find cookie-cutter formats and styles to how a city would choose to perform their engineering work. The region is home to hundreds of municipalities, each with unique needs. Some cities choose to hire in-house, public engineers, while others choose to consult out their engineering work to private firms, who direct a staff member to act as that cities' engineer. While all municipal projects involve both public and private work and input, the origin of those features can be hard to trace.

Inconsistent city engineering structures cause headaches for municipalities and consultants alike, as misunderstandings may arise from the lack of consistency from city to city. All involved parties in municipal work benefit from increased familiarity with the system. The honors thesis project behind this report hopes to provide insight into public and private city engineers, as to how city engineering departments work. How can cities and consultants answer tough questions about their work to better understand all involved parties? Knowing the municipal landscape of the Twin Cities can be part of that solution.

# Procedure

## Interviews

This project took two approaches to investigating city engineering in the Twin Cities. One involved conducting interviews with engineers from municipalities with diverse profiles. Engineers were interviewed from the following nine cities: Centerville, Eagan, Edina, Lakeville, Richfield, Robbinsdale, Rosemount, Roseville, and White Bear Lake. Figure P1 details the locations of these cities relative to the center cities of Minneapolis and St. Paul (MSP).

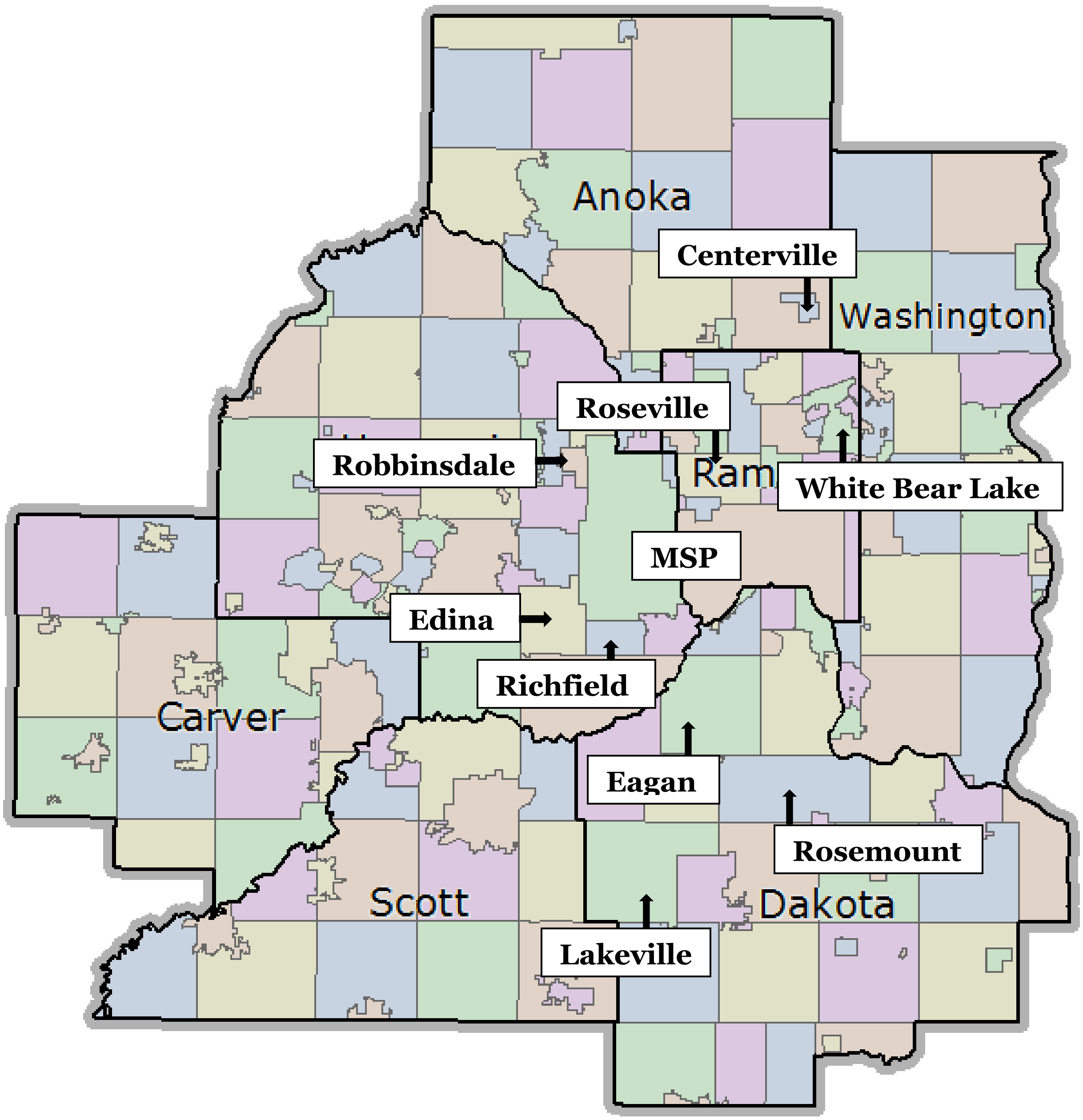


Figure P1: Twin Cities Metro with labeled cities [4]

At each city, the interviews took a different tone and had a unique focus. However, a set list of ten questions was asked to improve consistency between engineers. The following list includes the questions asked of each city engineer (with a few adjustments for city name and job title):

1. How did you become the [*Job Title*] of [*City Name*]?
2. What are some of your roles and responsibilities as [*Job Title*]?
3. How is the engineering department structured at [*City Name*]?
4. Describe the role of consultants to the city's engineering work.
5. What are some advantages and disadvantages to the city's engineering work?
6. What are some factors that allow to choose when and from whom to hire out work?
7. How many people are on your staff and what are their roles?
8. How supportive is the city council and administration to the engineering department and how does this affect the work you do?
9. How long have you been at [*City Name*] and what has changed since you started?
10. What are some other things you can tell me about [*City Name*]?

As in any interview setting, some questions were combined or covered out of a specific order. However, each engineer was asked to provide the responses to the content of all listed questions. This information, along with city-specific research, is provided in the 'City Profiles' section of the thesis.

## State Aid Cities

The other approach used to study regional municipal engineering trends was to do a quantitative analysis on cities in the metro area. This practice proved difficult, as there aren't many sources that have consistent data on many metrics of city profiles, such as income and growth. However, the MnDOT Metro State Aid website proved to be an invaluable source in this practice [10]. Each metro city that qualifies for state aid is listed, along with the name, employer, and contact information of their city engineer. This information provided a framework with which to structure the quantitative analysis.

Using various public and private sources, each city's information was compiled into an extensive data table (Table A1/A2) that included information on city population, income, growth, density, and location. This data, along with the State Aid resource, allowed for characteristics to be analyzed in comparisons between cities with public or private engineers. Two types of comparisons were produced.

The first comparison type grouped metro cities according to similar characteristics, such as density or location, and determined the percentage of each city category with public engineers. The other type found the average value of each metric for cities with either a public or private engineer. Both comparison types provided insight into trends associated with the way cities hire out their engineering work, which will be discussed in the 'Analysis' section of the thesis report. Additionally, for quantitative factors, all state aid cities were plotted against population to see if any cross comparisons could be analyzed.

# Results

## City Profiles

City engineering, like many fields involving local government, is a diverse profession. As any industry professional will tell you, each metro city does it differently. There are dozens of factors that could influence a city's engineering work. These factors include anything from history of work to working relationships with consultants. The diversity of cities in the metro creates a plethora of engineering structures in the region, but by delving deeper into their profiles, there is much to be learned about the choices cities make regarding engineering.

An effective way to view similarities and differences is to place metro cities into categories based on their history, growth, and location. For the nine cities investigated, three categories were developed for understanding purposes: Historic Cities, Stable Inner Suburbs, and Growing Outer Suburbs. Brief descriptions of these categories are included below

<u>Historic Cities</u>

There is no strict definition of 'historic' used in this report, but generally, this category refers to older cities that existed long before the suburban sprawl of the Twin Cities engulfed them into the metro area. They have established downtowns and street grids that are similar to the central cities, despite their location farther away from the core. City boundaries don't necessarily follow the square township boundaries that many metro suburbs now have. Additionally, the infrastructure in these cities is typically older than surrounding areas.

<u>Stable Inner Suburbs</u>

The cities in this group are inner suburbs, located adjacent to the central cities of MSP. They are growing at a moderate, relatively stable rate. Much of the work done involves maintenance of infrastructure, as much of it was built in the years following World War II, when the suburban metro area began to boom.

<u>Growing Outer Suburbs</u>

This category contains the newest cities in the report. They are growing at a faster rate than most metro cities. A large factor influencing that growth is the open land available within city boundaries that doesn't exist for inner suburbs. These cities have relatively new infrastructure, although they do have older sections that must be renewed. Their distance from the central city means there is a higher focus on residential development than industrial or commercial developments.

## Historic Cities

<u>White Bear Lake</u>

Located in NE Ramsey County, the City of White Bear Lake (WBL) is a community of approximately 25000 people. As the name suggests, the city is centered around White Bear Lake, a large regional recreational lake. The city established in the late 19$^{th}$ century, separate from the Twin Cities. It neighbors the only remaining township in Ramsey County, White Bear Township, which is often confused with the city itself, although they are technically two separate bodies.

White Bear Lake has a huge focus on water supply management. Due to the prominence of the lake in town, which has suffered from shortages in recent years, the city puts great effort into finding sustainable sources for water. Though this is a regional effort, WBL is affected the most by changes in lake levels and must prioritize sustainability in that regard. Stormwater management and construction regulations are key features of WBL regulation.

The City Engineer of WBL is Paul Kauppi, P.E. Mr. Kauppi is also the Director of Public Works in WBL. As a result, the departments are inevitably connected, despite being housed in different locations in the city. The engineering department does some in-house design, although the staff is relatively modest in size (around six people). The lack of a huge staff helps shield the city from financial loss during times of economic downturn and lack of city projects. However, the smaller size also means that work must be consulted out often. The city does not have a consulting pool, and therefore always uses Request for Proposals (RFPs). Despite this, there are consultants that the city typically works with due to their historic connections.

Though the city does continually update their Capital Improvement Program (CIP), there is a fair amount of resistance from the city council in long range planning. Specifically, the city has typically only seen the need for financing through the next five years, as that is when it should feel like infrastructure rehabilitation is complete. However, the department has continued to push the council to plan farther out than five years. The current way of financing involves enterprise funds, which has been a cause of fiscal concern in the city.

Figure R1: City of White Bear Lake logo [8]

Centerville

Completely surrounded by the larger community of Lino Lakes, Centerville is located north of the cities in Anoka County. It is one of the oldest cities in the metro area, as it was established in 1857. The city is small in both geographic and population size. Unlike many of the cities highlighted in this report, Centerville is not a state aid city. It's population around 4000 people is less than the 5000-person threshold needed to qualify for Metro State Aid (MSA). Therefore, its processes are unique in comparison to other cities.

The City Engineer in Centerville is Mark Statz, P.E., who is also the City Administrator. This dual position is unique, and it exists due to the small, flexible government of the city. Mr. Statz was previously a private city engineer for Stantec, but was then hired on for this position, at which point the City Engineer became a public role. This was seen as a way to improve efficiency and effectiveness by the city. He provides engineering consultation while also dealing with city government matters. Despite this, he is the only engineering staff member in Centerville. There is a separate public works director on staff, who has a few employees for maintenance.

The smaller geographic size means that the city government can effectively manage city infrastructure and regularly make field visits to check site conditions. Additionally, the city council sees great value in the engineering work done, so there is enough money for infrastructure improvements to be done well. This money does not come from MSA funds, like most metro cities. However, due to its size, there isn't always a large project going on, meaning funding needs aren't always consistent. The city counters this by planning and by attempting to stay on top of improvements.

Figure R2: City of Centerville logo [1]

**Stable Inner Suburbs**

Richfield

Though technically a suburb, Richfield in many ways acts as an extension to the southern neighborhoods of Minneapolis. The city has a population around 37000. All major thoroughfares that start at the north end of the city continue to the south, and there is a large, established grid network of roads. The city was also one of the very first places to develop at the start of the suburban expansion of the metro. Its convenient location immediately adjacent to the Minneapolis-St. Paul International airport made it an excellent choice for development. The airport brought commercial viability and improved transportation infrastructure, helping to spur the cities' growth. However, after most of the city's grid was built out, there was very little growth for many decades. That meant that almost all the infrastructure in Richfield was built at the same time. The same infrastructure is now in serious need of repair and improvement.

The City Engineer of Richfield is Jeff Pearson, P.E. Mr. Pearson runs the engineering department, which is one of four groups under the Public Works Director. There are five other staff in the department, which is relatively small. As a result, the city does very little in-house design work. Part of the city's decision to maintain a smaller staff involves the outlook of needs moving forward. Because so much of the repairs are needed right now, it is likely that the work will slow down noticeably once the current needs are addressed. Additionally, a large portion of the city's roads have already been given a mill and overlay update, meaning a good amount of the work that was done in-house is complete. Future needs are tallied at over $100 million dollars, largely due to projects initiated by Hennepin County, for which the city has less control.

The consulting work done in Richfield is completed through an engineering consultant pool that is reevaluated every six years. Originally, the pool was intended to include a larger number of consultants than today, but not every company on the list was getting projects, so it has been reduced to a modest size. The flexibility of the consultant work is very important to the city, especially due to the inconsistent workload over a large time period.

Figure R3: City of Richfield logo [13]

Roseville

As a suburb and neighbor of both Minneapolis and St. Paul, Roseville has always been a city that works heavily with its neighbors. In fact, it shares a border with 10 different cities, which is much higher than most cities in the metro area. Due to its closeness to the central cities, Roseville was one of the first suburbs to develop after World War II. Many neighborhoods were developed in the 1950s and 1960s and have largely remained the same since. The population of 36000 has grown only slightly since then. This stability in population does not translate to the commercial development space of Roseville. The city has seen huge growth in its commercial sector, specifically related to retail and dining.

The City Engineer of the City of Roseville is Jesse Freihammer, P.E. Mr. Freihammer also serves as the Assistant Public Works Director for the city. In Roseville, engineering is a subdepartment of the greater Public Works department. The engineering work is split into two groups, utilties and street divisions. A unique part of Mr. Freihammer's work is that besides Roseville, he also serves as the City Engineer of Falcoh Heights, a neighboring community to the south of about 5000 people. Both Roseville and Falcon Heights have an agreement that allows the engineering department of Roseville to essentially serve as a consultant to Falcon Heights, a rarity in local government practices in the Twin Cities area.

Engineering work in Roseville, due to its population and economic stability, typically involves simpler rehabilitation and repair projects. As a result, most of the engineering work is completed in-house. The staff of 7 people works largely on mill-and-overlay projects, as well as sewer upgrades. Due to the age of the infrastructure, most of Roseville's roads and pipes have reached their expected lifespans. This means that the rehab projects are consistent and similar, allowing for an effective use of in-house staff. Specialty projects like lift stations are consulted out. This system is economically efficient for the city, as in-house work is cheaper than hiring a consultant. Additionally, the city government is supportive of continued funding and support of the infrastructure upgrades. That consistent funding allows for the CIP to be updated and worked on without interruption.

Figure R4: City of Roseville logo [16]

Robbinsdale

The City of Robbinsdale is located directly east of North Minneapolis, in a relatively small area surrounded by other smaller suburbs. The city's area speaks to the more modest size of the first ring suburbs in the Twin Cities area, compared to larger outer ring suburbs such as Lakeville or Maple Grove. In fact, its area of 3.0 square miles is less than 8% the size of Lakeville and less than 9% of that of Maple Grove. However, the city boasts one of the highest population densities in the Twin Cities metro, at just under 5000 people per square mile, a high number in relation to the region. The city has a population of just under 15000 people. As shown later in the report, this population size tends to be close to the cutoff of where cities would be just as likely to have a public in-house or private consultant city engineer. However, due to the city's established government practices and location, an in-house engineer is practical for Robbinsdale.

The City Engineer and Public Works Director is Richard McCoy, P.E. Mr. McCoy directs seven smaller departments, including engineering and water resources. To maintain efficiency at the city, the city engineer also must manage groups such as parks and building inspection. This allows Robbinsdale to maintain an in-house staff and keep them busy without the need to consult out a lot of work. However, prior to 2004, the city had separate engineering and public works departments. Their merger helped the city save money while also connected the work of both groups.

The city has infrastructure nearing the century age mark, meaning it needs replacement. Much of the design work is done in-house, but specialty work, like subsoil engineering projects, is given to a consultant. The city tries to do as much work as possible in-house, due to the high cost of private contracts. The city is hugely supportive of the engineering department and provides financial support to make sure there is adequate funding for needs. The political stability allows for high productivity in the department. However, the only P.E. on staff is Mr. McCoy, so all projects must ultimately work through him. This means that there is potentially less flexibility in timing and process than under any number of consultants.

Robbinsdale is working to condense three separate wastewater treatment plants into one large site. This project is way above the typical financial and engineering scope that they are used to. As a result, the city will work with a consultant to get this done. This is typical of cities with in-house staff. When projects are drastically out of the normal work range, consultants are typically used.

Figure R5: City of Robbinsdale logo [3]

Edina

With a population of around 52000 people, Edina is one of the largest first ring suburbs. It is growing faster than most inner ring suburbs and has seen a great deal of commercial development centered around the main business district along France Ave. There is so much interest in the area that the city council has had to deny several high-profile projects in order to maintain their goals. Many regional have covered these storylines, so Edina has faced high pressure to be more inclusive of a variety of development. These renewals of city properties are coupled with its aging infrastructure to provide the city with a situation in which lots of engineering work is needed.

The City of Edina is somewhat different than other inner suburbs studied in this report. One main difference is the road network setup. While many inner metro suburbs have grid systems with major arterials that traverse the entire city, Edina has a road network with a much more suburban feel. There are few roads that travel the entire length of the city, meaning most vehicles are forced onto freeways instead of taking arterials through town. As a result, most of west Edina has lower levels of traffic compared to suburbs of similar age or location. However, the city has still aged considerably since first development, and many roads need repair.

The Engineering Director in Edina is Chad Millner, P.E. Mr. Millner heads a department of 14 people, whose work is split into design/construction, transportation, and engineering services. There is extensive planning and design work done in-house. However, the city does employ an informal consultant pool to cover gaps in design work. The focus on planning helps the city cover potential financial losses during recession times. Instead of working on design, engineers can be employed in planning during slow years. This improves efficiency at the city and gives them a long-term plan that betters their focus during busy years.

Figure R6: City of Edina logo [17]

## Growing Outer Suburbs

Eagan

It is perhaps a bit of a stretch to classify the City of Eagan as an outer suburb. Technically, it is in the second ring of suburbs, so it could be classified as a middle suburb. However, until recently, Eagan was basically on the edge of the metro area, with infrastructure much closer in age to other outer ring suburbs. Therefore, from an engineering point of view, many of the same qualities of outer suburbs apply to Eagan.

Eagan is a city of over 68000 people and has been growing for the majority of the last half century. Unlike other outer suburbs, Eagan is almost entirely built out, with most development occurring as redevelopment. However, the city never went through the same population stagnation or decline as many inner metro suburbs, as the city developed much later in the game. The city has a huge industrial presence on its north end and, despite being known as a bedroom community, has the fourth highest job presence in the metro area as of 2010 at around 50000 jobs [18]. This combination of high population and jobs growth means there is a huge demand on infrastructure to keep up with growth. This doesn't even consider the large amount of commercial redevelopment occurring on the city's west side, including Town Center Commons and Twin Cities Premium Outlets. The city has lots of work on its hands.

The City Engineer of Eagan is John Gorder, P.E. Mr. Gorder leads the engineering department, which is one of four groups underneath the director of public works. Nine people work underneath the city engineer. This means the size of the department is relatively small compared to the amount of work done in the city. They maintain a lean in-house staff and consult a large amount of work. However, unlike many cities, Eagan does not necessarily bid out every project they have. This is possible from having a consultant pool, which the city reassesses every five to seven years. The engineering consultant pool is different from other cities, as it is split up by discipline. For example, Eagan has different consultants for transportation than general municipal engineering. This organization saves the city time and resources, and due to the high amount of work, it is beneficial to utilize consultants to get it done.

Figure R7: City of Eagan logo [12]

## Lakeville

There is perhaps no city in the metro that better fits the description of a growing outer suburb than Lakeville. The city is located quite far from the central cities and is the city farthest south in the entire metro area. At 62000 people, the city has a large population, but still has a huge amount of land to develop, meaning it could be one of the largest cities in state. Though there are a few older, established neighborhoods in the city, most of Lakeville has been developed in the 21st Century. Further, almost all that development has occurred in single family homes, meaning the city has the lowest population density in the metro area for cities above 50000 people. Due to this sprawl-like development, growth in the city has put stress on the city's road network. The latest CIP in Lakeville is the largest ever in city history.

The Assistant City Engineer in Lakeville is Alex Jordan, P.E. Mr. Jordan is assistant to the City Engineer, who is underneath the Public Works Director. The city engineering department is one of five divisions under public works. The city's engineering staff is small compared to the amount of work done in the city. Most of the work completed comes from consultants. A few miscellaneous tasks and projects are completed by in-house staff, such as trails, street patches, and minor overlays.

Lakeville also has a priority to remain one of the lowest taxed cities in the metro area. Part of this desire is to maintain a reputation to encourage growth. However, this lower revenue base causes the need to search for other sources of money. Lakeville applies for and gets a large amount of money in grants from the state and county. Dakota County has invested heavily in Lakeville due to its growth and economic development. However, the city is forced to implement assessments for residents involves in their street rehab program. This financial resource is kept at as low levels as possible, but there is not enough city revenue to pay for those projects without money from property owners.

Figure R8: City of Lakeville logo [2]

Rosemount

Although not the same size as other cities interviewed in this category, Rosemount certainly has experienced a great amount of growth in recent years. With a population of 24000, the city is easily big enough to have a public staff for engineering. However, until recently, the city had a private city engineer. Change in the city's priorities and spending focus led to the hires of the city engineer, assistant city engineer, as well as other staff members. There is no history of a design staff in the city beyond the last two years, meaning that much of the processes for the engineering work are new to Rosemount. Many cities like Rosemount go through this difficult transition once they reach the population and needs level to have an in-house staff. Notably, cities typically don't ever go from a public to a private engineer. The rarity of that transition lies in city government practices and the tendency of cities to avoid actively cutting employees. Rosemount prefers to keep very few engineers on staff as preventative financial insurance for the city's payroll the next time the economy lags. The smaller staff allows for flexibility and all workers have enough work to keep busy, allowing high work efficiency.

Brian Erickson, P.E., is the City Engineer and Director of Public Works in Rosemount. The engineering staff is small compared to the public works staff, which has a much longer history in the city. Due to having almost no design staff history, the city has a pool of consulting engineers it uses for their work. This is similar to other quickly growing cities, as the capacity of the in-house staff is unable to keep up with the scope of the projects.

The city sees consultants as an economic advantage. However, with the rapid growth in town, there is need to use new consultants. It has been difficult to get all consultants on the same page regarding project coordination and compliance with city rules. This work has caused the city to increase focus on the need to increase education for new consultants. The city is also looking to update the specs. New specs should be easier to understand and up-to-date with recent code. These efforts would hopefully improve coordination and increase efficiency in the city's work.

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Figure R9: City of Rosemount logo [14]

## Quantitative Factors

### Population

Perhaps the most obvious factor to consider between cities is their population [15]. Simple numbers of people indicate a lot about a city, including the relative size of its tax base, budget, and political influence. For simplification, metro cities were divided into groups at every 5000-person interval. Table R1 shows the number of cities in each population group, as well as the number of publicly employed city engineers in that group. The percentage total value indicates the percentage of municipalities with a public engineer in each population group.

Table R1: Public engineer percentage by population group

| Population | Number | Public | % Total |
|---|---|---|---|
| 5000-10000 | 23 | 3 | 13 |
| 10000-15000 | 10 | 3 | 30 |
| 15000-20000 | 5 | 3 | 60 |
| 20000-25000 | 13 | 10 | 77 |
| > 25000 | 34 | 34 | 100 |

The average population of cities with either a public or private engineer was calculated. Additionally, the difference of those averages, as well as the total average was determined to allow for comparisons between the values. This data is presented in Table R2.

Table R2: Average population of cities with either a public or private city engineer

| | Average of Population |
|---|---|
| Public | 48730 |
| Private | 10113 |
| Difference | 38617 |
| Average | 34192 |

## Income

A common metric of the size of a city's budget is the median income of its residents. A tax base with higher incomes at a constant percentage would mean more money for the city than a comparable city with lower incomes. Median income across Metro State Aid cities [6] was analyzed according to income group, portioned off for every $20000 increase in median income. Table R3 shows the percentage of public engineers for each group.

Table R3: Public engineer percentage by income group

| Income | Number | Public | % Total |
|---|---|---|---|
| < $55000 | 10 | 8 | 80 |
| $55000-$75000 | 30 | 17 | 57 |
| $75000-$95000 | 26 | 18 | 69 |
| $95000-$115000 | 13 | 8 | 62 |
| > $115000 | 6 | 2 | 33 |

Additionally, the average median income of cities with either a public or private engineer was measured. Those values, along with their difference and total average, are in Table R4.

Table R4: Average median income of cities with either a public or private city engineer

| | Average of Median Income |
|---|---|
| Public | $76,445 |
| Private | $84,556 |
| Difference | ($8,111) |
| Average | $79,499 |

Figure R10 illustrates a chart that compares public and private engineering cities by both their population and median income. The central cities were not included to avoid chart skewness.

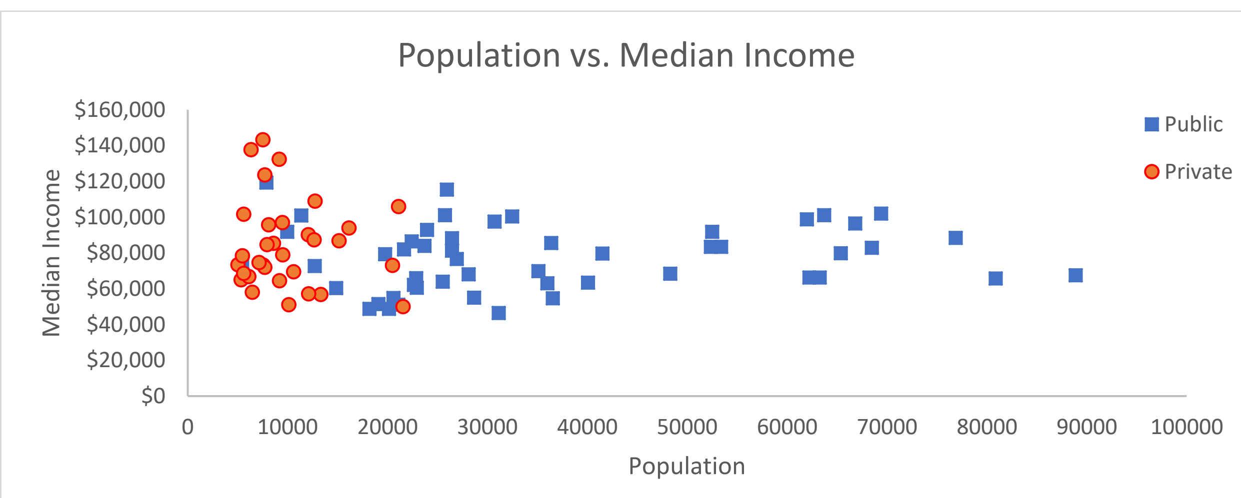


Figure R10: Population vs. median income of State Aid cities (excluding Minneapolis/St. Paul)

**Growth**

Population growth [15] plays an important role in the types of work completed by a city during a given period. If growth is low, there is less need for larger infrastructure. Most projects in low growth cities would be expected to be maintenance and rehabilitation projects. Contrarily, a city with high growth would likely need to create systems that have greater capacity than projects based on past needs. Table R5 shows the percentage of public engineers in each population growth group, sectioned off by every additional 4% of growth between the years 2010 and 2017.

Table R5: Public engineer percentage by population growth group

| Growth since 2010 [%] | Number | Public | % Total |
|---|---|---|---|
| 0-4 | 20 | 14 | 70 |
| 4-8 | 34 | 21 | 62 |
| 8-12 | 17 | 12 | 71 |
| 12-16 | 7 | 6 | 86 |
| > 16 | 7 | 0 | 0 |

Table R6 shows the average growth of public and private engineering cities, along with their difference and total average.

Table R6: Average population growth of cities with either a public or private city engineer

| | Average of Growth since 2010 [%] |
|---|---|
| Public | 6.94 |
| Private | 10.43 |
| Difference | (3.49) |
| Average | 8.25 |

A cross comparison of population size and growth is shown in Figure R11. This chart does not include Minneapolis or St. Paul to avoid skewness.

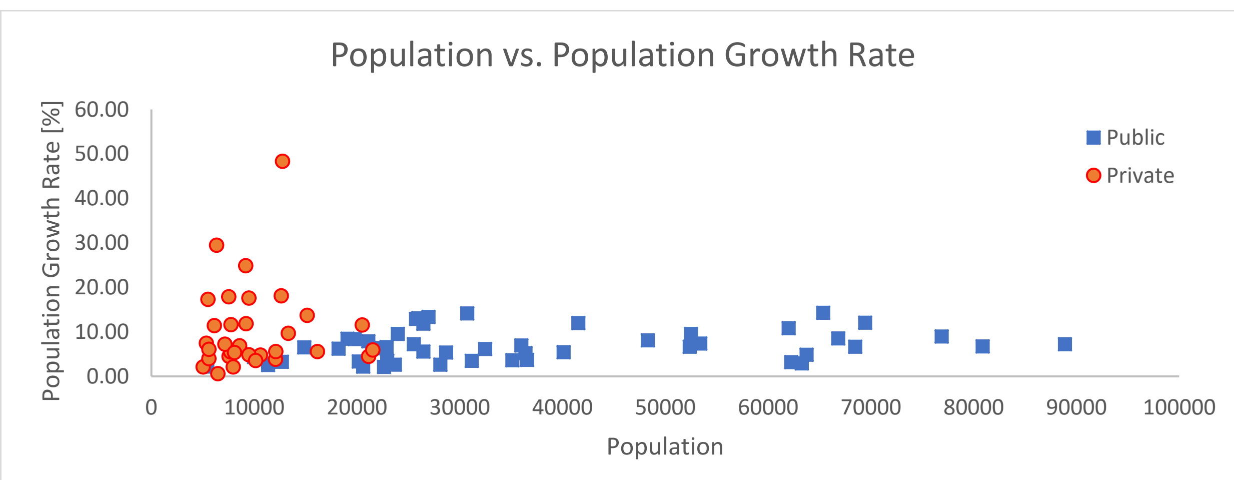


Figure R11: Population size vs. growth of State Aid cities (excluding Minneapolis/St. Paul)

**Density**

Population density can also indicate the type of projects that a city would be working at a given time [7]. A city with lower density would likely focus on accessibility and automotive traffic. Cities with higher densities would likely prioritize transit, as that is much more feasible in a dense environment. Density also typically is an indicator of how far away from the metropolitan center a city is. Lower density can indicate that there are likely longer commutes, but less local traffic, meaning travel times are prioritized. Table R7 shows the public engineer percentage by each group. Each group was separated by every additional 1000 people per square mile.

Table R7: Public engineer percentage by population density group

| Density [pop/mi$^2$] | Number | Public | % Total |
|---|---|---|---|
| < 1000 | 24 | 5 | 21 |
| 1000-2000 | 20 | 16 | 80 |
| 2000-3000 | 22 | 18 | 82 |
| 3000-4000 | 9 | 6 | 67 |
| > 4000 | 10 | 8 | 80 |

Table R8 indicates the average population density for cities with either a public or private engineer. The difference in those values, as well as an overall average, are also included.

Table R8: Average population density of cities with either a public or private city engineer

| | Average of Density [pop/mi$^2$] |
|---|---|
| Public | 2542 |
| Private | 1299 |
| Difference | 1243 |
| Average | 2074 |

The following chart (Figure R12) compares population size and density of private and public engineering cities, excluding the central cities.

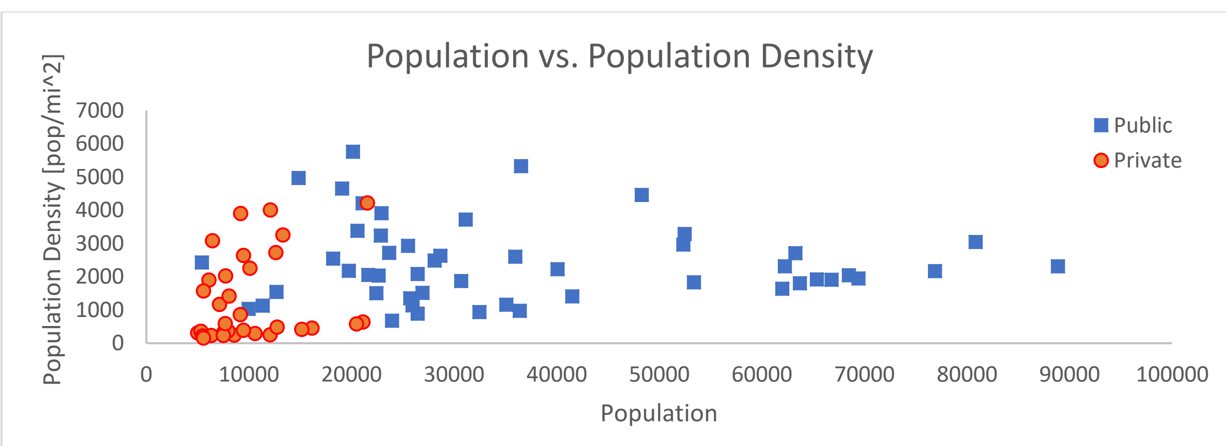


Figure R12: Population size vs. density of State Aid cities (excluding Minneapolis/St. Paul)

## Qualitative Factors

### Location

One of the purposes of this thesis is to affect the regional trends and practices of metro cities. However, though the Twin Cities metro is a specific location, there are many different locations within it. A city's location within the metropolitan area could potentially play a large role in its engineering work. For example, a central city is expected to have a large in-house engineering staff, as they typically have more work and many regional workers also depend on the system. An exurban city is the opposite, and is largely self-contained, which means there is less regional dependence on its system. In Table R9, the percentage of public engineers was determined for cities in each location category. Central City is defined as the Twin Cities, Minneapolis and St. Paul. Each following category describes a city that is one more away from the central cities [4]. For example, an outer city would be a third-ring city, as the inner and middle cities are in between it and the central city. Exurbs are any city in the metro area that is beyond the third-ring.

Table R9: Public engineer percentage by location group

| Location | Number | Public | % Total |
|---|---|---|---|
| Central City | 2 | 2 | 100 |
| Inner | 17 | 16 | 94 |
| Middle | 26 | 19 | 73 |
| Outer | 23 | 13 | 57 |
| Exurb | 17 | 3 | 18 |

It was also beneficial to categorize cities in a much more concrete way. There are eight counties that make up the MnDOT Metro District (Figure R13), so cities were classified according to the metro county they are located in. Table R10 shows the percentage of public engineers by Twin Cities metro county. It is worth noting that Chisago county is not considered part of the Twin Cities Metropolitan 7-county area, but it is included in the MnDOT (Figure R14) district.

Table R10: Public engineer percentage by county group

| County | Number | Public | % Total |
|---|---|---|---|
| Anoka | 14 | 7 | 50 |
| Carver | 4 | 2 | 50 |
| Chisago* | 3 | 0 | 0 |
| Dakota | 11 | 11 | 100 |
| Hennepin | 26 | 17 | 65 |
| Ramsey | 12 | 9 | 75 |
| Scott | 6 | 3 | 50 |
| Washington | 9 | 4 | 44 |

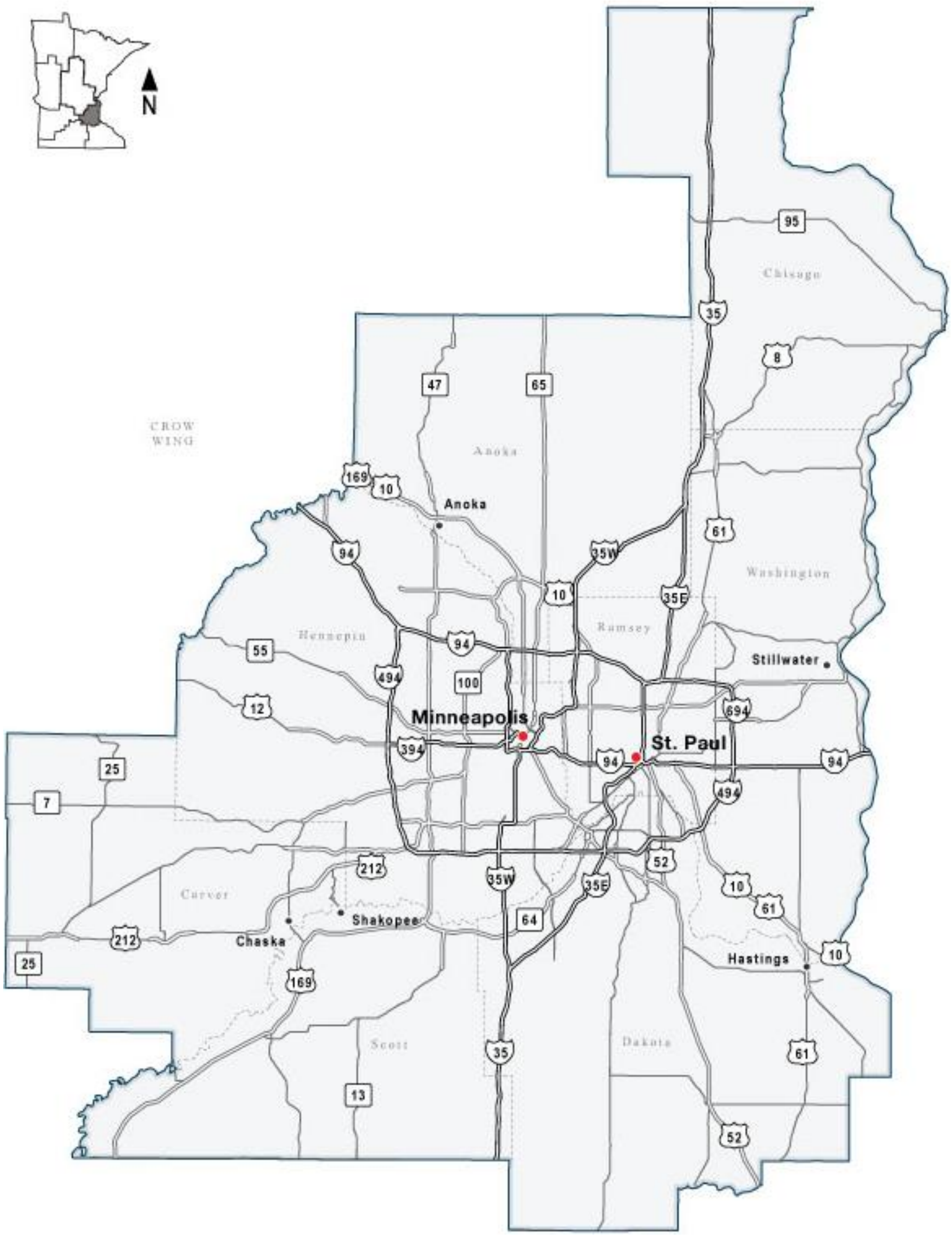


Figure R13: MnDOT Metro District with county labels [19]

DEPARTMENT OF
TRANSPORTATION

Figure R14: Minnesota Department of Transportation logo [11]

**Consultants**

Each city that decides to consult out their city engineering work must decide which firm to hire. In the metro area, there are ten separate firms that work for a total of 32 state aid cities [15]. Table R11 shows the number of cities that consult out work from each of these ten firms, along with the number of public city engineers for reference.

Table R11: Number of city engineers by metro consultant

| City Engineer Consultant | Number of Cities |
|---|---|
| Bolton & Menk | 6 |
| Elfering & Associates | 1 |
| Focus Engineering | 2 |
| Hakanson Anderson | 2 |
| MSA Professional Services | 1 |
| RFC Engineering | 1 |
| S.E.H. | 1 |
| Stantec | 3 |
| Wenck | 2 |
| WSB | 13 |
| Public (No consulting engineer) | 53 |

Figure R15 shows the number of cities hiring each consultant in a visual format. Public engineers are not included in this chart.

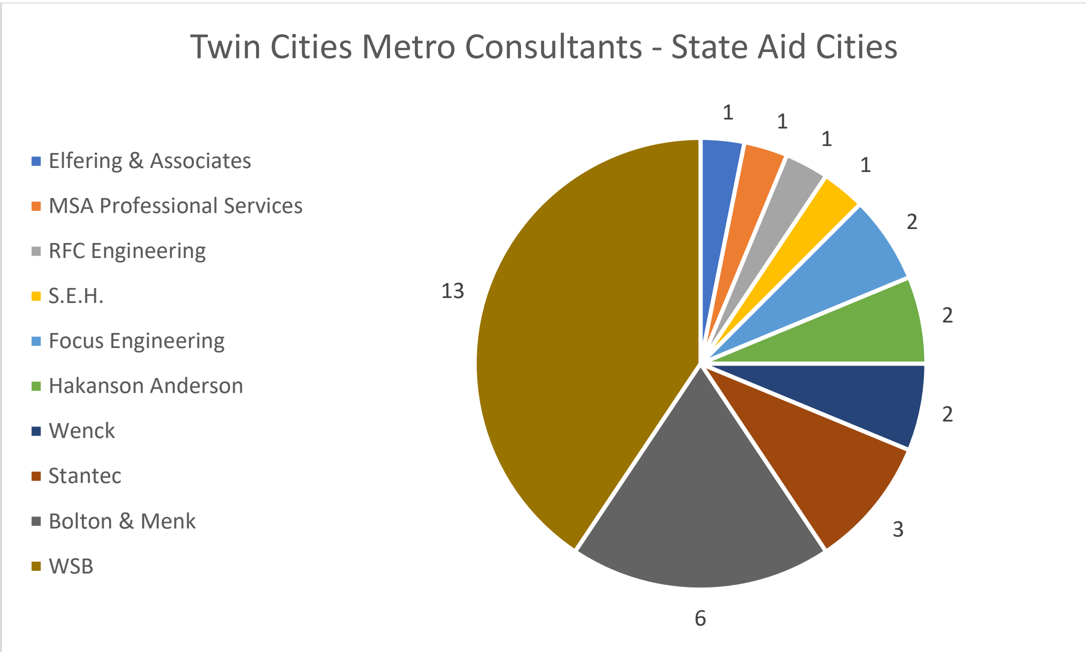


Figure R15: Visual representation for number of city engineers by metro consultant

# Analysis

## Quantitative Factors

### Population

Cities are incredibly dependent on their population size for a lot of government functions. Each person in the city affects how much money the city must spend in different areas, as well as the amount of money they get from the state government. From an engineering perspective, population size affects how cities design their public systems. With these considerations in mind, it is no surprise that population a huge factor in how a city would choose to hire out their engineering work.

There is a direct correlation showing that cities with larger populations are more likely to have an in-house engineer than a private consultant. In fact, the largest city with a private city engineer is New Hope, with just under 22000 people in 2017, making it the $44^{th}$ largest in the metro. All the 43 largest cities have public, in-house engineers. Contrarily, only three state aid cities with populations less than 10000 have public engineers. Of those three cities, one city, Falcon Heights shares a city engineer with another city (Roseville). Therefore, only two cities have a unique public city engineer, which is less than 10% of the total number of cities with less than 10000 people.

According to Table R1, the $50^{th}$ percentile where a city would have to hire a public or private engineer falls somewhere closely under 15000 people. However, cities between 10000 and 25000 people have a wide variety of other characteristics that affect how they hire out their work.

### Income

An important consideration in any city budget is the amount of tax revenue that the city will receive. Tax revenue is largely dependent on local property taxes. Additionally, property taxes are generally higher in paces with large demand. In general, many of these locations tend to house people with higher incomes. It would be expected that a city with higher median incomes would have a larger budget due to higher revenues. According to the data, it is not exactly clear how that translates to budgeting for a city engineer.

In general, when viewing Table R3, it is clear there is a slight trend that shows richer cities favor private engineers. However, the three largest income categories with middle incomes all have a similar percentage of public city engineers (around 63%). The category of rich cities, which has comparably fewer public engineers, only has six cities, which is a small sample size. Additionally, upon further investigation, most of those cities are quite small, which makes them more likely to have a private engineer anyway. An analysis of Table R4 shows that there is a small difference between the average median incomes of cities with public or private engineers (about $8000). Though significant, this metric weighs all cities evenly, regardless of size, so the central cities with relatively small median incomes and the tiny outer cities with high incomes would skew that data slightly.

Figure R10 shows that most public and private cities are clustered in a similar range of median incomes. It is hard to decipher a specific trend from the visual representation. Only a few high-income cities stand out from the majority of cities, which have between $50000 to $100000 in median income. Most are private consulting cities, though not entirely.

**Growth**

Population growth is often an indicator of how well a city is doing at a given time. People tend to move to places that are attractive to live in. Growth is also often centered in places that have policies that are supportive of new residents. The metric analyzed in this report was population growth by percentage, to maintain consistency.

Similarly, the analysis of population growth rate as it relates to a city's engineering work isn't clear. For most cities with growth under 16%, the percentage of public engineer utilization is similar (around 70%). However, despite the highest percentage group of public engineers being between 12 and 16% growth, the next fastest growth group has zero public engineers. It is hard to access exactly why this occurs without digging deeper into the numbers surrounding the growth. All cities in that category except one (Waconia) have populations under 10000 and extremely low densities. Though the number of people in population growth was small, there previously tiny populations allowed for huge growth. The city of Rogers, in particular, had incredible growth (48%). This is because the city recently (2011) annexed Hassan Township and gained those residents [9]. Though other cities with extremely high growth didn't necessarily have the same story, small changes in regional development or investment could drastically change their populations.

When viewing the average population growth of public vs. private engineering cities (Table R6), the trend becomes a little clearer. Private engineering cities had growth an average of 3.5% greater than public engineering cities. In this case, the average value analysis might be more beneficial than grouping the cities into broader categories. Additionally, it is clear from Figure R11 that the group of low population, high growth cities all have private engineers. The seven cities with populations under 15000 and growth over 15% all consult out to private firms.

**Density**

Population density usually indicates the type of policies a city employs for growth. A city with higher density undoubtedly has fewer zoning barriers to dense housing than a low-density city. Additionally, density can indicate that a city is closer to the central city, though not always (such as in the case of an old, established city that was populated before the suburban sprawl of the metro). Dense cities generally have larger focuses on transit and multi-modal transportation options, which affects policy at the government level.

For this analysis, it was obvious that there was a threshold at which density was large enough to make sense for a city to hire an in-house engineer. For cities under 1000 people per square mile, only 21% had public engineers. However, above that threshold, approximately 80% had public engineers, regardless of density group. This consistency shows that the type of policy needed for extremely sparse cites does not always require an in-house engineer. Many of these towns were recently part of townships and have a large amount of underdeveloped infrastructure. Public staff would have less maintenance and rehabilitation projects to do, so they would be less needed. Observing Table R8 shows that public engineering cities have about double the density on average than private ones. This is likely not a coincidence.

Doing a cross factor comparison of population size vs. density, like in Figure R12, is more revealing than for other cross factors. It is clearly shown that there are two cutoffs for when a private consultant would be used., with very few exceptions. All private cities are either less than 15000 people in size or have a density less than 650 people per square mile. Besides the City of New Hope with medium population size (about 22000 people) and fairly high density (about 4000 people per square mile), every private consultant city meets one or both criteria. Only four public cities meet one of these criteria, with four cities less than 15000 in population. However, three of these cities have populations above 10000. Only Falcon Heights, with a population just above 5000 is below 10000 people. Notably, Falcon Heights has a public engineer only through the City of Roseville, which is a consultant arrangement of sorts in the public realm.

## Qualitative Factors

### Location

Perhaps the most obvious qualitative variable that affects cities is their location. Distance from the center city, as well as distance from other suburbs, plays a large role in a city's feel and environment. A city closer to downtown would likely share more in common with the central city than an exurban community. Location also typically indicates age, although not exclusively, as many exurban communities are historic cities now enveloped by the metro area.

The relative distance to downtown, analyzed by location groups in R9 showed a clear trend of private engineers in greater numbers at farther distances from MSP. Inner suburbs almost exclusively had public engineers on hand, and a large majority of middle suburbs did as well. Outer suburbs had a bare majority, and exurbs had very few. Part of this is likely due to the age of the communities, as older, established cities are likely to have a more stable government, indicating an in-house engineer. However, the prevalence of private engineers outside the central metro indicates that outside cities have other factors at play, many of which were discussed in the 'Quantitative Factors' section.

Additionally, specific counties had shared traits, which indicated that engineering hiring practice was possibly even more local than a regional trend. In Table R10, it is easily shown that Dakota county, despite being similar distance from MSP as Anoka and Washington, has zero private engineers in state aid cities. It is worth noting that Dakota county has six state aid cities with under 25000 people, yet no private engineers. This is a noteworthy point that could indicate that the county has either strong traditions or policies that push cities to consider in-house engineers. Contrarily, the exurban county of Chisago, which isn't included in typical metro statistical analysis, has zero public engineers. This is not surprising, however, as none of the communities top 11000 people. Most other counties have an expected mix of public and private engineers.

### Consultants

Although the selection of a consultant isn't necessarily dependent as much on the other factors considered in this report, it is still worthy of notice to get an accurate perspective of the Twin Cities municipal engineering market. Of the ten consultants that work for the 32 metro state aid cities, only three work for three or more cities. WSB consults at 13 cities, distantly followed by Bolton & Menk at six cities, and Stantec at three cities. The remaining ten cities are covered by seven consultants. This shows that WSB has a large market share, but other companies haven't expanded much beyond their base. This level of competition has likely changed over the years, so further analysis of consultant histories would be needed to analyze these statistics further.

# Conclusions

The Twin Cities region has well-established cities and companies that are constantly changing how they hire engineering work. Each city makes decisions on how it wants to structure its engineering department, as well as whether to hire a private consultant or in-house staff engineer.

From the research conducted in this thesis, there are a few main factors that most greatly influence each city's engineer decision. The most obvious and intuitive factor is population size. Naturally, the larger cities in the metro, with larger tax bases and needs, have a public engineer on staff. Cities between 15000 and 20000 have about a half chance of a public engineer, and it gets more likely to have a private consultant under 15000 people.

However, population size isn't the only determining factor. Location regarding proximity to the central cities of Minneapolis and St. Paul plays a huge role in the private engineering percentage as well. Cities farther out from MSP have less chance of having a public engineer. Outer suburbs and exurbs are typically newer, growing faster, and are less dense, all factors that diminish the likelihood of an in-house city engineer. There is a steep decline in public engineers farther from the central cities.

When viewing how factors interact, there is also a strong lesson to be gathered between population size and density. Almost every private engineering city has an extremely low population density, a low population, or both. There is only one exception (City of New Hope) to this trend, showing its significance. Other factors like growth and income may make a difference, but their influence is largely overshadowed by the interaction of population size and density.

One important point of notice is that these conclusions are entirely based on data specifically regarding state aid cities. It is unlikely that many non-state aid cities have public engineers, although that does occur, like in Centerville. However, most are too small and have too few projects to warrant in-house staff. The cutoff of state aid cities was necessary to maintain consistency in data analysis and with making conclusions.

Lastly, it is obvious, but each city has a unique history of development and government. Specific individuals or projects can completely change the trajectory of a city's engineering department. Nothing noted in this research is a concrete rule that a city must follow. However, most metro cities tend to follow similar trends. Understanding how the municipal engineering work of this region functions is crucial to governments and companies that navigate the Twin Cities Metro.

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# Appendix: City Data

Table A1: Metro city data [4], [6], [7], [10], [15]

| City | Population | Median Income | County | Location | Public or Private? |
|---|---|---|---|---|---|
| Andover | 32470 | $100,358 | Anoka | Outer | B |
| Anoka | 18205 | $48,850 | Anoka | Outer | B |
| Apple Valley | 52361 | $83,450 | Dakota | Middle | B |
| Arden Hills | 9969 | $91,875 | Ramsey | Middle | B |
| Belle Plaine | 7144 | $74,635 | Scott | Exurb | R |
| Blaine | 65369 | $79,915 | Anoka | Middle | B |
| Bloomington | 88885 | $67,473 | Hennepin | Inner | B |
| Brooklyn Center | 31145 | $46,400 | Hennepin | Inner | B |
| Brooklyn Park | 80866 | $65,695 | Hennepin | Middle | B |
| Burnsville | 62239 | $66,225 | Dakota | Middle | B |
| Champlin | 23690 | $84,042 | Hennepin | Outer | B |
| Chanhassen | 25955 | $115,449 | Carver | Outer | B |
| Chaska | 26941 | $76,673 | Carver | Outer | B |
| Chisago City | 5335 | $65,119 | Chisago | Exurb | R |
| Circle Pines | 5023 | $73,352 | Anoka | Middle | R |
| Columbia Heights | 20153 | $48,791 | Anoka | Inner | B |
| Coon Rapids | 63272 | $66,313 | Anoka | Middle | B |
| Corcoran | 5592 | $101,659 | Hennepin | Outer | R |
| Cottage Grove | 36399 | $85,516 | Washington | Middle | B |
| Crystal | 22929 | $60,494 | Hennepin | Inner | B |
| Dayton | 5481 | $78,477 | Hennepin | Outer | R |
| Eagan | 68488 | $82,855 | Dakota | Middle | B |
| East Bethel | 12074 | $90,134 | Anoka | Exurb | R |
| Eden Prairie | 63726 | $101,094 | Hennepin | Middle | B |
| Edina | 52497 | $91,847 | Hennepin | Inner | B |
| Falcon Heights | 5436 | $75,167 | Ramsey | Inner | B |
| Farmington | 22421 | $86,447 | Dakota | Outer | B |
| Forest Lake | 20497 | $73,091 | Washington | Outer | R |
| Fridley | 28667 | $55,006 | Anoka | Inner | B |
| Golden Valley | 21646 | $81,919 | Hennepin | Inner | B |
| Ham Lake | 16153 | $93,900 | Anoka | Outer | R |
| Hastings | 22640 | $62,155 | Dakota | Exurb | B |
| Hopkins | 19079 | $51,466 | Hennepin | Middle | B |
| Hugo | 15158 | $86,789 | Washington | Outer | R |
| Inver Grove Heights | 35106 | $69,893 | Dakota | Middle | B |

| | | | | | |
|---|---|---|---|---|---|
| Jordan | 6106 | $66,818 | Scott | Exurb | R |
| Lake Elmo | 9481 | $96,944 | Washington | Outer | R |
| Lakeville | 61993 | $98,864 | Dakota | Outer | B |
| Lino Lakes | 21117 | $105,934 | Anoka | Outer | R |
| Little Canada | 10120 | $51,154 | Ramsey | Middle | R |
| Mahtomedi | 8085 | $95,679 | Washington | Outer | R |
| Maple Grove | 66814 | $96,410 | Hennepin | Outer | B |
| Maplewood | 40084 | $63,367 | Ramsey | Inner | B |
| Medina | 6335 | $137,692 | Hennepin | Outer | R |
| Mendota Heights | 11352 | $100,903 | Dakota | Inner | B |
| Minneapolis | 423990 | $56,255 | Hennepin | Central City | B |
| Minnetonka | 53394 | $83,496 | Hennepin | Middle | B |
| Minnetrista | 7526 | $143,191 | Hennepin | Exurb | R |
| Mound | 9494 | $78,920 | Hennepin | Exurb | R |
| Mounds View | 13327 | $56,753 | Ramsey | Middle | R |
| New Brighton | 22875 | $66,003 | Ramsey | Middle | B |
| New Hope | 21545 | $50,000 | Hennepin | Middle | R |
| New Prague | 7725 | $72,052 | Scott | Exurb | R |
| North Branch | 10608 | $69,419 | Chisago | Exurb | R |
| North St. Paul | 12099 | $57,156 | Ramsey | Middle | R |
| Oak Grove | 8582 | $85,446 | Anoka | Exurb | R |
| Oakdale | 28115 | $67,991 | Washington | Middle | B |
| Orono | 7883 | $119,393 | Hennepin | Outer | B |
| Plymouth | 76882 | $88,378 | Hennepin | Middle | B |
| Prior Lake | 25735 | $101,128 | Scott | Outer | B |
| Ramsey | 26462 | $88,286 | Anoka | Exurb | B |
| Richfield | 36544 | $54,642 | Hennepin | Inner | B |
| Robbinsdale | 14860 | $60,388 | Hennepin | Inner | B |
| Rogers | 12753 | $109,023 | Hennepin | Exurb | R |
| Rosemount | 23965 | $92,939 | Dakota | Outer | B |
| Roseville | 35987 | $63,022 | Ramsey | Inner | B |
| Savage | 30713 | $97,584 | Scott | Middle | B |
| Shakopee | 41519 | $79,648 | Scott | Outer | B |
| Shoreview | 26447 | $81,353 | Ramsey | Middle | B |
| Shorewood | 7708 | $123,629 | Hennepin | Outer | R |
| South St. Paul | 20598 | $54,777 | Dakota | Inner | B |
| Spring Lake Park | 6450 | $57,993 | Anoka | Middle | R |
| St. Anthony | 9200 | $64,504 | Hennepin | Inner | R |
| St. Francis | 7541 | $73,211 | Anoka | Exurb | R |
| St. Louis Park | 48290 | $68,451 | Hennepin | Inner | B |
| St. Paul | 309180 | $54,085 | Ramsey | Central City | B |

| | | | | | |
|---|---|---|---|---|---|
| St. Paul Park | 5594 | $68,586 | Washington | Middle | R |
| Stillwater | 19748 | $79,293 | Washington | Exurb | B |
| Vadnais Heights | 12704 | $72,673 | Ramsey | Middle | B |
| Victoria | 9172 | $132,431 | Carver | Exurb | R |
| Waconia | 12633 | $87,394 | Carver | Exurb | R |
| West St. Paul | 21085 | $51,066 | Dakota | Inner | B |
| White Bear Lake | 25512 | $63,916 | Ramsey | Outer | B |
| Woodbury | 69426 | $101,922 | Washington | Middle | B |
| Wyoming | 7955 | $84,712 | Chisago | Exurb | R |

Table A2: Additional Metro city data [4], [6], [7], [10], [15]

| **City** | **Company (if applicable)** | **Growth since 2010 [%]** | **Area [mi^2]** | **Density [pop/mi^2]** |
|---|---|---|---|---|
| Andover | | 6.12 | 34.8 | 932 |
| Anoka | | 6.20 | 7.2 | 2539 |
| Apple Valley | | 6.68 | 17.7 | 2967 |
| Arden Hills | | 4.37 | 9.7 | 1032 |
| Belle Plaine | Bolton & Menk | 7.25 | 6.1 | 1165 |
| Blaine | | 14.31 | 34.0 | 1920 |
| Bloomington | | 7.23 | 38.4 | 2314 |
| Brooklyn Center | | 3.46 | 8.4 | 3717 |
| Brooklyn Park | | 6.71 | 26.6 | 3046 |
| Burnsville | | 3.21 | 26.9 | 2316 |
| Champlin | | 2.60 | 8.7 | 2720 |
| Chanhassen | | 13.08 | 22.8 | 1137 |
| Chaska | | 13.34 | 17.8 | 1511 |
| Chisago City | Bolton & Menk | 7.41 | 14.7 | 362 |
| Circle Pines | WSB | 2.14 | 16.0 | 315 |
| Columbia Heights | | 3.37 | 3.5 | 5758 |
| Coon Rapids | | 2.92 | 23.3 | 2711 |
| Corcoran | Wenck | 3.96 | 36.1 | 155 |
| Cottage Grove | | 5.23 | 37.5 | 970 |
| Crystal | | 3.51 | 5.9 | 3906 |
| Dayton | Wenck | 17.34 | 25.2 | 218 |
| Eagan | | 6.67 | 33.5 | 2046 |
| East Bethel | Hakanson Anderson | 3.85 | 47.7 | 253 |
| Eden Prairie | | 4.82 | 35.3 | 1807 |
| Edina | | 9.50 | 16.0 | 3289 |
| Falcon Heights | | 2.16 | 2.2 | 2427 |
| Farmington | | 6.33 | 14.9 | 1508 |
| Forest Lake | Bolton & Menk | 11.54 | 35.5 | 577 |
| Fridley | | 5.36 | 10.9 | 2632 |

| | | | | |
|---|---|---|---|---|
| Golden Valley | | 6.26 | 10.5 | 2054 |
| Ham Lake | RFC Engineering | 5.60 | 35.9 | 450 |
| Hastings | | 2.11 | 11.1 | 2034 |
| Hopkins | | 8.46 | 4.1 | 4653 |
| Hugo | WSB | 13.70 | 36.0 | 421 |
| Inver Grove Heights | | 3.62 | 30.2 | 1162 |
| Jordan | Bolton & Menk | 11.42 | 3.2 | 1902 |
| Lake Elmo | Focus Engineering | 17.62 | 24.2 | 392 |
| Lakeville | | 10.79 | 37.9 | 1636 |
| Lino Lakes | WSB | 4.46 | 33.2 | 636 |
| Little Canada | Elfering & Associates | 3.55 | 4.5 | 2254 |
| Mahtomedi | WSB | 5.33 | 5.7 | 1418 |
| Maple Grove | | 8.52 | 35.1 | 1906 |
| Maplewood | | 5.43 | 18.0 | 2231 |
| Medina | WSB | 29.50 | 27.1 | 234 |
| Mendota Heights | | 2.54 | 10.1 | 1130 |
| Minneapolis | | 10.82 | 57.5 | 7375 |
| Minnetonka | | 7.36 | 29.1 | 1835 |
| Minnetrista | WSB | 17.89 | 31.8 | 237 |
| Mound | Bolton & Menk | 4.88 | 3.6 | 2645 |
| Mounds View | Stantec | 9.64 | 4.1 | 3258 |
| New Brighton | | 6.61 | 7.1 | 3240 |
| New Hope | Stantec | 5.93 | 5.1 | 4216 |
| New Prague | S.E.H. | 11.63 | 3.8 | 2022 |
| North Branch | WSB | 4.77 | 36.0 | 294 |
| North St. Paul | WSB | 5.58 | 3.0 | 4006 |
| Oak Grove | MSA Professional Services | 6.86 | 35.2 | 244 |
| Oakdale | | 2.61 | 11.3 | 2486 |
| Orono | | 6.00 | 25.3 | 312 |
| Plymouth | | 8.94 | 35.5 | 2167 |
| Prior Lake | | 12.89 | 19.1 | 1348 |
| Ramsey | | 11.80 | 29.8 | 887 |
| Richfield | | 3.74 | 6.9 | 5327 |
| Robbinsdale | | 6.50 | 3.0 | 4970 |
| Rogers | WSB | 48.34 | 26.3 | 486 |
| Rosemount | | 9.56 | 35.2 | 680 |
| Roseville | | 6.91 | 13.8 | 2600 |
| Savage | | 14.13 | 16.4 | 1873 |
| Shakopee | | 11.98 | 29.4 | 1411 |

| | | | | |
|---|---|---|---|---|
| Shoreview | | 5.61 | 12.7 | 2086 |
| Shorewood | WSB | 5.49 | 13.1 | 589 |
| South St. Paul | | 2.17 | 6.1 | 3382 |
| Spring Lake Park | Stantec | 0.59 | 2.1 | 3086 |
| St. Anthony | WSB | 11.84 | 2.4 | 3898 |
| St. Francis | Hakanson Anderson | 4.47 | 23.7 | 318 |
| St. Louis Park | | 8.11 | 10.8 | 4455 |
| St. Paul | | 8.46 | 56.2 | 5503 |
| St. Paul Park | WSB | 6.09 | 3.6 | 1571 |
| Stillwater | | 8.34 | 9.1 | 2175 |
| Vadnais Heights | | 3.27 | 8.2 | 1544 |
| Victoria | Focus Engineering | 24.87 | 10.7 | 858 |
| Waconia | Bolton & Menk | 18.10 | 4.6 | 2723 |
| West St. Paul | | 7.91 | 5.0 | 4209 |
| White Bear Lake | | 7.21 | 8.7 | 2926 |
| Woodbury | | 12.05 | 35.7 | 1944 |
| Wyoming | WSB | 2.10 | 21.7 | 367 |