Airport Strategic Planning

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Outline of Introduction

• The Vision
• The Context
• The Problem
  → Fixed Master Plan
  → Management Commitment to Plan
  → Inflexibility; Losses
• The Solution: Dynamic Strategic Planning
  → Recognition of Risk as Reality of Planning
  → Analysis of Situation
  → Flexible, Dynamic Planning
• Miami Used as an Example
The Vision

A significantly improved approach to Airport Systems Planning that realistically accounts for rapid changes

- in the economy
- airline routes and alliances
- airport competitors (regional and local)
- and technology

The Context

- The Traditional Approach is a Master Plan
  - e.g.: US Federal Aviation Advisory Circular 150/5070-6A

- The development of a Master Plan involves
  - Defining the Forecast (pick one)
  - Examining Alternatives ways of development for THAT FORECAST
  - Selecting a SINGLE SEQUENCE OF DEVELOPMENT with no examination of alternative scenarios
The Problem

- **The Master Plan**
  - does not anticipate RISK of possible changes in market conditions, that is, of “trend-breakers”
  - thus does not provide insurance against those real risks,
  - is inflexible, and inherently unresponsive to the risks.
  - 1994 Master Plan for Miami typical

- **Management furthermore may commit to plan**
  - leading to resistance to change when it is needed

- **The consequences are**
  - losses or extra costs
  - losses of opportunities

Examples of the Problem

- **New Denver**
  - Management could not reduce initial size... Even when airlines were not committed
  - No back-up for failure of new technology (Bag System)

- **Dallas / Fort Worth**
  - Gate Arrival Master Plan: No Provision for Transfer passengers, and huge unnecessary costs
  - No provision for failure of technological leap (AirTrans)

- **Miami**
  - No recognition of highway plans blocking airport access
### Forecast versus Actual Operations after 5 years

<table>
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<tr>
<th>Airport</th>
<th>Base Year</th>
<th>Forecast</th>
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<th>F/A Ratio</th>
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### Forecast versus Actual Operations after 10 years

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# Forecast versus Actual Operations after 15 years

## Airport Base Year Forecast Actual F/A Ratio

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## Forecast Unreliability Increases for Longer Planning Horizon

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## Forecast versus Actual Projects after 5 years

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Outline of Solution

- **Dynamic Strategic Planning**
- **3 Phases**
  - Recognition of Risk as Reality of Planning
  - Analysis of Situation
  - Flexible, Dynamic Planning -- designed to track real developments in air transport industry
- **Compatible with Master Planning but**
  - Examine plans under various forecasts
  - Analyze variety of development patterns, sequences
  - Reallocate analytic effort
    - from in depth examination of an unlikely future
    - to many quick reviews likely to include actuality
Process of Dynamic Strategic Planning

- Recognizes Risk
  - looks ahead at opportunities and threats of many scenarios
  - accepts that future levels and types of traffic cannot be known

- Examines Complex Possible Developments
  - “Pure” plans PLUS
  - combinations of these: “HYBRID” solutions

- Chooses Flexibility
  - Plans responsive to market, industry conditions
  - These are necessarily “HYBRID”

- Commits only one period at a time

Chess Analogy

DYNAMIC STRATEGIC PLANNING IS LIKE PLAYING CHESS AS A GRAND MASTER
-- YOU LOOK AHEAD MANY MOVES BUT ONLY DECIDE ONE MOVE AT A TIME.

DYNAMIC STRATEGIC PLANNING COMPARES TO MASTER PLANNING AS GRAND MASTER CHESS COMPARES TO BEGINNER PLAY.
Phase 1: Recognition of Risk and Complexity

**Risk: Wide Range of Futures**
- The Forecast is “always wrong”
  - Extrapolations of past cannot anticipate the surprises that always occur somewhere
  - Many extrapolations are possible for any historical record

**Complexity: Wide Range of Choices**
- Number of Choices is Enormous
  - “Pure” solutions only 1 or 2% of possibilities
  - Most possibilities are “hybrid”, that combine elements of “pure” solutions
  - “Hybrid” choices provide most flexibility

Forecast “Always Wrong”

**Reason 1: Surprises**
- Past trends always interrupted by surprises
  - Major political, economic changes
  - New airline alliances or plans
  - Economic Booms or Recessions

**Reason 2: Ambiguity**
- Many extrapolations possible from any historical data
- Many of these extrapolations are “good” to the extent that they satisfy usual statistical tests
- Yet these extrapolations will give quite different forecasts!

Example: Miami Master Plan Forecasts
Rear View Mirror Analogy

“RELYING ON FORECASTS IS LIKE STEERING A CAR BY LOOKING IN THE REAR VIEW MIRROR...

SATISFACTORY FOR A VERY SHORT TIME, SO LONG AS TRENDS CONTINUE, BUT ONE SOON RUNS OFF THE ROAD.”

Complexity of Choices

- The Usual Error
  - Polarized concepts, simple ideas
  - “Pure” choices narrowly defined on a continuous path

- Examples of polarized concepts
  - Dallas/Fort Worth -- “Gate Arrival” Concept
  - Denver -- “Multi-Airline Super-Hub”

- Correct View: “Hybrid” plans that Combine concepts. These
  - cater to different tendencies,
  - thus allow the greatest flexibility
  - and adjust easily to variety of possible industry futures
Hybrid Designs

- Combine “Pure” Concepts
  - New York/LaGuardia: “Finger Piers” and “Gate Arrival”
  - Chicago/O’Hare (United): “Gate Arrival” and “Midfield”

- Are Inevitable -- The “Pure” concepts become inadequate for actual conditions
  - Washington/Dulles:
    - “Transporters” => “Gate Arrival” plus “Midfield”
  - Dallas/Fort Worth:
    - “Gate Arrival” => “Midfield” (Delta; American?)

Phase 2: Analysis

- Strengths, Weaknesses, Opportunities, Threats (SWOT)
- Identifying Risks
- Decision Analysis of Possibilities
- Identification of Initial Phase and Potential Different Responses to Actual Events
Strengths, Weaknesses, Opportunities, & Threats

• Present
  ➔ Positive: Strengths
     • Strong Traffic, Major Transfer Hub
     • Profitable
  ➔ Negative: Weaknesses
     • Volatile Traffic, Dominant Client (American AL)
     • Old Facilities, Limited Site

• Future
  ➔ Positive: Opportunities
     • Growth of South American Economies
  ➔ Negative: Threats
     • Competitive airports; Fickleness of Major Client

Identifying Risks

• Competition
  ➔ International Airports: Atlanta, Orlando...
  ➔ Regional Airports: Hollywood/Ft. Lauderdale...

• Dependence on Major Client with Alternatives
  ➔ Great financial demands -- US$ 3 Billion
  ➔ Long-term commitment ?

• Change in Airline Industry Structure
  ➔ Shifting Airline Alliances
  ➔ New Airlines (Jet Blue, etc)
Decision Analysis of Possibilities

- Simple way of defining wide range of possible developments
  - Over several periods
  - Including Risks
  - Standard Method

- Expected Results:
  - NOT a Simple Plan: Do A in Period 1, B in Period 2, ...
  - A DYNAMIC PLAN: Do A in Period 1, BUT in Period 2
    - If Growth, do B
    - If Stagnation, do C
    - If Loss, do D

Phase 3: Dynamic Strategic Planning

- The Choice
  - Any Choice is a PORTFOLIO OF RISK
  - Choices differ in their
    - Likely benefits
    - Performance over a range of futures

- The Plan
  - Buys Insurance -- by building in flexibility
  - Balances Level of Insurance to Nature of Risk
  - Commits only to immediate first stage decisions
  - Maintains Understanding of Need for Flexibility
The Best Choices

- Permit good Performance for range of futures
- Achieve Overall Best Performance by
  - Building in Flexibility to adjust plan to actual situation is later periods -- this costs money
  - Sacrificing Maximum Performance under some circumstances
- “Buy Insurance” in the form of flexibility; capacity to adjust easily to future situations
- Commit only to Immediate Period
  - Decisions later in should depend on then actual situation

Strategic Planning for Miami

- Master Plan Completed in 1994 Obsolete
  - “Accepted” but recognized as
    - Overtaken by Changes in Airline Industry
    - Insensitive to realities of Access Constraints
- Strategic Plan Started in 1995
- Focus on Key Decision points
  - Which are major “forks in road” that shape future
    - State decisions on highways, rail access
    - Arrangements with major Airline “Families”
- Focus on Providing for Alternative Futures
  - Space for New Megacarriers, Spine access system
### Example of Flexible Plans: Paris/de Gaulle (Air France)

- **Hybrid Design:**
  - Gate Arrival that permits Transporters as Needed

- **Anticipation of Future**
  - Room for Expansion
  - Provisions for Rail Access

- **Investment according to need**
  - Easy to Change Design (as done)

### Example of Flexible Plans: Sydney Second Airport

- **Hybrid Strategy:**
  - Maintain and Enhance Principal Airport
  - Acquire Major Site

- **Anticipation of Future**
  - New Site is Insurance against Need
  - Cost small compared to Major Construction

- **Investment According to Need**
  - Future Plans Easily Tailored to Industry Structure, Traffic Levels
### Example of Inflexible Plans: New Denver

- **Pure Design: Multi-Airline Super-Hub**
  - But United Dominates
  - Phase-out of Continental

- **Massive Immediate Commitment**
  - Could not adjust to actual traffic
  - Disadvantages of High Costs per Passenger

- **Reliance on Untested Technology**
  - Failure of High-tech baggage system
  - No effective fall-back position

### Example of Inflexible Plans: New York / Newark

- **Pure Design: Unit Terminals, Satellites**
  - Uns suited for actual Transfer, International Traffic
  - Use of 1950’s Terminal

- **Premature Investments**
  - Terminal C Boarded up, unopened for decade
  - Major changes required
Recommendation

• Evaluate Situation
  ➔ Strengths, Weaknesses, Opportunities, Threats
  ➔ Risks

• Analyze Possibilities
  ➔ Major Attention to “Hybrid” Options
  ➔ Match Physical Facilities to Industry Structure
    • Current Major Clients
    • Possible Future Clients

• Dynamic Strategic Plan
  ➔ Define Initial Commitment
  ➔ How Plan Can Develop to Meet Range of Possible Future Market Conditions