Transportation Procurement in the Digital Age

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Outline

- Procurement
- Transportation procurement
- Economies of scope
- Multi-attribute procurement
- Forecasting transportation requirements
- The transportation procurement and management process

Procurement: The Killer B2B App.

- Main idea: consolidate the buying power
  - Within a unit/location (plant, office, etc.)
  - Within a corporation
  - Within an industry
- Increase reach
  - Get to foreign suppliers
  - Consolidate the gathering of information (capabilities, LOS, quality, etc.)

Procurement: The Killer B2B App.

- Central point of control:
  - Manage spending and acquisitions efficiently
  - Negotiate centrally (economies of scale)
  - Let everybody buy smartly, independently but with accountability
  - So: save time and money

- Automate the process
  - Allow multiple rounds
  - Pressure suppliers with transparency of prices

Procurement Software & Services

- First applications: indirect material (not critical, would not shut a plant, does not require significant expertise)
- Direct (productive) material: handled by ERP originally and only now by specialized software
- Software companies: Ariba, CommerceOne, Netscape, i2, Cominenet…
- Consulting services: FreeMarkets, ICG commerce…
- Consortia: Covisint, Transora, e2open, WWRE …

Transportation Procurement Is Different

- Controlling economics: economies of scope, not only scale
- The are many dimensions to transportation services
- Forecasting transportation is difficult
- Complex administration

Transportation Operations

Consolidated operations

- Bus/rail transit
- LTL
- Rail
- Airlines
- Ocean carriers
- Package delivery

Direct operations

- Taxi
- TL
- Unit trains
- Charter
- Tramp services
- Courier

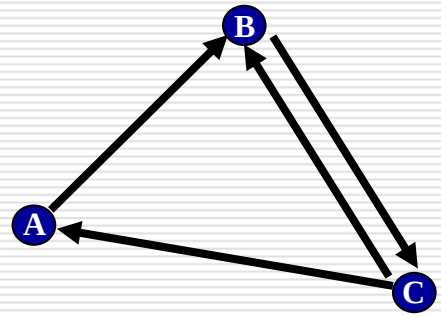
Economies of Scope

- Transportation product: a lane
- Costs: direct & connection
- Lane cost dependencies => economies of scope
- The issue: shippers evaluate each lane bid by itself while carriers are trying to build a network

Current Practice

- Information exchange:
  - Shippers give aggregated volume estimates (by lane, origin, region, system), based on last year.
  - Carriers submit lane rates (per mile or per move).
- Assignment mechanism:
  - Lane-by-lane analysis.
  - Low bid wins.
  - Spreadsheet analysis.

Fig.1 A Simple Network with Four Lanes



	Carriers	
Lane	**A**	**B**
A→B	$ 500	$ 525
B→C	$ 500	$ 475
C→A	$ 500	$ 525
C→B	$ 475	$ 500

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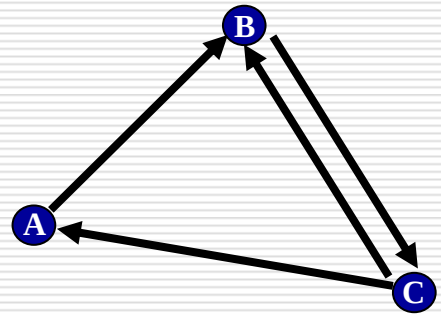

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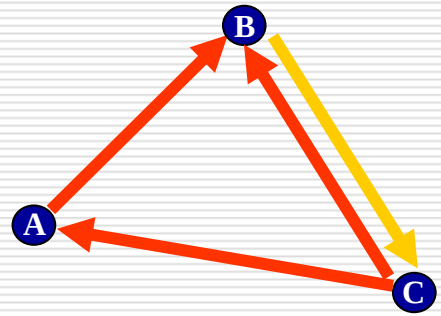

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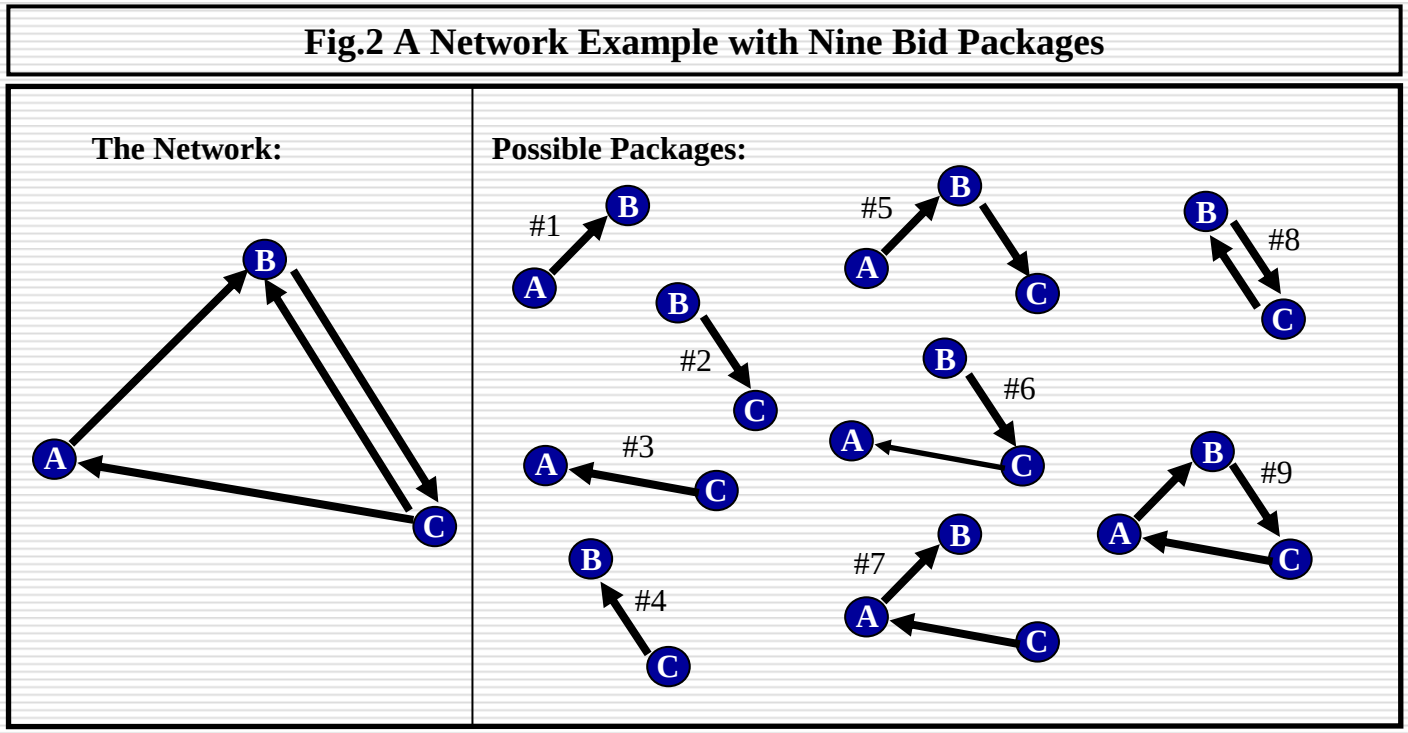
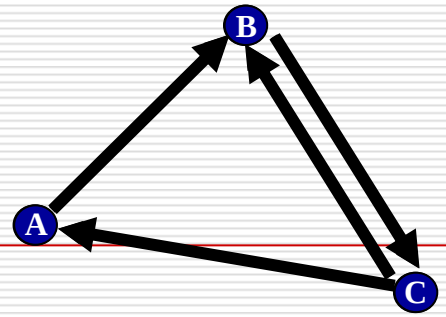
Combinatorial Bidding



Packaged Bids



	Carrier I									Carrier II								
	#1	#2	#3	#4	#5	#6	#7	#8	#9	#1	#2	#3	#4	#5	#6	#7	#8	#9
A→B	1				1		1		1	1				1		1		1
B→C		1			1	1		1	1		1			1	1		1	1
C→A			1			1	1		1			1			1	1		1
C→B				1				1					1				1	
Bid	500	500	500	475	975	950	975	900	1325	525	525	475	525	1000	925	925	900	1375

$1325 + $475 = $1800

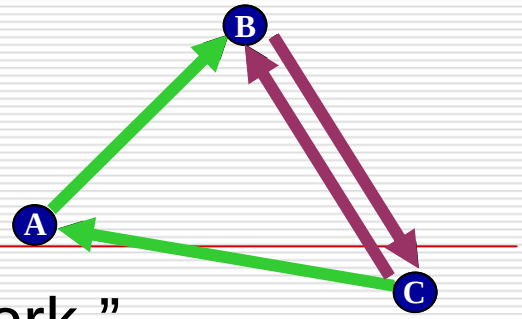
Multi-attribute Procurement

- Transportation *service* involves more than price (two types of attributes):
- Lane attributes
  - On time performance
  - Familiarity (incumbency)
  - Proper equipment
  - Billing accuracy
- System attributes/constraints
  - "At least two and no more than five carrier serving my Ohio plant"
  - "Ensure carrier X has at least a million dollars with this bid"
  - "25% of our carriers have to be minority-owned"

Lane Attributes

- Current practice:
  - "Screen and auction" (define "core carrier" group based on service followed by an RFP process based on price)
  - Drawback: does not allow trade-offs (e.g., A 93% service carrier may be "out" and a 94% "in" regardless of price)
- Within an optimization framework:
  - Modify prices based on service *before* the optimization
  - Example:
    - 97% carrier is bidding $500
    - 94% carrier is bidding $475
    - LOS is worth $10 per 1% of service
    - The 97% carrier bid is modified: $500-$30=$470
    - The more expensive carrier wins (but the shipper pays $500!)
- Challenge: estimate the LOS and its impact

System Constraints



"More than one carrier serving the network."

	Carrier I									Carrier II								
	#1	#2	#3	#4	#5	#6	#7	#8	#9	#1	#2	#3	#4	#5	#6	#7	#8	#9
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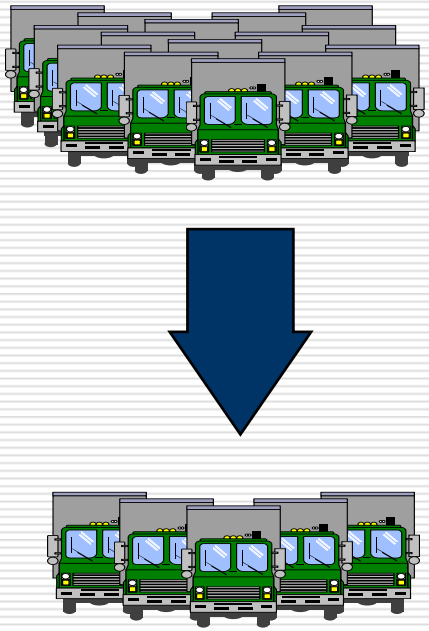
Bid	500	500	500	475	975	950	975	900	1325	525	525	475	525	1000	925	925	900	1375

Re-running the optimization with additional constraints: "what if" analysis

$900 + $925 = $1825

System Requirement Example:
Core Carrier Programs



Carrier selection

How to reduce the base from 200 carriers to 10?

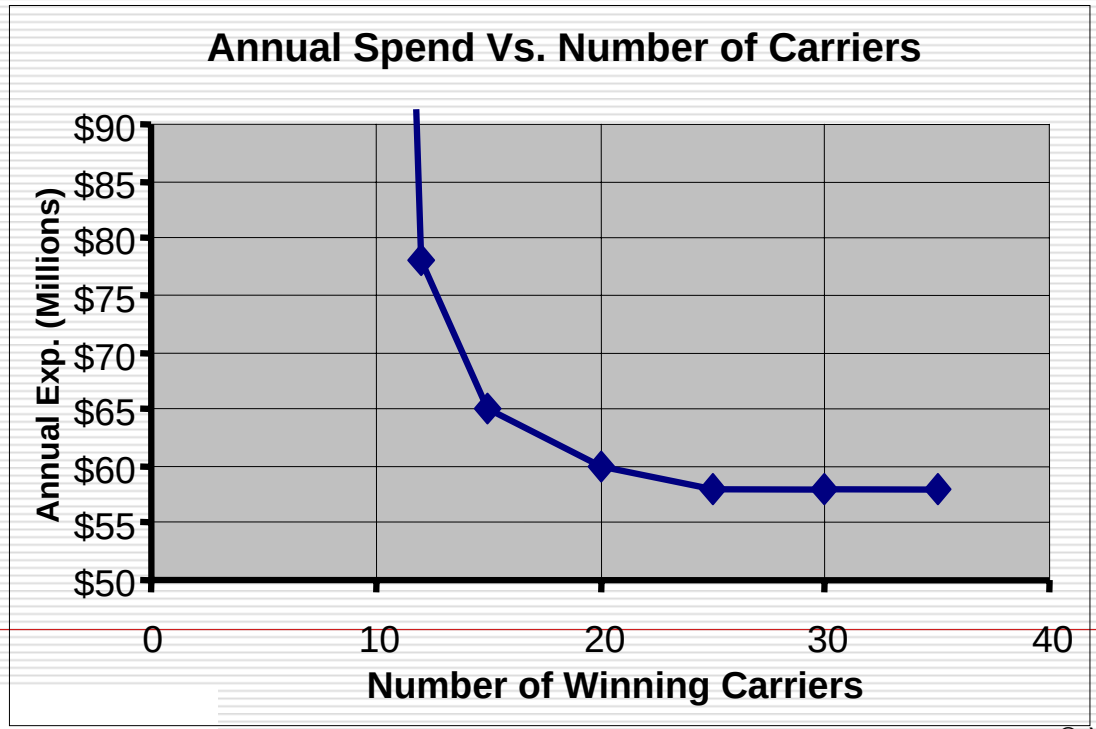
Costs and Benefits

How much does it cost to reduce the carrier base?

System Requirement Example:
Core Carrier Programs

Lost Opportunity Cost

- Limiting the number of carriers constrains bidding opportunities.
- Result: higher cost solution
- The question: is it worth it?



Forecasting Transportation Requirements

- Forecasting is a prerequisite to any procurement process
- Transportation requirement forecasting is particularly difficult:
  - It requires disaggregate forecasting
    - By lane, season (also weekly, monthly quarterly variations), equipment, type of load (hazmat?)
  - It is volatile
    - Almost any system change will affect transportation needs
    - Most ERP systems do not have an integrated transportation requirement planning module

Consequences of Forecasting Difficulties

- A good forecast require a manual process based on network adjustments beyond a statistical forecast
- Contracts are not binding
- Requirements for alternate winners and an exception/rejection management process

Transportation Procurement Administration

- A large number of non-independent “items”
- A large number of bidders
- Preliminary analysis:
  - Data availability and forecast
  - Does an RFP make sense?
  - Choice of bidding partners
  - Design issues (private fleet, dedicated, common, etc)
- Carrier communications and “education”
- System constraints
- Corollary: A single round, simultaneous, sealed bid auction (sometimes with follow-on “discussions”)

Optimization-Based Procurement

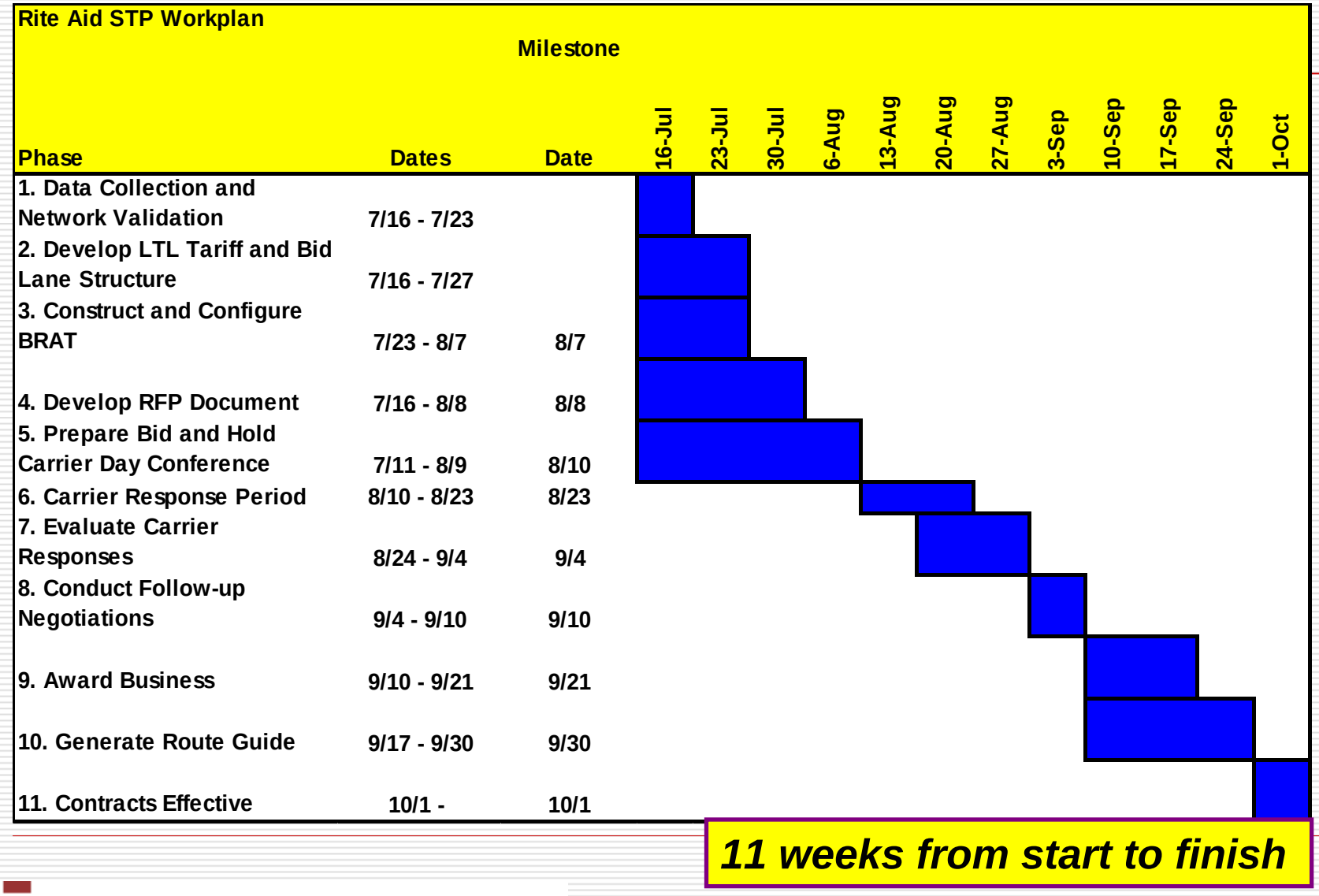
- Controlling economics: economies of scope, not only scale
- The are many dimensions to transportation services
- Forecasting transportation is difficult (non-binding contracts)
- Complex administration

- Use combinatorial bidding
- Use:
  - Modified pricing for lane attributes
  - Constraints in the optimization framework for system attributes
- Allows for manual adjustments; keeps all bids for follow-on processes
- Single round auction process

Rite-Aid

- One of the US's leading drugstore chains
  - Modern store base
  - Strong brand
  - Modern distribution centers
  - Superior pharmacy technology
- 77,000 full and part-time associates
- 3600 stores in 30 states and DC
- $14.5B at end of FY 2001

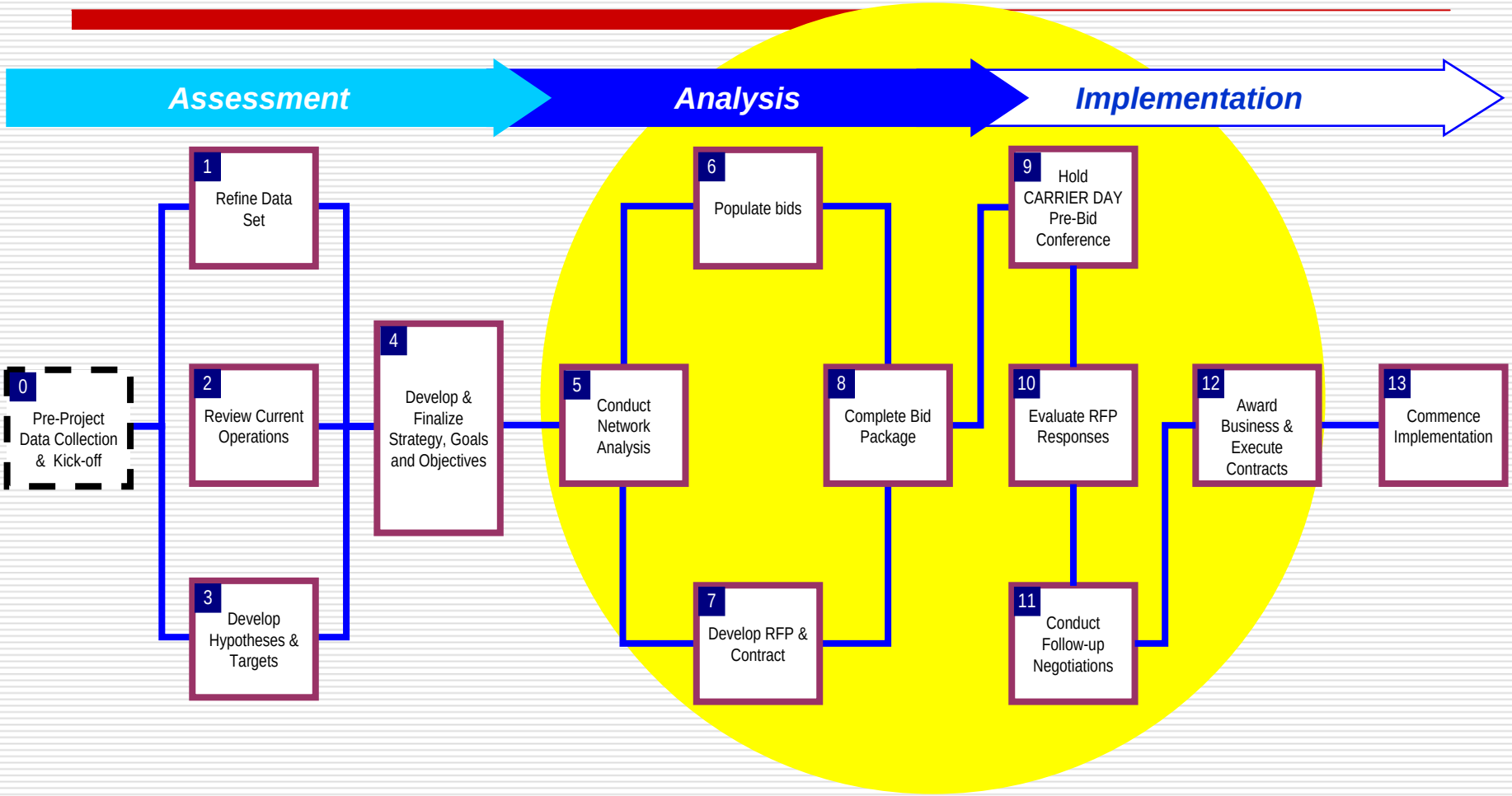
Project Activities & Timeline



11 weeks from start to finish

The Process

Bidding Optimization



The bidding optimization software is the engine providing the analytical horsepower for getting the right pricing across complex networks.

Scenario Summary (Example)

- The **"Baseline"** is pre-defined prior to the bid process
- The **"Least Cost Scenario"** is simply the least-cost combination of rates, which is seldom implementable entirely, which leads to:
- Analysis of **"Incumbent Carriers"** and then to other pre-defined alternatives
- Other considerations include lane coverage capability, past service history, and other qualitative factors
- The final scenario is run to create a solution which is both cost effective and operationally feasible

Facility Code	# 422
Facility Location	Cincinnati
Number of Lanes	58
Annual Volume	2000

Scenario	Annual Spend	Savings from Baseline($)	Savings from Baseline (%)	Delta above Least Cost ($)	Delta above Least Cost (%)	Lane Coverage
Baseline	$ 1,810,208					
Least Cost Scenario	$ 1,300,132	$ 510,076	28.2%	$ -	0.0%	100%
Incumbent Carriers	$ 1,703,818	$ 106,390	5.9%	$ 403,686	31.0%	100%
Carrier "A" Sole Source	**$ 1,368,801**	**$ 441,407**	**24.4%**	**$ 68,669**	**5.3%**	**100%**
Carrier "B" Sole Source	$ 1,379,123	$ 431,085	23.8%	$ 78,991	6.1%	100%

Representative Sample Data

Realized Benefits

- **Reduced freight costs for inbound transportation**
  - LTL savings exceeded 10%
  - TL/ Inter-modal savings exceeded 7%
  - Leveraged volume from prepaid to collect conversion project
  - Holistic bid involving current and new carriers
- **Standardize and simplify administrative functions and procedures**
  - Standardized Contracts format and terms
  - Selected one standard LTL Tariff
  - Standardized tiered FAK structure
  - Standardized accessorial charges
- **Enhance service**
  - 3 of 4 LTL successful carriers were incumbent providers with a history of strong service with Rite Aid
  - Largest Incumbent Truckload and Inter-modal providers with strong service records were retained
  - Benefits tracking process was developed to track project savings

Going Beyond the Annual Process

- Need for a contract-augmenting procedure
- Need for tender-rejection management
  - Replace “dialing for diesels”
- Need for TMS that can execute sophisticated bid results (e.g., Surge pricing)
- Some conditional bid results are surprising
- But: it works ($7 billion in bids; $450 million in savings)

Lane-Based Bidding

- Relevant for:
  - Changes to the network between annual bids
  - Small shipper with up to several dozen lanes
- Requires:
  - Fast turnaround
  - Multiple attribute bidding
  - Private auction mechanism

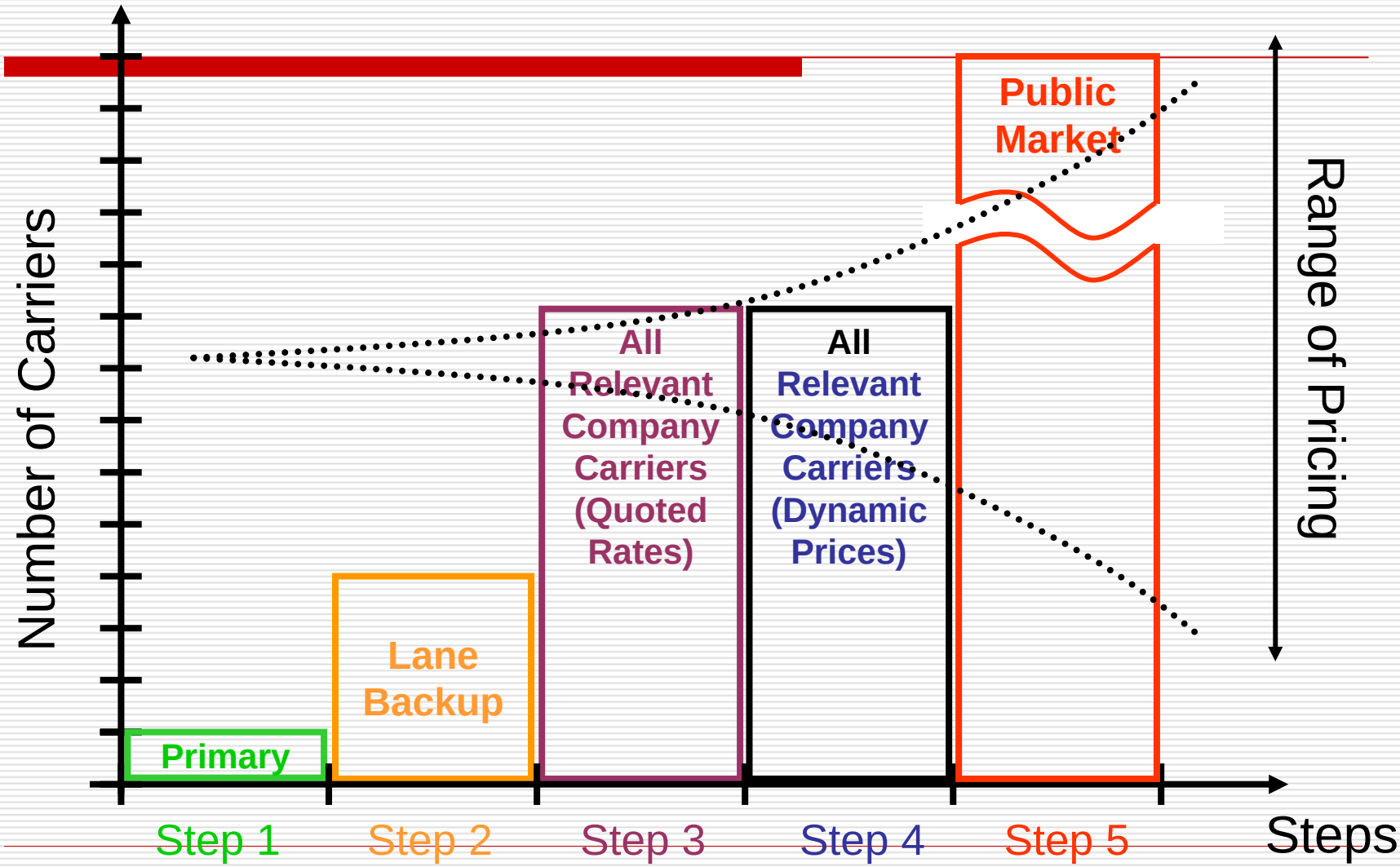
Capacity Finder

- The problem:
  - Carrier rejection of tender
  - Significant resources tied in “dialing for diesels”
  - Load are not moved in time since carriers are called late in the day
  - Price rises as subsequent carriers are called

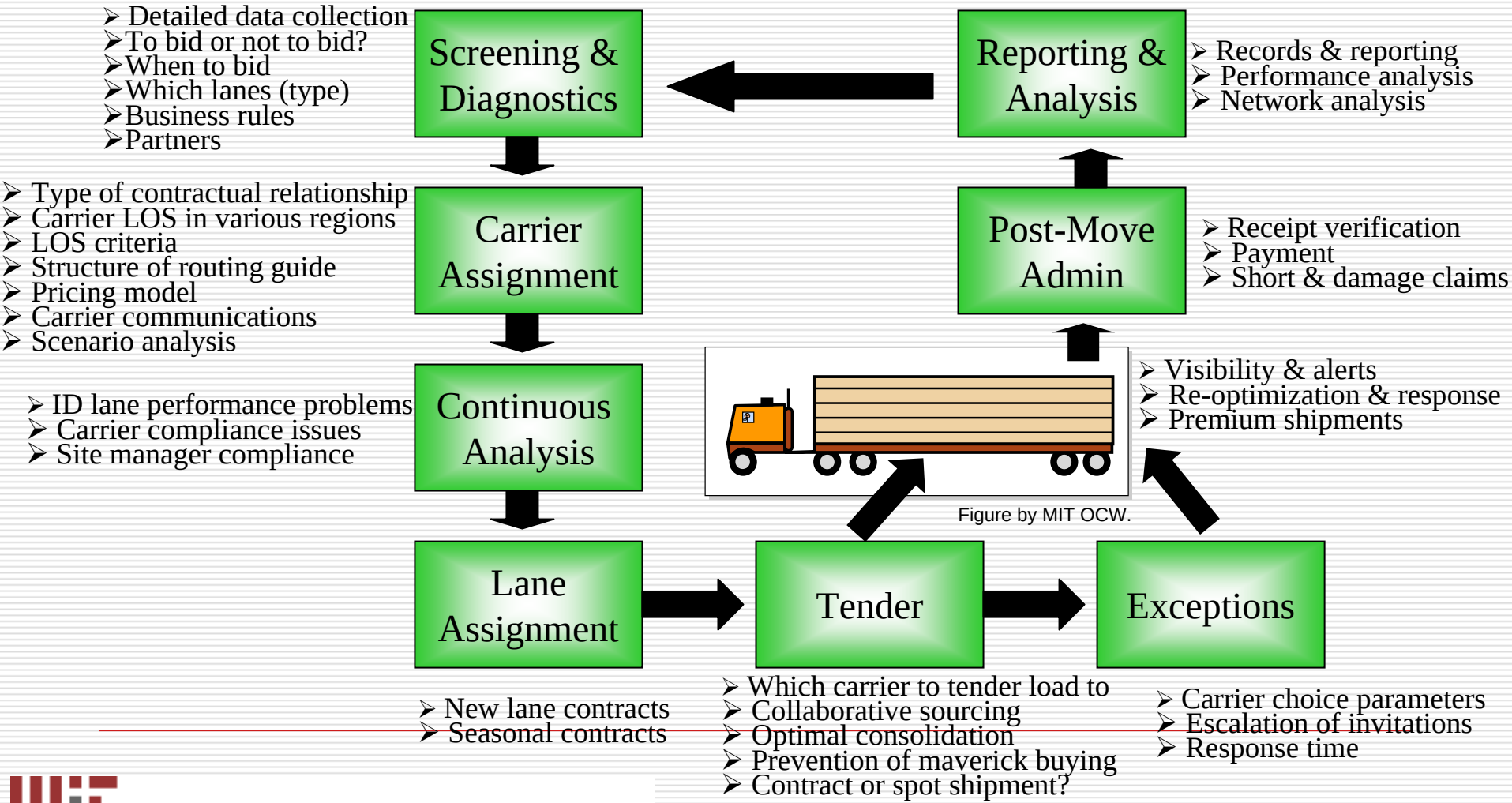
Capacity Finder Solution

- Rejection EDI
- CF Server
- Check contract file
- Post in CF site
- Eligible carrier notification
- Carrier Y/N response
- Automatic carrier selection
- TMS notification & carrier tender

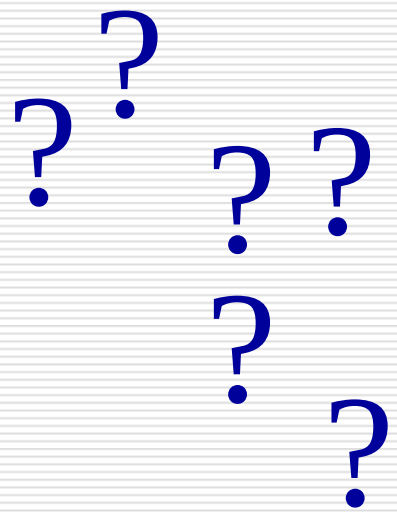
Automated Escalation Process



Transportation Procurement & Management Process



Any Questions?



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