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# **Applying the Systems Approach to Sustainable Transport and Mobility**

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# Outline

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- **Overview of the systems approach**
- **Application of the approach to a transport research project for the European Commission (SUMMA)**

# Many Policy Problems Are 'Wicked'

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## – Involve

- » Interacting systems, each of which may have several subsystems

- » Many possible policy options

- » Many possible outcomes of interest

- » Massive uncertainties

- » Many actors and stakeholders (with competing objectives)

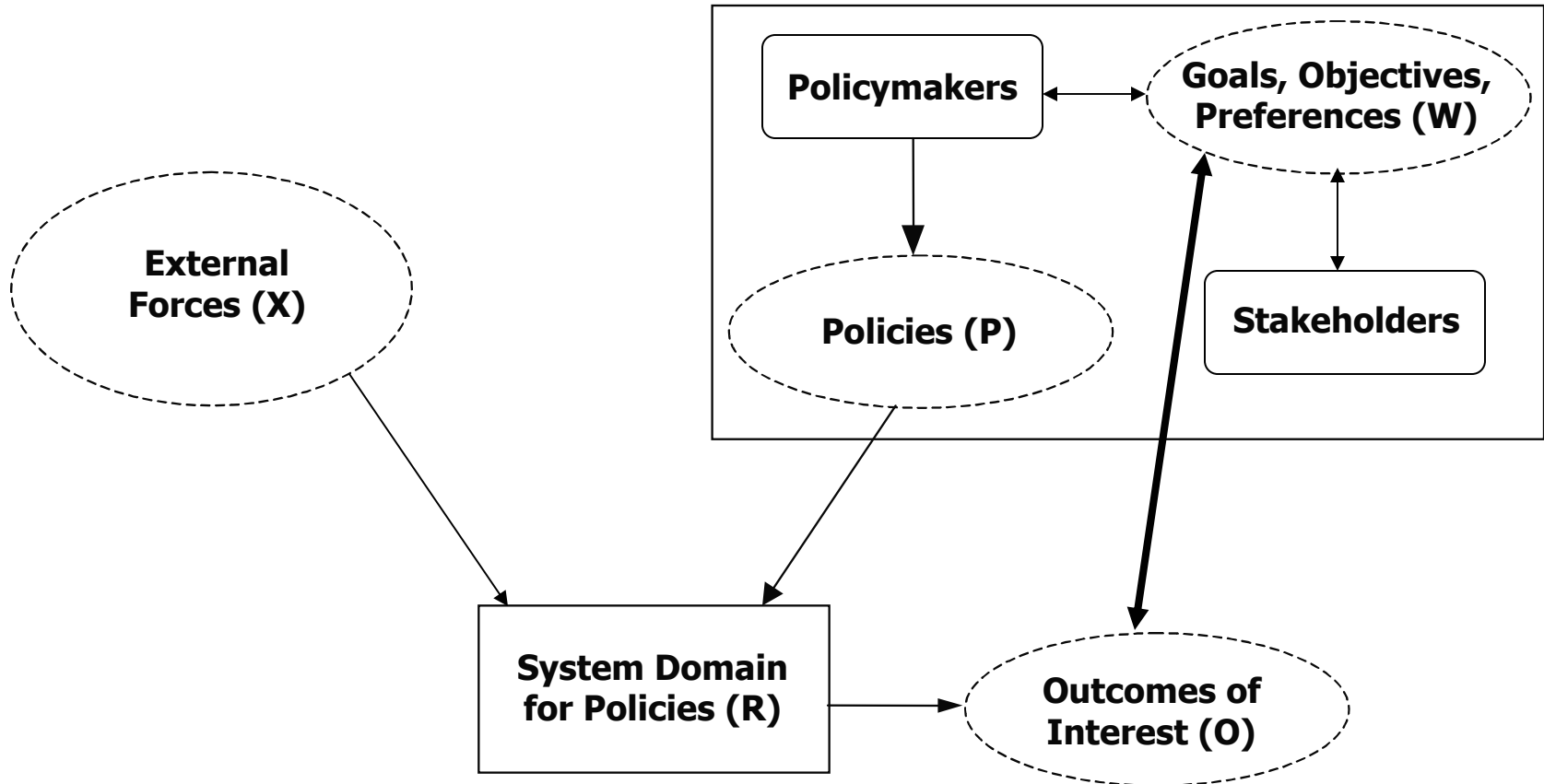
– Since it is unlikely the objectives of all stakeholders can be met, there is no optimal solution

- » The role of the policy analyst is to illuminate the situation and identify a 'satisficing' solution

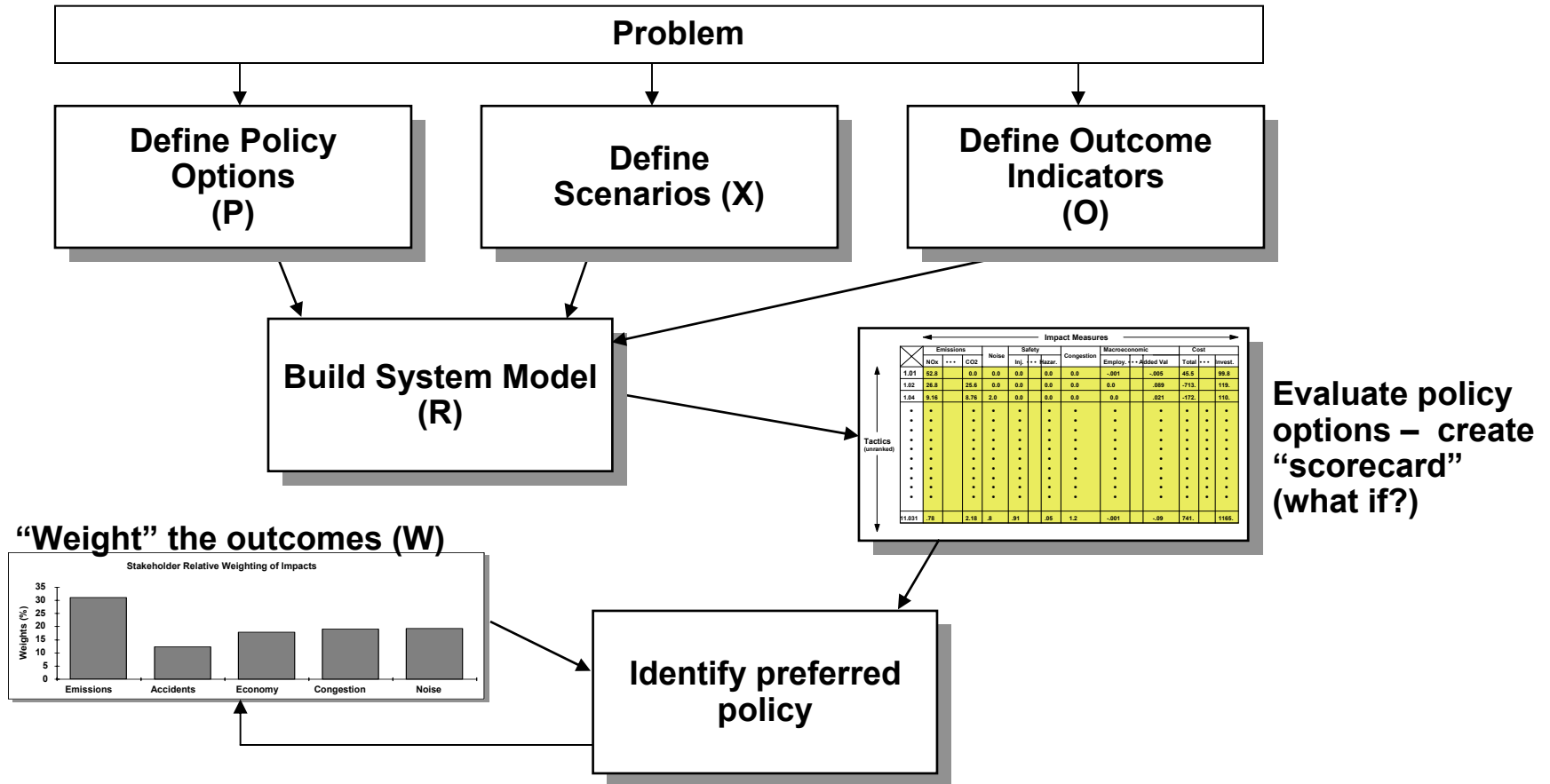
- » Requires analytic tools to structure the huge amount of information that needs to be analyzed and communicated

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# A Framework for Policy Analysis



# Elements of the System Approach



# Policy Analysis Tools

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- **We have tools for helping with the various elements (X, P, R, O, W)**
- **This talk will focus on the relationships (R), and the use of a ‘system diagram’**

# Basic Elements of a System Diagram

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- **Specification of the system boundaries, identifying what is inside and what is outside the system**
- **Specification of the structure and relationships within the system (elements, links, and flows)**
- **Specification of the relationships between what is inside the system and the outcomes of interest**

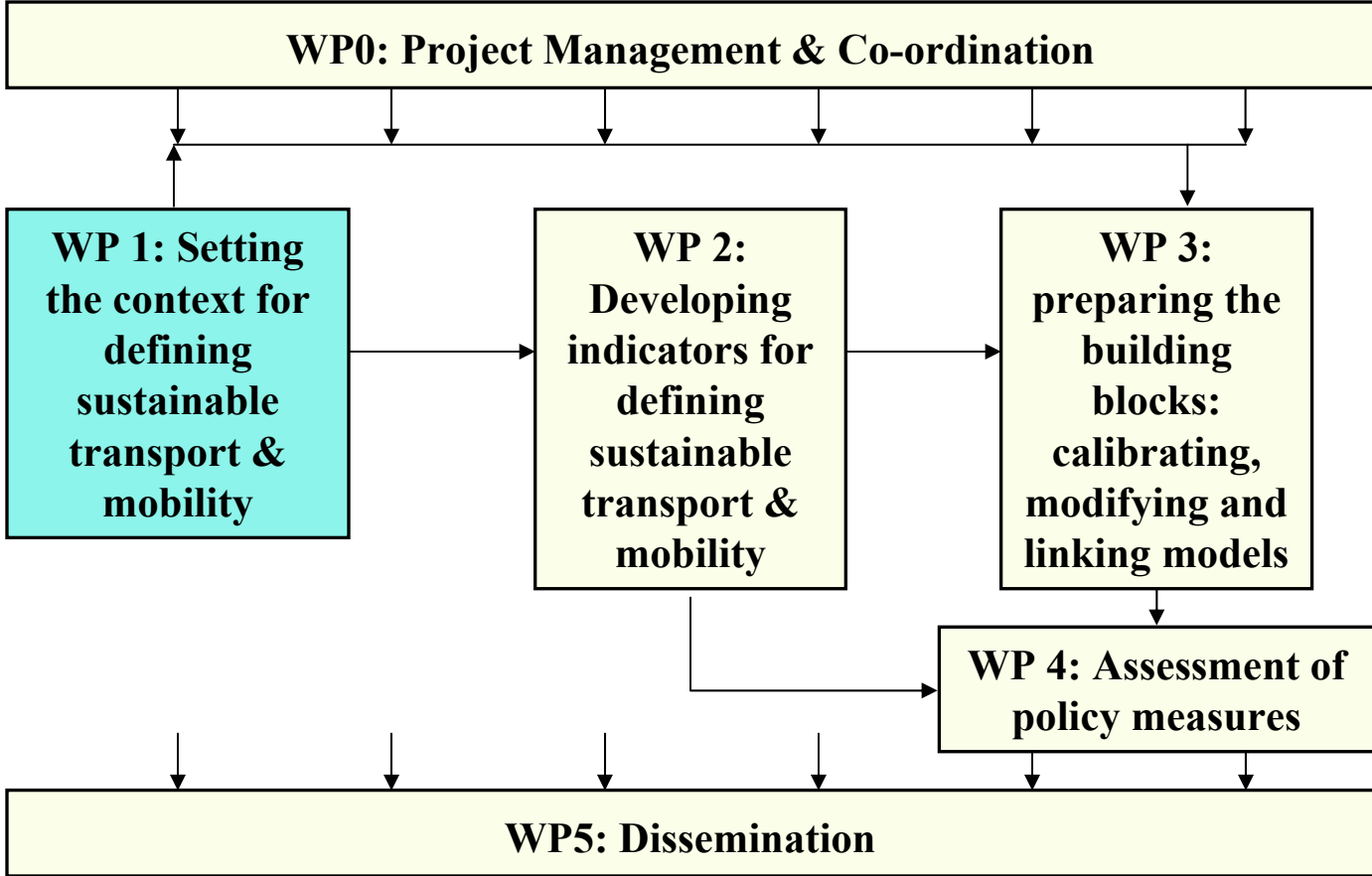
# Why Develop a System Diagram?

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- **To understand the system and the processes within it (relationships)**
- **To identify changes inside and outside the system that affect the outcomes of interest, so that they can be modelled and monitored**
- **To help locate policy intervention points**
- **To serve as a communication tool**



# SUMMA Tasks



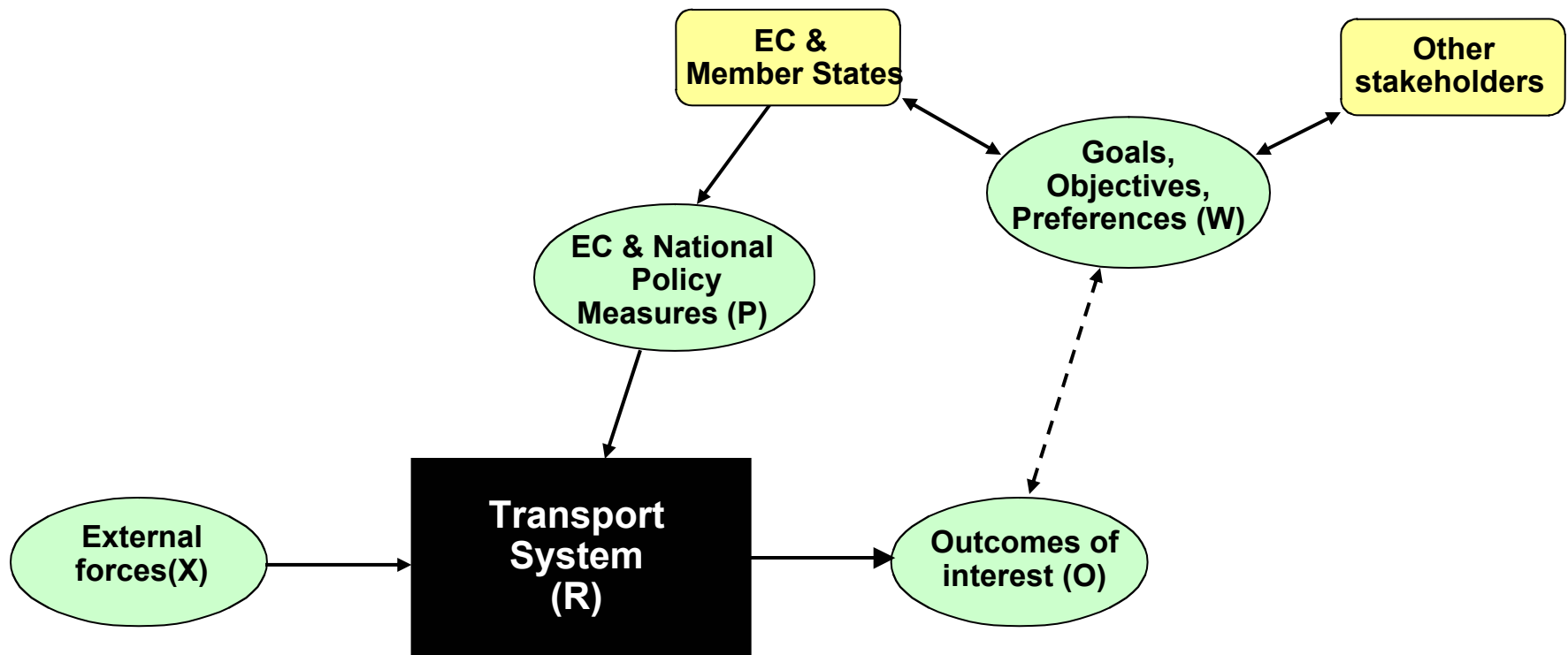
# Defining Sustainable Transport

(Council of the EU, 2001)

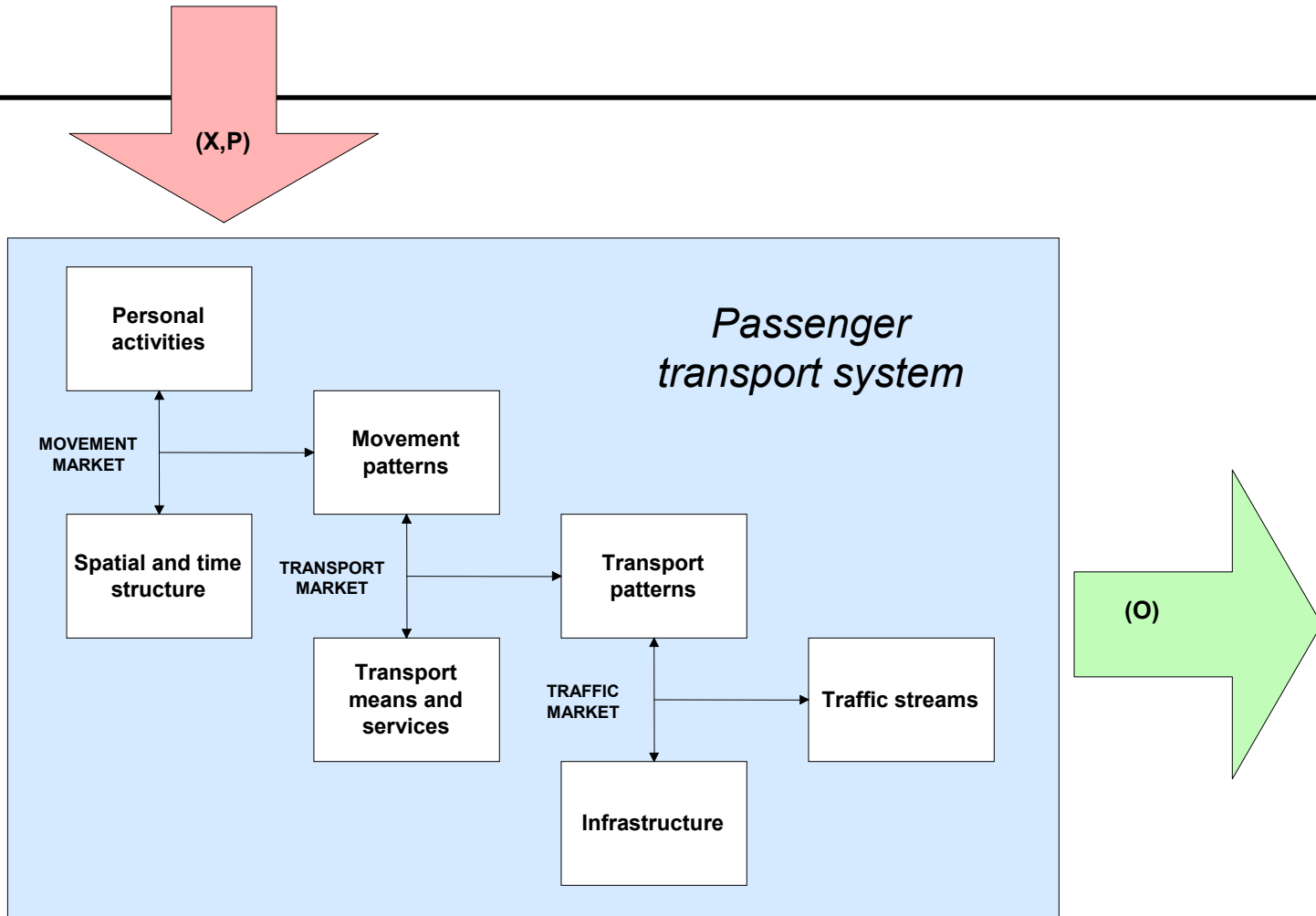
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- **A sustainable transport system is defined as one that:**
    - **Allows the basic access and development needs of individuals, companies and societies to be met safely and in a manner consistent with human and ecosystem health, and promises equity within and between successive generations**
    - **Is affordable, operates fairly and efficiently, offers choice of transport mode, and supports a competitive economy, as well as balanced regional development**
    - **Limits emissions and waste within the planet's ability to absorb them, uses renewable resources at or below their rates of generation, and, uses non-renewable resources at or below the rates of development of renewable substitutes while minimizing the impact on land and the generation of noise.**
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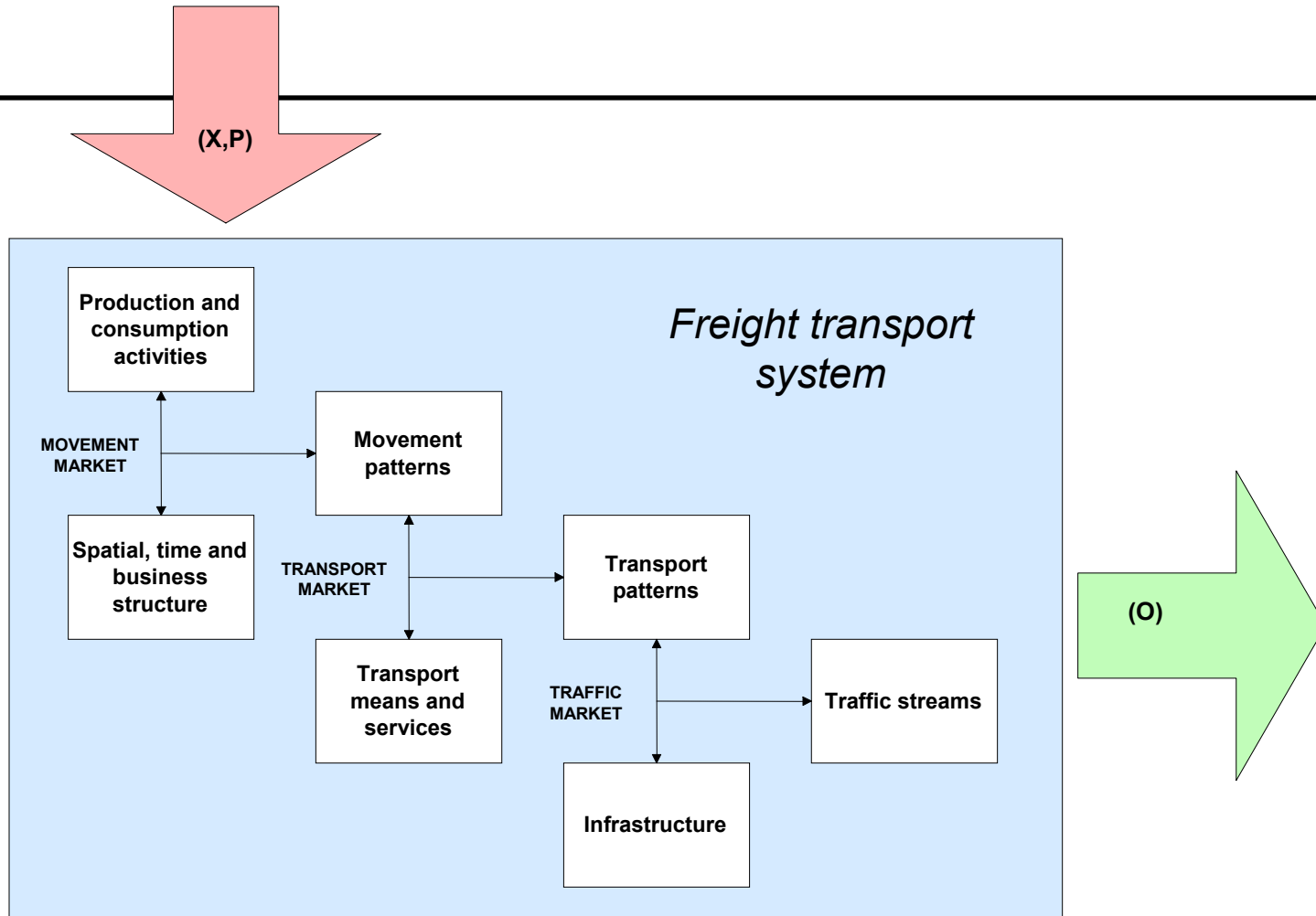
# The Policy Analysis Framework Applied to the SUMMA Project



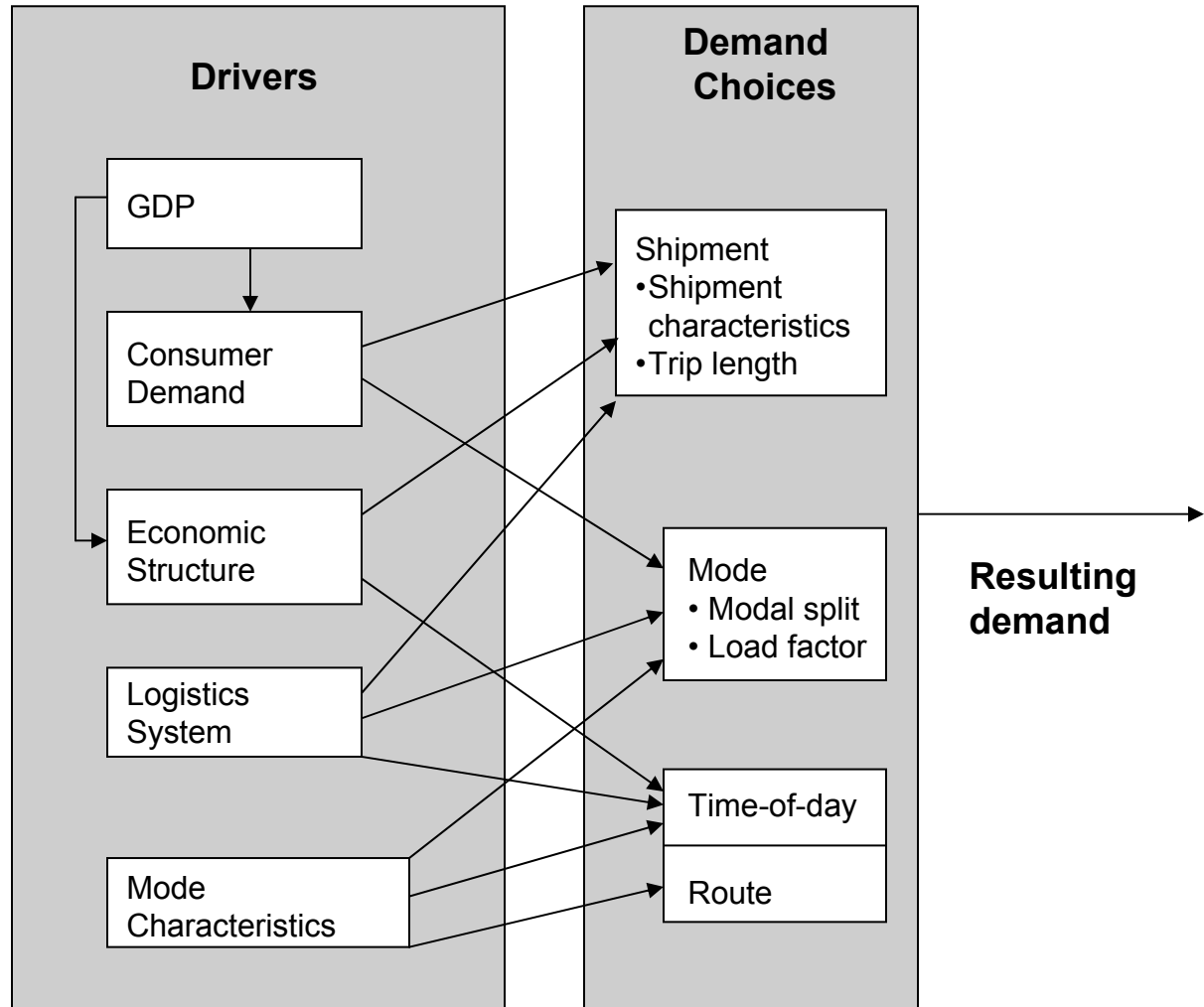
# Passenger Transport System



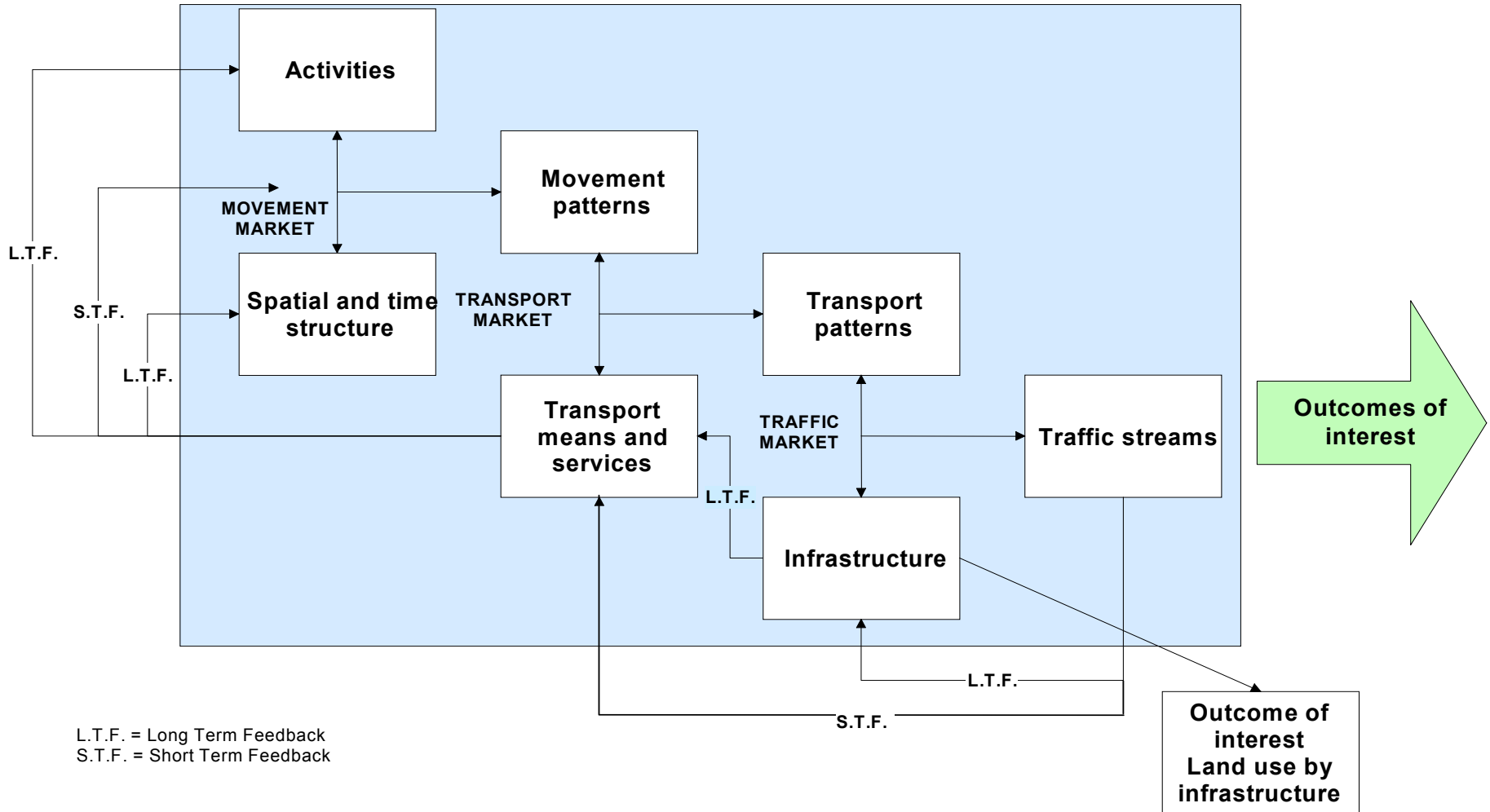
# Freight Transport System



# Relationship Between Freight Transport Demand and Actor Decisions



# Dynamics of the Transport System



# The Policy Analysis Framework Applied to the SUMMA Project

