A Network of Complementary SMEs for a Global Infrastructure for Services:

the Example of Environmental Urban Services

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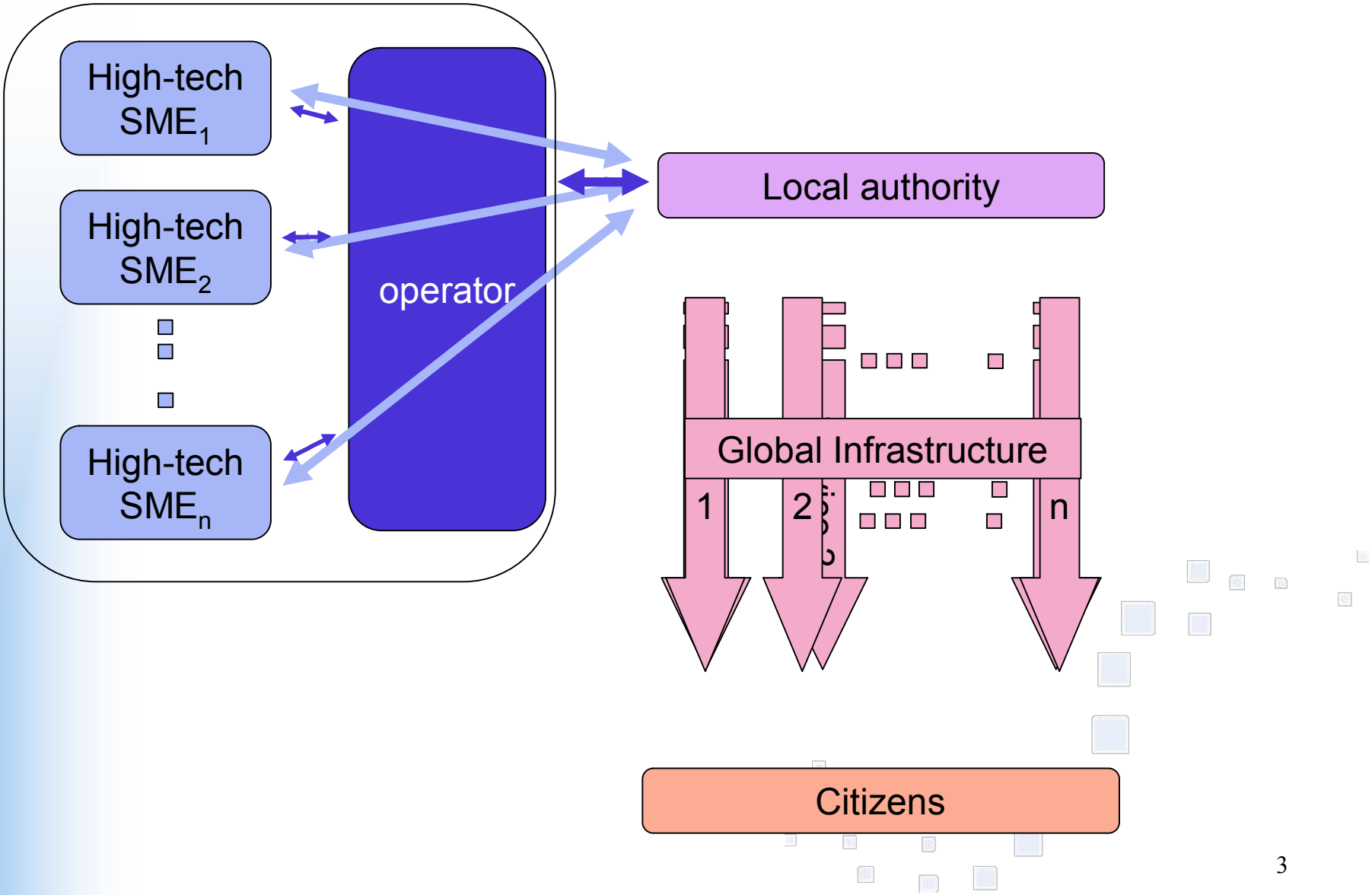
Introduction

Collaborative Networks and Global Infrastructure for Urban Services

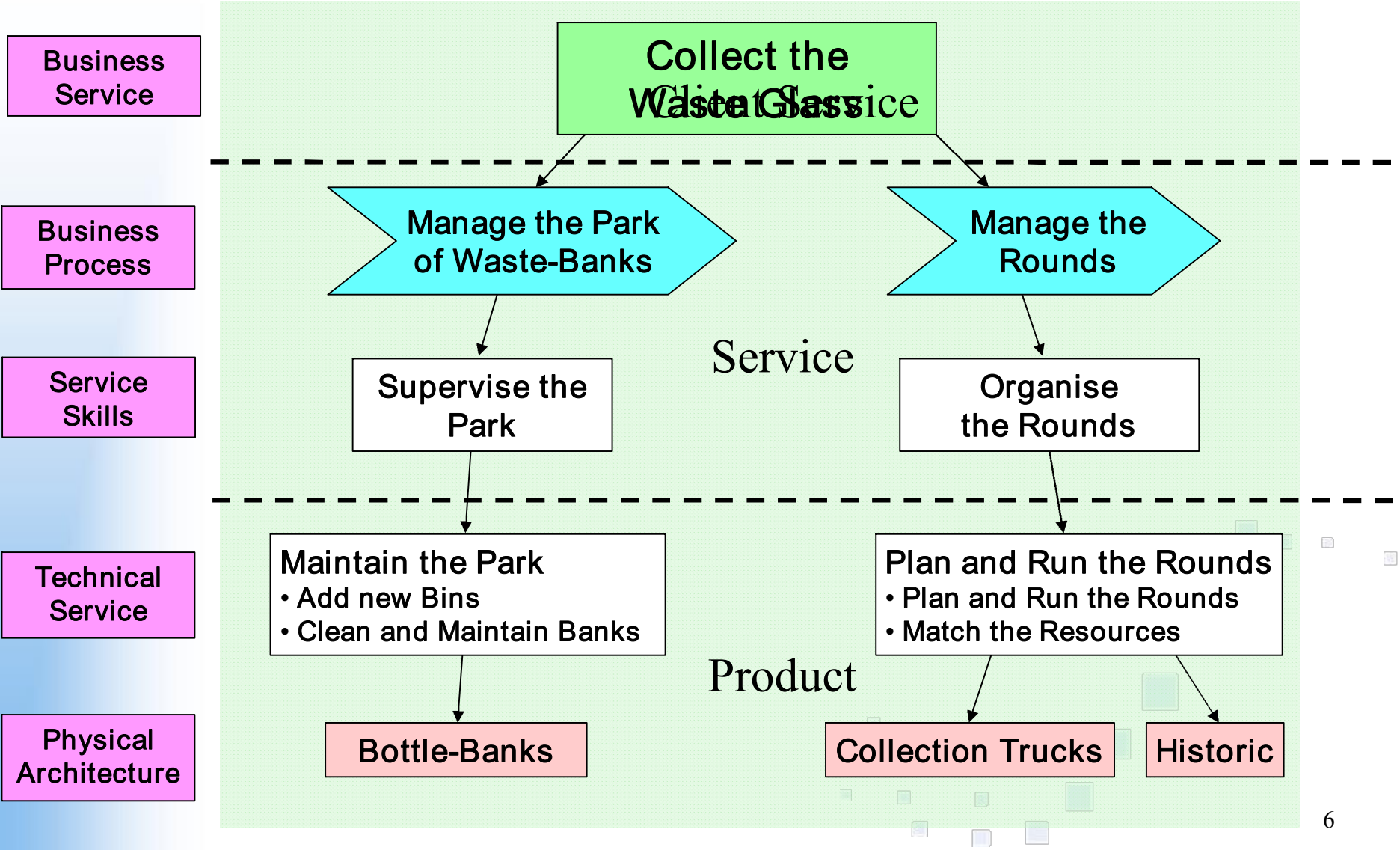


Basic Service

Basic Waste Glass Collection

- Brief History
  - 1974: household glass waste collection for recycling started in France.
  - In the 90's: bring-in systems for glass waste began to be organized and bottle banks for collection were generalized.
- Bring-in systems:
  - Service provider
    - Local council (state controlled)
    - Sub-contracted (private)
  - Bottle-banks
    - Containers (buried or overhead)
  - Systematic rounds
    - Collection truck (weekly rounds, …)

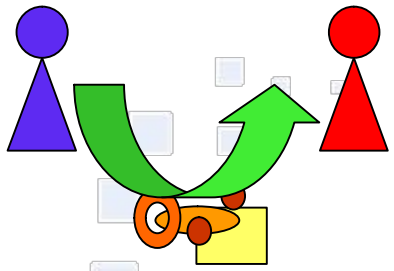
Basic Service Architecture



M2M-Enhanced PSS

Product-Service System

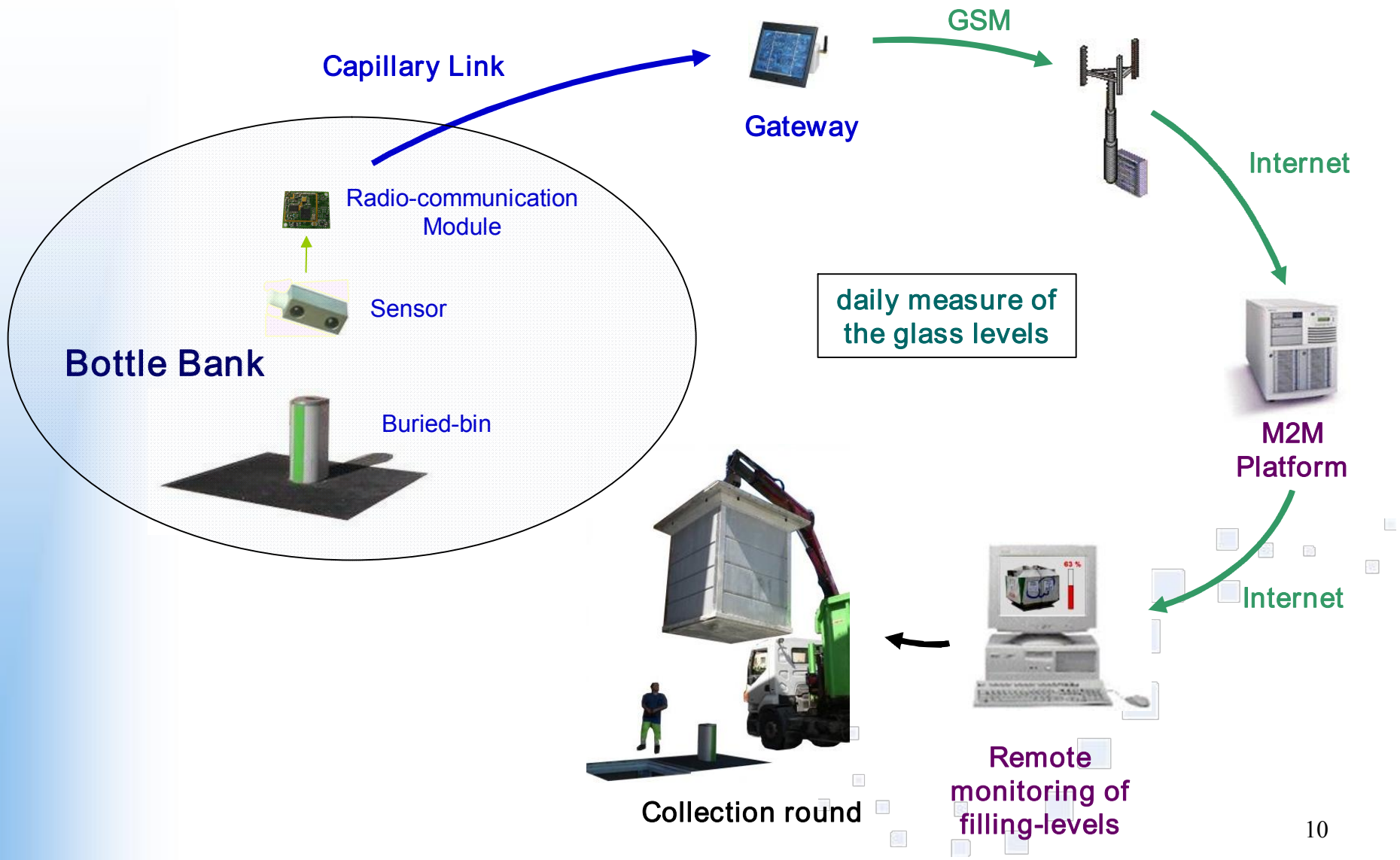
- Context
  - Strain on environment, resources.
  - Globalization.
  - Increasing demand for personalised services.
- Consequences
  - ➔ Quest for sustainable solutions.
  - ➔ Investigation of new business strategies.
  - ➔ Move to a service-based economy.



- Product-Service System (PSS)
  - Marketable services based on underlying products jointly produced by the provider and the customer.

M2M-Enhanced Collection Scenario

M2M-Enhanced PSS



M2M Technical Installation

Waste Collection Park

- Bottle Banks
- Bins + Sensors
- Gateways

Communication Systems

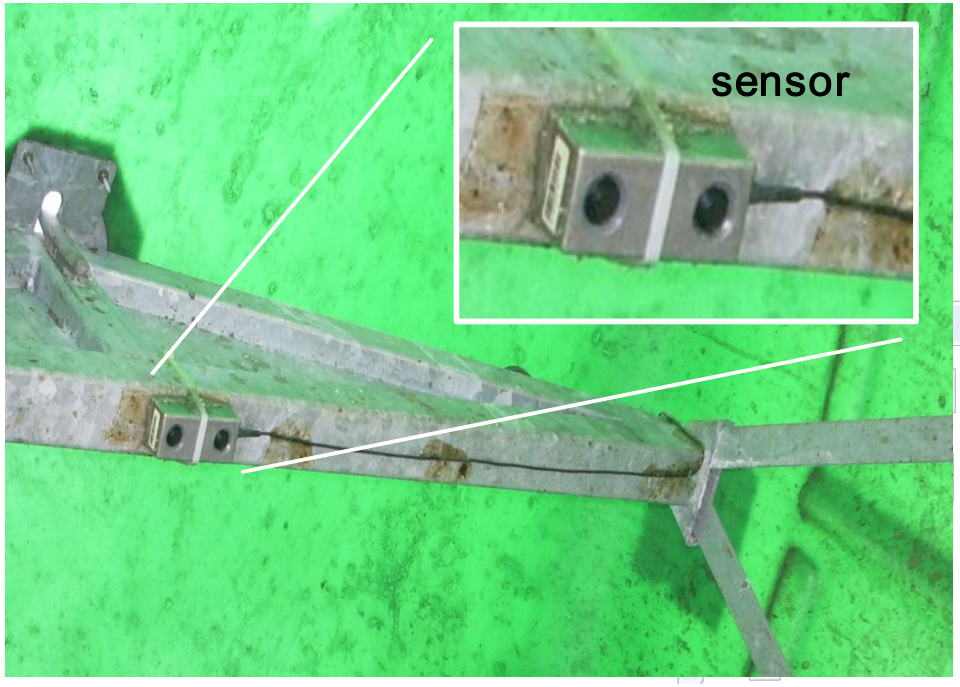
- GSM: Gateway ⇔ Telecom Network
- IP: Telecom Network

Information Systems

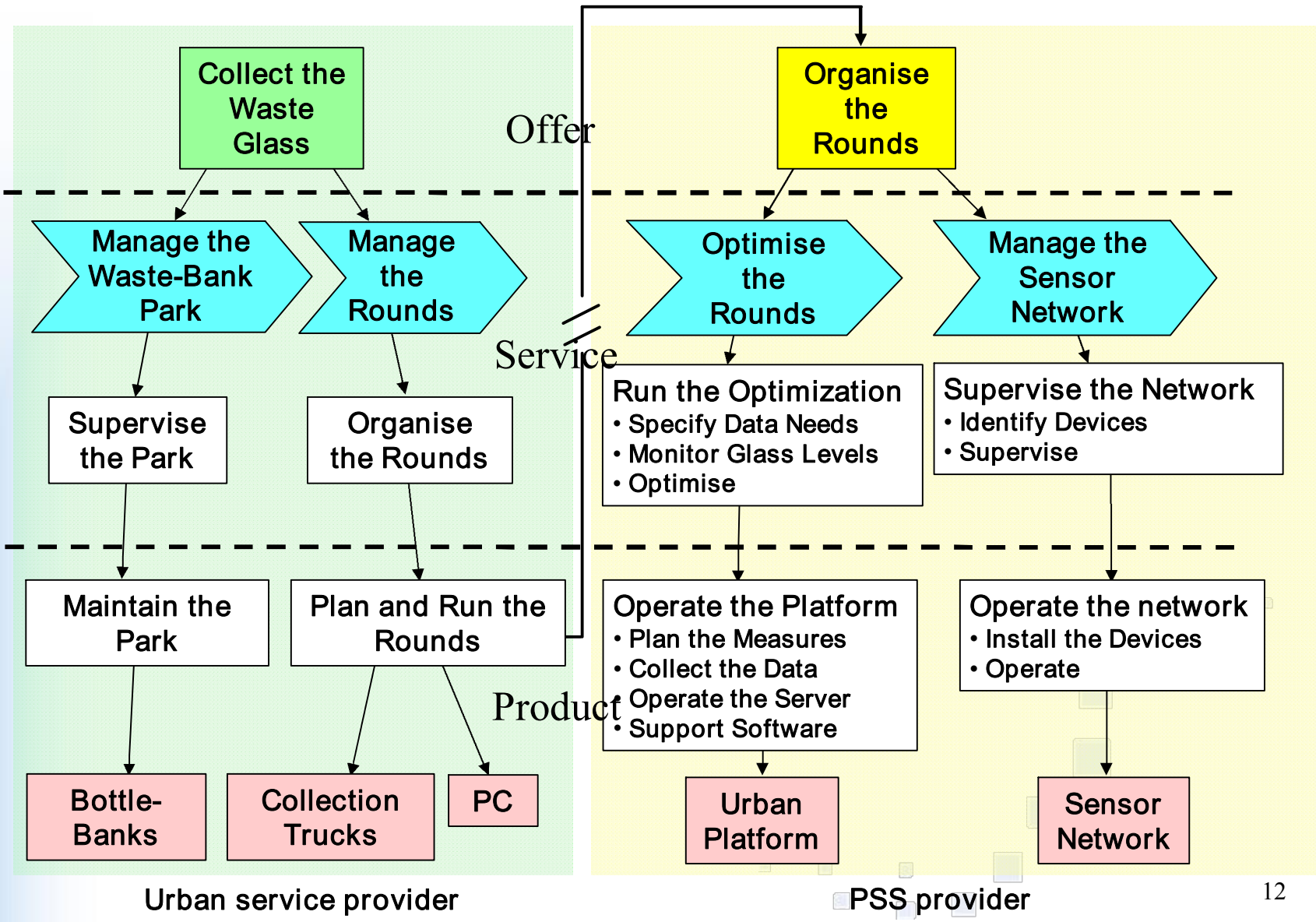
- M2M platform
- PC Terminal

Collection

- Truck



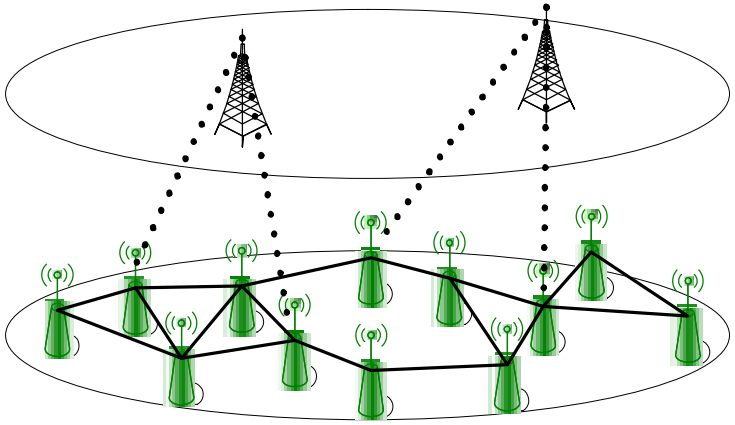
PSS Architecture



M2M-Enhanced Mutualised Infrastructure for PSS

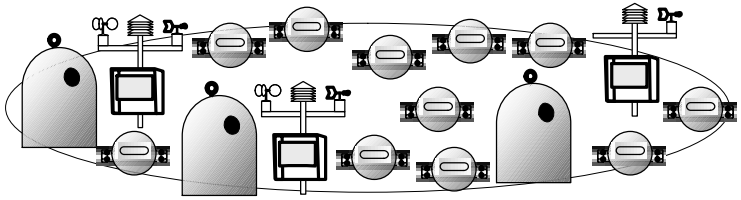
Urban Low Power M2M Network

Telecom Network

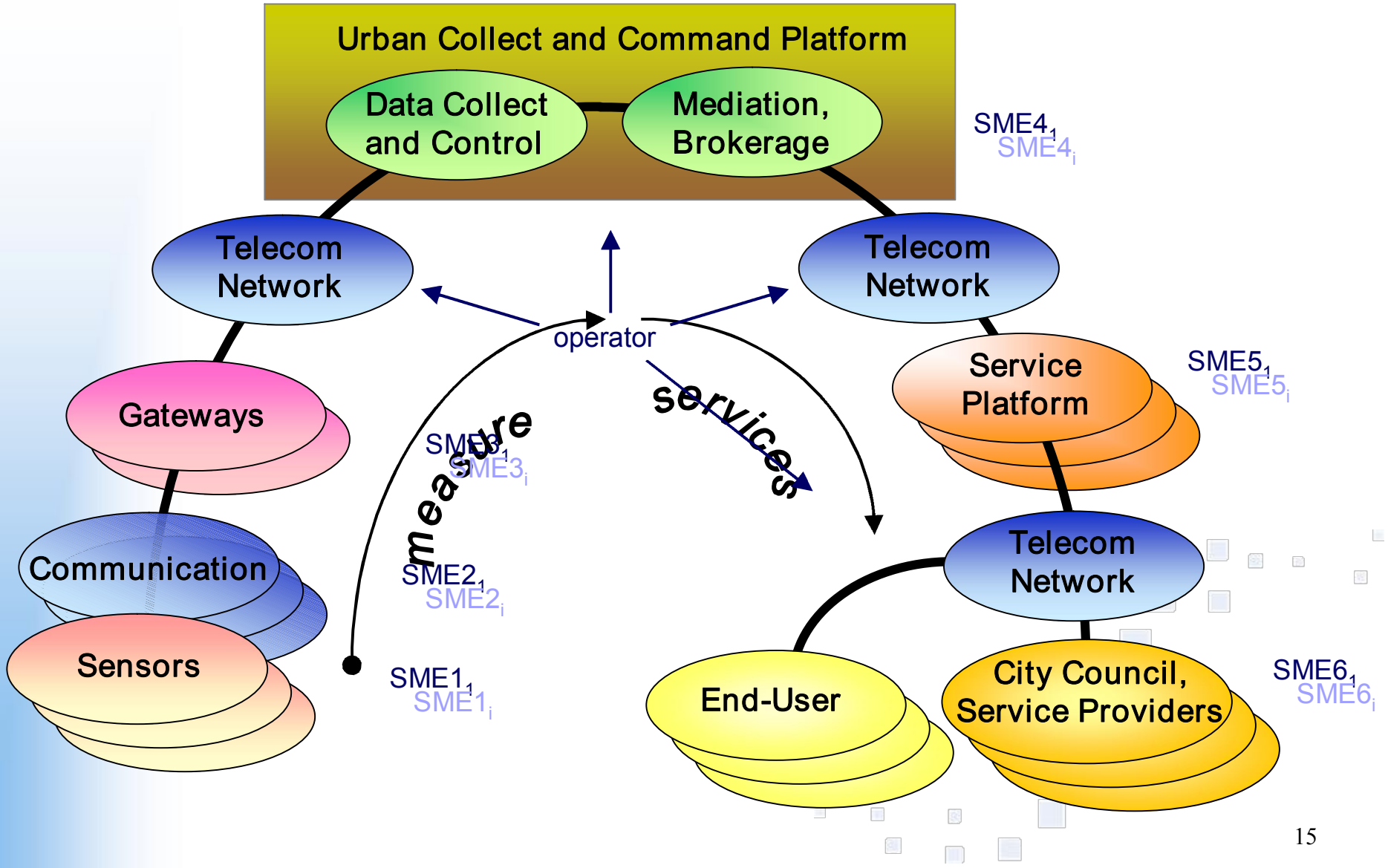


Gateways

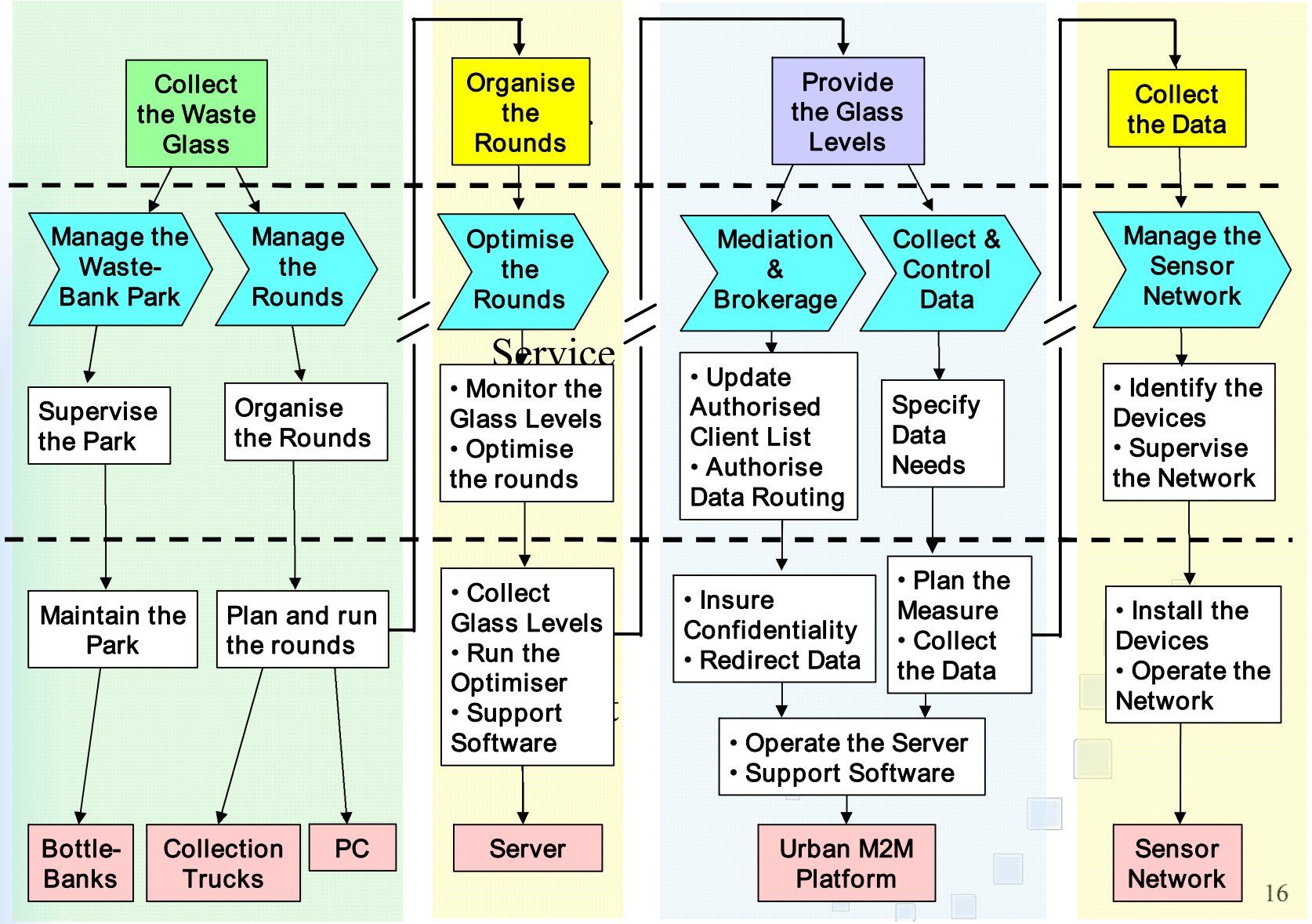
Equipments, sensors:
- Counters
- Environment
- Waste
- Transport…



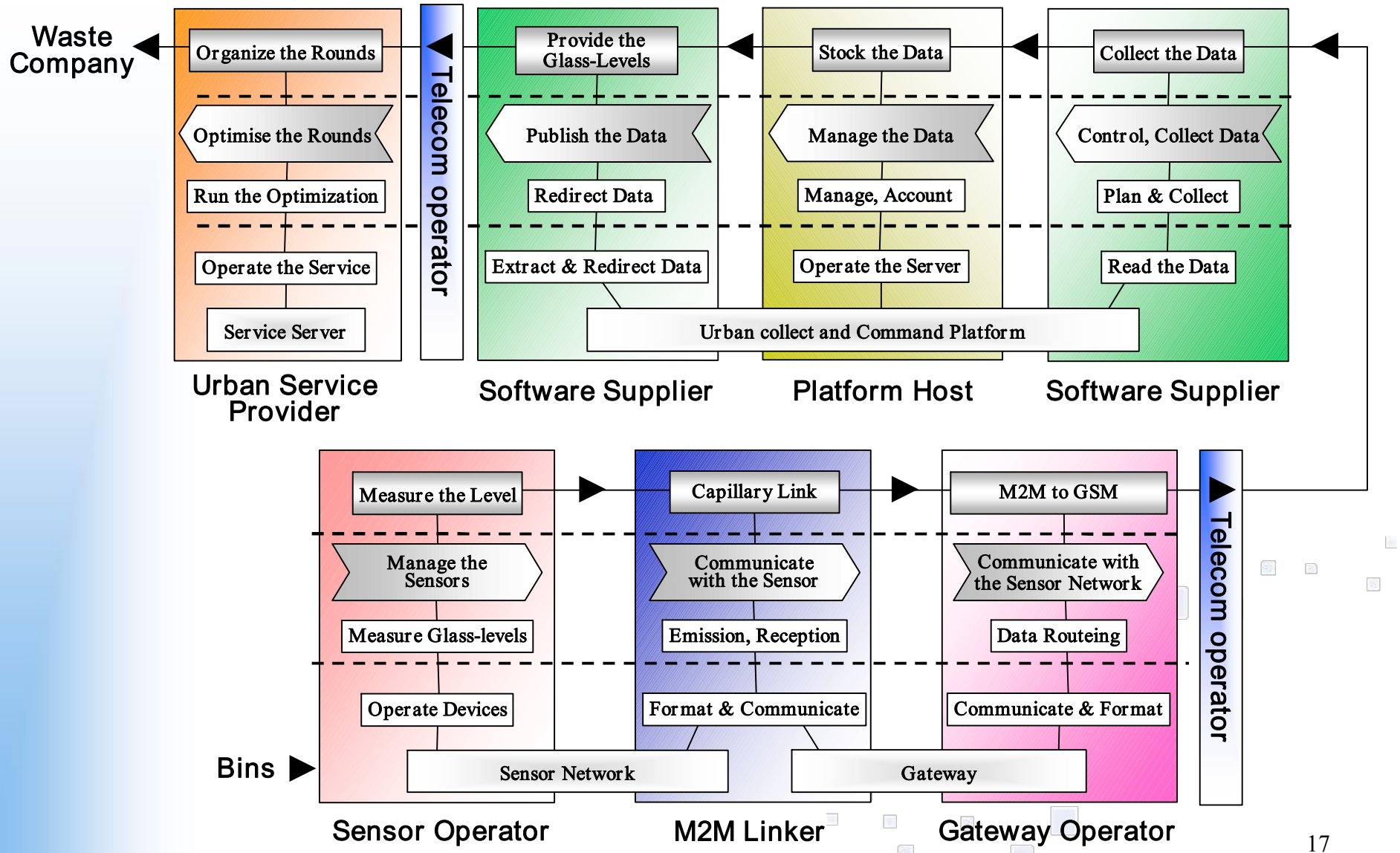
Global Urban M2M Infrastructure for PSS



PSS Architecture
with a mutualised telecom infrastructure



PSS Network


Waste Company
Organize the Rounds
Optimise the Rounds
Run the Optimization
Operate the Service
Service Server
Telecom operator
Provide the Glass-Levels
Publish the Data
Redirect Data
Extract & Redirect Data
Stock the Data
Manage the Data
Manage, Account
Operate the Server
Collect the Data
Control, Collect Data
Plan & Collect
Read the Data
Urban collect and Command Platform
Urban Service Provider
Software Supplier
Platform Host
Software Supplier
Measure the Level
Manage the Sensors
Measure Glass-levels
Operate Devices
Sensor Network
Capillary Link
Communicate with the Sensor
Emission, Reception
Format & Communicate
Gateway
M2M to GSM
Communicate with the Sensor Network
Data Routeing
Communicate & Format
Telecom operator
Bins
Sensor Operator
M2M Linker
Gateway Operator

Discussions and Conclusion

Opportunities and Limits of a Network of Enterprises Providing Environmental Urban Services

- **Optimal Size**
  - Operator: Create the conditions for a solid infrastructure capable of quickly adapting to changing markets
  - SME: Capable of rapidly integrating new tools, but its' small size does not allow it to penetrate the market alone
- **Delegation of power by the SME**
  - Preponderant position of the operator
  - SME concedes parts of its' service to other specialized companies
  - SME concentrates on the real added value of its core skills
- **Environmental Pressure**
  - Europe / Public ➔ Operator ➔ SME ⇔ SME
- **Territorial Advantages**
  - Backbone capable of supporting multiple services
  - Environmental advantages from sharing facilities
  - Equipment doesn't necessarily have to be duplicated
  - Professional intervention for installation, maintenance and end-of-life

Conclusion

- We have presented a network of complementary SMEs lead by an operator / integrator to provide a global infrastructure for urban services.

- The representation of the PSS architecture can help:
  - Clarify the passage from the ***basic services*** to ***vertical M2M services*** and finally to ***a mutualised infrastructure for services in the city***.
  - Clarify the positioning of the different SME partners.