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**Draft Technical Report:**  
**Methodology for Computing Proposed FTA DBE Goals**  
**Minnesota Department of Transportation (MnDOT)**  
**FY2019-2021**

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## Table of Contents

<b>ACKNOWLEDGEMENTS</b> .....	<b>2</b>
<b>EXECUTIVE SUMMARY</b> .....	<b>4</b>
<b>SECTION 1: INTRODUCTION</b> .....	<b>11</b>
<b>SECTION 2: DATA</b> .....	<b>12</b>
<b>SECTION 3: METHODOLOGY TO ESTABLISH OVERALL GOAL</b> .....	<b>12</b>
<b>3.1 Defining the Geographical Marketplace</b> .....	<b>12</b>
<b>3.2 Utilization Analysis</b> .....	<b>13</b>
<b>3.3 Distribution of Estimated Expenditures by Industry Classification for Year     2018-2021</b> .....	<b>14</b>
<b>3.4 Calculating the Weighted Availability Measure</b> .....	<b>15</b>
3.4.1 Certified DBE List Method .....	15
3.4.2 Dun & Bradstreet Method.....	16
3.4.5 The Base Goal.....	18
<b>3.5 Adjustment to the Base Goal</b> .....	<b>19</b>
3.5.1 Data Used for Adjustment to the Base Goal .....	19
3.5.2 Dummy Variable Method.....	19
3.5.3 Adjustment .....	19
<b>3.6 Race Neutral Analysis</b> .....	<b>20</b>
<b>SECTION 4: THE MnDOT PROPOSED DBE GOALS</b> .....	<b>20</b>
<b>SECTION 5: APPENDICES</b> .....	<b>22</b>
<b>APPENDIX A: AVAILABILITY ANALYSIS</b> .....	<b>22</b>
<b>Table A-1. Weights used for the Availability Analysis</b> .....	<b>22</b>
<b>Table A-2. Availability Analysis - DBE Method</b> .....	<b>23</b>
PJM-1 .....	23
PJM-2 .....	24
VJM-1 .....	25
<b>Table A-3. Availability Analysis - D&amp;B Method</b> .....	<b>26</b>
PJM-1 .....	26
PJM-2 .....	27
VJM-1 .....	28
<b>APPENDIX B: DISCRIMINATION ANALYSIS</b> .....	<b>29</b>
<b>Table B-1. Description of Variables in the Regression Analysis</b> .....	<b>29</b>
<b>Table B-2. Summary Statistics for both prime and subcontracts</b> .....	<b>30</b>
<b>Table B-3. Discrimination Analysis Dummy Variable Method for both Prime and         Subcontracts: By Natural Log (ln) Award Amount</b> .....	<b>31</b>

## EXECUTIVE SUMMARY

This report provides proposed DBE goal and race neutral participation for the Minnesota Department of Transportation (MnDOT) for fiscal years 2019-2021 on Federal Transportation Administration funded expenditures. To satisfy the requirements set forth in the USDOT regulations, availability rates of willing, able and qualified firms must be computed for well-defined geographic market areas. This report was constructed based on the best available information received from MnDOT as well as the government-published secondary data.

The analysis undertaken suggests a proposed agency-wide DBE goal of 9.12 percent for 2019-2021 on FTA-funded projects.

This goal was derived in the following manner:

- A base goal of 6.54 percent was computed.
- An adjustment to the base goal was made to account for disparities in prime and subcontract awards that cannot be attributed to differences in industry, location, firm size, credit risk, or other characteristics of DBE versus non-DBE contracts. The adjustment was to increase the base goal by 39.52 percent, resulting in the adjusted goal of 9.12 percent ( $= 6.54 \times 1.3952$ ).
- The maximum portion of the adjusted goal deemed to be achievable by race-neutral means was found to be equal to 73.36 percent. Therefore, the race neutral goal was computed to be equal to 6.69 percent ( $= 9.12 \times 0.7336$ ) and the race-conscious goal was computed to be equal to 2.43 percent ( $= 9.12 \times (1 - 0.7336) = 9.12 \times 0.2664$ ).

Table 1 provides the detailed breakdowns:

***Table 1. Proposed MnDOT FTA DBE Goal FY2019-2021***

	<b>Goals as June 23</b>
Base Goal	6.54%
Discrimination Gap for Adjustment	39.52%
<b>Adjusted Goal</b>	<b>9.12%</b>
<i>Race-Neutral Portion</i>	73.36%
<b>Race-Neutral Goal</b>	<b>6.69%</b>
<i>Race-Conscious Portion</i>	26.64%
<b>Race-Conscious Goal</b>	<b>2.43%</b>

## **BACKGROUND**

As a recipient of federal transportation dollars awarded through the U.S. Department of Transportation's Federal Transportation Administration (FTA), MnDOT is required to establish and submit a three-year goal to the FTA for review. This goal is to be established in compliance with the federal regulations governing the *Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs* (hereafter referred to as "USDOT regulations"). The USDOT regulations instruct state and local grant recipients to follow a two-step process to establish their annual DBE goal [49 C.F.R. §26.45]. The analysis conducted by the Roy Wilkins Center complies with these guidelines.

## **METHODOLOGY**

In order for the MnDOT FTA DBE goal to satisfy the requirements set forth in the USDOT regulations, availability rates of willing, able and qualified firms must be computed for well-defined geographic market areas. We established three different geographic market areas. Two were based on political jurisdictions and the other one was based on zip codes where there were substantial numbers of prime and subcontractors for MnDOT contracts between fiscal year 2015 and 2017. Relevant industries with MnDOT contracts were identified by examining the distribution of MnDOT contract dollars by industry classification for contracts awarded between October 1, 2014 and September 30, 2017. We then estimated the distribution of anticipated MnDOT contract dollars by industry classification for FY 2019-2021 from the information about future projects that was provided by MnDOT.

Availability rates were computed from multiple data sets and were appropriately weighted to produce a base goal. The base goal was then adjusted to account for disparities in prime contract and subcontract award amounts. The result is the proposed goal. The proposed goal was further partitioned between a race conscious and race neutral portion using a methodology upheld by the 3<sup>rd</sup> Circuit Federal Court in *GEOD v. New Jersey Transit* and published in the peer reviewed journal, *Applied Economics Letters*.

## **DATA**

The research team obtained all prime contract and subcontract files from the Office of Civil Rights, Minnesota Department of Transportation for the years 2015 to 2017. Obvious data entry errors, improbable measures, possible duplicates and related questionable items were flagged and forwarded to MnDOT staff for clarification and/or correction.

Contract files were supplemented with data obtained from Dun & Bradstreet. Other data used included: the MnDOT DBE Certification Directory and the U.S. Census ZIP code Business Patterns (ZBP) data for 2016.

## UTILIZATION

The utilization analysis shows that 100 percent of prime contract dollars were awarded to non-DBE prime contractors while 0.75 percent of subcontract dollars were awarded to DBE subcontractors. The vast majority of prime contract dollars were awarded to Minnesota firms (90.44%). The bulk of contracts and contract dollars awarded were in the professional and technical service industry.

**Table 2. DBE Share of FTA Contract Amount**

		N	Contract Amount	Percent
Prime Contracts	Total	61	\$19,611,973.47	
	DBE	0	\$0.00	0.00%
	Non-DBE	61	\$19,611,973.47	100.00%
Sub Contracts	Total	47	\$14,443,101.09	
	DBE	2	\$108,840.10	0.75%
	Non-DBE	45	\$14,334,260.99	99.25%
Both Prime and Sub Contracts				
	DBE	2	\$108,840.10	0.55%

Source: MnDOT FTA contracts: Oct. 1, 2014 - Sep. 30, 2017

## GEOGRAPHIC MARKET AREAS

In order for the MnDOT FTA DBE goal to satisfy the requirements set forth in the USDOT regulations as well as comply with the Supreme Court's narrowly-tailored standard, the DBE goal must be based on a narrowly-defined geographic market. In order to define the geographic market in such a manner that the vast majority of contract dollars awarded would be incorporated in the definition, the research team considered two broad methods: a) political jurisdiction method (PJM), based on the counties where contracts were awarded; and b) virtual jurisdiction method (VJM), based on the zip code location of contracts and/or contractors in the client's database. All methods yield different counts or estimates of the numbers of firms within industry codes, and accordingly will yield alternative measures of availability. For this report, the following alternative markets were used.

**Table 3. MnDOT Geographic Market Areas (GMAs) for FTA DBE Goals**

GMA	Definition	Total Amount	Share of Dollars
<b>Political Jurisdiction Method (PJM)</b>			
PJM-1	All Minnesota counties	\$31,290,684.19	91.88%
PJM-2	Ranked Counties in USA where the total contract dollars for the sum of the counties exceeds 75% and the marginal contribution to the overall total is at least 1%	\$31,898,418.40	93.67%
<b>Virtual Jurisdiction Method (VJM)</b>			
VJM-1	Ranked zip codes anywhere in the USA where the total contract dollars awarded for the sum of the zip codes exceeds 75% and the marginal contribution to the overall total is at least 0.25%	\$33,055,074.53	97.84%
Total Contract Amount (Primes and Subs)		\$34,055,074.53	

Source: FTA contracts between Oct. 1, 2014 and Sept. 30, 2017

The first method, PJM-1 represents the State of Minnesota. The second method, PJM-2, defines those counties where there are enough contracts to represent the Minnesota counties where the total contract amount exceeds 75 percent and the marginal contribution of each county to the overall total contract amount is at least 1 percent. The other measure, VJM-1, is similar to PJM-2, but focuses on zip codes.

The distribution of dollars per GMA is presented in Table 3 as well. Each geographic market area has more than 90 percent of contract dollars.

### **DISCUSSION OF AVAILABILITY METHODS**

The research team obtained from MnDOT a list of all firms that were in their various databases, which include prime contractors and subcontractors, certified DBEs. NAICS codes for the firms were obtained from the AASHTOWare database, and Dun & Bradstreet (D&B). When no NAICS could be found from D&B, observations were not used in the weighted availability counts.

The research team also obtained from MnDOT the list of projects that MnDOT expects to undertake and identified 31 separate six-digit NAICS codes associated with comparable

projects from the period of 2018-2021. The identified 31 separate six-digit NAICS codes were used to generate the weights.<sup>1</sup>

### **Dun and Bradstreet Method**

The research team obtained access to D&B Hoover's database, a subsidiary of Dun & Bradstreet, to compute the number of firms in each relevant NAICS code within a specified geographic market area.<sup>2</sup> This research product covers more than 23 million U.S corporations and other entities (i.e. government agencies, partnerships, non-profits, and educational institutions). For the state of Minnesota, information included information on headquarters, branches, and single locations.<sup>3</sup>

The availability rate is computed by finding the weighted share of women- and minority-owned businesses within each NAICS code for a specified geographic market area. Unlike the other methods, the D&B method uses "self-reported" minority/gender designations. Thus, the D&B method can include firms that are not MnDOT certified DBEs. On the other hand, not every certified DBE is included in this database because a requirement of inclusion is the existence of a DUNS number. According to Hoover's customer service, D&B contacts firms directly to verify their gender or minority status and checks with third party sources and proprietary databases for further verification.

### **DBE List Method**

We obtained the list of certified DBEs from Minnesota Uniform Certification Program (UCP) Directory. The numerator in the availability ratio is the number of certified DBE firms for specified NAICS codes within a given geographic market area. The denominator is the number of firms in the County Business Patterns (CBP) or ZIP code Business Patterns (ZBP) database, depending on the definition of the geographic market area, for specified NAICS codes within a geographic market area. The numerator and denominator come from different sources. The numerator counts firms and the denominator counts establishments with paid employees. The Census Bureau explains:

*An establishment is a single physical location at which business is conducted or services or industrial operations are performed. An establishment is not necessarily equivalent to a company or enterprise, which may consist of one or more establishments. A single-unit company owns or operates only one establishment. A multi-unit company owns or operates two or more establishments.*  
*<https://www.census.gov/programs-surveys/cbp/technical-documentation/methodology.html><sup>4</sup> (Census Bureau, County Business Patterns, "Technical Documentation: Methodology").*

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<sup>1</sup> According to Department of Transportation regulations, the availability rate should be weighted by the "amount of money to be spent" in each industry. The research team requested a copy of MnDOT's estimated expenditures for the next three years, broken down by NAICS code. Projected expenditures for the next three years included in the State Transportation Improvement Program (STIP) 2018-2021 data files were provided and categorized by type of work. In order to calculate the weights for the availability analysis, the research team categorized projected expenditures by NAICS code. The result was 31 NAICS codes.

<sup>2</sup> D&B Hoover provided one NAICS code for each business.

<sup>3</sup> Headquarter: indicates that the company has subsidiaries or branches; branch indicates a company location other than the headquarters; and single location indicates that the company does not have any subsidiaries or branches.

<sup>4</sup> As a result, the denominator includes many establishments that might not normally contract with MnDOT.

## THE BASE GOAL

Depending on the method used to calculate availability rates, each geographic market area captures a different share of available contract dollars. As a result, each method also yields a different DBE availability goal for each geographic market.

In order to derive a single base goal for MnDOT that is based on all the goals calculated for each geographical market, it is necessary to weight each geographical market-specific goal according to the percentage of contract dollars awarded in that area.

The two different methods use data that report multiple industries for many of the firms in their databases. Table 4 presents the details of the weighted availability rate using all NAICS codes level. This base goal is used in subsequent analyses.

*Table 4. FTA Availability Rates and Base Goal*

Method	PJM-1	PJM-2	VJM-1	Base Goal
DBE List Method	1.12%	1.95%	2.43%	6.54%
D&B Method	7.89%	9.31%	16.24%	

Source: Author's calculation using FTA data files, DBE, D&B, and US Census data

## ADJUSTMENTS TO THE BASE GOAL

According to the USDOT regulations, recipients of federal funds are required to adjust their base goal in light of other evidence regarding the market area [49 C.F.R. §26.45(d)]. One valid reason for adjusting the goal would be if the analysis showed discrimination, either in the overall market place or in the specific agency or governmental unit undertaking the procurement and contracting process.

A standard method for estimating discrimination is to compute the difference in contract award amounts attributable to DBE status. The research team merged awarded contracts files from year of 2012 to year of 2017 together to obtain enough observations on DBE awards to perform regression analysis.

The standard method of the base goal adjustment is not significant due to the small sample size. In total, we are able to identify 160 FTA contracts (prime and sub) and 5 DBE contracts from the year 2012-2017. The small sample size due to the absence of DBEs awarded contracts in the past six years justifies the reasons to make the base goal adjustment. The adjustment is 39.52 percent. The confidence interval for the coefficient on DBE is (-2.631994, 1.626137).

## RACE NEUTRAL ANALYSIS

In compliance with federal regulations, state and local transit authorities must identify the maximum feasible portion of the DBE goal that can be achieved through race-neutral measures and the percentage of the goal that can only be achieved through race-conscious measures [49 C.F.R. §26.51(a)]. Myers and Ha have pioneered the use of a detailed econometric procedure that maximizes the race-neutral component of the DBE goals.<sup>5</sup> This method has established a rigorous standard for maximizing the race neutral portion of the overall DBE goal.<sup>6</sup>

The logic of the analysis is that some share of DBE dollars awarded would have gone to DBEs without goals. One can compute the share of dollars that would have gone to DBEs without goals for contracts and firms that are comparable. This method requires the estimation of a regression model that controls for a host of relevant variables.

The race neutral analysis uses the best regression model for predicting DBE contract amounts with and without goals. The data set is the merged data set combining FHWA and FTA contracts with the same NAIC codes found in the FTA dataset. Following this specification, our analysis shows that 73.36 percent of the goal can be achieved through race neutral measures and 26.64 percent can be achieved through race conscious goals.

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<sup>5</sup> Myers, Samuel L. and Inhyuck "Steve" Ha. "Estimation of Race Neutral Goals in Public Procurement and Contracting," *Applied Economics Letters*, 2009, vol. 16, issue 3, pages 251-256.

<sup>6</sup> 2010-10-19, Civil Action No. 04-2425, GEOD CORPORATION, et al., Plaintiffs v. NEW JERSEY TRANSIT CORPORATION, et al., Defendants.

## SECTION 1: INTRODUCTION

Minnesota Department of Transportation (MnDOT) is a recipient of federal transportation dollars awarded through the U.S. Department of Transportation's Federal Transit Administration (FTA). As such, MnDOT is required to establish a three-year goal and submit it to the FTA for review (Final Rule, 2014) This goal must be in compliance with the federal regulations governing the *Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assistance Programs* (hereafter referred to as "USDOT regulations"). The USDOT regulations instruct state and local grant recipients to follow a two-step process to establish their annual DBE goal [49 C.F.R. §26.45].

Step 1: Determine the base figure for the relative availability of DBEs in the specific industries and geographical market from which DBE and non-DBE contractors are drawn.

Step 2: Adjust the base figure in light of other evidence regarding the market area.

This two-step process is designed to satisfy several important objectives [49 C.F.R. §26.1]. According to USDOT regulations, DBE programs are designed to:

- (a) Ensure *non-discrimination in the award* and administration of DOT-assisted contracts in the Department's highway, transit, and airport financial assistance programs.
- (b) Create a *level playing field* on which DBEs can compete fairly for DOT-assisted contracts.
- (c) Ensure that the Department's DBE program is *narrowly tailored* in accordance with applicable law.
- (d) Ensure that only firms that fully meet this part's *eligibility standards* are permitted to participate as DBEs.
- (e) Help *remove barriers* to the participation of DBEs in DOT-assisted contracts.
- (f) Assist the development of firms that can *compete successfully in the marketplace* outside the DBE program.
- (g) Provide appropriate *flexibility to recipients* of federal financial assistance in establishing and providing opportunities for DBEs (emphasis added).

The MnDOT DBE program and goal-setting process is designed to meet these objectives. On behalf of MnDOT, the University of Minnesota research team completed the required

two-step process outlined in the USDOT regulations. This report details the methodology used to provide MnDOT with the information it needs to make its decision about the setting of the DBE goals for 2019-2021.

## **SECTION 2: DATA**

Staff at the Office of Civil Rights, Minnesota Department of Transportation, provided the research team with electronic copies of all known prime contract and subcontract files for the years 2015 to 2017. Obvious data entry errors, improbable measures, possible duplicates and related questionable items were flagged and forwarded to MnDOT staff for clarification or correction.

Contract files were supplemented with data obtained from D&B Hoover. Other data used included: Minnesota UCP Directory, MnDOT Vendors List, and the U.S. Census Zip code Business Patterns (ZBP) data set for 2016

## **SECTION 3: METHODOLOGY TO ESTABLISH OVERALL GOAL**

The USDOT suggests rather than prescribes how the base figure of relative availability of DBEs is to be calculated [49 C.F.R. § 26.45(c)]. The base figure for the MnDOT goal was calculated using several variations of the availability methodology proposed in the USDOT regulations. The methodologies performed and results produced are summarized here.

### **3.1 Defining the Geographical Marketplace**

In order for the MnDOT FTA DBE goal to satisfy the requirements set forth in the USDOT regulations as well as comply with the Supreme Court’s narrowly-tailored standard, the DBE goal must be based on a narrowly-defined geographic market.

The Wilkins Center analyzed contracts awarded between October 1, 2014 and September 30, 2017. Our analysis of contracts confirmed that the majority of contracts (80.33 percent for prime contracts) and contract dollars (90.44 percent for prime contracts) were awarded to Minnesota-based firms. A small portion of contract dollars was awarded to firms located in Iowa (5.74%) and California (3.82%).

***Table 5. Prime Contracts by State***

	Contracts	Percent	Contract Amount	Percent
California	3	4.92%	\$748,631.23	3.82%
Minnesota	49	80.33%	\$17,736,994.20	90.44%
Iowa	9	14.75%	\$1,126,348.00	5.74%
Total	61	100.0%	\$19,611,973.44	100.0%

Source: MnDOT FTA contracts: Oct. 1, 2014 - Sep. 30, 2017

In order to define the geographic market in such a manner that the vast majority of contract dollars awarded would be incorporated in the definition, the research team

considered two broad methods: a) political jurisdictional method (PJM), based on the counties where contracts were awarded; and b) virtual jurisdictional method (VJM), based on the zip code location of contracts and/or contractors in the client’s database. All methods yield different counts or estimates of the numbers of firms within industry codes, and accordingly will yield alternative measures of availability. For this report, the following alternative markets were used.

As shown in Table 6 below, the first method, PJM-1, represents the State of Minnesota. The second method, PJM-2, defines those counties where there are enough contracts to represent the Minnesota counties where the total contract amount exceeds 75 percent and the marginal contribution of each county to the overall total contract amount is at least 1 percent. The other measure, VJM-1, is similar to PJM-2, but focuses on zip codes.

**Table 6. Geographic Market Areas (GMAs)**

GMA	Definition
<b>Political Jurisdiction Method (PJM)</b>	
PJM-1	All Minnesota counties
PJM-2	Ranked Counties in USA where the total contract dollars for the sum of the counties exceeds 75% and the marginal contribution to the overall total is at least 1%
<b>Virtual Jurisdiction Method (VJM)</b>	
VJM-1	Ranked zip codes anywhere in the USA where the total contract dollars awarded for the sum of the zip codes exceeds 75% and the marginal contribution to the overall total is at least 0.25%

Source: FTA contracts between Oct. 1, 2014 and Sept. 30, 2017

### 3.2 Utilization Analysis

As shown in Table 2 above, the utilization analysis shows that 100 percent of prime contract dollars were awarded to non- DBE prime contractors while 0.55 percent of contract dollars were awarded to DBE subcontractors. The vast majority of prime contract dollars were awarded to Minnesota firms (90.44%). Table 7 shows that 70.36 percent of prime contracts were awarded to public sector.

**Table 7. Prime Contracts by Type of Entity**

	Contracts	Percent	Contract Amount	Percent
Rural Transit Assistance Program (RTAP) Trainer	6	9.84%	\$17,994.00	0.09%
Nonprofit	11	18.03%	\$1,554,300.00	7.93%
Private Company	21	34.43%	\$4,241,379.23	21.63%
Public Sector	23	37.70%	\$13,798,300.20	70.36%
Total	61	100.0%	\$19,611,973.44	100.0%

Source: MnDOT FTA contracts: Oct. 1, 2014 - Sep. 30, 2017

### **3.3 Distribution of Estimated Expenditures by Industry Classification for Year 2018-2021**

According to the Department of Transportation regulations, the availability rate should be weighted by the “amount of money to be spent” in each industry. The research team requested a copy of MnDOT’s estimated expenditures for the next three years, broken down by NAICS code. Projected expenditures for the next three years included in the State Transportation Improvement Program (STIP) 2018-2021 data files were provided. Projected expenditures were categorized by type of work. However, in order to calculate the weights for the availability analysis, projected expenditures must be categorized by NAICS code. In collaboration with construction engineers in MnDOT, NAICS codes have been assigned to each of the relevant projects listed in the STIP data files.

Due to the important of the expenditure projection in calculation of the weights, NAICS codes from the past contract file is assigned to each work type based on the description of the work type and the NAICS definition. There were 10 work types with MnDOT’s expenditure projection in the STIP report, with 4 distinct 6-digit NAICS; in the FTA contract file, there are 29 available distinct NAICS codes where there were only two distinct NAICS code in common between the two files, which makes it hard to use the conventional method of calculating weights. As an alternative, the research team used NAICS codes from both STIP projection data and FTA contract file and calculated the weights based on summed dollar amount of past- and projected-expenditures.

- Step 1: Obtained the projected expenditures for the next three years (STIP data)
- Step 2: Identified six-digit NAICS codes for each projected contract based on its type of work
- Step 3: Combined expenditure amount between STIP data and FTA contract data by the six-digit NAICS.

The weights by NAICS code are shown in Table A-1 in Appendix A.

### 3.4 Calculating the Weighted Availability Measure

The formula below, which was prescribed in the Final Rule (1999), was used to perform the availability analysis. This formula computes the weighted share of DBE firms within the geographic market area. The weights are the share of dollars DBEs can expect to be awarded within each industrial NAICS code.

$$\begin{aligned} \text{Availability Rate} &= \left[ \left( \frac{\text{Number of DBEs in NAICS}_1}{\text{Number of Total Firms in NAICS}_1} \right) \times \text{weight}_1 \right. \\ &\quad \left. + \left( \frac{\text{Number of DBEs in NAICS}_2}{\text{Number of Total Firms in NAICS}_2} \right) \times \text{weight}_2 + \dots \right] \end{aligned}$$

To calculate the availability rates, the number of ready, willing, and able minority and women-owned firms in the defined geographic market area were compared to the total number of ready, willing, and able firms in the same geographic market area. Although the U.S. Department of Transportation does not dictate a single method for calculating the DBE availability rate or the source of the base goal, it does suggest several methods for calculating the base goal. Moreover, the federal rule mandates that all available data be used. In order to produce the best estimate of the available number of women and minority-owned firms in MnDOT's geographic market areas, the research team used a combination of relevant methods suggested in the regulations.

The U.S. Department of Transportation recommends that grant recipients use 1) a DBE directory and census data, 2) a bidders list, 3) data from a disparity study, 4) the goal of another DOT recipient, or 5) alternative methods that are “rationally related to the relative availability of DBEs in your market” [49 CFR §26.45(c)]. The availability rates from the last statewide disparity study were deemed too old<sup>7</sup>. The availability rates from the most recent local disparity studies (e.g., Minneapolis) were deemed inapplicable. Accordingly, the research team adopted two different measures of availability, each of which meets the standards articulated in the federal regulations. These two methods use alternative data sources, each with different advantages and disadvantages.

- 1) MnDOT Certified DBE Directory
- 2) Dun & Bradstreet database

#### 3.4.1 Certified DBE List Method

Step 1: The certified DBE directory includes the firms that are certified as DBEs by MnDOT. The research team obtained the list of DBEs. The directory contains detailed information on each DBE firm including NAICS codes.

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<sup>7</sup> The availability rate from 2017 Minnesota statewide disparity study was under the public comment period when the research team was preparing the databases for the analysis. Therefore, the research team did not adopt the availability rate from the 2017 Minnesota statewide disparity study.

- Step 2: Obtained the 2016 ZIP Code Business Patterns (ZBP) and County Business Patterns (CBP) from the Census website (most recent year available to prepare the availability ratios). This dataset provides, for each NAICS code, the total number of firms headquartered in a given zip code. This list is used for the denominator in the availability calculation, while the merged DBE list is used to determine the numerator.<sup>8</sup>
- Step 3: Narrowly defined the geographic markets as PJM-1, PJM-2, and VJM-1.
- Step 4: Derived, in each geographic market and for each relevant NAICS code, the total number of DBE firms (using the DBE list) and the total number of firms (using the ZBP or CBP list).
- Step 5: Calculated the share, or the un-weighted availability, of DBEs, which is the ratio of DBEs to total firms in a given relevant industry (NAICS code) and narrowly tailored geographic market.
- Step 6: In some cases the NAICS code for future expenditures produces zero counts of total available firms. The resulting DBE share is not calculable and setting the value to zero provides the erroneous conclusion that there are no available DBEs. Therefore, these cases were treated as missing values, and the values were replaced by the un-weighted mean of the values with positive denominators.
- Step 7: Calculated, for each geographical area, the weighted availability rate of DBEs according to the prescribed availability formula.
- Step 8: Averaged availability results with and without imputing means in order to obtain the final availability rate for each geographic market area.

Please see Tables A-2 in Appendix A for the availability rates for three different geographic market areas.

### 3.4.2 Dun & Bradstreet Method

- Step 1: The research team obtained access to Hoover's database, a subsidiary of Dun & Bradstreet (D&B), to compute the number of firms in each relevant NAICS code within a specific geographic market area. This research product covers more than 23 million U.S corporations and other entities (i.e. government agencies, partnerships, non-profits, and educational

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<sup>8</sup> The Census Bureau explains: An establishment is a single physical location at which business is conducted or services or industrial operations are performed. An establishment is not necessarily equivalent to a company or enterprise, which may consist of one or more establishments. A single-unit company owns or operates only one establishment. A multi-unit company owns or operates two or more establishments. (<https://www.census.gov/programs-surveys/cbp/technical-documentation/methodology.html>). As a result, the denominator includes many establishments that may not normally contract with MnDOT.

institutions). For the state of Minnesota, information included information on headquarters, branches, and single locations<sup>9</sup>.

- Step 2: Queried the Hoover’s database to obtain the list of all the firms, minority-owned firms, and women-owned firms from the relevant NAICS codes in the relevant market areas<sup>10</sup>. These lists have NAICS codes for each listed firm, along with the firm’s zip code, minority ownership status, and women ownership status. This dataset was used to calculate both the numerator and denominator of the availability rate.
- Step 3: Narrowly defined the geographic market as PJM-1, PJM-2, and VJM-1.
- Step 4: Calculated the numerator of the D&B availability measure by summing the number of minority-owned business or women-owned enterprises in the geographic market area for each NAICS code.
- Step 5: Calculated the denominator of the D&B availability measure by summing the number of total firms in in the geographic market area for each NAICS code.
- Step 6: Calculated the share, or the un-weighted availability, of women-owned business enterprises (WBEs) or minority-owned business enterprises (MBEs), which is the ratio of WBE or MBE firms to total firms in a given relevant industry and narrowly tailored geographic market.
- Step 7: In some cases the NAICS code for future expenditures produces zero counts of total available firms. The resulting women-owned enterprises or minority-owned business share is not calculable and setting the value to zero provides the erroneous conclusion that there are no available DBEs. Therefore, these cases were treated as missing values, and the values were replaced by the un-weighted mean of the values with positive denominators.
- Step 8: Calculated, for each geographic market area, the weighted availability rate of women-owned enterprises or minority-owned business according to the prescribed availability formula.
- Step 9: Averaged availability results with and without imputing means in order to obtain the final availability rate for each geographic market area.

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<sup>9</sup> “Headquarters” indicates that the company has subsidiaries or branches; “branch” indicates a company location other than the headquarters and single Location indicates that the company does not have any subsidiaries or branches.

<sup>10</sup> Unlike the other methods, the D&B method uses “self-reported” minority/gender designations. Thus, the D&B method can include firms that are not MnDOT Certified DBEs. On the other hand, not every certified DBE is included in this database because a requirement of inclusion is the existence of a DUNS number. According to Hoover’s customer service, D&B contacts firms directly to verify their gender or minority status and checks with third party sources and proprietary databases for further verification.

Please see Tables A-3 in Appendix A for the availability rates for three different geographic market areas.

### 3.4.5 The Base Goal

The base goal is the weighted average across the two availability methods: Certified DBE List method and Dun & Bradstreet method. Depending on the method used to calculate availability, each defined market area captures a different share of available contract dollars. As a result, each method also yields a different DBE availability goal for each market. In order to derive a single base goal for MnDOT that is based on all the goals calculated for each geographical market, it is necessary to weight each geographical market-specific goal according to the percentage of contract dollars awarded in that area.

The two different methods use data that report multiple industries for many of the firms in their databases. We count the firms at the NAICS level. Table 8 presents the details of the calculation of the weighted availability rate at the NAICS code level. This base goal is used in subsequent analysis.

**Table 8. Computing Base Goal**

Method	PJM-1	PJM-2	VJM-1	Unweighted Average	Weighted Average	Weighted Base Goal
Certified DBE List Method	1.12%	1.95%	2.43%	6.49%	1.85%	6.54%
D&B Method	7.89%	9.31%	16.24%		11.24%	
Distribution of Award Amount to compute weights for base goal						
Percent Distribution of Award Amount	91.88%	93.67%	97.84%			
	(a)	(b)	(c)			
Proportional Weight	32.42%	33.05%	34.52%			
	(d)	(e)	(f)			

$$(d) = (a)/[(a)+(b)+(c)]$$

$$(e) = (b)/[(a)+(b)+(c)]$$

$$(f) = (c)/[(a)+(b)+(c)]$$

Note 1: Weighted average is the sum of the availability rates of each GMA multiplied by its proportional weight (d, e, and f), respectively.

Note 2: Weighted base goal is the average of weighted averages of all two methods.

### **3.5 Adjustment to the Base Goal**

According to the USDOT regulations, recipients of federal funds are required to adjust their base goals in light of other evidence regarding the market area [49 C.F.R. §26.45(d)]. One valid reason for adjusting the goal would be if the analysis showed discrimination, either in the overall market place or in the specific agency or governmental unit undertaking the procurement and contracting process. The regressions and computations are based on FTA contract awards from 2012-2017 to DBEs and non-DBEs.

The research team used dummy variable methods to measure the degree of discrimination. The dummy variable method estimates coefficient on the DBE dummy variable to control for the relevant observable factors that influence award amount. The purpose of this method is to include the impact FTA funding has on contracts awarded to DBEs.

#### 3.5.1 Data Used for Adjustment to the Base Goal

The original FTA contract data from MnDOT 2015- 2017 contains 108 observations with 2 DBEs, which makes it difficult to run a statistical analysis. In order to overcome this limitation, research team merged the FTA 2012-2014 contract data with FTA 2015-2017 contract data. One observation have dollar values equal to zero for the dependent variable, which is the contract award amount. This observation is dropped from the sample because they are undefined when log-transformed for the final analysis.

The description of the variables used in the analysis is shown in Table B-1 in Appendix B. The summary statistics of the dataset used in the analysis is shown in Tables B-2

#### 3.5.2 Dummy Variable Method

The research team developed three statistical models in order to conduct thorough analysis of the FTA awarded contract data, each model encompasses both prime contracts and subprime contracts. The dependent variable is the logarithm of the contract amount. In moving from Model 1 through Model 3, the number of variables being controlled for increases. Due to the due to the absence of DBEs awarded contracts in the past six years, the coefficient of the DBE status is not significant. However, this justifies the reasons to make the base goal adjustment. The results are shown in Tables B-3 in Appendix B.

#### 3.5.3 Adjustment

The base goal is adjusted using the exponent of coefficient on DBE status minus 1. The adjustment is 39.52% as shown in Table 9.

**Table 9. Discrimination Gap for Adjustment**

Dependent Variable	Percentage Difference
Natural Log of Awarded Contract Amount	39.52%

### 3.6 Race Neutral Analysis

In compliance with federal regulations, state and local authorities must identify the maximum feasible portion of the DBE goal that can be achieved through race-neutral measures and the percentage of the goal that can only be achieved through race-conscious measures [49 C.F.R. §26.51(a)]. Myers and Ha have pioneered the use of a detailed econometric procedure that maximizes the race-neutral component of the DBE goals. This method has established a rigorous standard for maximizing the race neutral portion of the overall DBE goal. The logic of the analysis is that some share of DBE dollars awarded would have gone to DBEs without goals. The following method is utilized for the race neutral analysis: To compute the ratio of predicted award dollar amount without goals over predicted award dollar amount with and without goals using the DBE subsample in contract file. Table 10 shows how the race-neutral portion of the goal was calculated. The race neutral analysis based on the above-mentioned method indicates Race-Neutral Percent is 73.36%.

**Table 10. Race Neutral Analysis**

	Average of log contract	Average of exponential of predicted value of log amount	Total Amount	Race neutral percent
Predicted DBE contract	9.83	\$18,595.76	\$92,978.81	
Estimated DBE contract setting 0% goal	9.52	\$13,641.97	\$68,209.87	
				73.36%

Source: Author's computation

## SECTION 4: THE MnDOT PROPOSED DBE GOALS

In summary, the Roy Wilkins Center presented the following recommendation, as shown in Table 11, to the Office of Civil Rights, MnDOT for the proposed overall DBE Goal and race neutral participation.

**Table 11. Proposed MnDOT FTA DBE Goals FY2019-2021**

<b>Base Goal</b>	<b>6.54%</b>
Discrimination Gap for Adjustment	39.52%
<b>Adjusted Goal</b>	<b>9.12%</b>
<i>Race-Neutral Portion</i>	73.36%
<b>Race-Neutral Goal</b>	<b>6.69%</b>
<i>Race-Conscious Portion</i>	26.64%
<b>Race-Conscious Goal</b>	<b>2.43%</b>

Source: Author's calculation using the FTA data files.

## SECTION 5: APPENDICES

### APPENDIX A: AVAILABILITY ANALYSIS

**Table A-1. Weights used for the Availability Analysis**

NAICS	Description	Weight
236220	Commercial and Institutional Building Construction	0.01114
323111	Commercial Printing (except Screen and Books)	0.00001
332510	Hardware Manufacturing	0.00003
339950	Sign Manufacturing	0.00001
423490	Other Professional Equipment and Supplies Merchant Wholesalers	0.00001
442210	Floor Covering Stores	0.00001
485111	Mixed Mode Transit Systems	0.12060
485113	Bus and Other Motor Vehicle Transit Systems	0.12256
485210	Interurban and Rural Bus Transportation	0.12146
485410	School and Employee Bus Transportation	0.12555
485999	Other Transit and Ground Passenger Transportation	0.12088
488210	Support Activities for Rail Transportation	0.12056
488490	Other Support Activities for Road Transportation	0.12085
488510	Freight Transportation Arrangement	0.12059
512110	Motion Picture and Video Production	0.00009
515120	Television Broadcasting	0.00005
541213	Tax Preparation Services	0.00003
541310	Architectural Services	0.00007
541330	Engineering Services	0.00085
541511	Custom Computer Programming Services	0.00005
541512	Computer Systems Design Services	0.00000
541611	Administrative Management and General Management Consulting Services	0.00036
541614	Process, Physical Distribution, and Logistics Consulting Services	0.00133
541690	Other Scientific and Technical Consulting Services	0.00019
541810	Advertising Agencies	0.00002
541910	Marketing Research and Public Opinion Polling	0.00009
541990	All Other Professional, Scientific, and Technical Services	0.00392
561990	All Other Support Services	0.00005
624190	Other Individual and Family Services	0.00351
811111	General Automotive Repair	0.00059
813319	Other Social Advocacy Organizations	0.00456

**Table A-2. Availability Analysis - DBE Method**

PJM-1					
NAICS	Weight	Number of DBE firms	Total Number of Firms	Unweighted Rate	Weighted Rate
236220	0.01114	12	706	0.0170	0.0002
323111	0.00001	0	486	0.0000	0.0000
332510	0.00003	0	16	0.0000	0.0000
339950	0.00001	2	124	0.0161	0.0000
423490	0.00001	0	36	0.0000	0.0000
442210	0.00001	0	233	0.0000	0.0000
485111	0.12060				
485113	0.12256	0	18	0.0000	0.0000
485210	0.12146	0	9	0.0000	0.0000
485410	0.12555	0	223	0.0000	0.0000
485999	0.12088	0	31	0.0000	0.0000
488210	0.12056	0	23	0.0000	0.0000
488490	0.12085	4	48	0.0833	0.0101
488510	0.12059	2	311	0.0064	0.0008
512110	0.00009	2	192	0.0104	0.0000
515120	0.00005	0	32	0.0000	0.0000
541213	0.00003	0	525	0.0000	0.0000
541310	0.00007	12	358	0.0335	0.0000
541330	0.00085	19	916	0.0207	0.0000
541511	0.00005	7	1,659	0.0042	0.0000
541512	0.00000	9	1,033	0.0087	0.0000
541611	0.00036	20	1,390	0.0144	0.0000
541614	0.00133	6	138	0.0435	0.0001
541690	0.00019	9	408	0.0221	0.0000
541810	0.00002	1	306	0.0033	0.0000
541910	0.00009	4	127	0.0315	0.0000
541990	0.00392	1	676	0.0015	0.0000
561990	0.00005	1	336	0.0030	0.0000
624190	0.00351	0	862	0.0000	0.0000
811111	0.00059	0	1,670	0.0000	0.0000
813319	0.00456	1	216	0.0046	0.0000
Total	1.00	112	13,108	0.85%	1.12%

PJM-2

NAICS	Weight	Number of DBE firms	Total Number of Firms	Unweighted Rate	Weighted Rate
236220	0.01114	6	211	0.0284	0.0003
323111	0.00001	0	164	0.0000	0.0000
332510	0.00003	0	3	0.0000	0.0000
339950	0.00001	1	43	0.0233	0.0000
423490	0.00001	0	12	0.0000	0.0000
442210	0.00001	0	72	0.0000	0.0000
485111	0.12060				
485113	0.12256	0	7	0.0000	0.0000
485210	0.12146	0	2	0.0000	0.0000
485410	0.12555	0	56	0.0000	0.0000
485999	0.12088	0	11	0.0000	0.0000
488210	0.12056	0	5	0.0000	0.0000
488490	0.12085	1	7	0.1429	0.0173
488510	0.12059	1	85	0.0118	0.0014
512110	0.00009	1	32	0.0313	0.0000
515120	0.00005	0	8	0.0000	0.0000
541213	0.00003	0	130	0.0000	0.0000
541310	0.00007	8	90	0.0889	0.0000
541330	0.00085	15	301	0.0498	0.0000
541511	0.00005	6	385	0.0156	0.0000
541512	0.00000	6	243	0.0247	0.0000
541611	0.00036	14	321	0.0436	0.0000
541614	0.00133	5	37	0.1351	0.0002
541690	0.00019	9	99	0.0909	0.0000
541810	0.00002	1	68	0.0147	0.0000
541910	0.00009	3	21	0.1429	0.0000
541990	0.00392	1	126	0.0079	0.0000
561990	0.00005	1	84	0.0119	0.0000
624190	0.00351	0	180	0.0000	0.0000
811111	0.00059	0	438	0.0000	0.0000
813319	0.00456	1	21	0.0476	0.0002
Total	1.00	80	3,262	0.45%	1.95%

VJM-1

NAICS	Weight	Number of DBE firms	Total Number of Firms	Unweighted Rate	Weighted Rate
236220	0.01114	1	141	0.0071	0.0001
323111	0.00001	0	94	0.0000	0.0000
332510	0.00003	0	3	0.0000	0.0000
339950	0.00001	1	20	0.0500	0.0000
423490	0.00001	0	7	0.0000	0.0000
442210	0.00001	0	45	0.0000	0.0000
485111	0.12060	0	0	0.0000	0.0000
485113	0.12256	0	4	0.0000	0.0000
485210	0.12146	0	1	0.0000	0.0000
485410	0.12555	0	20	0.0000	0.0000
485999	0.12088	0	7	0.0000	0.0000
488210	0.12056	0	2	0.0000	0.0000
488490	0.12085	1	5	0.2000	0.0242
488510	0.12059	0	80	0.0000	0.0000
512110	0.00009	0	10	0.0000	0.0000
515120	0.00005	0	4	0.0000	0.0000
541213	0.00003	0	77	0.0000	0.0000
541310	0.00007	0	34	0.0000	0.0000
541330	0.00085	3	125	0.0240	0.0000
541511	0.00005	2	172	0.0116	0.0000
541512	0.00000	0	119	0.0000	0.0000
541611	0.00036	1	130	0.0077	0.0000
541614	0.00133	1	23	0.0435	0.0001
541690	0.00019	0	57	0.0000	0.0000
541810	0.00002	0	29	0.0000	0.0000
541910	0.00009	0	10	0.0000	0.0000
541990	0.00392	0	71	0.0000	0.0000
561990	0.00005	0	49	0.0000	0.0000
624190	0.00351	0	142	0.0000	0.0000
811111	0.00059	0	233	0.0000	0.0000
813319	0.00456	0	13	0.0000	0.0000
Total	1.00	10	1727	0.58%	2.43%

**Table A-3. Availability Analysis - D&B Method**

PJM-1

NAICS	Weight	Number of MBE/WBE firms	Total Number of Firms	Unweighted Rate	Weighted Rate
236220	0.01114	121	1,145	0.1057	0.0012
323111	0.00001	127	1,094	0.1161	0.0000
332510	0.00003	0	37	0.0000	0.0000
339950	0.00001	61	464	0.1315	0.0000
423490	0.00001	16	87	0.1839	0.0000
442210	0.00001	44	1,177	0.0374	0.0000
485111	0.12060	2	135	0.0148	0.0018
485113	0.12256	3	30	0.1000	0.0123
485210	0.12146	4	25	0.1600	0.0194
485410	0.12555	5	132	0.0379	0.0048
485999	0.12088	11	117	0.0940	0.0114
488210	0.12056	13	265	0.0491	0.0059
488490	0.12085	12	219	0.0548	0.0066
488510	0.12059	71	572	0.1241	0.0150
512110	0.00009	39	468	0.0833	0.0000
515120	0.00005	6	72	0.0833	0.0000
541213	0.00003				
541310	0.00007	64	694	0.0922	0.0000
541330	0.00085	121	1,582	0.0765	0.0001
541511	0.00005	159	1,722	0.0923	0.0000
541512	0.00000	224	1,660	0.1349	0.0000
541611	0.00036	431	3,841	0.1122	0.0000
541614	0.00133	6	52	0.1154	0.0002
541690	0.00019	99	808	0.1225	0.0000
541810	0.00002	70	514	0.1362	0.0000
541910	0.00009	51	320	0.1594	0.0000
541990	0.00392	338	5,280	0.0640	0.0003
561990	0.00005	581	26,238	0.0221	0.0000
624190	0.00351				
811111	0.00059	81	2,973	0.0272	0.0000
813319	0.00456				
Total	1.00	2,760	51,723	5.34%	7.89%

PJM-2

NAICS	Weight	Number of MBE/WBE firms	Total Number of Firms	Unweighted Rate	Weighted Rate
236220	0.01114	10	124	0.0806	0.0009
323111	0.00001	18	119	0.1513	0.0000
332510	0.00003	0	6	0.0000	0.0000
339950	0.00001	5	54	0.0926	0.0000
423490	0.00001	2	15	0.1333	0.0000
442210	0.00001	7	134	0.0522	0.0000
485111	0.12060	0	14	0.0000	0.0000
485113	0.12256	0	6	0.0000	0.0000
485210	0.12146	2	5	0.4000	0.0486
485410	0.12555	1	21	0.0476	0.0060
485999	0.12088	2	20	0.1000	0.0121
488210	0.12056	2	29	0.0690	0.0083
488490	0.12085	0	28	0.0000	0.0000
488510	0.12059	9	66	0.1364	0.0164
512110	0.00009	6	65	0.0923	0.0000
515120	0.00005	2	14	0.1429	0.0000
541213	0.00003	2	18	0.1111	0.0000
541310	0.00007	19	108	0.1759	0.0000
541330	0.00085	15	182	0.0824	0.0001
541511	0.00005	19	229	0.0830	0.0000
541512	0.00000	13	130	0.1000	0.0000
541611	0.00036	30	319	0.0940	0.0000
541614	0.00133	1	5	0.2000	0.0003
541690	0.00019	15	97	0.1546	0.0000
541810	0.00002	8	65	0.1231	0.0000
541910	0.00009	3	19	0.1579	0.0000
541990	0.00392	41	565	0.0726	0.0003
561990	0.00005	67	2,933	0.0228	0.0000
624190	0.00351	0	71	0.0000	0.0000
811111	0.00059	13	428	0.0304	0.0000
813319	0.00456	0	16	0.0000	0.0000
Total	1.00	312	5,905	5.28%	9.31%

VJM-1

NAICS	Weight	Number of MBE/WBE firms	Total Number of Firms	Unweighted Rate	Weighted Rate
236220	0.01114	12	101	0.1188	0.0013
323111	0.00001	16	106	0.1509	0.0000
332510	0.00003	0	1	0.0000	0.0000
339950	0.00001	7	39	0.1795	0.0000
423490	0.00001	0	11	0.0000	0.0000
442210	0.00001	2	96	0.0208	0.0000
485111	0.12060	0	12	0.0000	0.0000
485113	0.12256	1	4	0.2500	0.0306
485210	0.12146	3	4	0.7500	0.0911
485410	0.12555	0	7	0.0000	0.0000
485999	0.12088	3	17	0.1765	0.0213
488210	0.12056	1	27	0.0370	0.0045
488490	0.12085	0	15	0.0000	0.0000
488510	0.12059	10	93	0.1075	0.0130
512110	0.00009	0	27	0.0000	0.0000
515120	0.00005	0	4	0.0000	0.0000
541213	0.00003	6	40	0.1500	0.0000
541310	0.00007	3	38	0.0789	0.0000
541330	0.00085	10	111	0.0901	0.0001
541511	0.00005	6	81	0.0741	0.0000
541512	0.00000	15	107	0.1402	0.0000
541611	0.00036	27	218	0.1239	0.0000
541614	0.00133	1	3	0.3333	0.0004
541690	0.00019	7	45	0.1556	0.0000
541810	0.00002	1	27	0.0370	0.0000
541910	0.00009	0	20	0.0000	0.0000
541990	0.00392	12	288	0.0417	0.0000
561990	0.00005	46	1,299	0.0354	0.0000
624190	0.00351	0	56	0.0000	0.0000
811111	0.00059				
813319	0.00456				
Total	1.00	189	2,897	6.52%	16.24%

## APPENDIX B: DISCRIMINATION ANALYSIS

**Table B-1. Description of Variables in the Regression Analysis**

Variable	Description
DBE	Dummy variable to indicate DBE status
Prime	Dummy variable to indicate a prime contract
FFY2015	Dummy variable for federal fiscal year 2015
FFY2016	Dummy variable for federal fiscal year 2016
FFY2017	Dummy variable for federal fiscal year 2017
Minnesota	Dummy variable for location in Minnesota
Construction	Dummy: NAICS defined industry for construction

Source: MnDOT FTA contracts: Oct. 1, 2011 - Sep. 30, 2017

**Table B-2. Summary Statistics for both prime and subcontracts**

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min.</b>	<b>Max.</b>
In award amount	10.11	2.16	5.89	15.68
DBE	0.03	0.17	0	1
Prime	0.69	0.46	0	1
FFY2015	0.30	0.46	0	1
FFY2016	0.23	0.42	0	1
FFY2017	0.34	0.48	0	1
Minnesota	0.10	0.30	0	1
Construction	0.01	0.08	0	1
N	160			

Source: MnDOT FTA contracts: Oct. 1, 2011 - Sep. 30, 2017

**Table B-3. Discrimination Analysis Dummy Variable Method for both Prime and Subcontracts: By Natural Log (ln) Award Amount**

	Both Primes and Sub data		
	(1)	(2)	(3)
	ln_AA	ln_AA	ln_AA
DBE	-0.5789	-0.6964	-0.5029
	(0.9835)	(1.0158)	(1.0776)
Prime		-0.0525	0.0366
		(0.4134)	(0.4280)
Minnesota		-0.7740*	-0.5444
		(0.4007)	(0.8874)
FFY2015			0.4933
			(0.9198)
FFY2016			-0.0441
			(0.9210)
FFY2017			0.6155
			(1.0117)
Construction			5.0832**
			(2.1602)
Constant	10.1303***	10.4026***	10.0733***
	(0.1739)	(0.3238)	(0.9635)
N	160	160	160
Prob.> F	0.557	0.180	0.0697
adj. $R^2$	0.00219	0.0307	0.0813

Standard errors in parentheses

\* p<0.1, \*\* p<0.05, \*\*\* p<0.01