Topic	Physical Process Inputs: Outputs:	Enterprise	Enterprise Performance Measures and Gaps	Stakeholders and Tensions	Design Alternatives	
ROQA	Process for separating stochastic arrivals of aircraft for approach and landing using discrete separation standards. Inputs: Fleet mix, Separation Standards, ATC Buffer, Approach Path Length, Rules (e.g. SRO, …) Outputs: IAT, LTA, ROT, SRO Count, Collision Risk, Wake Encounter Count	Collaborative System of ATC, Airlines, Airports, + supply chains	1. Runway Throughput 2. Collision Risk vs Target level of Safety 3. Separation Violations 4. SRO		ATCo Control Strategies SRO Rules	
UAS: S&A	Airspace flight trajectories Sense & Avoid technology performance	Collaborative System of UAS Ground Controllers, ATC, Airlines, Safety regulators	Collision Risk vs Target level of Safety ATC Workload UAS GC Workload Airline Workload		S&A Performance measures	
Gravity Survey	Survey logistics Process Inputs: process, performance distributions for each	NOAA Gravity Survey Process	Schedule performance (actual vs Target) Costs vs Budget		Ranking of strategies to reduce performance distributions	

	sub-process, parameters to improve each performance distribution (i.e. reduce variance) Outputs: % days actively surveying, % days down,		% Survey complete Worker satisfaction vs management objetives			
Campus Shuttle and Transportation System	Demand for transportation by time of day and location Transportation mode selection utility function Fuel costs Vehicle performance (e.g. mpg) and emissions Inputs: population growth, population demographics and geography, consumers utility functions for mode choice, vehicle performance characteristics, fuel price profiles, … Outputs: costs, emissions, fuel burn, transit times, parking slots used, …	GMU Transportation and Parking Dept	Costs vs Budget Emissions vs Social demand for carbon neutral growth Parking Fuel Burn Transit Time Customer Satisfaction		Areas served. Routes & schedules Vehicles Contract clauses Fuel price hedging	
CR/ANSP	Enroute flight trajectories and vehicle emissions.	Collaborative System of ATC, Airlines,	Emissions vs Carbon Neutral growth, fuel burn,		Affecting approx 80% of flights will have no impact. 20%	

	Inputs: O-D Schedules, Fleet Mix, Airspace constraints, Wind Outputs: Emissions, Fuel Burn, Transit Time, delays	Climate change watchdogs, + supply chains	transit time, track distance.		of the flights will make a difference. Which ones are these? What about preferential treatment for better equipped, or cap-and trade.	
Green Leasing	Operation and maintenance financing of (green) leased buildings Inputs: Building properties, energy costs (i.e. fuel price fluctuations), water costs, weather, supply/demand for buildings in region Outputs: Life-cycle costs for leasing	FAA Facilities Management Dept.	# Green buildings leased Facilities leasing costs Employee satisfaction GHG emissions from DOT facilities		Ranking of alternate buildings in each regions Leasing costs savings/overshoot	
Sports Analytics	College volleyball game Inputs: States of game, transition probabilities, functions that adjust transition probabilities Outputs: Win %	NCAA Div 1 University Volleyball Program (M and W)	Tournament appearances Conference championships Win % All Americans, Olympians, etc Graduation Rates		Ranking of transition probabilities improvements to improve Enterprise metrics	
Bio-Diesel	Small-scale farm economics Process of generating bio-diesel	Small-scale farm in Stafford and Spotsylvania	Profit Fuel Quantity Fuel Quality Fuel production		Alternate crops Equipment choices (buy vs build) Crop vs Cost vs Price	

	Inputs: Crop choices, crop yields, harvesting costs, equipment costs, operational costs, maintenance costs, … Outputs: fuel quantity, fuel quality, life-cycle production costs, net energy ratio, MTBF, Farm fuel costs, Farms Profits	Counties	Costs (life-cycle) Fuel prices Net Energy ratio Hazards and Mitigation Costs		trade-off	