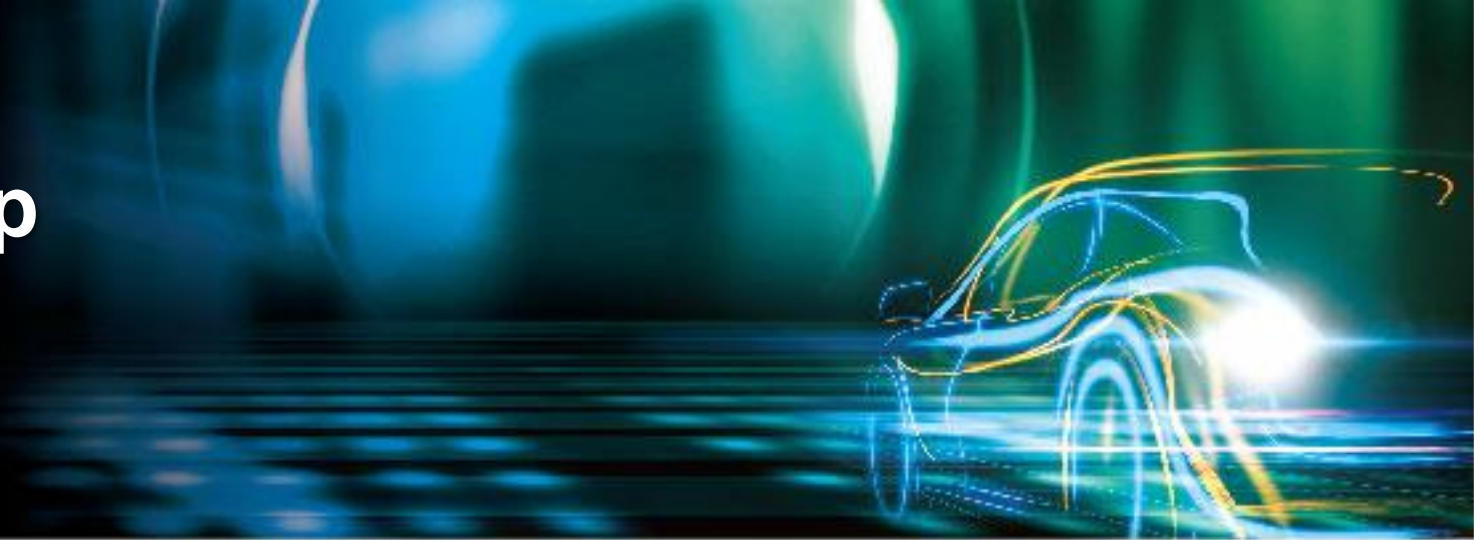


SIP-adus Workshop 2020



Analysis of automated driving diffusion : Consumers' willingness-to-pay in Japan

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12th November, 2020

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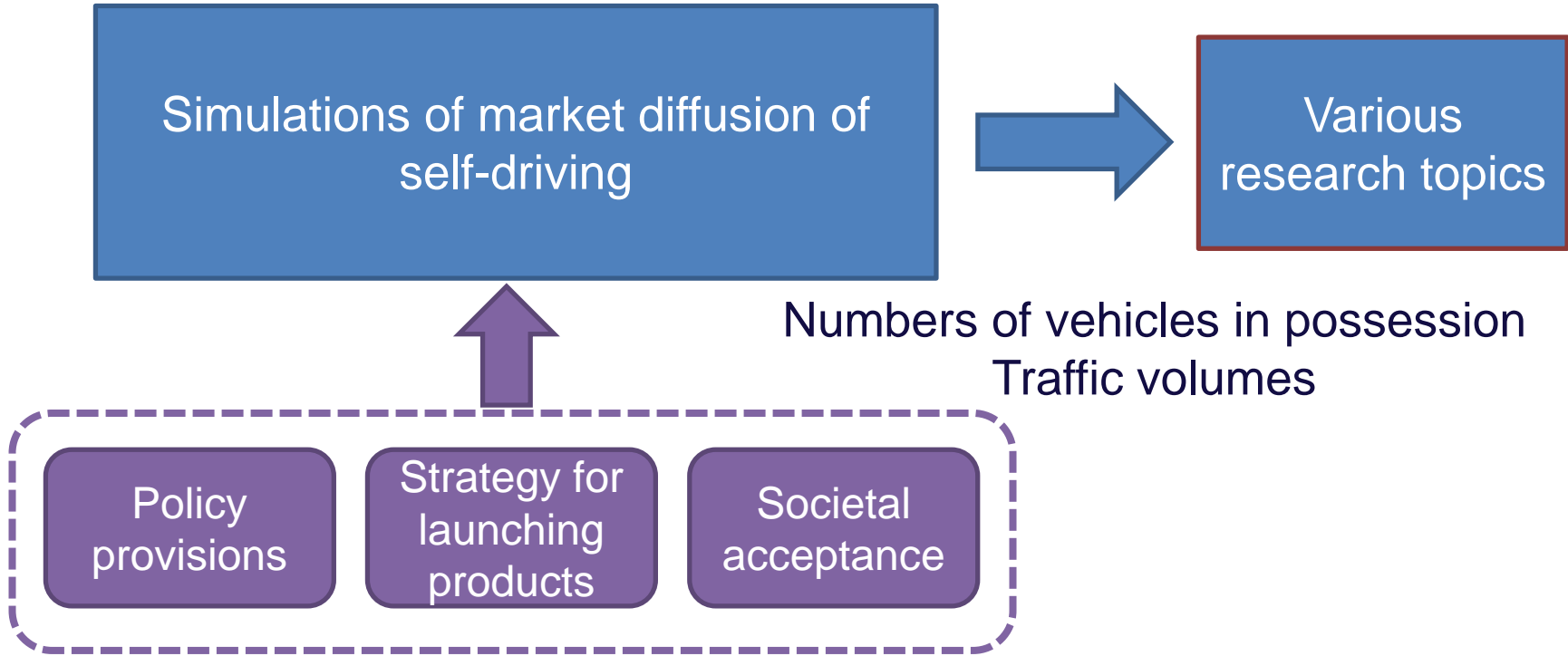


Outline of simulation

Two types of diffusion simulation

- **Dynamic model that demonstrates the diffusion process of SAE Levels 0 – 4.**
- **Static model targeting SAE Level 5.**

Objectives



Categories of self-driving vehicle

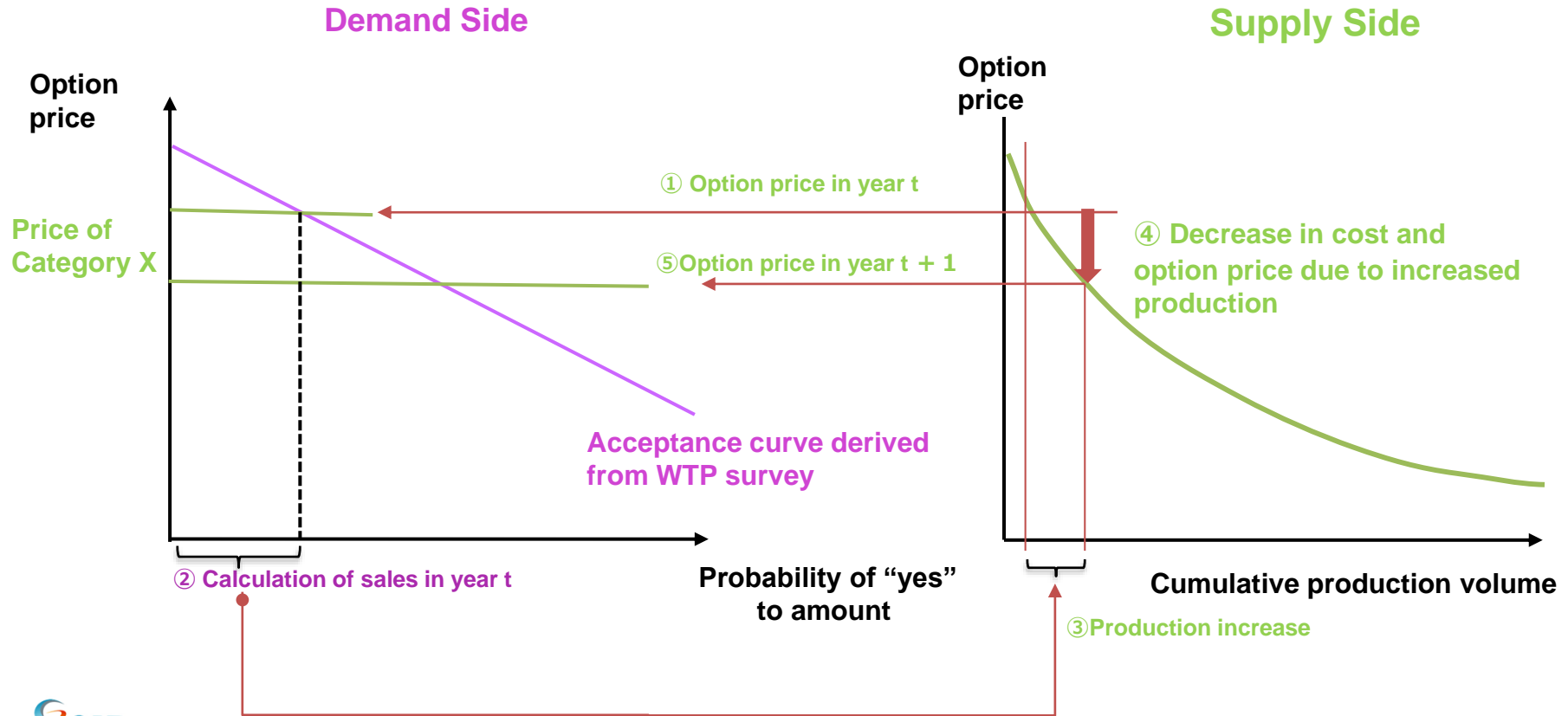
Category	Highways	General roads	Compatible technologies
C0	SAE Lv.0	SAE Lv.0	No driving-support devices
C1	SAE Lv.1 Driver assistance	SAE Lv.1	<ul style="list-style-type: none"> • Collision-damage-reducing brakes • Acceleration limiters for accidental accelerations (due to driver error) • Lane-departure warning system • Car distance warning system
C2	SAE Lv.2 Partial automation	SAE Lv.1	In addition to C1: <ul style="list-style-type: none"> • On highway, lane keeping systems (LKAS) + adaptive cruise control (ACC) applicable to all vehicle speed regimes, including low-speed motion and stopping • Automatic lane changing on highway
C3	SAE Lv.3 Conditional automation	SAE Lv.2	In addition to C2: <ul style="list-style-type: none"> • Lv.3 on highways • Lv.2 on general roads
C4	SAE Lv.4 High automation	SAE Lv.3 on major arteries and thoroughfares	In addition to C3: <ul style="list-style-type: none"> • Lv.4 on highways • Lv.3 on major general roads • On general roads, take-over requests (TORs) for driving operations will be issued in response to system demand
C5	SAE Lv.4 High automation	SAE Lv.4 on major arteries and thoroughfares	In addition to C4: <ul style="list-style-type: none"> • Lv.4 on major general roads • Take-over requests (TORs) will not be issued
SIP C6	SAE Lv.5 Full automation		

2

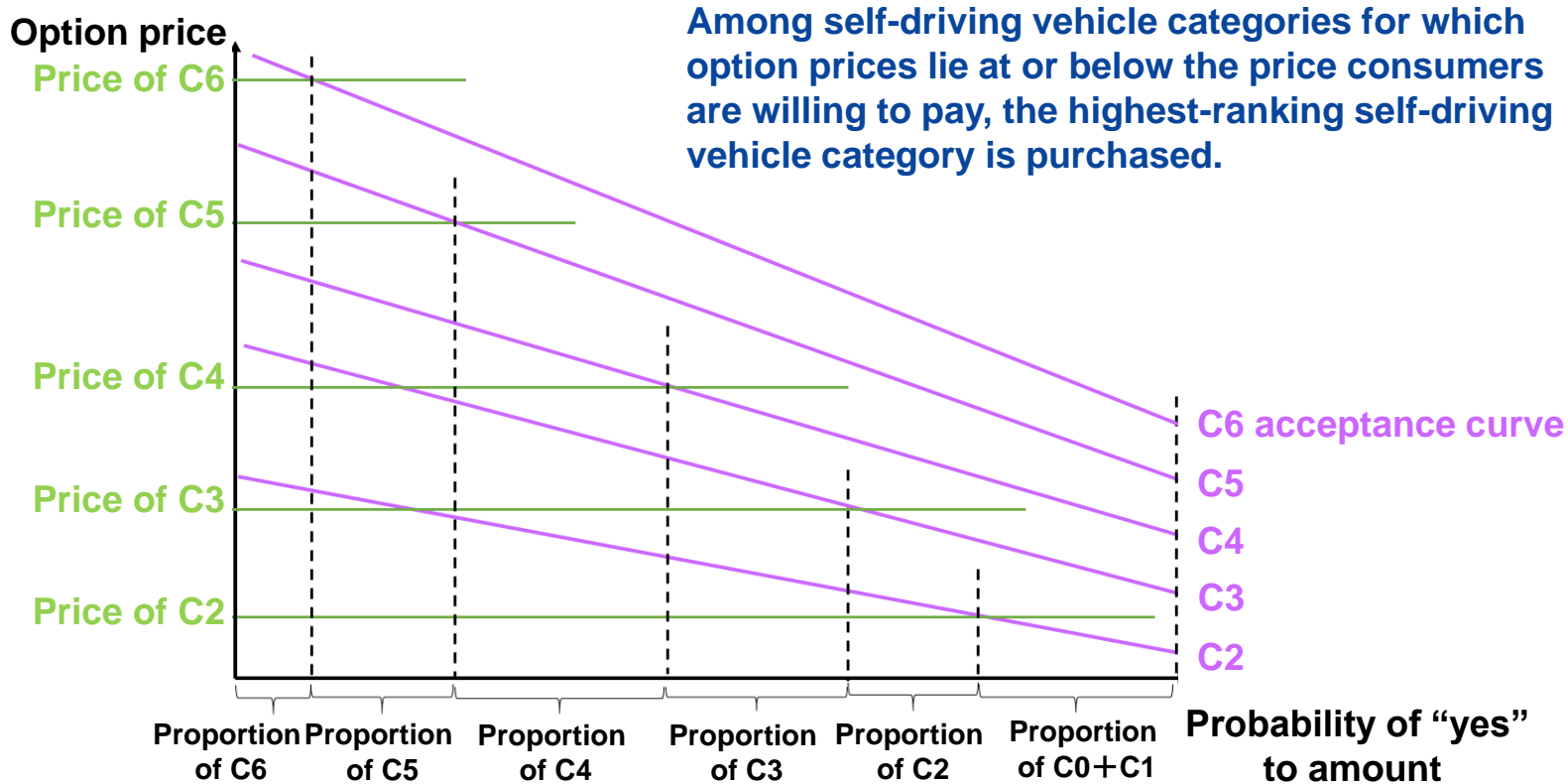
Dynamic model targeting SAE Levels 0 - 4



Basic idea of the model for privately-owned passenger vehicle (1)



Basic idea of the model for privately-owned passenger vehicle (2)



Outline of WTP online survey

◆ Respondents:

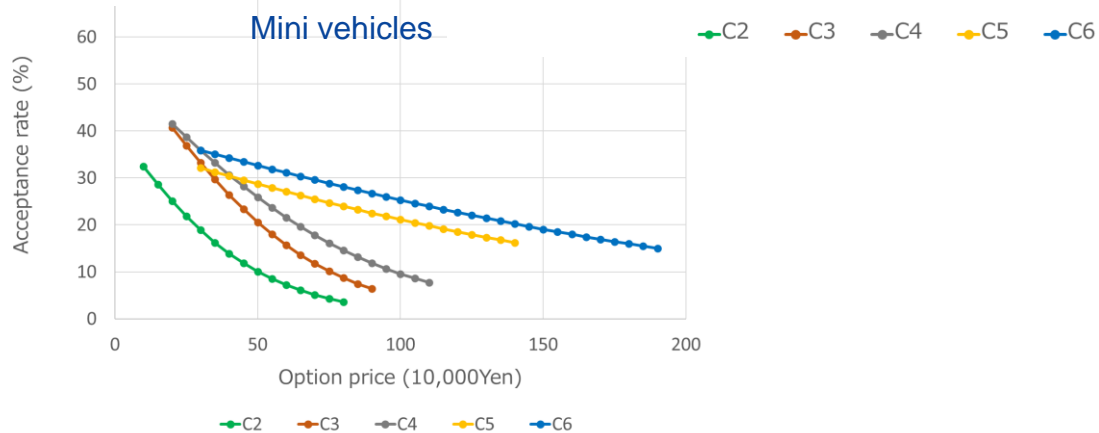
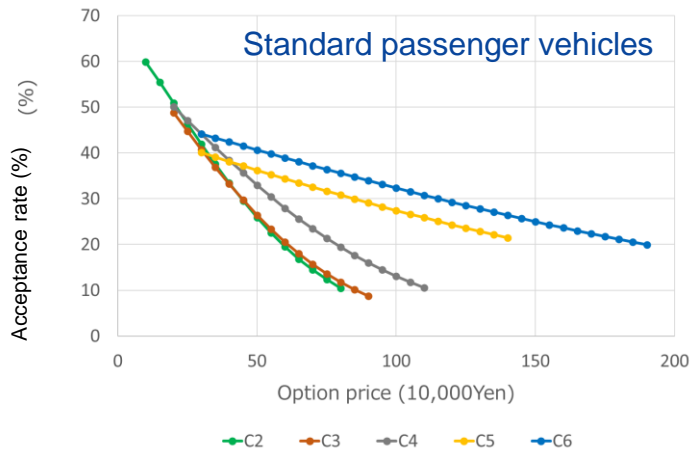
- Current or former owners of vehicles for personal household use, who possess or formerly possessed a driver's license
- 5,159 responses

◆ Survey methodology:

- Online survey (conducted in Dec., 2019)

Acceptance curves for various categories of automated driving

Acceptance curves for each automated driving category are derived from individual responses to WTP online surveys.



3

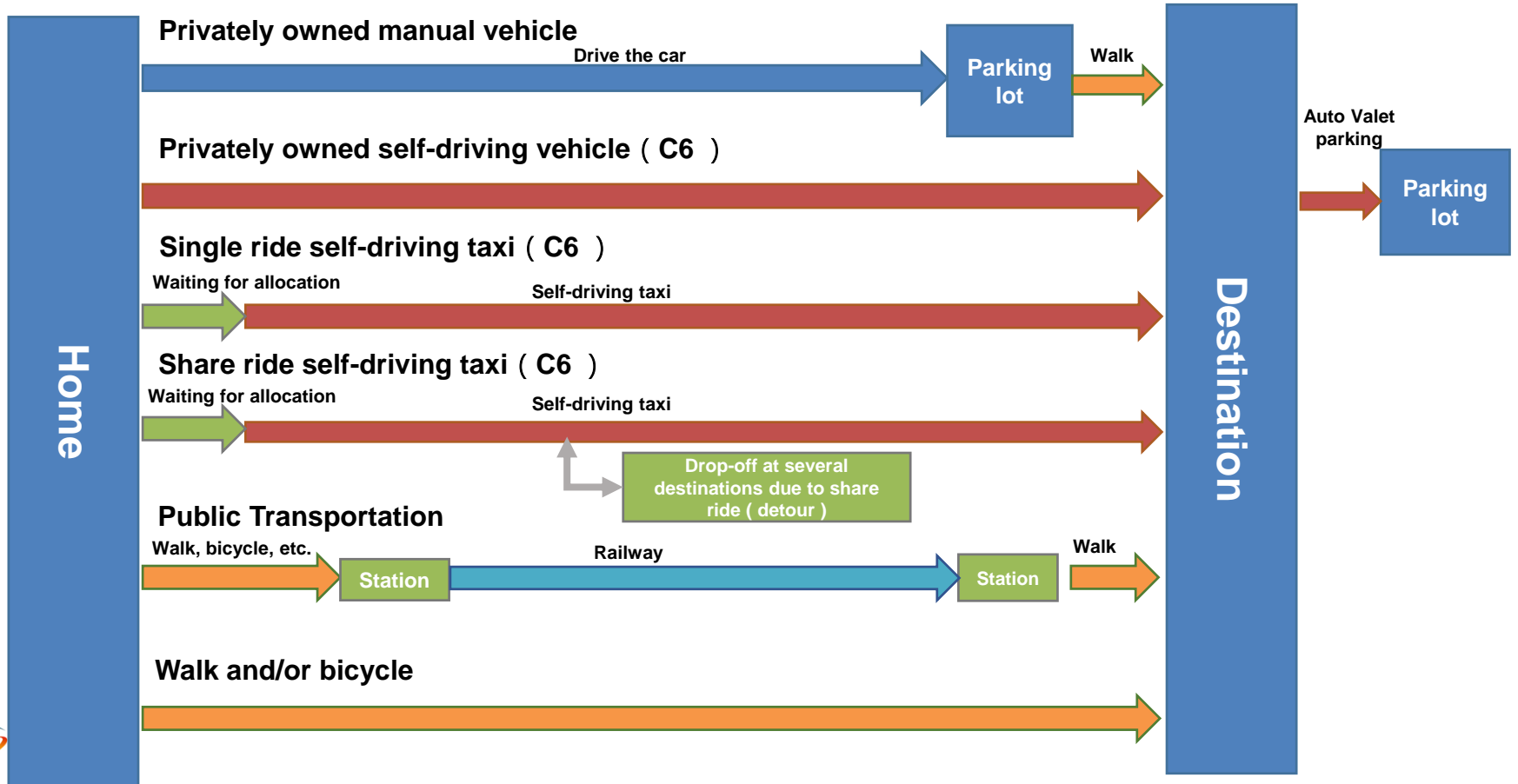
Static model targeting SAE Level 5



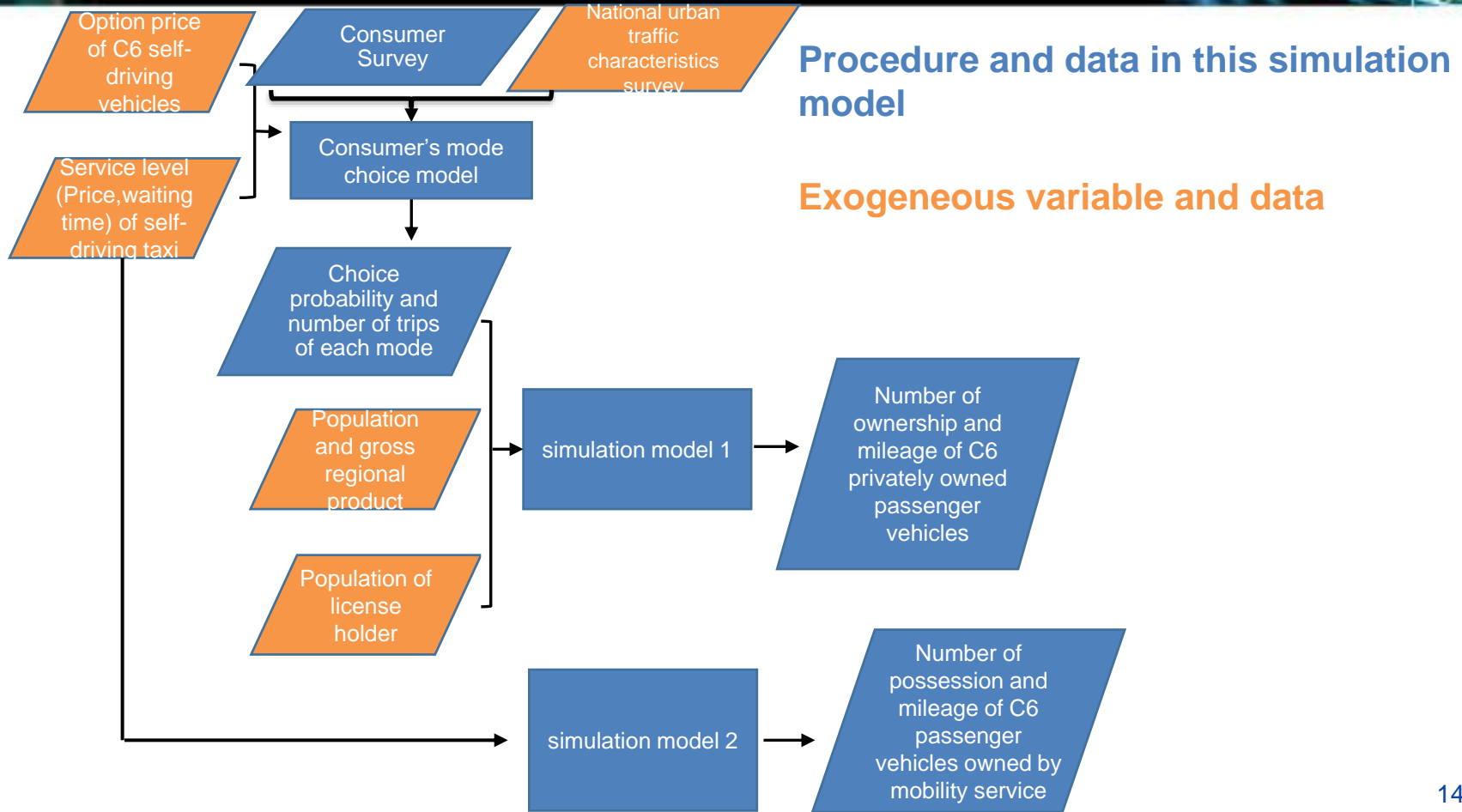
Purpose of the modelling

- ◆ The consumer's mode choice behavior is expected to change drastically when transportation such as C6 (SAE Level 5) privately owned self-driving vehicles, self-driving taxis are available in the market.
- ◆ Simulate the change both in
 - 1) consumer's mode choice behavior, and
 - 2) the number of ownership and mileage both of privately owned passenger vehicles and mobility services.

Transport modes in the consumer survey



Overview of the model



4

Plan



- ◆ Questionnaire survey and model construction for static model.
- ◆ Impact assessment of various policy measures and enhancement of social acceptance on automated driving diffusion,
- ◆ Comparison between Japanese and German simulation results.

Thank you

