
**Value Engineering
Annual Report
FY 2015/2016**



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Executive Summary

Value Engineering During Project Development

The districts conducted 20 studies or 91% of the original number of studies scheduled for fiscal year 2015/2016. The original work plan had 22 studies scheduled for the year and the target was to complete 75% or 17 of the planned studies. Due to the dynamics of the department's work program, 9 of the 22 scheduled studies (41%) were either dropped from the work plan altogether or rescheduled for the 2016/2017 fiscal year, while 7 of the conducted studies were added to the original work plan.

During this same period, the districts acted on 152 recommendations, approving 80 for a 53% adoption rate. Seventy-one of the approved recommendations resulted in \$148.9 million in project cost avoidance/savings. The remaining 9 approved recommendations were value added recommendations that increased project performance, while adding \$4.2 million to the project cost. Therefore, the total value of the approved recommendations, including the value added recommendations, produced **\$144.7 million in project cost avoidance/savings**.

The approved recommendations resulted in a 6.24% project saved, 5.65% program saved and a Return on Investment (ROI) of \$113 to \$1. The percent project saved is calculated by dividing the value of all approved recommendations by the total costs of the projects studied, while the percent program saved is calculated by dividing the value of all approved recommendations by the average project cost of three fiscal year lettings. The ROI is calculated by dividing the value of all approved recommendations by the cost of administering the program.

There were 58 pending recommendations totaling \$99.6 million in potential cost avoidance/savings at the end of the 2015/2016 fiscal year. This is a 23% decrease in the total number of pending recommendations and a 62% decrease in the amount of pending dollars from the 4th quarter of last year. Twenty-six of the 58 recommendations have been pending for more than 12 months, which is 45% of the total number of pending recommendations. Since the VE Study is a 'snapshot' of the project at some point in time of project development and projects are continuously moving forward in development, this is a concern. The longer recommendations are unresolved and in a pending status the less likely that they will be adopted because the development of the project has advanced.

Cost Savings Initiatives During Construction

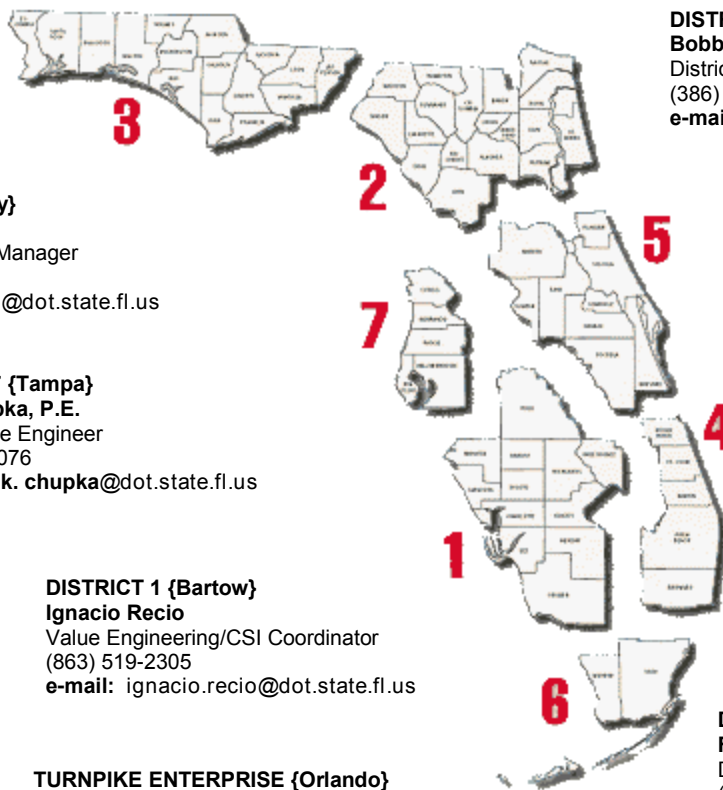
Thirty-six Cost Savings Initiative (CSI)'s Proposals were submitted during fiscal year 2015/2016. During this same period, the districts approved 35 proposals totaling more than \$11.62 million in savings. The approved CSI proposals resulted in a 0.53% project saved and a 0.42% program saved. There are currently 2 pending CSI's totaling \$1.31 million in potential project savings.

Program Organization

Mission: Administer the Florida Department of Transportation Value Engineering and Cost Savings Initiative Programs, satisfying the needs of the stakeholders.

Vision: Value Engineering . . . providing an effective support function which maximizes project and process value for the transportation systems in the State of

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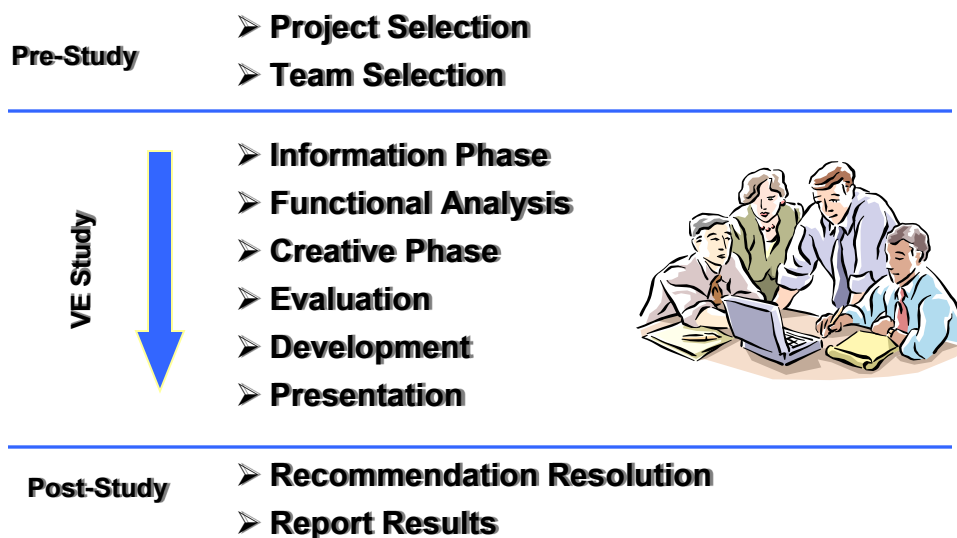
DISTRICT 6 {Miami}
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District Value Engineer
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e-mail: fang.mei@dot.state.fl.us

Value Engineering Overview

What is Value Engineering

Value Engineering (VE) is the formal application of a proven and effective tool used to improve the value of a project, product or service. VE strives to optimize the use of allocated funds without reducing the quality or performance. A multi-disciplined team is assembled and the six phases of the VE Job Plan (Information, Functional Analysis, Creative, Evaluation, Development and Presentation) are used to guide the team through the process.

VE Job Plan



The administration of the VE Program can be broken down into the following key processes.

Pre-Study	Study	Post Study
Project Selection	Conduct VE Study	Recommendation Resolution
Team Selection		Report Results

Value Engineering Overview

Performance Measures

The VE Program and the Cost Savings Initiative (CSI) Program are managed through the use of the Process Control Systems found in Appendix B. Each process has a set of Quality and In-Process measures that are used to evaluate the performance of the program. The Quality Measures for the overall VE program are defined below.

VE Program	
Quality Measure	Calculation
Q1: Approved Cost Avoidance Recommendations	Sum of all approved cost avoidance/ savings recommendations
Q2: Approved Value Added Recommendations	Sum of all approved value added recommendations
Q3: Adoption Rate	$\frac{\# \text{ of Approved Recommendations}}{\# \text{ of Proposed Recommendations}}$
Q4: Percent Project Saved	$\frac{\text{Value of Approved Recommendations}}{\text{Total Project Costs}}$
Q5: Percent Program Saved	$\frac{\text{Value of Approved Recommendations}}{\text{3 Year Monthly Average Lettings}}$
Q6: Return on Investment (only reported annually)	$\frac{\text{Value of Approved Recommendations}}{\text{Total cost of VE Program}}$

Cost Savings Initiative Overview

What is Cost Savings Initiative

The Cost Savings Initiative Program offers an opportunity for the contractor to propose cost savings ideas prior to work beginning and as work progresses on a project. Contractors can demonstrate their innovation and ingenuity by proposing ideas that contribute to the cost effectiveness of the project. The contractors are then rewarded for this ingenuity and innovation by sharing in any project savings generated from an approved Cost Savings Initiative (CSI) proposal.

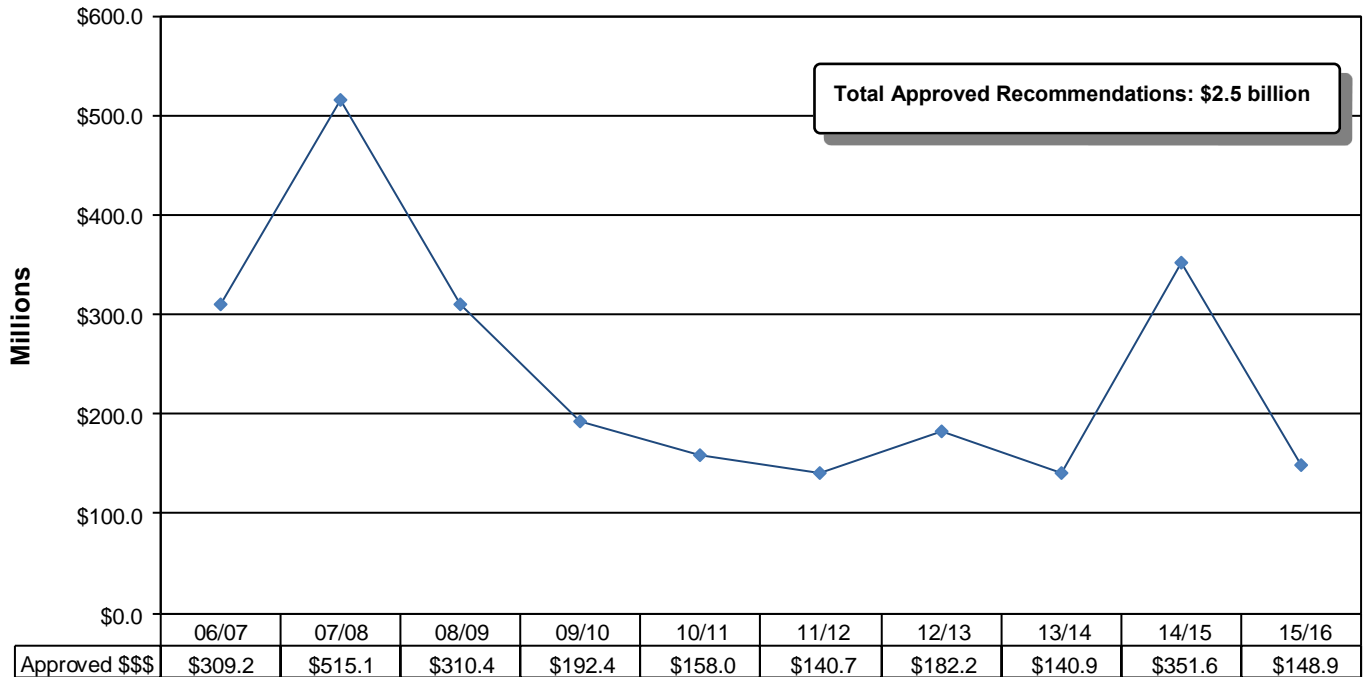
Performance Measures

CSI Program	
Q1: Number of CSI's	Sum of all CSI's
Q2: Approved Cost Savings	Sum of all approved CSI savings
Q3: Percent Project Saved	$\frac{\text{Value of Approved Proposals}}{\text{Total Project Costs}}$
Q4: Percent Program Saved	$\frac{\text{Value of Approved Recommendations}}{\text{3 Year Monthly Average Lettings}}$

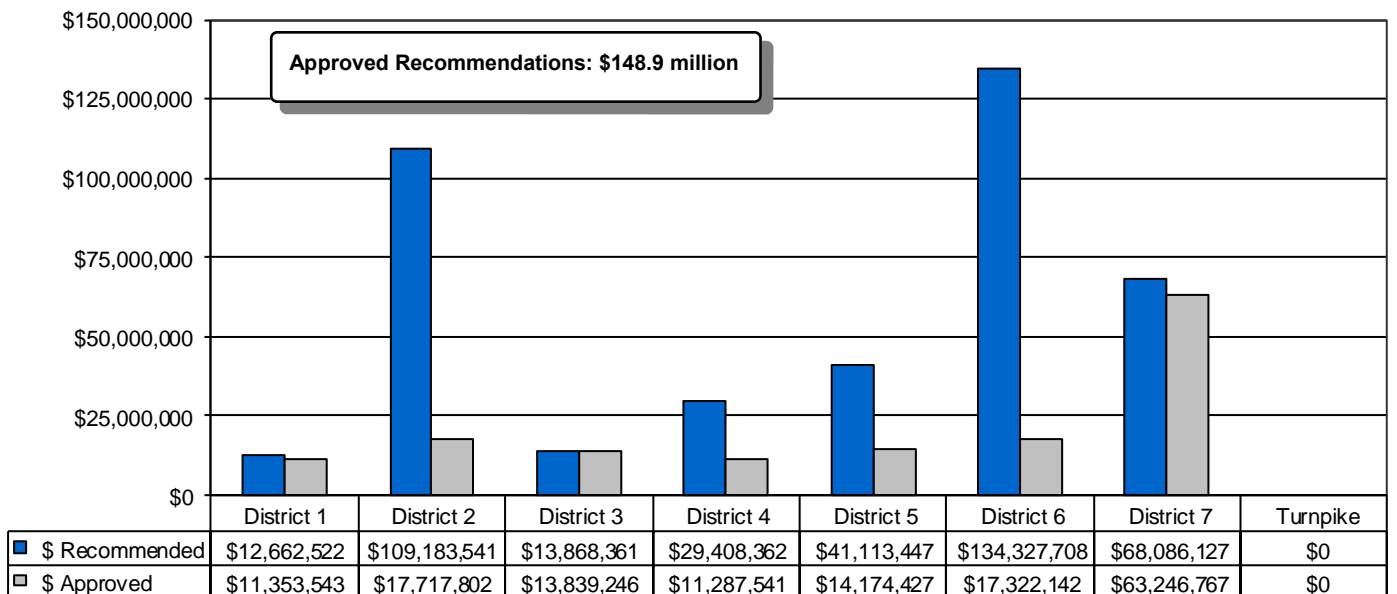
**Fiscal Year 2015/2016
Value Engineering
Performance Measures**

Adopted Recommendations

Q1: Annual Approved Cost Avoidance/Savings

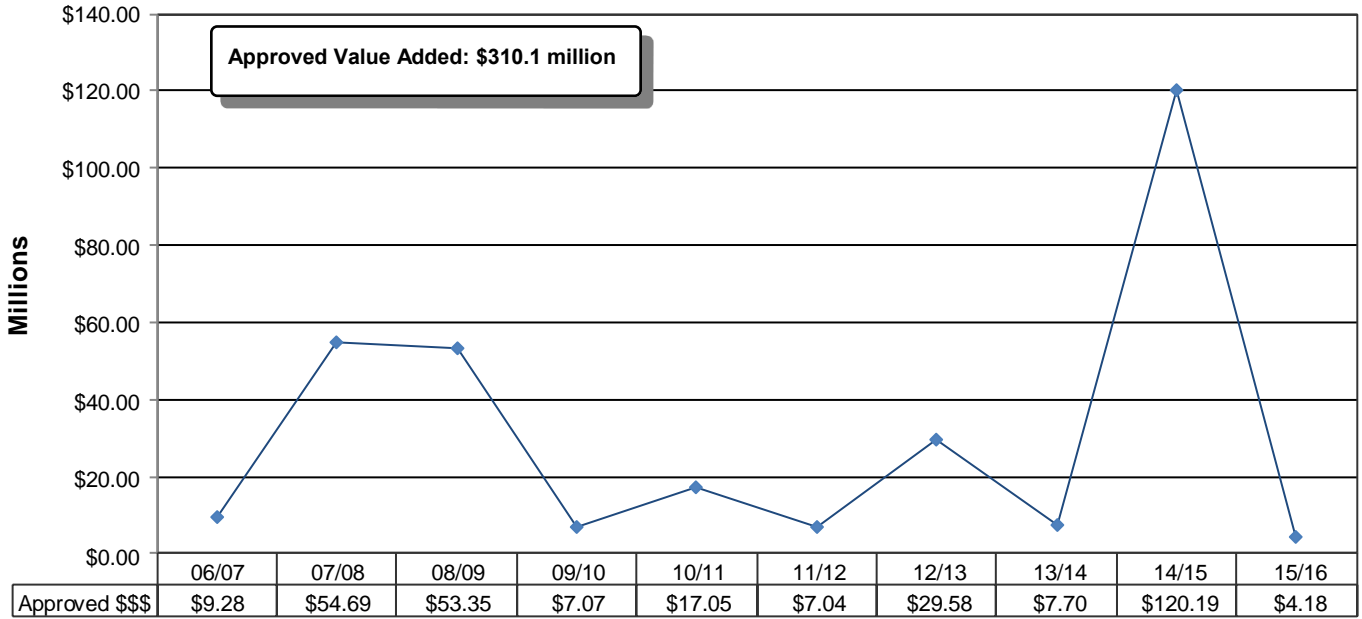


Q1: Cost Avoidance Recommendations Annual Report FY 2015/2016

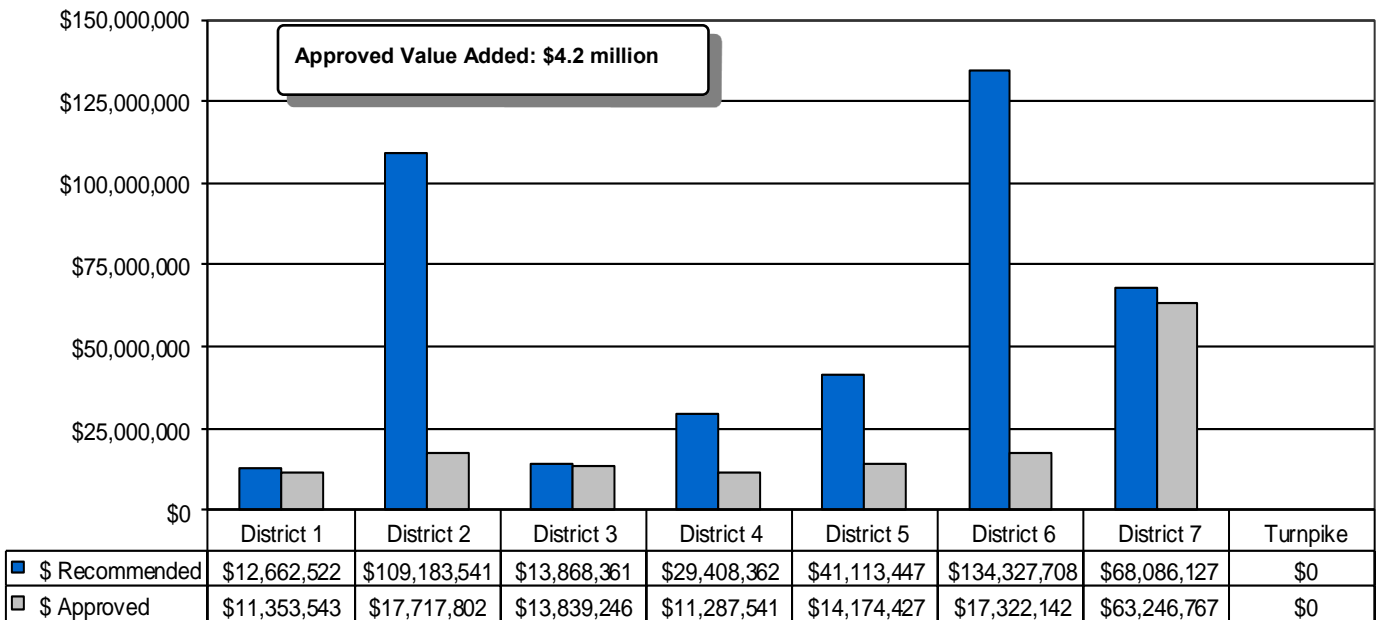


Adopted Recommendations

Q2: Annual Approved Value Added Recommendations



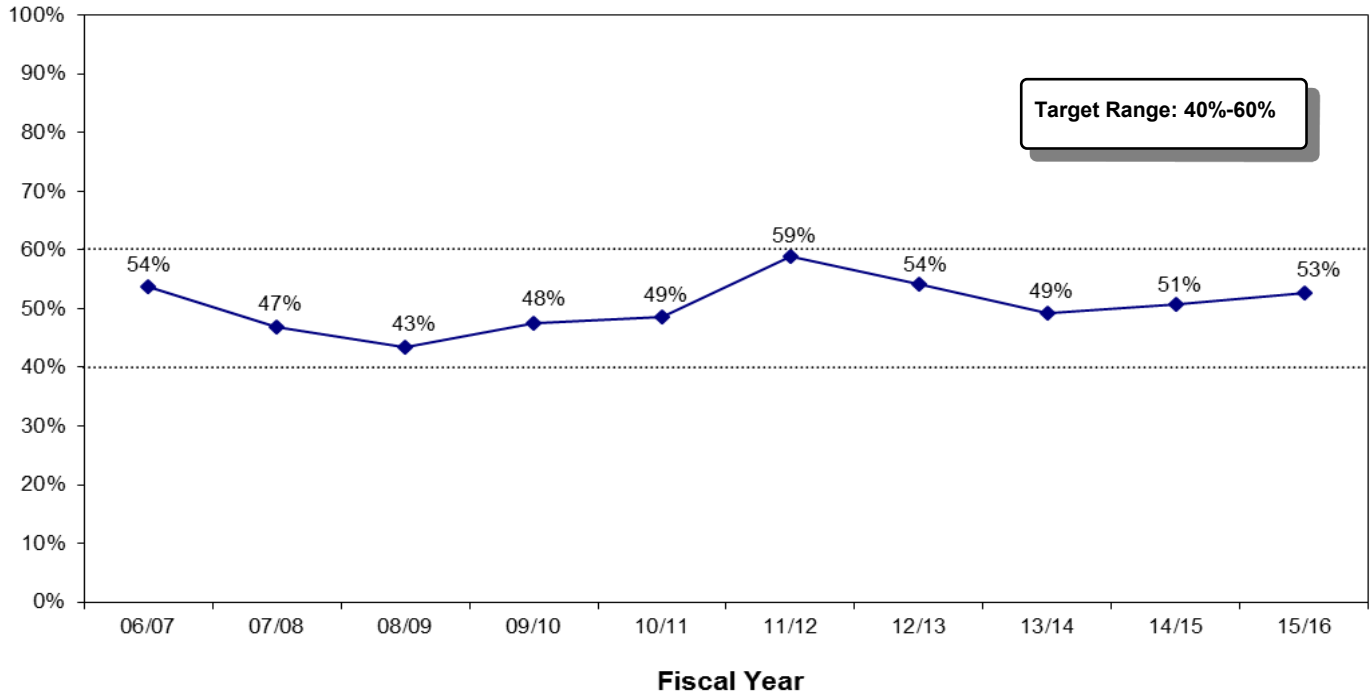
Q1: Cost Avoidance Recommendations Annual Report FY 2015/2016



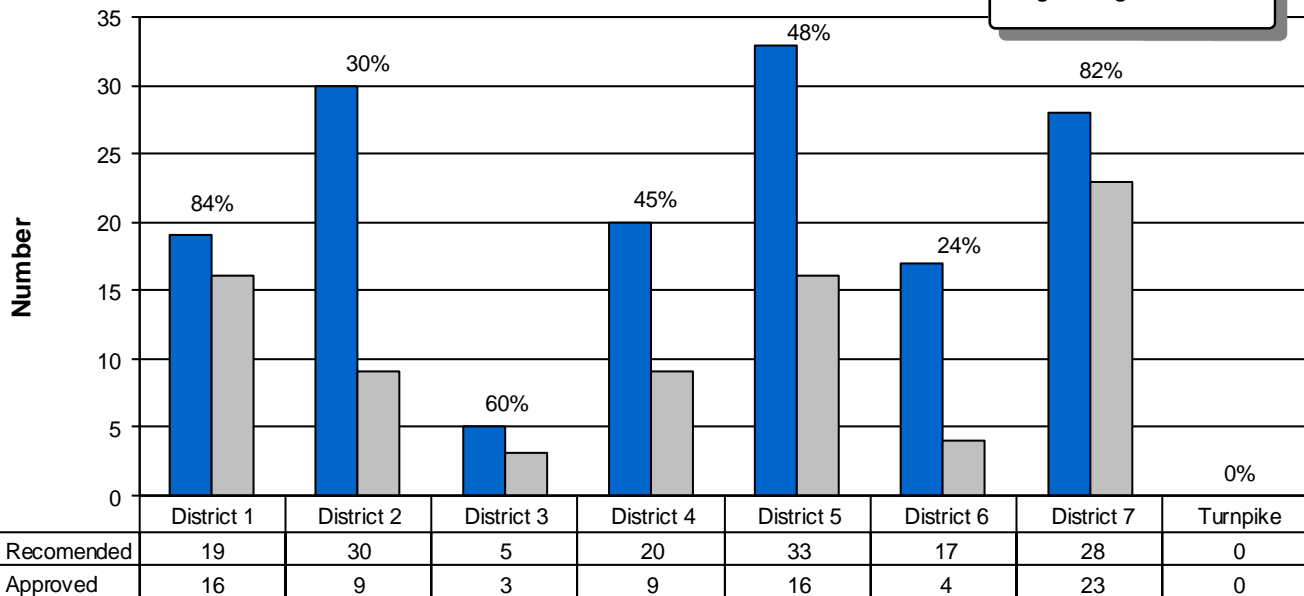
increasing the cost.

Adoption Rates

Q3: Annual Adoption Rate

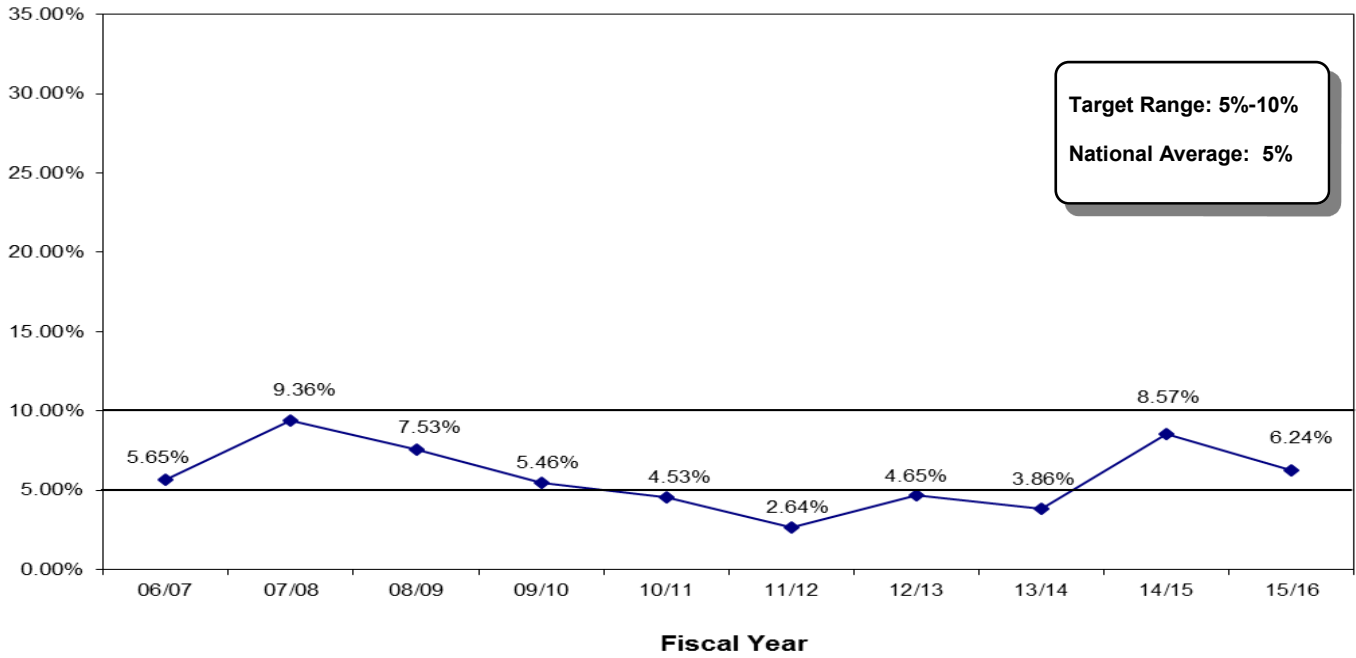


Q3: Adopted Recommendations Annual Report FY 2015/2016

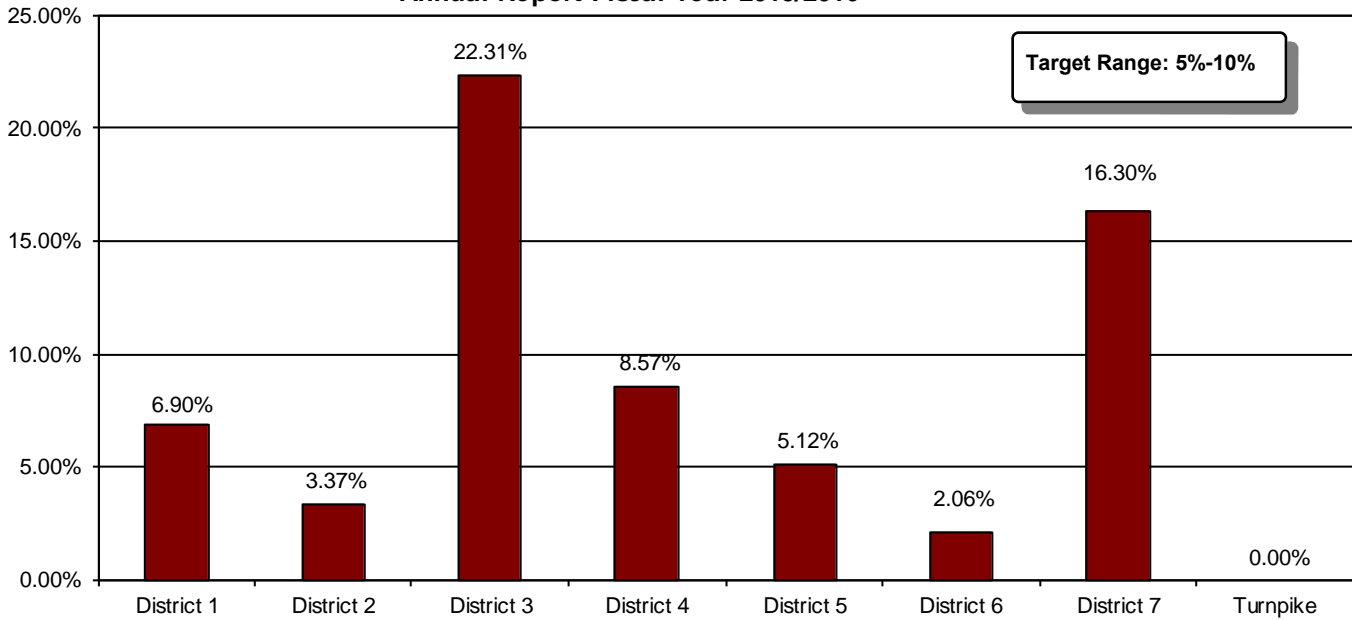


Percent Project Saved

Q4: Annual Percent Project Saved

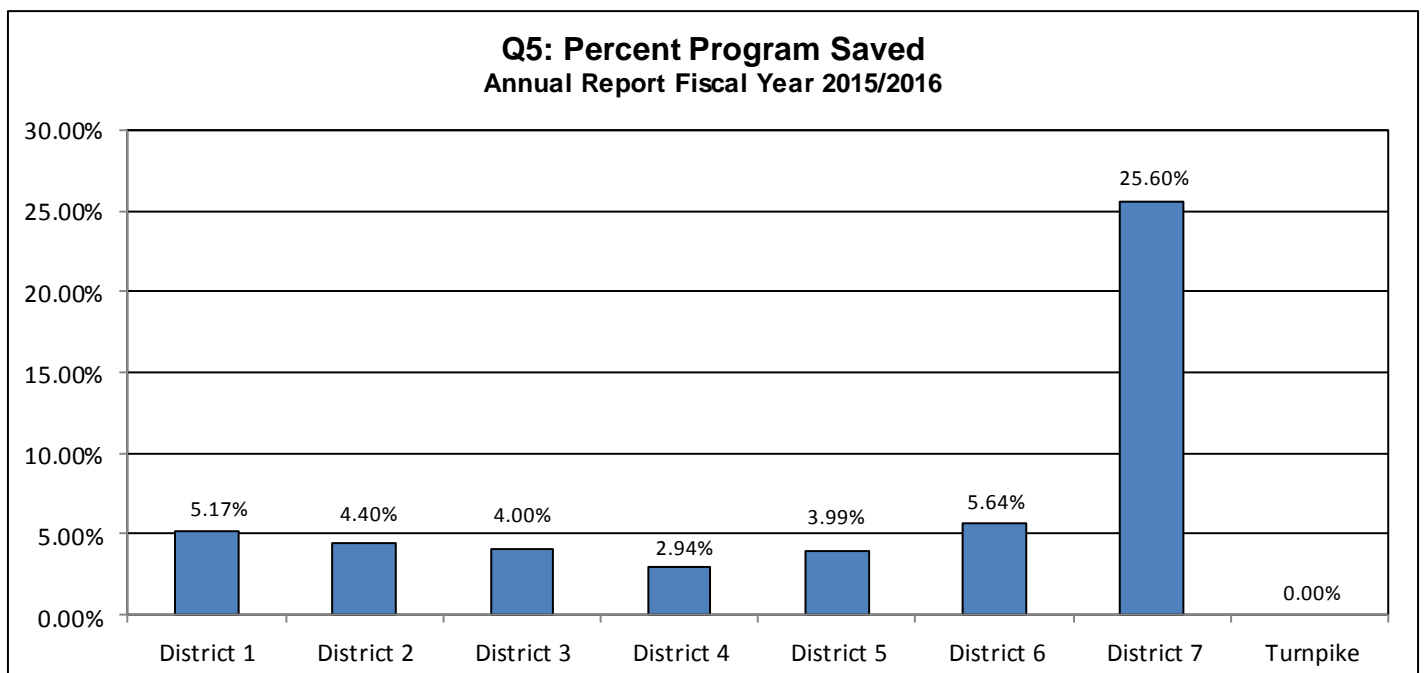
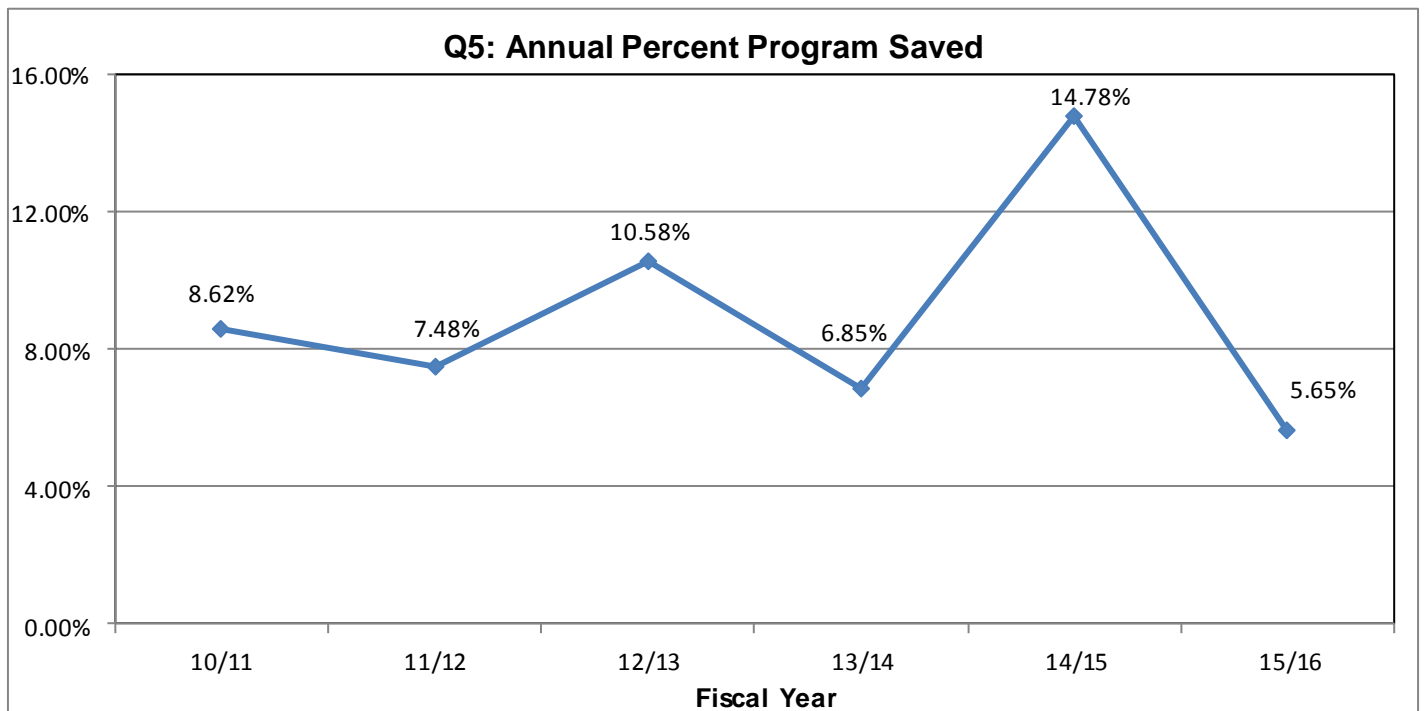


**Q4: Percent Project Saved
Annual Report Fiscal Year 2015/2016**



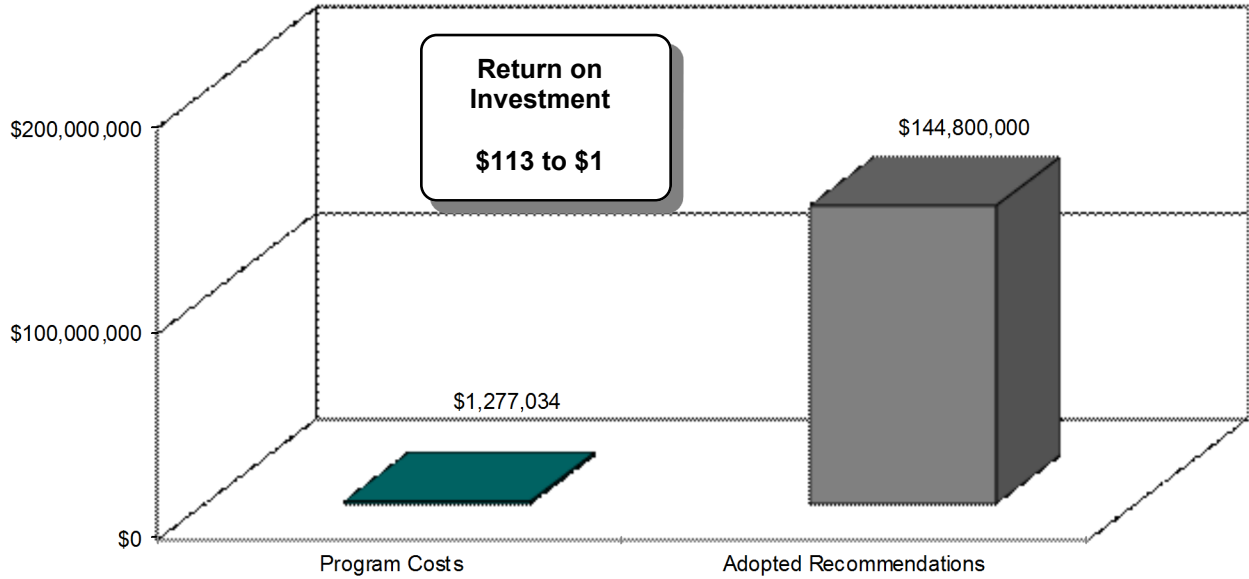
Percent Program Saved

The intent of the Percent Program Saved measure is to compare the cost avoidance/savings to the overall work program. The measure is calculated by dividing the three year average monthly lettings into the overall cost avoidance/savings.

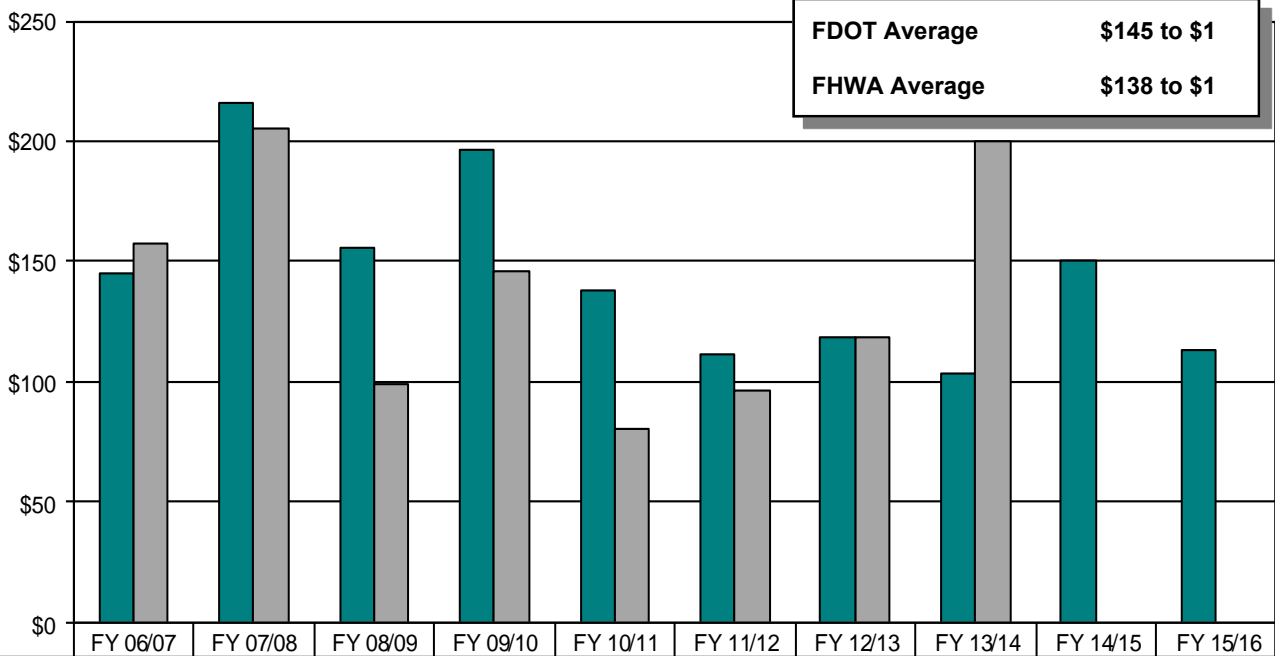


Return on Investment

Q6: Return on Investment
Annual Report Fiscal Year 2015/2016



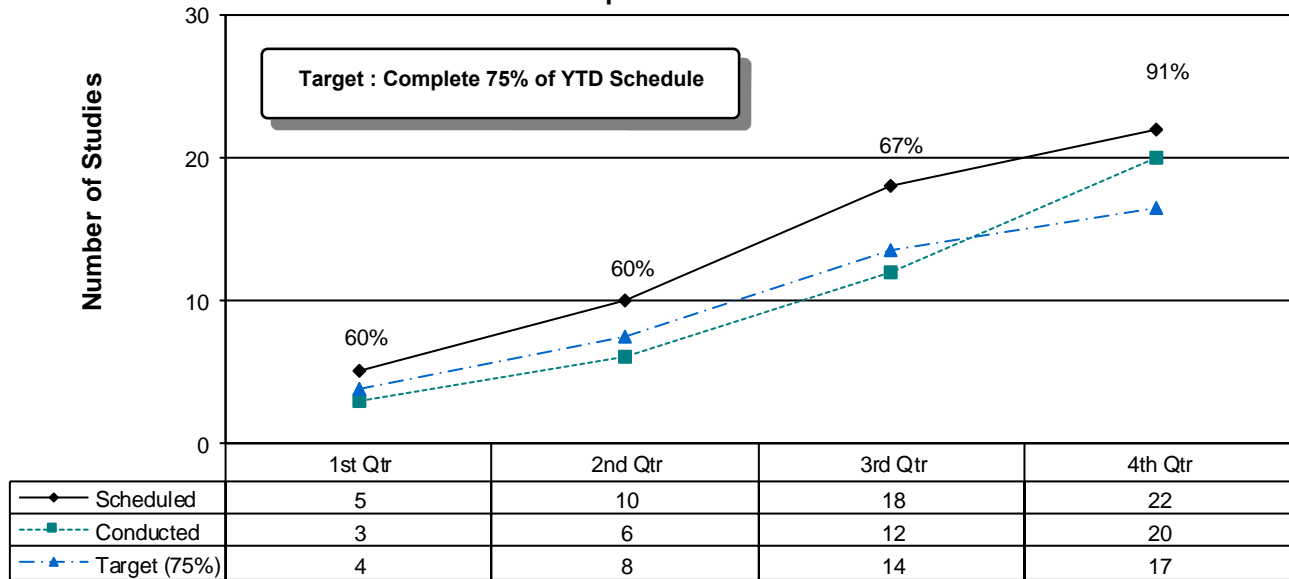
Q6: Annual Return on Investment



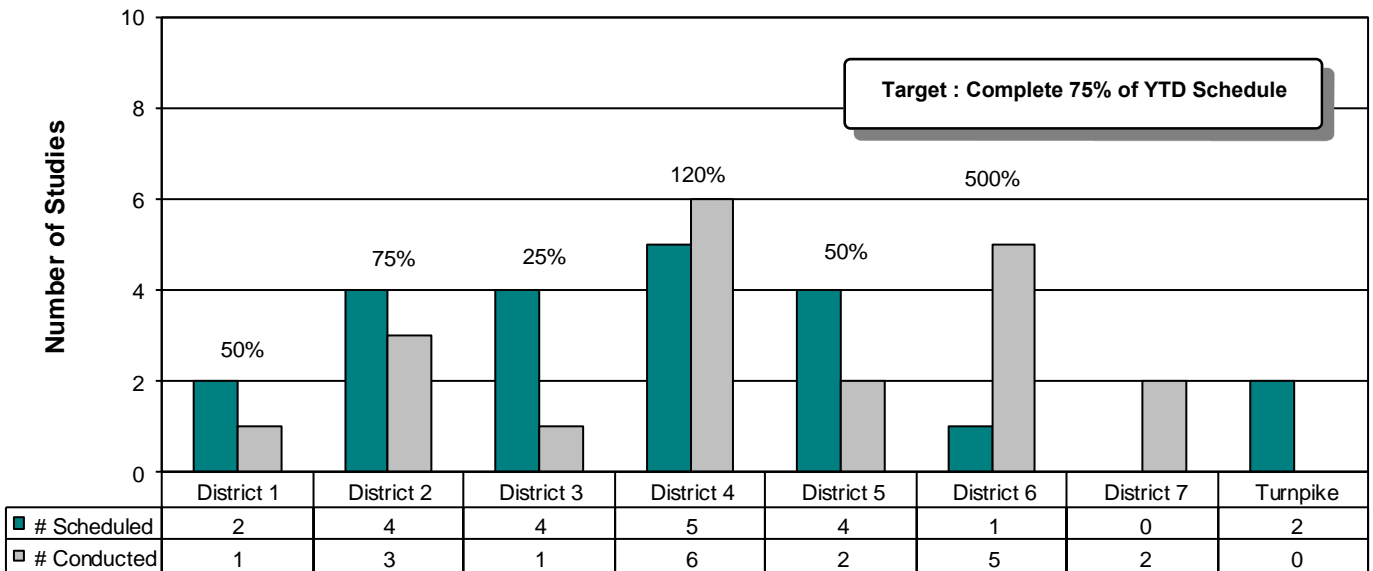
	FY 06/07	FY 07/08	FY 08/09	FY 09/10	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16
■ FDOT	\$145	\$216	\$156	\$196	\$138	\$111	\$118	\$103	\$150	\$113
■ FHWA Avg.	\$157	\$205	\$99	\$146	\$80	\$96	\$118	\$200		

Work Plan Completion

P1: VE Studies Scheduled vs. Completed
Annual Report FY 2015/2016



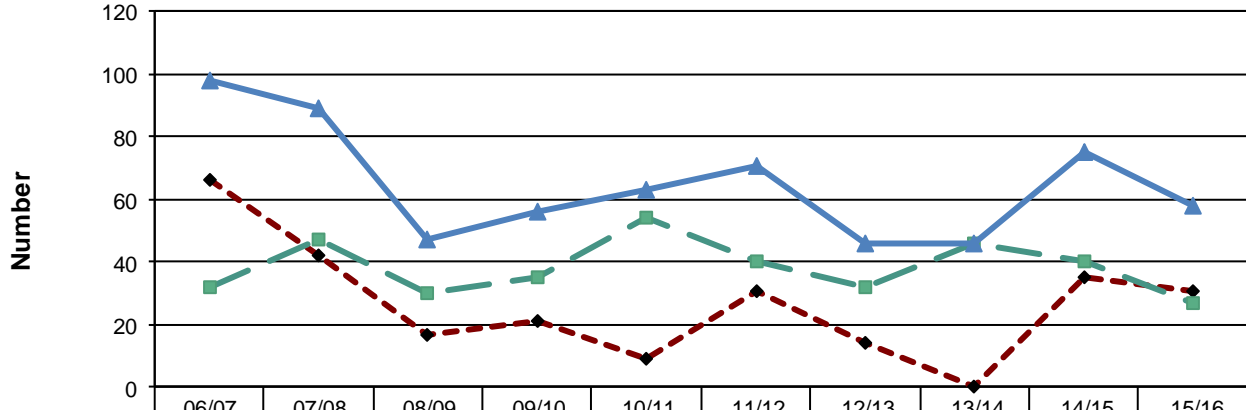
P1: VE Studies Scheduled vs. Completed
Annual Report FY 2015/2016



* District 7 or Turnpike Enterprise did not submit a Work Plan as required. District 6 did not have any planned studies

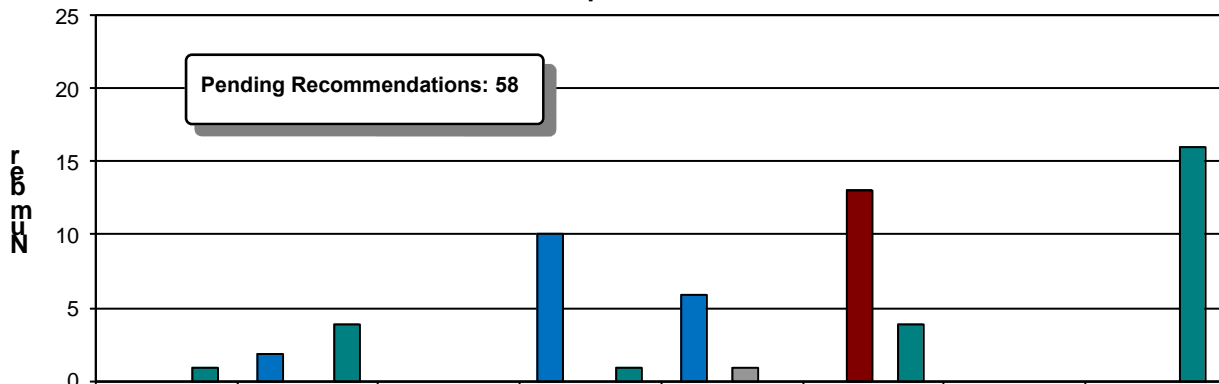
Pending Recommendations

P2: Annual # Pending Recommendations
Annual Report FY 2015/2016



	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14	14/15	15/16
0 - 6 Months	66	42	17	21	9	31	14	0	35	31
> 7 Months	32	47	30	35	54	40	32	46	40	27
Total	98	89	47	56	63	71	46	46	75	58

P2: # Pending Recommendations
Annual Quarter Report FY 2015/2016

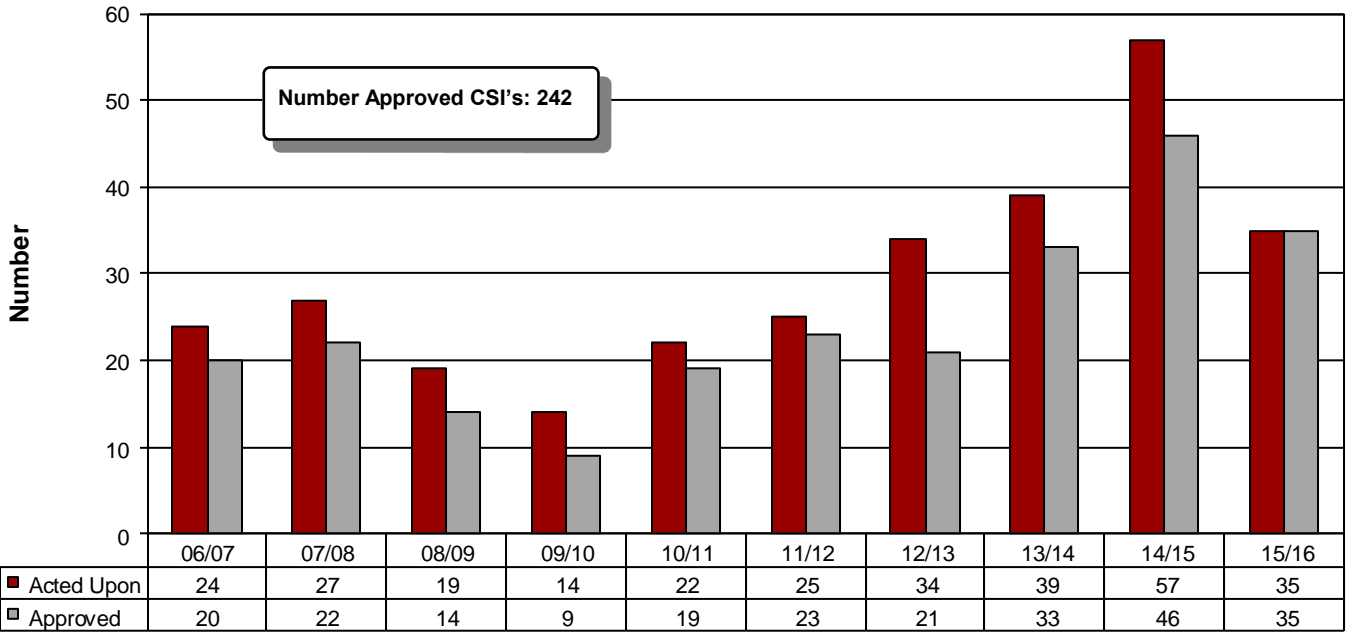


	District 1	District 2	District 3	District 4	District 5	District 6	District 7	Turnpike
0 - 3 Months	0	2	0	10	6	0	0	0
4 - 6 Months	0	0	0	0	0	13	0	0
7 - 12 Months	0	0	0	0	1	0	0	0
> 12 Months	1	4	0	1	0	4	0	16

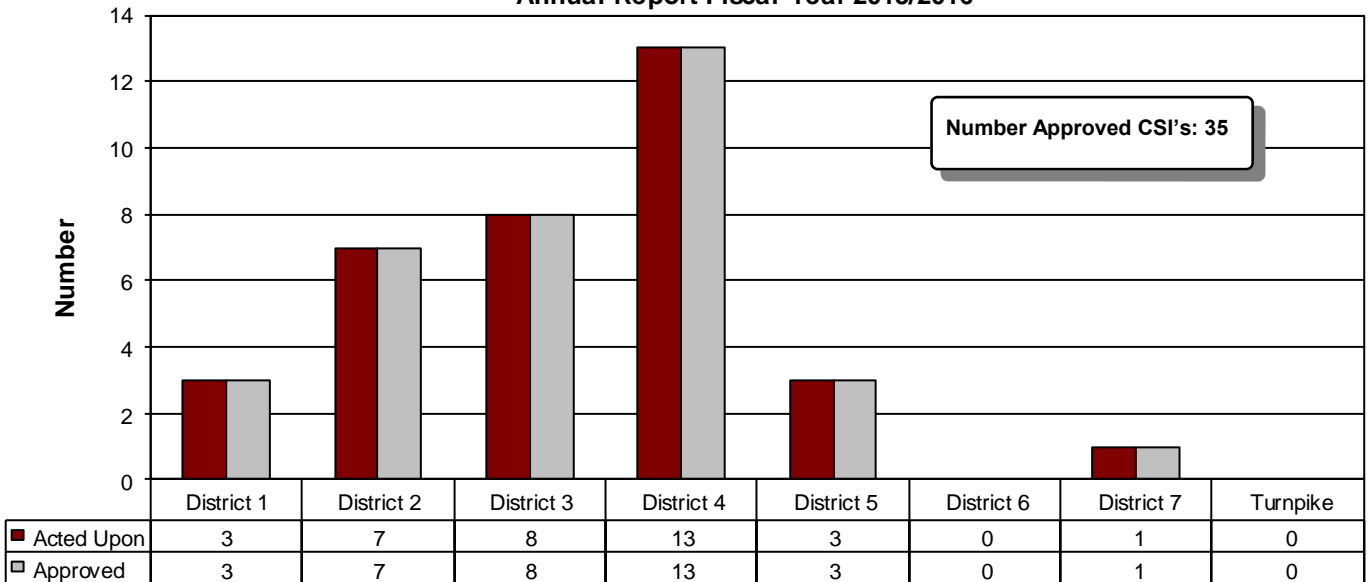
**Fiscal Year 2015/2016
Cost Savings Initiative
Performance Measures**

CSI Summary

Q1: Annual CSI Acted Upon



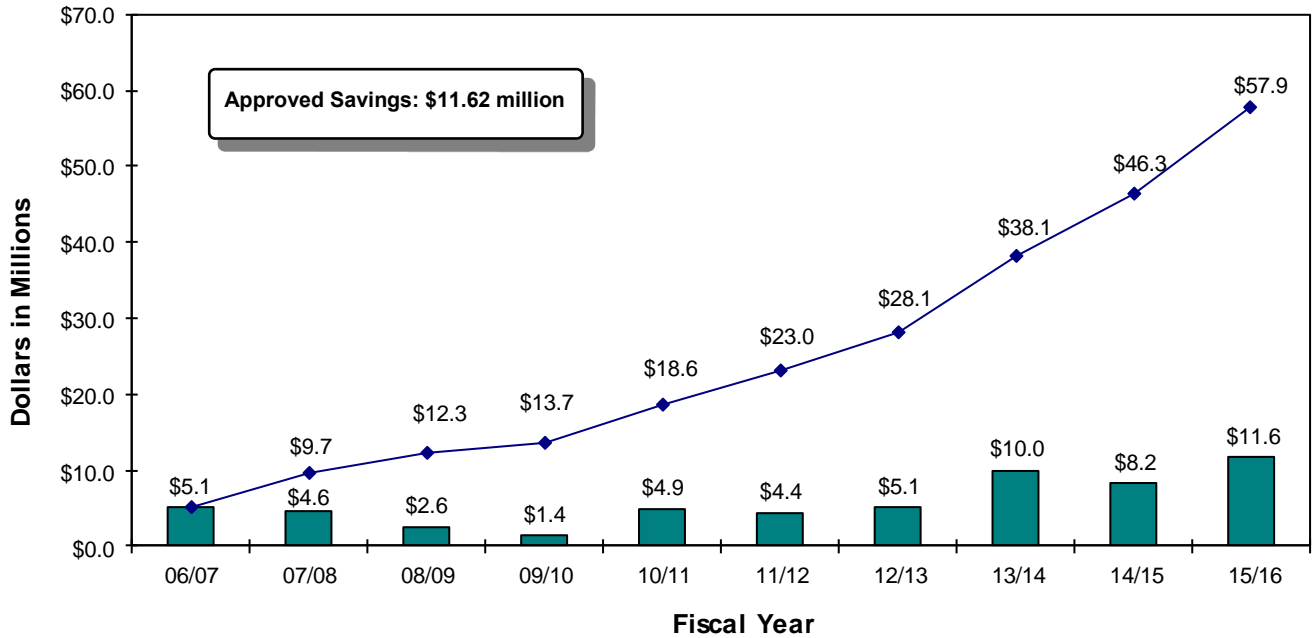
**Q1: CSI's Acted Upon
Annual Report Fiscal Year 2015/2016**



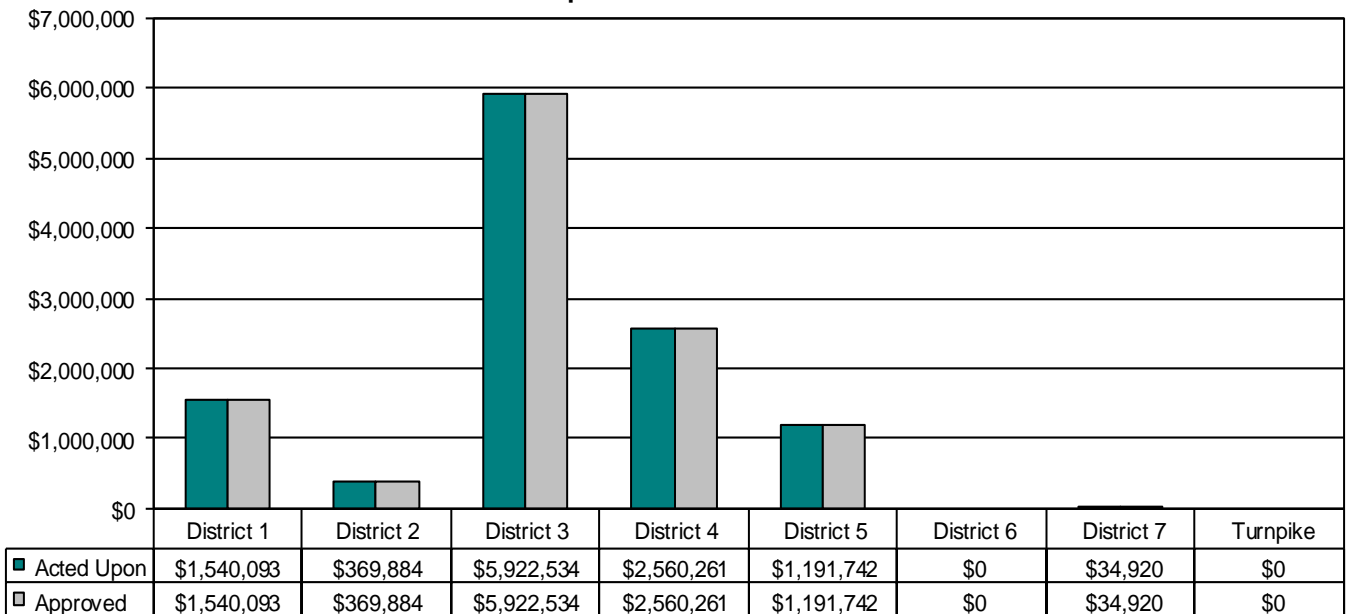
* Prior to fiscal year 2010/2011, Cost savings Initiatives (CSI) were formerly referred to as Value Engineering Change Proposals (VECP's).

CSI Approved Savings

Q2: Cumulative CSI Construction Cost Savings



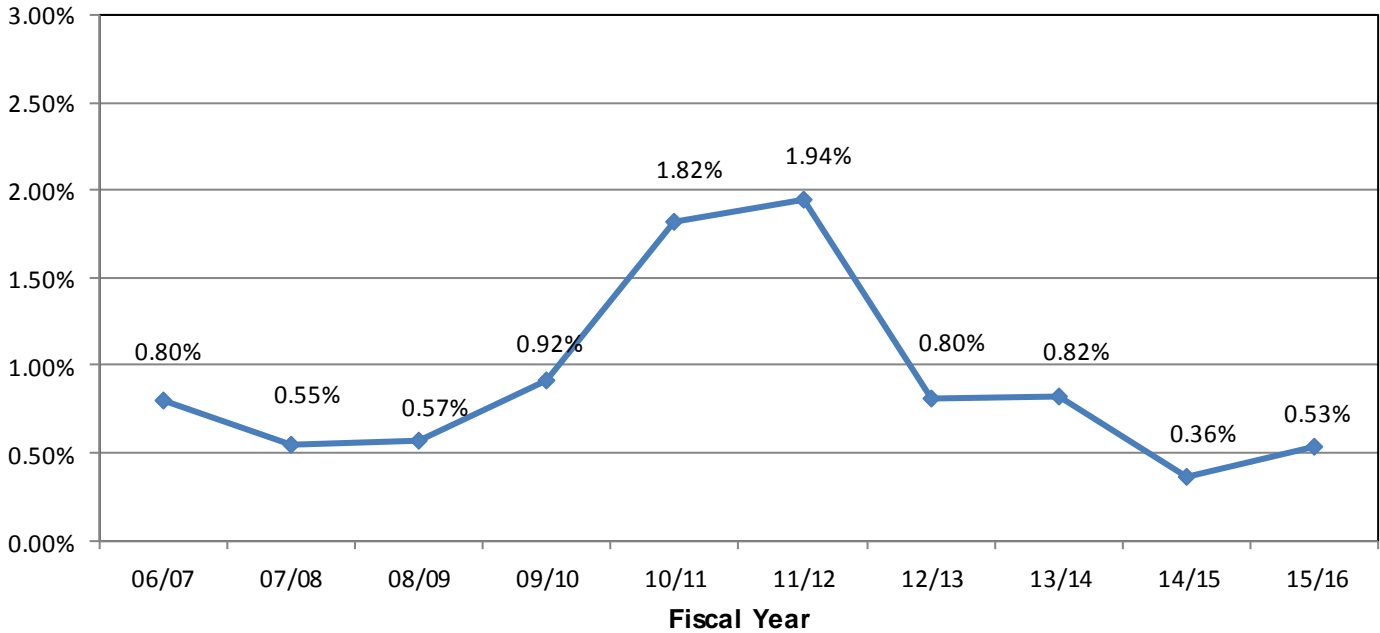
Q2: Approved CSI Savings Annual Report Fiscal Year 2015/2016



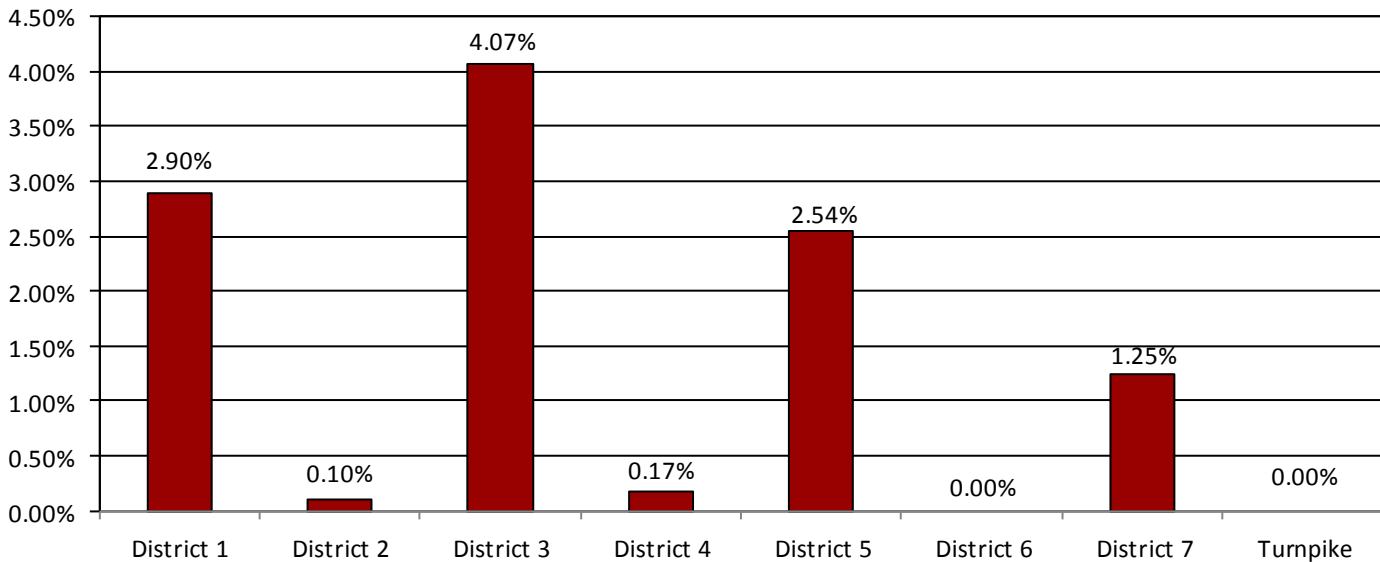
* Prior to fiscal year 2010/2011, Cost savings Initiatives (CSI) were formerly referred to as Value Engineering

CSI Percent Project Saved

Q3: CSI Percent Project Saved
Annual Report Fiscal Year 2015/2016



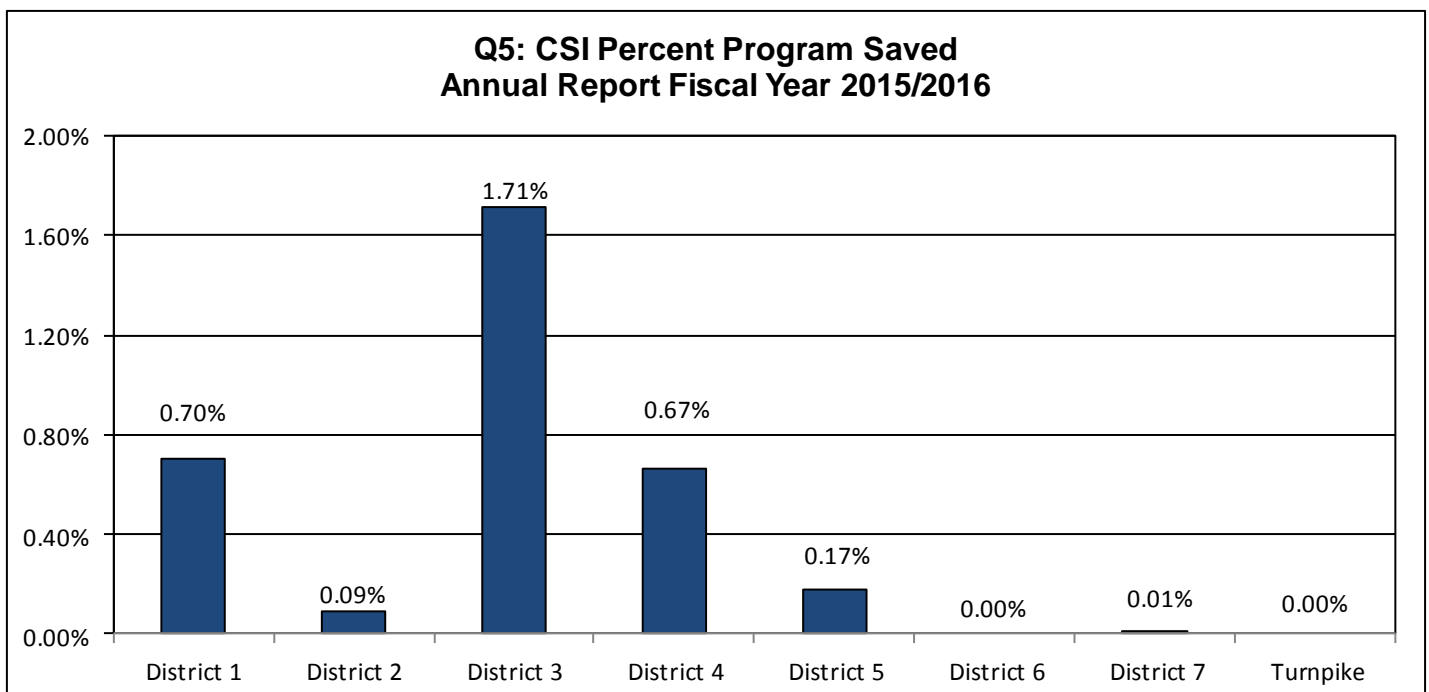
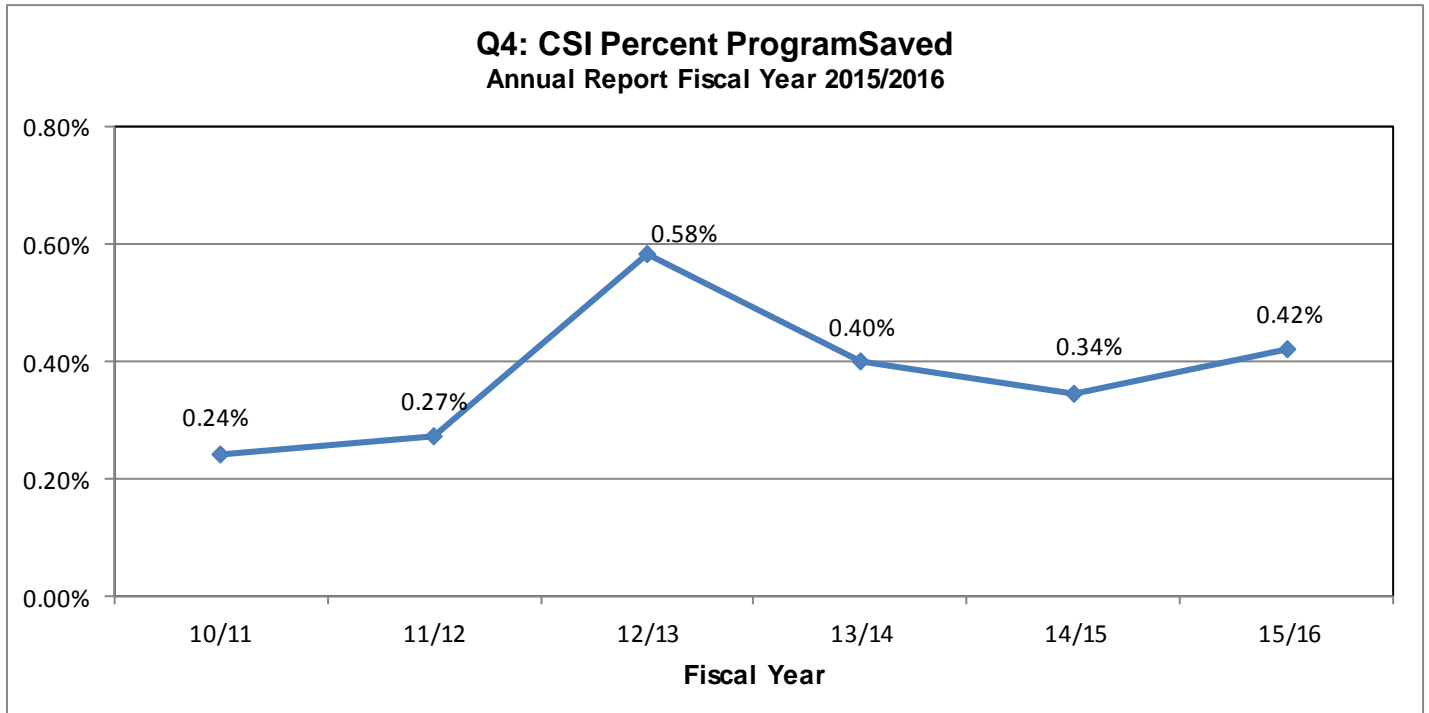
Q3: CSI Percent Project Saved
Annual Report Fiscal Year 2015/2016



* Prior to fiscal year 2010/2011, Cost savings Initiatives (CSI) were formerly referred to as Value Engineering Change Proposals (VECP's).

CSI Percent Program Saved

The Percent Program Saved is a new measure. The intent is to compare the cost avoidance/savings to the overall work program. The measure is calculated by dividing the three year average monthly lettings into the overall cost avoidance/savings.



Appendix

Process Control Systems

Process Control System

Process Name: Value Engineering Program		Product/Service: Perform Value Engineering analysis or select projects and document findings		Primary Customers: Management Regulators: FHWA		Customer's Valid Requirements: Checks use of resources to produce a quality transportation system.		Regulator's Valid Requirements: Projects that meet the requirements of 23 CFR 657 have a VE Analysis conducted in accordance with 23 CFR 657.			
Input/Process/Supplier: Risk Program		Flow Chart									
Step / Time	Dept / Process	DISTRICT VALUE ENGINEER	VALUE ENGINEERING TEAM	STATE VALUE ENGINEER	Process and Quality Measures (QA/QC)		Checking / Measurement Monitoring		Miscellaneous Information		
					Process Measures (QA/QC) Control Limits And Specs / Targets Quality Measures		Checking Item What to be checked?	Frequency When to check?	Responsibility Who will check?	QAR Date of Last Review	- Abbreviations - Procedures - Reference - Notes, etc.
PROJECT SELECTION					75% 3 schedules completed	VDR & Work Plan	Monthly	DVE	D1-12009 C	Federal Regulations 23 CFR 657	
TEAM SELECTION					# of pending proposals per time period 333 based on per time period Value added \$/hour time period	VDR	Monthly	DVE	D2-112015 C	VE Procedure 625-034-002 AASTTO Guidelines for VE	
STUDY					48%-67% Percent report based	VDR	Monthly	DVE	D3-12009 C	MCHRP System's 302 - Value Engineering Applications to Transportation	
RESOLUTION					2% Percent on hand \$100 to \$1	VDR	Monthly	DVE	D4-12015 C		
REPORTING						VDR	Annual	DVE	D5-12009 C		
									D6-120215 C		
									D7-12009 C		
									TRAC 12316 C		
									COOES		
									C-Compliance NC - Noncompliant BP Best Practice		

Approved: _____ Date: _____ Process Owner: State Value Engineer Rev # 1.6 Rev Date: 3/2016

Process Control System

Process Control System		Flow Chart	Checking / Indicator Monitoring	Miscellaneous Information
Process Name: Value Engineering Project Selected on Budget/Service/Develop a Value Engineering Work Plan by July 1 of each fiscal year. Partners: FHMMA	Primary Customers: District Management, State Value Engineer. Partners: FHMMA	DISTRICT VALUE ENGINEER	Process and Quality Indicators	Regulator's Value Requirements: All projects with the most potential for improvement have a VE Analysis. million plus & VE analysis
Project/Program	DISTRICT MANAGEMENT	DISTRICT VALUE ENGINEER	Process Indicators	Checking / Indicator Monitoring
Dept / Phase / Step / Time	DISTRICT VALUE ENGINEER	DISTRICT MANAGEMENT	Process Indicators	Checking / Indicator Monitoring
NEED			Process Indicators: Quality Indicators (A) % of projects approved (B) % of projects reviewed	Regulator's Value Requirements: All projects with the most potential for improvement have a VE Analysis. million plus & VE analysis
REVIEW			Control Limits: 100% Goals: 100%	Checking Item: Work Plan Reviewed Frequency: Annual Who will check?: SVE Date of Last Review: 01-1-2009
DRAFT			Control Limits: 75% Goals: 75%	Checking Item: VES & Work Plan Frequency: Quarterly Who will check?: SVE Date of Last Review: 01-1-2009
APPROVAL			Control Limits: 100% Goals: 100%	Checking Item: Work Plan Reviewed Frequency: Annual Who will check?: SVE Date of Last Review: 01-1-2009
DISTRIBUTE			Control Limits: 100% Goals: 100%	Checking Item: Work Plan Reviewed Frequency: Annual Who will check?: SVE Date of Last Review: 01-1-2009
EXECUTE			Control Limits: 100% Goals: 100%	Checking Item: Work Plan Reviewed Frequency: Annual Who will check?: SVE Date of Last Review: 01-1-2009

Process Control System

Process Control System									
Process Name: Value Engineering Team Selection	Product/Service: Team with the necessary skills and experience to conduct a value engineering analysis	Primary Customers: Team Leader & Team Members	Flow Chart				Valid Requirement(s): Multi-disciplined team of individuals personally involved in the design of the project	Regulator's Valid Requirement(s): Multi-disciplined team of individuals personally involved in the design of the project	
DISTRICT VALUE ENGINEER		DEPARTMENT HEAD		STATE VALUE ENGINEER				Checking / Indicator Monitoring	Miscellaneous Information
Input: Project description Scope(s): Department needs, Consultants	Output: Project description Scope(s): Department needs, Consultants	Process and Quality Indicators	Checking Item	Timeframe (Frequency)	Responsibility	Date of Last Review			
Dist/Prncr Suo / Tne	Dist/Prncr Suo / Tne	Process Indicators Quality Indicators	What is to be checked?	When to check?	Who will check?	GAR			
NEED	NEED	<p>1. # of teams (6)</p> <p>2. # of teams with the correct educational backgrounds (6)</p> <p>3. # of team leaders and meeting qualifications (6)</p>	<p>VED & VE Study Report</p> <p>VER & VE Study Report</p> <p>VDR, VE Study report, SAGE, LIFE, TRS58</p>	<p>Annual</p> <p>Annual</p> <p>Annual</p>	<p>SVE</p> <p>SVE</p> <p>SVE</p>	<p>01-11-2004 C</p> <p>02-11-2010 C</p> <p>03-12-2006 C</p> <p>04-11-2015 C</p> <p>05-10-2007 C</p> <p>06-12-2015 C</p> <p>07-11-2006 C</p> <p>TRC-10-2016 C</p>	<p>Federal Regulation 23 CFR 627</p> <p>VE Procedure 625-03-002</p> <p>AASHTO Guidelines for VE</p> <p>NCHRP Synthesis 352 - Value Engineering Applications in Transportation</p>		
CONSULTANT REQUESTS	CONSULTANT REQUESTS						<p>Abbreviations</p> <ul style="list-style-type: none"> - Procedure - Reference - Notes, etc. 		
TEAM SELECTION	TEAM SELECTION						<p>Compliance</p> <p>NC - Non-compliant</p> <p>RP - Best Practice</p>		
NOTIFICATION	NOTIFICATION								

Process Control System

Process Name: Conduct Value Engineering Study Product/Service: Completed VE Analysis with a report summarizing the findings of the team. Primary Customers: Management & DVE. Partners: CH2M, State Value Engineer.		Customer's Valid Requirements: Follow the VE Job Plan to produce quality recommendations that can be implemented.	Regulator's Valid Requirements: Follow industry recognized systematic problem solving process that is used throughout private industry and government agencies.
Flow Chart			
District Value Engineer Conduct VE Study	VALUE ENGINEERING TEAM		
NEED	Information Phase: - Gather information about project from Project Manager, Designer and anyone else familiar with the project, including objectives, costs, constraints, and constraints. - Gather information about the present design from engineering reports, design plans, estimates, alternatives, report of way repairs. - Team identifies components and concerns of high cost. - Tools used during this phase include: Project Team Briefing, Site Visit and Photo Analysis.		
INFORMATION	Function Analysis Phase: - Team analyzes the project and defines the project functions using a recognized active, well-measurable team technique. - Team determines which functions can be improved, eliminated or combined. - Team identifies remaining functions as either Basic or Secondary Functions. - Tools used during this phase include: Random Function Identification, Function Analysis System Technique (FAST), Function Listing and Value Maps.		
CREATIVE	Creative Phase: - Team generates alternative ideas to perform the project functions by using creative techniques, such as brainstorming techniques.		
EVALUATION	Evaluation Phase: - Team evaluates and rejects the ideas with the greatest potential for development into fully supported recommendations. - Tools used during this phase include: Advantage and disadvantage comparison, evaluation matrix with weighted criteria.		
DEVELOPMENT	Development Phase: - Team develops the ideas with the greatest potential value into fully supported recommendations by establishing costs and back-up documentation needed to convey the benefit of the developed ideas. - Tools used during this phase include: sketches, cost estimates, Life Cycle Cost Analysis and allocation of data and other technical work.		
PRESENTATION	Presentation Phase: - Team presents its recommendations to management and appropriate staff with items allocated for question and answer. - Best VE Study report is developed during this study and is developed report.		
RESULTS	Enter data into VE database		
Process and Quality Indicators		Checking / Indicator Monitoring	
Process Indicators (and Quality Indicators)	Control Limits (and Specs / Targets)	Checking Item (What is to be checked?)	Response (Who will check?)
80% Alignment	80% - 90%	VEB	SVE
Timeframe (Frequency) (When to check?)		Date of Last Review	
Monthly		01-10-2006 C 02-10-2015 C 03-10-2016 C 04-11-2015 C 05-10-2017 C 06-10-2015 C 07-11-2016 C 08-10-2016 C	
Miscellaneous Information			
- Abbreviations - Procedure Reference - Notes, etc.			
Federal Regulation 23 CFR 327 VE Procedure 030-030-002 999-653110 (submittal to VE) NCHRP Synthesis 333 - Value Engineering Applications in Transportation			
CODES C- Compliance NC - Noncompliant BR Best Practice			

Process Control System

Process Name: Value Engineering Reporting Process		Product/Service: Razor detailing the needs of the Value Engineering Program		Primary Customers: Management Partners: PHMA		Customer's Valid Requirement(s): Report accurate results of the Value Engineering Program		Regulator's Valid Requirement(s): Report accurate results of the Value Engineering Program		Miscellaneous Information	
Regulator: Study Research Supplement: DVE		Flow Chart		Process and Quality Indicators		Checking / Indicator Monitoring		Checking / Indicator Monitoring		Miscellaneous Information	
Dept / Phase	Step / Time	STATE VALUE ENGINEER	DISTRICT VALUE ENGINEER	Process Indicators Quality Indicators	Control Limits And Specs / Targets	Checking Item What is to be checked?	Timeframe (Frequency) When to be checked?	Responsibility Who will check?	QAR Date of Last Review	Miscellaneous Information	
NEED											
MAINTAIN FILES		<p> P - Final construction Monthly Report completed by Production Management Office C - Annual Report prepared by July 31st P - PHMA Annual Report prepared by July 31st C - PHMA Annual Report prepared by July 31st </p>									
DATA VERIFICATION											
REPORT											
										FEDERAL REGULATIONS 29 CFR 837 VE Procedure 603-008-002 1999 AASHTO Guidelines for VE Michigan Symbols 200 - Value Engineering Applications to Transportation	
										CODES C- Completion NC - Nonconformant BP - Best Practice	

Process Control System

Process Name: Value Engineering Change Proposal		Product/Service: Resubmit to submit VCCP by the contractor	Primary Customers: Management, Contractor Priority: P/H/A		Customer's Value Requirements: Review and other approvals to reject the VCCP in a timely manner.	Regulator's Value Requirements: Program that encourages the use and resolution of VCCP during construction.			Miscellaneous Information										
Dept / Person Step / Time	Flow Chart										Checking / Indicator Monitoring			Miscellaneous Information					
	CONTRACTOR	RESIDENT ENGINEER	DISTRICT VALUE ENGINEER	REVIEWERS DESIGN CONST. OTHERS	DISTRICT CONSTRUCTION ENGINEER	DISTRICT DIRECTOR OF OPERATIONS	Process Indicators Quality Indicators	Control Units Specs / Targets	Checking Item What is to be checked?	Timeframe (Frequency) When to check?	Responsibility Who will check?	QAR Date of Last Review							
PRIOR TO BEGINNING OF CONTRACT TIME												VER	Quantity	DVS/DVE	01-11-2008 C	Who will check?	DVE/DVE	01-11-2008 C	<ul style="list-style-type: none"> • Addendums • Procedures • Relineation • Notes, etc.
AFTER CONTRACT TIME BEGINS												VER	Quantity	DVS/DVE	02-10-2008 C	Who will check?	DVS/DVE	02-10-2008 C	
SUBMITTAL												VER	Quantity	DVS/DVE	03-10-2008 C	Who will check?	DVS/DVE	03-10-2008 C	
REVIEW												VER	Quantity	DVS/DVE	04-5-2007 C	Who will check?	DVS/DVE	04-5-2007 C	
NOTIFICATION												VER	Quantity	DVS/DVE	07-11-2008 C	Who will check?	DVS/DVE	07-11-2008 C	
											VER	Quantity	DVS/DVE	08-5-2007 C	Who will check?	DVS/DVE	08-5-2007 C		
											VER	Quantity	DVS/DVE	09-11-2008 C	Who will check?	DVS/DVE	09-11-2008 C		
											VER	Quantity	DVS/DVE	10-5-2007 C	Who will check?	DVS/DVE	10-5-2007 C		
											VER	Quantity	DVS/DVE	11-11-2008 C	Who will check?	DVS/DVE	11-11-2008 C		