



Paul Pisano

Paul Pisano is the team leader for the Road Weather Management Team in the Federal Highway Administration (FHWA), Office of Transportation Operations.



Mr. Pisano has worked in several offices at FHWA over the past 20 years, serving as team leader for the Traffic Safety Research Team at the Turner-Fairbank Highway Research Center before moving to the Office of Transportation Operations.

In his current capacity, he is responsible for the program that addresses the impacts of weather on all aspects of the highway system, including winter maintenance, traffic management, and traveler information.

Paul's educational background is in Civil Engineering, holding Bachelor's and Master's degrees from the University of Maryland.



Intelligent Transportation Systems
U.S. Department of Transportation



Clarus Initiative

Rural ITS Web Conference
October 6, 2005

Paul Pisano, FHWA





The Problem

- Adverse effects of Weather on Operations and Safety
 - 1.57 million weather-related crashes, leaving over 713,000 injured and over 7,300 dead (annually, based on an 8 year average)
 - Delay caused by adverse weather has reached nearly 1 billion hours per year
- NOAA estimates that weather adversely affects 1/3 of nation's GDP



What Travelers Typically Get

SPECIAL WEATHER STATEMENT

NATIONAL WEATHER SERVICE BALTIMORE MD/WASHINGTON DC

505 AM EST FRI DEC 10 2004

...FOGGY AND WET MORNING COMMUTE...

WIDESPREAD FOG CONTINUES ACROSS THE REGION...WITH VISIBILITIES REDUCED TO NEAR ZERO IN SOME LOCATIONS. IN ADDITION...RAIN WILL CAUSE PONDING OF WATER ON SOME ROADWAYS ACROSS LOWER SOUTHERN MARYLAND AND ACROSS SOME COMMUNITIES EAST AND SOUTHEAST OF BALTIMORE AND THE DISTRICT...WHILE LIGHTER AND MORE ISOLATED SHOWERS ROAM THE REMAINDER OF THE REGION THROUGH THE MORNING COMMUTE.

MOTORISTS SHOULD SLOW DOWN AND USE CAUTION DURING THE MORNING COMMUTE DUE TO THE COMBINATION OF WET ROADWAYS AND LOW VISIBILITIES.



Changing Current Practices

- Weather products today generally are insufficient for transportation operations
 - Focus on the atmosphere
 - Surface observing is airport based
- Surface weather forecasting benefits from more data from more sources
 - Ground observations are plentiful (2,500 ESS), but not managed to form coherent picture
- Managing all available ground data yields new products



Why now?

Growing demands for specific road weather products to offset safety impacts and impeded mobility





Clarus – Scope & Objectives

- Scope – To design, develop and demonstrate a system that assimilates, quality controls and disseminates road weather observations
- Objective – Enable the public (i.e., NOAA/NWS) & private weather enterprise to develop better road weather information products that improve the safety and mobility of the surface transportation system
 - Establish a network for exchanging surface transportation weather observations
 - Craft better models and decision support tools
- Initiative Hypotheses
 - Reduce delay from weather by 10%
 - Reduce weather-related crashes by 10%

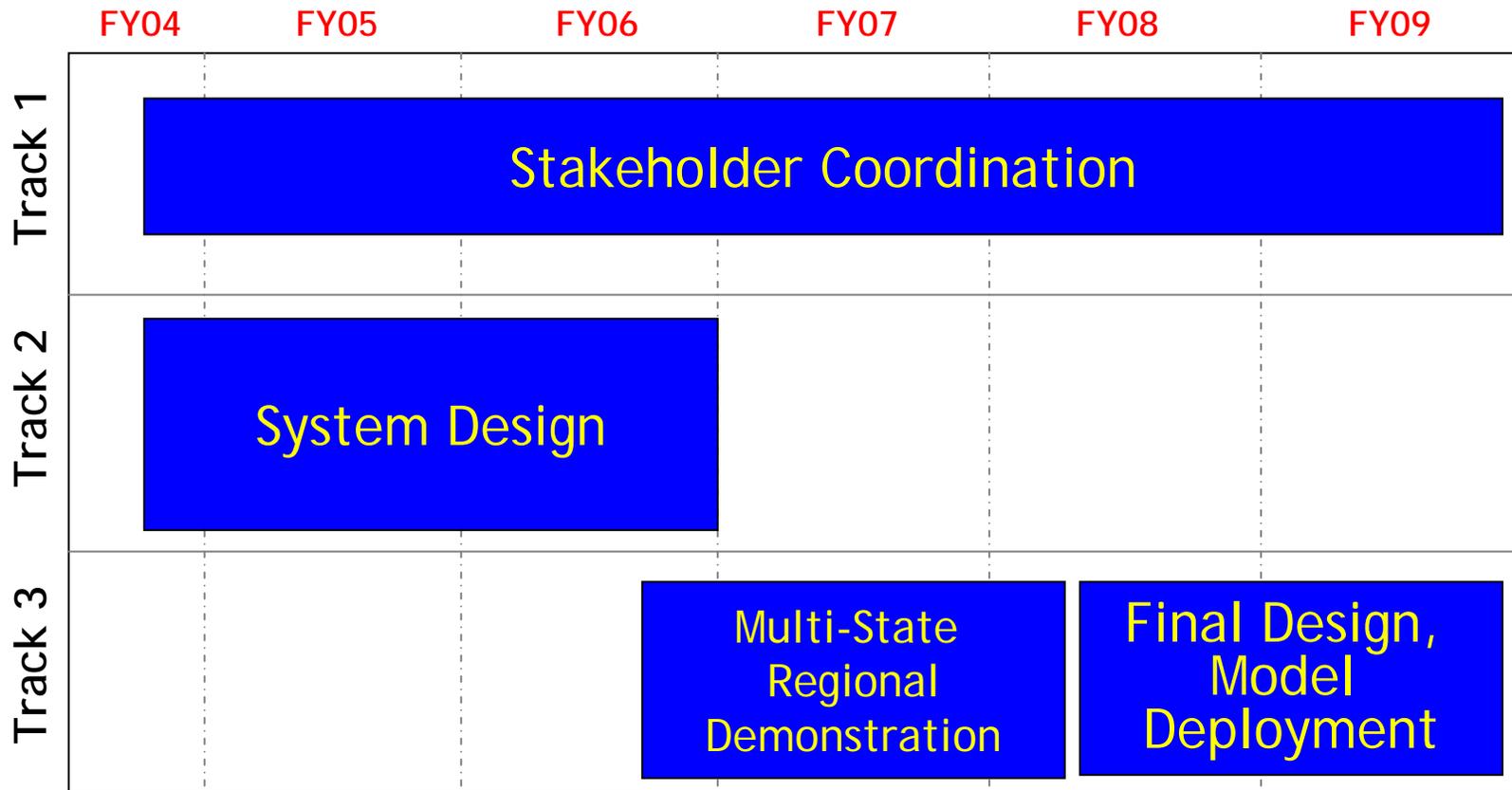


Clarus Impact on Overcoming Gaps

- Three fundamental deficiencies today
 - Lack of transportation system relevant weather observations
 - Lack of understanding on how to apply weather information in decision making
 - Lack of capabilities for predicting and/or assessing surface level weather phenomena
- Clarus opens the opportunity for real-time surface transportation weather observations not possible otherwise

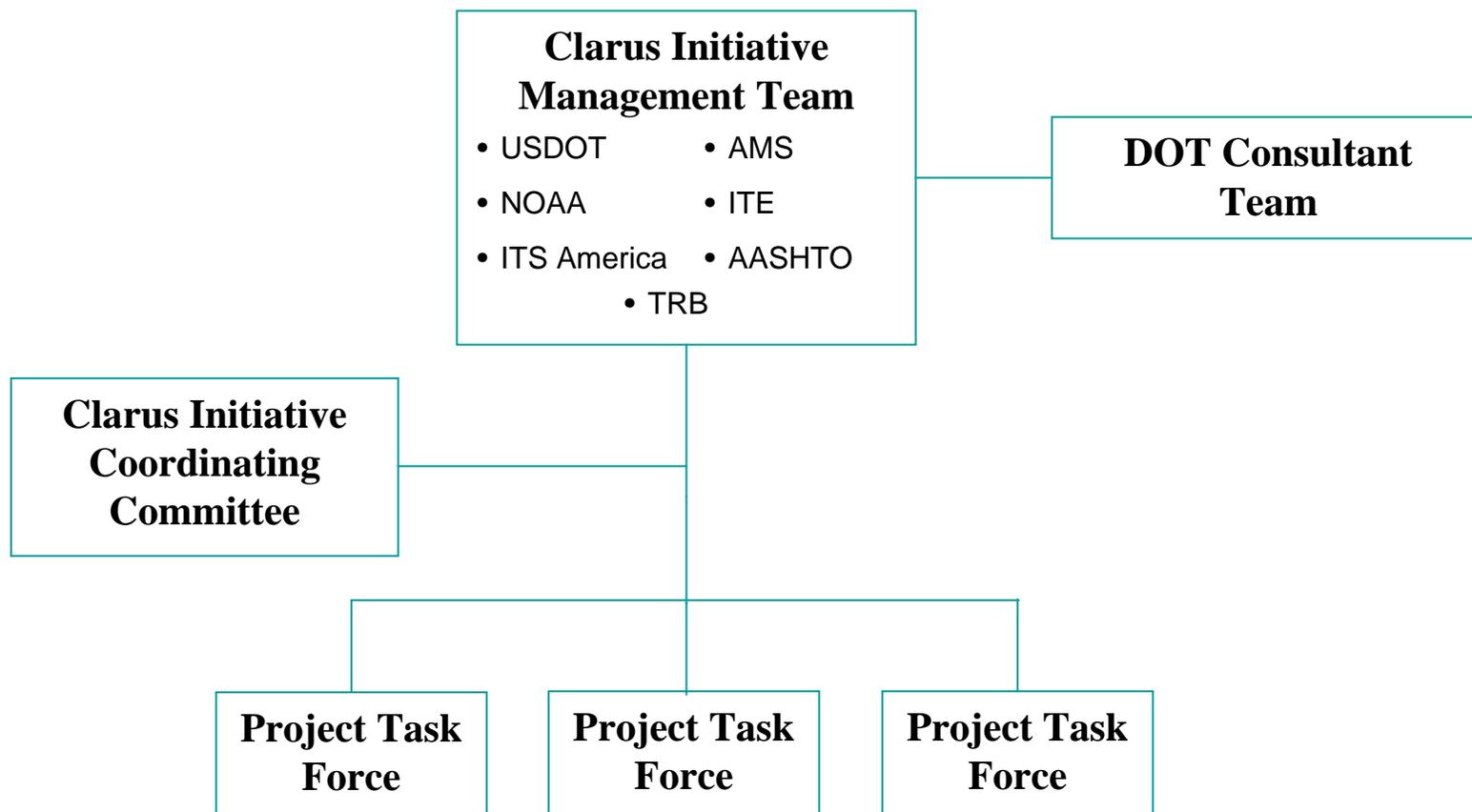


Clarus Development Tracks





Initiative Coordinating Committee (ICC)





Progress to Date

- Concept of Operations
 - Operational Scenarios and Use Case Development
 - Final ConOps released
- System Design Contract
 - Awarded to Mixon/Hill
 - Team includes: University of Oklahoma; Cambridge Systematics; ConSysTec
 - Duration May 2005 to December 2006
 - Requirements development - Ongoing
 - System design - November through February
 - Proof-of-Concept Testing - March through September
- <http://www.clarusinitiative.org>

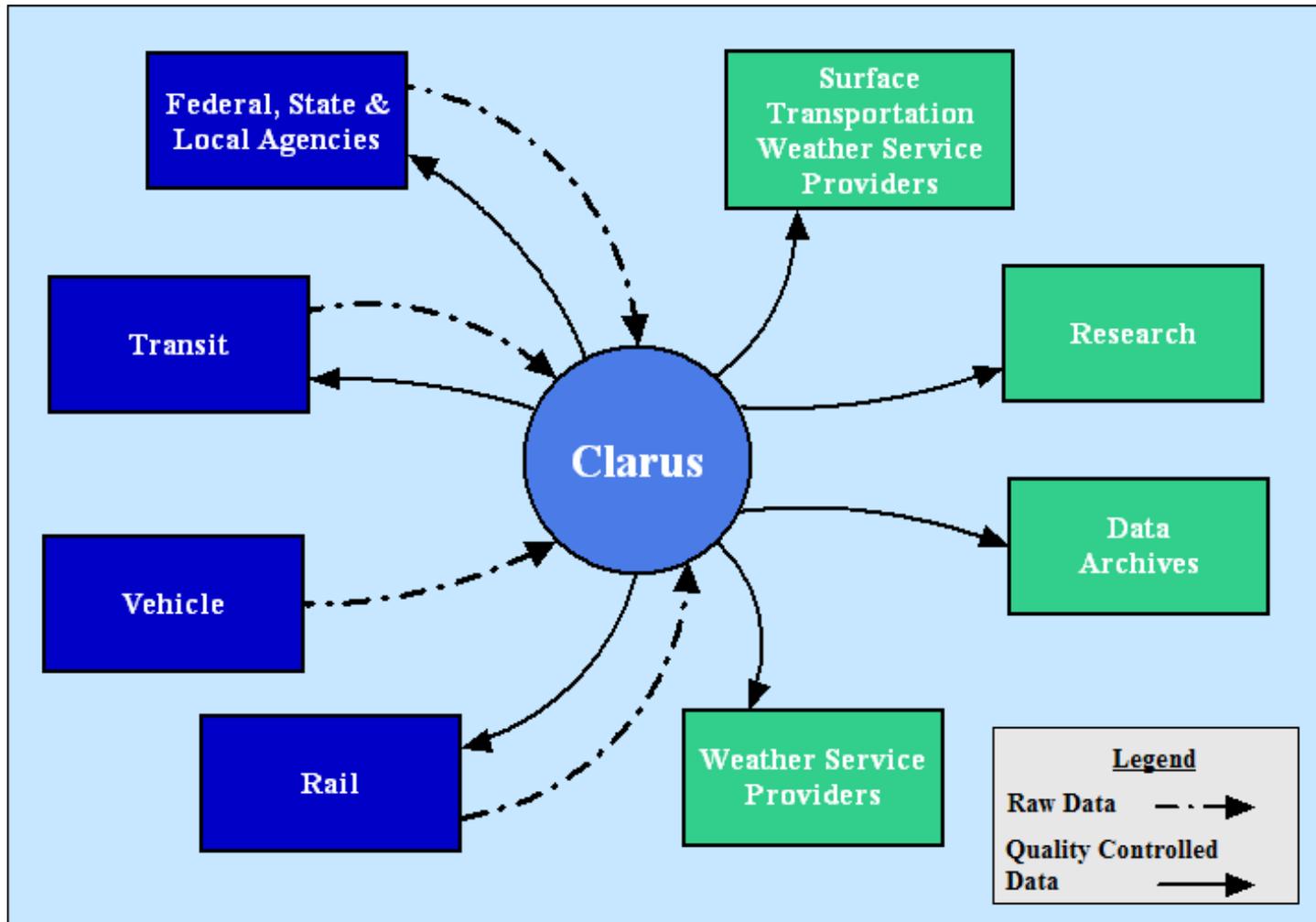


Clarus Use Cases & Operational Scenarios

- Roadway Maintenance & Construction Operations
- Traffic Operations
- Traveler Information
- Transit Management
- Emergency and Public Safety
- Railroad Operations Management
- Commercial Vehicle Operation



High-level Logical View





Clarus Impact on Decision Making

- Clarus enables enhanced response and planning through improvements to weather observations, models, and predictions
 - Microscale events for immediate response (e.g., black ice, fog banks) conveyed in seconds to minutes
 - Mesoscale events for tactical response (e.g., thunderstorms, flash floods) forecast in minutes to hours
 - Synoptic scale events for strategic response (e.g. blizzards, floods, heat) forecast in hours to days



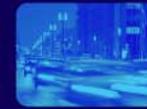
Challenges

- Observation gathering limitations (esp. VII)
 - Urban focus on traffic safety
 - Rural impacts of weather are often more severe, yet coverage will remain limited
- Making sense of the observations (esp. VII)
 - Volume (filtering, prioritization)
 - Geographic distribution
 - Quality assurance
 - Anonymity of data
- Building interfaces that take advantage of standards
- Coordination with NOAA and other Weather enterprise partners



Activities & Actions

- Convergence of Clarus/NOAA NSWOS (National Surface Weather Observing System)
- Business models white paper being written by PBS&J
 - Consideration various paths to operations and the ties to the various stakeholders
- Research Projects
 - VII project with UCAR – initial assessment of VII uses
 - CCTV project with MIT/LL – machine vision for assessing precipitation
 - Phased Array Radar - study of low power radar for ground observations
 - VII/Mobile Sensing test - Mitretek



Rapid Development

- System Design Effort is Launched
 - High Level Requirements completed in mid-July
 - Detailed Requirements slated for completion in mid-November
- Design and Architecture Gaps being studied
 - Review and analysis on decision to complete design slated for late October
- Intensive review process involving the stakeholders
 - High Level Requirements Review Task Force
 - Detailed Requirements Review Task Force
 - Design Gaps/Architecture Analysis Task Force



Upcoming Activities

- ICC Meeting #3
 - Salt Lake City
 - Nov. 15-17th, including TMC tour
- Initiative Management Team (IMT) Mtg.
 - Next meeting immediately following ICC #3
 - Nov. 18th
- Clarus presentations/papers
 - TRB, January 2006
 - AMS, January 2006



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Clarus Initiative

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Rural ITS CoP

<http://knowledge.fhwa.dot.gov/ruralits>