

سیستم های مهندسی لجستیک

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پائیز 94

لجسٹیک شہری
City Logistics

حرکت بار در مناطق شهری

- Essential to most economic and social activities
 - Vital link in the supply chain from producers to customers: supplies of stores, offices, and homes
 - The means to keep cities clean
 - Major source of employment
- Major disturbing factors
 - Interference with passenger traffic
 - Cities are polluted
 - Cities are not safe...

نقش در ترافیک

- Commercial distribution to supply stores, offices, industries, tourist infrastructures,...
- Individual pickup and delivery activities at private addresses, stores, companies, offices,...
- Express and regular couriers services
- Access to major (intermodal) facilities: ports, airports, rail yard, terminals,...

نقش در ترافیک

- Average load or empty movement levels
 - Rome: 75% of truck trips for 1 destination only
 - Average vehicle load < 20% of vehicle capacity
- Volume rapidly increasing
 - E-business, Express courier, Door-to-door, Reverse logistics
- Major and heavy world-wide trend: urbanization
 - Large cities become larger
 - More cities become large

دستاوردهای ناشی از ترافیک

- Congestion, noise, safety, pollution,...
- Urban network critically congested
- Fierce competition for street and parking space
- Double (triple) parking of trucks for pickup and delivery

نیازها و مسائل موجود

- Analyze. Control, reduce freight vehicle movements within cities to:
- Reduce congestion & Pollution & increase mobility
- Improve living conditions
- Reduce/control number and dimensions of freight vehicles operating within city
- Improve efficiency of movements
- Reduce empty vehicle-km

ایده اصلی-لجستیک شهری

- Stop considering each shipment and company individually
- Consider them as components of an integrated logistics system
- Consolidation and coordination
 - Coordination of shippers and carriers
 - Consolidation of several shipments of different shippers, carriers, and deliveries by the same vehicle

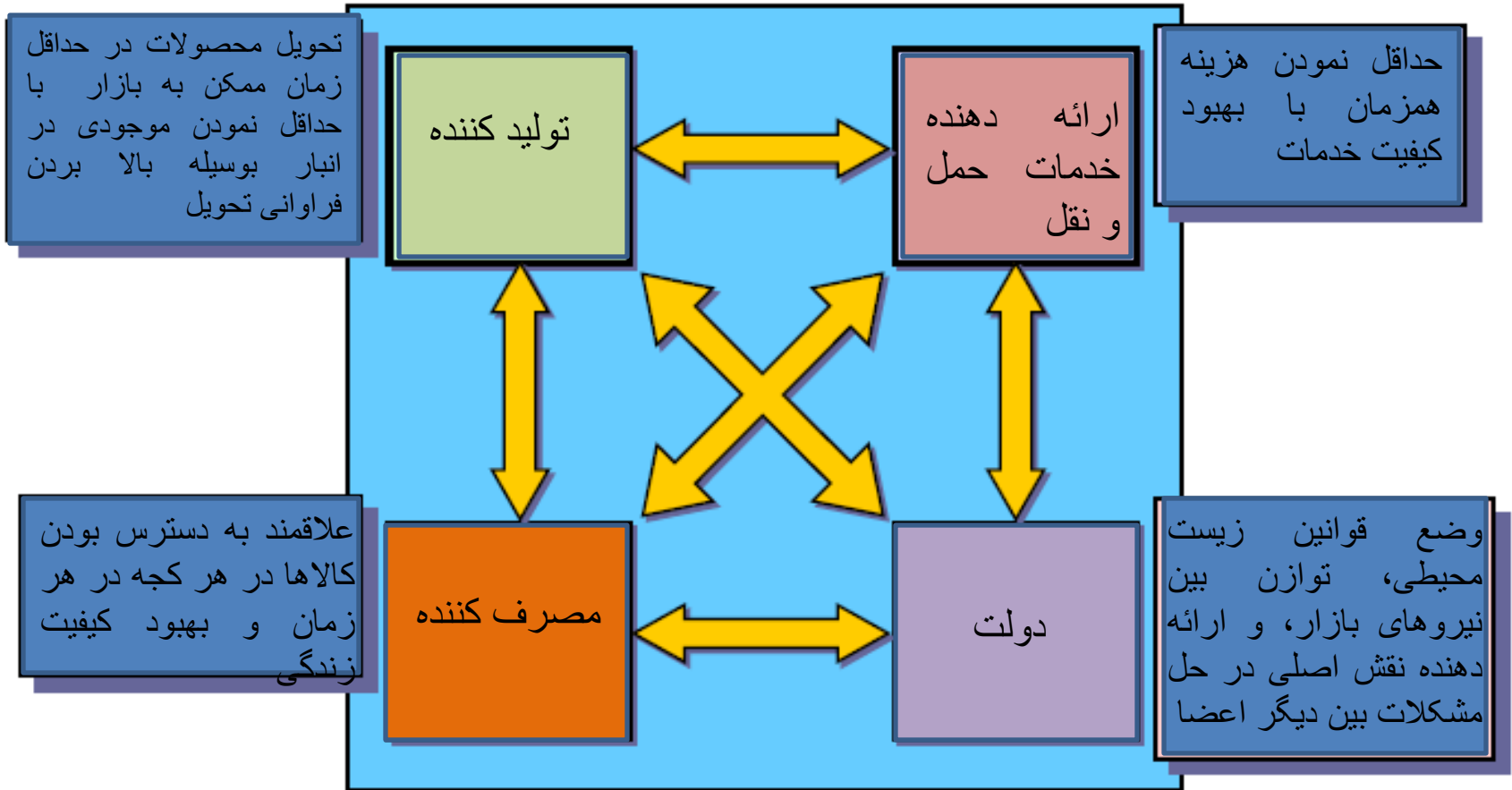
• تعریف: فرایند بهینه سازی لجستیک و فعالیت های حمل و نقل در مناطق شهری به منظور 2 هدف:

1. کاهش هزینه های بخش خصوصی در حمل و نقل و تولید
2. در نظر قرار دادن مسائل زیست محیطی، ترافیک و مصرف انرژی

راهکارهای لجستیک شهری

- Centralized distribution
- Vehicle route planning
- Tracking and tracing
- Environment friendly fuel
- Schedules delivery (fixed window periods)

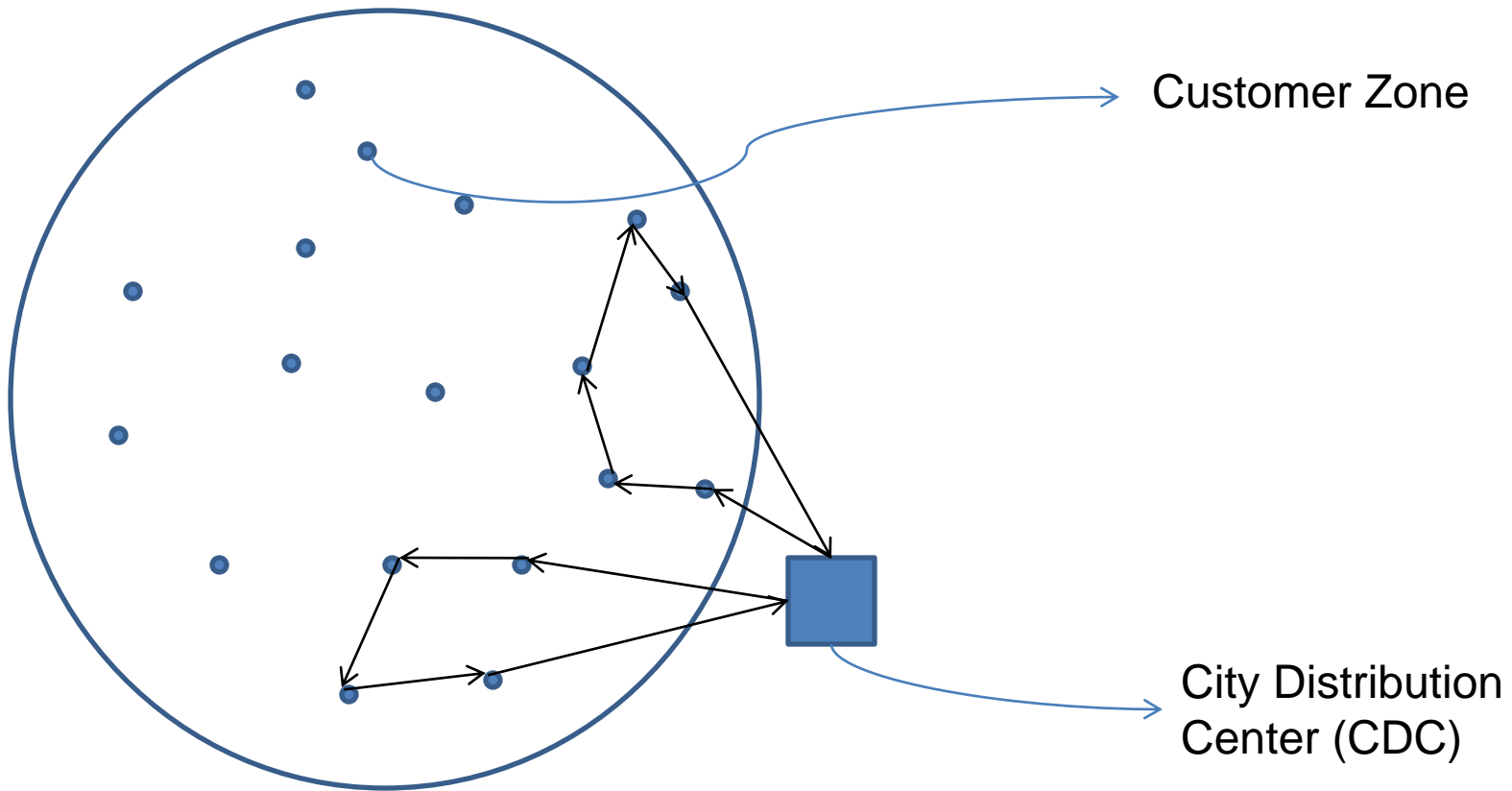
اعضا



مسائل و سیاست های مرتبط با لجستیک شهری

	Transport Function	Goods Handling Function	Information Function
Node	1 ➤ Freight terminals (Distribution centers)	➤ Off-street loading and parking facilities	3
Link	2 ➤ Road construction	➤ On-street loading and parking bays	4 ➤ Road traffic info system
Mode	➤ Low emission vehicles, Electric vehicles, etc.		➤ Parking guidance info
Operation	➤ Cooperative delivery		➤ Vehicle tracking system
Control	5 ➤ Truck ban, size/weight restrictions, allocation of truck routes/lanes, etc.	➤ Loading and parking time limits ➤ Building ordinances	➤ Vehicle routing system ➤ Cargo info system
Market	6 ➤ Road pricing	➤ Parking charges	

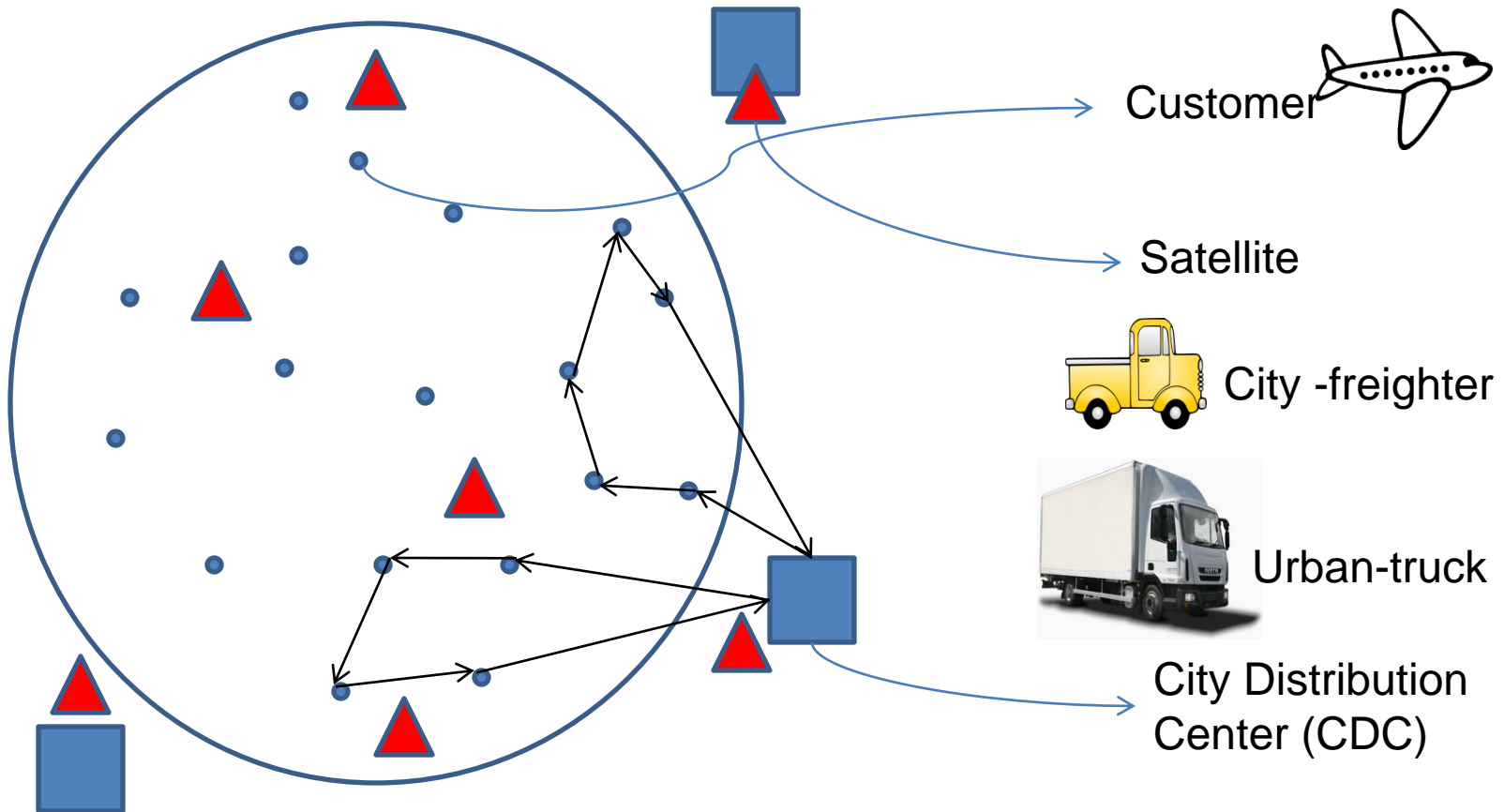
Single-Tier Single –CDC City Logistics



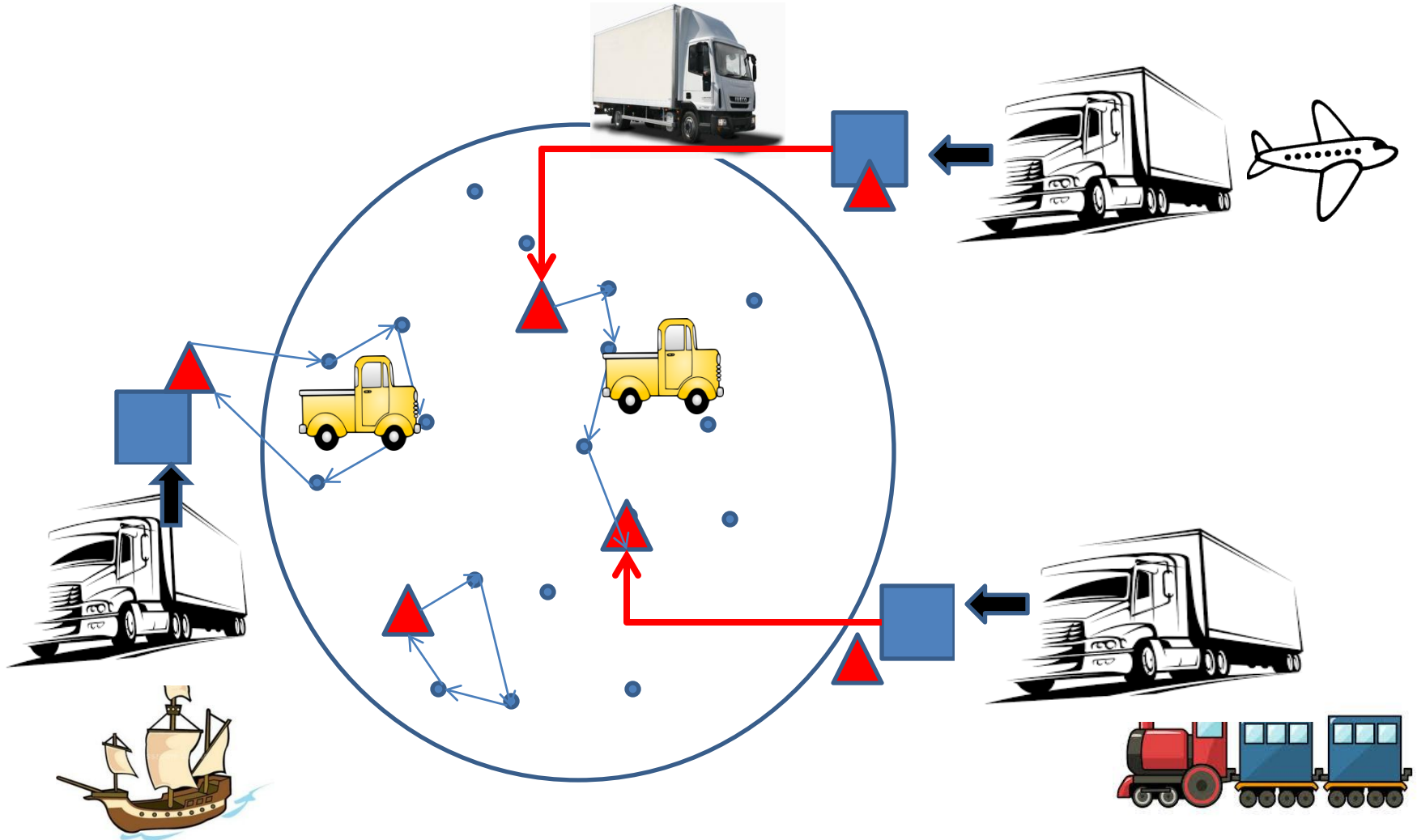
Single-Tier Single –CDC City Logistics

- Based on the utilization of a facility where shipments are consolidated prior to distribution : CDC
- Most activities are related to distribution and less to pick up
- Limited number of shippers and carriers
- Used in most projects, including the pilot implementations
- Limited usage of Intelligent Transportation System technologies

Satellite City Logistics



Satellite City Logistics



Satellite City Logistics

- Main Idea

- Urban-trucks move cargo from CDC to satellite platforms
- Urban-trucks travel as little as possible through inner city
- No storage facilities at satellite platforms
- Vehicles are loaded as fully as possible
- Reverse operations as well

Satellite City Logistics

- City Distribution Centers
 - Link the city to the region, the country, the world
 - Located close to access or ring highways or within air, rail or navigation terminals
 - Accommodate long-haul vehicles and urban vehicles
 - Storage and sorting/consolidation activities

Satellite City Logistics

- Satellite

- In large cities limited number of CDC located far from central city,
 - longer vehicle trips,
 - Difficulties in fully using the vehicle capacities
- Idea: bring cargo closer to inner-city by fully loaded urban trucks, transfer to small energy-efficient vehicles for circuit delivery
- Better vehicle utilization
- Optimize the system for total system cost

Satellite City Logistics

- Satellite
 - Very light structure
 - Use existing facilities (e.g., city bus terminals)
 - Transfer direct from vehicle to vehicle

Satellite City Logistics

- City-freighter
 - Relatively small capacity
 - Standardized
 - Environment-friendly: electric or hydrogen-based
 - Travel along any street in the city-center area
 - Several types in terms functionality: box design, loading/unloading technology, capacity.

Satellite City Logistics

Issues and Decisions:

- System Design
 - Location and design of CDC
 - Location of satellites and customer allocation
 - Fleet dimensioning
 - Urban-truck corridors
- Short-term planning
- Real-time operation, control, and dispatch of vehicles and terminal activities

Challenges facing megacities

Economy

Competition Growth
Inflation Service Sector
Employment Investment
Structural Change

Urbanization

Growing City Population
Security
Urban Diseases
Consumer goods

Traffic

Number of Vehicles
Traffic Time Index
Trucks Transporting Goods
Congestion

Logistics

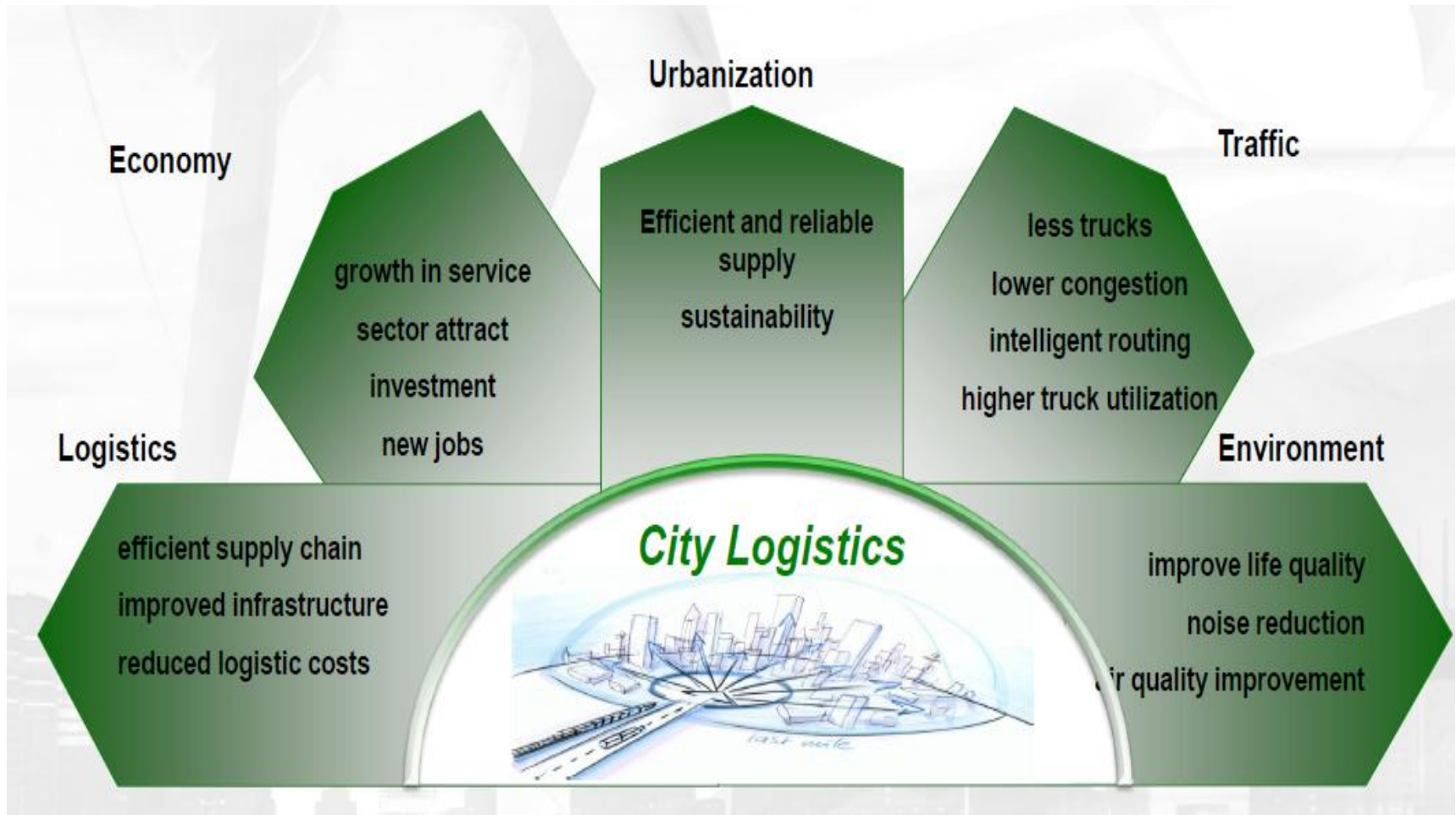
Low Truck Utilization
Transparency Logistic Costs
Supply Chain Agility / Reliability
Complexity of Last Mile



Environment

City Image Green Agenda
Local Air Pollution
CO2 NOx Noise
Quality of Live

Benefits of City Logistics



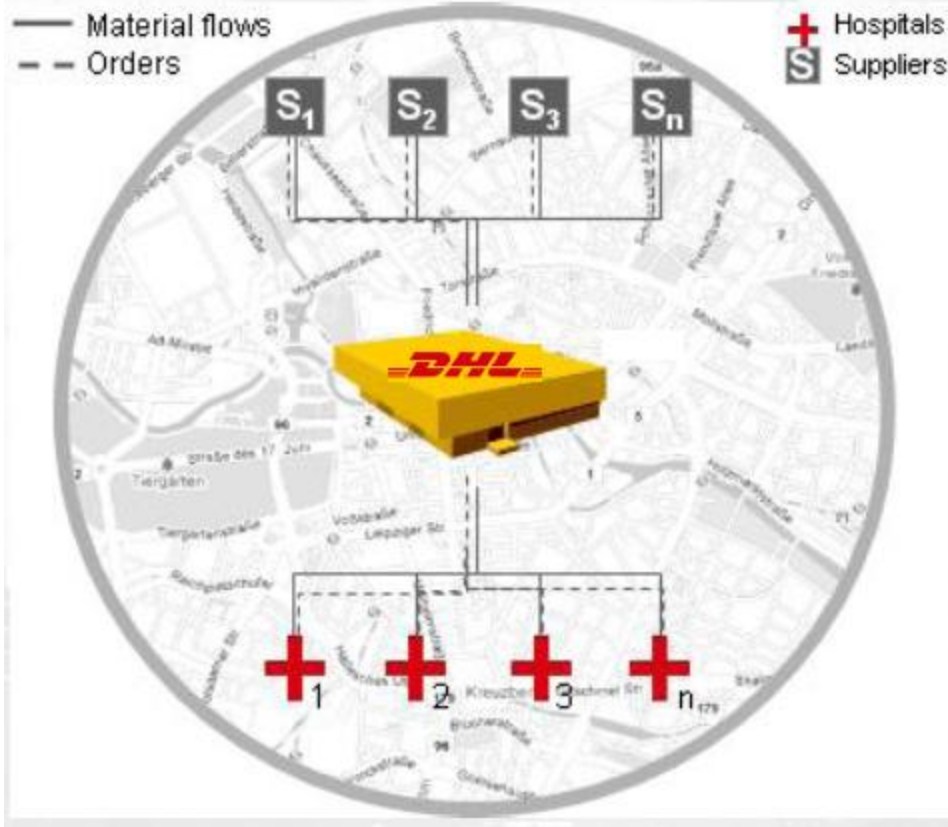
City Logistics: Values for a Sustainable Future

Logistics Improved efficiency	<ul style="list-style-type: none">• Higher supply chain agility• Optimized timing of deliveries (off-peak hours)• Less stock outs
Traffic Improved streets situation	<ul style="list-style-type: none">• Increased load factor from ~40% to >95% due to consolidation of deliveries• Substantial reduction of trucks going into and leaving the city, by ~50%• Reduction in congestion resulting in increased average speed of travel
Environment Reduction of pollution	<ul style="list-style-type: none">• Reduction of emissions and noise related to freight traffic, by ~70%• Utilizing hybrid or e-vehicles for additional pollution reduction
Economy Improved GDP & tax income	<ul style="list-style-type: none">• Reduction in logistics costs• Spill-over effects on other business sectors
Urbanization Improved quality of life	<ul style="list-style-type: none">• Citizens take advantage of reliable supply of goods
City Improved image	<ul style="list-style-type: none">• Municipalities that implement City Logistics will become a role model for innovation and sustainability• Increased security level through full transparency

Hospital Logistics

Large Savings for the National Health System in London

Operated by DHL since 1998



KEY FACTS

- Consolidated deliveries for hospitals in London
- 30 % reduction in stock levels
- Substantial expenditure savings
- Improved procurement for NHS in UK achieved 100 m GBP saving in first 3 years

Hotel Logistics

Logistics Management for the Venetian Resort in Macau (China)

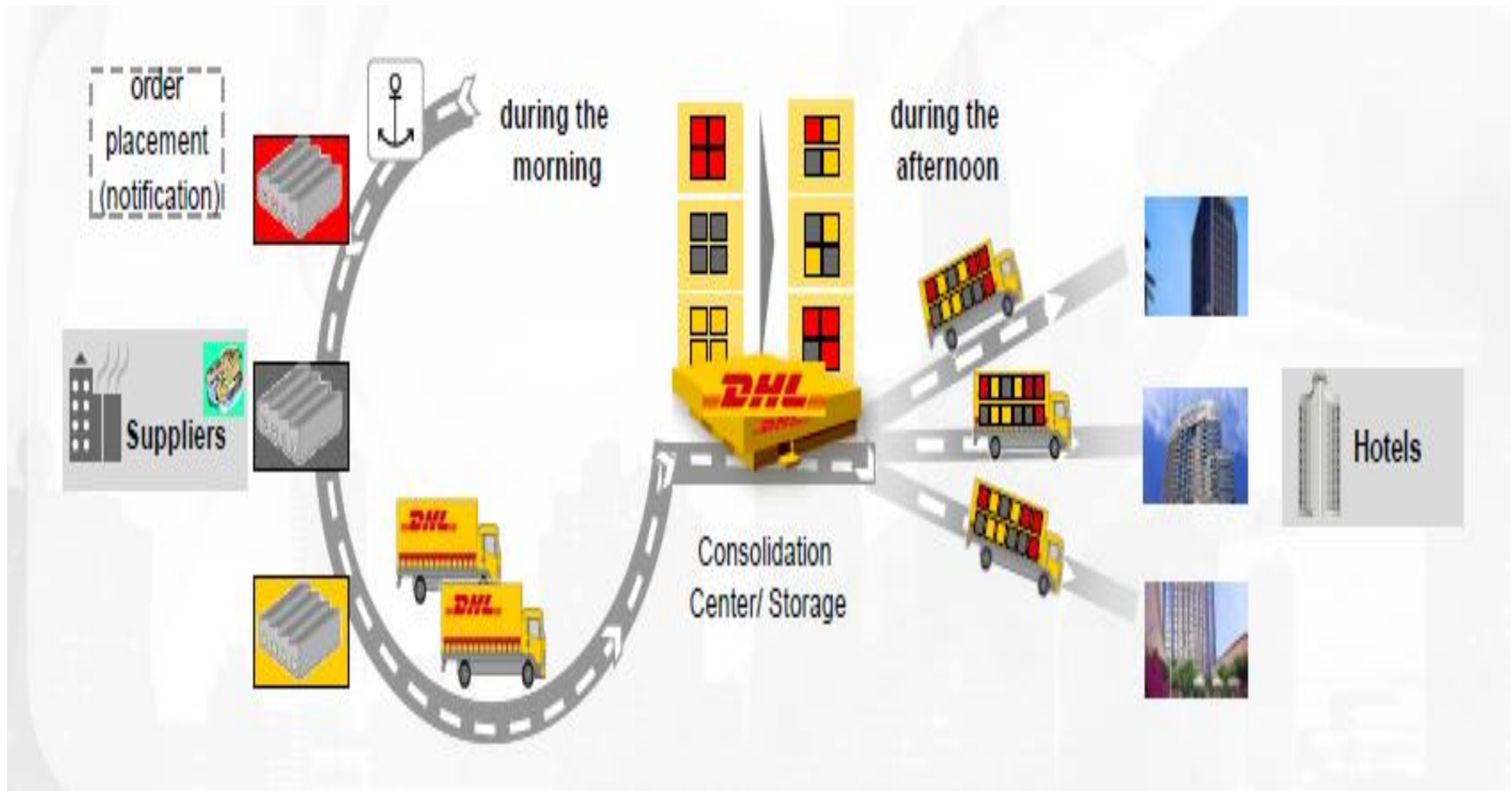
➤ Operations went live in 2006



KEY FACTS

- 3300 hotel rooms, conference center, casino, event arenas, mall and restaurants
- Consolidation and deliveries to all stores
- In-bound dock management
- Inventory management
- Laundry transport

Consolidation for three Hotels in Kuala Lumpur



Consolidation for three Hotels in Kuala Lumpur

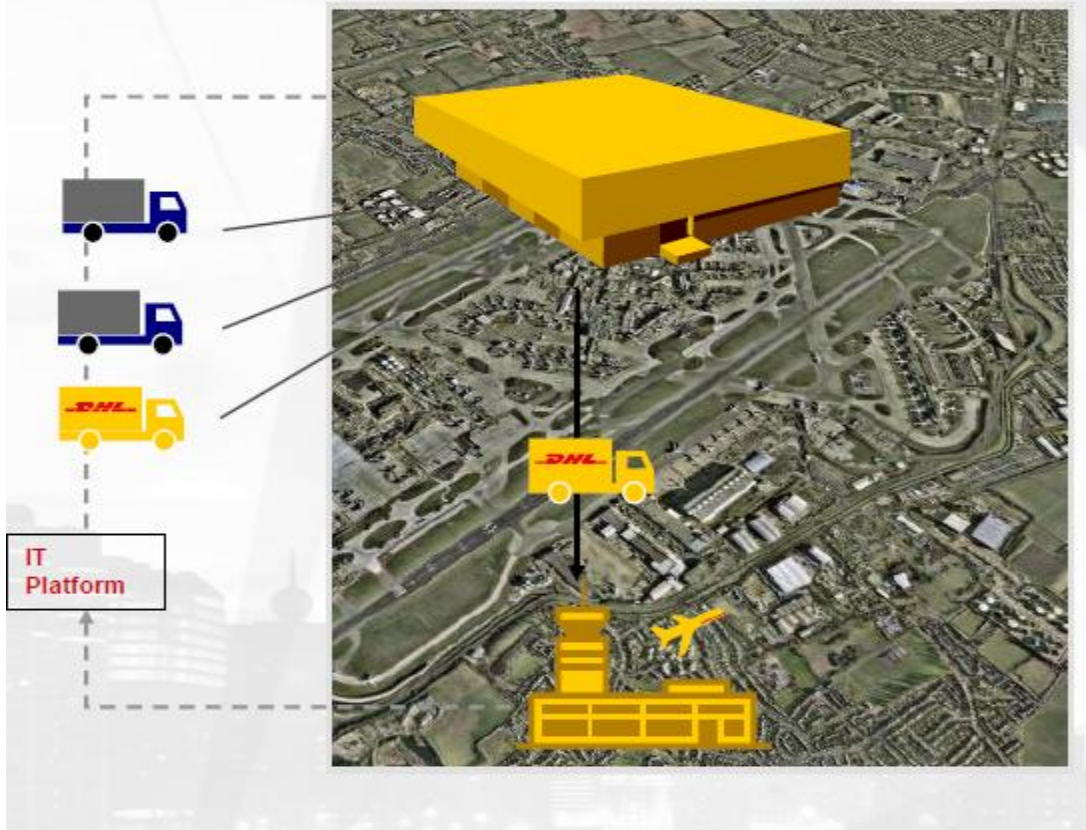
KEY FACTS

- Consolidation for three hotels in the city center
- Reducing deliveries, and storage
- Optimizing in-house replenishment and procurement
- Achieving cost savings up to 13 %

Airport Retail Logistics

Improved Logistics through the Heathrow Consolidation Centre at London

Operated by DHL since March 2003



KEY FACTS

- 323 retail stores
- Problem with congestion and security
- DHL reduced CO2 emissions by 70 %
- Service levels increased to ~ 99 %
- 50 % less trucks around airport
- Stores reduced costs and improved sales

Logistics for Retailers

Bristol and Bath Councils Consolidation Centre

Operated by DHL since 2004

KEY FACTS

- 100% on time delivery
- No losses or damages
- Over half of retailers achieve 20 minute saving per delivery
- 30% reduction in CO₂, zero emissions in air quality & low noise impact
- 76% reduction in delivery trips for retailers

