ecotale
EXTERNAL COSTS OF TRANSPORT AND LAND EQUALIZATION

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

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# Urban transit investments as a catalyst for overall transport external costs reduction and urban regeneration

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- Stakeholders involvement in facilitating policy formulation
- Investigation of new financing schemes including PPP, DBFO, value capture, joint development, JESSICA, inc. cross-financing of LRT through congestion charging revenues
- Implementation Plan preparation for investments in the new programming period 2014-2020 and synergies with EU Urban Mobility Package 2013, Sustainable Urban Mobility Plans (SUMP) and Public Transport funding innovations

# Good Practice Definition INTERREG IVC

- **Initiative (e.g. methodologies, projects, processes and techniques)**
- **Undertaken in one of the programme's thematic priorities (Innovation & Environment)**
- **Already proved successful ( i.e. tangible and measurable results in achieving a specific objective)**
- **Potential to be transferred to a different geographic area**

# Transfer of Good Practice Definition

- **A practice introduced by one partner that has a concrete and measurable impact on another partner (e.g. through the initiation of a pilot project or through the adoption of a certain methodology by this other partner)**

- ***But: Dissemination of good practices or the intention of a partner to adopt a new practice is not sufficient to consider the practice as transferred***

# Good Practice Transfer to ThePTA

- **Ile de France** development of Rapid Transit Schemes – Tramway T3 experience and ex-post evidence
- **Nottingham Express Transit (NET)** scheme development and funding by DBFO (Design Build Finance Operate)
- **London Congestion Charging** experience and cross-funding PT

# Evidence of new Transit system benefits

International Association of Public Transport
*Connecting the world of public transport*


## UITP focus paper

## "Assessing the benefits of public transport"

***"appraisal of transport schemes or strategies should take into account impacts on other relevant public policies such as economic growth, housing (or generally speaking land use), health, environment and social inclusion, wider economic benefi ts, regeneration and urban realm"***

***"Decision-makers should recognise the wider economic, environmental and social contribution made by public transport to the success of their cities, and provide the resources needed to ensure public transport can continue to play this critical role."***

***UITP urges decision-makers to recognise the role public transport plays in enabling economic productivity improvements and supporting economic growth in their cities***

# Strasbourg Tram


# Strasbourg Tram Evidence

- Ex-post example – tram system, Strasbourg, France: in 1994, Strasbourg became the fourth city in France to introduce a new tramway system.
- The revitalisation of Strasbourg and its city centre was the key principle of the scheme, whilst also improving the urban quality of life.
- The first line of the new tramway was opened with a length of 9.8km (now extended to 12.5km). It runs via the city centre and is connected to a national rail station, directly serving 140,000 people.
- Within its first year, there was a 30% increase in public transport passengers in the city, with a total increase over ten years to 65 million public transport passengers in 2004, from 32 million public transport passengers in 1994.
- An additional two new lines, bringing the total cost of the scheme to EUR 328m, were introduced in 2000, and have further reduced the volume of through traffic in the city centre and created a more enjoyable, peaceful and prosperous city centre

# Ex-post evidence – Tramway line T3 IdF

- **Paris, Ile de France:** the **tramway line T3** opened on December 16, 2006 at a cost of EUR 312m
- It catered for an estimated 25 million passengers during its first year of operation - an average of 100,000 passengers every weekday and 70,000 at weekends
- It has facilitated a **25% decrease in car use**
- The total social benefits, including reductions in noise, pollution and greenhouse gas emissions, are about **EUR 550,000 per year**

# Nottingham LRT development by DBFO

- Nottingham Express Transit **NET** system
- Design Build Finance Operate **DBFO** method
- Concession by **PPP** almost completely funding the LRT system investments and operation encompassing construction of new lines and operation of the entire network, including Park & Ride sites
- 1st line opened in 2005, 2nd line under development

# Congestion Charging

- Congestion charging is the **most effective tool for demand management**
- **Establish a sound transport policy** demonstrating the necessity and urgency of a pricing scheme;
- **Raise awareness** on the seriousness of the situation and **explain that 'business as usual' is simply not an option any more;**
- **fairness** through strong commitments on the use of additional revenues. Links between the scheme and improvements to alternative modes should be explicit;
- **Improve public transport**, if possible even before detailed discussion of any potential scheme.
- **Other transport means** like car sharing, walking or cycling should equally be promoted;
- **Allocate at least a part of the income** from congestion charging to help finance these accompanying measures.

# Integrated Pricing Principles

- **Economic Efficiency**
- **Theoretical Optimal Pricing at Marginal Social Cost (Short Run)**
- **Social Costs = Resource + External Costs**
- **Difficult to Implement in Practice**
- **Second-Best Solutions Required**
- **European Commission:**
  - **Green Paper, December 1995**
  - **White Papers, 1998, 2001, 2006, 2011**

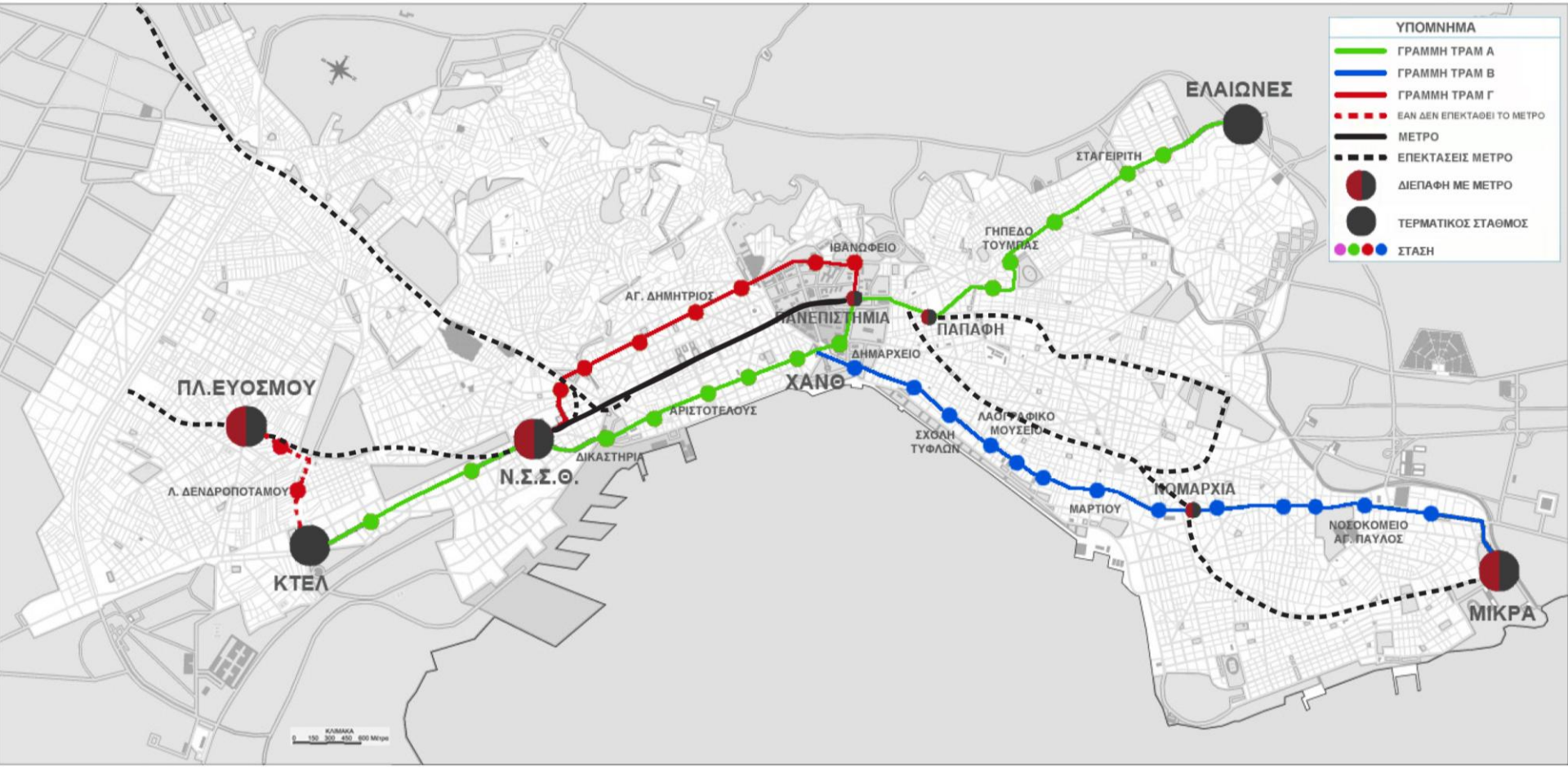
**Congestion Charging a potential effective measure for both mode choice and revenues raising for public transport investments**

# Thessaloniki Case Study

## Investigation of the feasibility of a Tramway/LRT system for Thessaloniki Metropolitan area and impacts on overall external costs and land uses

- Network length : 24 km
- Double track of normal gauge
- Electrification - Catenaries
- Priority at intersections
- Protected corridor : 89.6 % of the total length
- 3 Tram Lines of length : 12.5 km, 8.8 km, 14.5 km
- Commercial speeds : 20.6 km/h, 20.4 km/h, 21 km/h respectively
- 43 stops in total
- Implementation in 3 phases (2020, 2025, 2030)
- Implementation cost : 516 million € - 21.6 million € / km
- 45 vehicles (in phase 3) (35m long , low floor, 2.30 m width)
- One depot of 35,000- 40,000 m2
- Estimation of 172,700 passengers per day (simulation model)

# Proposed Tram System 2030



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ΕΛΑΙΩΝΕΣ
Πλατεία Αριστοτέλους
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ΕΚΤΟΣ ΕΔΩΝΩΝ
EXECUTIVE KIOS


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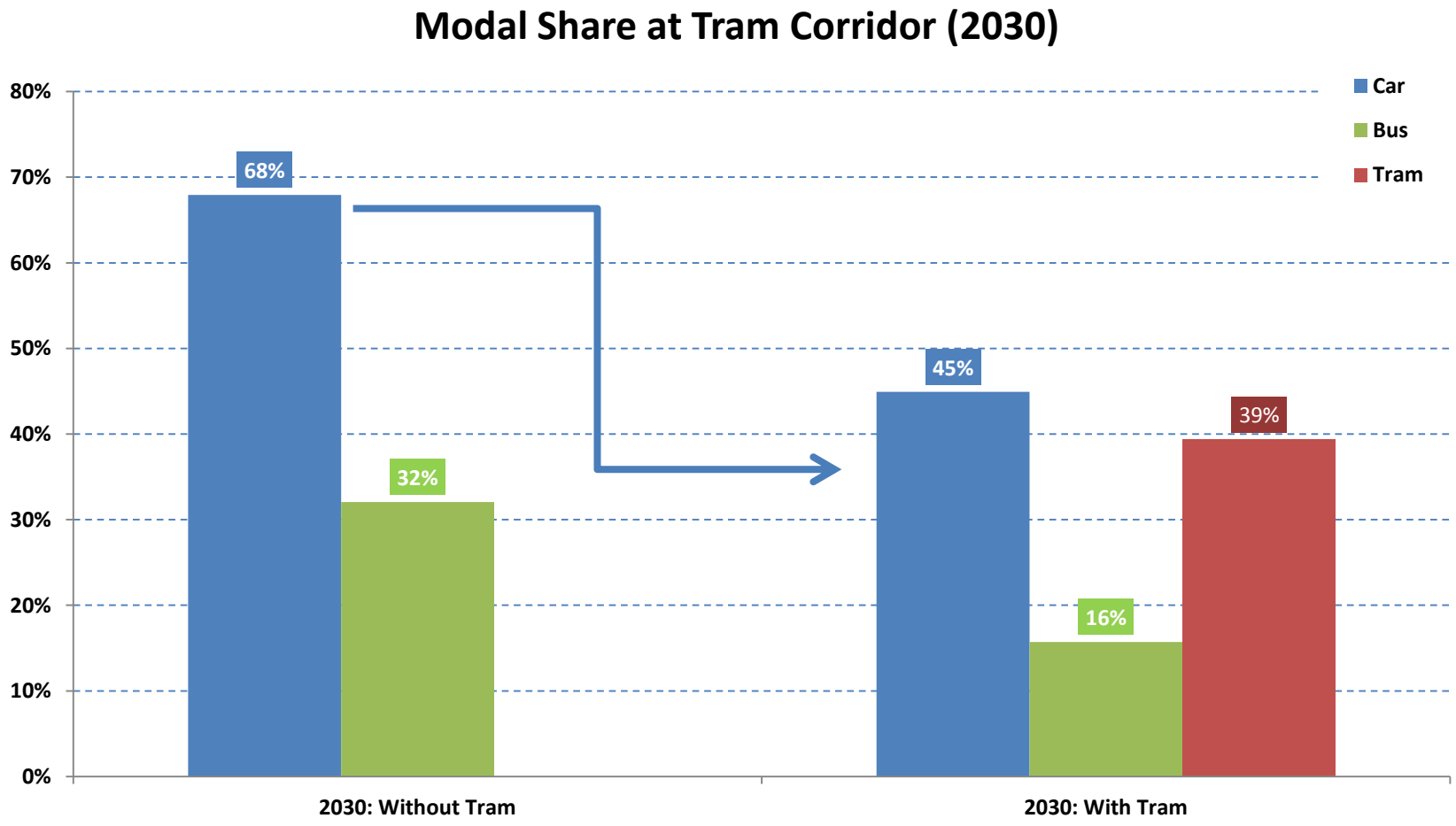
# Evaluation of Modal Split effects



# Evaluation of benefits

**Annual benefits due to:**

- **emmisions reduction**: 0.64 million EUR
- **travel times reduction**: 14.7 million EUR
- **decongestion cost reduction**: 23.4 million EUR
- **accidents reduction**: 1 million EUR
- **Total annual benefits: 40 million EUR**

# Financial Evaluation Results

| Financial Indices | Basic Scenario |
|---|---|
| Discount Rate | 5% |
| Net Present Value (NPV) (€) | -17,420,956.81 |
| Internal Rate of Return (IRR) | 4.66% |
| Cost Benefit Ratio(B/C) | 0.98 |
| 'break-even point' Analysis | fare: 1.0255 € |

# Socio-Economic Evaluation Results

| Index | Basic scenario (phase 3) | Optimistic scenario (phase 3) |
|---|---|---|
| Net Present Value | 346 mi € | 861.6 mi € |
| Internal Rate of Return IRR | 10.02% | 13.87% |
| Cost Benefit Ratio | 1.59 | 2.47 |

# Stakeholder Involvement

- **Thessaloniki Public Transport Authority Board**
- Mobility Forum (meeting every 6 months)
- Municipalities Union
- Regional Authority of Central Macedonia - Thessaloniki Metropolitan Unit
- Thessaloniki Bus Transport Operator OASTh
- Aristotle University of Thessaloniki AUTh
- Public Participation (through Civil Society, E M W)

# Local stakeholders involvement actions

- **Tram proposal as a key measure in the Sustainable Urban Mobility Plan (SUMP) of Thessaloniki Metropolitan Area, approved by ThePTA Board in Feb. 2014**
- **Publicity during the European Mobility Week 2012 & 2013**
- **THEPTA participated also at the UITP World Campaign GROW with PT & PTx2=2025**
- **1st ecotale Stakeholders Meeting held on 30 October**
- **2nd ecotale Stakeholders meeting planned for 6 June 2014 at Thessaloniki City Hall**
- **Implementation Plan presentation and approval**
- **Consensus building amongst relevant local/regional authorities, central government and the general public**
- **Target for co-funding by EU structural & investment funds in the new programming period 2014-2020**

# Congestion Charging in Thessaloniki

- Charge of 3-5 EUR per day in the city centre
- Reduction of car traffic demand in the city centre by 20-24% at peak times, 9-11% overall
- Increase of congestion at perimeter by 4-5%

- Implementation Capital Costs: 20 Million EUR
- Operating Costs: 9 Million EUR per year
- Revenues 33 Million EUR per year
- Net revenues 24 Million EUR per year

- Tram investment cost repaid over 25 years max through congestion charging net revenues

# Global External Costs Reduction

- External Costs of Transport according to Update of Handbook published by EC DG MOVE in Jan 2014
- For Metropolitan areas Car Congestion Cost given as 1.50 EUR per Vehicle-km
- Modal Shift of 23% from Private Car to Tram will provide reduction of 9.6 million Car-km per year
- Hence: Reduction in Global External Costs of 14.4 million per year
- Tram system investment costs repaid over 40 years on the basis of external costs reduction
- Combination of congestion charging revenues and external costs reduction would give a repayment period of under 15 years for the proposed network

# Other Synergies towards Implementation

- **New financing schemes: PPP concession**
- **DBFO model, as for Nottingham LRT (Transfer of Good Practice)**
- **Value Capture** (eg Crossrail in London aims at generating £500 million in the region for the funding package by maximising the property development opportunities above its stations and on land currently being used to support Crossrail's construction) - Further transfer of Good Practice
- **Joint development**
- **Urban Regeneration: benefits can increase by x2-3 when induced land use development is taken into account**
- **Employment generation at 31 jobs per 1 Million EUR invested**
- **Multiplier of Regional DGP estimated at 2.2 – 2.9 due to Urban Transit systems (based on evidence from 10 European cities)**
- **JESSICA Initiative support through EIB Urban Development Fund & leverage of private sector investment funds**
- **Cross-financing of Tram investments through potential congestion charging revenues**
- **Urban Mobility Package 2013 DG MOVE**

# Urban Mobility Package 2013 DG MOVE

- **Support for Sustainable Urban Mobility Plans (SUMPs), including through funding instruments**
- **Promotion of access regulation schemes and urban road user charging**
- **Providing targeted financial support through the European Structural and Investment Funds (ESIF)**
- **Funding integrated packages of measures by ESIF in cities that have an integrated local plan such as a SUMP and identified appropriate actions**
- **Measures of urban mobility that contribute to low carbon objectives (implicit global external costs reduction)**

# Conclusions & Recommendations

- **Tramway system proposal for Thessaloniki Metropolitan Area, examined as a case study in ECOTALE project, is a viable investment**
- **Investment appraisal facilitated when Global Transport Costs are considered**
- **External cost reduction through forecast mode choice shifts from Private Car to Tramway and decongestion**
- **Unique opportunity to mobilise new EU ESIF co-funding, combined with JESSICA initiative, potential congestion charging revenues and value capture**
- **Good practice transfer process: a valuable asset**
- **ECOTALE Implementation Plan will be an important output facilitating policy making for investments in urban transit systems**
- **Project legacy through the proposed DECLARATION**

# Thank you !

GROW with PUBLIC TRANSPORT 2025=PT×2

ΚΕΡΔΙΖΟΥΜΕ με τα ΜΕΣΑ ΜΑΖΙΚΗΣ ΜΕΤΑΦΟΡΑΣ 2025=PT×2

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