

Session B3: Maintenance and Operations Management - Are we thinking strategically

- Format – Panel and Audience participation
- Presentation
- Q+A, Discussion
- Next Steps and Future Research

Oregon ITS Maintenance Plan



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Overview

- Review project scope
- Discuss plan methodology
- Present key findings
- Highlight lessons learned
- Review potential future research activities

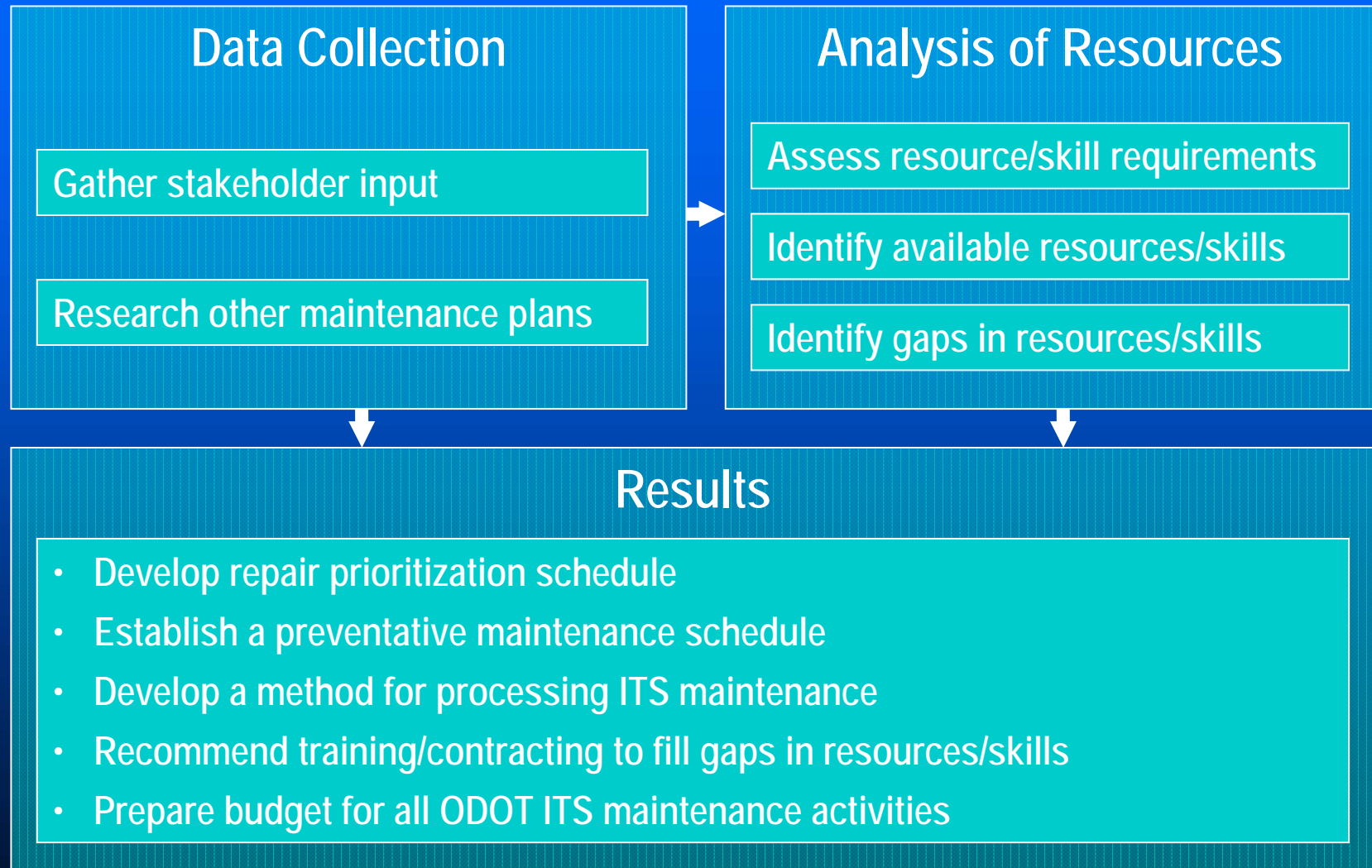
Project Description

- ODOT partnered with WTI/MSU to produce a statewide ITS maintenance plan
- The plan is intended to serve as a companion document to the Oregon ITS Strategic Plan 1997-2017



Graphic courtesy of ODOT

Project Approach



Review of Other Plans

- Several metropolitan areas have developed models; no statewide plan was identified
- No documented private sector plans
- Some plans relate device deployment and resource levels
- Most maintenance models are for a single, centralized organization
- Budgeting a major emphasis



Logos provided courtesy of DOTs

Stakeholder Input

- The following stakeholders were identified as critical in ITS maintenance:
 - Electricians
 - TOC Managers
 - Traffic Signal Services Unit (TSSU)
 - Transportation Data Section
 - Information Services
 - Motor Carrier Transportation Division
 - District Managers
 - ITS Executive Steering Committee

Stakeholder Input

- What did stakeholders identify as major concerns?
 - Inadequate staffing levels and/or conflicting priorities
 - Ambiguous responsibilities
 - Inadequate training
 - Poor logging and tracking systems
 - Non-standardized devices

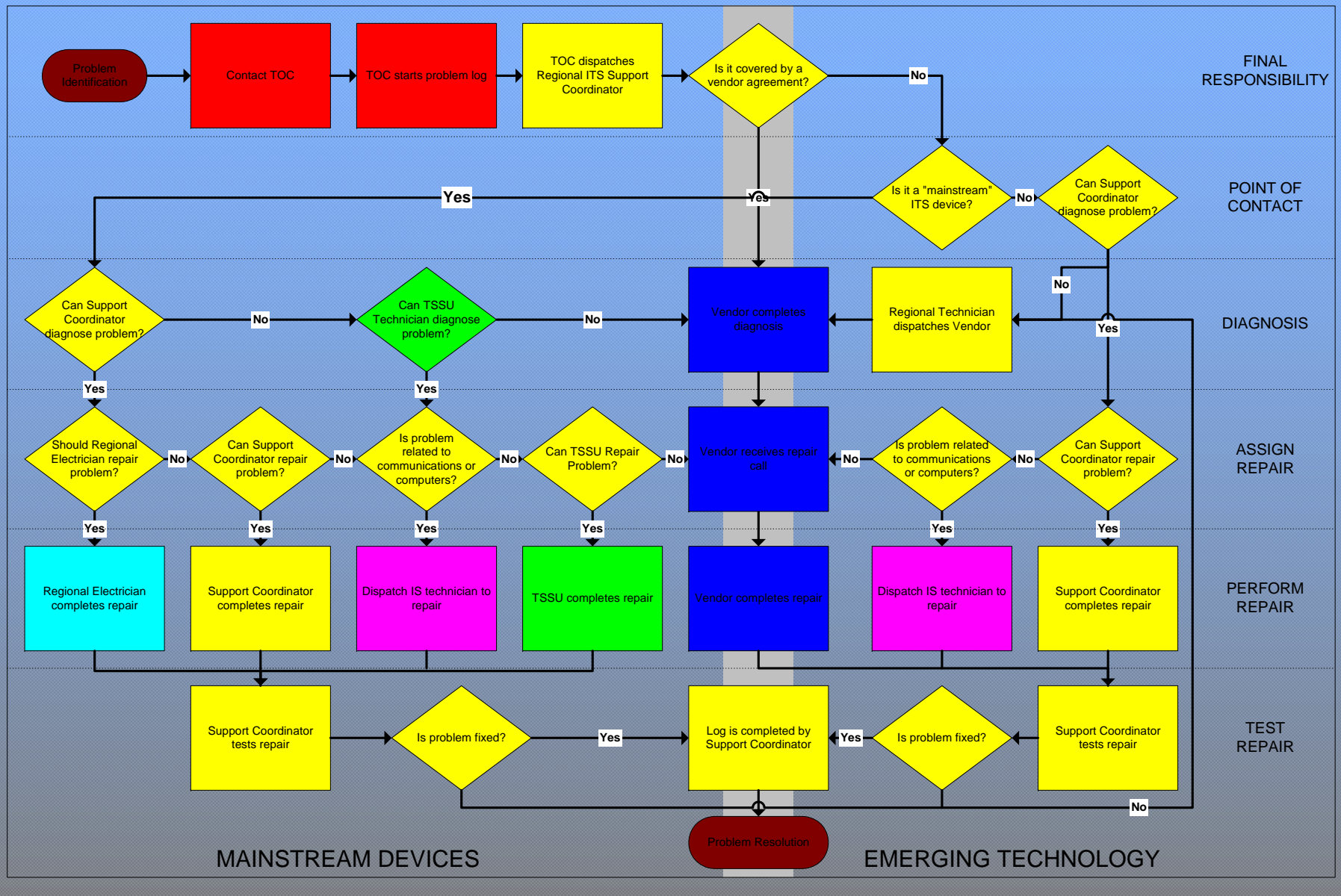
Stakeholder Input

- What did stakeholders want this maintenance plan to accomplish?
 - Serve as a foundation for addressing all issues and regions
 - Develop a process for maintaining new technology once it is implemented
 - Raise awareness of staffing, training, maintenance, and standardization needs
 - Clearly define organizational responsibilities

Maintenance Model

- Four alternative models were presented to stakeholders
- Consensus favored two-tier approach:
 - On mainstream devices (e.g. RWIS), perform ITS maintenance through district / regional model
 - On emerging technologies (e.g. video detection, travel time estimation), perform ITS maintenance through coordinated ITS model

Two-Tier Maintenance



Two-Tier Maintenance

■ Advantages

- Provides maintenance process
- Provides some relief to district work burden
- Simplifies repair process for emerging technologies by involving fewer parties
- Addresses technological evolution and training
- Uses existing ODOT diagnostic capabilities

Two-Tier Maintenance

- Advantages (cont.)
 - Improves statewide coordination for procurement and standardization
 - Allows for integration between design, operations and maintenance of ITS

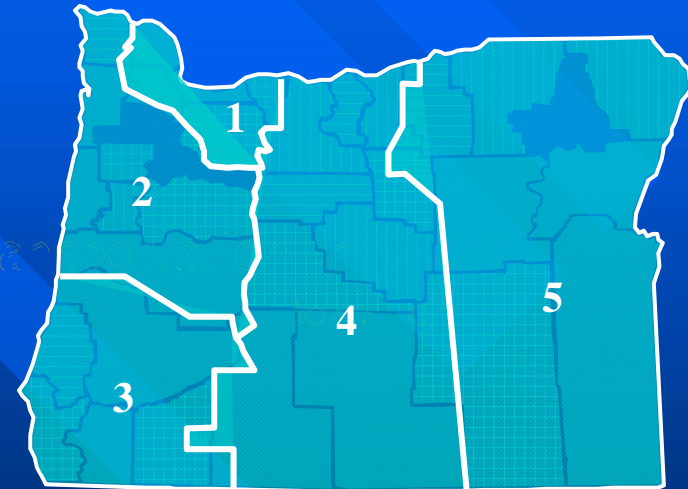
Repair Prioritization

- Existing guidelines
 - Top five priorities
 - » Emergency services
 - » Draw bridges
 - » Traffic signals
 - » ODOT radio communications sites
 - » Ports of entry and scales
 - All of these recommend 24 hr/7 day support
 - Not adequate for prioritizing ITS

Repair Prioritization

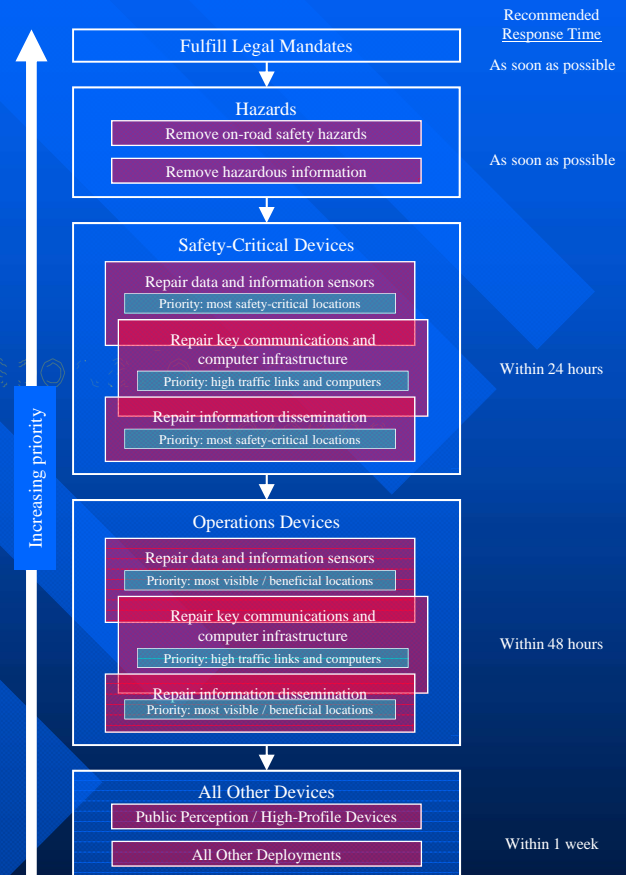
■ ODOT Surveys

- Regional flexibility was found to be important
- Safety is a paramount concern
- Geography is relevant
- Device function is more critical than device type



Repair Prioritization

- Recommended priorities
 - Fulfill legal mandates
 - Address safety hazards
 - Safety-critical devices (field devices first)
 - Operations-critical devices (largest scale first)
 - All other devices (greatest exposure first)

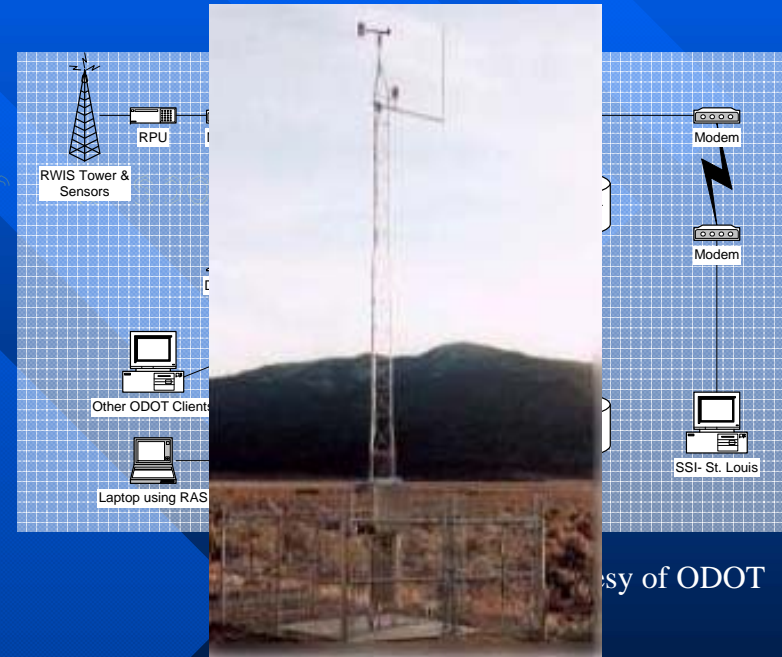


Resource Analysis



Resource Needs

- Maintenance needs estimated at device and component level
 - Sensors
 - Communications
 - Field processor
 - Software
 - Center sub-systems
 - Information delivery



Resource Needs

- Other considerations for resource needs
 - Preventative and repair maintenance
 - » Visits per year, hours per visit, skill set
 - » Multiple data sources
 - Employee classifications
 - Technological change
 - Minimal vendor support
 - Number of hours in FTE year
 - Travel time

Resource Availability

- Telephone interviews used at first, but...
 - Few people have 100 percent commitment to ITS maintenance
 - Lack of easily accessible tracking system
 - Trip-chaining by maintenance technicians
 - Overcommitment of people's time
 - Deployment vs. maintenance time
- Therefore, job descriptions for ODOT staff were used

Resource Gaps

- Analysis revealed staffing gaps
 - In each region
 - In each skill set
- To continue to perform maintenance in-house through the end of the Strategic Plan, ODOT would need to add 2 FTEs per year to keep up

Gap Management

- Two alternatives for addressing resource gaps:
 - Enhance and develop resources within the organization
 - Rely on contract support
- The appropriate method may vary according to:
 - Device type
 - Geography

Training

■ Recommendations

- Require training on new procurement
- Provide in-house training on basic troubleshooting
- Maintain extensive repair capability on high-priority devices
- Minimize remedial training
- Pursue greater cross-training
 - » Allocate time for training activities
- Give staff chance to use training

Contracting

- Recommendations
 - Provide performance specifications
 - Don't necessarily use vendor
 - Multiple, concurrent contracts may lead to “finger pointing”
 - Short duration with renewal options
 - Consider cost of specialized equipment

Contracting

- Recommendations (cont.)
 - Price contracts may hinder long-term relationships
 - Don't restrain competition
 - » Cost competition between ODOT and contractor
 - » Subdivide activity between multiple contractors
 - Some in-house expertise needed to assist new contractors

Contracting

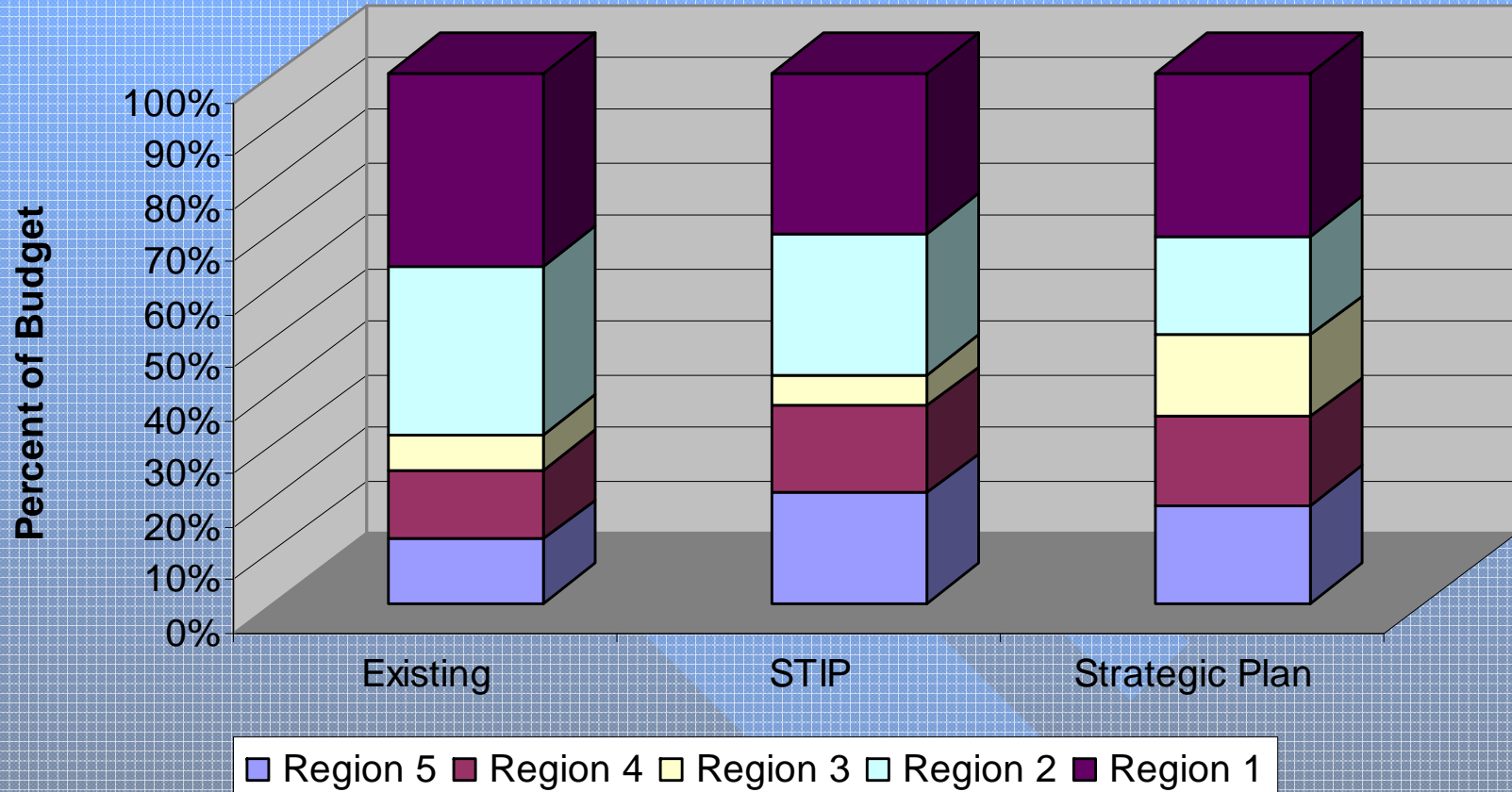
- Criteria for deciding when to contract
 - Is a particular device especially critical to how ODOT plans to fulfill its mission to the traveling public?
 - Does a particular device have a broad enough deployment around the state to make a contract economically viable?
 - Could clear lines of responsibility between ODOT and the contractor be readily established?

Comprehensive Budget

■ Components

- Staffing
- Contractors
- Training
- Spare parts
- Emergency device replacement
- Test/specialized equipment

Budget by Region



Lessons Learned

- Stakeholder input is critical
- Need an agency champion
- Organizational issues are as critical as technical issues
- Geography is critical
- Device inventories are critical
- Maintenance should not be an afterthought

Q+A

- What are the major concerns with ITS and maintenance ?
- Is a strategic plan needed?
- What models exist that could be used to plan better for maintenance needs and activities?
- What are the priorities ?
- Are there resource needs and contracting models?
- What are the future research needs?

Future Research Activities

- Maintenance model evaluation
- Refine planning-level budgeting estimates based on actual maintenance experience
- Explore contracting issues beyond ITS maintenance