

The Trajectory-Capable Aircraft

Presented to: ICNS

By: Bruce DeCleene, Manager, Avionics Systems

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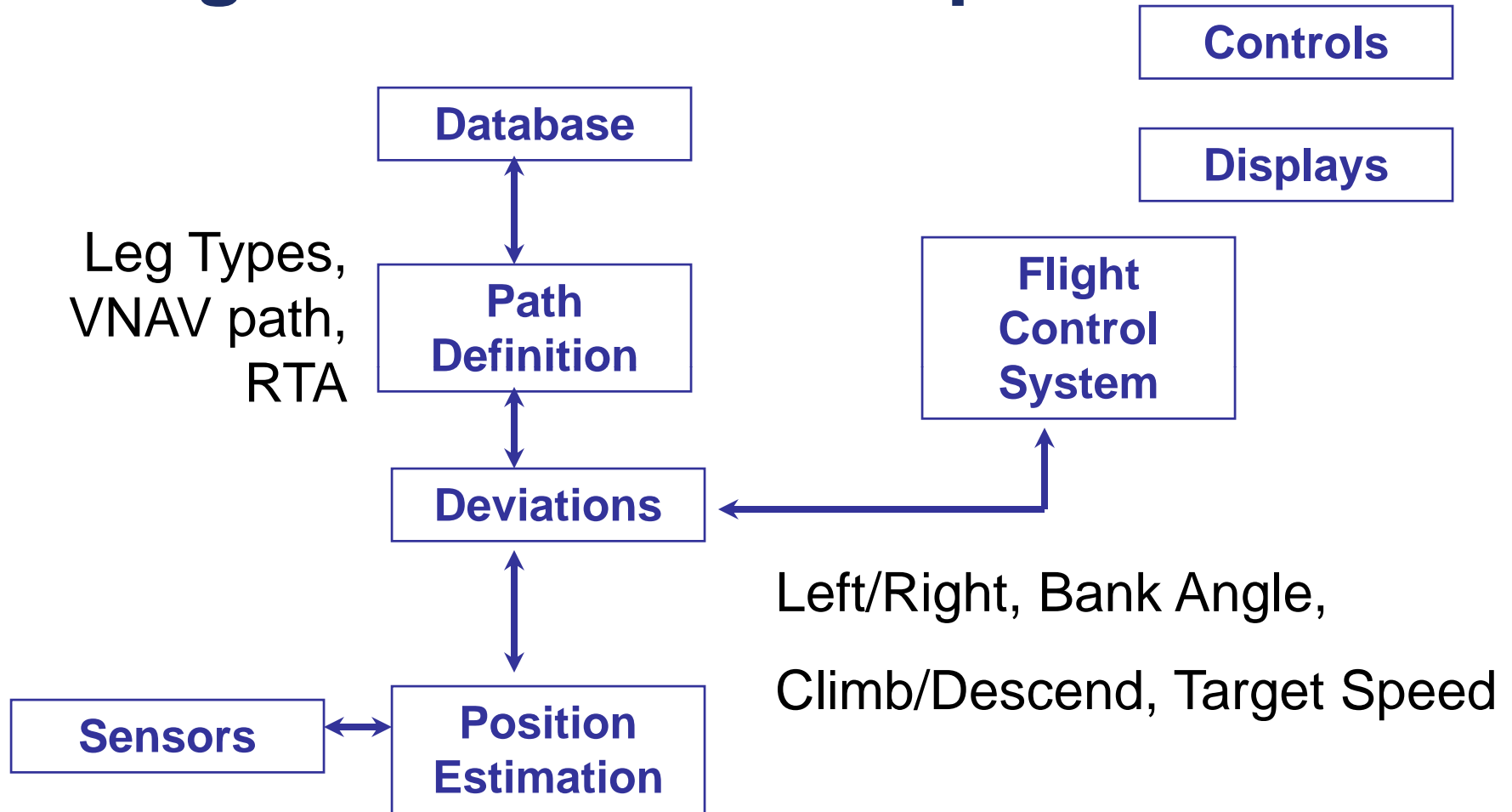
Federal Aviation
Administration



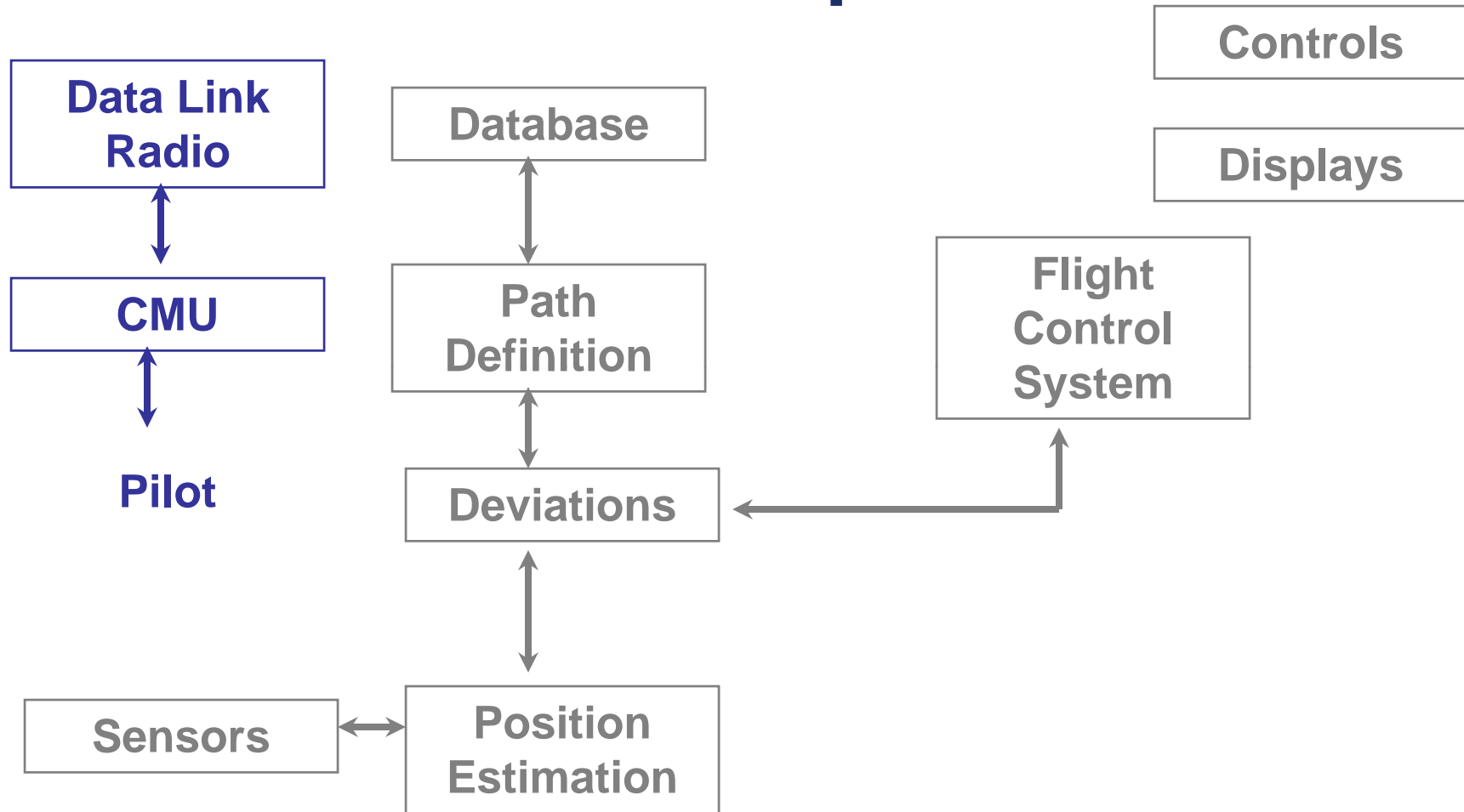
Trajectory-Enabling Systems



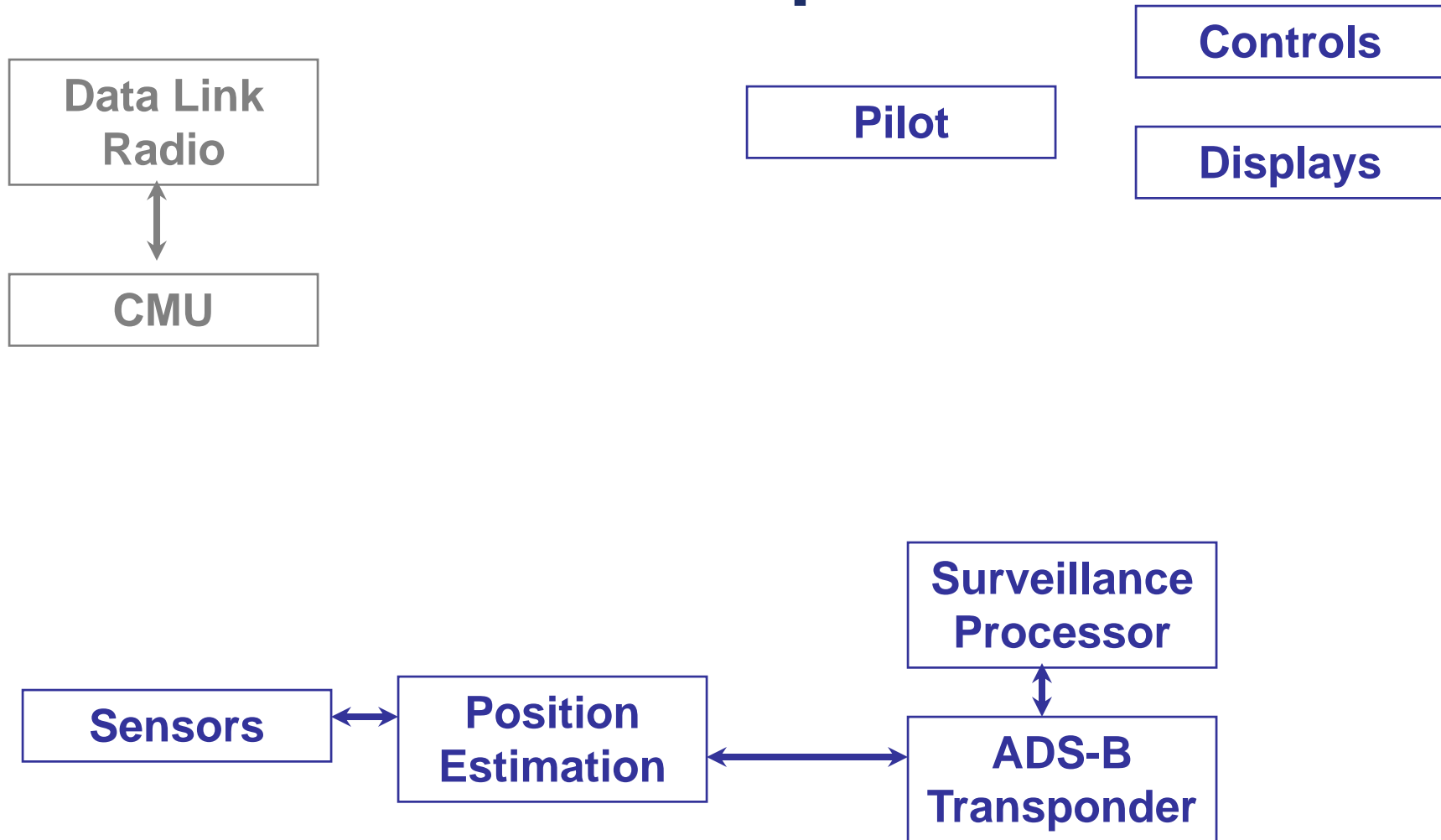
Navigation-Centric Perspective



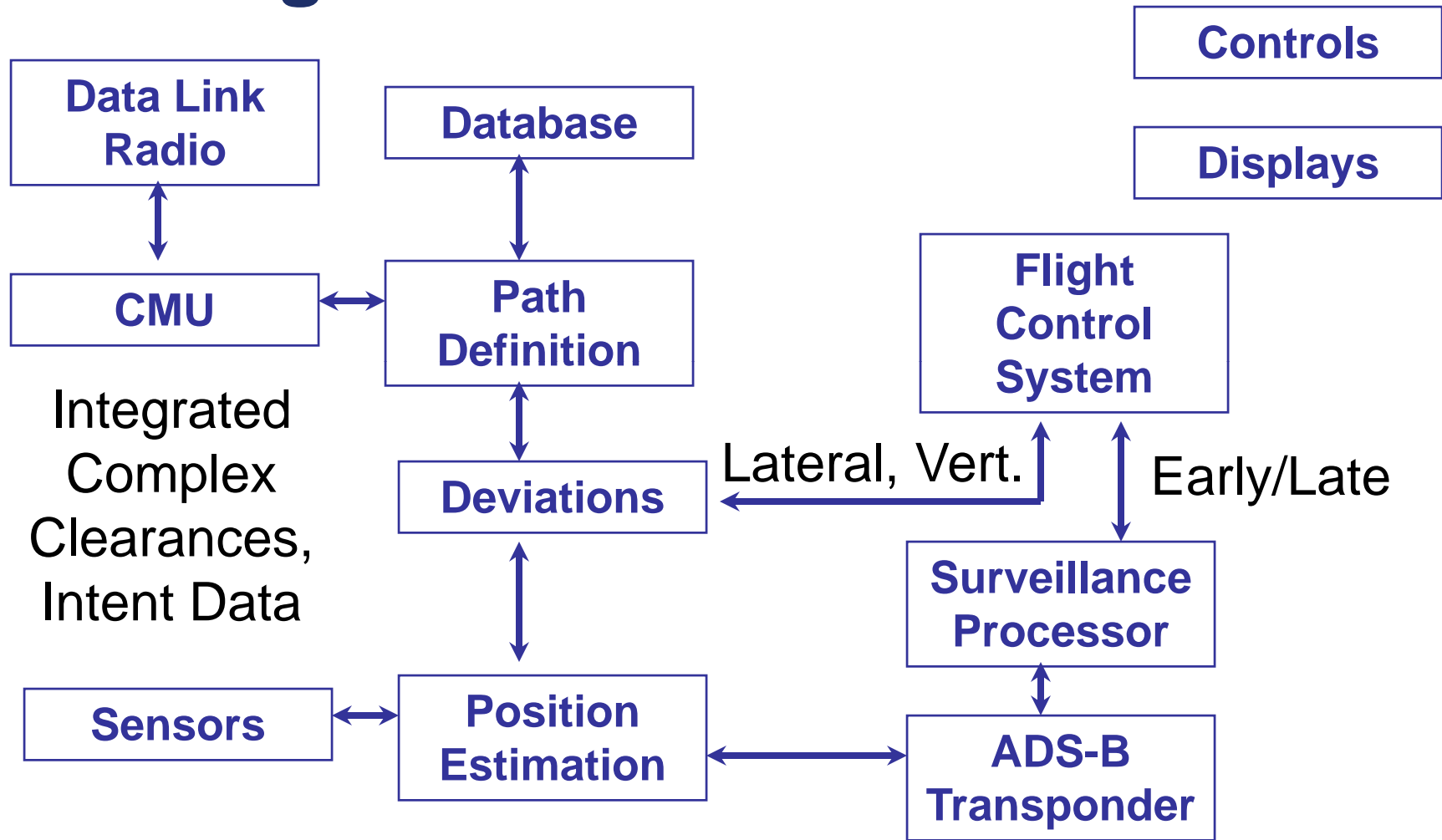
CPDLC-Centric Perspective



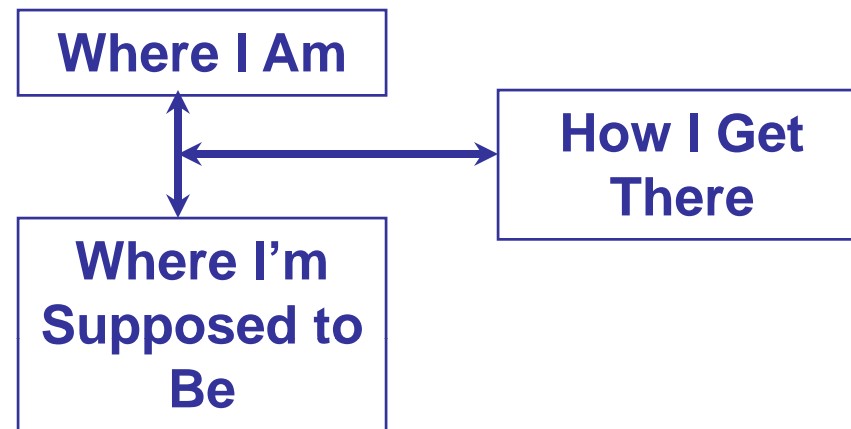
ADS-B-Centric Perspective



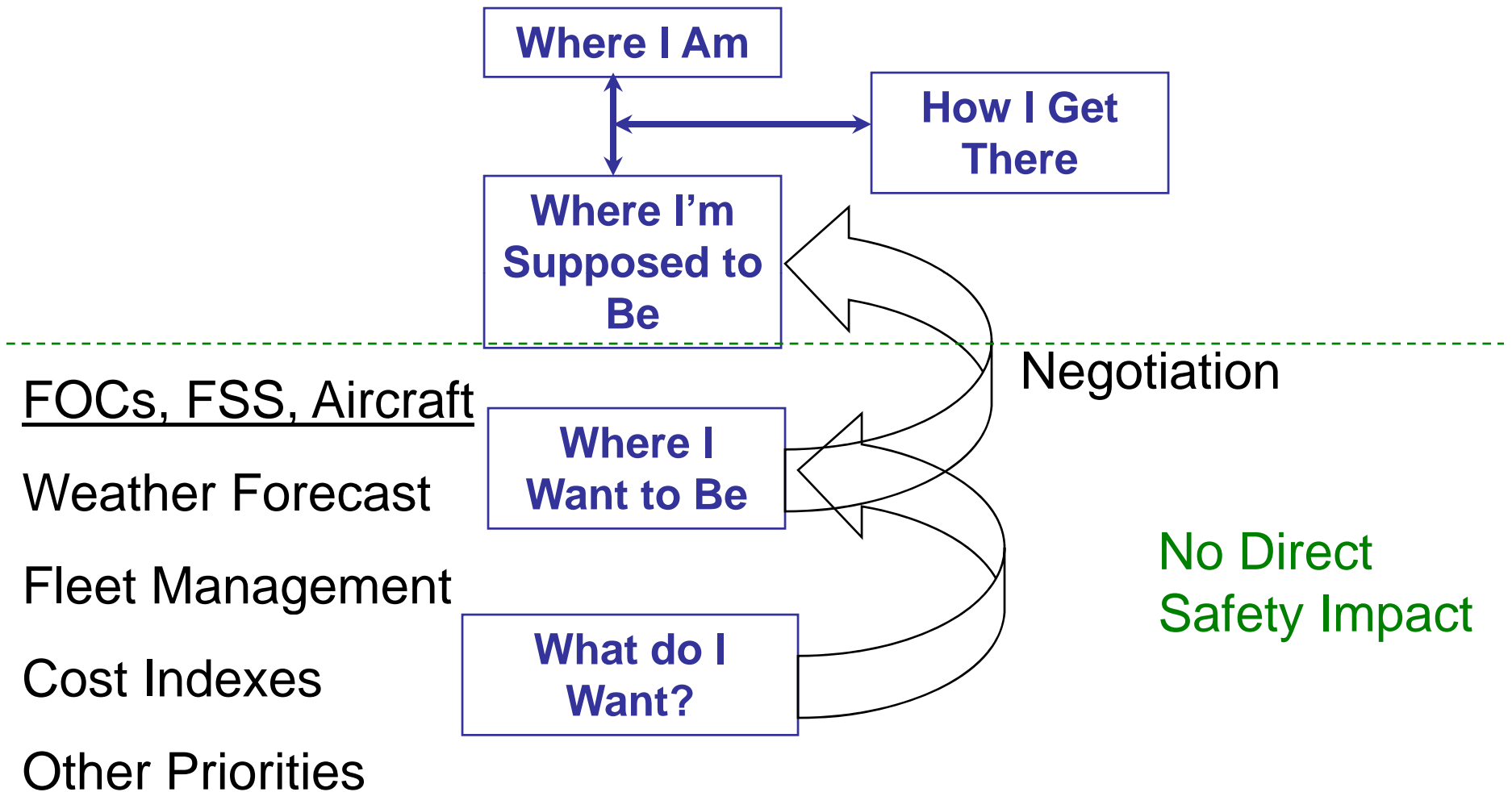
Finding Common Ground



A Broader View



A Broader View: Net Centric Planning



Observations

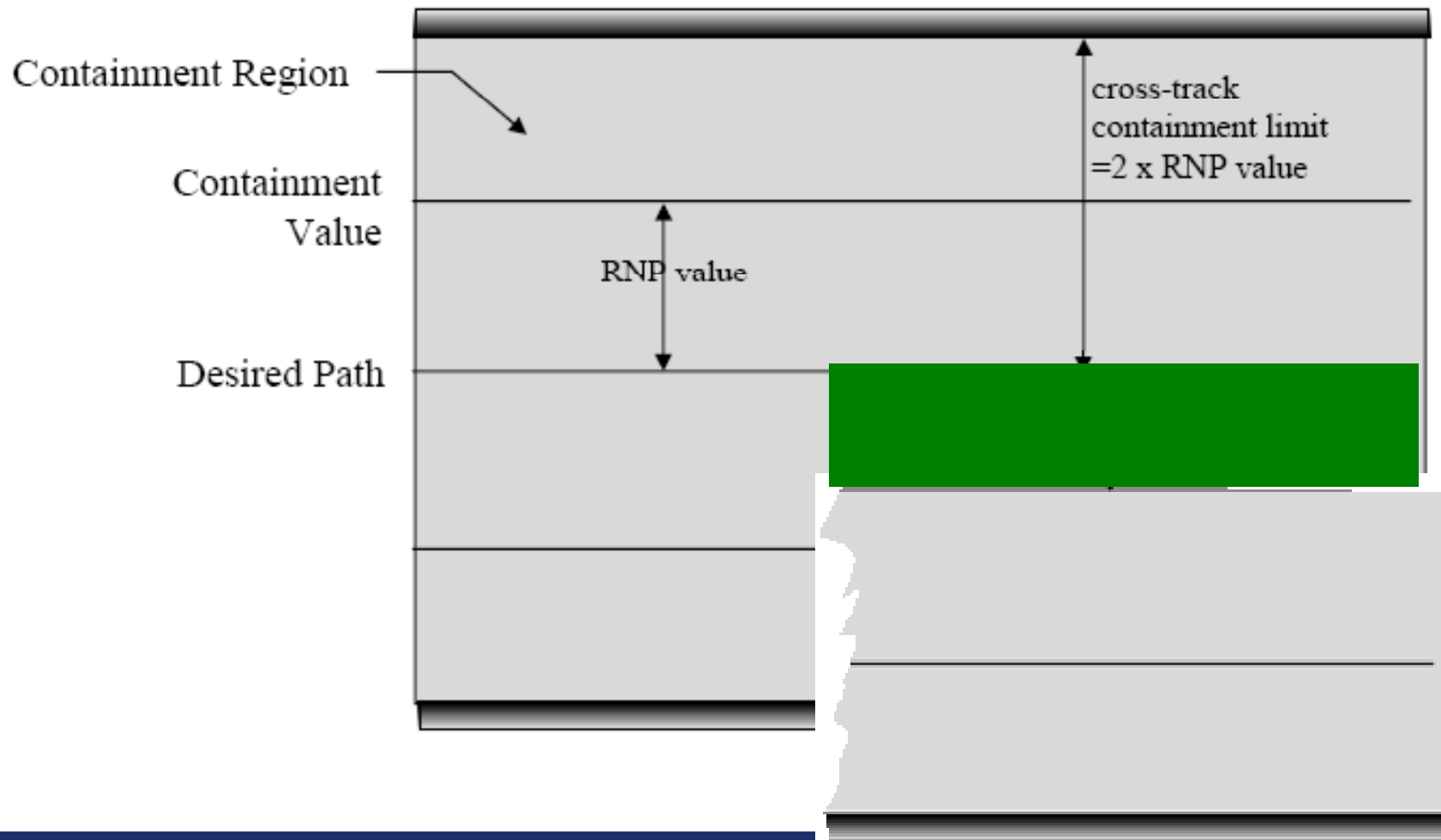
- **Integrated Systems?**
 - Federated systems provide transition step with reduced retrofit costs, but limited benefit
- **ADS-C or ADS-B?**
 - ADS-B for ATC surveillance (position vector)
 - Data BROADCAST of intent when target user includes neighboring aircraft
 - Data COMM of intent when target user is ANSP



Precision Navigation or Delegated Separation?

- **Precision navigation:**
 - Negotiate best-available trajectory with built-in separation, fly it precisely
 - No flexibility in path once defined
- **Delegated Separation**
 - Determine minimum spacing, fly best-available trajectory given constraint
 - Requires flexibility in path to achieve spacing
- ***Trajectory Window* offers potential for integrating these concepts**

Trajectory Window



FLIPINT or RTA or ADS-B In-Trail?

- **FLIPINT/Speed:**
 - How accurate must it be?
 - How well do we need to know winds aloft, or planned configuration changes?
- **RTA:**
 - How accurate must it be?
 - How well do we need to know winds aloft, or planned configuration changes?
 - Alerting requirements when it is unlikely to be met?
 - Single or multiple, single time or time window?
- **ADS-B in-trail:**
 - How accurate must it be?
 - Range of ADS-B?
 - How much intent data is required?
 - How well do we need to know winds aloft?
 - Alerting requirements when spacing is unlikely to be met?



Conclusion

- **Major Steps Already Taken**
 - Performance-Based Navigation
 - RNAV, RNP (including VNAV, Curved Path), RNP AR Approach
 - Initial Data Communications
 - FANS-1/A, FANS-1/A+, ATNB1
 - Early-Adopters of ADS-B Guidance Displays
- **Next Steps**
 - Consolidated Concept of Use
 - Consensus on New Standards
 - Data Communication (SC 214): Scope of functions
 - ADS-B (SC-186): Advanced applications, intent data, etc.
 - Navigation: Trajectory windows, RTA alerting, other?

