



# Integrating Urban Freight Transport measures in a Sustainable Urban Mobility/Logistics Plan

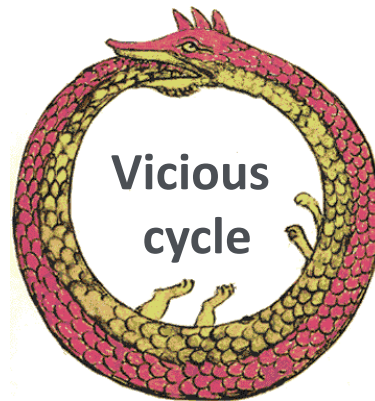
**Thomas H Zunder**



# Challenges in Urban Freight Transport

## Sustainability & Logistical Excellence

- Long-term viability of sustainable urban freight transport (UFT) measures/services
- Uncertainty in the actions of public authorities
- Uncertainty in the market reaction to urban freight services



# NOVELOG Guidance TOOL

Integrate Urban Freight Transport Solutions  
in the city's  
Sustainable Urban Mobility Plan (SUMP)



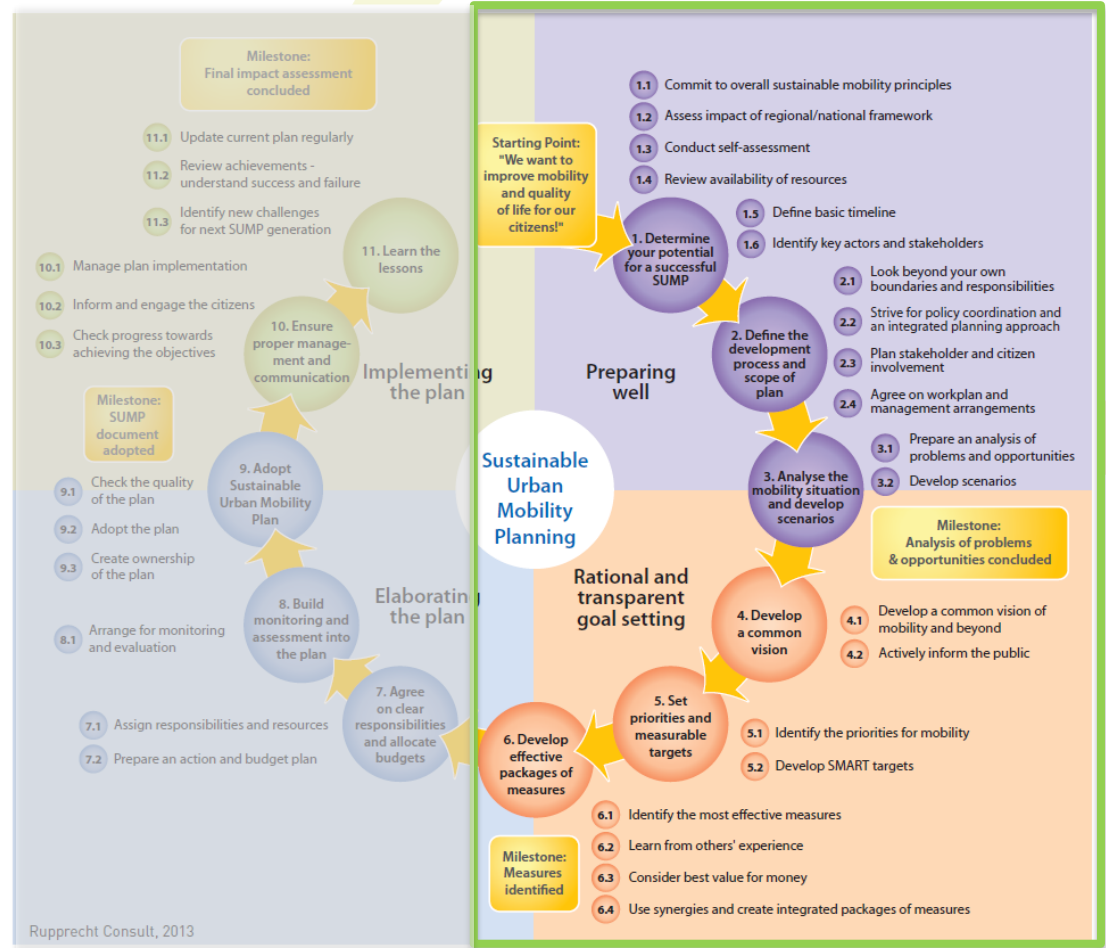
Generation of **Business Models**  
for each measure

Create **Multi-Stakeholder Platform**

Key partners	Key activities	Value proposition	Customer relationships	Customer segments
Who are the firm's partners?	What are the key activities, such that the firm operates successfully?	What value does the firm deliver to the customer?	What type of relationship is established between the firm and the customer?	For whom is the firm creating value?
	<b>Key resources</b>	<b>Internalization of externalities</b>	<b>Channels</b>	
	What does the firm need to create value?	How are externalities from firm's business activities internalized?	How does the firm reach the customer?	
	<b>Cost structure</b>		<b>Revenue streams</b>	
	What are the costs associated to the business model?		For what value are the customers paying and how are they charged?	

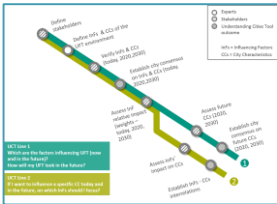
# Integrate UFT solutions in the city's SUMP

Developing and implementing a sustainable urban mobility plan (ELTIS 2013)



# Integration steps for UFT solutions

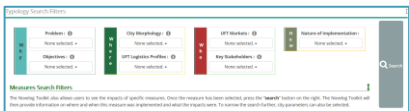
## Understanding Cities Tool



## Evaluation Tool "EVALOG"



## NOVELOG Toolkit



Step 1: Determination of the city's potential for a successful urban freight planning process

Multi-Stakeholder Platform

Step 2: Definition of the development process and scope of the plan

Step 3: Analysis of the city's current UFT situation

Step 4: Development of a common vision and future improvement scenarios

Step 5: Setting priorities and measurable targets

Step 6: Develop effective package of measures

Business models

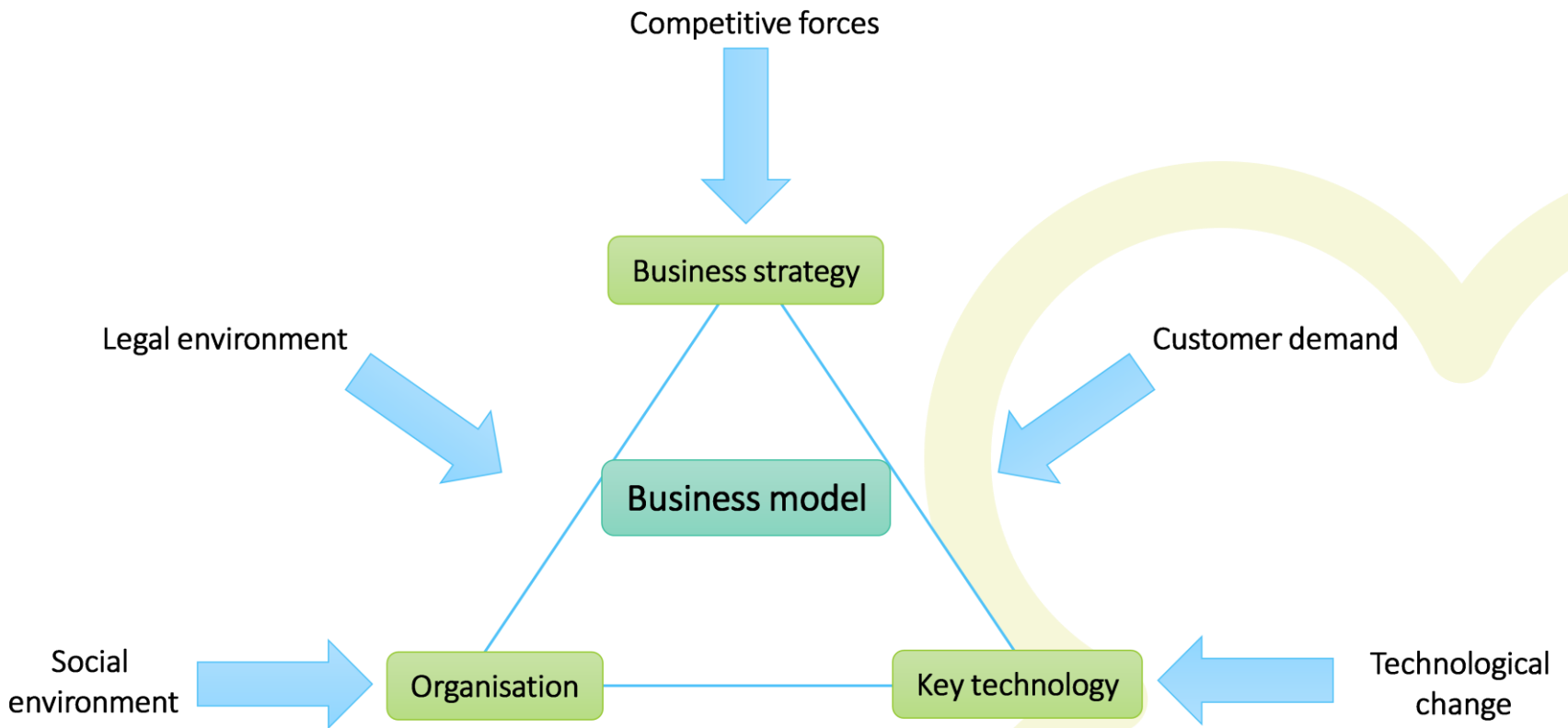
# Foundational feature in the approach: Multi-Stakeholder Platform

- Identify participants of the multi-stakeholder platform

Supply Chain Stakeholders	Freight Forwarders, Transport Operators, Shippers, Major Retail chains, Shop Owners
Public Authorities	Local Government, National Government
Other stakeholders	Industry and Commerce Associations, Consumers Associations, Research and Academia


- Initiate engagement
- Maintain engagement

# Enhancing and adapting UFT measures using Business Modelling



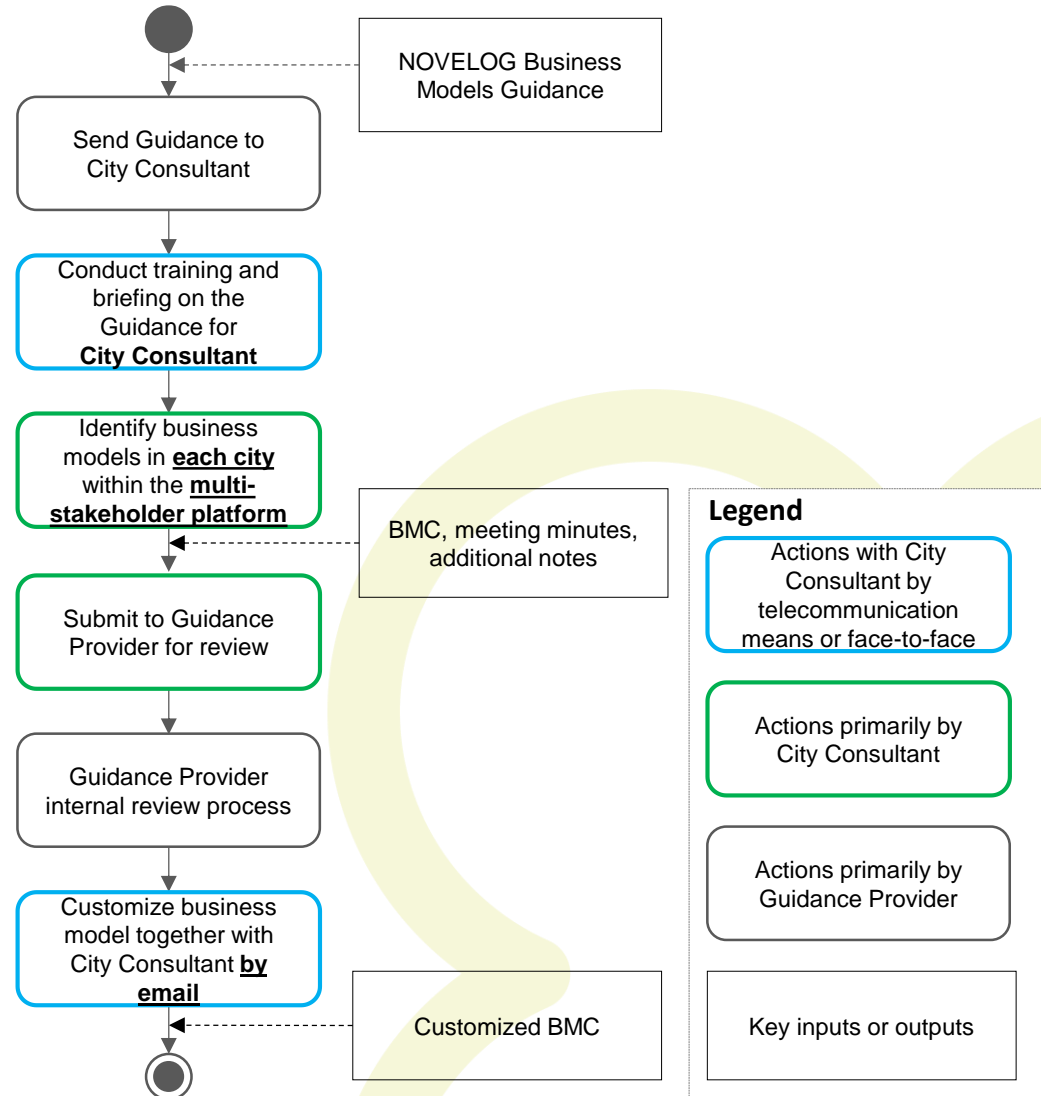
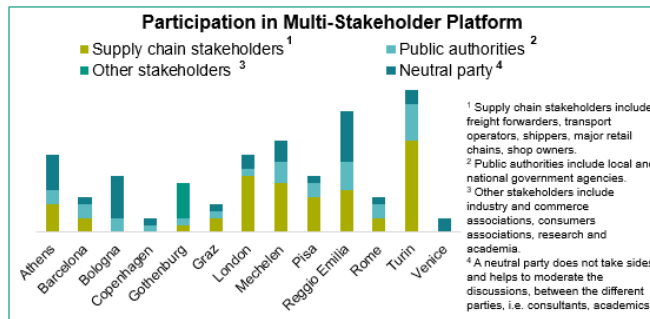


# Enhancing and adapting UFT measures using Business Modelling

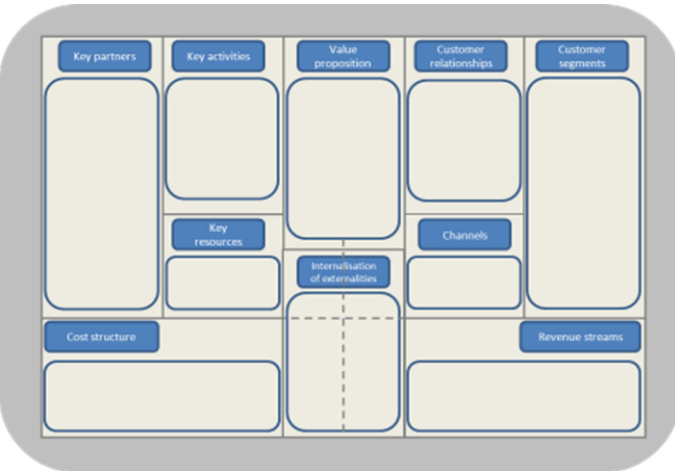
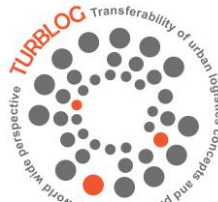
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<b>Cost structure</b>			<b>Revenue streams</b>	
What are the costs associated to the business model?			For what value are the customers paying and how are they charged?	
				

Modified Business Model Canvas

# Workflow to develop business models used in Novelog



# Building the framework



BUSINESS MODEL BLOCKS	CHARACTERISTICS	DESCRIPTION
Key partners	Motivations to create partnerships	Optimization and economy of scale to reduce costs, and often involve outsourcing or sharing infrastructure. Economy in which trade in goods, services and learn to network worldwide, including over the Internet, benefiting from new information technologies and communication.
	acquisition of particular resources and activities	Most companies rely on other firms to furnish particular resources or perform certain activities. Such partnerships can be motivated by needs to acquire knowledge, licenses, or access to customers.
	reduction of risk	Partnerships can help reduce risk in a competitive environment characterized by uncertainty
Key activities	production	These activities relate to designing, making, and delivering a product in substantial quantities and/or of superior quality. Production activity dominates the business models of manufacturing firms.
	Distribution	Distribution is also a very important component of Logistics & Supply chain management. Distribution in supply chain management refers to the distribution of a good from one business to another.
	Supporting activities	e.g. Placing - network design
Key resources	physical	This category includes physical assets such as manufacturing facilities, buildings, vehicles, machines, systems, point-of-sales systems, and distribution networks.
	Know-how	Know-how is practical knowledge of how to get something done. In the context of industrial property, know-how is a component in the transfer of technology in national and international environments, co-existing with or separate from other IP rights such as patents, trademarks and copyright.
	financial	Some business models call for financial resources and/or financial guarantees, such as cash, lines of credit, or a stock option pool for hiring key employees.

Key partners	Type of key partnerships	Strategic alliances between non-competitors Partnerships between competitors Joint ventures to develop new businesses Buyer-supplier relationships
Key activities	Categories	production Distribution Supporting activities
	Type of key resource	physical know-how human financial
Cost structure	Characteristics of cost structures	fixed costs variable costs sunk costs
Customer relationships	Types of relationships	personal assistance self-service/self-automated services collaborative
Customer segments	Types according to the needs, behaviors	Mass market Segmented Multi-side market
Value propositions	Elements that can contribute to customer value creation	performance/efficiency customization flexibility price cost reduction accessibility
	Channels	Type of channels
Revenue Streams	How or ways to generate revenue streams	asset sale service advertising production
Internalisation of externalities	Environmental savings	Truck-km Noise Congestion
	Social Impact savings	Quality of Life Accident reduction



# Meetings format



Moderator: pilot responsible



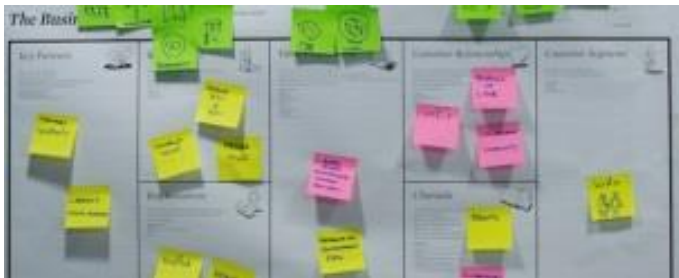
Consortium supporter (same country or nearby)



Stakeholders involved or that could be potentially involved in the measure implementation



Moderator presents a slide with the measure and the canvas explaining the meaning of the blocks



Fill the info for the building blocks in post it's



Multistakeholders platform

City authorities

Industry

International associations

Research & Academia

Consultants

# Meetings format

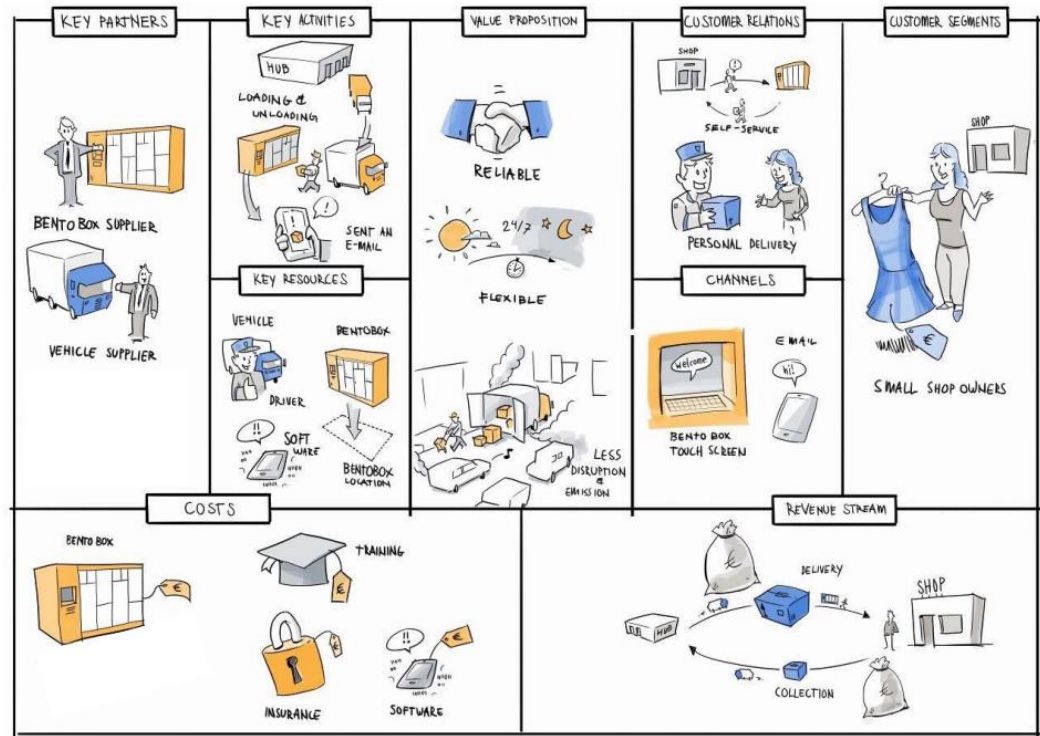


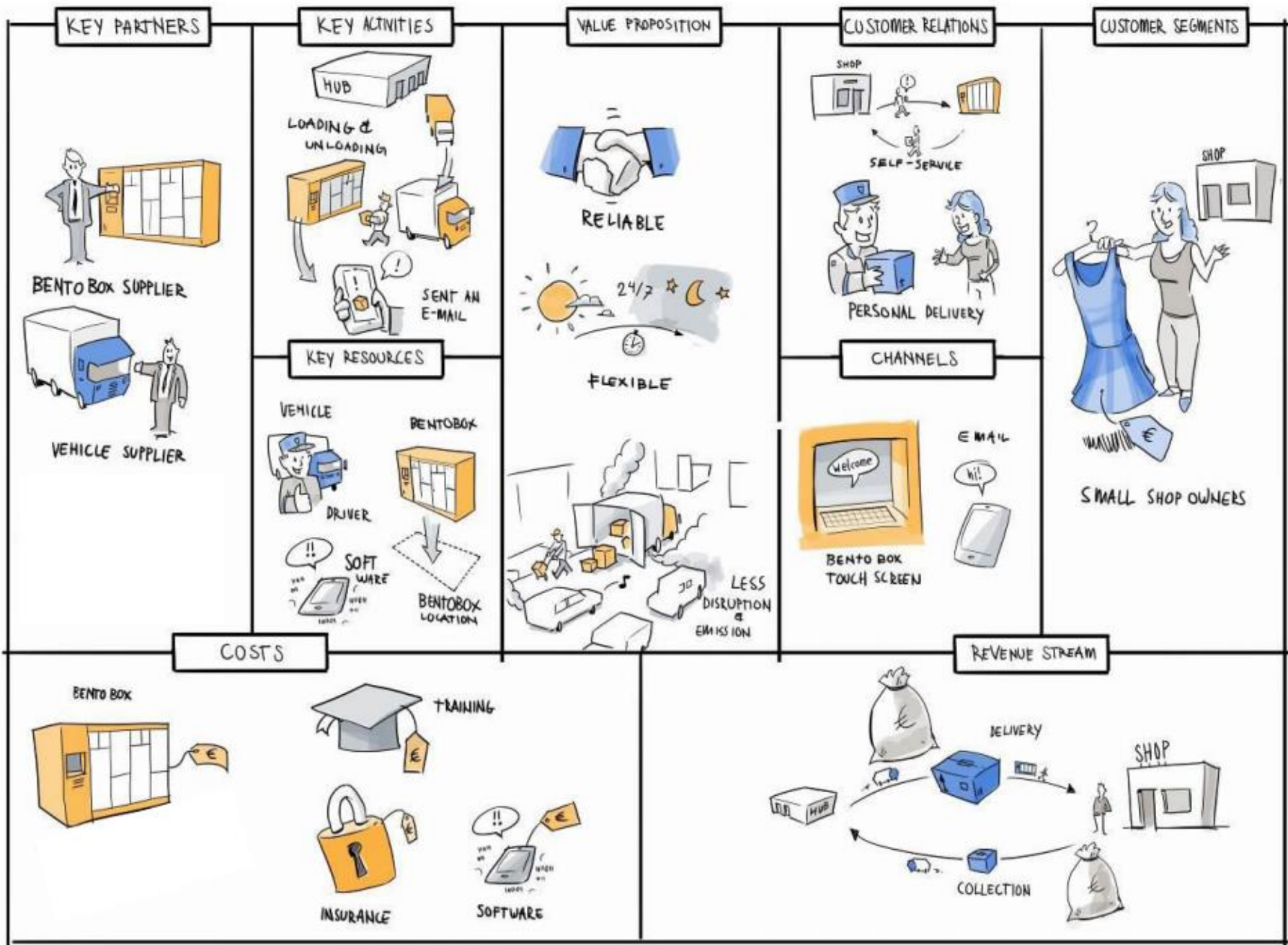
Moderator and supporter make an overview of the drafted business model



Achieve consensus on the business model; discuss other possibilities or how the BM could be improved and collect feedback

- What would the municipality be willing to facilitate?
- What would the private/users be interested in?
- Should another type of stakeholder be engaged?
- Can we increase the value proposition?
- Can we reduce externalities?





# Novelog business model types

City	Measure description	Urban consolidation schemes	Shared transport capacity	Integrated delivery services with in-store purchase	Novel management of public resources	Governance of sustainable urban freight
Athens	Vehicle sharing		x			
	Container sharing		x			
Turin	Dynamic use of public transport lanes and a new governance model				x	
Graz	Home delivery service for brick-and-mortar shoppers			x		
Rome	DSS for city logistics solutions					x
Barcelona	Micro-distribution centre with cargobike service	x				
Mechelen	1. Locker system as delivery point	x				
	2. Cargobike delivery service	x				
Emilia Romagna Region	Reggio Emilia: UDC with clean vehicle delivery	x				
	Bologna: Hybrid retail channel service			x		
Gothenburg	Consolidated delivery for shopping centre replenishment	x				
Venice	Use of public transport capacity for delivery				x	
Copenhagen	Freight quality partnership					x
Pisa	Sensor implementation and app development for free parking spots in LTZ				x	
London borough of Barking and Dagenham	Freight travel plan					x

# How we assessed/classified the types of BM?

## 1. Sustainable value (economic, social, environment)

- What do businesses value and are willing to pay for?
  - To transport service contractors who are receiving the transport services.
  - To partners, producing value for customers.
  - As sub-contractors, providing value for customers of original contractors
- What do public authorities value and are willing to support?

## 2. Sustainable business activity

- How are activities and resources needed to deliver sustainable value?
- Who carries these out and how are these organized?



# Example: Urban consolidation schemes

## Sustainable value

Table 1. A summary of customer-facing components of the business model and the main costs for urban consolidation schemes.

Consolidation scheme	Customer (offering)	Value proposition	Reduced value proposition	Revenue stream	Cost structure
Urban Consolidation Centre (UCC)	LSP (UCC services)	<ul style="list-style-type: none"> <li>Green branding</li> <li>Responsiveness to delivery (due to proximity)</li> <li>Value-added services</li> </ul>	<ul style="list-style-type: none"> <li>Additional fixed costs</li> <li>Additional handling</li> </ul>	<ul style="list-style-type: none"> <li>Subscription model</li> </ul>	<ul style="list-style-type: none"> <li>Existing UCC to be renovated</li> <li>Operational costs</li> </ul>
	LSP (Electric vehicle (EV) rental solutions)	<ul style="list-style-type: none"> <li>Green branding</li> <li>EV rental (and recharging)</li> </ul>	<ul style="list-style-type: none"> <li>Additional transport costs</li> </ul>	<ul style="list-style-type: none"> <li>Subscription model</li> </ul>	<ul style="list-style-type: none"> <li>Purchase of vehicles and charging system</li> </ul>
Micro-Consolidation Centre (MCC)	LSP (Light goods delivery)	<ul style="list-style-type: none"> <li>For receivers – higher availability and therefore convenience</li> <li>Reduced transport cost</li> <li>Access to restricted area</li> <li>Pick-up point for parcels</li> </ul>	<ul style="list-style-type: none"> <li>Additional handling</li> </ul>	<ul style="list-style-type: none"> <li>Long-term contract with LSP</li> <li>No extra cost to receiver</li> <li>Charged for parcel pick-up</li> </ul>	<ul style="list-style-type: none"> <li>Investment and operational costs for MCC</li> <li>Real estate (provided by municipality)</li> </ul>
	Other Last Mile Operators (Bicycle servicing)	<ul style="list-style-type: none"> <li>Bicycle repair or e-bike recharge</li> </ul>	None	<ul style="list-style-type: none"> <li>Per use</li> </ul>	<ul style="list-style-type: none"> <li>Investment and operational cost for cargobike deliveries</li> <li>ICT fleet management system</li> </ul>
	City council (Delivery/transport data)	<ul style="list-style-type: none"> <li>Understand urban freight flows of e-commerce</li> </ul>	None	None	
Receiver-led Consolidation (RLC)	Retailers in shopping (replenishment with consolidated transport)	<ul style="list-style-type: none"> <li>Delivery flexibility</li> <li>Delivery reliability and punctuality</li> <li>“Basic” transport service cost reduced</li> <li>Value-added services</li> </ul>	None	<ul style="list-style-type: none"> <li>Base service – paid by shopping centre owners</li> <li>Extra services – paid by tenants</li> </ul>	<ul style="list-style-type: none"> <li>Use of existing UCC/warehouse -&gt; no new investment cost</li> <li>Operational costs</li> </ul>
Automated Locker System (ALS)	LSP (Light goods delivery)	<ul style="list-style-type: none"> <li>Reduced failed deliveries</li> <li>Reduced costs for transport</li> <li>Access to city</li> <li>Green branding</li> </ul>	<ul style="list-style-type: none"> <li>Extra costs for usage</li> </ul>	<ul style="list-style-type: none"> <li>Pay-per-use charged to LSP</li> </ul>	<ul style="list-style-type: none"> <li>Real estate (fully funded by municipality)</li> <li>Installation of lockers</li> <li>Operating costs (maintenance, surveillance, energy, ICT system)</li> </ul>
	Receivers (Light goods delivery)	<ul style="list-style-type: none"> <li>Reception flexibility</li> <li>Reception accessibility</li> <li>No extra cost</li> </ul>	<ul style="list-style-type: none"> <li>May not fit every receiver due to travelling</li> </ul>		

# Sustainable business activities

**Table 1 Urban consolidation facilities adapted from** (Merchán & Blanco, 2015)

Type	Warehouse	Urban consolidation centre	Micro-consolidation centre	Mobile depot <sup>1</sup>	Loading/unloading bay	Automated Locker System	Mailbox
Surface (m <sup>2</sup> )	>1,000	200 - 500	50 - 100	50 - 100	10	5	1
Location	Logistics Industrial Park	Outer city core	Inner city core	Inner city core	Street	Retail/transit node	Building/Home
Range	Citywide	District	Neighbourhood	Neighbourhood	Block	Flexible or flow driven	Dwelling
Inbound vehicle	Large truck	Truck	Truck or Van	Large truck with swap body	Truck or Van	Truck, van, bike, or pedestrian	Truck, van, bike, or pedestrian
Inbound load unit	Pallets	Pallets	Pallets or cartons	Swap body	Pallets or cartons	Parcels or thin packages	Parcels or thin packages
Outbound vehicle	Truck or van	Van	Bike or pedestrian	Bike or pedestrian	Pedestrian (also as recipient)	Pedestrian (recipient)	Pedestrian (recipient)
Outbound load unit	Pallets or cartons	Pallets or cartons	Cartons	Parcels or thin packages	Pallets or cartons	Parcels or thin packages	Parcels or thin packages
Storage	Yes. > 24 hours	Yes. < 24 hours	No	No	No	Yes < 48 hours	Yes < 48 hours

# Reflections

- The **process of making** an attractive and cost-effective business case **can be enhanced through the use of the BM Canvas**;
- Using the variation developed in the TURBLOG project, the **sustainability aspects are taken into account**, which creates value for the public sector (i.e. city authorities and residents).
- The application of the method also had a second purpose of **achieving consensus through the visualization of the needs of a business model**, clarification of how each partner can contribute to the success of the city logistics initiative, which should speed up implementation and be a preliminary step to ensure the continuity of the pilot after NOVELOG project ends.
- Though the guidance material for using the BMC was provided to all the participating cities and NOVELOG partners, **the implementation has not been straightforward**, a trusted moderator was needed

# Reflections

- The joint-development of the Business Models in a workshop or meeting enables both private and public sector participants to develop a mutual understanding of each other, **INSTEAD** of the commonly adversarial relationship.
- Understanding how the business models of the Logistics Service Providers work, enable us to design schemes that help LSPs to be sustainable, and are attractive to them economically as well. Value proposition of the schemes are of vital importance to get **RIGHT** from the start!
- An accurate description of the business model can guide public authorities to support in ways, which actually matter to the businesses. Sustainable urban freight requires a collaborative effort!

# Our legacy regarding Business Models



- Use Multistakeholders platform and business modelling as a consensus tool
- Guidance framework to include UFT into SUMP's
- Business modelling for long term sustainability
- Recipes for business models (5 main types)

Thank you for your attention!  
Comments are very much welcome!

Thomas Zunder  
Paulus Aditjandra  
Maria Rodrigues  
Tharsis Teoh  
Arnaud Burgess  
Jasper Tanis



# Identify the characteristics of the BM

BUSINESS MODEL BLOCKS	CHARACTERISTICS		DESCRIPTION
 <b>Key partners</b>	<b>Motivations to create partnerships</b>	optimization and economy of scale	Optimization and economy of scale partnerships are usually formed to reduce costs, and often involve outsourcing or sharing infrastructure. Economy in which trade in goods, services and learn to network worldwide, including over the Internet, benefiting from new information technologies and communication.
		acquisition of particular resources and activities	Most companies rely on other firms to furnish particular resources or perform certain activities. Such partnerships can be motivated by needs to acquire knowledge, licenses, or access to customers.
		reduction of risk	Partnerships can help reduce risk in a competitive environment characterized by uncertainty
	other		
 <b>Key activities</b>	<b>Categories</b>	production	These activities relate to designing, making, and delivering a product in substantial quantities and/or of superior quality. Production activity dominates the business models of manufacturing firms.
		Distribution	Distribution is also a very important component of Logistics & Supply chain management. Distribution in supply chain management refers to the distribution of a good from one business to another.
		Supporting activities	e.g. Placing - network design
	other		
<b>Key resources</b>	<b>Type of key resource</b>	physical	This category includes physical assets such as manufacturing facilities, buildings, vehicles, machines, systems, point-of-sales systems, and distribution networks.
		Know-how	Know-how is practical knowledge of how to get something done. In the context of industrial property, know-how is a component in the transfer of technology in national and international environments, co-existing with or separate from other IP rights such as patents, trademarks and copyright.
		financial	Some business models call for financial resources and/or financial guarantees, such as cash, lines of credit, or a stock option pool for hiring key employees.
	other		



# Identify the characteristics of the BM



Cost structure	Characteristics of cost structures	fixed costs	Costs that remain the same despite the volume of goods or services produced.
		variable costs	Costs that vary proportionally with the volume of goods or services produced.
		Sunk costs	In economics and business decision-making, sunk costs are retrospective (past) costs that have already been incurred and cannot be recovered. Sunk costs are sometimes contrasted with prospective costs, which are future costs that may be incurred or changed if an action is taken. Both retrospective and prospective costs may be either fixed (that is, they are not dependent on the volume of economic activity, however measured) or variable (dependent on volume).
		Externalities	In economics, an externality (or transaction spillover) is a cost or benefit, not transmitted through prices, incurred by a party who did not agree to the action causing the cost or benefit. A benefit in this case is called a positive externality or external benefit, while a cost is called a negative externality or external cost.
	other		
Customer relationships	Types of relationships	personal assistance	The customer can communicate with a real customer representative to get help during the sales process or after the purchase is complete.
		self service / automated services	self service provides all the necessary means for customers to help themselves. Automated services can recognize individual customers and their characteristics, and offer information related to orders or transactions.
		collaborative	Customers share infrastructures and services expecting to exchange knowledge and solve its' problems, which are common to other logistic companies.
	other		
Customer segments	Types according the needs, behaviours	Mass market	Large group of customers with broadly similar needs and problems
		Segmented	Some business models distinguish between market segments with slightly different needs and problems.
		Multi side market	Organizations serve two or more interdependent Customer Segments
	other		

# Identify the characteristics of the BM



Value proposition	Elements that can contribute to customer value creation	performance	Improving product or service performance has traditionally been a common way to create value
		customisation	Tailoring products and services to the specific needs of individual customers or Customer Segments creates value.
		reliability	Customers trust and therefore find value in using and displaying a specific brand.
		price	Low-price Value propositions have important implications for the rest of a business model.
		cost reduction	Helping customers reduce costs is an important way to create value.
		risk reduction	Customers value reducing the risks they incur when purchasing products or services.
	accessibility	Making products and services available to customers who previously lacked access to them is another way to create value. This can result from business model innovation, new technologies, or a combination of both. Making things more convenient or easier to use can create substantial value.	
	other		

Channels	Type of channels	own direct (sales force/web force); own indirect/own stores	Owned Channels and particularly direct ones have higher margins, but can be costly to put in place and to operate.
		partner indirect (partner stores/wholesaler)	Partner Channels lead to lower margins, but they allow an organization to expand its reach and benefit from partner strengths.
		informal	On the other hand, informal approaches recognize that a variety of needs, including social ones, underlie communication in organizations and that, as a result, the actual communication relationships in an organization may be less rational than formal systems (Johnson, 1993).
		other	

Revenue Streams	Several ways to generate revenue streams	asset sale	The most widely understood Revenue Stream derives from selling ownership rights to a physical product.
		service	This Revenue Stream is generated by the use of a particular service. The more a service is used, the more the customer pays
		advertising	This Revenue Stream results from fees for advertising a particular product, service, or brand.
	other		