
Value Engineering Annual Report FY 2016/2017



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Executive Summary

Value Engineering During Project Development

The districts conducted 32 studies or 103% of the original number of studies scheduled for fiscal year 2016/2017. The original work plan had 31 studies scheduled for the year and the target was to complete 75% or 23 of the planned studies. Due to the dynamics of the department's work program, 7 of the 31 scheduled studies (23%) were either dropped from the work plan altogether or rescheduled for the 2017/2018 fiscal year, while 8 of the conducted studies were added to the original work plan.

During this same period, the districts acted on 226 recommendations, approving 135 for a 60% adoption rate. Ninety-eight of the approved recommendations resulted in \$480.3 million in project cost avoidance/savings. The remaining 37 approved recommendations were value added recommendations that increased project performance, while adding \$22.0 million to the project cost. Therefore, the total value of the approved recommendations, including the value added recommendations, produced **\$458.3 million in project cost avoidance/savings**.

The approved recommendations resulted in a 7.59% project saved, 16.30% program saved and a Return on Investment (ROI) of \$208 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 79 pending recommendations totaling \$906.1 million in potential cost avoidance/savings at the end of the 2016/2017 fiscal year. This is a 36% increase in the total number of pending recommendations and a 809% increase in the amount of pending dollars from the 4th quarter of last year. Forty-five of the 79 recommendations have been pending for more than 12 months, which is 57% 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

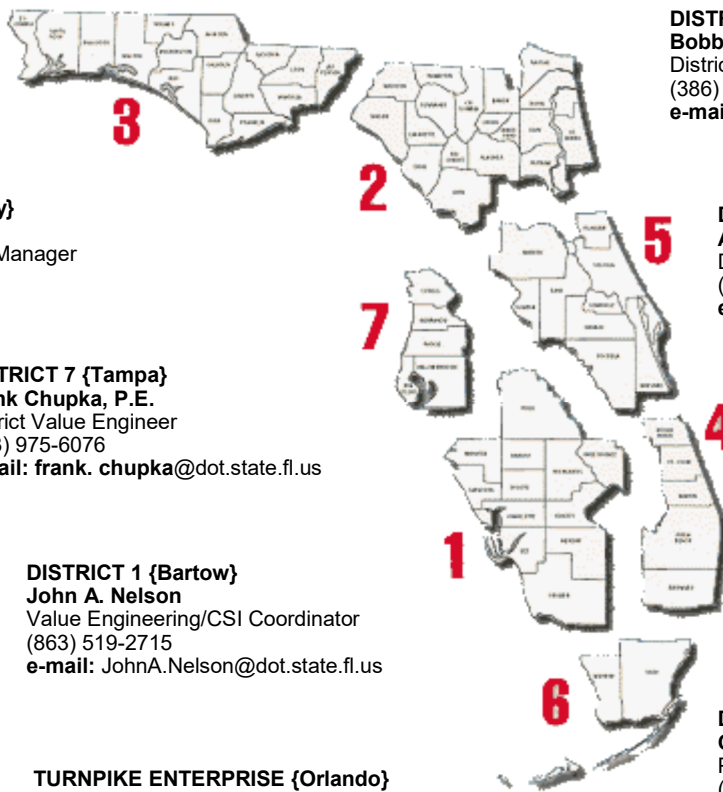
Twenty-eight Cost Savings Initiative (CSI)'s Proposals were submitted during fiscal year 2016/2017. During this same period, the districts approved 19 proposals totaling more than \$4.05 million in savings. The approved CSI proposals resulted in a 0.22% project saved and a 0.14% program saved. There are currently 6 pending CSI's totaling \$1.46 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 Florida.

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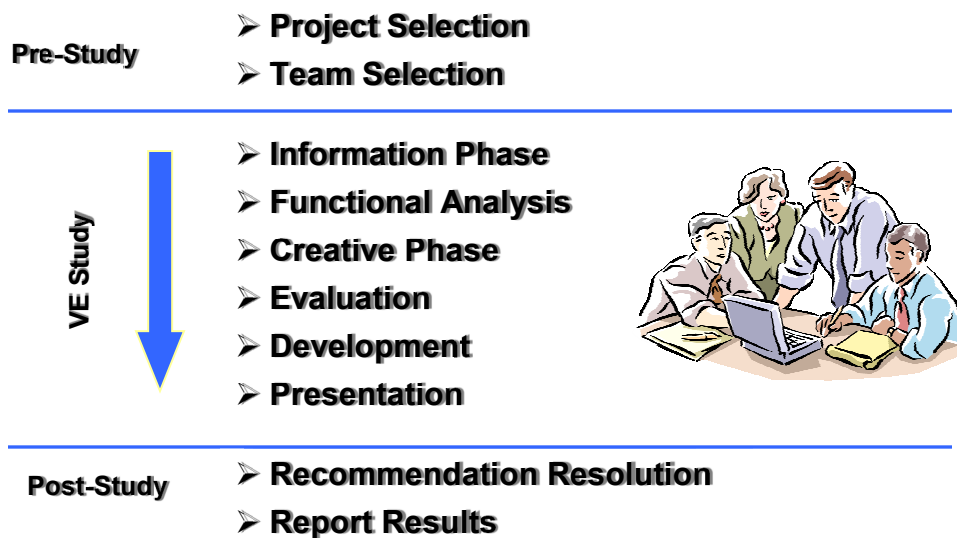
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Value Engineering Overview

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.

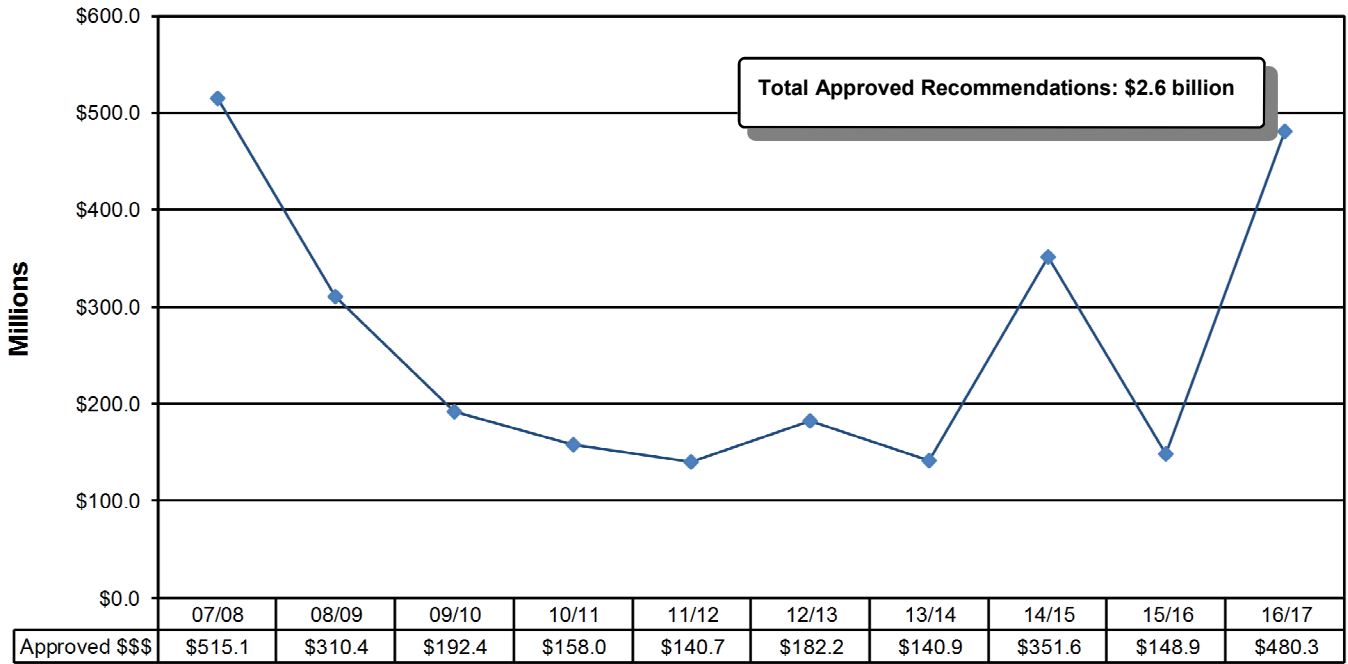
Performance Measures

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	$\frac{\text{Value of Approved Recommendations}}{\text{3 Year Monthly Average Lettings}}$

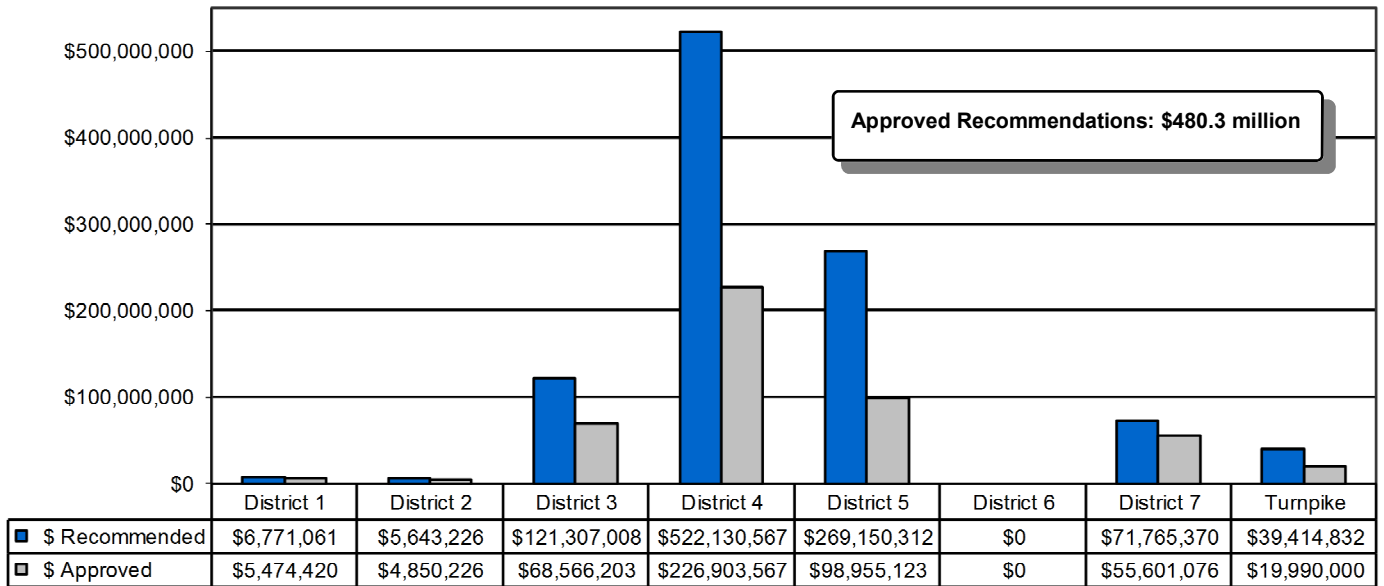
**Fiscal Year 2016/2017
Value Engineering
Performance Measures**

Adopted Recommendations

Q1: Annual Approved Cost Avoidance/Savings

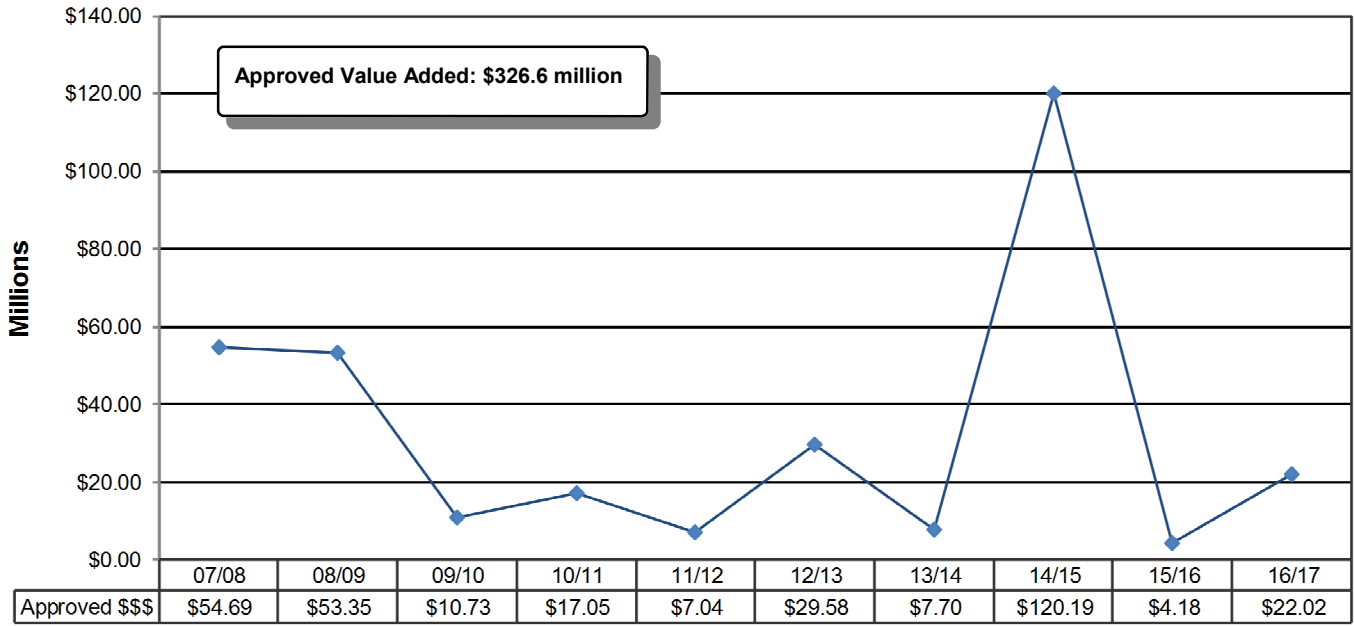


**Q1: Cost Avoidance Recommendations
Annual Report FY 2016/2017**

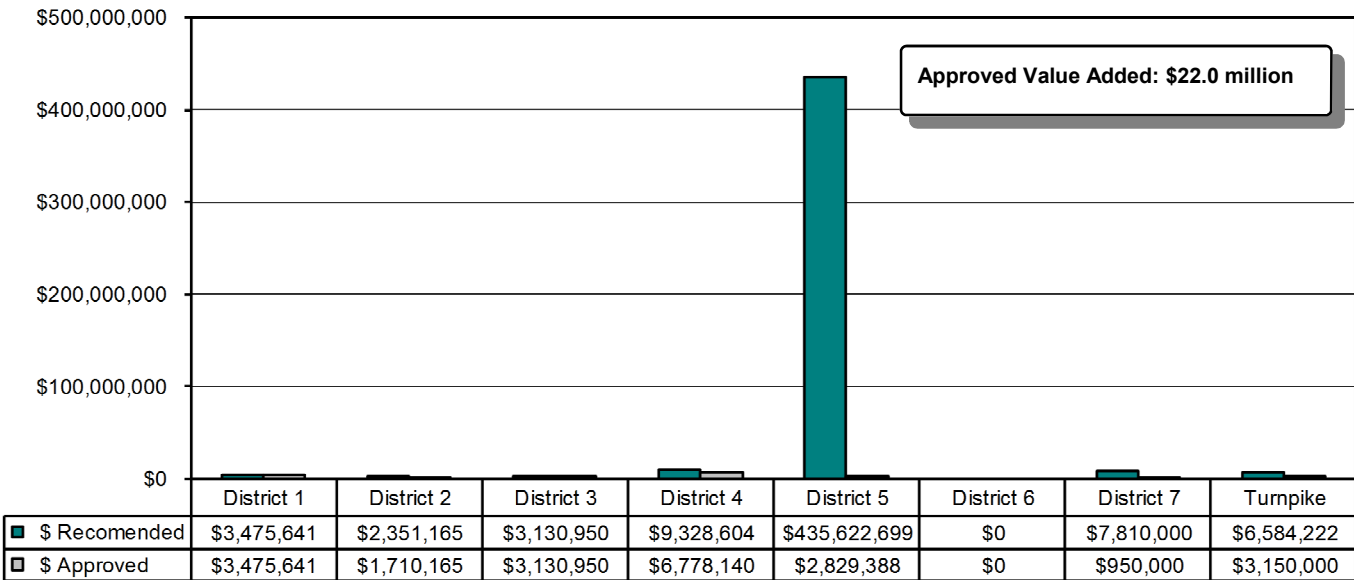


Adopted Recommendations

Q2: Annual Approved Value Added Recommendations



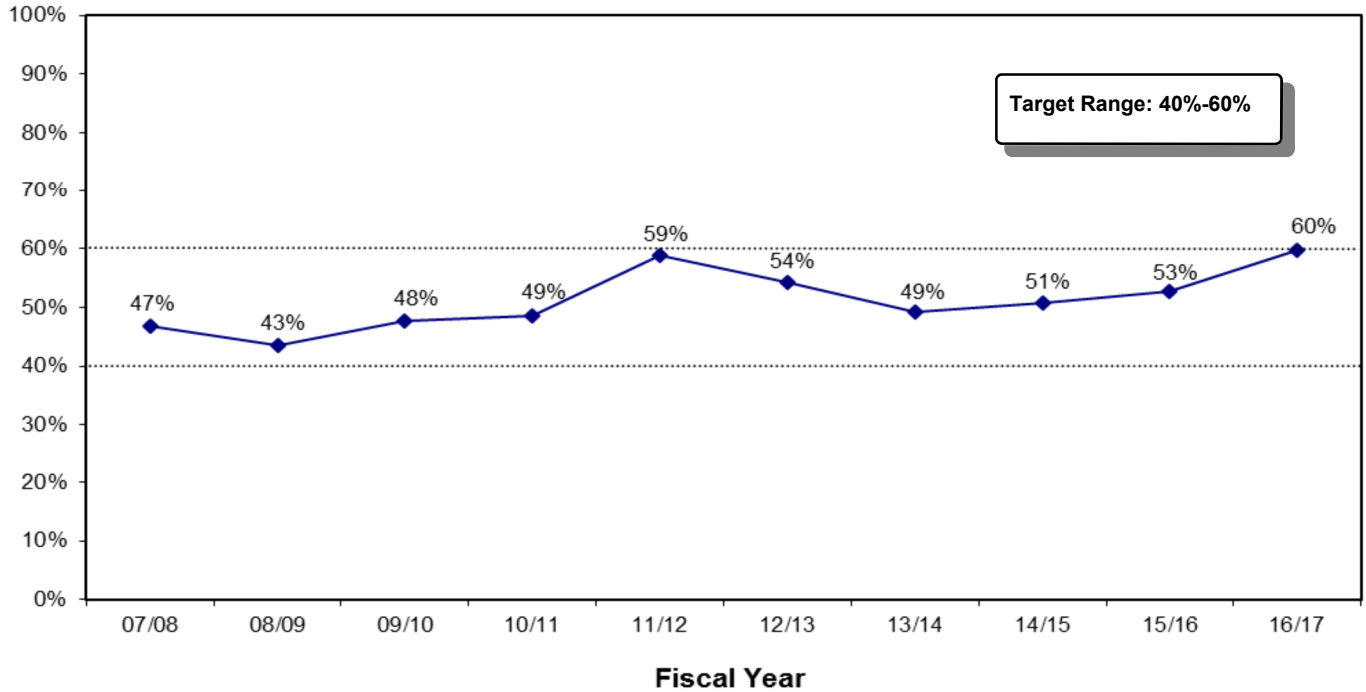
Q2: Value Added Recommendations Annual Report FY 2016/2017



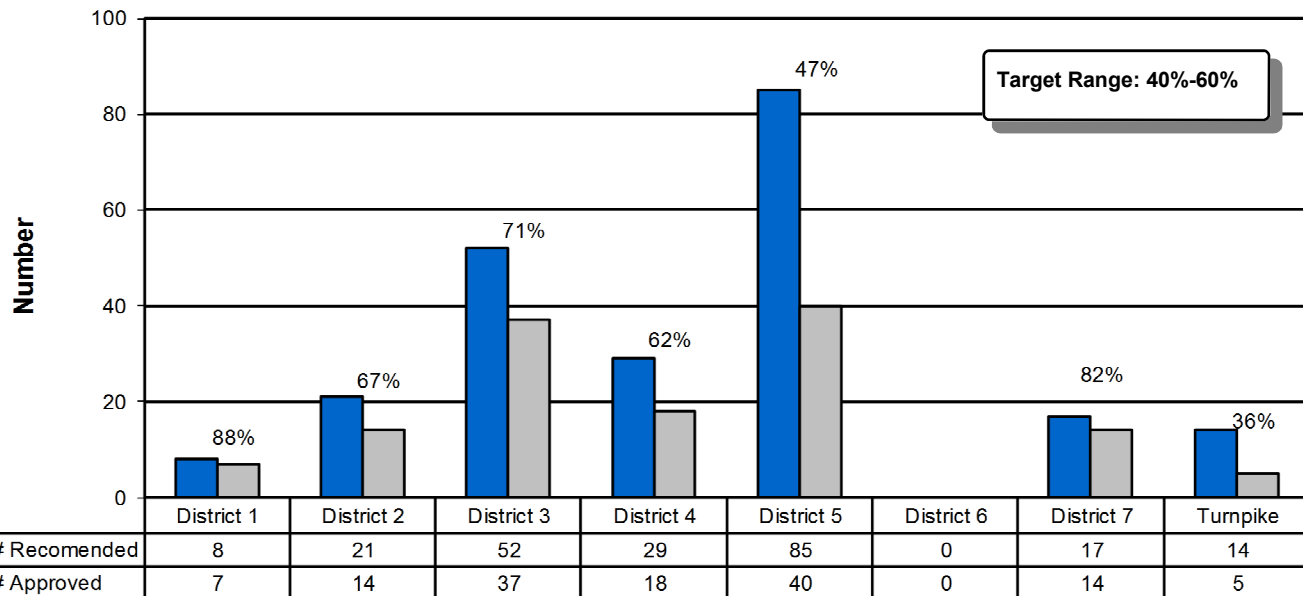
* A Value Added Recommendation significantly increases the performance of a function while also increasing the cost.

Adoption Rates

Q3: Annual Adoption Rate

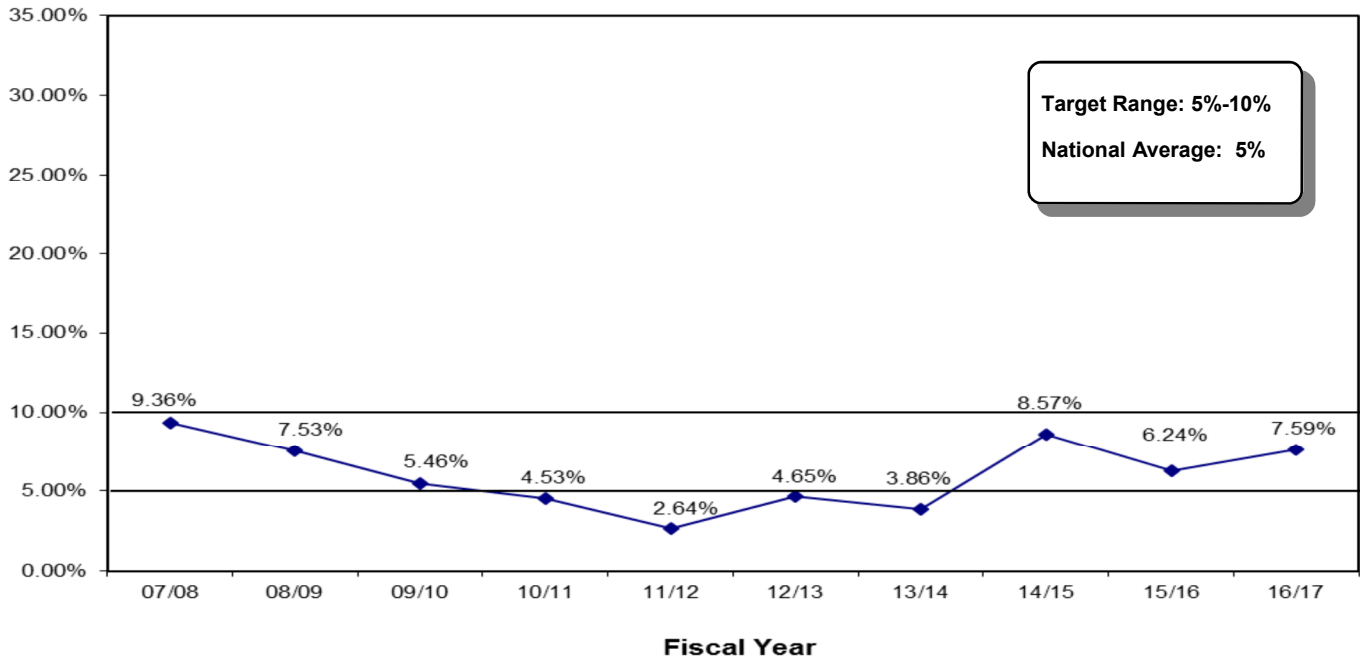


Q3: Adopted Recommendations Annual Report FY 2016/2017

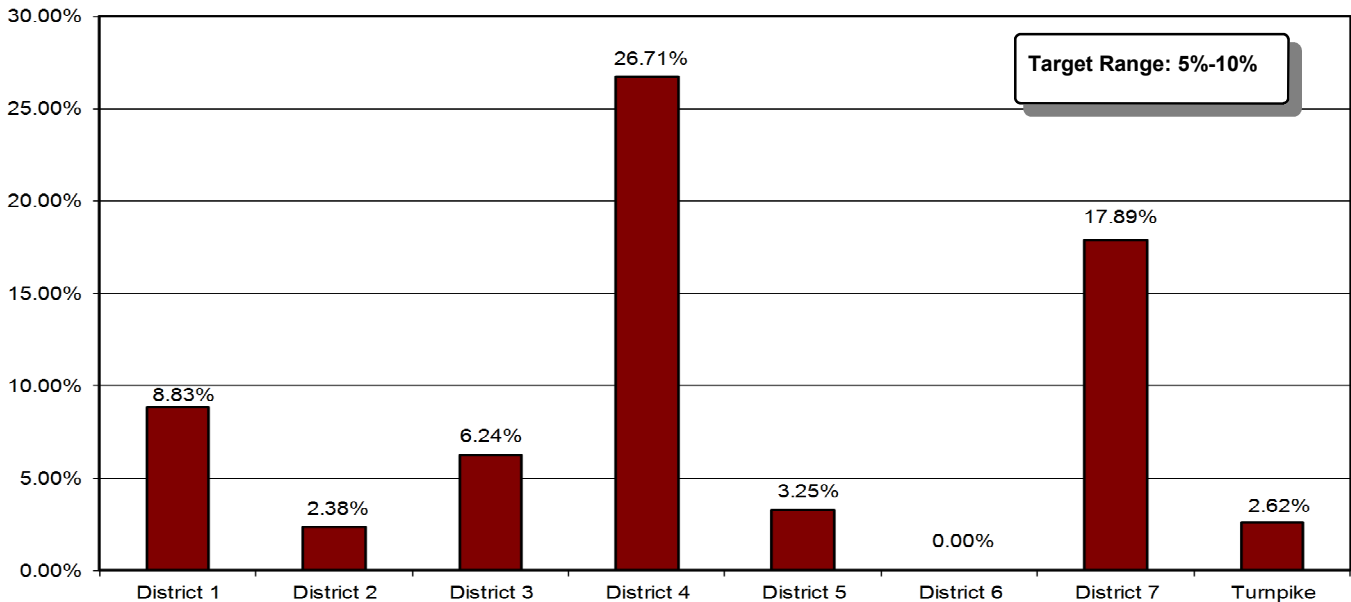


Percent Project Saved

Q4: Annual Percent Project Saved

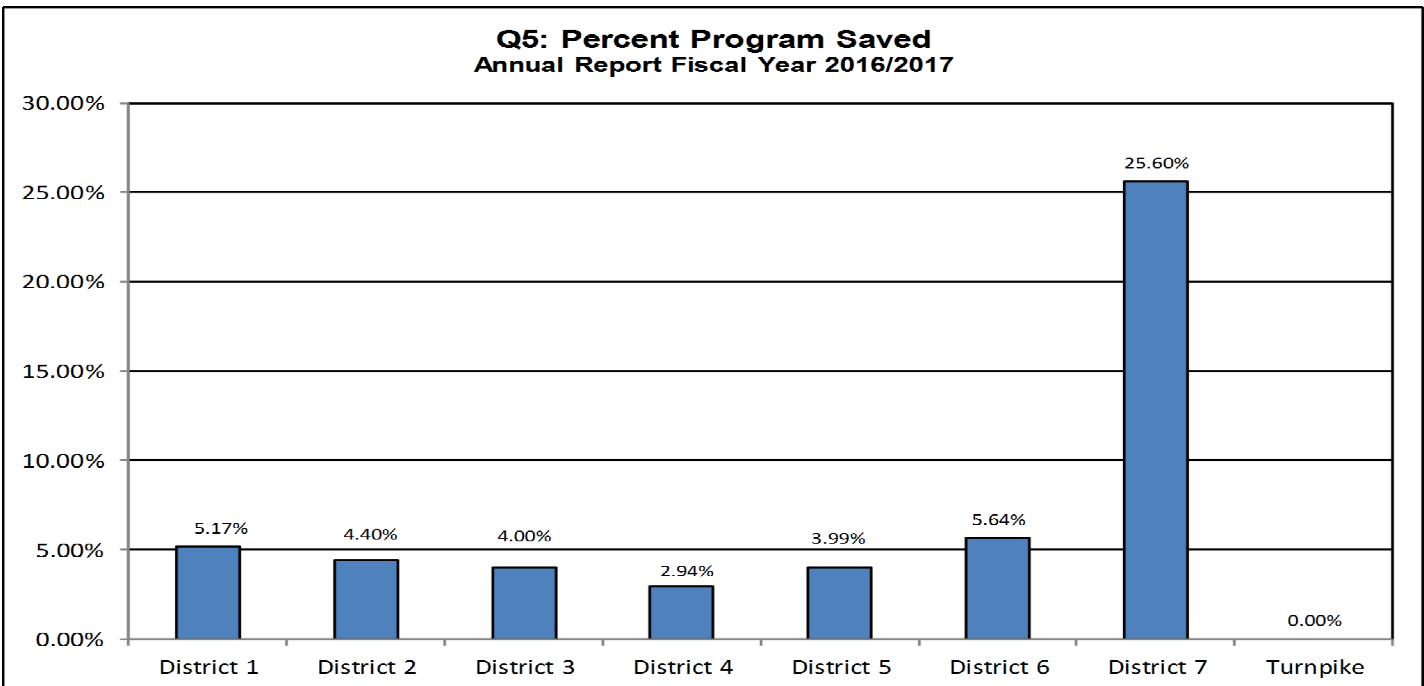
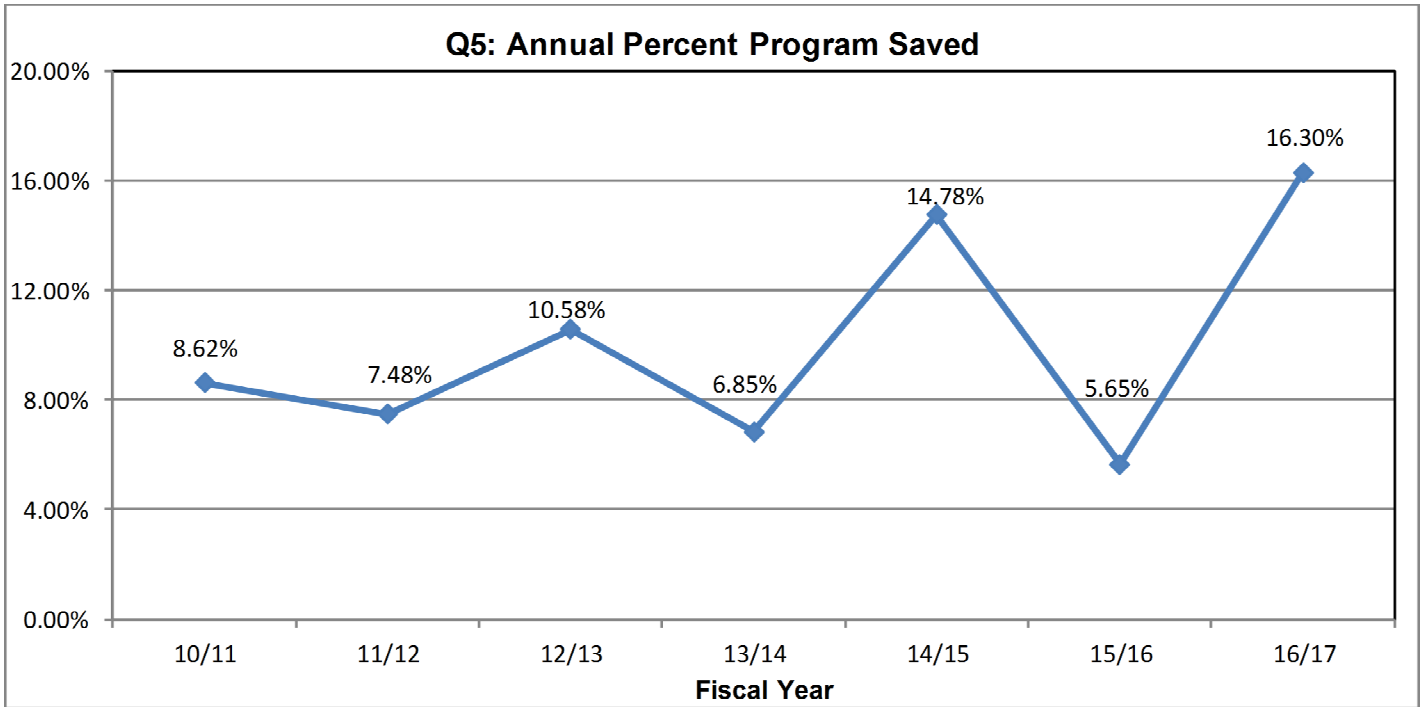


**Q4: Percent Project Saved
Annual Report Fiscal Year 2016/2017**



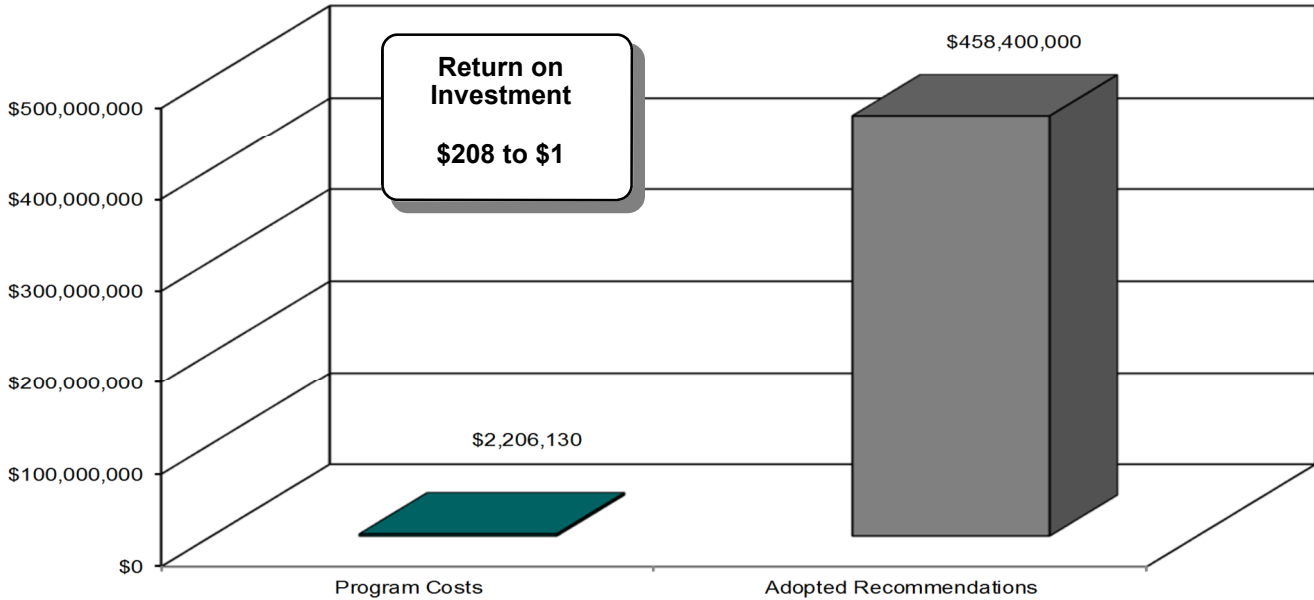
Percent Program Saved

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.

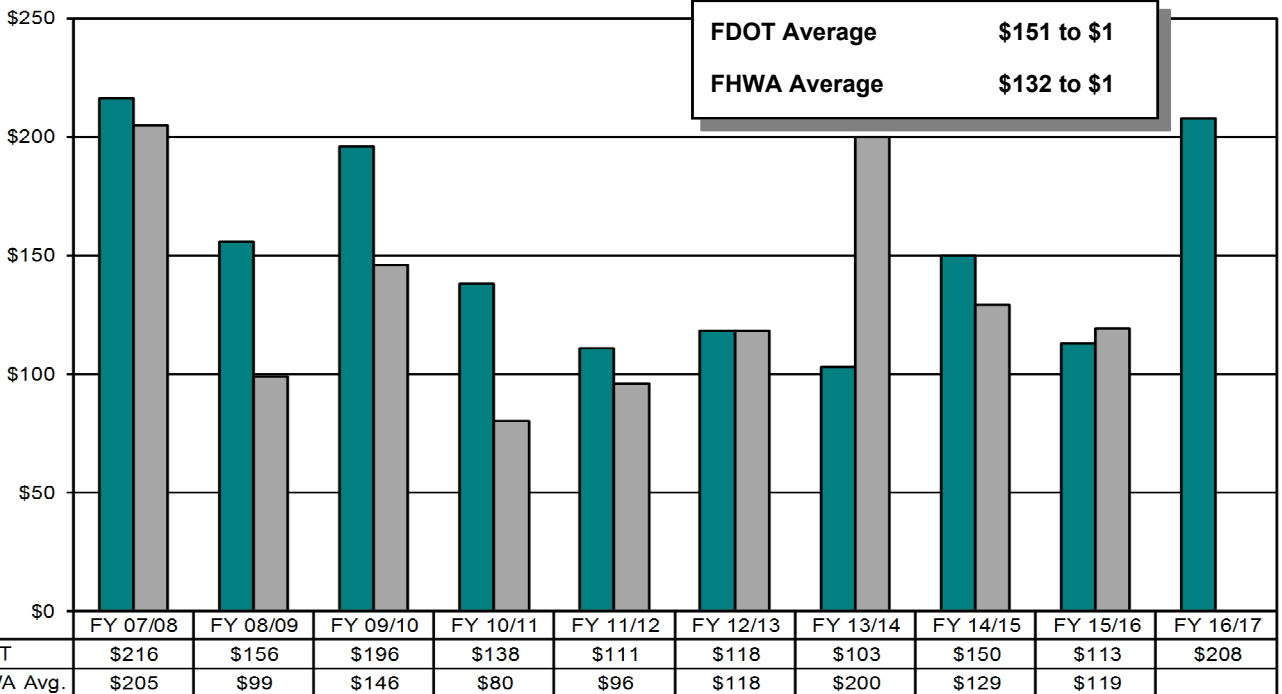


Return on Investment

Q6: Return on Investment
Annual Report Fiscal Year 2016/2017



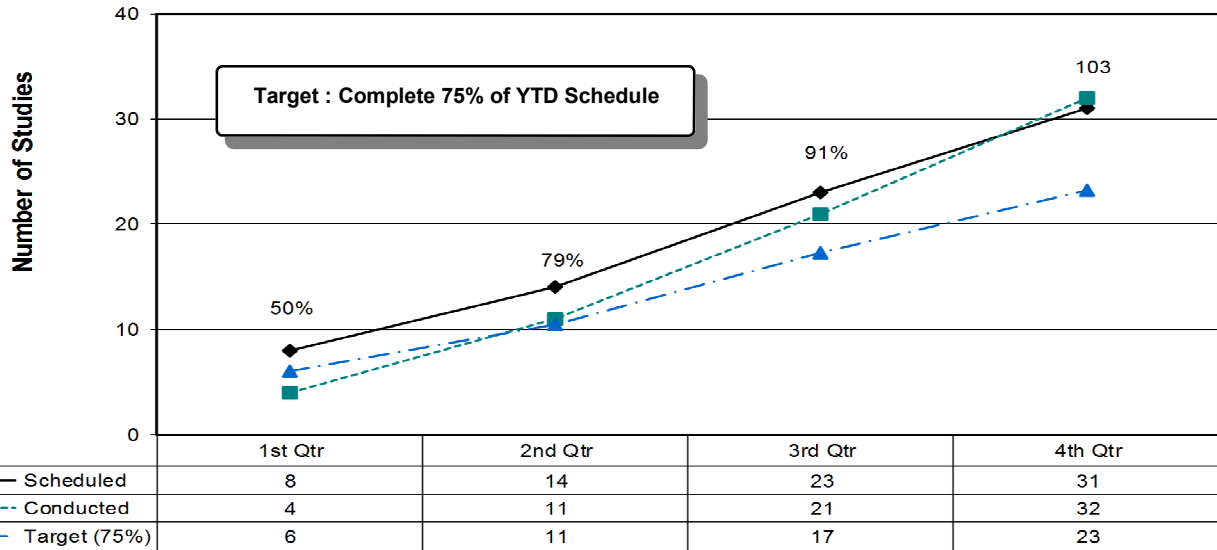
Q6: Annual Return on Investment



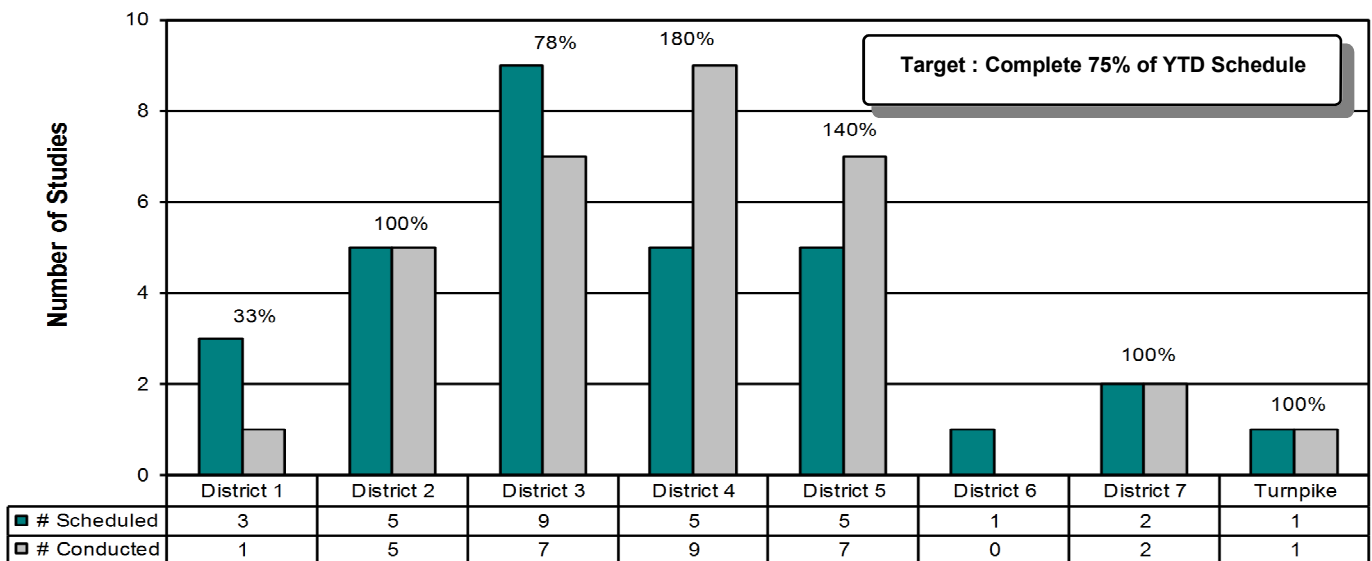
* FHWA data for fiscal year 2016/2017 and was not available at time of publication.

Work Plan Completion

P1: VE Studies Scheduled vs. Completed
Annual Report FY 2016/2017

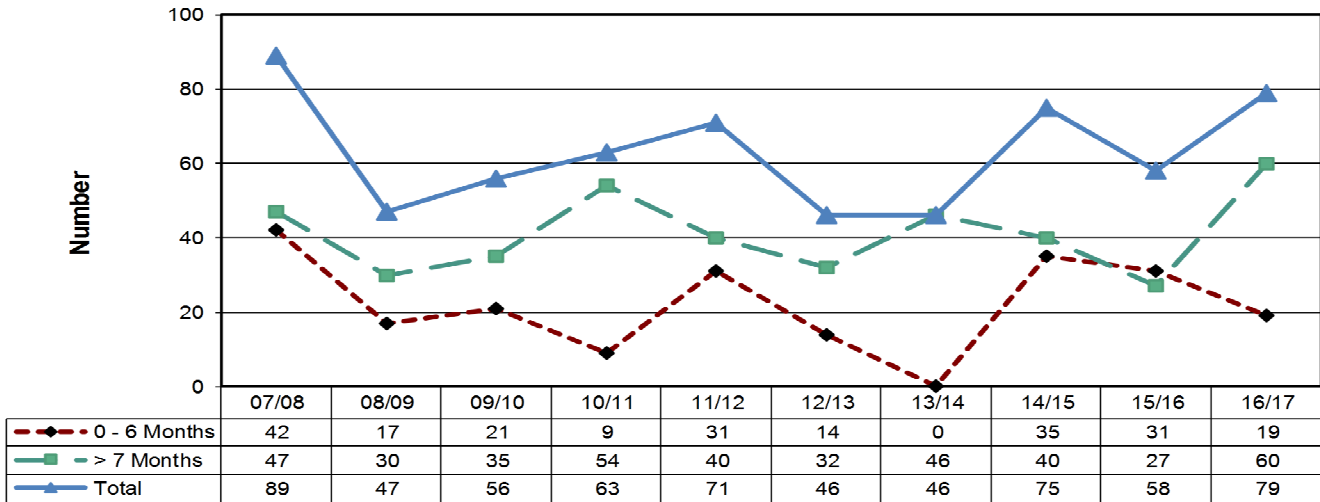


P1: VE Studies Scheduled vs Completed
Annual Report FY 2016/2017

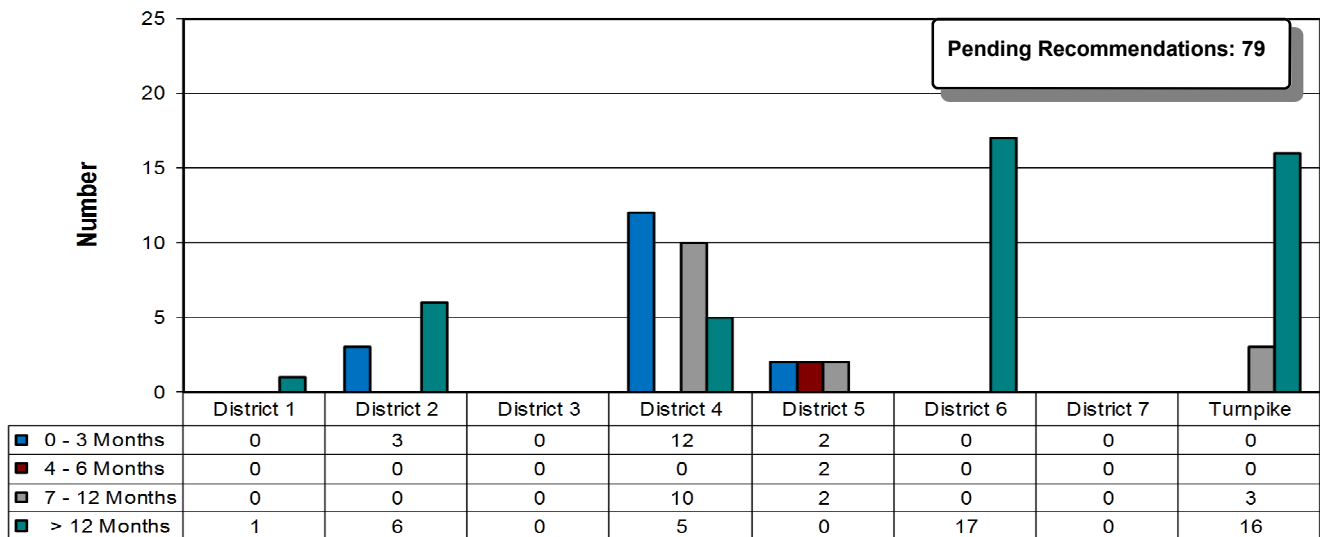


Pending Recommendations

P2: Annual # Pending Recommendations
Annual Report FY 2016/2017



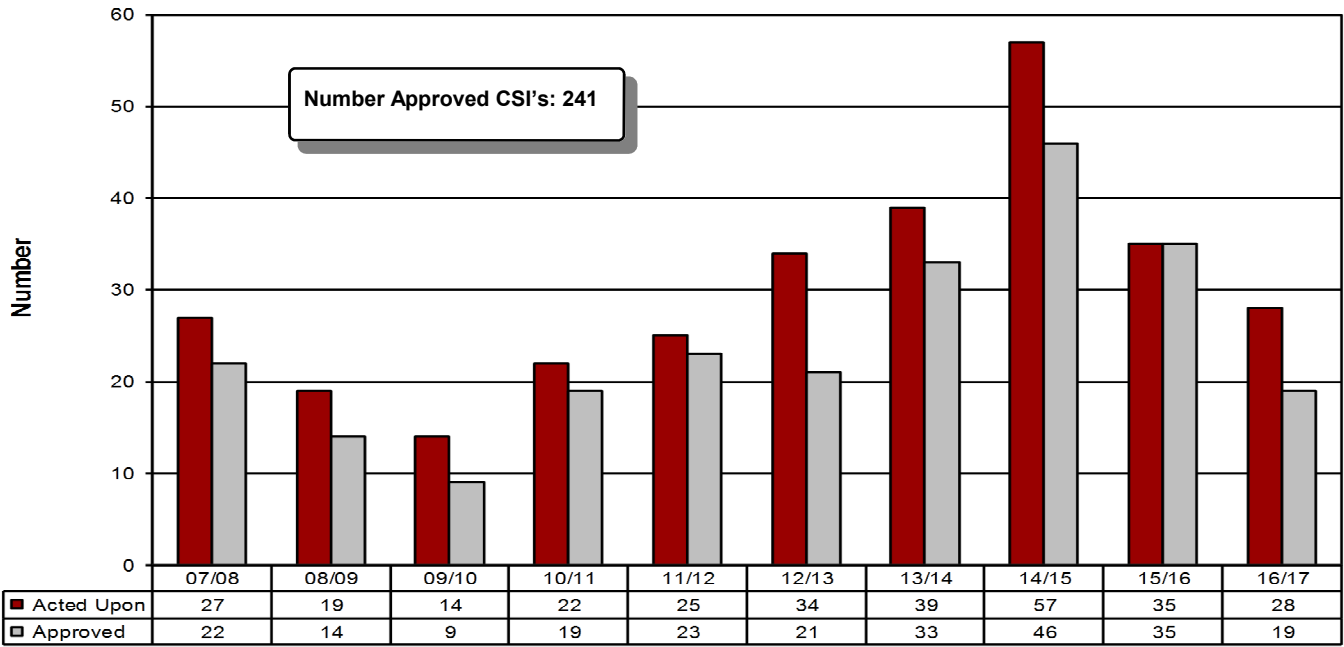
P2: # Pending Recommendations
Annual Quarter Report FY 2016/2017



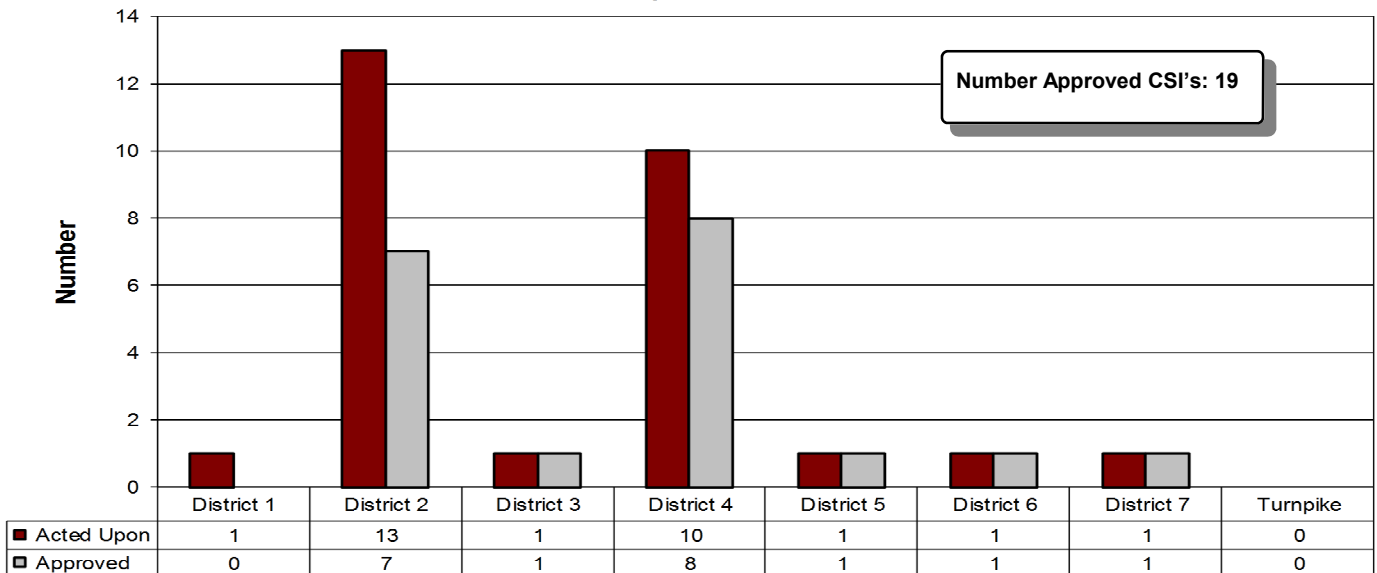
**Fiscal Year 2016/2017
Cost Savings Initiative
Performance Measures**

CSI Summary

Q1: Annual CSI Acted Upon



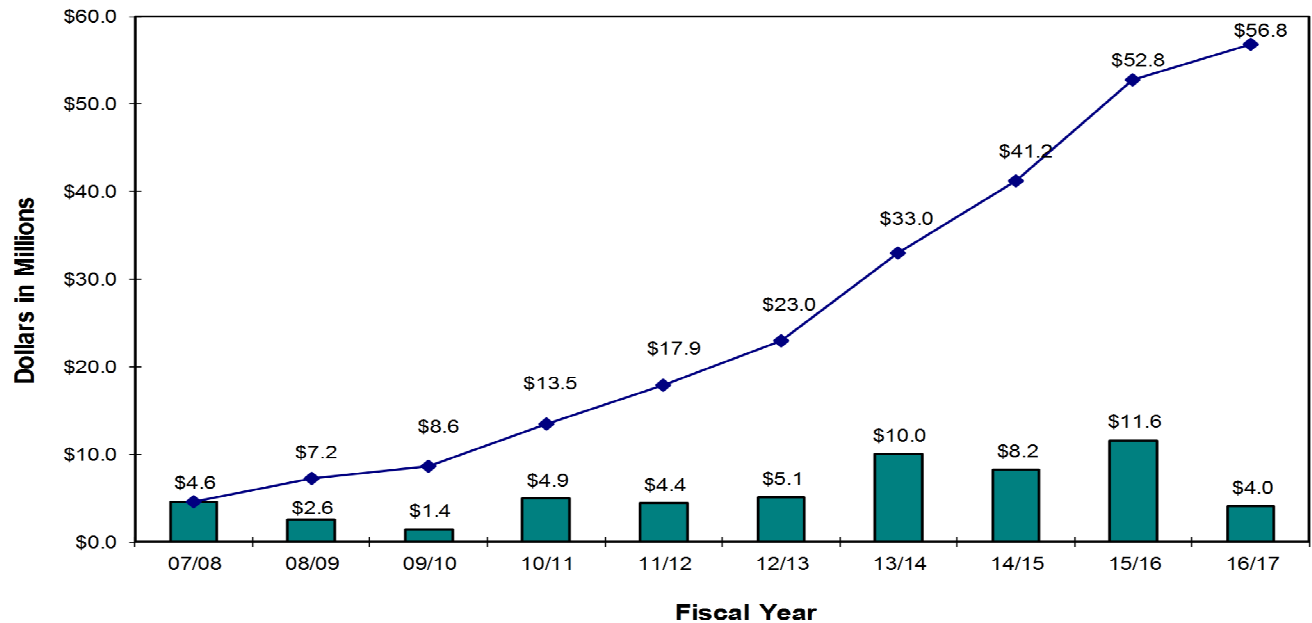
**Q1: CSI's Acted Upon
Annual Report Fiscal Year 2016/2017**



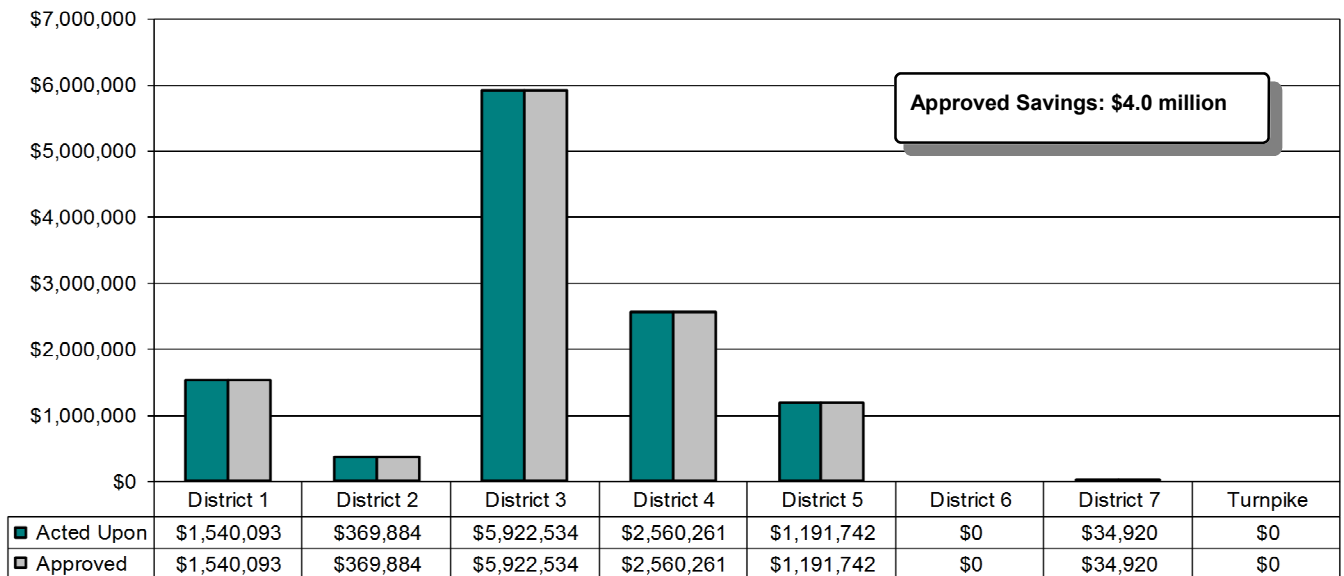
* Prior to fiscal year 2010/2011, Cost savings Initiatives (CSI) were formerly referred to as Value Engineering Change Proposals (VECP's).

CSI Approved Savings

Q2: Cumulative CSI Construction Cost Savings



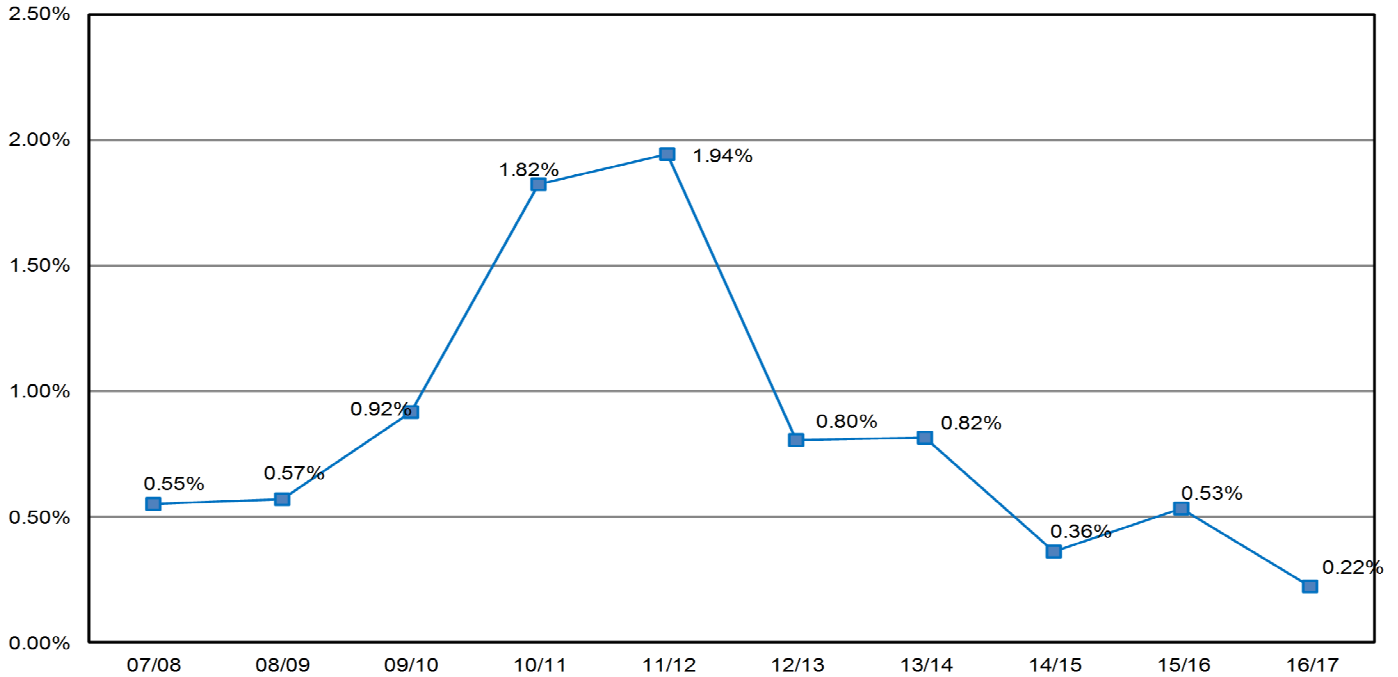
**Q2: Approved CSI Savings
Annual Report Fiscal Year 2016/2017**



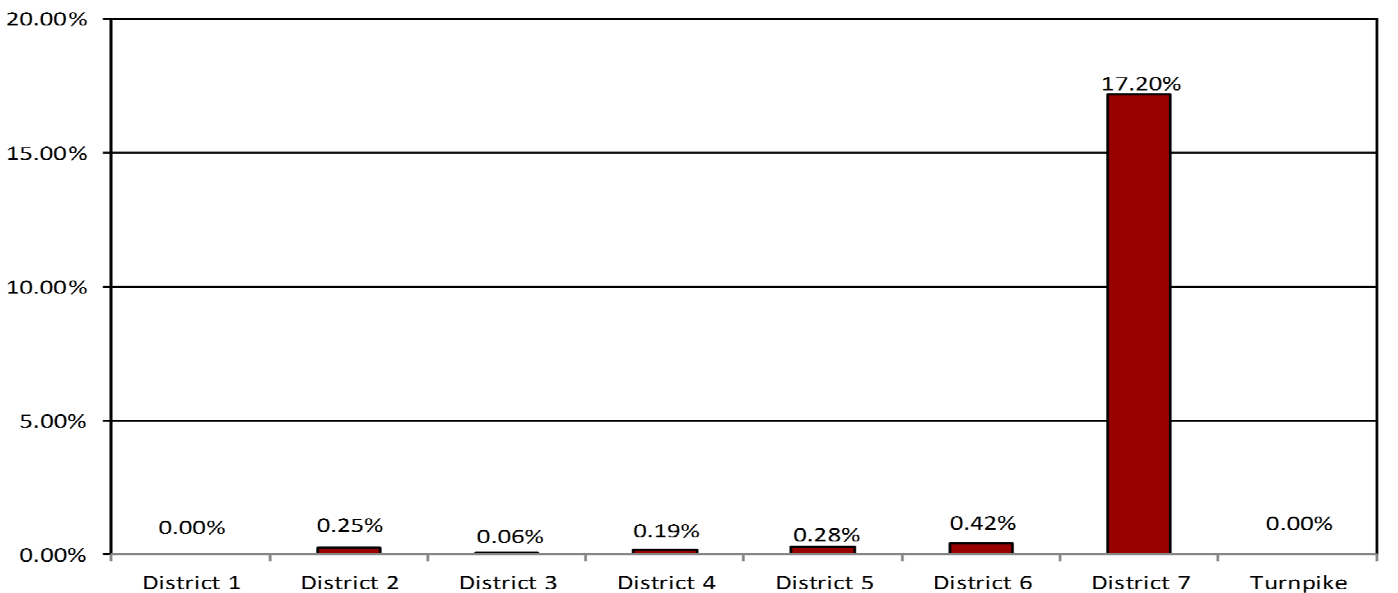
* Prior to fiscal year 2010/2011, Cost savings Initiatives (CSI) were formerly referred to as Value Engineering Change Proposals (VECP's).

CSI Percent Project Saved

Q3: CSI Annual Percent Project Saved



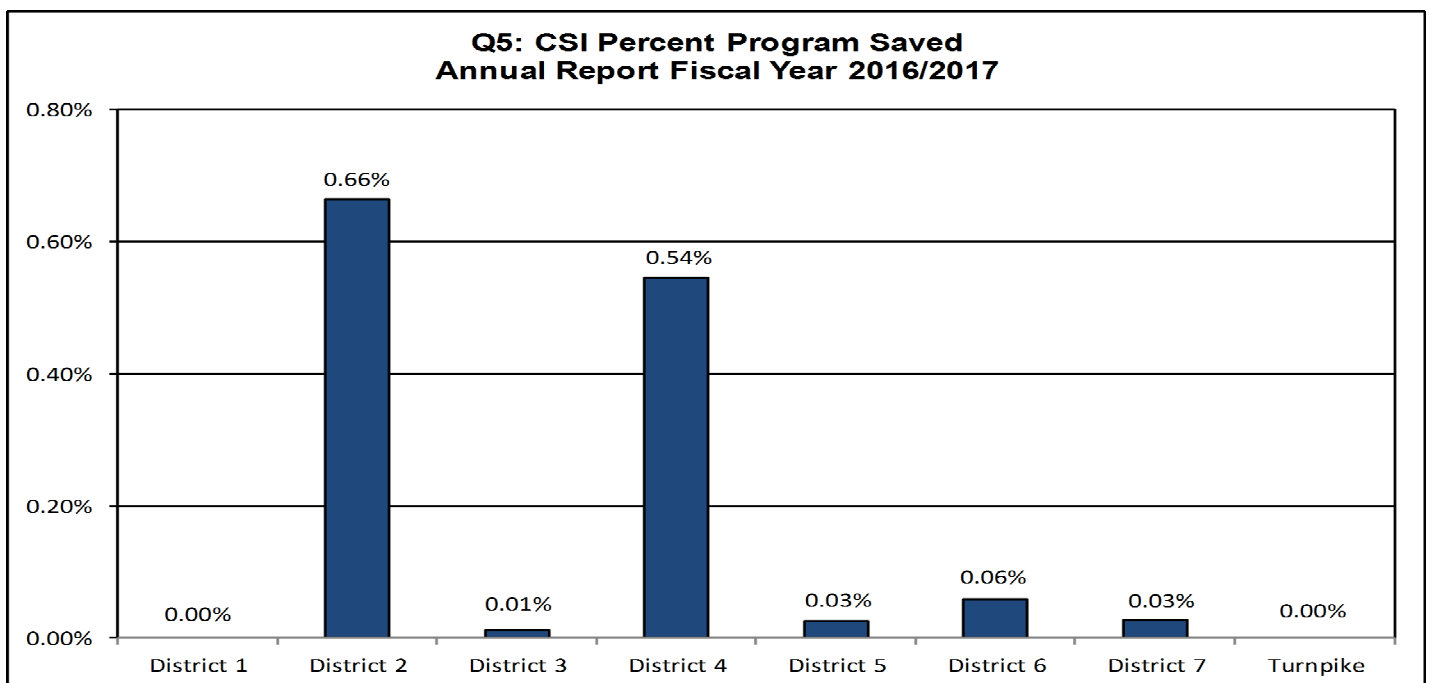
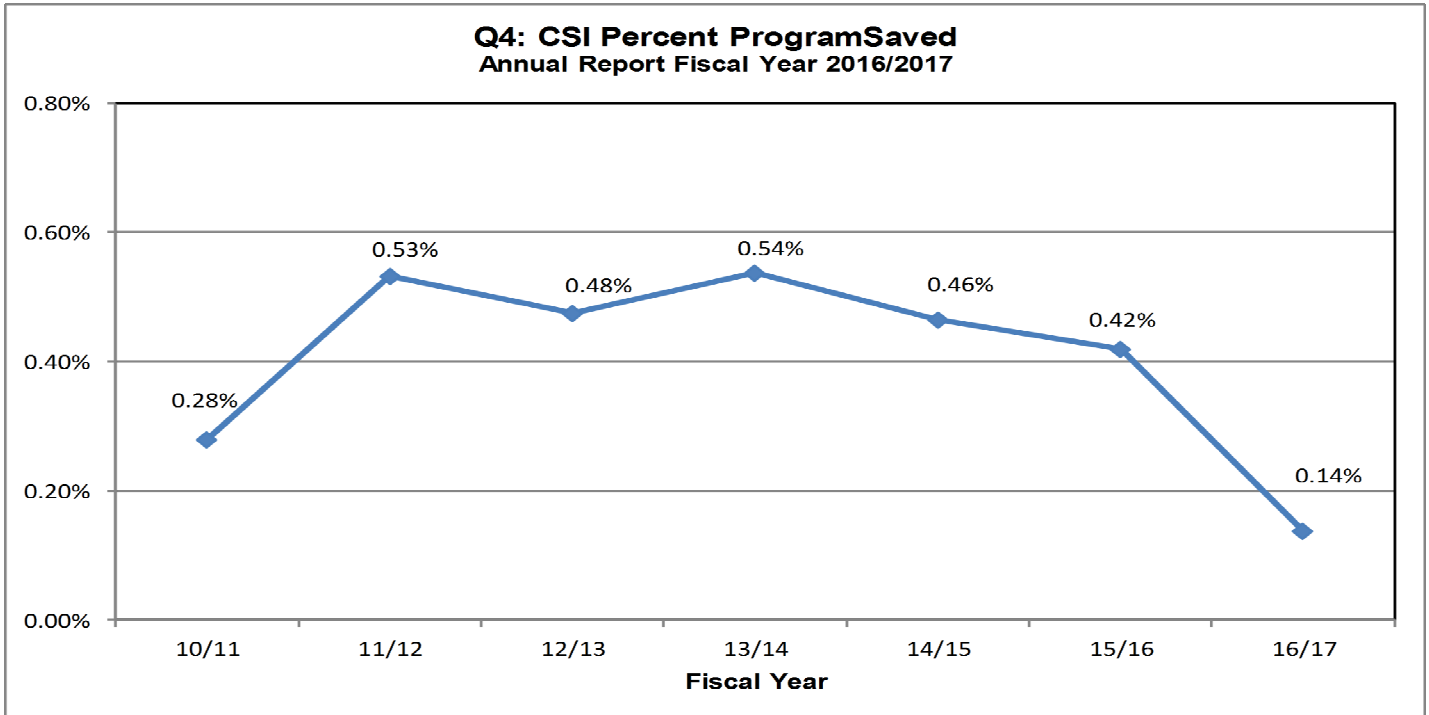
**Q3: CSI Percent Project Saved
Annual Report Fiscal Year 2016/2017**



* 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.					
Flow Chart										
Step / Time	District Value Engineer	Value Engineering Team	State Value Engineer	Checking / Measurement Monitoring						
Step / Time				Checking Item What is to be checked?	Frequency When to check?	Responsibility Who will check?	QAR Date of Last Review	Miscellaneous Information		
PROJECT SELECTION	<pre> graph TD A([Project Selection Process]) --> B[Team Selection Process] </pre>			75%	VDR & Work Plan	Monthly	SVE	D1-12009 C	Federal Regulations 23 CFR 657	
TEAM SELECTION	<pre> graph TD B[Team Selection Process] --> C[Study] </pre>			# of pending proposals per time period	VDR	Monthly	SVE	D2-112015 C	VE Procedure 625-034-002	
STUDY	<pre> graph TD C[Study] --> D[Resolution] </pre>			# of awarded proposals per time period	VDR	Monthly	SVE	D3-12009 C	MCHRP System's 302 - Value Engineering Applications to Transportation	
RESOLUTION	<pre> graph TD D[Resolution] --> E([Reporting/Tracking Process]) </pre>			Value added \$/hour time period	VDR	Monthly	SVE	D4-112015 C		
REPORTING	<pre> graph TD E([Reporting/Tracking Process]) </pre>			# of proposals completed	VDR	Annual	SVE	D6-120215 C	D5-12009 C	D7-12009 C
				\$100 to \$1	VDR	Annual	SVE	D6-120215 C	D7-12009 C	
								D8-120115 C	D9-120115 C	
								D10-120115 C	D11-120115 C	
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Approved: _____ Date: _____ Process Owner: State Value Engineer Rev # 1.6 Rev Date: 3/2016

Process Control System

Process Control System			
Process Name: Value Engineering Project Selected on Budget/Service/Develop a Value Engineering Work Plan by July 1 of each fiscal year.	Primary Customers: District Management, State Value Engineer, Partners: FHWA.	Valid Requirements: All projects with the most potential for improvement have a VE Analysis.	Regulator's Valid Requirements: All projects on the MHS system with estimated total costs > \$25 million have a VE analysis.
Benefit: Projects Suppliment Work Program	Flow Chart		Miscellaneous Information
Dept / Phase / Step / Time	DISTRICT VALUE ENGINEER	DISTRICT MANAGEMENT	Checking / Indicator Monitoring
	Process Indicators	Checking Item	Responsibility
	Control Limits	Who will check?	QAR
	Process Indicators	What is to be checked?	Date of Last Review
NEED	<p>Develop VE Work Plan</p> <p>Review project in production (see flow)</p> <p>Meet Federal requirements?</p> <p>Project a good candidate?</p> <p>Project Cost > \$25 million?</p> <p>Grant Winner?</p> <p>Written notice from Director of Transportation Development to DVE.</p>	Work Plan Recalled	D1:12009 C
REVIEW	<p>Does work in this fiscal year?</p> <p>Add project to Candidate List</p> <p>all projects been reviewed?</p> <p>Develop Work Plan</p> <p>Submit work plan approval</p> <p>Approve work plan and return to DVE</p> <p>Consider plans and publish on SharePoint</p>	<p>100% 100% 100%</p> <p>1. Number items currently on job 1 2. Number items completed</p>	<p>D1:12009 C</p> <p>D1:12015 C</p> <p>D1:12009 C</p> <p>D1:12015 C</p> <p>D1:12009 C</p> <p>D1:12015 C</p> <p>D1:12009 C</p> <p>D1:12015 C</p>
DRAFT			
APPROVAL			
DISTRIBUTE			
EXECUTE			

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	Valid Requirement(s): Team making has the required discipline, leadership skills and VE experience to study the selected project.			Regulator's Valid Requirement(s): Multi-disciplined team of individuals personally involved in the design of the project.			
Flow Chart			Process and Quality Indicators			Checking / Indicator Monitoring			Miscellaneous Information
Request: Project discipline Specific(s): Department Heads, Consultants	DISTRICT VALUE ENGINEER	DEPARTMENT HEAD	STATE VALUE ENGINEER	Control Limits	Checking Item	Timeframe (Frequency)	Responsibility	Date of Last Review	GAR
Dept/Project Site / Title				Process Indicators Quality Indicators	What is to be checked?	When to check?	Who will check?		
NEED	<pre> graph TD Start([Select VE Team]) --> Step1[Determine required disciplines] Step1 --> Dec1{Focus Study?} Dec1 -- YES --> Dec2{Goals Confirmed?} Dec1 -- NO --> Dec2 Dec2 -- YES --> Step2[Request District Consultant Services] Dec2 -- NO --> Step3[Request for Consultant to SAC] Step3 --> Dec3{DVE Lead Team?} Dec3 -- YES --> Step4[Request Team Leader] Dec3 -- NO --> Step4 Step4 --> Step5[Request Team Members for each discipline] Step5 --> Step6[Review team selections] Step6 --> Dec4{Team accessible?} Dec4 -- YES --> End([Send Team Notification]) Dec4 -- NO --> Step7[Revise team selections] Step7 --> Step8[Request request] Step8 --> Step9[Make selections & send to DVE] Step9 --> Step5 </pre>			# of teams meeting required disciplines	VED & VE Study Report	Annual	SVE	D1-110204 C	
CONSULTANT REQUESTS				# of teams with the required technical qualifications according to primary team leader	VER & VE Study Report	Annual	SVE	D2-110210 C	
TEAM SELECTION				# of team leaders and meeting qualifications	VED, VE Study report, SAC, T, L, P, TRS&S	Annual	SVE	D3-120206 C	
NOTIFICATION								D4-110215 C	
								D5-100607 C	
								D6-120215 C	
								D7-110206 C	
								TRC-102116 C	
								C0163	C- Compliance NC - Non-compliant RP - Best Practice

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 & DVC. 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 widely recognized systematic problem solving process that is used throughout private industry and government agencies.	
Flow Chart DISTRICT VALUE ENGINEER VALUE ENGINEERING TEAM		Process and Quality Indicators Control Limits Specs / Targets 80% 40%	
Defect/Penalty Step/Time	Conduct VE Study	Checking / Indicator Monitoring Checking Item What is to be checked? SVE	Response Who will check? SVE
NEED		80% 40% SVE	Date of Last Review 01-10-2006 C
INFORMATION	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 requests. - Team identifies components and concerns of high cost. - Tools used during this phase include: Project Team Briefing, Site Visit and Photo Analysis.		01-10-2015 C
FUNCTION ANALYSIS	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 classifies 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.		03-10-2004 C
CREATIVE	Creative Phase - Team generates alternative ideas to perform the project functions by using creative techniques, such as brainstorming techniques.		04-11-2015 C
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.		06-10-2007 C
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.		06-10-2015 C
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 plus supporting material.		07-11-2004 C
RESULTS	Enter data into VE database		08-10-2014 C
		Miscellaneous Information - Abbreviations - Procedure Reference - Notes, etc. Federal Regulation 23 CFR 327 VE Procedure 033-038-002 999-643(H)(3) Subtitle (b) VE NCHRP Synthesis 333 - Value Engineering Applications in Transportation	03/01/05 C- Compliance NC - Noncompliant BR Best Practice

Process Control System

Flow Chart		Process and Quality Indicators		Checking / Indicator Monitoring		Miscellaneous Information		
Step/ Time	Dist/ Period	DISTRICT VALUE ENGINEER	PROJECT MANAGER/ CONSULTANT	DISTRICT MANAGEMENT	Checking Item (What is to be checked?)	Timeliness (Frequency) (When to check?)	Responsibility (Who will check?)	GAR (Date of Last Review)
<p>NEED</p> <p>Inputs: Recommendations Supplier(s) VE Team</p> <p>Product/Service: Resolution of VE Team Recommendations</p> <p>Primary Customers: Project Manager, SVE</p> <p>Partners: PHHA</p> <p>Customer's Valid Requirements(s): Recommendations are acted upon in timely manner, but that a recommendation is acted upon based on information available.</p> <p>Regulator's Valid Requirements(s): Process to approve or reject recommendations to ensure the correct review of VE recommendations.</p>		<p>Process Indicators: Qualify Indicators</p> <p>Central Limits and Specs / Targets</p> <p>Control Limits</p>		<p>Checking Item: VCR</p> <p>Timeliness: Monthly</p> <p>Responsibility: SVE</p> <p>GAR: 01-11-2016 C</p>		<p>Miscellaneous Information:</p> <ul style="list-style-type: none"> Abbreviations Procedures Reference Notes, etc. <p>Federal Regulations 29 CFR 927</p> <p>VE Procedure 603-030-002</p> <p>1991 ADHITG Guidelines for VE</p> <p>MCNRP Symbols 302 - Value Engineering Applications in Transportation</p>		
<p>REVIEW</p> <p>Process Indicators: Qualify Indicators</p> <p>Central Limits and Specs / Targets</p> <p>Control Limits</p>		<p>Checking Item: VCR</p> <p>Timeliness: Monthly</p> <p>Responsibility: SVE</p> <p>GAR: 01-11-2016 C</p>		<p>Miscellaneous Information:</p> <ul style="list-style-type: none"> Abbreviations Procedures Reference Notes, etc. <p>Federal Regulations 29 CFR 927</p> <p>VE Procedure 603-030-002</p> <p>1991 ADHITG Guidelines for VE</p> <p>MCNRP Symbols 302 - Value Engineering Applications in Transportation</p>				
<p>RESOLUTION MEETING</p> <p>Process Indicators: Qualify Indicators</p> <p>Central Limits and Specs / Targets</p> <p>Control Limits</p>		<p>Checking Item: VCR</p> <p>Timeliness: Monthly</p> <p>Responsibility: SVE</p> <p>GAR: 01-11-2016 C</p>		<p>Miscellaneous Information:</p> <ul style="list-style-type: none"> Abbreviations Procedures Reference Notes, etc. <p>Federal Regulations 29 CFR 927</p> <p>VE Procedure 603-030-002</p> <p>1991 ADHITG Guidelines for VE</p> <p>MCNRP Symbols 302 - Value Engineering Applications in Transportation</p>				
<p>MONITOR</p> <p>Process Indicators: Qualify Indicators</p> <p>Central Limits and Specs / Targets</p> <p>Control Limits</p>		<p>Checking Item: VCR</p> <p>Timeliness: Monthly</p> <p>Responsibility: SVE</p> <p>GAR: 01-11-2016 C</p>		<p>Miscellaneous Information:</p> <ul style="list-style-type: none"> Abbreviations Procedures Reference Notes, etc. <p>Federal Regulations 29 CFR 927</p> <p>VE Procedure 603-030-002</p> <p>1991 ADHITG Guidelines for VE</p> <p>MCNRP Symbols 302 - Value Engineering Applications in Transportation</p>				

Process Control System

Process Name: Value Engineering Reporting Process		Product/Service: Reporting the results of the Value Engineering Program	Primary Customers: Management, Partners, FHWA	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	Checking / Indicator Monitoring				Miscellaneous Information			
Regulator's Study Research Supplier(s): DVE		Flow Chart				Process and Quality Indicators		Checking / Indicator Monitoring		Miscellaneous Information			
Dept / Process	Step / Time	STATE VALUE ENGINEER	DISTRICT VALUE ENGINEER	Process Indicators Qualify Indicators		Checking Item What is to be checked?		Timeframe (Frequency) When to check?		Responsibility Who will check?		Date of Last Review	
NEED		<p style="text-align: center;">Report the results of the VE program to management</p> <pre> graph TD A([Report the results of the VE program to management]) --> B[Enter data into VE database as compiler of study] B --> C[Upload copy of final study reports to VDR] C --> D[Prepare Draft Report & e-mail to District] D --> E[Review Draft Report] E --> F{Is Draft Report accurate?} F -- NO --> G[Correct database and refile VDR] G --> C F -- YES --> H{Is this the Annual Report?} H -- NO --> I[Send Monthly Report to Evaluation Management Office] I --> J[Present at Monthly Performance Meeting] H -- YES --> K[Prepare Final Annual Report] K --> L[Prepare Annual Profit Report] L --> M[Dist base Reports] </pre>											
MAINTAIN FILES		<p> P Final construction study report complete by Production Management for file Q Annual Report complete by July 31st R FHWA Annual Report complete by September 1st S District Reports complete by 10/15 </p>											
DATA VERIFICATION		<p> P Final construction study report complete by Production Management for file Q Annual Report complete by July 31st R FHWA Annual Report complete by September 1st S District Reports complete by 10/15 </p>											
REPORT		<p> P Final construction study report complete by Production Management for file Q Annual Report complete by July 31st R FHWA Annual Report complete by September 1st S District Reports complete by 10/15 </p>											

Process Control System

Process Name: Value Engineering Change Proposal		Product/Service: Resubmit to submit VCCP by the contractor		Primary Customers: Management, Contractor		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's during construction.		Miscellaneous Information	
Flow Chart		REVISIONS		DISTRICT DIRECTOR OF OPERATIONS		Process and Quality Indicators		Checking / Indicator Monitoring		Miscellaneous Information	
		DESIGN		CONSTRUCTION		OTHERS		DISTRICT CONSTRUCTION ENGINEER		DISTRICT DIRECTOR OF OPERATIONS	
		DISTRICT VALUE ENGINEER		RESIDENT ENGINEER		CONTRACTOR		CONTRACTOR		CONTRACTOR	
Dept / Person	CONTRACTOR	RESIDENT ENGINEER	DISTRICT VALUE ENGINEER	DISTRICT CONSTRUCTION ENGINEER	DISTRICT DIRECTOR OF OPERATIONS						
Step / Time											
	<p>PRIOR TO BEGINNING OF CONTRACT TIME</p>										
	<p>AFTER CONTRACT TIME BEGINS</p>										
	<p>SUBMITTAL</p>										
	<p>REVIEW</p>										
	<p>NOTIFICATION</p>										