Lessons Learned

Nevada Department of Transportation Next Generation 511 Implementation Project

Linda Kennedy, PMP

511 Nevada Travel Info

NEVADA DOT

511 Traffic Management System

- Traffic, road conditions, and weather information
- Website
- Dial in--511
- Mobile app
- Text alerts
- Twitter
- Facebook

Lessons Learned

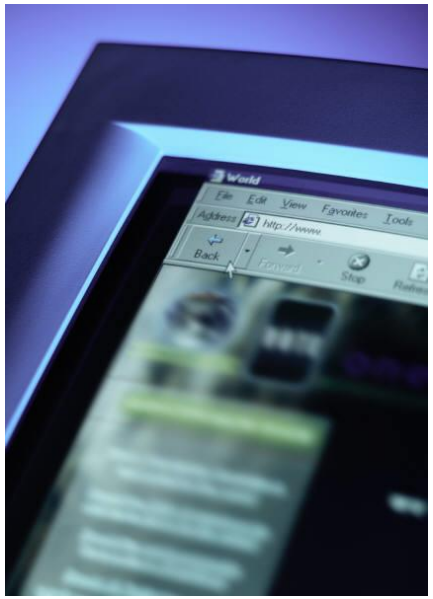
- Process
- Requirements
- Stakeholders
- Budget

History of 511

- 1999 USDOT petitioned FCC
  - 17 state DOTs
  - 32 transit operators
  - 23 metro planning organizations & local agencies
- 2000 FCC designated “511”
  - Design & coordination left up to those who deployed
  - Deployed by DOTs and metro planning organizations

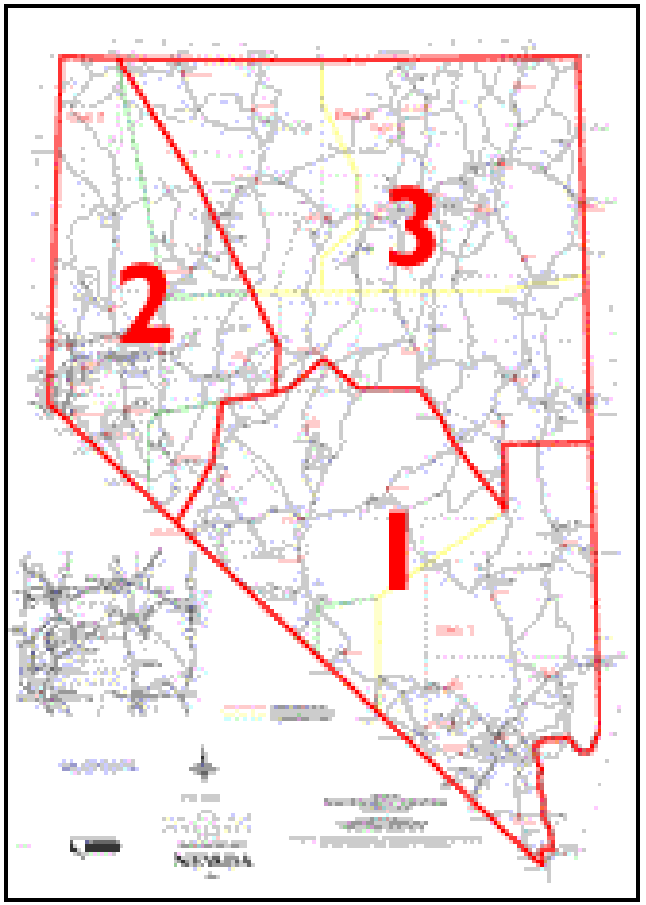
State of 511

- As of 2011
  - 51 systems
  - 37 states
  - Interactive Voice Response (IVR)
  - Websites



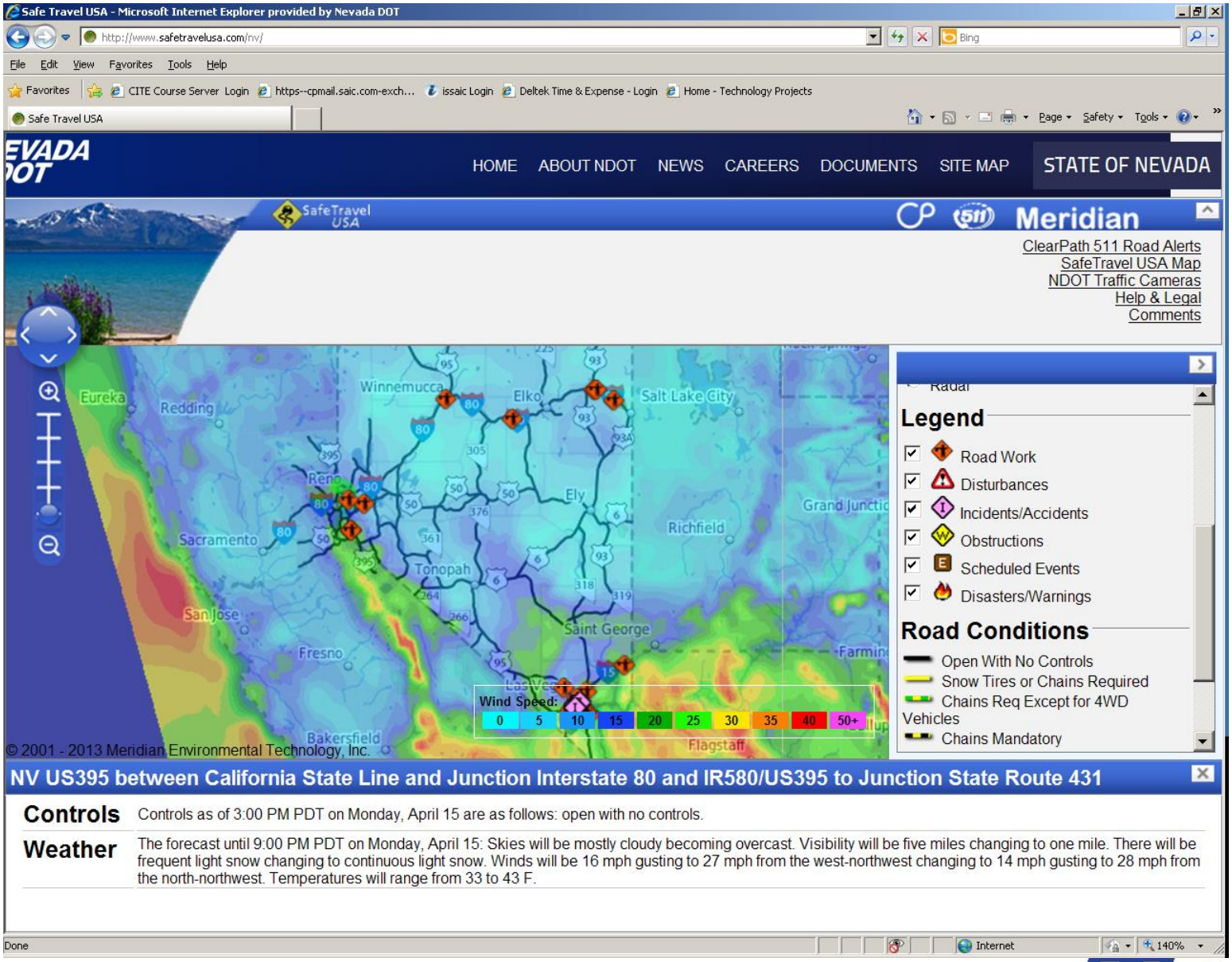
NDOT Operations

- Road Operations Centers
  - Las Vegas (District 1)
  - Reno (District 2)
  - Elko (District 3)



Status Quo of 511

- NDOT early adopter of 511
- 2006 Meridian System
- Contract expired May 2013
- Comfort zone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Wind Speed:
0 5 10 15 20 25 30 35 40 50+
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Road Work
Disturbances
Incidents/Accidents
Obstructions
Scheduled Events
Disasters/Warnings
Road Conditions
Open With No Controls
Snow Tires or Chains Required
Chains Req Except for 4WD Vehicles
Chains Mandatory
NV US395 between California State Line and Junction Interstate 80 and IR580/US395 to Junction State Route 431
Controls
Controls as of 3:00 PM PDT on Monday, April 15 are as follows: open with no controls.
Weather
The forecast until 9:00 PM PDT on Monday, April 15: Skies will be mostly cloudy becoming overcast. Visibility will be five miles changing to one mile. There will be frequent light snow changing to continuous light snow. Winds will be 16 mph gusting to 27 mph from the west-northwest changing to 14 mph gusting to 28 mph from the north-northwest. Temperatures will range from 33 to 43 F.
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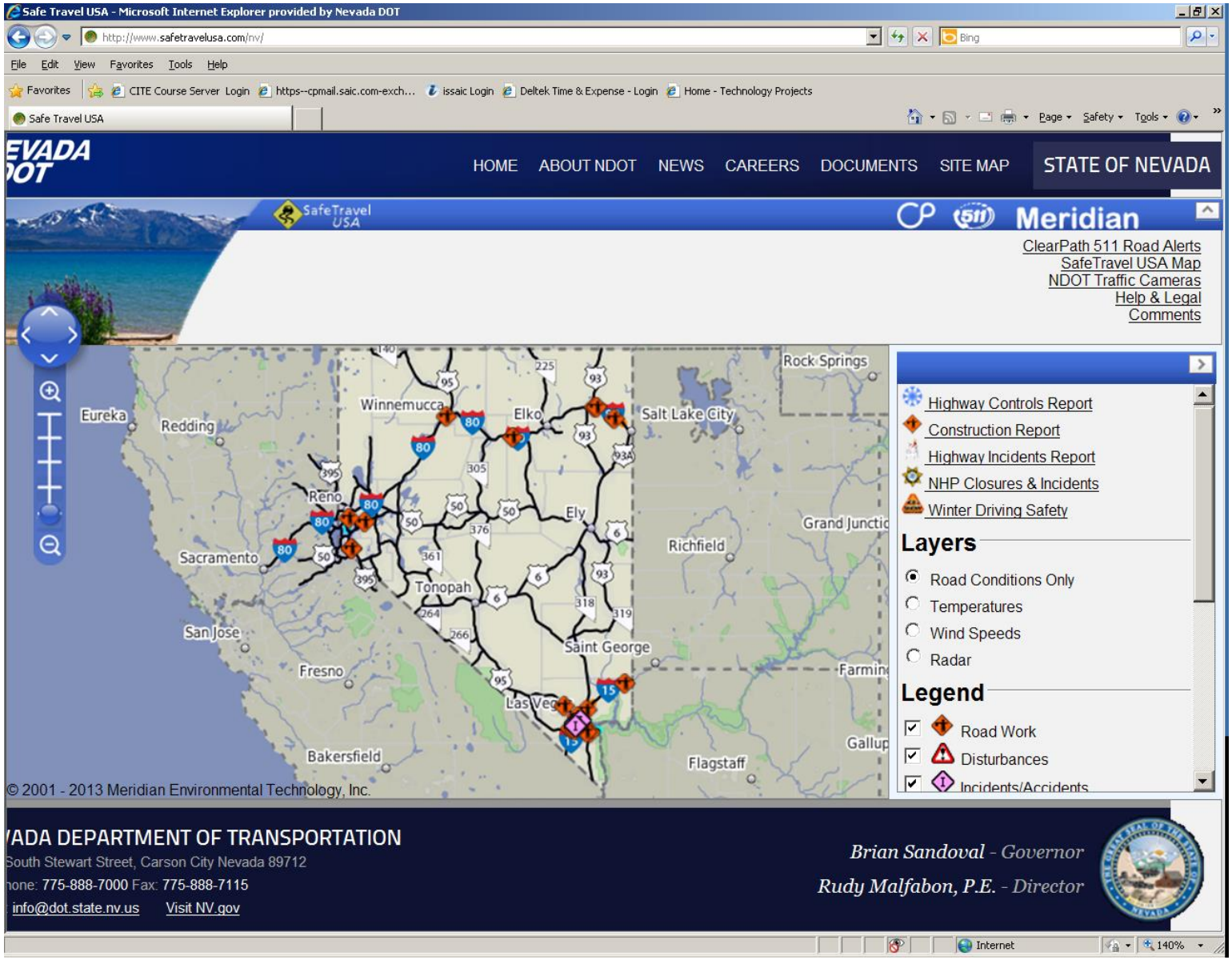
NEVADA DOT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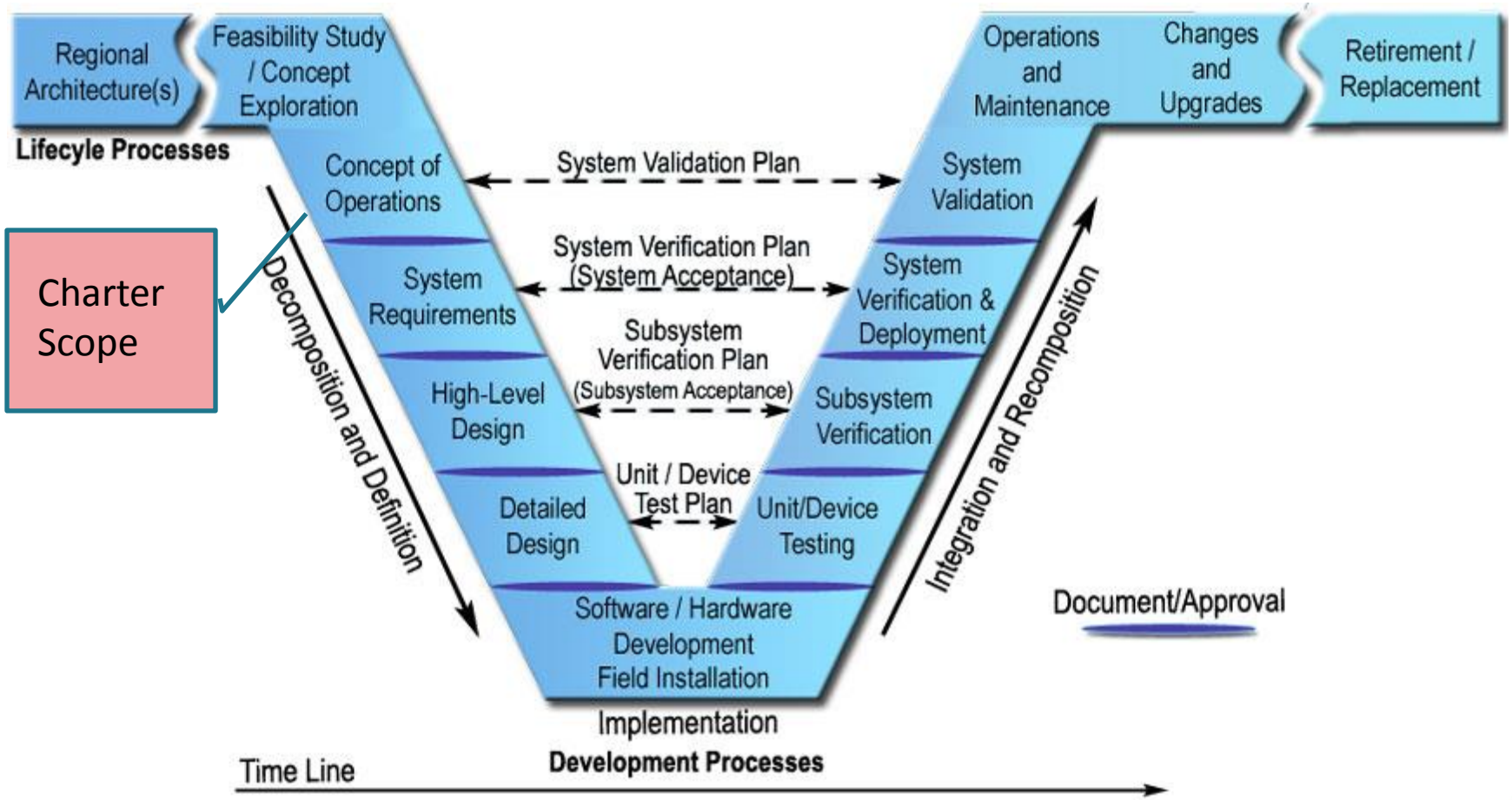
Beginning of Project

- Next Generation 511 started in 2011
- Formal process followed by NDOT
- Hired consultant to help prepare documentation, requirements, and prepare RFP
- Proposed $1 M, Reduced budget to $½ M
- Followed the Systems Engineering process dictated by federal government

Lesson Learned--Process

- Followed the System Engineering Process, PMBOK Process, Waterfall Development
- Consultant was new PMP
- First Traffic Operations project using System Engineering Process
- Required to follow NDOT procurement process

System Engineering Process



Concept of Operations

- Hired consultant to prepare Concept of Operations
- Who, what, when, where, and why
- Decision to procure
  - Advances in technology
  - Additional data
  - Additional channels of communication
  - Reduce duplication of effort
  - Reduce redundancy of data dissemination
  - Reduce errors

Nevada Next Generation 511 Project

- General Goals
  - Improve usability and ease for the public
  - Scalable, to handle new data input as it becomes available
  - A one-stop-shop for multi-modal traveler information
  - Make use of advances in technology
  - Both regional and statewide focused
  - Consider Nevada's texting while driving ban, in effect Jan 2012

Nevada Next Generation 511 Project

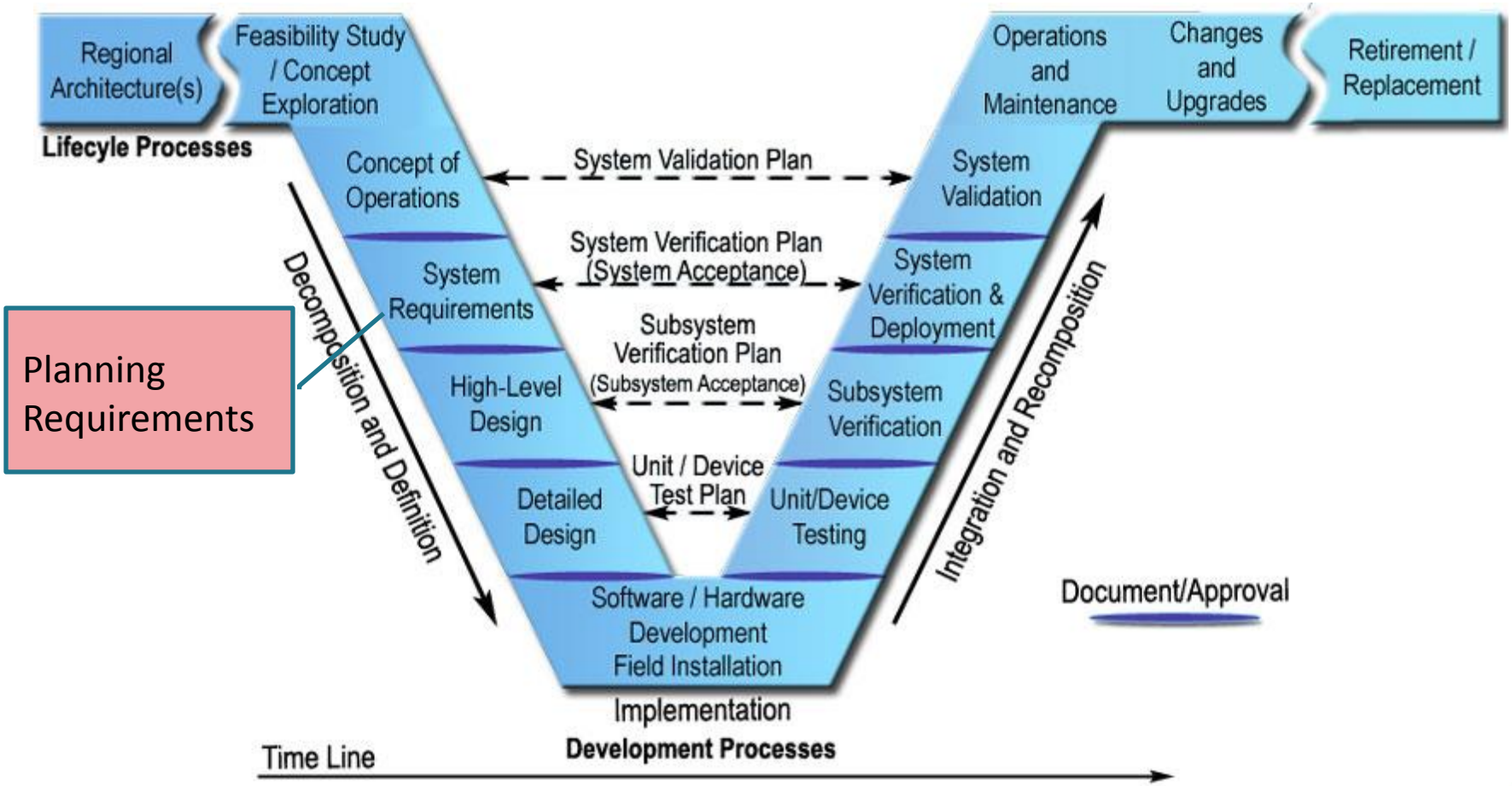
- Functionality and Dissemination
  - Mostly automated system
    - But with a manual conditions reporting interface
  - Call transfers and web links to transit, NHP and partner agencies
  - Personalization for registered users
- Dissemination Channels
  - Enhanced email and text alerting system
  - Mobile applications
  - Regional Twitter and Facebook feeds
    - Updated automatically

NEVADA DOT

Nevada Next Generation 511 Project

- Content
  - Incidents, construction, controls, congestion, road weather conditions on NDOT roads shown with icons
  - Travel times where available
  - CCTV streaming video
  - DMS (Dynamic Message Signs)
  - RWIS (Road Weather Information System)
  - HAR (Highway Advisory Radio) message text online
  - More detailed and interactive map

System Engineering Process



Lesson Learned--Requirements

- Written
- Testable
- Specific
- User driven

Types of Requirements Identified

- Functional
  - *"Each floodgate message shall be able to be designated as uninterruptible or interruptible."*
- Transition
  - *"The Nevada Next Generation 511 shall use standards that support open architecture and interoperability with the other NDOT systems needed to support traveler information."*
- Project
  - *"The vendor shall provide a project manager throughout the life of the project who does not change without the written permission of NDOT."*

Types of Requirements Identified

- Quality
  - *"The data fusion function availability shall be 99.80% or greater each 24 hour period as measured from midnight to midnight exclusive of planned downtime for maintenance."*
- Business
  - *"The Nevada Next Generation 511 shall minimize the time it takes for users to gain access to the system and obtain their desired information."*
- Operational
  - *"The IVR shall be able to add additional capacity within 10 business days or less to meet its response time."*

Lessons Learned--Requirements

- Written
- List, not structured
- Not all testable
- Not all user driven
- Included the user, overwhelmed, then excluded

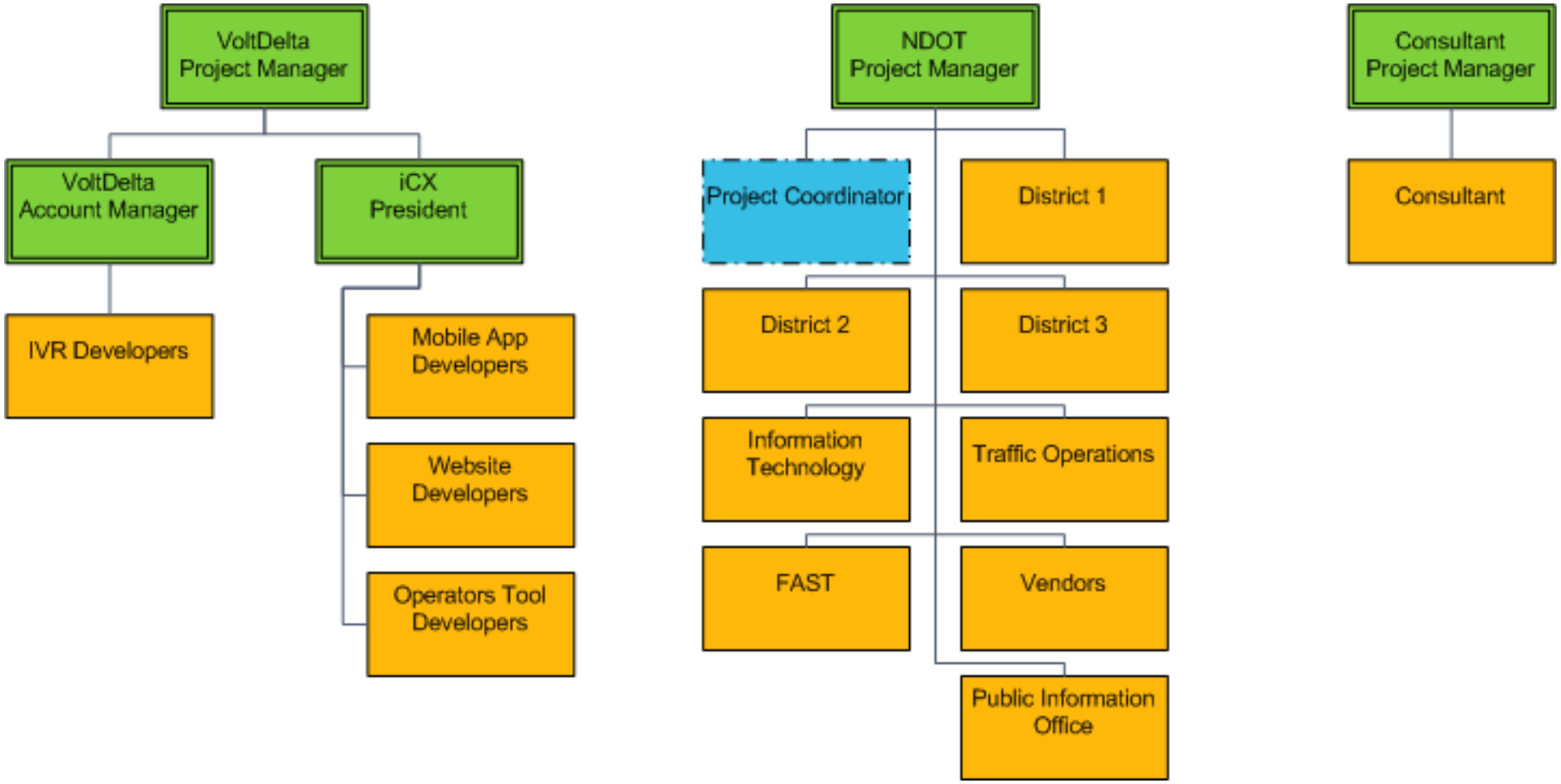
Lesson Learned--Budget

- Reduced budget
- Best in the business didn’t respond
- Limited selection of vendors
- Negotiations challenging

RFP Process

- Selected vendor one
- Negotiations broke down
- Selected vendor two
- Negotiated agreement
- Started project

Project Structure—Phase One



Documentation Required

- Request for Proposal (RFP) Response
- Communications Plan
- Program Management Plan
- Monthly Status Reports
- Work Breakdown Structure
- Staffing Plan
- Cost Plan (Budget)
- Schedule
- Configuration Management Plan
- Risk Management Plan
- Performance Monitoring/Quality Assurance Plan
- Transition Plan
- Operations and Maintenance Manual
- Training Plan
- Subcontractor Management Plan
- System/Software Design (SDD) Document
- Design Requirements Traceability Matrix
- Factory Integration and Test Plan
- Factory Test Procedures
- Factory Acceptance Test Report
- Corrective Action Plan
- NNG511 Interface Control Specification
- System Operations and Maintenance Manual
- Meeting Agendas and Minutes

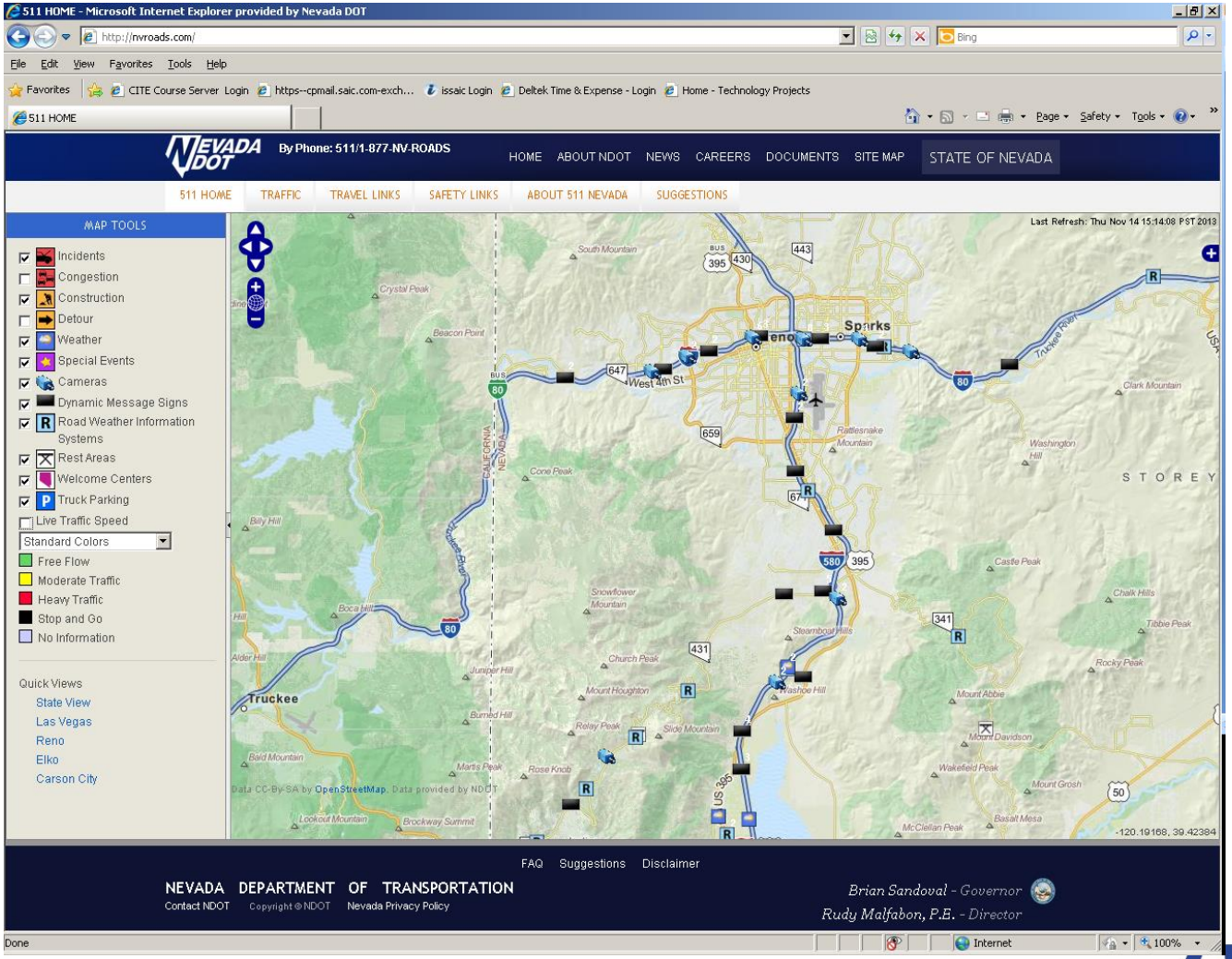
March 2013

- Deadline looms—May 2013
- No product delivery
- Still working on documentation
- Multiple spiral reviews still planned
- Risk management process

Lesson Learned--Process

- Documentation overload
- Not enough progress
- Risk assessment
- Change in strategy

NVRoads.com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Moderate Traffic
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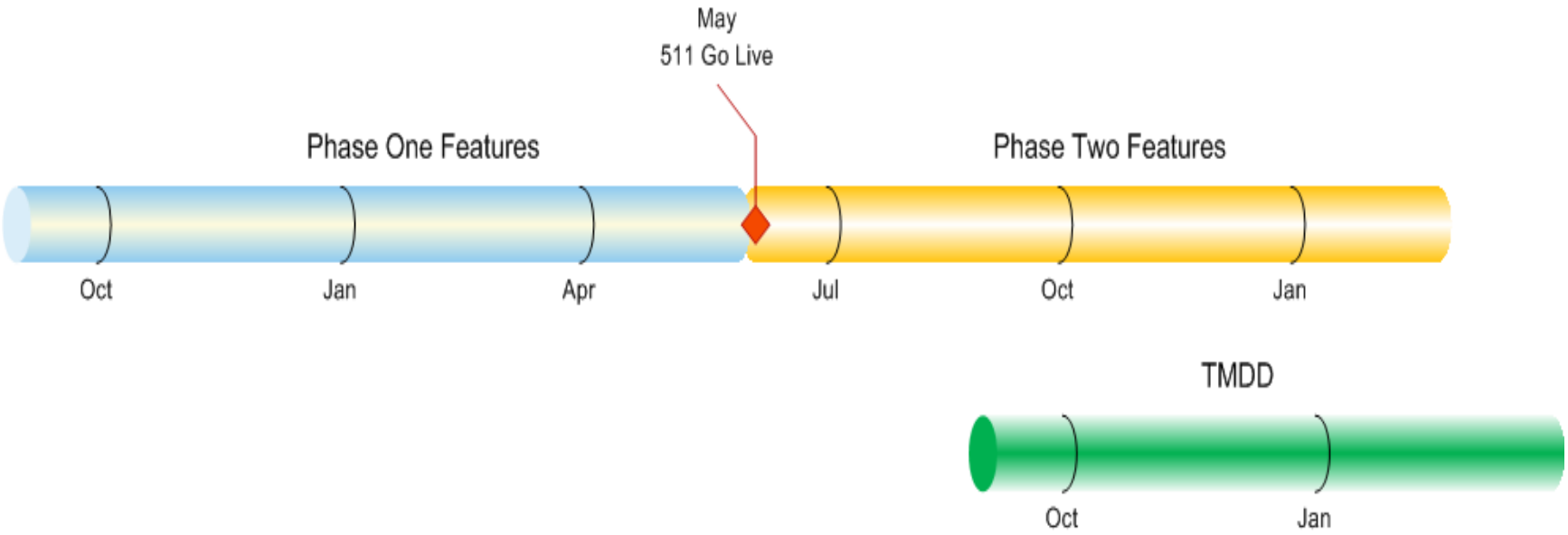
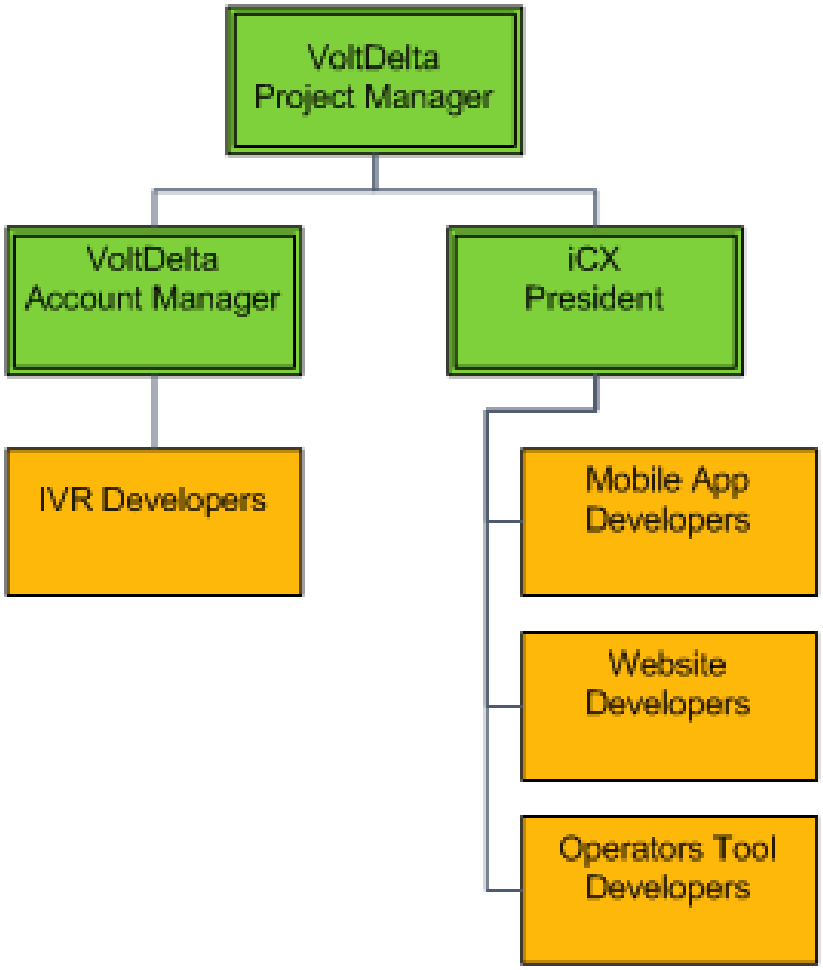
Project Schedule

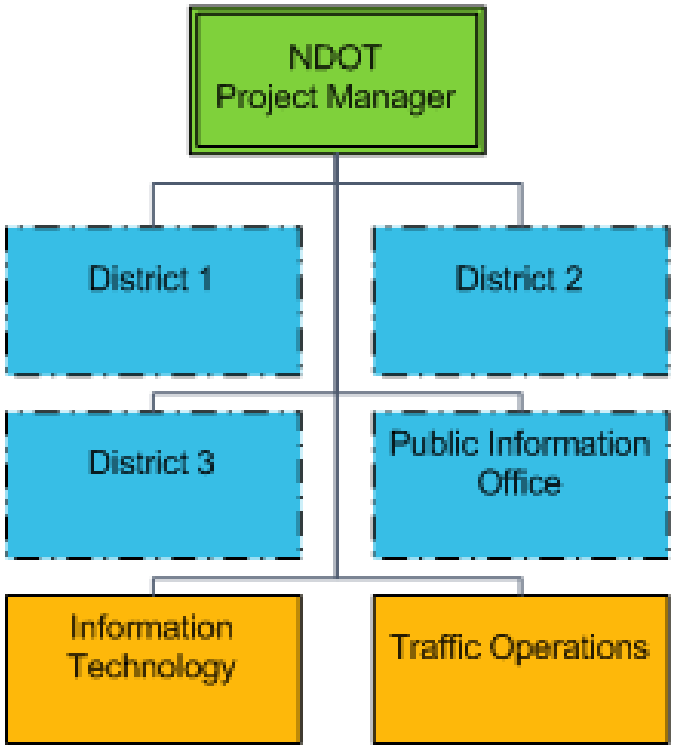


Phase 2

- Changed Project Manager
- Single point of contact
- Smaller circle of stakeholders
- Iterative development (Agile)
- Change management process

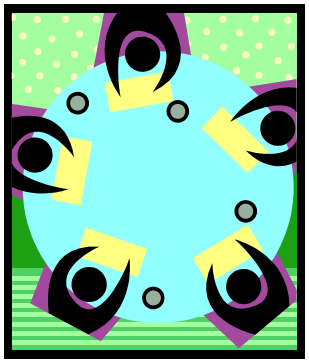
Project Structure—Phase Two





Lessons Learned--Stakeholders

- Single point-of-contact
- Monthly district ROC meetings
- Monthly status to district traffic engineers
- Stakeholders meetings on specific topics—e.g. condition layers



Change Management Board

- Road Operation Center representatives
- Traffic Operations representatives
- Rotating chairmanship
- Maintains log of requested changes
- Meets quarterly
- Documentation of process

Lesson Learned--Stakeholders

- Vocal stakeholders
- Levels of authority
- Internal perspective
- Public opinion
- Condition Layer

Conditions Pix.pdf - Adobe Reader

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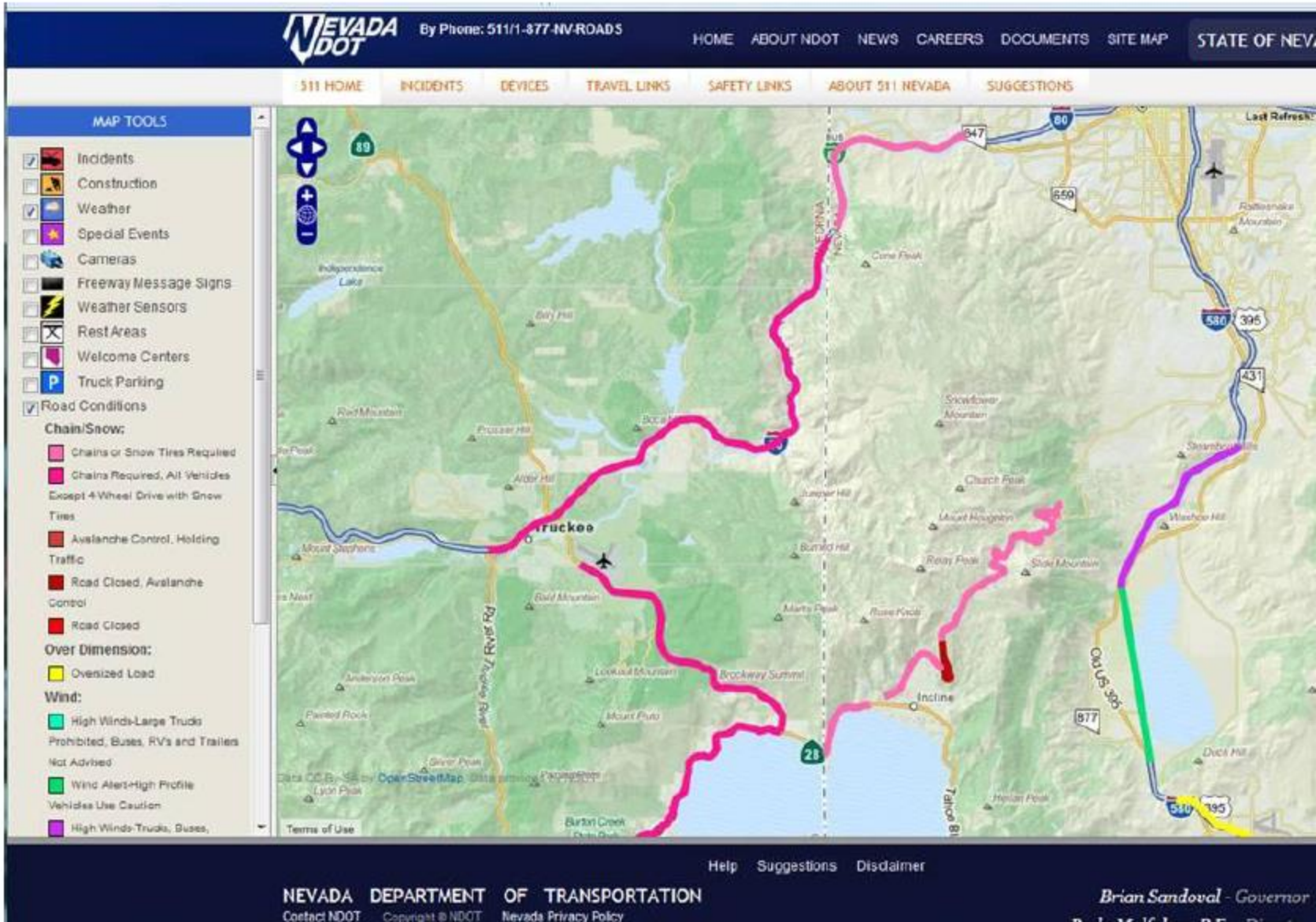
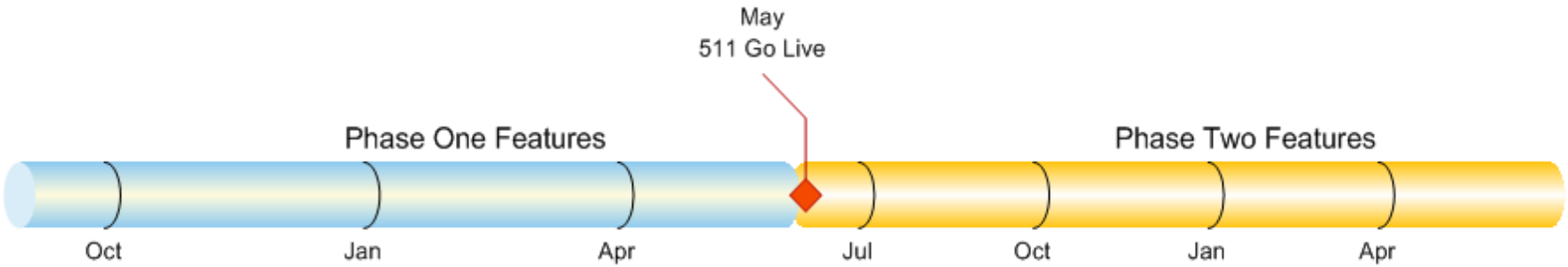
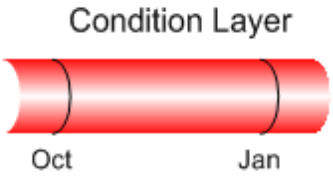
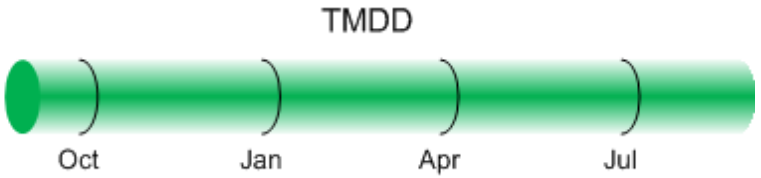


Modified Project Schedule

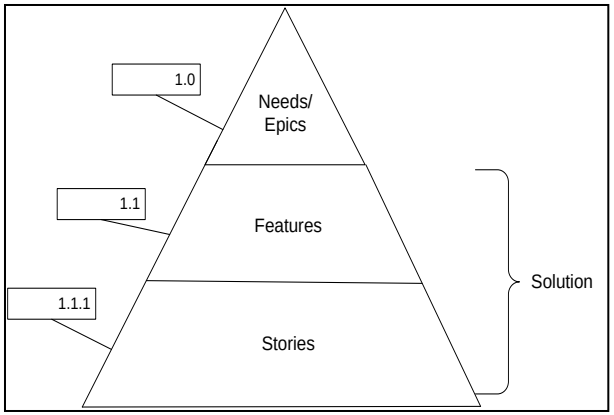






More enhancements

- New set planned for 2014



- Documented using Agile “user stories”
- Used team approach
- Approved by CMB
- Test driven development approach
- Iterative development

Lesson Learned--Budget

- Pay me now—Pay me later
- Original Contract + Condition Layer + Enhancements = Original Budget

Lessons Learned

- Process
  - Not too much or too little
  - Flexible
- Requirements
  - Testable
  - Change control
- Stakeholders
  - Right people
  - Right number
  - Right level of involvement
- Budget
  - Needs to match the requirements

Demo

- http://nvroads.com

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