

## Mobilization by Work Type Tables

The following tables summarize the mobilization according to work type based on 5 years of data from January 2009 to December 2014. Tables for all work types are in the following pages. Definitions for the statistics provided in the tables are listed in the Appendix on the last page of this document.

If you are interested in examining the data in more detail or according to different parameters than those provided in the tables below, the *Historical Mobilization Calculator* excel document allows sorting of all 5 years of data by a number of criteria including region, month, year, and total bid price. The excel document is available via a link directly below this document on the Estimating Guidance website.

### All Work Types

Type:	2009-2014	2009	2010	2011	2012	2013	2014
SAMPLE SIZE	1964	384	471	303	294	259	253
MEDIAN	4.5%	4.0%	3.7%	4.3%	4.9%	4.8%	6.1%
1ST QUARTILE	2.2%	2.0%	1.8%	2.1%	2.2%	2.5%	3.8%
3RD QUARTILE	7.8%	7.8%	6.7%	7.1%	8.0%	8.1%	9.4%
IQR	5.5%	5.7%	4.8%	4.9%	5.8%	5.5%	5.7%
HIGH OUTLIER BOUND	21.1%	21.3%	18.2%	19.1%	22.1%	21.4%	23.1%
MEDIAN WITHOUT OUTLIERS	4.5%	4.0%	3.5%	4.3%	4.9%	4.8%	6.0%
TRIMEAN	4.8%	4.5%	4.0%	4.4%	5.0%	5.0%	6.3%

### General Construction (A)

Type:	2009-2014	2009	2010	2011	2012	2013	2014
SAMPLE SIZE	273	39	62	40	47	46	39
MEDIAN	4.4%	3.3%	4.2%	3.9%	4.8%	4.3%	5.8%
1ST QUARTILE	2.7%	2.4%	2.2%	2.0%	2.7%	2.9%	4.3%
3RD QUARTILE	6.8%	5.8%	7.4%	5.9%	7.1%	6.7%	9.0%
IQR	4.2%	3.4%	5.2%	3.9%	4.4%	3.8%	4.7%
HIGH OUTLIER BOUND	16.9%	13.4%	19.9%	15.6%	17.9%	15.6%	20.0%
MEDIAN WITHOUT OUTLIERS	4.3%	3.3%	4.2%	3.9%	4.8%	4.3%	5.8%
TRIMEAN	4.6%	3.7%	4.5%	3.9%	4.8%	4.5%	6.2%

### Grading (B), Grading & General Construction (AB)

Type:	2009-2014	2009	2010	2011	2012	2013	2014
SAMPLE SIZE	101	11	21	22	17	21	9
MEDIAN	3.9%	4.0%	3.7%	3.4%	3.1%	5.2%	6.6%
1ST QUARTILE	2.1%	1.8%	2.2%	2.5%	1.9%	2.2%	2.0%
3RD QUARTILE	6.4%	6.5%	4.7%	5.2%	4.9%	6.7%	10.4%
IQR	4.3%	4.7%	2.5%	2.7%	3.0%	4.5%	8.3%
HIGH OUTLIER BOUND	16.7%	18.1%	11.1%	11.5%	12.0%	18.8%	31.6%
MEDIAN WITHOUT OUTLIERS	3.9%	4.0%	3.5%	3.3%	3.1%	5.2%	6.6%
TRIMEAN	4.1%	4.1%	3.6%	3.6%	3.2%	4.8%	6.4%

### Concrete Pavement (C), Concrete Pavement & General Construction (AC)

Type:	2009-2014	2009	2010	2011	2012	2013	2014
SAMPLE SIZE	109	26	25	20	16	14	8
MEDIAN	3.0%	3.5%	2.4%	3.1%	3.0%	3.0%	3.2%
1ST QUARTILE	1.6%	2.2%	1.5%	1.3%	1.7%	2.1%	2.4%
3RD QUARTILE	4.4%	5.1%	3.2%	4.1%	4.3%	4.7%	3.8%
IQR	2.8%	2.8%	1.7%	2.8%	2.7%	2.7%	1.4%
HIGH OUTLIER BOUND	11.3%	12.0%	7.5%	11.5%	11.0%	11.0%	7.3%
MEDIAN WITHOUT OUTLIERS	3.0%	3.4%	2.4%	3.1%	3.0%	3.0%	3.1%
TRIMEAN	3.0%	3.5%	2.3%	2.9%	3.0%	3.2%	3.1%

### Asphalt (D), Asphalt & General Construction (AD)

Type:	2009-2014	2009	2010	2011	2012	2013	2014
SAMPLE SIZE	525	107	123	77	76	78	74
MEDIAN	2.5%	2.2%	2.3%	2.3%	2.0%	2.5%	4.1%
1ST QUARTILE	1.2%	1.2%	1.2%	1.2%	1.0%	1.2%	3.0%
3RD QUARTILE	4.6%	3.7%	4.4%	4.9%	4.8%	4.8%	6.2%
IQR	3.3%	2.4%	3.2%	3.6%	3.7%	3.6%	3.1%
HIGH OUTLIER BOUND	12.5%	9.5%	11.8%	13.2%	13.2%	13.2%	13.5%
MEDIAN WITHOUT OUTLIERS	2.4%	2.0%	2.3%	2.3%	2.0%	2.5%	4.0%
TRIMEAN	2.7%	2.3%	2.6%	2.7%	2.4%	2.8%	4.4%

### Structures (F)

Type:	2009-2014	2009	2010	2011	2012	2013	2014
SAMPLE SIZE	232	63	38	43	29	20	39
MEDIAN	7.9%	7.6%	8.3%	6.9%	7.0%	9.2%	9.4%
1ST QUARTILE	5.6%	4.8%	6.1%	5.0%	5.9%	7.1%	6.7%
3RD QUARTILE	10.5%	10.7%	10.1%	8.1%	8.3%	11.4%	11.3%
IQR	4.9%	6.0%	4.0%	3.1%	2.4%	4.3%	4.6%
HIGH OUTLIER BOUND	22.6%	25.5%	20.3%	16.2%	14.1%	22.2%	23.1%
MEDIAN WITHOUT OUTLIERS	7.8%	7.6%	8.3%	6.7%	6.9%	9.2%	9.4%
TRIMEAN	7.9%	7.7%	8.2%	6.7%	7.0%	9.2%	9.2%

### Structures & General Construction (AF)

Type:	2009-2014	2009	2010	2011	2012	2013	2014
SAMPLE SIZE	243	55	49	37	36	32	34
MEDIAN	6.9%	6.6%	6.8%	6.4%	7.6%	6.8%	7.7%
1ST QUARTILE	5.1%	4.8%	5.0%	4.3%	6.2%	5.8%	5.1%
3RD QUARTILE	9.3%	10.6%	9.8%	9.3%	8.7%	8.6%	9.2%
IQR	4.2%	5.8%	4.8%	5.0%	2.5%	2.8%	4.1%
HIGH OUTLIER BOUND	19.4%	24.1%	21.1%	21.6%	15.2%	15.2%	20.1%
MEDIAN WITHOUT OUTLIERS	6.8%	6.3%	6.6%	6.4%	7.4%	6.8%	7.6%
TRIMEAN	7.0%	7.2%	7.1%	6.6%	7.5%	7.0%	7.4%

### Bridge Painting (H), Bridge Painting & General Construction (AH)

Type:	2009-2014	2009	2010	2011	2012	2013	2014
SAMPLE SIZE	25	9	5	4	4	3	0
MEDIAN	6.7%	9.7%	6.2%	5.5%	5.7%	4.5%	-
1ST QUARTILE	4.4%	6.6%	5.4%	3.6%	3.4%	3.4%	-
3RD QUARTILE	9.7%	10.9%	6.7%	7.4%	7.9%	7.2%	-
IQR	5.2%	4.3%	1.3%	3.9%	4.5%	3.8%	-
HIGH OUTLIER BOUND	22.4%	22.6%	10.0%	17.1%	19.1%	15.8%	-
MEDIAN WITHOUT OUTLIERS	6.7%	9.7%	6.2%	5.5%	5.7%	4.5%	-
TRIMEAN	6.9%	9.2%	6.1%	5.5%	5.7%	4.9%	-

### Incidental (K)

Type:	2009-2014	2009	2010	2011	2012	2013	2014
SAMPLE SIZE	138	23	27	24	26	20	18
MEDIAN	2.7%	1.8%	1.5%	1.9%	3.7%	4.2%	3.8%
1ST QUARTILE	1.3%	0.9%	1.2%	1.2%	1.4%	1.6%	2.4%
3RD QUARTILE	6.3%	4.4%	5.6%	6.2%	8.9%	9.1%	6.3%
IQR	5.0%	3.5%	4.3%	5.0%	7.5%	7.5%	3.9%
HIGH OUTLIER BOUND	17.7%	12.4%	14.5%	17.1%	26.3%	26.8%	15.6%
MEDIAN WITHOUT OUTLIERS	2.6%	1.7%	1.5%	1.8%	3.7%	4.0%	3.8%
TRIMEAN	3.2%	2.2%	2.5%	2.8%	4.4%	4.8%	4.1%

### Incidental & General Construction (AK)

Type:	2009-2014	2009	2010	2011	2012	2013	2014
SAMPLE SIZE	145	19	35	19	30	18	24
MEDIAN	4.7%	3.3%	3.6%	6.1%	7.4%	5.1%	6.3%
1ST QUARTILE	2.8%	2.4%	2.5%	2.0%	3.7%	3.3%	4.4%
3RD QUARTILE	9.0%	5.3%	5.2%	9.8%	14.2%	8.9%	9.3%
IQR	6.2%	2.9%	2.7%	7.8%	10.5%	5.6%	4.9%
HIGH OUTLIER BOUND	23.4%	11.9%	11.6%	29.6%	39.0%	22.0%	21.0%
MEDIAN WITHOUT OUTLIERS	4.7%	3.1%	3.5%	6.1%	7.4%	4.8%	5.8%
TRIMEAN	5.3%	3.6%	3.7%	6.0%	8.2%	5.6%	6.6%

# Appendix

**Sample Size:** Number of projects used to calculate the median.

**Median (Q2):** Middle value; 50% of the values in the sample size are above this value and 50% are below this value.

**1st Quartile (Q1):** 25% of the values in the sample are less than this value.

**3rd Quartile (Q3):** 75% of the values in the sample are less than this value.

**Interquartile Range (IQR):** Difference between the 1<sup>st</sup> and 3<sup>rd</sup> quartile.

**High Outlier Bound:**  $(3 * IQR + Q2)$ ; Commonly used method for identifying strong outliers.

**Median Without Outliers:** Median of the sample without the values determined to be strong outliers (values greater than the high outlier bound).

**Trimean:**  $\frac{Q1+Q2*2+Q3}{4}$ ; Combines the median's focus on center with the extremes.

## Work Type Letter Codes

The letter codes listed in parenthesis symbolize the work type and are assigned by the plan checkers at the Bureau of Project Development. They are assigned according to a formula based on the quantity of items in the project from each work type. For example, if a majority of the items are asphalt items, the project will be assigned a D work type code. A combined work type code is used when another work type makes up a significant portion of the project. For example, a primarily asphalt job with a significant amount of general construction items would be labeled AD. The definitions for each letter are listed below.

- A General Construction
- B Grading
- C Portland Cement Concrete Pavement
- D Asphaltic Surfacing
- F Highway Structures
- G Railroad Road and Bridge
- H Bridge Painting
- I Street and Airport Lighting
- J Building Construction
- K Incidental Construction

## Work Type Grouping

Data analysis showed that there was little difference in mobilization between B (Grading) and AB (General Construction and Grading). Since there was a limited sample size for B (Grading) alone, B and AB were grouped together in the table. This was also true for the Concrete, Asphalt, and Bridge Painting work types. However, the F (Structures) work type and K (Incidental) work type showed a significant difference when combined with A (General Construction); therefore, these were kept in separate tables.