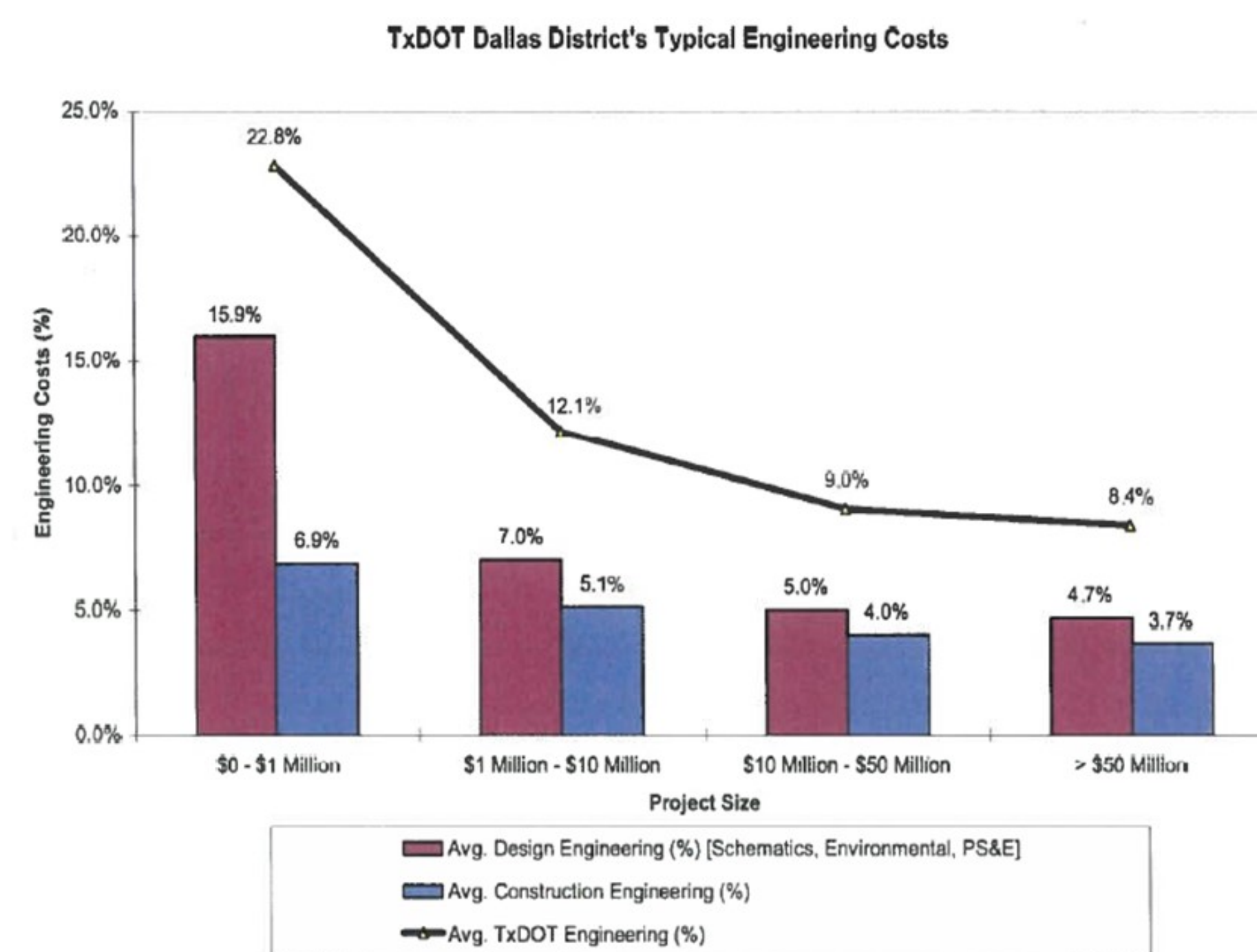


## Introduction

In TxDOT, Construction Engineering and Inspection (CE&I) costs comprised between 3.2% and 4.4% of total construction costs every year between 2005 and 2015.

This study provides an overview of CE&I costs TxDOT incurred between 2001 and 2017 to identify optimal allocation of resources (and consequently costs) for CE&I functions at the project level.



Source: memo provided by Bill Hale, February 2008

## Methods

### Dataset

An Excel-based dataset of financial information for 7,094 projects was provided by TxDOT's Finance Division in November 2016.

The projects' letting dates range from 2001 to 2017, with a majority letting between 2013 to 2015.

Attributes available for each project include:

- Control Section Jobs (CSJ), a unique contract identification number,
- Life-to-date construction (LTD) costs with and without administration costs,
- LTD CE&I costs with and without administration costs,
- Project classification and a description of the project work

### Data preparation

- 6,577 projects (\$13.7 Billion total construction costs) out of 7,094 (\$14.7 Billion total construction costs) were selected for the main analysis
- 517 projects were excluded based on their classification, description or let date if they did not typically require CE&I from TxDOT
- Projects were aggregated at the *Contract CSJ* level, with 2,370 unique Contract CSJ to ensure an analysis at the construction-project level.

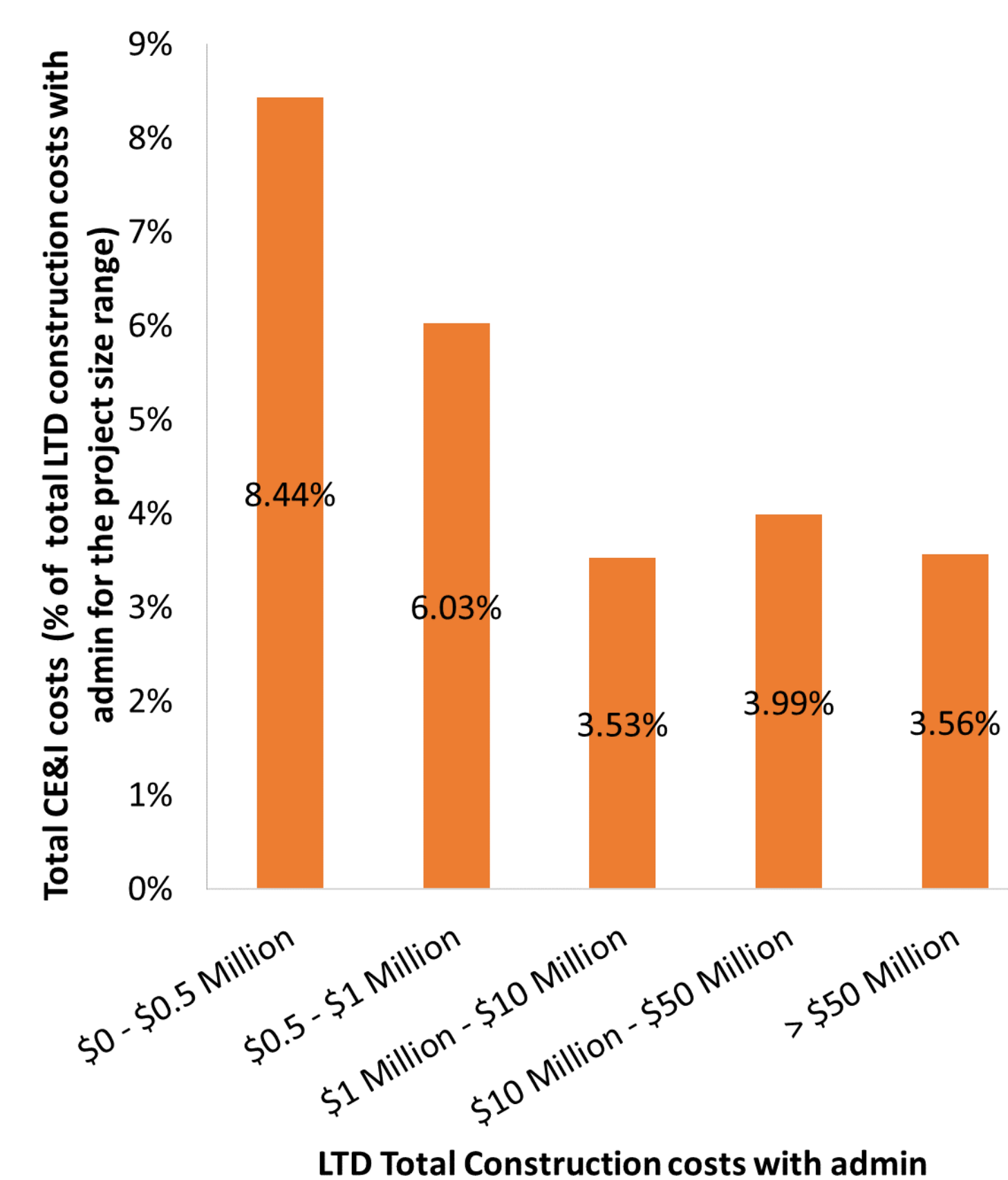
## Data characterization

Project classifications with highest total LTD construction costs

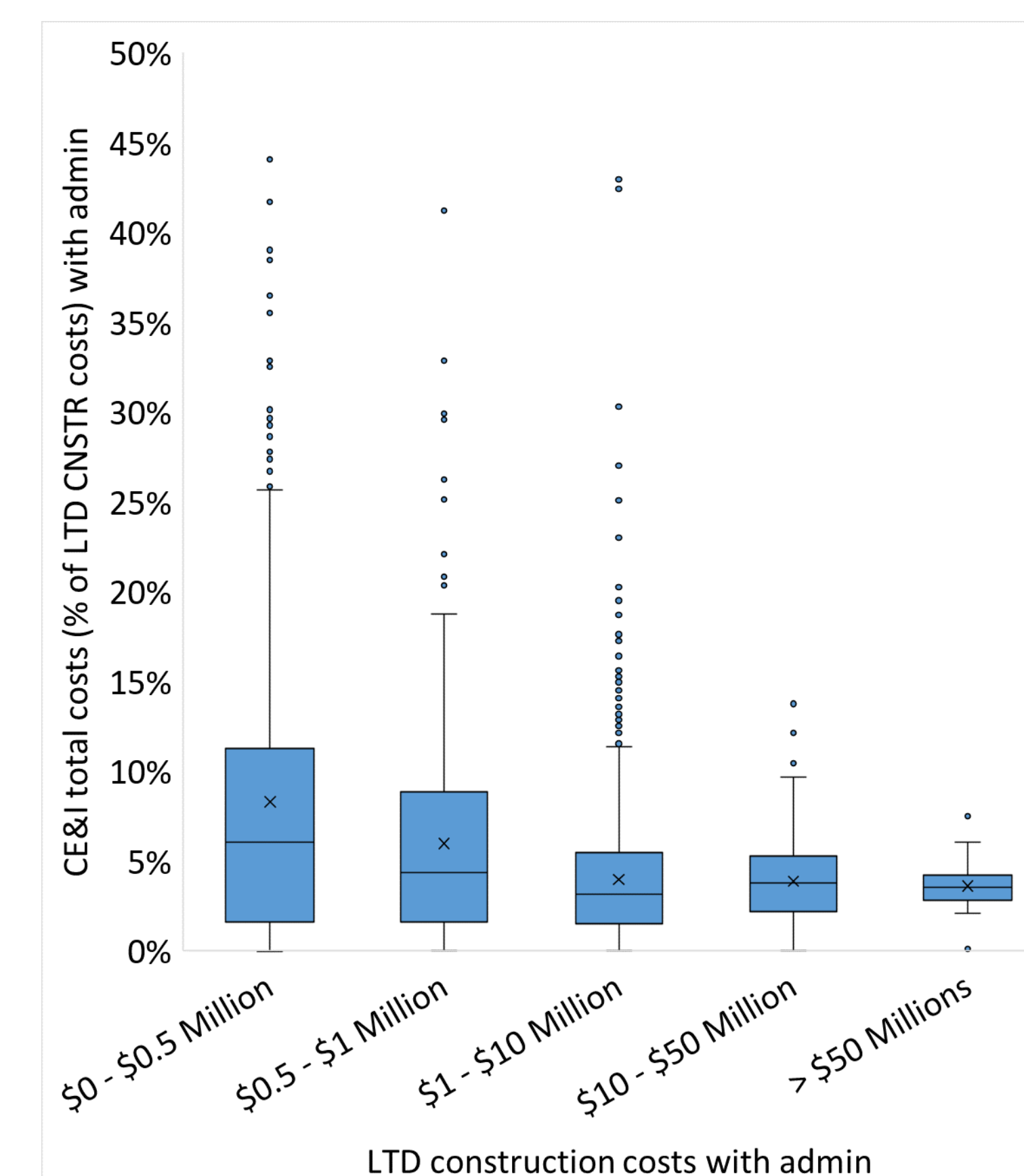
Classification	No. of unique contract CSJs selected after aggregation	Total LTD construction costs (including admin) (\$)	Total CE&I costs (% total LTD construction costs)
Widen Freeway	24	1,916,914,984	3.70%
Widen Non-Freeway	64	1,876,402,374	4.40%
Rehabilitation of Existing Road	320	1,813,564,112	3.50%
Miscellaneous Construction	278	689,447,782	4.70%
Interchange	35	1,380,394,929	4.00%
Overlay	357	1,334,004,289	2.70%
Pavement Markings and Texturizing	345	713,900,101	4.10%
New Location Freeway	9	643,727,817	3.80%
New Location Non-Freeway	49	642,790,542	3.80%
Bridge Replacement	361	635,080,787	6.00%

## General results

Total CE&I costs per project size range (% of total construction cost) versus project size

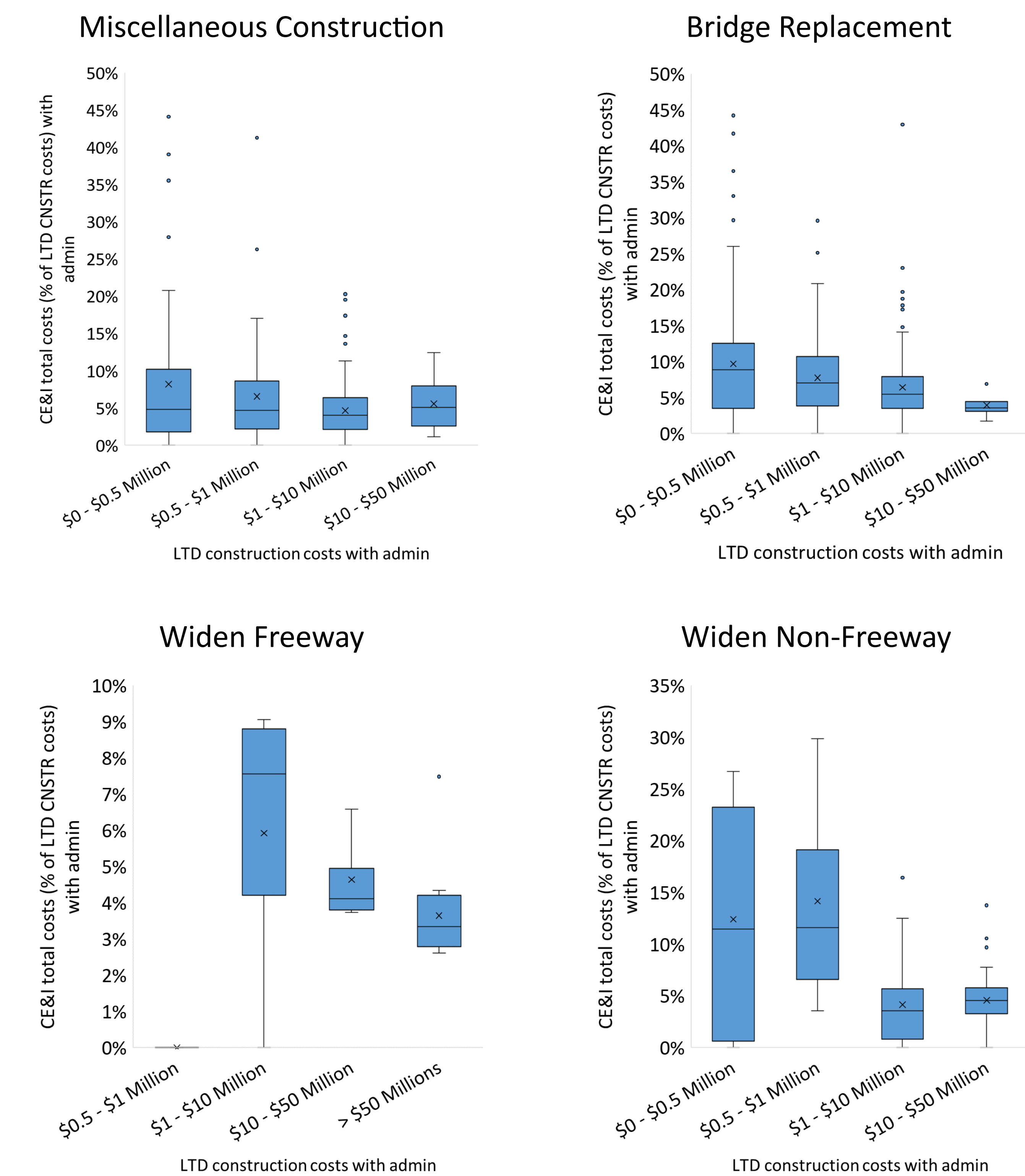


Total CE&I costs (% of total construction cost) versus project size



## Results per project classification

Total CE&I costs as a percentage of the total LTD construction costs for:



## Discussion

- CE&I costs (when expressed as a percentage of construction costs) have an inverse relationship with construction costs and vary based on the project type
- There is a potential need for attention for projects larger than \$1 million in total construction costs and whose classifications are Miscellaneous Construction and Bridge Replacement

## Acknowledgements

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