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## Industrial Efficiency and Value in a Changing Market

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## Agenda

- Capacity study – using Logistics Activity Profiling to measure facility effectiveness
- Case study:
  - Problem description
  - Facility layout, original flows
  - Study Results/Opportunities
  - Changes and benefits
  - Conclusion
- Physical and locational attributes
  - Building and site characteristics
  - Case study: how market changes will affect value and remaining economic life
  - Case study results
- Overall conclusions

## Key Concepts

- Facilities are built to serve a business need – they are the physical implementation of a firm's business model
- Physical plant design and operational procedures are determined by the firm's:
  - Customers
  - Products
  - Order demand (quantity and time)
- Over time these factors change and impact the facility's capability to serve the firm's business mission
- A capacity study can identify how well a facility is meeting current and projected business needs, and identify opportunities for improvement

## How Do I Get There From Here? *Capacity Study*

- Product – *Logistics Activity Profiling*:
  - Customers (location, product demand)
  - Physical product
- Facility
  - Physical dimensions
  - Layout and inventory of storage modes
  - Material handling equipment
- Material Flow – how material currently flows into and out of the plant

## Logistics Activity Profiling *Inventory Characteristics*

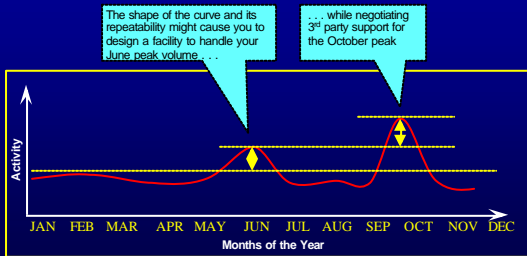
- Physical
  - Weight, cubic size and dimensions (length, width, height) of each product
  - Material handling requirements
- Population
  - Total product stock keeping unit (SKU) counts
  - Family/Group SKU counts
- Anticipated movement profile
  - Stock/repeatable item
  - Seasonal or "one-time use" goods

## Logistics Activity Profiling *Order Data—Three Views*

- Identify demand patterns at the aggregate level:
  - Daily
  - Weekly
  - Monthly
  - Quarterly
  - Annually
- Identify and model order/line characteristics
  - Single-line orders
  - Multi-line orders
  - Pallet, case, and unit combinations
- Identify inventory-specific order characteristics:
  - For all SKUs
  - For individual SKUs
  - For groups/families of SKUs

## Logistics Activity Profiling

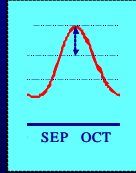
### Demand Patterns—Aggregate Level



## Logistics Activity Profiling

### Aggregate Order Data—Uses and Risks

Be very careful when making a key, high-cost decision based on this form of analysis—the data could be skewed by one-time or rare events. *Know your business—know your data!!*

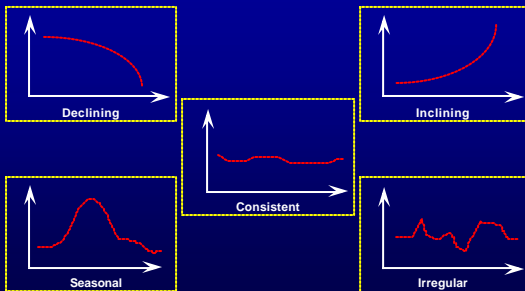


This peak *could* be . . .

- Regular, repeatable, and expected
- Caused by an acquisition/expansion
- The result of your having the nation's only remaining supply of pet rocks in a sudden, unexpected nostalgia craze!

## Logistics Activity Profiling

### Identify Demand Patterns



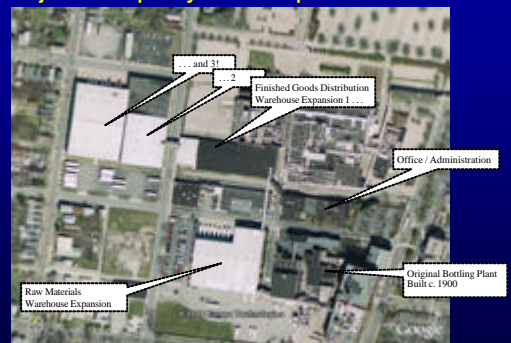
## Pareto Analysis

- Takes into account all products
- Ranks products by velocity into
  - “A” items (top 20%)
  - “B” items (next 20%)
  - “C” items (next 20%)
  - “D” items (last 20%)
- Pareto rule holds – 20% of products will be responsible for 80% of activity
- Determines which items should have the shortest travel path

## Case Study Problem Description

- 100+ year old bottling firm in urban location
- Firm experiencing significant growth through increased sales and brand acquisition
- Campus expanded to maximum size possible due to land constraints
- Firm wanted to know if facility could handle three new brands or if they must find outside warehousing and distribution capacity

## Subject Property – Campus View

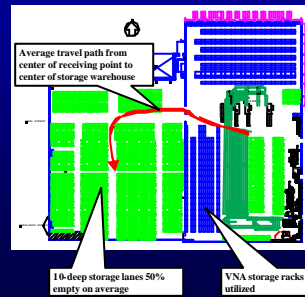


## Subject Property – Study Facility



## Key Study Results

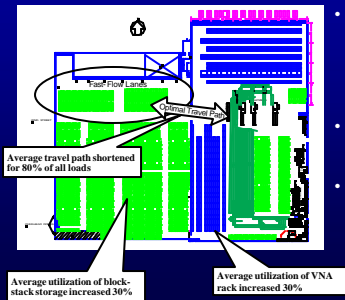
### Current Problems



- All products treated equally
  - wasted travel time
  - avg. waste for "A" products 300 feet (91 metres) per load
  - Equivalent to 3,682 miles (9,144 km) per year
- All lanes the same depth
  - wasted space
  - avg. storage capacity utilization 50%
- Partial pallets stored in block stack area
  - double handling
  - Under-utilization of very-narrow aisle (VNA) rack storage

## Key Study Results

### Solutions and Benefits



- All products treated equally
  - Placed "A" items in fast-flow lanes near shipping docks
  - Reduced travel time for 80% of all loads
  - Saved equivalent to 5,682 miles (9,144 km) of forklift travel time per year
- All lanes the same depth
  - Reconfigured to 2-3-4-5-7 and 10-deep lanes
  - Gained 30% facility capacity
- Partial pallets stored in block stack area
  - Reconfigured low-volume items to fit in VNA rack
  - Changed procedures to eliminate partial pallets in block storage
  - Increased VNA rack utilization 30%; eliminated double handling in bulk

## Key Study Results

### Overall Conclusions

- Client could not gain enough space in study facility to handle proposed business expansion
- Client estimated operational changes extended useful life of building 2 years with normal growth of existing business

## Outline

- Building and site characteristics
- Key site questions
- Linkages within the market
- Case study for timeline effects

## Subject – The Physical Building

- General purpose facilities
- Special purpose facilities
- Single-use facilities

## Key Building Characteristics

- Ceiling Height
- Construction Material (steel, wood frame, or masonry)
- Sufficient Quantity and Size of Bay Doors (10x10)
- Truck Wells and Dock Height (3.75 feet for rail; 4.25 feet for truck)
- Location and Quantity of Office Space (< 30% typically)
- Bay Size and Column Spacing (50x50)
- Building Shape (rectangular)
- Ratio of Manufacturing to Warehouse Space

## Physical Site Characteristics

- Site Shape and Size
- Frontage
- Possibility of Flooding
- Soil Conditions & Topography
- Corner Location
- Environmental Issues
- Legal and Allowable Use Issues

## Linkages

- Linkages (time/distance) to raw materials
- Linkages to the worker population
- Linkages to the destination of the finished product

## Linkages (cont.)

- Access to and quality of large roadways, local roadways, sea routes, rail facilities, and airport facilities
- The expected change in the labor market over time
  - Quantity
  - Cost
  - Competition
  - Legal issues
- The expected change in the demand for the finished product over time
  - Quantities
  - Timing
  - Location of the demand sources (customers)
  - Competition
  - Legal implications
- Access to complementary facilities
- Access to educational facilities

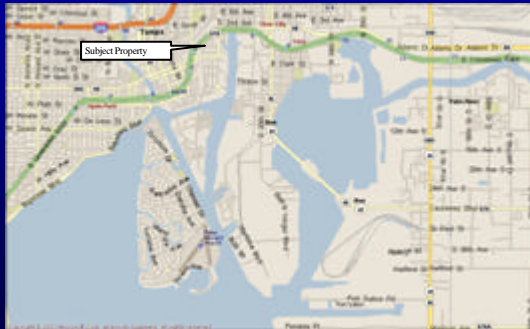
## Linkages (cont.)

- Is the transportation network already at capacity?
- How predictable is the transportation network?
- What is the growth pattern in the market for workers?
  - Are worker populations being pushed further away?
  - Is the cost of labor increasing rapidly?
- What is the growth pattern in the demand centers for our finished products?
  - Will the transportation costs increase rapidly over the coming years?
  - Will the required transportation methods change?
- Will raw materials become more costly?
  - Is there a known limit on a key raw material?
  - Will increased demand cause the operation to require more costly sources of raw materials?
- Will there be efficiencies of scale as the operation grows?
- Are there governmental incentives that will be available?

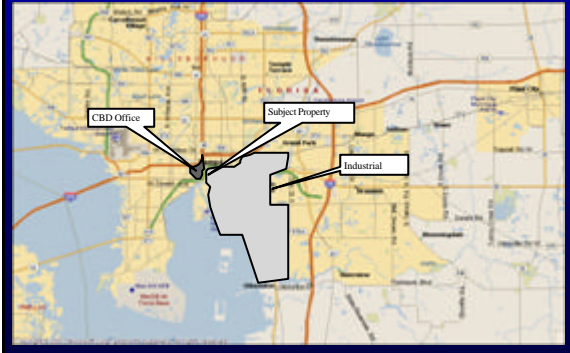
## Key Site Questions

- Can the site / yard accommodate a building expansion?
- Can opening new doors, or expanding existing ones, help product flow?
- Can the addition of truck wells and dock space help product flow?
- Can neighboring parcels be acquired for expansion?
- Does the site have sufficient space for truck turn-around (often 150 feet) and loading?
- Is parking adequate?
- How will an expansion of the facility affect site efficiency?

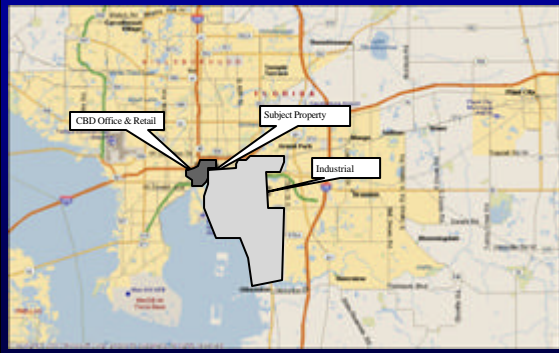
## Subject Property – CBD Tampa, Florida USA



## Land Uses in 1985



## Land Uses in 2006



## Case Study Conclusion

### Benefits of Proper Long-Term Planning

- A flexible or generic design could limit the conversion costs at the end of the building's useful life as an industrial facility
- Forecasting the time that this niche industrial market would transition could have allowed for the development of a shorter-life structure that would expire at approximately the same time as the niche market lost its competitive edge for industrial uses
- The development of the "proper" building component in this location could have been both a good investment and filled a useful business function during an interim period

## Case Study Conclusion

### Pitfalls of a Lack of Proper Long-Term Planning

- Investing in costly long-term facilities that would be difficult or impossible to convert to another use when market viability ended
- Operational business losses due to inefficiency

## Industrial Efficiency – Overall Conclusions

- Efficiency, economic life, and value can be enhanced with prudent planning
- Logistics activity profiling can enhance internal flow and extend useful life
- Investors should consider each element of a property relative to the market and trends in technology
- Accurate analysis of trends and labor, raw materials, transportation, and other factors will enable a facility to be more competitive in a changing world

Thank You!

Questions?