

**INFORMATION COLLECTION
SUPPORTING JUSTIFICATION
FEDERAL RAIL ADMINISTRATION DISPARITY STUDY
FRA Form Numbers FRA F 6180.171; FRA F 6180.172;
FRA F 6180.173; FRA F 6180.174**

Part B: Collections of Information Employing Statistical Methods

- Describe (including a numerical estimate) the potential respondent universe and any sampling or other respondent selection methods to be used. Data on the number of entities (e.g., establishments, state and local government units, households, or person) in the corresponding sample are to be provided in tabular form for the universe as a whole and for each of the strata in the proposed sample. Indicate expected response rates for the collection as a whole. If the collection had been conducted previously, include the actual response rate achieved during the last collection.**

The conduct of the study requires three surveys and a series of webinar focus groups. In Survey #1, the study team will survey the entire universe of respondents. In Surveys #2 and #3, the team will employ random sampling by industry/DBE status strata. The team will also conduct a follow-up non-response bias survey using a random sample by DBE status. The following table provides estimates of the potential respondent universe, the expected number of responses, and the expected response rate for each of the surveys.

Form No.	Respondent Universe	Sampling or Other Respondent Selection Methods	Total Responses	Expected Response Rate
Survey #1 Grantee and Contractor Collection Form	1,250 Grantees, Sub-grantees, Prime-Contractors, and Sub-Contractors	No sampling, the universe of entities will be contacted	1,000 Surveys	80.0 percent
Survey #2 Experiences with Discrimination	35,000 DBE and Non-DBE Firms	Team will select respondent universe based on pattern of FRA purchases by industry/geographic region. Team will employ random sampling by industry/DBE status strata. To test for non-response bias, team will select a random sample of 7,500 firms stratified by DBE Status for a truncated phone survey.	5,500 surveys	15.7 percent
Focus Groups on Experiences with Discrimination	20,000 DBE and Non-DBE Firms	Team will select respondent universe based on pattern of FRA purchases by industry/geographic region. Team will employ random sampling by industry/DBE status strata.	250 participants	2.5 percent
Survey #3 DBE Status Verification	35,000 DBE and Non-DBE Firms	Team will select respondent universe based on pattern of FRA purchases by industry/geographic region. Team will employ random	4,250 surveys	30.4 percent

		sampling by industry/DBE status strata.		
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There are two key sources of business information to be used in this study. The first is the FRA Grantee files for grants awarded from 2009 to 2017. Firms that received contracts from FRA Grantees make up this population. The second firm list is all firms in selected industries and regions where Grantee contracting occurs. This firm list is from D&B/Hovers which maintains business profiles for over 120 million firms nationwide. The selected firms are stratified by economic sector and region. The economic sector and region comes from processing the FRA Grantee contractor file being developed in Survey #1.

In Survey #1, the study will contact all the grant recipients and work with them to identify all of the prime contractors, consultants, and vendors with whom they spent grant funds and the amount of those funds. Next, the study will contact the sub-grantees, prime contractors, consultants and suppliers that the study identified, and work with them to identify all subcontractors, sub-consultants, and suppliers that they utilize and the amount of those contracts. This survey is necessary to develop estimates of the amount of FRA grants and contracts that flow to DBEs.

In Survey #2, the study will survey DBE and non-DBE firms in industries and geographical areas that serve the FRA grants. The survey will elicit data on firms' experiences with discrimination, as well as experiences in bidding with the grantees and their prime contractors and consultants. The study team will select the respondent universe based on the pattern of FRA purchases by industry/geographic region. The team will employ random sampling by industry/DBE status strata. In a second phase of this survey, which the study team designed to test for non-response bias, the team will select a random sample of 7,500 firms stratified by DBE status for a truncated phone survey. This approach ensures that the anecdotal findings will be representative of the DBE and non-DBE communities at large in the relevant markets.

In the Focus Groups, the study will also collect qualitative anecdotal information through in-depth webinar focus groups of DBE and non-DBE business owners, as well as procurement personnel at FRA and its grantees. To elicit enough participants, the study team will send invitations to 20,000 firms. The study team will select firms using random sampling by industry/DBE status strata. The focus group attendees will represent a small response rate and will not necessarily be statistically representative of the larger population. This is not an issue, however, as purpose of the focus groups is not to develop estimates of population-level statistics, but to drill down deeper into discrimination and its causes and solutions. This is because to be legally defensible, a race-based program must meet the judicial test of constitutional strict scrutiny. Strict scrutiny is the highest level of judicial review and consists of two elements:

- The government must establish its “compelling interest”¹ in remedying race discrimination by showing “a strong basis in evidence”² of the persistence of

1 Croson, 488 U.S. at 492.

2 Id. at 500 (citing Wygant v. Jackson Board of Education, 476 U.S. 267, 277 (1986)).

discrimination. Such evidence may consist of demonstrating that the entity is a ‘passive participant’ in a system of racial exclusion....”³

- Any remedies that the government adopts they must narrowly tailor to that discrimination; that is, “the means chosen to accomplish the government’s asserted purpose are specifically and narrowly framed to accomplish that purpose.”⁴

The government can meet the compelling interest prong through two types of proof:

- Statistical evidence of “identified discrimination in [the relevant] industry,”⁵ typically established by showing the underutilization of minority-owned firms relative to their availability in the jurisdiction’s market area known as disparity indexes or disparity ratios.⁶
- Anecdotal evidence of race-based barriers to the full and fair participation of minority owned firms in the market area and in seeking contract opportunities with the agency.⁷

The study design uses these focus groups to develop the second type of proof.

In Survey #3, the research will survey firms to verify their DBE status. The comparison of FRA’s use of DBEs versus their prevalence by industry and geography is crucial to developing the evidence the sound statistical evidence of discrimination the courts have required. Previous research has found that the classification of firms as or as not minority- or women-owned in Dun & Bradstreet/Hoover database or in the Master DBE Directory are incorrect. Starting from known business establishment lists (such as those from Dun & Bradstreet) the study will cross-reference numerous additional listings and directories of DBE firms in the relevant geographic and product markets in order to improve the classification of firms according to their status. Next, the team will take the additional step of validating putative assignments using telephone surveys. The study team will select the survey universe of firms based on the pattern of FRA purchases by industry and geographic region. The team will employ random sampling by industry/DBE status strata.

3 Id. at 492.

4 Sherbrooke, 345 F.3d at 971 (citing Grutter v. Bollinger, 539 U.S. 306, 333 (2003)).

5 Croson, 488 U.S. at 505.

6 See J. Wainwright and C. Holt, Guidelines for Conducting a Disparity and Availability Study for the Federal DBE Program, Transportation Research Board of the National Academies, NCHRP Report, Issue No. 644, 2010, pp. 5-6.

7 Concrete Works of Colorado, Inc. v. City and County of Denver, 36 F.3d 1513, 1520 (10th Cir. 1994) (“Concrete Works II”) (“Personal accounts of actual discrimination or the effects of discriminatory practices may, however, vividly complement empirical evidence. Moreover, anecdotal evidence of a municipality’s institutional practices that exacerbate discriminatory market conditions are often particularly probative. Therefore, the government may include anecdotal evidence in its evidentiary mosaic of past or present discrimination.”). See also Adarand VII, 228 F.3d at 1166 (“Both statistical and anecdotal evidence are appropriate in the strict scrutiny calculus, although anecdotal evidence by itself is not.”).

Response Rates

The study team developed the expected response rates for each of the surveys using response rates for three earlier disparity studies conducted by NERA Economic Consulting. These studies are similar to the current study except NERA conducted them for state and local governments for smaller geographic areas. NERA conducted these studies for Maryland,⁸ Massachusetts,⁹ and San Antonio.¹⁰ The following table provides the sample size, number of responses, and response rate for each survey for each study/jurisdiction.

Form No.	Maryland			San Antonio			Massachusetts			Total		
	Sample Size	Responses	Response Rate	Sample Size	Responses	Response Rate	Sample Size	Responses	Response Rate	Sample Size	Responses	Response Rate
Survey #1 Grantee and Contractor Collection Form												
Main Survey	1,452	1,352	93.1%	255	183	71.8%	684	596	87.1%	2,391	2,131	89.1%
Survey #2 Experiences with Discrimination												
Main Survey	18,362	1,706	9.3%	9,199	1,047	11.4%	14,422	1,263	8.8%	41,983	4,016	9.6%
Non-Response	11,000	2,261	20.6%	3,500	820	23.4%	5,750	1,253	21.8%	20,250	4,334	21.4%
Total	18,362	3,967	21.6%	9,199	1,867	20.3%	14,422	2,516	17.4%	41,983	8,350	19.9%
Survey #3 DBE Status Verification												
DBE Survey	18,697	5,435	29.1%	5,542	1,925	34.7%	5,669	2,148	37.9%	29,908	9,508	31.8%
Non-DBE Survey	41,428	12,857	31.0%	11,906	3,560	29.9%	23,796	9,156	38.5%	77,130	25,573	33.2%
Total	60,125	18,292	30.4%	17,448	5,485	31.4%	29,465	11,304	38.4%	107,038	35,081	32.8%

For Survey #1, which collects data from grantees and contractors, response rates from the three earlier efforts ranged from a high of 93.1 percent to a low of 71.8 percent. The overall response rate across the three surveys was 89.1 percent and the simple average of the response rate across the three surveys was 84.0 percent. The study team selected 80.0 percent as the expected response rate for this survey. While it is below the average response rate, it is conservative in that it recognizes the low response rate for the San Antonio study.

For Survey #2, which seeks to quantify experiences with discrimination, the study uses a two-part survey. In the first part, response rates in previous surveys ranged from a high of 11.4 percent to a low of 8.8 percent. The overall response rate across the three surveys was 9.6 percent and the simple average of the response rate across the three surveys was 9.8 percent. In the second phase, response rates in previous surveys ranged from a high of 23.4 percent to a low of 20.6 percent. The overall response rate across the three surveys was 21.4 percent and the simple average of the response rate across the three surveys was 21.9 percent. Since both parts draw from the same sample, the overall response rates when considering both parts of the survey were higher and ranged from a high of 21.6 percent to a low of 17.4 percent. The overall response rate across both parts of all three

8 NERA Economic Consulting, Disadvantaged Business Enterprise Disparity Study, Volume I, Prepared for the Maryland Department of Transportation, June 25, 2018.

9 NERA Economic Consulting, Business Disparities in the DCAMM Construction and Design Market Area, Prepared for the Commonwealth of Massachusetts Division of Capital Asset Management and Maintenance, December 22, 2017.

10 NERA Economic Consulting, Business Disparities in the San Antonio, Texas Market Area, Prepared for the City of San Antonio, November 12, 2015.

surveys was 21.9 percent and the simple average of the response rates was 19.8 percent. For this effort, the study team selected 11.0 percent as the expected response rate for the first part of Survey #2 and 22.0 percent for the second part. This results in a total expected response rate of 15.7 percent. While this is lower than previous efforts, it partially reflects the larger relative share of first part surveys, which have a lower response rate.

For Survey #3, which verifies disadvantaged business, the study also uses a two-part survey. The first part verifies that firms listed as DBE are DBEs, while the second part verifies that firms not listed as DBE are, in fact, not DBEs. For the first part, response rates in previous surveys ranged from a high of 37.9 percent to a low of 29.1 percent. The overall response rate across the three surveys was 31.8 percent and the simple average of the response rate across the three surveys was 33.9 percent. In the second phase, response rates in previous surveys ranged from a high of 38.5 percent to a low of 29.9 percent. The overall response rate across the three surveys was 33.2 percent and the simple average of the response rate across the three surveys was 33.1 percent. Since both parts draw from the same sample, the overall response rates when considering both parts of the survey were higher and ranged from a high of 38.4 percent to a low of 30.4 percent. The overall response rate across both parts of all three surveys was 32.8 percent and the simple average of the response rates was 33.4 percent. For this effort, the study team selected the response rates from the Maryland surveys as a conservative assumption, as it was both the most recent survey and had the lowest response rates.

This table does not provide response rates for focus group participants in the previous studies. The study team does not believe these participant rates are valid for this study. In the previous study, the focus groups were in person events held in small geographic areas. For this study, which has a nationwide focus, local in person events are not possible. Instead, the study team will run the focus groups as webinars, which will greatly reduce the time and cost for participants. In the previous studies, the focus groups had 183 participants (Maryland), 90 participants (San Antonio), and 120 participants (Massachusetts). For this set of focus groups, the study team has set a very conservative minimum goal of 250 participants using 20,000 invitations for a response rate of 2.5 percent. The study team has designed these focus groups to illicit judicially required anecdotal evidence, not statistically significant numerical results.

2. **Describe the procedures for the collection of information including:**
 - **Statistical methodology for stratification and sample selection**
 - **Estimation procedure**
 - **Degree of accuracy needed for the purpose described in the justification**
 - **Unusual problems requiring specialized sampling procedures, and**
 - **Any use of periodic (less frequent than annual) data collection cycles to reduce burden**

Statistical Methodology

The statistical methodology for this study duplicates the procedures that JFA team members have used in conducted over 30 similar studies for transit agencies, airports, local governments, and state departments of transportation. The resulting disparity studies have survived repeated scrutiny by the courts, both at trial and on appeal. This includes four cases for which USDOJ retained JFA team members for expert work including *Kevon v. United States*, *Rothe Development v. US Dept. of Defense*, *Geyer Signal v. Minnesota DOT*, and *Midwest Fence v. Illinois DOT and ISTHA*. Each of these cases was decided in favor of the defendants, both at trial and on appeal.

This statistical methodology relies heavily on surveys and data collection for the sample of selected firms. Estimating disparity in FRA grantee contracting, and subcontracting requires the estimation of two ratios. The first is the ratio of dollars contracted by FRA Grantees to minority or women owned businesses to the total contracting revenue by all FRA Grantees. This is the Utilization Ratio (UR). The second ratio is the ratio of all minority and women owned business revenue to all business revenue in all similar businesses. This is the Availability Ratio (AR). The UR is divided by the AR to calculate the Disparity Ratio (DR). These calculations are carried out on an industry by industry basis. Evidence of disparity is estimated for each industry of interest.

The initial data collection, Survey 1 has two parts. It is used to calculate the UR. Part 1 is the detailed processing of all FRA grants from 2010-2017. This processing extracts information contained in the FRA Grant files that identifies the Grantee, including contact information, grant amount, status, subgrantee or contractor information as well as other data and the industry sector of the goods and services to be procured by the Grantees. This is referred to as the Client-Maintained Data Collection Plan.

The Master Contract/Subcontract Database will provide the statistical platform upon which the Study Team will build much of the utilization, availability and disparity analyses. Substantial data processing is required to assemble the Master Contract/Subcontract Database from the raw data provided via the Client-Maintained Data Collection Plan and the Prime Contractor Statistical Sampling Frame.

The Team will use the Client-Maintained Data Collection Plan to finalize the Prime Contractor Statistical Sampling Frame for each major contracting category (i.e., construction, construction-related professional services, other professional and general services, and, commodities, supplies, and equipment). This is Part 2 of Survey 1. We will then proceed to identify the relevant prime contractors and consultants from the grantees and grants in our sample. In turn, we will collect the required subcontract records from the grantees' prime contractors and consultants in our sample, utilizing as much of the existing information already in-hand from FRA's existing records and systems and FRA grantees' existing records and systems as possible.

The goal of this effort is to collect information to track the specific contracting process for all Grantee dollars. Experience with many previous single location (state, city) disparity studies in the transportation sector suggests that from 80-95 percent of the grant dollars will be associated with specific prime, subcontract and consultant activity. This

activity will be classified as being accomplished by disadvantaged or non-disadvantaged businesses. This data is organized by industry sector. Until this review is completed, the team will not know how many industry sectors will be involved. Experience with other transportation disparity studies suggests that between 200 and 300 industry sectors may be impacted by Grantee spending. However, this study is limited to the railroad contracting industry, so we expect a significantly fewer number of impacted sectors. These are the markets in which disparity will be tested.

After the Master Contract/Subcontract Database is completed, we will use it to determine empirically those states that account for at least 75 percent of contract/subcontract dollars in grantee contracts. Similarly, we will use it to determine those NAICS codes that account for the largest 75 percent of contract/subcontract dollars in the database. The relevant geographic and product market definitions will define a subset of business universe data the Study Team will license from the Dun & Bradstreet/Hoover's database. The activities in Survey 2 and Survey 3 as well as the webinar activities are designed to augment the statistical findings of disparity with anecdotal evidence which can support the findings.

Strict scrutiny requires anecdotal evidence of discrimination against DBEs consistent with the statistical evidence. Anecdotal information is significant both for determining whether there is strong evidence of discrimination and for narrowly tailoring any program recommendations. Courts have held that the personal experiences of disparate treatment suffered by minorities or women in seeking and performing public and private sector work in the relevant market place buttress sound statistical evidence of disparate impacts. Therefore, the Study Team will also elicit information about the utilization and success of DBEs on projects without mandatory affirmative action efforts. As several courts have recognized, such anecdotal evidence is probative of whether there is a continuing need for governmental remedial intervention in a market made imperfect by the operation of discrimination.

For this study, we will use several techniques to gather anecdotal evidence—both quantitative and qualitative. First, we will conduct a large-scale mail/email survey of DBEs as well as non-DBEs about their experiences in working or attempting to work on prime contracts and subcontracts with FRA grantees, with other public agencies in the surrounding area, and in the private sector. This is referred to as Survey 2. We will ask DBEs about their experiences with disparate treatment resulting from applying for commercial loans, applying for surety bonds, applying for commercial or professional insurance, obtaining price quotes from suppliers, payment practices, hindrance or harassment at the work site, joining or dealing with trade associations, double standards in performance, and other areas. The universe of businesses will be determined in the processing of Survey 1. This will identify the specific markets to be included and the number of businesses participating in these markets. We will select the sample of businesses randomly within strata. The sample size will be determined by the number of such strata. Given previous experience in these studies, we expect to sample 35,000 businesses. We will increase or decrease the sample size based on the number of strata to sample.

The mail/electronic surveys will also ask DBEs and non-DBEs the same set of questions

regarding each firm's characteristics, its experiences regarding various bid requirements, bonding, financing, and the impact of these requirements on the firm's ability to obtain awards. We will then program Stata® to conduct regression analyses that compare DBEs with non-DBEs experiences while holding observable firm characteristics constant. The Study Team will also conduct a telephone survey of non-respondents (Survey 3) to Survey 2 to examine if there are any systematic differences between respondents and non-respondents. Non-response surveys are important since litigants can challenge survey results.

Finally, the webinars are designed to collect anecdotal evidence of discrimination. Based on previous disparity studies and the national scope of the current effort we have established a goal of 250 participants in a series of on-line meetings. Small groups of about 30 businesses will be gathered and a moderator will guide a discussion of these businesses experience in railroad industry contracting. Invitations to participate will be included in previous survey materials, substantial mailings and emails to businesses included in the Master Contract/Subcontract Database as well as advertising in industry publications are designed to encourage participation.

Estimation Procedure

The basis for the population of business to be included in the Utilization Ratio calculation is the FRA Grant data files. These data will be augmented with telephone and email contact with FRA staff, Grantee staff and the staff of Grantee prime and subcontractors. The collected information will define the specific goods and services procured by the prime and subcontractors. It will also determine the ownership of these prime and subcontractor businesses as being DBE or non-DBE.

Using the Final Public Sector DBE Utilization Estimates and the Final DBE Availability Estimates, we will calculate a Disparity Index, formed by dividing the latter into the former and multiplying the quotient by 100. The smaller the value is for the Disparity Index, the greater underutilization in the market area. For example, a Disparity Index near zero indicates availability far in excess of actual utilization, while a Disparity Index near 100 indicates availability levels similar to actual utilization.

A given disparity index is said to be "statistically significant" if the probability that the difference between utilization and availability is zero is sufficiently small. The analysis classifies a disparity index to be "substantively significant" if the difference between utilization and availability is large. For example, a disparity index of 98 could be statistically significant, but it is not large enough to cause concern. The Study Team will calculate statistical significance using statistical routines in Stata®. The goal of the study is to provide an overall Disparity Index for the Railroad Contracting sector. The study will provide, to the extent they are supported by the collected data, a separate Disparity Index calculated for: (1) All race/gender groups and all industry groups combined, (2) All race/gender groups combined by detailed NAICS industry, (3) All NAICS industry groups combined by detailed race/gender; (4) Detailed race/gender by detailed NAICS industry groups.

Degree of Accuracy

The heavy burden of proof required to meet the “strict scrutiny” test applied by the courts for programs that discriminate based on race requires the highest level of accuracy possible. In most cases, the study team expects to survey the entire universe of respondents. This will ensure the results are accurate and free from sampling bias and will ensure that the accuracy of results for subgroups does not suffer due to over stratification and small sample sizes. The largest potential problem is response bias to Survey #2, as DBE firms that have experienced discrimination are more likely to provide responses. The study design minimizes this accuracy problem through the conduct a truncated phone survey designed to test for non-response bias.

Unusual Problems Requiring Specialized Sampling

In a second phase of Survey #2, the study team will conduct a truncated phone survey designed to test for non-response bias. This will allow the study team to validate statistically the representativeness of the results using a sample of 7,500 firms stratified by industry/region. This approach ensures that the anecdotal findings will be representative of the DBE and non-DBE communities at large in the relevant markets. The lack of such non-response information can be detrimental in a litigation context, and no other consultant typically includes non-response surveys as part of their published disparity studies.

Use of Periodic Data Collection Cycles

This is a new information collection requirement for a one-time study. Therefore, use of periodic (less frequent than annual) data collection cycles to reduce burden is not necessary or possible.

- 3. Describe methods to maximize response rates and to deal with issues of non-response. The accuracy and reliability of information collected must be shown to be adequate for intended uses. For collections bases on sampling, a special justification must be provided for any collection that will not yield “reliable” data that can be generalized to the universe studied.**

Since response rates to voluntary surveys tend to be fairly low, the JFA team will take additional steps to increase responsiveness, including an outreach campaign, professionally designed surveys, cover letters signed by top FRA officials, multiple reminders, and a devoted WATS line and email address for requesting replacement surveys and addressing other inquiries. Moreover, the study team will statistically validate representativeness using a non-response survey. The lack of such non-response information can be detrimental in a litigation context, and no other consultant typically includes non-response surveys as part of their published disparity studies.

The accuracy and reliability of information collected will be adequate for intended uses. JFA team members have conducted over 30 similar studies using these survey methods for transit agencies, airports, local governments, and state departments of transportation. The resulting disparity studies have survived repeated scrutiny by the courts, both at trial

and on appeal. This includes four cases for which USDOJ retained JFA team members for expert work including *Kevon v. United States*, *Rothe Development v. US Dept. of Defense*, *Geyer Signal v. Minnesota DOT*, and *Midwest Fence v. Illinois DOT and ISTHA*. Each of these cases was decided in favor of the defendants, both at trial and on appeal.

- 4. Describe any tests for procedures or methods to be undertaken. Testing is encouraged as an effective means of refining collections of information to minimize burden and improve utility. Tests must be approved if they call for answers to identical questions from 10 or more respondents. A proposed test or set of tests may be submitted for approval separately or in combination with the main collection of information.**

JFA does not plan for any tests of the procedures or methods to be undertaken. The data collection and analysis methods and surveys that JFA plans to employ for this effort have already been used on over 30 similar studies that the project team has employed for transit agencies, airports, local governments, and state departments of transportation. Moreover, several court cases have tested this methodology and the methodology has withstood the challenges in all cases. This includes *Kevon v. United States*, *Rothe Development v. US Dept. of Defense*, *Geyer Signal v. Minnesota DOT*, and *Midwest Fence v. Illinois DOT and ISTHA*. Each of these cases was decided in favor of the defendants, both at trial and on appeal.

- 5. Provide the name and telephone number of individuals consulted on statistical aspects of the design and the name of the agency unit, contractor(s), grantees, or other persons(s) who will actually collect and/or analyze the information for the agency.**

FRA has engaged the services of Jack Faucett Associates, Inc., 4915 St. Elmo Ave, Suite 205, Bethesda, Maryland 20814, for the conduct of this study. Jack Faucett Associates, Inc. will be responsible for data collection, information coding, and analysis.

The Jack Faucett Associates primary point of contact for this work is:

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A Jack Faucett Associates, Inc. study team member developed the statistical aspects of

the study design as part of the original contract for this study. This team member is:

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This team member has conducted over 30 similar studies using this methodology for transit agencies, airports, local governments, and state departments of transportation. Dr. Wainwright is a trial-qualified and seasoned expert witness. He holds a Ph.D. in economics from The University of Texas at Austin. He is the only consultant whose disparity research has survived repeated scrutiny by the courts, both at trial and on appeal. Dr. Wainwright has testified directly or by deposition or affidavit in federal and state courts on DBE related issues and other matters on more than ten occasions, before state legislatures and before the U.S. Senate and House of Representatives. He has been repeatedly qualified as an expert economic witness under the federal rules of evidence. Since 2011, the U.S. Department of Justice has retained him to serve as their primary economic expert in four cases involving constitutional challenges to the DBE and SBA 8(a) programs.

Several court cases have tested this methodology and the methodology has withstood the challenges in all cases. This includes four cases for which USDOJ retained Dr. Wainwright and his firm for expert work including *Kevon v. United States*, *Rothe Development v. US Dept. of Defense*, *Geyer Signal v. Minnesota DOT*, and *Midwest Fence v. Illinois DOT and ISTHA*. Each of these cases was decided in favor of the defendants, both at trial and on appeal.

In the most recent case (*Midwest Fence v. Illinois DOT and ISTHA*), the Seventh Circuit upheld the constitutionality of Illinois DOT and Illinois State Toll Highway Authority DBE Programs, based in part on studies and expert witness work by Dr. Wainwright. In addition to authoring the original studies for IDOT and ISTHA, Dr. Wainwright authored an expert witness report for USDOJ submitted at trial that examined the outcomes of hundreds of relevant disparity studies, among other evidence. Dr. Wainwright also authored a rebuttal report to that of the plaintiff's expert Dr. Jonathan Guryan of Northwestern University and Charles River Associates.