

# Evaluation of Data Requirements for Computerized Constructability Analysis of Pavement Rehabilitation Projects

Javier Irizarry

Assistant Professor, javier.irizarry@coa.gatech.edu

Daniel Castro

Professor, daniel.castro@coa.gatech.edu

Masoud Gheisari

Assistant Professor, masoud@gatech.edu

Laura Florez

PhD Candidate, lflorez3@gatech.edu

Samaneh Zolfagharian

PhD Student, samanehz@gatech.edu

School of Building Construction, Georgia Institute of Technology



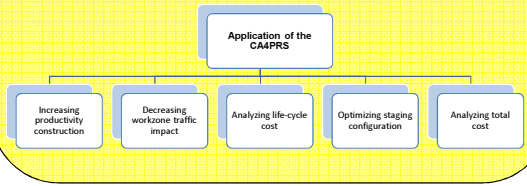
## Introduction

With the impending end of the serviceable life of the National Highway System, many transportation agencies have increased their focus on preservation, rehabilitation, and maintenance projects. The Construction Analysis for Pavement Rehabilitation Strategies (CA4PRS) software has been a useful decision making tool for various Departments of Transportation (DOTs) in the United States.

### CA4PRS:

Estimates the maximum probable length of highway pavement that can be rehabilitated given the various project constraints.

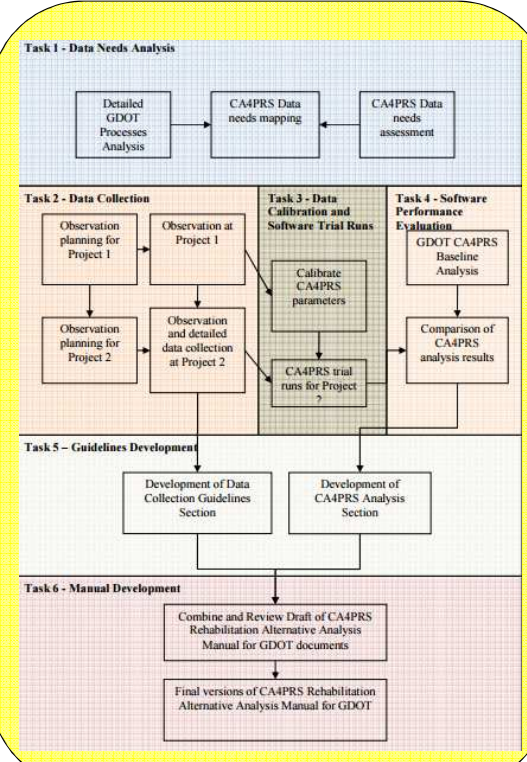
### Application of the CA4PRS



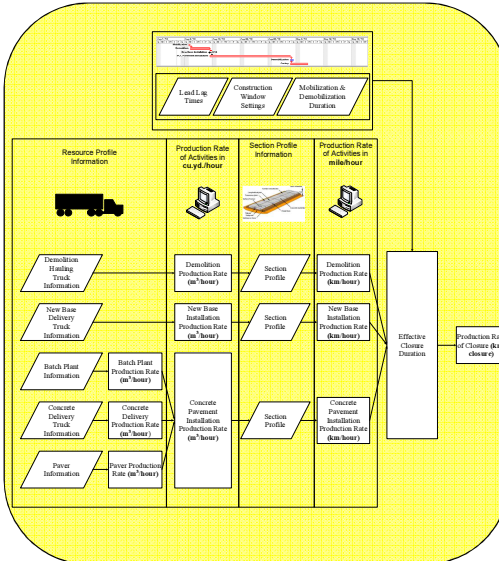
## Objective

To provide guidelines for the collection of data required for an adequate CA4PRS-based rehabilitation alternatives analysis. GDOT personnel will be then able to perform a wide range of analysis, such as evaluation of alternative contracting methods on critical projects where incentives and disincentives are considered, evaluation of contractors' work plans on major projects, evaluation of the impact of rapid construction strategies, and the effect of alternative construction windows among others.

## Methodology



## Overall Procedures of CA4PRS



## CA4PRS Data Need Analysis

## Tools Used During the Data Collection Phase

## Results & Future Research

Data requirements of CA4PRS

Variables	Units	Source	
Mobilization time	1.5 hr	On-site	
Activity constraints	Demobilization time	1 hr	On-site
	Lag time between Milling and Paving	24 hr	On-site
	Half closure traffic switch	1 hr	On-site
Construction window	Weekend closure	Start time	9:00 PM
		End time	5:00 AM
	Milling and hauling	Number of teams	2
		Team efficiency	0.875
		Machine class	Large
		AC material type	AC-medium
		Efficiency factor	0.875
		Capacity	400 ton/hr
Resource Profile		Number of plants	-
		Rated capacity	19 ton
		Trucks per hour per team	10.71
		Packing efficiency	0.75
		Rated capacity	20 ton
		Trucks per hour	15.46
		Packing efficiency	-
		Non-paving travel speed	30 km/hr

- Reduces the amount of construction knowledge necessary for estimates, but is not a replacement for experience.
- GDOT personnel could benefit from the use of IT tools that would facilitate their data collection and analysis process.
- Define the manner in which the missing 15% of data will be obtained.
- The CA4PRS program continues to be developed and, in the future, will also allow other analyses, such as widening, interchange rehabilitation, and bridge structure replacement, which could be beneficial to all DOTs, including GDOT.