**NEXTOR** Annual Research Symposium
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# Session II
# Collaborative Decision Making

## Future Directions

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# Potential Future Directions for CDM Research

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# Implications of CDM

- CDM represents a major change in ATM environment
- Opportunity to work and make decisions in real time with a common data basis
- Immediate impacts will be on ATFM
- Longer-term impacts on entire spectrum of ATM operations
- Possibly unexpected developments

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# Short-term Research Issues

- **Increasing efficiency in arrival slot utilization through**
  - **compression**
  - **improved Ground Delay Programs**
  - **improved MARs**
- **Improving prediction of actual take-off times [Shumsky, 1995]**
  - **Critical in predicting system loads**
  - **CDM will make available crucial data for better dynamic prediction models (arrival of aircraft at gate, estimated pushback time, runway configuration, et al.)**

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# Medium- and Long-term Issues

- **Multi-party collaborative arrival slot allocation (the “Slot Exchange”)**
- **Collaborative routing**
  - **development of “negotiating environment” (information basis, supporting agorithms)**
  - **experiment on variability of user-preferred flight plans over time**
- **Impacts of CDM on CTAS, Departure Planners, conflict probes**

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# Eventually...

**CDM may have a profound impact on every aspect of ATM planning:**

- **Initial allocation of arrival slot "blocks" among aircraft operators**
- **Assignment of arrival slots to flights**
- **Assignment of departure slots to flights**
- **En route flight planning**
- **Transition planning, tactical flow control**

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# A Final Observation

- **In the presence of continuing tight terminal area capacity constraints, CDM (and resulting improvements in Flow Management) will be essential for attaining some of the objectives and benefits of Free Flight**
- **“Better strategic co-ordination based on shared information will provide more tactical freedom”**