

National Exercise Simulation Center (NESC) – Informative Briefing

April 6, 2009



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Vision Statement:

To establish a state-of-the art National Exercise & Simulation Center (NESC) at FEMA Headquarters to support the Department's all-hazards preparedness and response program through the use of a central facility that coordinates Modeling & Simulation resources, maximizes exercise efficiency, and provides sustained exercise and training support to all stakeholders.

Section 664 of 2007 Homeland Security Appropriations Act:

“The National Exercise Simulation Center uses various methods of simulation to train elected officials and emergency response personnel from all levels of government.”

The Federal Response to Hurricane Katrina: Lessons Learned, page 119:

“DHS should develop and fund a National Exercise Simulation Center (SIMCEN), similar to the Department of Defense's Joint Warfighting Center. The SIMCEN would act as a tool to simulate the Federal role in emergency response and be capable of working with State and local exercises.”



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Projected Capabilities – January, 2010

Fully operational State-of-the-Art Exercise Control and Sim Center to:

1. Support national, federal, state, and local exercises throughout the United States and internationally with around-the-clock services
2. Act as the central hub linking exercises and planning personnel to specialty services in a hub and spoke framework
3. Incorporate National and FEMA improvement management services to include FEMA Remedial Action Management Program, National Corrective Action Program, and Lessons Learned Information System
4. Provide advanced operational planning support
5. Facilitate modeling and simulation activities that support exercises, training, and unique events
6. Act as an extension of the NRCC for purposes of supporting national readiness

January, 2010 represents the end of Stage I and the start of a multi-year Stage II designed to further increase operating capabilities

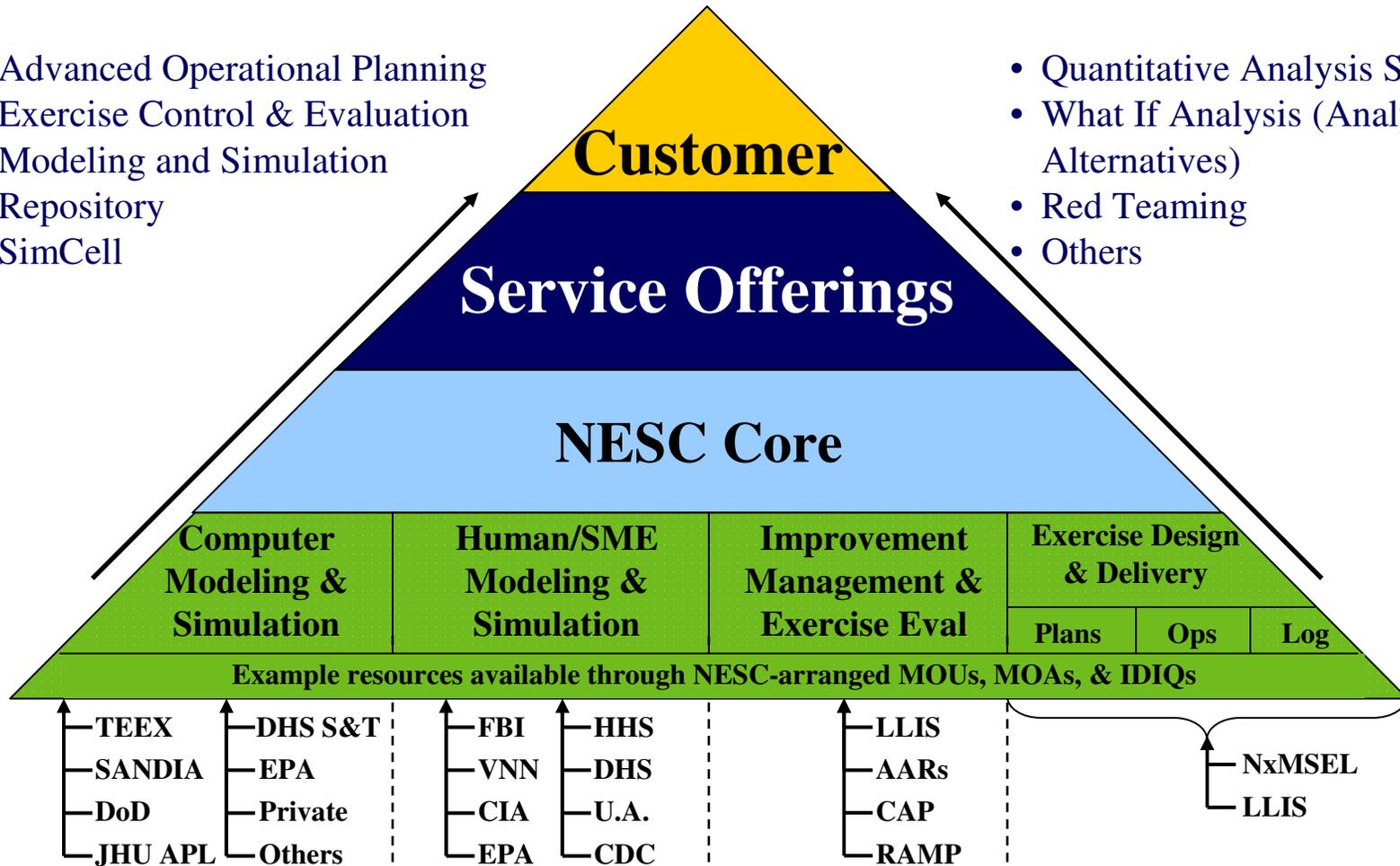


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Operating Concept of the NESCS

- Advanced Operational Planning
- Exercise Control & Evaluation
- Modeling and Simulation Repository
- SimCell

- Quantitative Analysis Support
- What If Analysis (Analysis of Alternatives)
- Red Teaming
- Others



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NESC Core Capability (3rd Floor FEMA HQ)



Current Operating Capabilities:

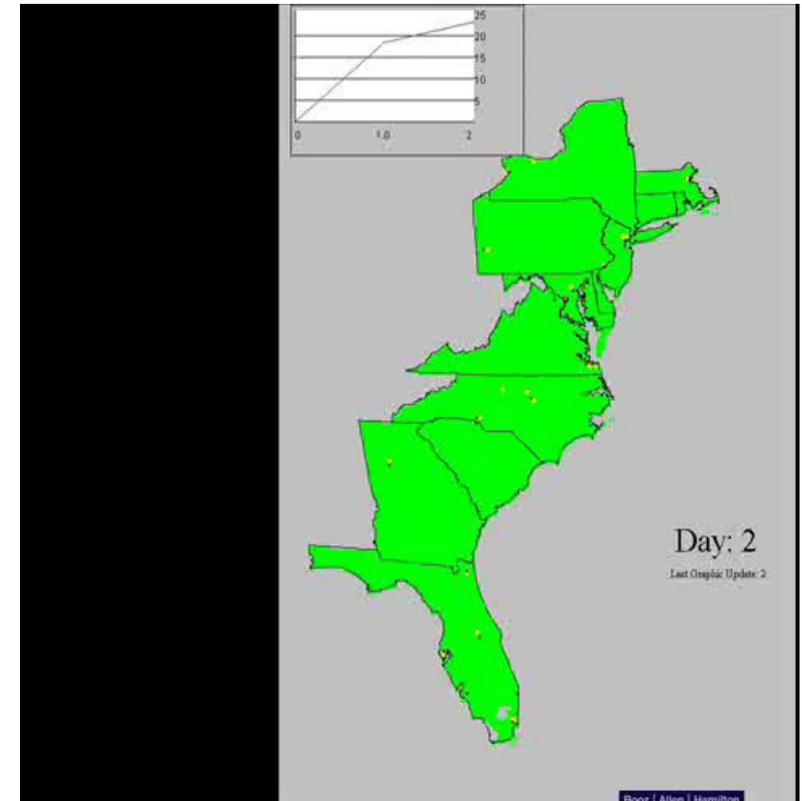
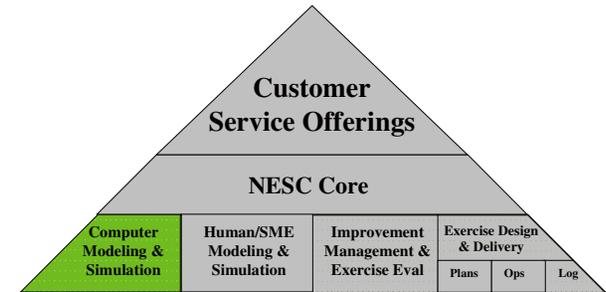
- Multiple linked display capability
- VTC, Teleconference
- 100+ networked workstations with integrated phone
- iSave technology installed
- In-house dedicated secure communications
- Capability includes up to “secret” classification level



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Benefits of Computer Simulation

- **Enhanced Realism** – Increases the realism participants experience throughout the exercise
- **Multiple Outcomes** - Potential for efficient multiple dynamically derived outcomes. Roll up performance metrics from multi-jurisdictional exercise into single location
 - $X = f(1,2,3,4)$
 - ROI & Cost-Benefit Analyses
- **Run & Re-run** – Provides a mechanism to show the responder the downstream impact to his/her decision. Participants can explore alternative courses of action in real-time and react to and go beyond their initial decisions (**What ifs?**)
- **Decision Timing** – draws out collaborative opportunities and the appropriate timing for engagement in these opportunities



Challenge of Exercise Culture Change - expanding the use and acceptance of computer simulation as a valuable exercise aid across the community



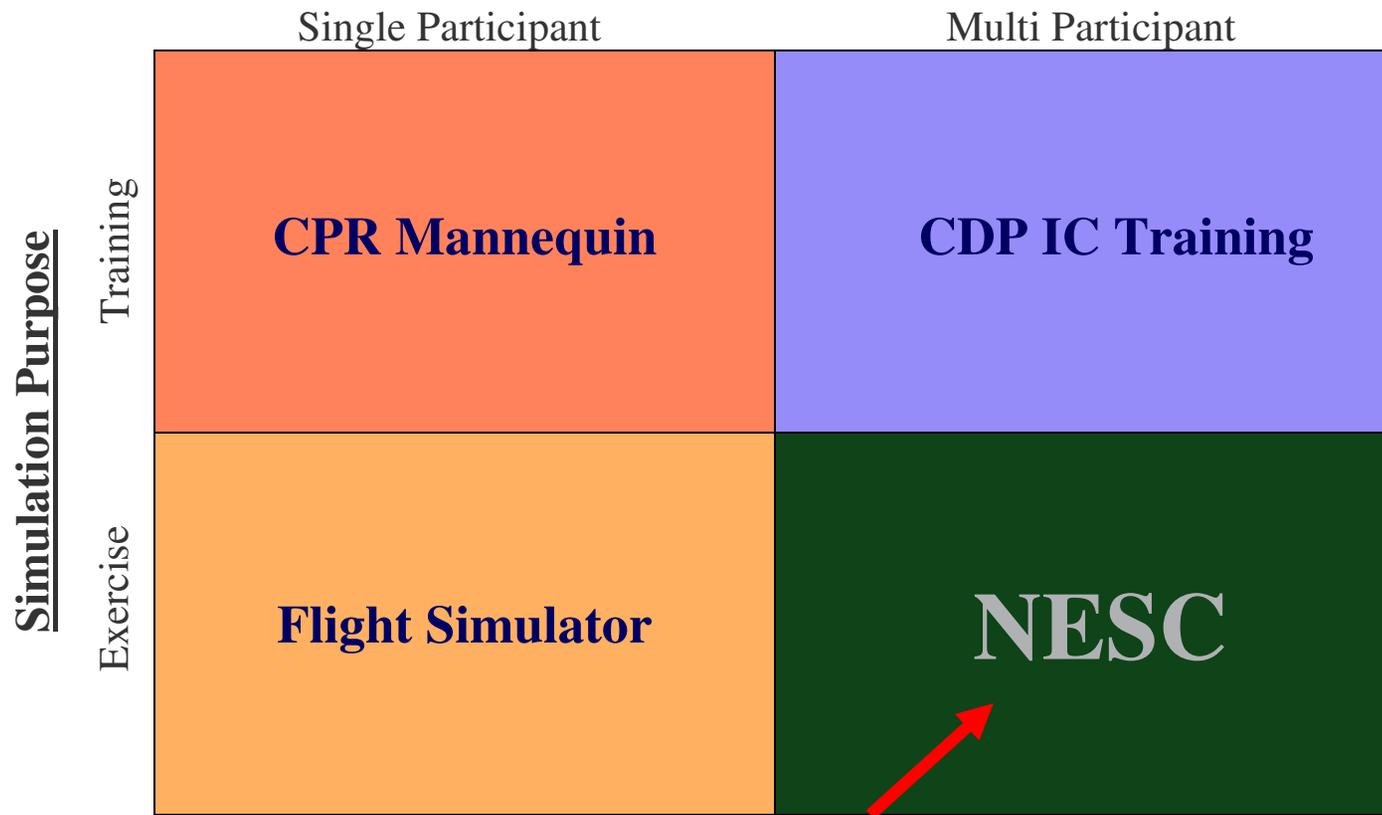
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NESC Simulation Categorization



Human in the Loop



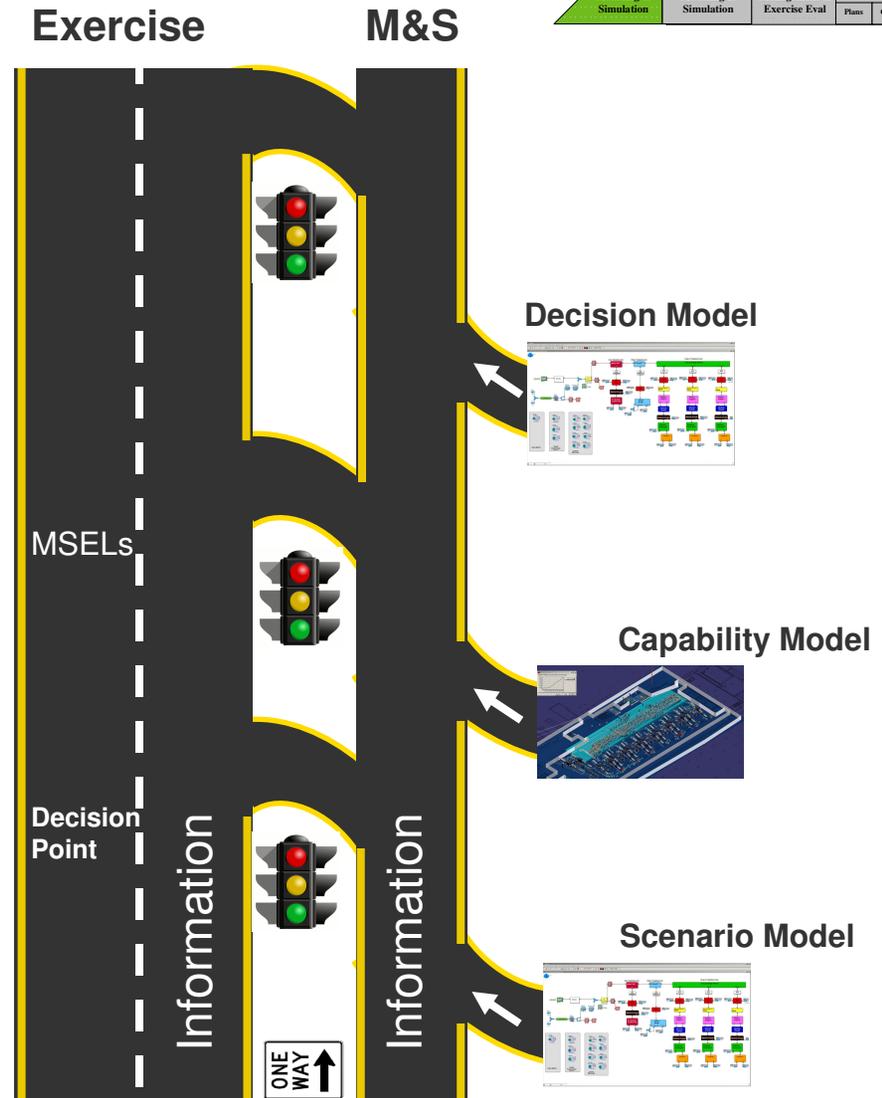
**NESC = Multi-participant
Exercise Simulations**



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Early Successes

- Year 1 goal is to operationalize 5-6 models with limited inputs to provide greater degree of immersion to participants
 - Model/Simulation will NOT drive the exercise, but rather provide inputs to and impacts of decisions made during the course of the exercise.



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Example Simulation User **Input** Interface (Hurricane/Flood)



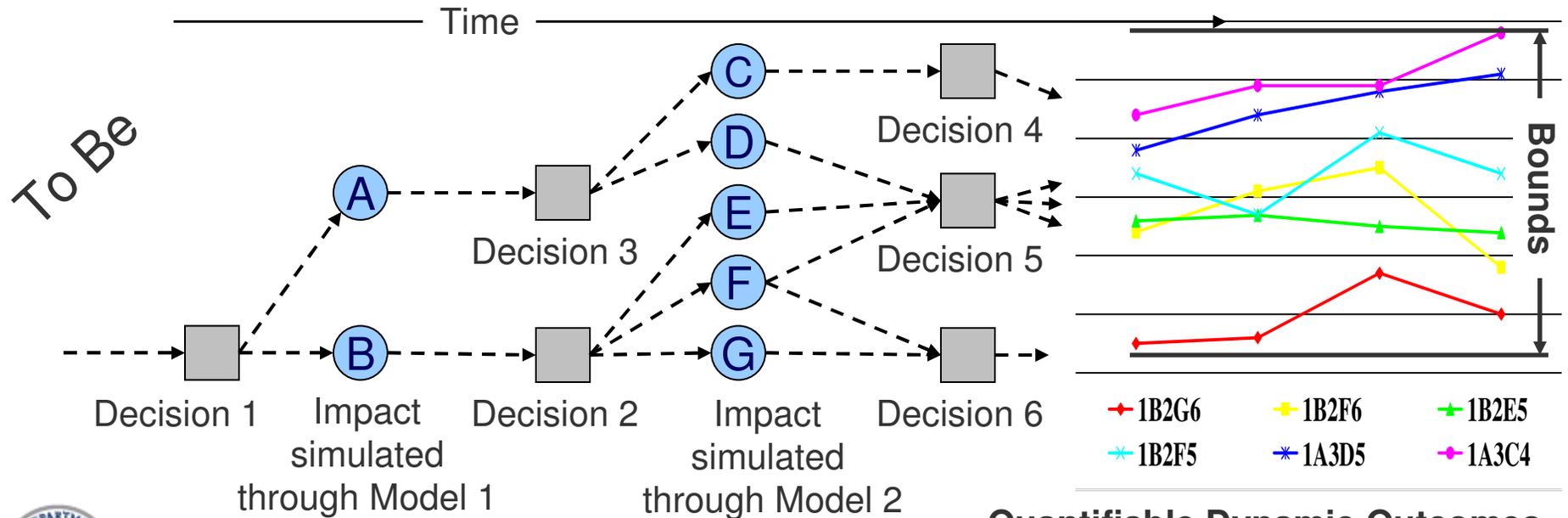
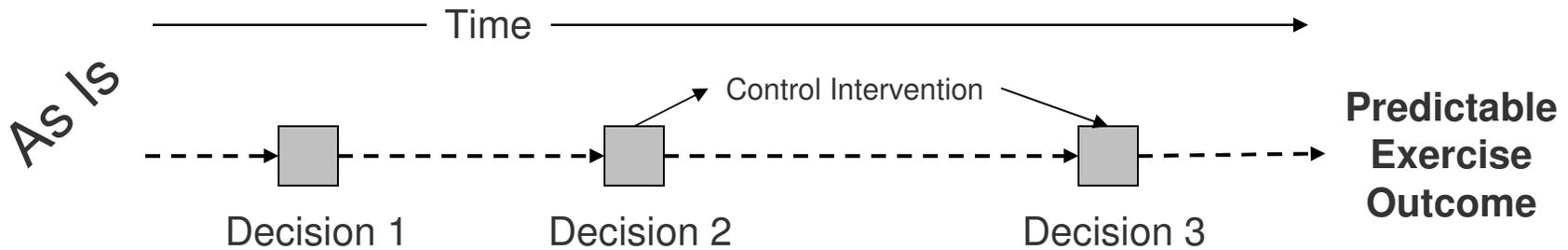
EXAMPLE----- Exercise 1 - Hurricane/Flood Simulation-----EXAMPLE

Model 1 On	Model 2 Off	Model 3 On
<p style="text-align: center; color: red;"><u>Crisis Communications Model</u></p> <p>Crisis Communications Decision Time: <input type="text" value="Event"/></p> <p>Crisis Communication Methods</p> <p><input checked="" type="checkbox"/> Radio: <input type="text" value="Event + 1 Hr"/></p> <p><input checked="" type="checkbox"/> Television: <input type="text" value="Event + 3 Hr"/></p> <p><input checked="" type="checkbox"/> Emrgy Broadcast: <input type="text" value="Event + 2 Hr"/></p> <p><input checked="" type="checkbox"/> Cell Phone/TextMsg: <input type="text" value="Event + 4 Hr"/></p> <p><input type="checkbox"/> Amber Alerts: <input type="text" value="Event"/></p> <p><input type="checkbox"/> D2D - PA Systems: <input type="text" value="Event"/></p> <p>Crisis Message Effectiveness %: <input type="text" value="46%"/></p> <p style="text-align: center; border: 1px solid gray; padding: 5px;">Process Inputs</p>	<p style="text-align: center; color: red;"><u>Hospital Evacuation Model</u></p> <p>Distance to Receiving Hospital: <input type="text" value="20 - 40 Miles"/> Direction: <input type="text" value="NW"/></p> <p># of Discharges: <input type="text"/></p> <p># of Floors: <input type="text"/></p> <p># of Staircases: <input type="text"/></p> <p>Backup Generator Time: <input type="text"/></p> <p># of Ambulatory: <input type="text"/></p> <p># of Litters: <input type="text"/></p> <p>Transportation Capability (Ambulances): <input type="text"/></p> <p style="text-align: center; border: 1px solid gray; padding: 5px;">Process Inputs</p>	<p style="text-align: center; color: red;"><u>Transportation & Evacuation Model</u></p> <p style="text-align: center;">% Population Evacuated: <input type="text" value="84%"/></p> <p>Contraflow Decision Time: <input type="text" value="Event + 2 Hr"/></p> <p>Mass Transit (Buses): <input type="radio"/> Yes <input checked="" type="radio"/> No</p> <p>Checkpoints: <input checked="" type="radio"/> Yes <input type="radio"/> No</p> <p>Special Population Requirements: <input checked="" type="radio"/> Yes <input type="radio"/> No</p> <p style="text-align: center; border: 1px solid gray; padding: 5px;">Process Inputs</p>



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Comparison of Outcomes

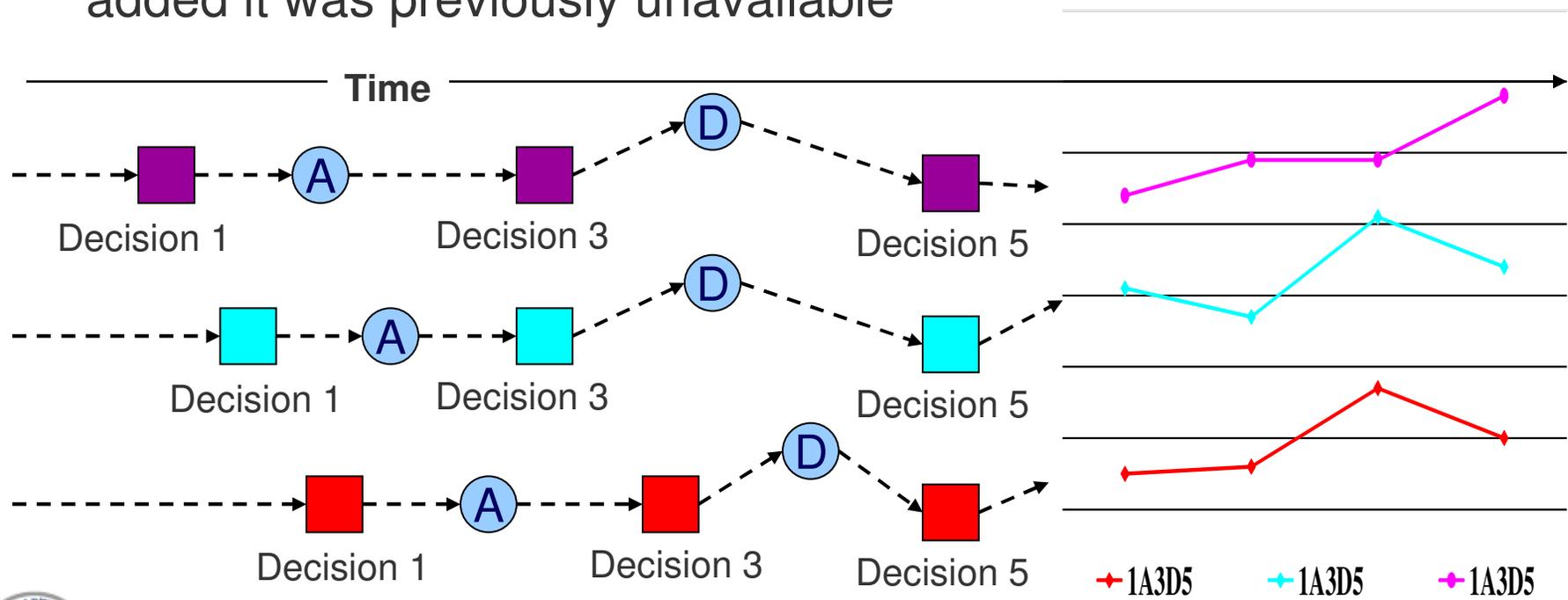


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Impact of Time on Decisions (in simulation)



- Within a given situation, the timing of a decision can have as much impact on the outcome as the actual decision itself
- Simulation allows for a more realistic timing component to be added it was previously unavailable



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Hurricane User Interface



Integrated Modeling, Mapping and Simulation (IMMS) Concept

Hurricane Planning
with Remote Collaboration

January 2009



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Questions?



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