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Context Sensitive and Sustainable Solutions (CS³)



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Table of Contents

- CS³ and the Oregon Transportation Investment Acts (OTIA)
- CS³ Philosophy, Framework, and Process
- CS³ Tools
- Success Stories
- Conclusion

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Historical Context of OTIA

- More vehicle miles traveled, but no increase in gas tax since 1993
- Gap between preservation, modernization needs, and funding
- Oregon's aging transportation system threatens economic recovery



3


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OTIA I and II + Partnerships = 160 Statewide Projects

- \$500 million in bonds from 2001-02 OTIA I and II plus matching funds from local governments equals \$672 million for 160 projects
- Move away from pay-as-go to innovative debt financing
- New project delivery to include outsourcing model


OREGON TRANSPORTATION INVESTMENT ACT


4

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OTIA III: \$2.46 Billion Over 10 Years

- 2003 Legislature designates \$1.3 billion to address Oregon's aging infrastructure
- OTIA III State Bridge Delivery Program

5

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OTIA III and CS³



"Community values shaping a new generation of bridges"

6

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Innovative Outsourcing Approach

- ODOT hires Oregon Bridge Delivery Partners (OBDP) as Program Management Firm
- OTIA III Bridge Delivery Unit (BDU) formed to oversee OBDP
- Agency shifts business model to focus on outsourcing
- Partnering with industry is vital to agency success

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Organization of Program Management

The diagram illustrates the organizational structure for Program Management. At the top is the 'Oregon Department of Transportation'. Below it are 'Program Oversight' and 'Program Project Safety'. The 'Program Oversight' box connects to a vertical stack of 'Level of Communication' boxes: 'Program Project', 'Program Design', 'Program Construction', 'Program Maintenance', and 'Program Life Cycle'. The 'Program Project Safety' box connects to a vertical stack of 'Level of Oversight' boxes: 'Program Safety', 'Program Design Safety', 'Program Construction Safety', 'Program Maintenance Safety', and 'Program Life Cycle Safety'. A central box labeled 'Program Management' is connected to both the 'Level of Communication' and 'Level of Oversight' stacks.

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Context Sensitive Design (CSD)


- Also known as Context Sensitive Solutions (CSS)
- An interdisciplinary approach that involves all stakeholders
- Collaboration leads to transportation solutions that
 - Fit the physical setting
 - Preserve scenic, aesthetic, historic, and environmental resources
 - Maintain safety and mobility (*FHWA*)

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Sustainability

Using, developing, and protecting resources at a rate and in a manner that enables people to meet their current needs and also ensures that future generations can meet their own needs

- Development of a State Strategy Promoting Sustainability in Internal State Government Operations (Executive Order EO-00-07)



10

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CSD + Sustainability = CS³

ODOT integrates sustainability with Context Sensitive Design philosophy

- Context Sensitive Solutions
 - Federal Highway Administration
 - State Departments of Transportation
- Sustainable Solutions
 - Longer history in vertical construction
 - Area of opportunity for other state DOT's

11

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Context Sensitive Sustainable Solutions (CS³)SM

- A philosophy
- A framework
- A process




12

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Innovative Implementation

- ODOT identified early tasks and partners needed for program success
- Engineering and environmental baseline reports (*context*)
- Programmatic permits lead to environmental stewardship
- Stakeholder Alignment
- Partnering



13

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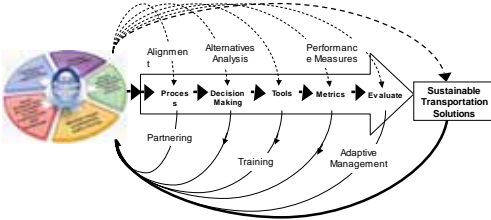
CS³: Achieving Program Goals



14


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CS³ Transportation Project Delivery Model



Program- and project-level integration

15


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CS³ Transportation Project Delivery Model

- Goals
- Objectives
- Metrics
- Resources and tools
- Program checklist
- Designer checklist
- Contractor checklist
- Contractor certification




16

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CS³ Critical Success Factors

- **Instill the principles** (goals and objectives) of CS³ in managing the program and projects
- **Design** the principles of CS³ from the beginning of the project
- **Collaborate** with stakeholders, building trust and relationships
- **Execute** the program and projects within the framework of CS³
- **Communicate** clearly, effectively, and in a timely manner

17

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CS³ Process: Program Level

- Build on goals and objectives
- ODOT/OBDP identify key task areas necessary for program success
- Task area define individual processes and tools
- CS³ team streamlines requirements into CS³ tools and resources
- Identify metrics
- Designers and contractor use these to plan for and implement CS³
- CS³ change management; adaptive management

18

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CS³ Process: Project Level

- CS³ Plan
- Public involvement
- Stakeholder information
- Cost-effective design methodologies
- Implementation of programmatic permits
- Environmental compliance
- Traffic Management Plan
- Performance reporting
- Monitoring of Contractor performance

19

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CS³ Key Areas: Integration at Project Level

DESIGN & CONSTRUCTION SOLUTIONS

- Public involvement
- Mobility
- Diversity
- Economic stimulus
- Environmental program
- Environmental justice



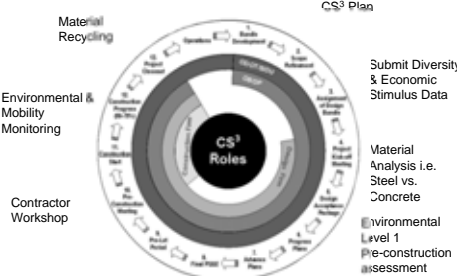
The solution must also provide:

- Sustainability
- Cost-effectiveness

20

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CS³ Tools, 13-Step Implementation Process



21

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CS³ Implementation: Roles and Responsibilities

Designers and contractors

- Develop a draft and final CS³ Plan
- Produce CS³ summary reports
- Implement the plan

OBDP:


- Review plan
- Track metrics
- Report on outcomes

BDU:

- Track metrics
- Report on performance measures



22


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Tools: CS³ Contract Language

Engineer shall prepare for submission of a CS³ Plan for review and acceptance by OBDP. It shall be in conformance with the CS³ Program goals and address all elements of the work.

A template/model of a CS³ Plan is provided in the A&E Consultant Guide to OTIA III State Bridge Delivery Program as a suggested starting point for the Engineer's CS³ Plan.

23

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Tools: CS³ Plan Template

Mobility

Engineer will provide a narrative describing the approach to mobility issues as addressed in the following documents:

- Project-level TMP Guidance Document
- Project scoping meetings
- Baseline reports
- Project Kickoff meeting
- Other sources

Example: The project requires complicated staging to maintain the existing number of lanes to preserve roadway capacity. The mobility narrative will briefly explain how this staging will be addressed in the Project-Level TMP and TCP/CS³ Plan template.

24

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CS³ Tools

- Decision matrix
- CS³ matrix
- CS³ Framework, program-wide performance & process measures
- CS³ Framework, project-level performance & process measures

25

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CS³ Implementation: Relevant Criteria and Methods for Assessment

- Qualitative and quantitative
 - Meets criteria
 - Below criteria
 - Needs immediate action

26

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CS³ Certification Requirements

- ODOT Staff
- A/E Prime Consultants
 - Principal
 - Project manager
 - Technical lead(s)
- A/E Specialty Consultants
 - Principal
 - Technical lead(s)
- Construction Contractors

27

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Tools: Training Requirements

28

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CS³ Implementation: Conventional and Unique Challenges


- New skills needed for designers and builders
- Established organizational protocols may conflict
- Resistance to change
- Few predecessors means more monitoring and flexibility

29

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CS³ Success Stories


30

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Job Stimulus


- OTIA III makes the most of employment opportunities for Oregonians—5,600 jobs at peak construction in 2009
- Of the \$163,277,613 spent on construction and design, 96.3 percent has gone to Oregon firms

31

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**Staton Companies—
Jeanne Staton**

- Dismantling sections of 28 bridges: \$1.46 million contract
- Bought \$600,000 in excavation equipment, hired four




32


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Diversity

- Improve workforce diversity relative to surrounding community
- Workforce Development Plan
 - Increased hiring targets
 - Apprenticeship program
- Recruitment of engineering interns
- To-date payments to DMWESB firms: \$105 million




33


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**Cooper Zietz Engineering –
Fred Cooper, Ph.D, PE**

- Elder in Shoalwater Bay Indian tribe
- Quality control management on 21 bridges on I-5: \$1 million in contracts




34


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**Michael Minor & Associates (MM&A) –
Michael Minor**

- Mitigating construction noise on eight bridges on Interstate 84
- MM&A's contract is for general construction noise analysis on I-84, and environmental analysis of the Hwy. 341 over Hwy. 6 (Hilgard Interchange) bridge




35

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Cost-Effectiveness and Efficiency

- Bundle projects for efficient delivery
- Standardize design elements
- Cost-loaded scheduling
- Innovative contracting methods
- Design-Build method
 - Flexibility
 - Creativity
 - Collaboration
 - Efficiency



36

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Big Beams Speed Construction

Precast single spans of concrete more than half the length of a football field



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Streamlined Permitting

Environmental Programmatic Permitting

- Merges multiple standards into one
- Sets expectations before construction



38

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Enhancing Mobility

- Statewide Mobility Management
 - Mobility Operations Room
 - Mobility Manual
- Minimizes disruption to traveling public and freight industry



39

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**Solving Mobility Issues:
Pleasant Hill Bridge**


- Problem: fast cars, slows trucks
- Solution: four-lane not two-lane



40

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**Sensitivity to Communities
and Landscape**



41

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Recycling: Madras Bridge

- Total recycled: 24,800 tons and \$204,000



42

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Public Involvement

- Vision, Strategy, and Design Guidelines for the Columbia River Gorge National Scenic Area

43

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Funding

- As of July 31, 2005, the bridge program had applied for 11 grants from five sources and obtained \$480,000 in funding


44

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Grants for Long-Term Worker and Community Health


- LRAPA grant for clean fuels
- AGC application to retrofit engines

45


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CS³ and OTIA III

Meeting program goals leads to sustainable revenue streams



46

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CS³ - A New Era in Transportation

- Sustainable programs mean sustainable jobs
- Sustainable infrastructure leads to a sustainable economy
- Sustainable project delivery leads to sustainable revenue streams, i.e. OTIA IV and V

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Questions





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