



School of Natural
Built Environments

University of
South Australia

Transport and Land Use Integrated Modelling

Li Meng

Sustainable transport and land use planning

an integrated transport and land use model considers different **economic**, **environment** and **socio-demographic** factors and specific elements according to **local conditions**.

Map of Transport Modelling Applications



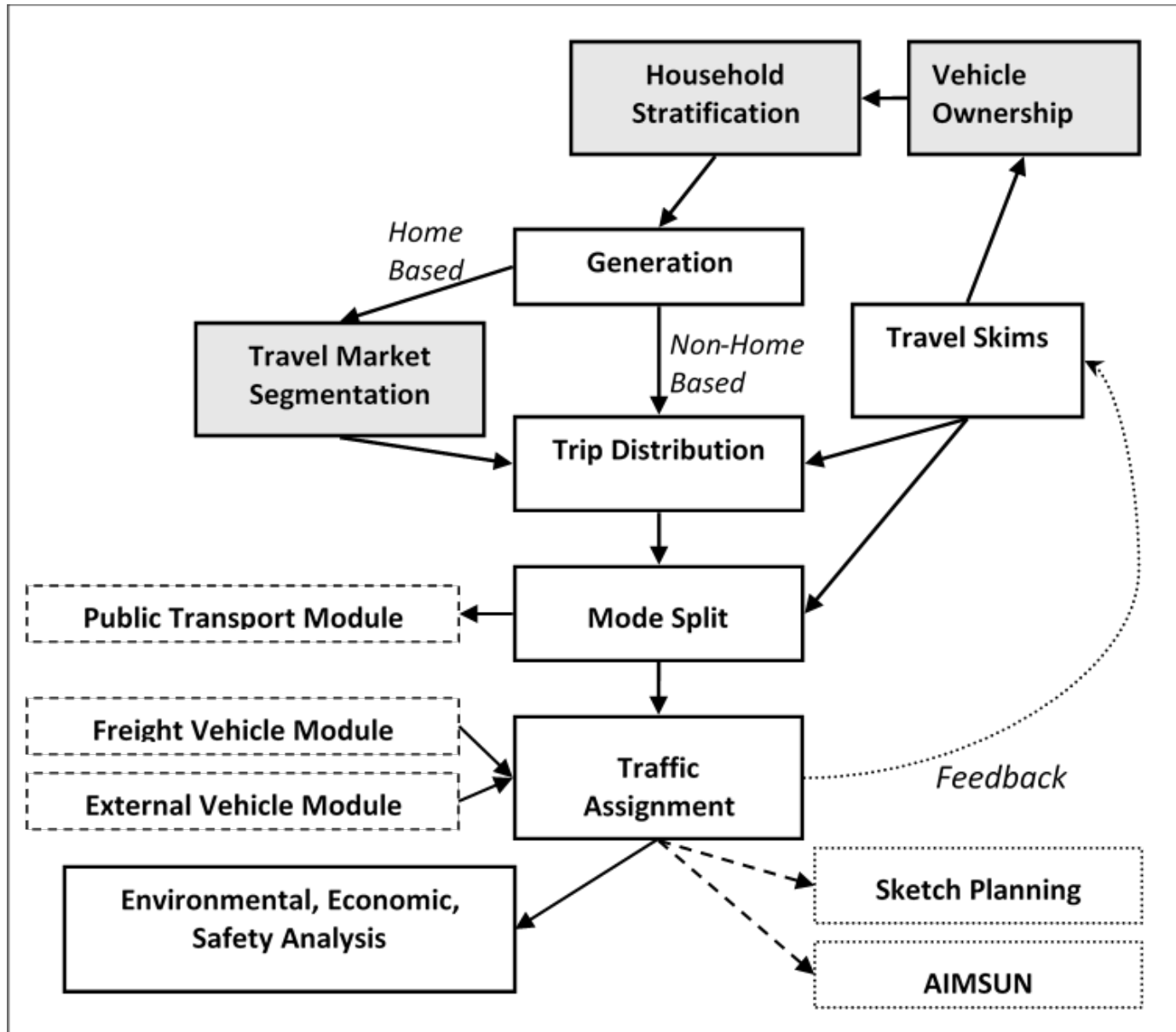
The Categories of the Modelling Applications

- 1). the Lowry Model and related developments including ITLUP (DRAM, EMPAL);
- 2). normative planning and related mathematical programming developments, such as POLIS Model;
- 3). multisectoral spatial modelling using input-output framework, such as MEPLAN model;
- 4). the contributions from urban Economics, such as Kim's Chicago Model; and
- 5). uses of Micro-analytic simulation, such as the MASTER model.

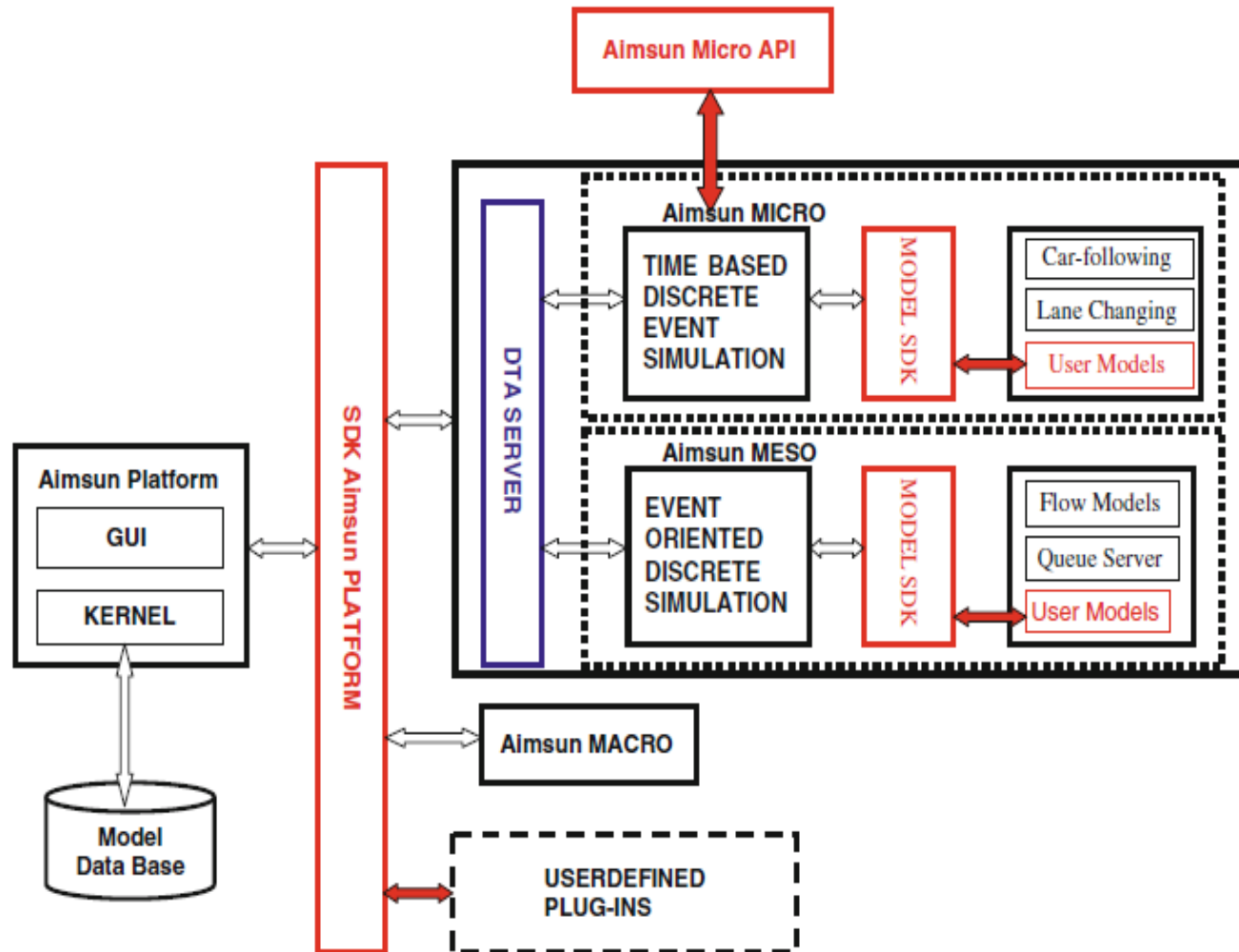
Existing Issues in Modelling

- multiwave panel analyses of empirically validated **travel behaviours** are still applicable [Lee's \(1973\)](#)
- a more modest and incrementalist **interpretation** of planning ([Wegener 1994](#))
- **operational, comprehensive and integrated** with transport and land use plan [Hunt, Kriger and Miller \(2005\)](#)
- **sensitive to issues of equity and of environmental sustainability** ([Wegener 1982](#); [Berling-Wolff and Wu, 2004](#))
- consider the **individuals or groups** participating in the **decision making process** usually do not share the same preferences with respect to project objectives ([Giuliano, 1985](#)),

Macro Transport Model--MASTEM

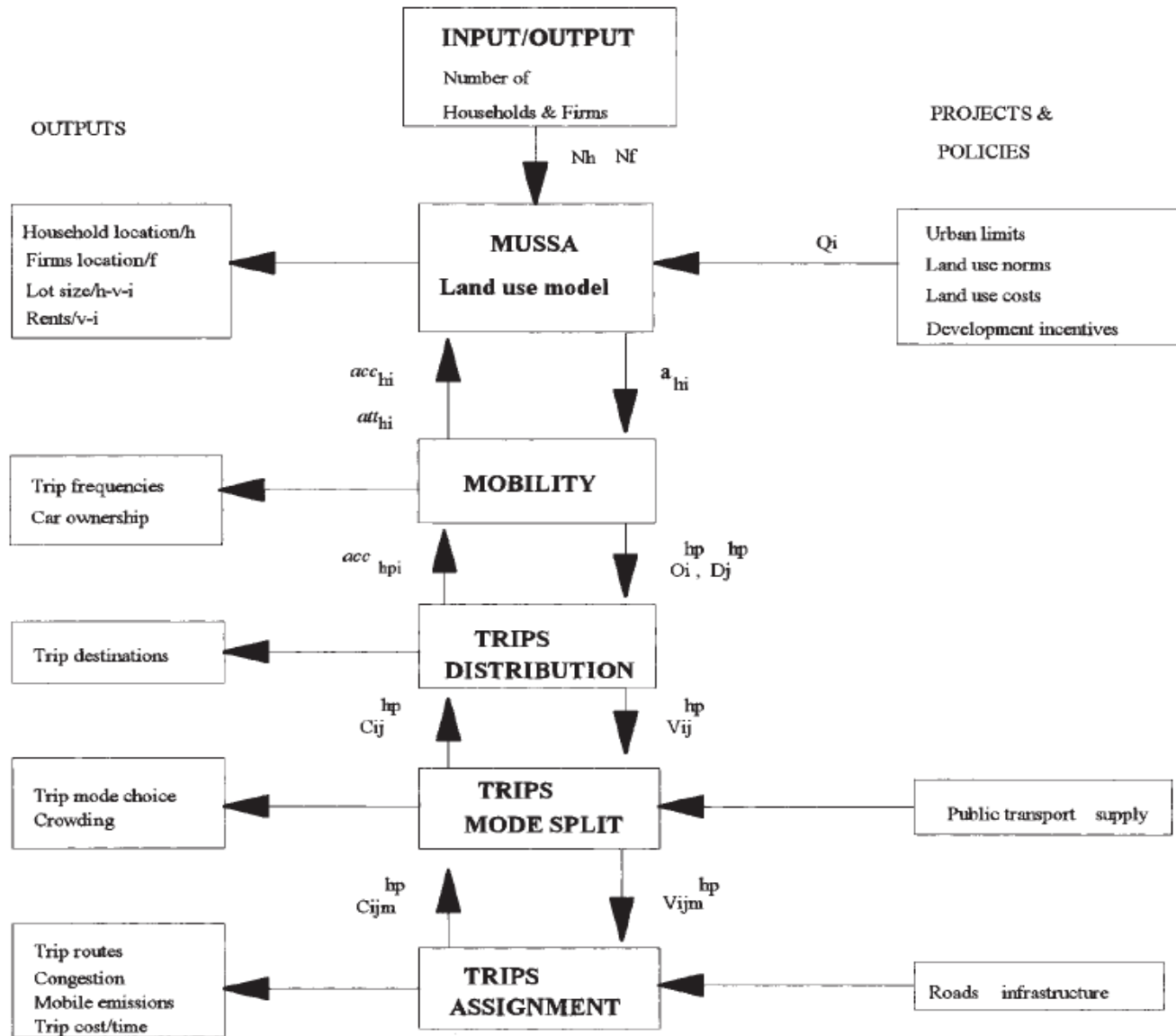


Meso Transport Simulation Model-Aimsun



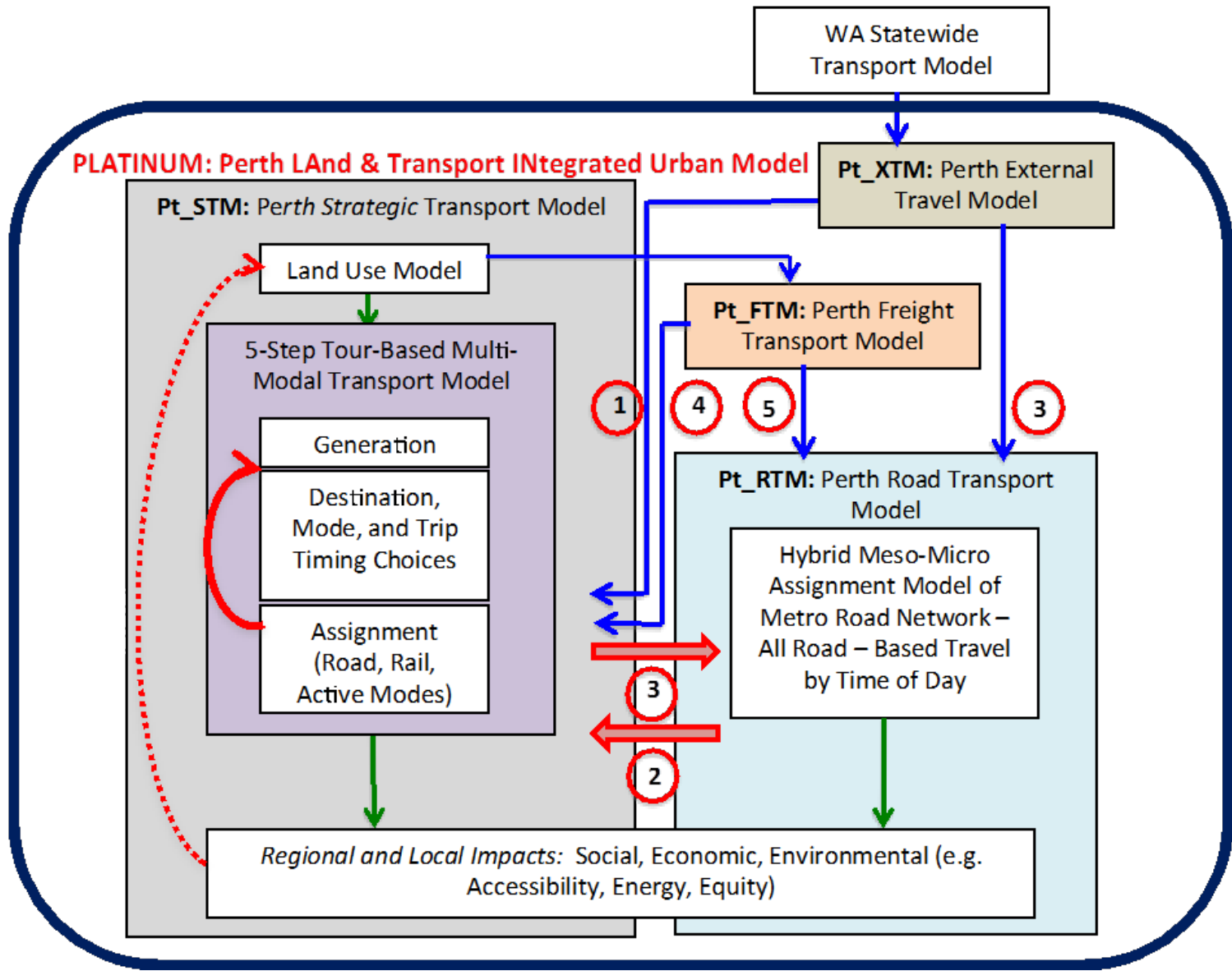
- SDK Aimsun Platform
- Micro API (APPI)
- Micro/Meso Model SDK

Land and Transport Model-MUSSA-ESTRAUS

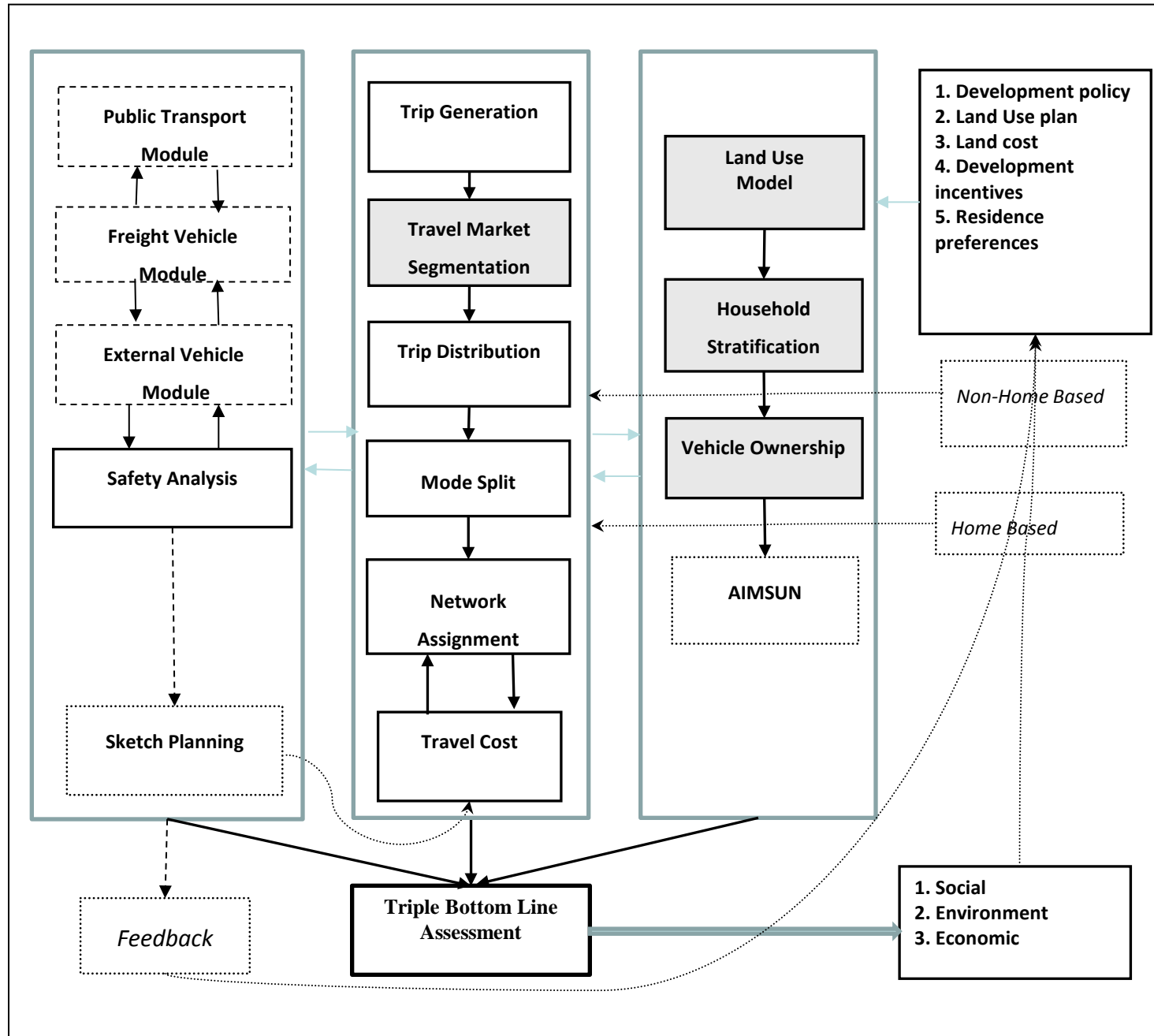


Source: [Martínez \(1996\)](#)

Structure of the proposed Perth Land and Transport Integrated Urban Model--PLATINUM



Proposed Adelaide Transport and Land Use Model (based on MASTEM)



The expected outcomes of the study:

- explain land use activities and land market segmentation with an explicit treatment of prices in land use and transport development,
- identify and forecast the behaviour of urban actors such as investors, households, firms or travellers (on the basis of the random utility discrete choice method),
- analyze individual and group travel behavior, and
- estimate environmental impacts and rationality in social factors to achieve sustainability in acceptable travel reduction strategies.

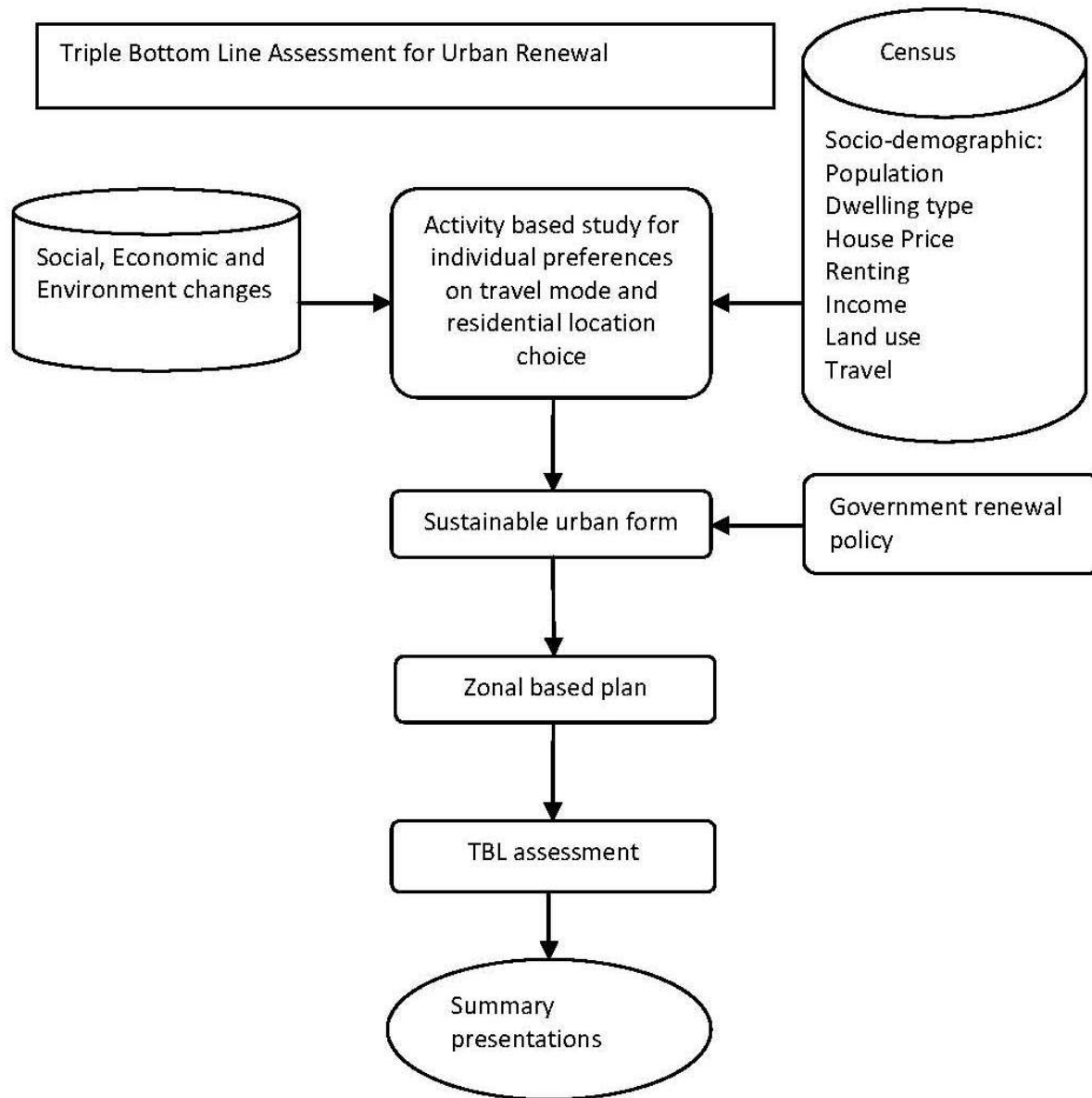


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Thank you very much for your attention.

Any questions please contact:

li.meng@unisa.edu.au



Triple Bottom Line Assessment Criteria

TBL Criteria		Sustainable urban renewal indicator		TBL Criteria		Sustainable urban renewal indicator		TBL Criteria		Sustainable urban renewal indicator	
No.	Social	No.	Indicators associated with Social	No.	Economic	No.	Indicators associated with Economic	No.	Environmental	No.	Indicators associated with Environment
S1	Community and individual health	S11	preferences and choices	Ec1	ACT Government Budget	Ec11	affordable development	En1	Biodiversity	En11	mixed land use
		S12	amenity			Ec12	mortgage repayment			En12	diverse food supply
		S13	outdoor activity								
		S14	pleasant environment								
S2	Access to services	S21	walk and cycling connections and public transport service	Ec2	Productivity and Innovation	Ec21	shortest travel time	En2	Landscape changes	En21	land size
		S22	disabled accessibility			Ec22	sustainable innovative designs			En22	real estate type
S3	Housing and affordable housing	S31	high density	Ec3	Income levels and distribution	Ec31	income group	En3	Heritage	En23	mixed land use
		S32	real estate type			Ec32	real estate type			En31	heritage sites
		S33	land size			Ec33	affordability				
S4	Access to social networks and community activities	S41	open entertainment	Ec4	Employment	Ec41	mixed employment	En4	Natural resources	En41	real estate type
		S42	community facility							En42	travel modes
										En43	mixed land use
				En44	car park design						
S5	Human rights	S51	disabled accessibility	Ec5	Small Business Impact	Ec51	infrastructure service	En5	Environmental quality	En51	greenery design
										En52	car park design
S6	Gender	S61	gender group	Ec6	Skills and Education	Ec61	education and training centre	En6	Greenhouse gas emissions	En61	reduce private car driving
S7	Indigenous and multicultural	S71	occupation group	Ec7	Investment and Economic Growth	Ec71	vibrate business	En7	Water	En71	water supply
		S72	multicultural centre			Ec72	future industry			En72	outdoor irrigation
		S73	church and temple								
S8	Impacts on different age groups	S81	retirement village	Ec8	Consumption	Ec81	vibrate shopping centre	En8	Air	En81	open plans
		S82	children plan ground			Ec82	variety of services			En82	reduced emissions
S9	Disability	S91	disable accessibility	Ec9	Competition	Ec91	competitive land designs	En9	Microclimate	En91	trees and greenery
S10	Disadvantage and vulnerable	S101	multi community centre and activities	Ec10	Cost of living	Ec101	reduced travel and car ownership	En10	Visual quality	En101	amenity and leafy designs
S11	Justice and crime	S111	safety	Ec11	Procurement	Ec111	freight connection	En11	Waste	En111	real estate type
		S112	street lighting			Ec112	mixed land sue			En112	land size
										En113	use of recycled material