Chapter 12 Supply Chain Network Analysis and Design

- The location of logistics and manufacturing facilities is critical, as firms search for new ways to lower costs and improve service to their customers
- An effective and efficient supply chain network can differentiate a firm in the market

Need for Long Range Supply Chain Network Planning

- In the short run, a firm's supply chain network and the locations of its key facilities are fixed.
- Site availability, leases, contracts, and investments make changing facility locations impractical in the short run.
- In the long run, the design of the overall supply chain network is variable.

Need for Long Range Supply Chain Network Planning

- Strategic Importance of Logistics/Supply Chain Network Design
  - All businesses operate in a very dynamic environment in which change is the only constant.
  - It is questionable whether any existing supply chain network can be truly up to date.

Need for Long Range Supply Chain Network Planning

- Changing Customer Service Requirements
  - Logistical requirements of customers are changing in numerous ways.
  - Some customers have intensified their demands for more efficient and more effective logistics services.
  - Others are seeking relationships with suppliers who can take logistical capabilities and performance to new heights.
  - Not just customer service requirements may change, the types of customers served may also evolve over time.

Need for Long Range Supply Chain Network Planning

- Shifting Locations of Markets and/or Supply Sources
  - Population shifts
  - Move to JIT-based manufacturing
  - Political or customs union, free trade agreements
  - Continuous search for lower-cost manufacturing locations & sourcing from offshore suppliers
  - Growing economic importance of Asia, especially China

Need for Long Range Supply Chain Network Planning

- Change in corporate ownership, M & A
  - Reconfigure network for new, merged operation
- Cost pressures
  - Take cost out of Supply Chain (e.g. lower manufacturing cost locations)
- Competitive capabilities
  - Improve service or lower cost
  - Exploit new transport alternatives (e.g. locate close to hub of express companies)

Figure 12-1 Key Steps in the Logistics/Supply Chain Network Design Process

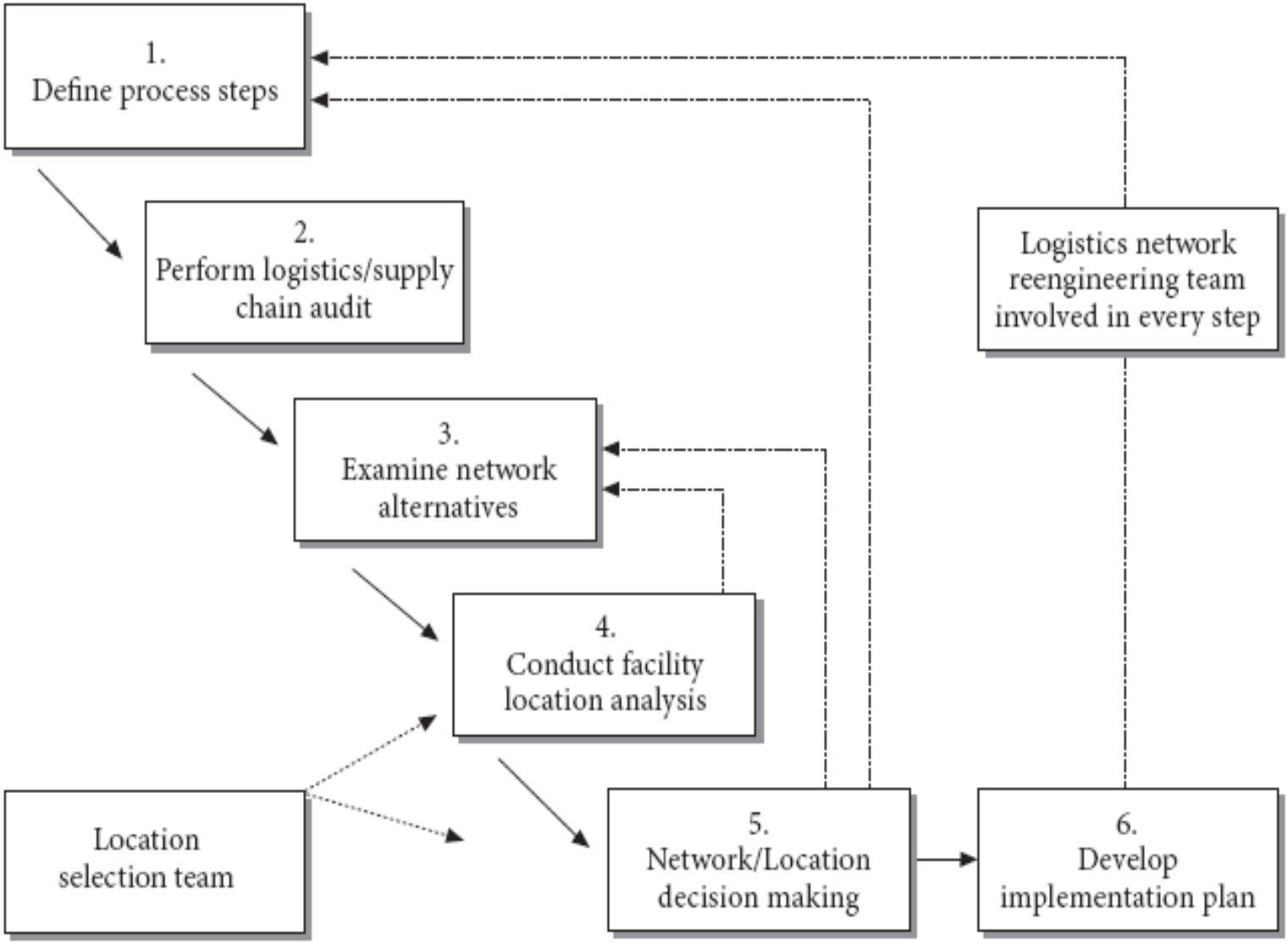

Table 12-1 Major Locational Determinants

NATIONAL/REGIONAL DETERMINANTS	SITE-SPECIFIC DETERMINANTS
Labor climate	Transportation access • Truck • Air • Rail • Water
Availability of transportation	
Services	
Infrastructure(road, rail, port, law, regulation, border management process, trade & transport impediments)	
Proximity to markets and customers	
Quality of life	
Taxes and industrial development incentives	Inside/outside metropolitan area
Supplier networks	Availability of workforce
Land costs and utilities	Land costs and taxes
Company preference	Utilities

Optimization Models

- Mathematical procedures that aim to find the “best,” or optimal solution
- Optimization selects the “best” course of action from a number of feasible alternatives
- Simulation models & heuristics models are often used for network optimization
- Relies heavily on computers
- Optimization models have limitations
- A stable, good enough solution can be better than an optimal solution that do not last

Potential Supply Chain Modeling Pitfalls to Avoid

- Short-term horizon
- Too little or too much detail
- Thinking in two dimensions, ignore other factors
- Using published costs instead of real cost
- Inaccurate or incomplete costs
- Use of erroneous analytical techniques