



THE UNIVERSITY OF
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A methodology for evaluating urban freight projects

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Outline

Need

Challenges

Defining goals & objectives

Determining criteria

Estimation of weightings

Project rankings

Adjustment methods

Conclusions

Need

“Specifically, the problem is this: the discovery and effective implementation of measures which will reduce the total social cost of goods movement to the lowest possible commensurate with the freight requirements and objectives of society”

Stuart Hicks

Challenges

Wealth of legislation, policies & interest groups

Transparency

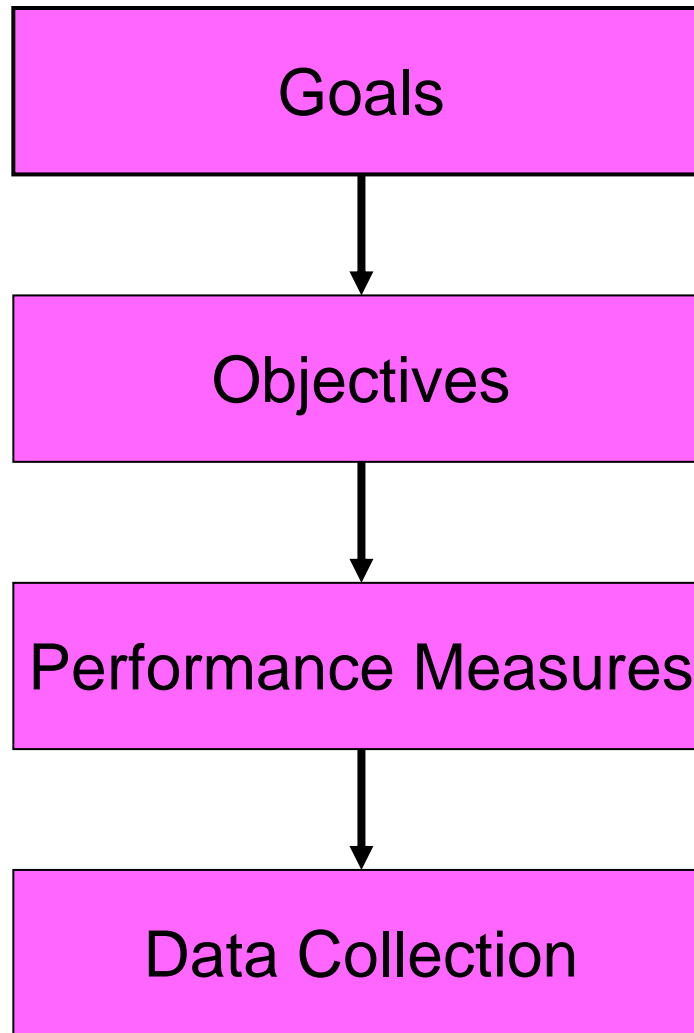
Consistency

Incorporating non-quantifiable issues (eg. health & environment)

Robustness

Incorporating foundation urban planning principles (eg. sustainability, mobility & liveability)

Planning Process



Goals

“The freight transport task should be performed at the lowest total social cost possible. The total amount of resources consumed and the disbenefits created in performing the freight task should be minimized”

Stuart Hicks

Goals, Objectives & Criteria

Goals

- Key stakeholders issues

- Public policy (plans & strategies)

Objectives

- Priority users (freight vehicles)

- Non-priority users (passenger vehicles)

- Non-users (residents)

Criteria

- Qualitative factors defined for each objective

Goals Identified

Reduce community impacts

Improve health & safety

Reduce freight operations costs

Improve business efficiency

Goal

Objectives

Criteria

Goal	Objectives	Criteria
Improve business/supply chain efficiency	Increase reliability of travel times	Variability of travel times
		Number of incidents (non recurrent congestion)
	Decrease transport costs between FAC's	Travel times on freight routes
		Travel speeds on freight routes
	Increase accessibility to intermodal terminals & Freight Activity Centres	Travel speeds for FV on intermodal terminal access routes
		Travel times of FV on access links to intermodal terminals

Goal

Objectives

Criteria

Goal	Objectives	Criteria
Reduce community impacts	Improve access to the arterial road network	Expected increase in FV numbers using the route
	Reduce FV impacts & intrusion in sensitive areas	Noise levels
		No. FV travelling near sensitive areas
	Reduce impact of FV noise	Daytime noise levels
		Night time noise levels

Weightings of Goal & Objectives

Analytical Hierarchy Process

Surveys of administrators

Pairwise statements (importance levels)

Root rule used to generate relative importance weightings

Goal Rankings

1. Reduce community impacts

2. Improve health & safety

2. Reduce freight operations costs

3. Improve business efficiency

<i>Improve health & safety</i>	<i>Reduce community impacts</i>	<i>Reduce freight operations costs</i>	<i>Improve business/supply chain efficiency</i>
1. Provide rest areas to meet demand	1. Improve access to arterial road network	1. Reduce delays for FV	1. Increase reliability of travel times
2. Reduce severity of crashes	2. Reduce FV impacts & intrusion in sensitive areas	2. Improve access for FV to key freight areas	1. Increase accessibility to intermodal terminals & FAC
2. Reduce crashes	3. Reduce impact of FV noise	2. Enhance flow efficiency for FV on critical parts of the network	2. Decrease transport costs between FAC's
		3. Reduce congestion	
		4. Improve loading & unloading facilities	

Criteria Categories

Benefit Criterion	No Significant Effect	Slightly Increased	Moderately Increased	Substantially Increased
Cost Criterion	No Significant Effect	Slightly Reduced	Moderately Reduced	Substantially Reduced
Normalised Performance	0	1/3	2/3	1

Project Rankings using weightings

1. Install height detection device for over height vehicles
2. Carriageway Duplication
3. Traffic Signal Linking
4. Ramp Metering with Heavy Vehicle bypass
5. Local Road truck bypass and road extension
6. Install Truck Parking
7. Provide Access – Signalised U-turn
8. Provide access from a local road via advance detection loops that set off pedestrian signals on the main road to create gaps in traffic
9. Construct additional Right Turn Lane
10. Modify roundabout to allow access for B-doubles

Rankings with Quantum Scores

	<i>Expected Effects</i>			
	<i>NS</i>	<i>Slight</i>	<i>Moderate</i>	<i>Substantial</i>
1. Carriageway Duplication	6	1	5	5
2. Traffic Signal Linking	12	0	3	5
3. Ramp Metering with Heavy Vehicle bypass	12	1	3	4
4. Provide Access – Signalised U-turn	13	4	1	2
5. Modify roundabout to allow access for B-doubles	18	0	0	2

Adjustment Methods

Strategic Use

- Priority programs (eg. rest areas)
- Exponent used to inflate utility

Queue Advancement

- Considers number of periods waiting
- Increases range of projects selected

Zonal Indicators

- Priority within or between geographic areas
- Linkages & access (eg. terminals & ports)

Conclusions

Transparency: Public documents for deriving goals & objectives

Consistency: Surveys estimate importance weightings of goals & objectives (AHP)

Data collection: qualitative impact categories

Rankings based on utilities & quantum scores differ slightly