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Mobility and the City of the Future

Towards low carbon smart cities: e-mobility and micro-vehicles experiments in Japan

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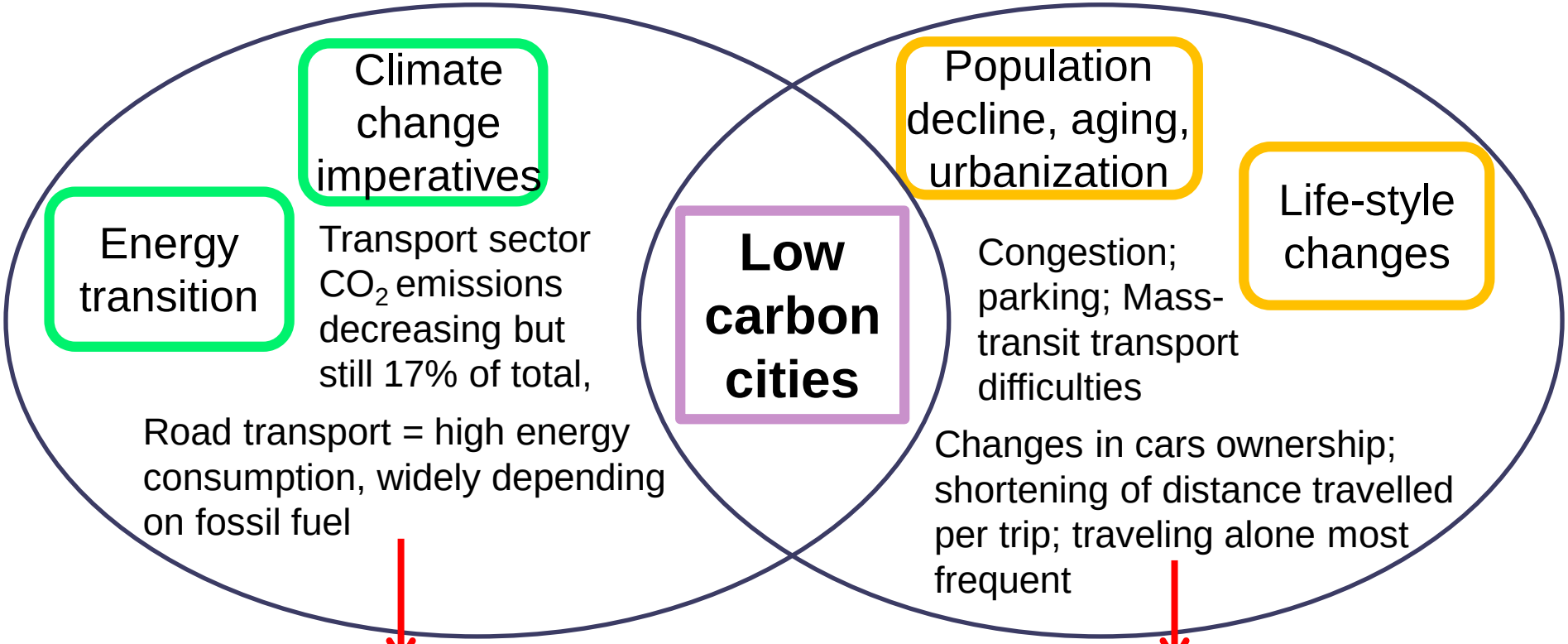
Presentation content

An on-going research on a nascent and still uncertain market
(Mostly based on interviews: Nissan, Toyota, Cities' executives and MLIT + documents/survey of carmakers and MLIT)

1. Introduction: Japan's challenges for the future, towards low carbon cities and Evs/micro-mobility promotion
2. On the government side: Micro-mobility potential demand
3. On the supply side: models available in Japan, market development through experimental projects
4. Case studies: comparing Choi Mobi in Yokohama and Ha:Mo Ride in Toyota city
5. Concluding remarks

Japan challenges for the future



EVs as a solution → **Micro-EVs as a solution**

Thanks to new energy management technologies: charged from renewables, save energy, reduce energy imports, reduce CO_2 emissions

Adapted to short distance, complementing replacing public transports, safer due to low speed, adapted to elderly

Next-Generation Vehicle Strategy

medium to long-term actions for the automotive and related

Diffusion Targets by types of vehicles
(Targets set by the Government)

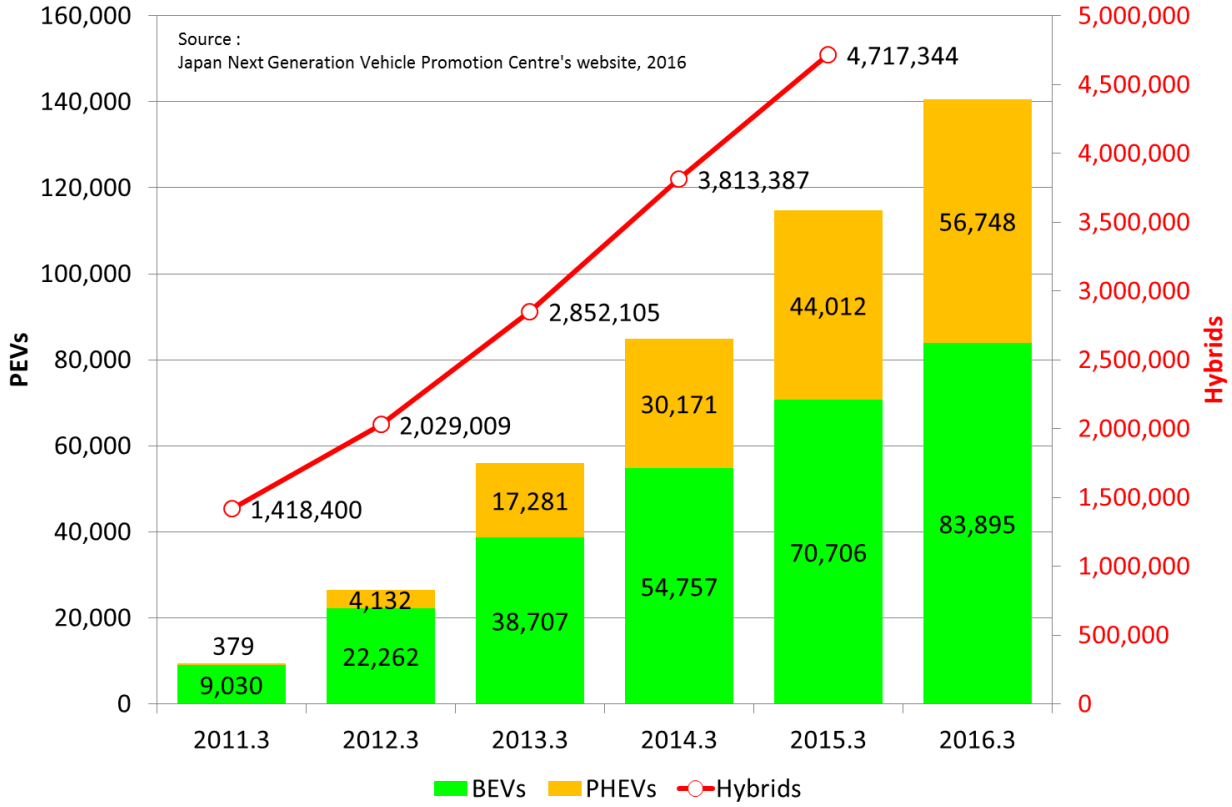
	Year 2020	Year 2030
Conventional Vehicles	50～80%	30～50%
Next-Generation Vehicles	20～50%	50～70%
Hybrid vehicles	20～30%	30～40%
Electric vehicles Plug-in hybrid vehicles	15～20%	20～30%
Fuel-cell vehicles	～1%	～3%
Clean diesel vehicles	～5%	5～10%

(from the Next-Generation Vehicle Strategy 2010)

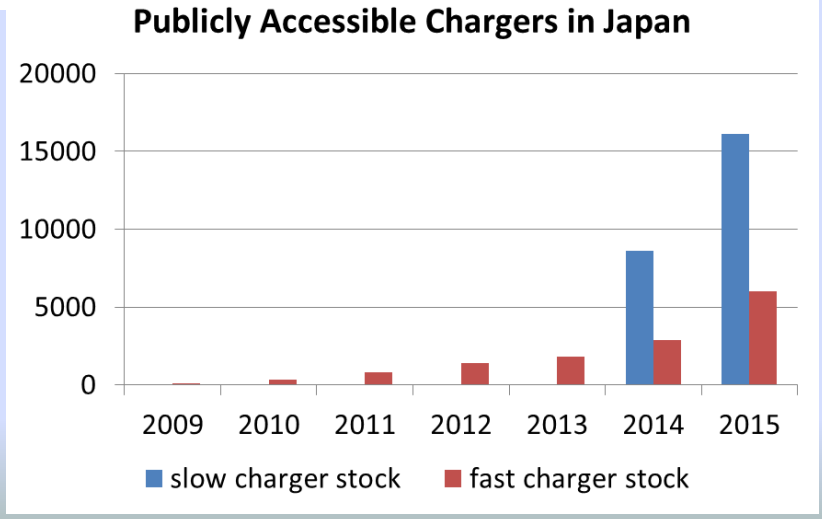
Targets set by government in 2010 as a basis for policy definition, tax break and subsidy schemes implementation

Source: Jisedai jidosha shinko senta (Next Generation Vehicle Promotion Center), 2012

Evolution of EVs market and chargers diffusion



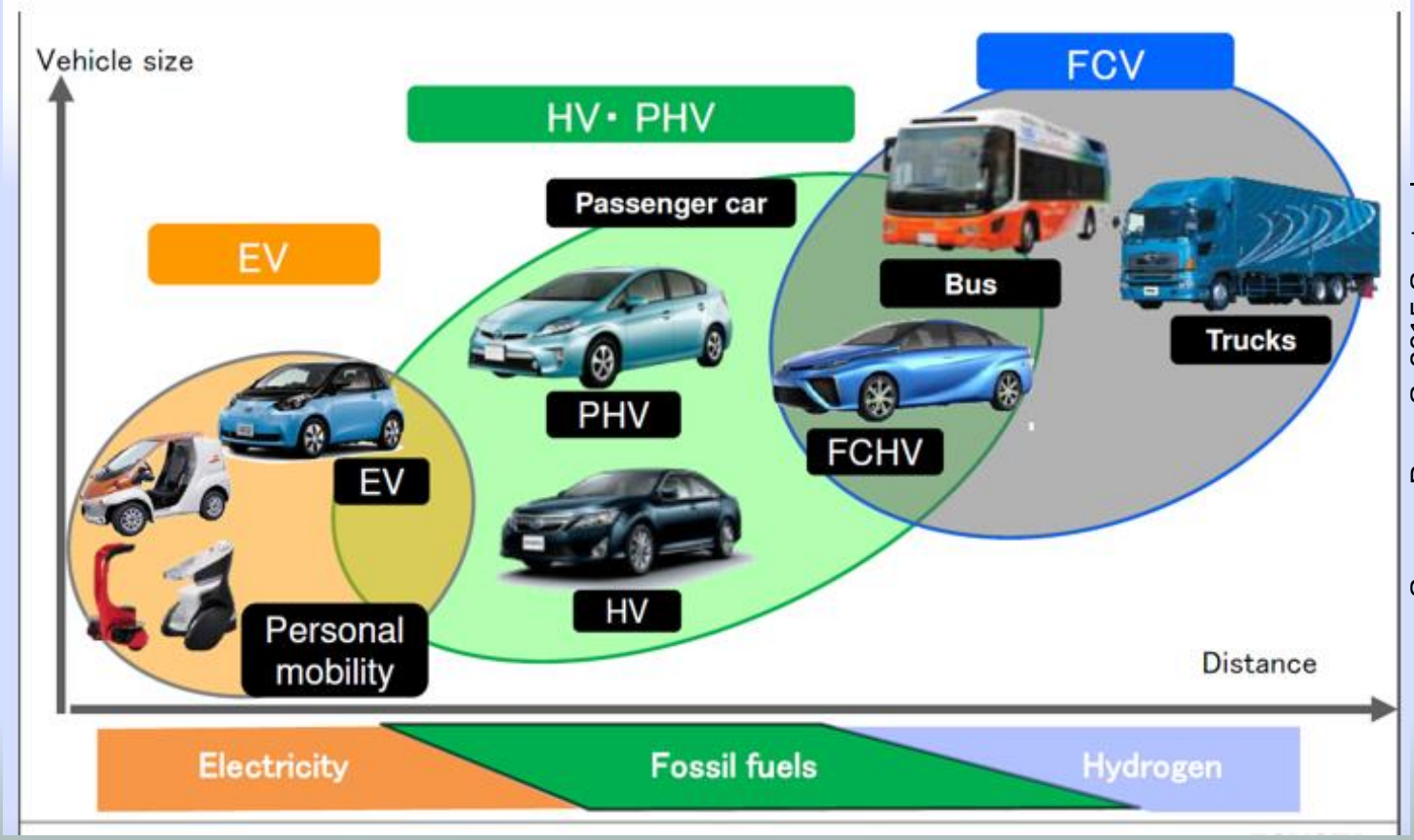
Although targets might not be achieved, infrastructure progressed and market is growing



The future of automotive industry

Simply replacing ICEs cars by EVs
will not solve all challenges (clean congestion in cities…?)

Necessary to change the game (Micro/personal mobility solution)



Source: Pean S. 2015 September

On the government side: micro-mobility potential demand

High potential demand

- Adapted for daily commuting in local city or low dense areas
- Adapted for last kilometer (car-sharing)
  - walking about 4/800m to or from a bus stop or train station unpleasant to anybody and Impossible to elderly/disabled;
- Adapted for the elderly
  - secure due to low speed, complementing or substituting public transport
- Adapted for housewives
  - shopping, small child accompanying…
- Adapted as company/public institution fleet, and for delivery in city centers
  - Short trips, frequent stops delivery… in city centers
- Adapted for tourism
  - Rental, car-sharing

market estimated by MLIT to 1.5 million vehicles in the future

(source: MLIT 2014/3 超小型モビリティの成果と今後)

Need to create an initial demand

Creating the conditions for market take off: showroom

- Organize events for people to test vehicles
- Experiment micro e-vehicles car-sharing or rental to raise awareness thanks to visibility on road
- Convince local stakeholders to experiment micro EVs delivery services

Seven Eleven Delivery by Coms

Post Office Mail Delivery by Coms

Awareness rate (all Japan):
hybrid and EVs <60%, PHEVs and FCV 30-40%, **micro-mobility 21%**

Higher rate where experiments are going-on

Interest to use:
People having already tested: 89%
People having already seen: 50%
People knowing about: 44%
People not aware: 27%

Source: デロイト・トーマツ「2015年次世代車に関する消費者意識調査結果」, https://www2.deloitte.com/content/dam/Deloitte/jp/Documents/about-deloitte/news-releases/jp-nr-nr20150629-report.pdf

Creating the conditions for market take off: regulatory issue

- Based on learnings from experimental projects, create a new vehicle's category to set usage conditions and homologate vehicles

Rated Output (Electric Vehicle)		0.6 kW and less	Exceeding 0.6 kW	
Engine Capacity		50 cc or less	Less than 660 cc	More than 660 cc
	Wheeled Walking Aids (No license required) * 6 km/h or less * No Vehicle inspection * Overall length: 1,200 mm * Overall Width: 700 mm * Overall Height: 1,090 mm	**Motorized cycles** **Micro Mobility** * 1 passenger * Max load 30 kg * Overall length: 2,500 mm * Overall Width: 1,300 mm * Overall Height: 2,000 mm * Not allowed on highways * No crash standard * No inspection	**Mini-sized Vehicle** * 2 passengers or less * Max output 8kW (or 125 cc) * not allowed on highways **Allowed on roads & streets under conditions** * 4 passengers * Max load 350kg * Overall length: 3,400 mm * Overall Width: 1,480 mm * Overall Height: 2,000 mm * Vehicle inspection * Allowed on highways * Crash standards	**Standard cars**

Source: MLIT micro-mobility guidelines 2013

On the supply side: vehicles and experimental projects

Micro e-vehicles (for 1-2 persons ≠ light cars)

Japanese car makers experimenting/selling micro-vehicles

Nissan New Mobility Concept

Honda Micro Car Beta (MC-B)

Suzuki Q concept

Price: ≈ ¥800,000/1 million (7,000/9,000€)
a Toyota Coms = ¥798,000 (6894 €)

N.b.: 1¥=0.86€

Coms (Toyota auto body)

i-road (Toyota)

Pico, Daihatsu

New entrant companies

Q'mo II (NTN)

Kobot (Kowa and Tmsuk co.)

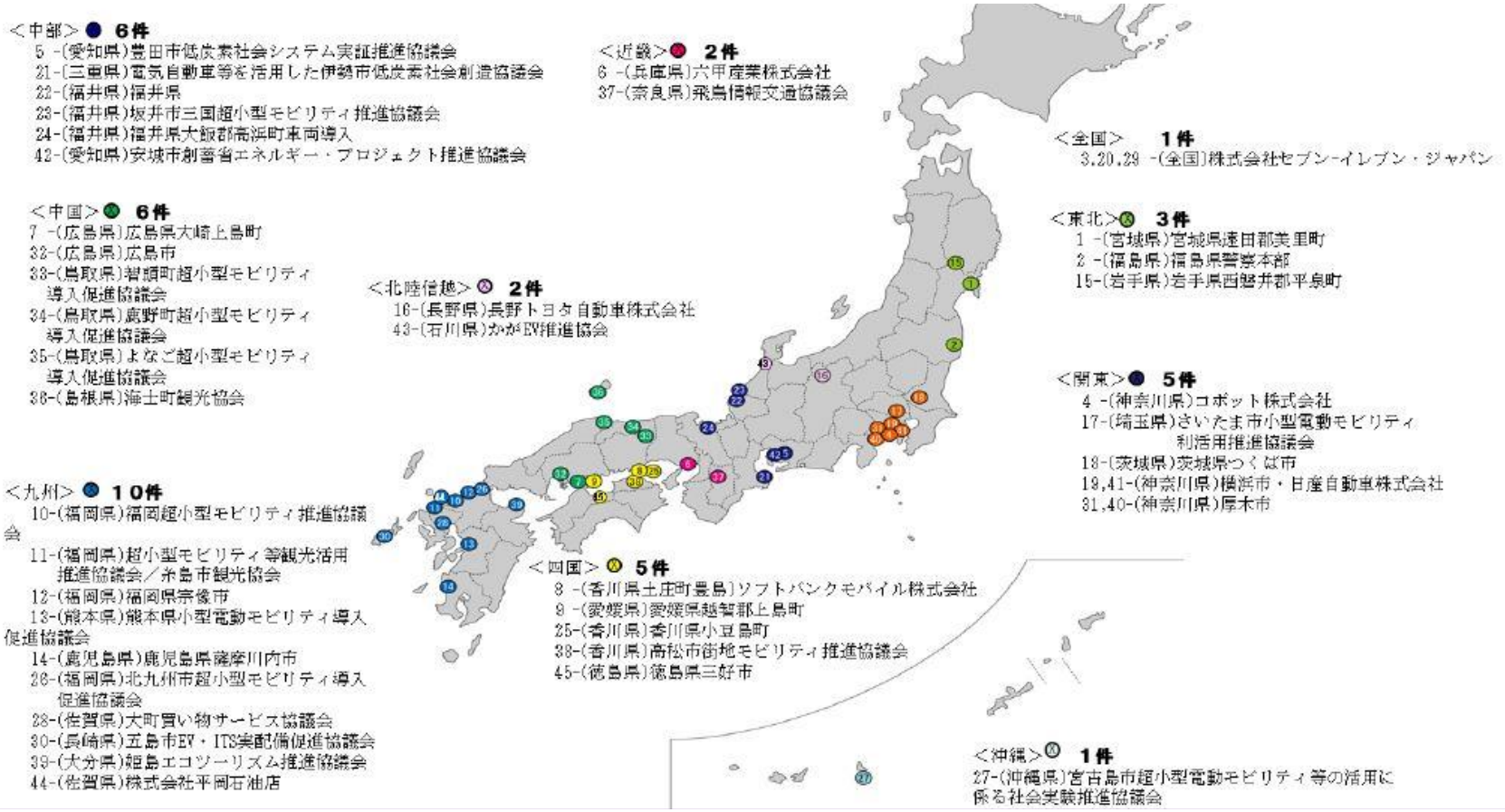
Piana (style D co.)

RimOnO (Rimono corp)

Sources: pictures from compagnies' websites

41 projects implemented (MLIT supported):

940 micro e-vehicles (708 Coms); car-sharing in cities, car-rental in touristic areas and small islands, company/city hall/prefecture fleets (short trips/small lot delivery…)



Source: **国土交通省自動車局環境政策課**(MLIT), 超小型モビリティの成果と今後, http://www.mlit.go.jp/common/001125685.pdf

Micro e-vehicles market estimates

According to Yano Economic Research Institute, market should grow from 4,000 at survey time (in FY2013) to 57,000 in 2016, 92,000 in 2020 and 190,000 in 2025 (estimates) provided that the new micro-vehicles category is created (if not only 28,000/43,000/72,000 respectively).

Source: Yano keizai kenkyujo, 2014: chôkogata mobiritei shijou nikansuru chôsa kekka 2014.

Case studies
Yokohama and Toyota-city car-sharing

Ha:Mo Ride Toyota-city

Car sharing system launched in October 2012 (+e-byke, 100 pass)
In sept. 2015: 35 stations, 100 one seat COMS, 3 two seats Coms, fully charged within six hours, traveling distance 50km, maximum speed 60/50 km/hour + 4 i-road, maxi speed 60km/h)
3,710 members, 54% Toyota city residents, 33% out of Toyota-city but in Aichi, 13% out of Aichi
86% one-way trips; 14% round-trips

Reservation can be made until 30 minutes before use. ¥200/first 10 minutes, then ¥20 per minute; special price when vehicle parked out of stations (1 or 2 ¥/minute).

Choi-Mobi Yokohama

Car-sharing system launched in October 2013 for one year,
70 units of NISSAN New Mobility Concept, a 2-seated 80km/hour maxi speed micro-vehicle,
63 stations centered around Yokoyama Station, Minato Mirai, and Kannai areas in downtown.

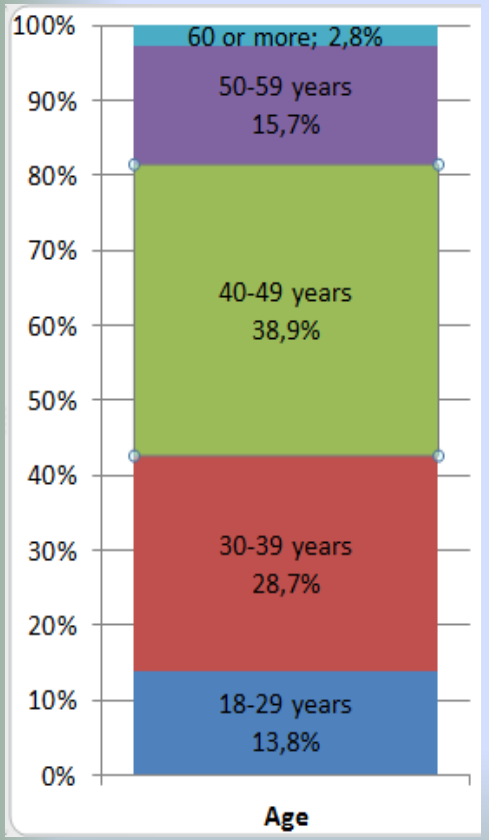
Project extended to one more year with 60 stations and 50 vehicles only.

January 2015: 11,584 registered members (9,000 regular users): 60% Yokohama residents; 40% outsiders

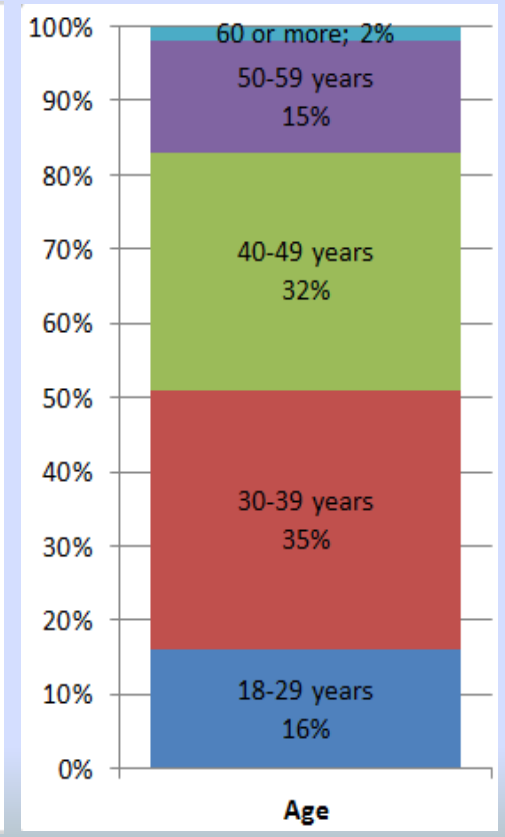
Age and gender of members

Sample:
Choi Mobi 8,355 users (Nissan survey); Ha:Mo Ride 850 users (Toyota Motor survey)

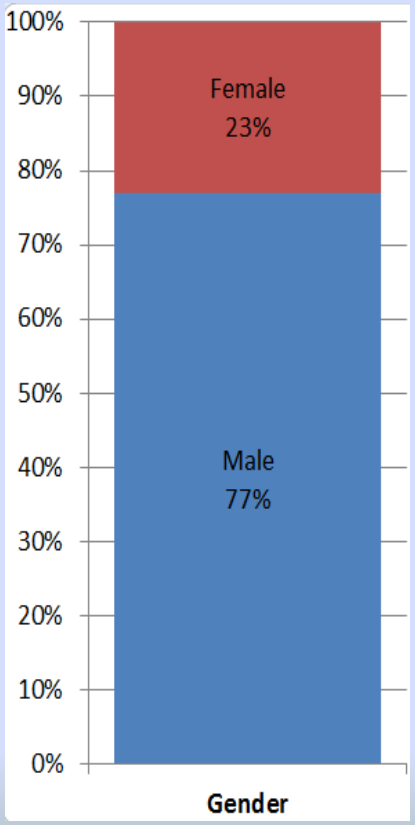
Choi Mobi



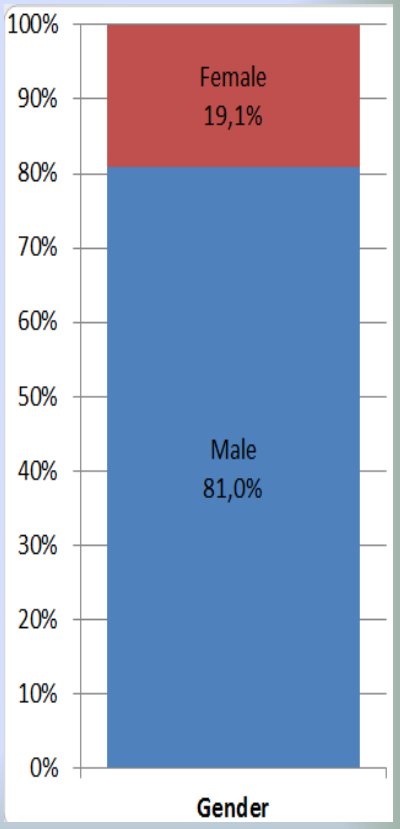
Ha:Mo Ride



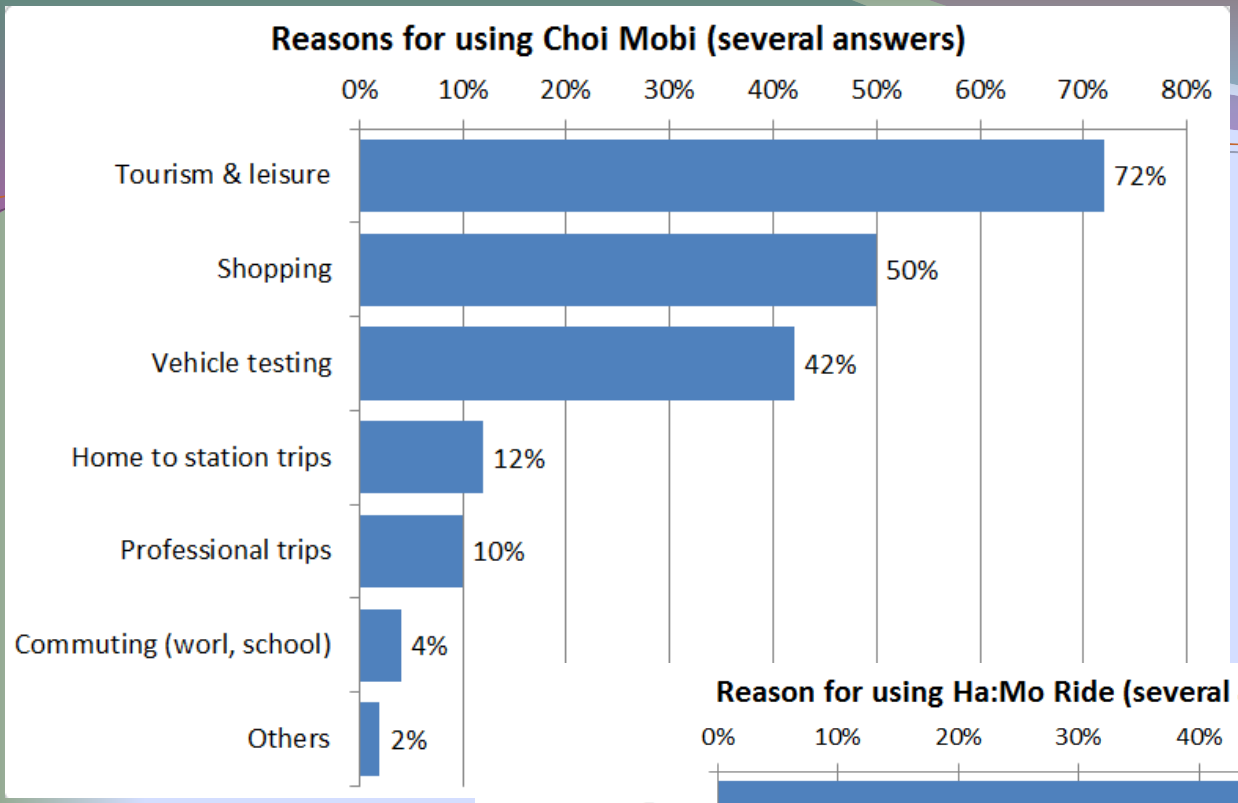
Ha:Mo Ride



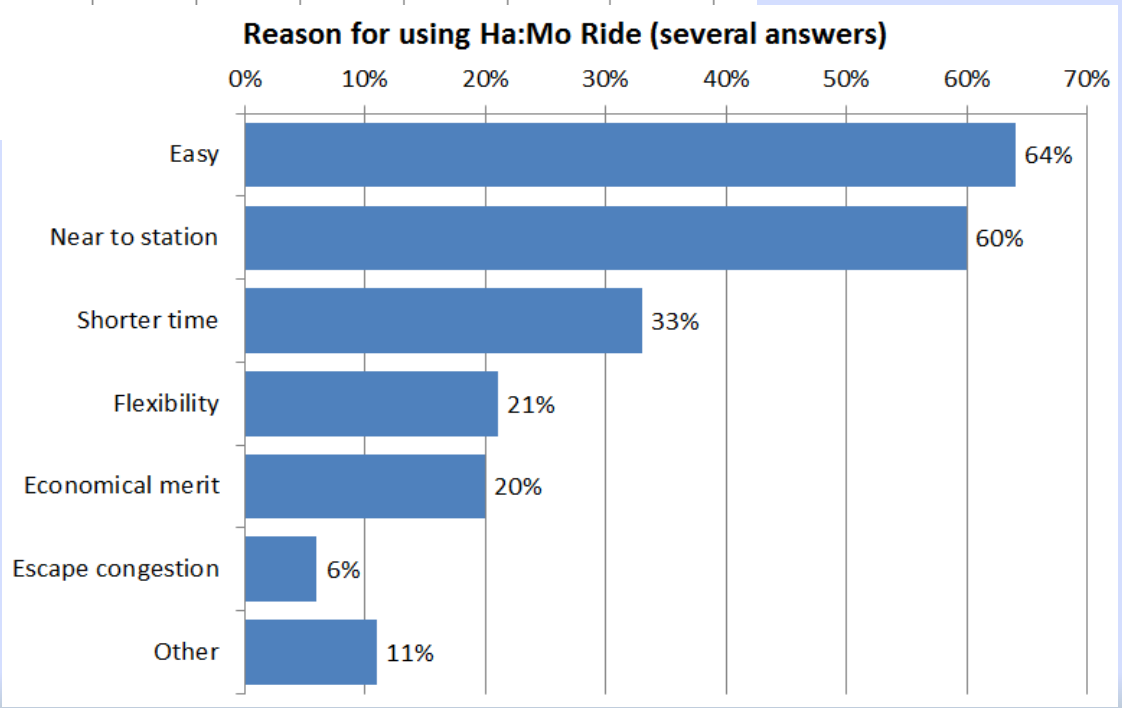
Choi Mobi

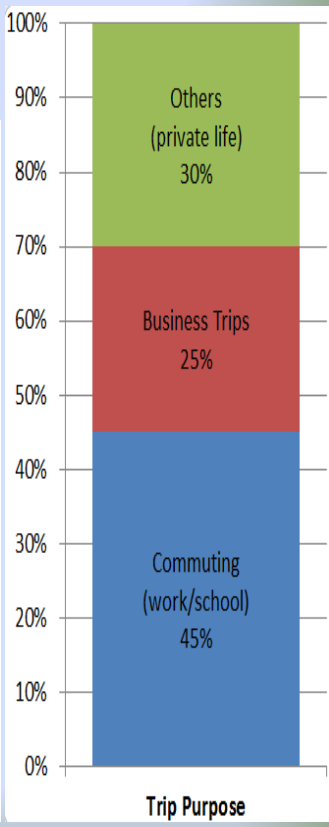


Sources: Non published documents given by companies



Depending on public transports development, but also to city size, purpose of usage differs: Much more used for commuting in Toyota city





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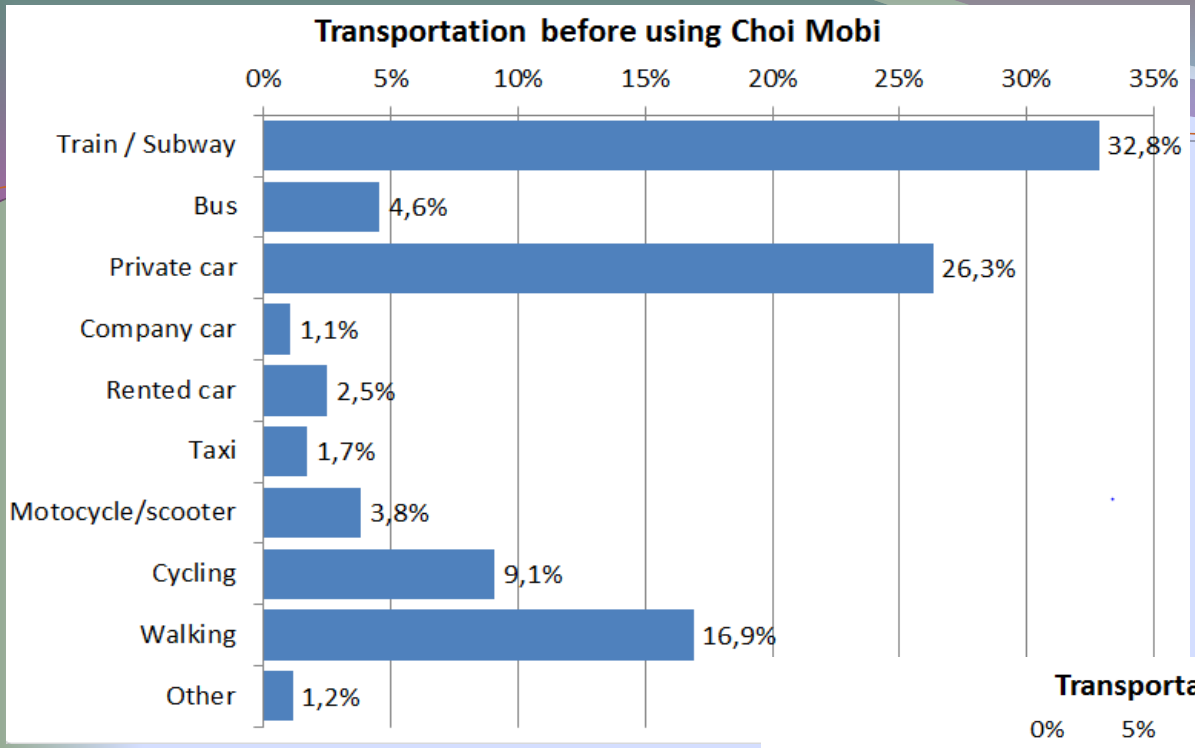
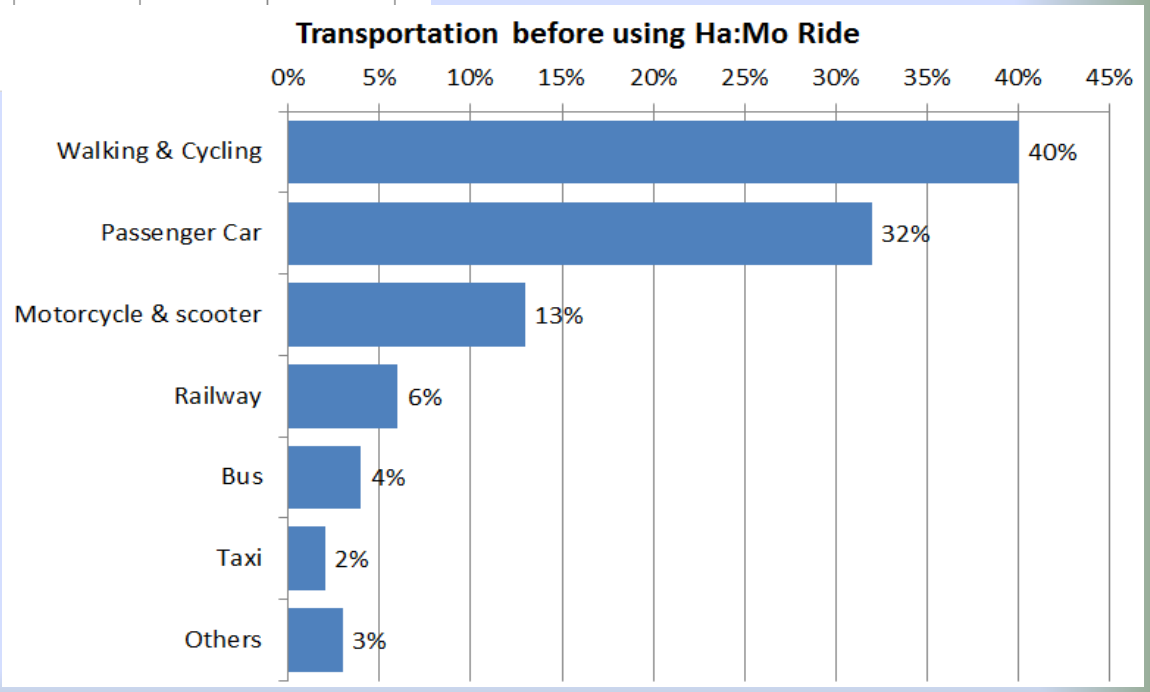


Choi Mobi: Substitution to

Train/subway

Private car

Walking and cycling



Ha:Mo Ride: Substitution to

Walking and cycling

Private car

Motorbike

Sources: Non published documents given by companies

MLIT potential demand/case studies

- Adapted for daily commuting in local city or low dense areas
  - Seems true as Toyota city shows (commuting = 45% of usages)
- Adapted for last kilometer
  - Not clearly identified, but to some extend true in Toyota city (substitution to walking 40% and close to station 60%)
- and for delivery in city centers
  - Experimentation by post office or Seven Eleven seem to confirm
- Adapted for the elderly
  - Not really, over 60 years old only 2-3% of users
- Adapted for housewives
  - Not really, male more numerous (female more or less 20%)
- Adapted for tourism (rental, car-sharing)
  - Seems true in Yokohama with 72% of trip purpose
- Adapted as company/public institution fleet
  - No evidence yet although most experimenting cities integrated some

Concluding remarks

Supply versus Demand

- Japanese Government proactively promotes **Micro E-Vehicles**
- Car makers propose vehicles, new companies enter the market on that segment

But although should fit present life/mobility style

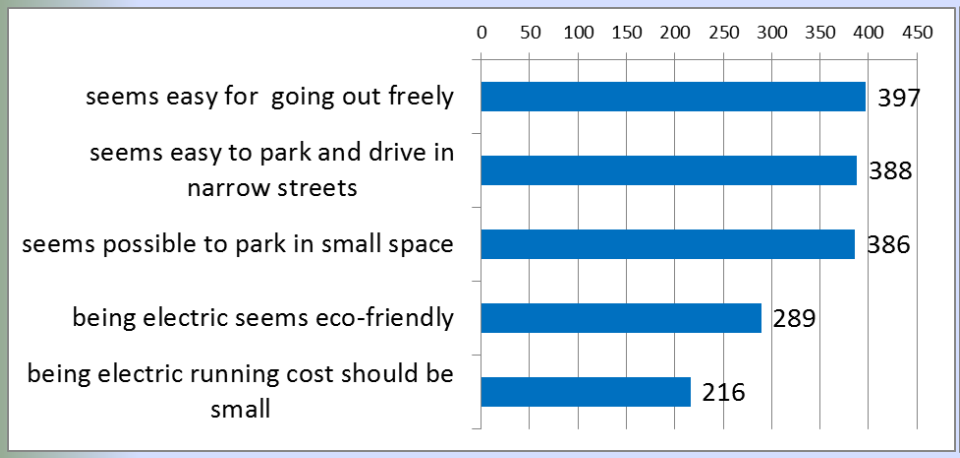
- Only 8% of people consider buying a micro-EV if changing or buying a car during the year (Deloitte 2015, sample 2075 persons)
- Only 6% of people interested to buy would certainly and 16% probably do if price at 800,000 yens
- If price down to ¥400,000 (3,500€): 27% would surely do while 42% would consider it (MLIT 2016/3,超小型モビリティの成果と今後, 2014 survey, sample 456)

Price clearly matters

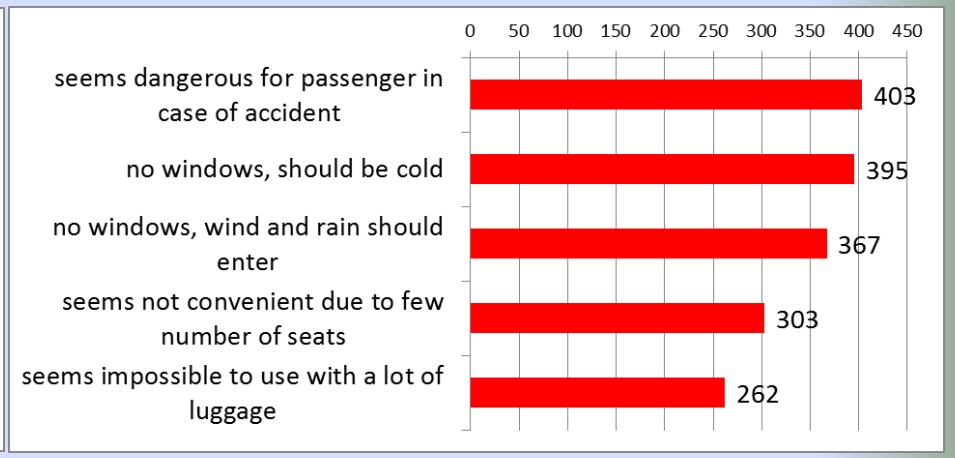
Perception of micro-vehicles

- If people see positive elements, they also see negative ones
  (MLIT survey, sample: 1,000 persons, choice: 5 items maxi)

Positive elements



Negative elements



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population acceptance also matters

More supply push than demand pull

Take a leading position on future world markets

- Government and car makers/companies not only focusing the Japanese market
  - Urbanization increasing worldwide
  - Congestion and pollution in huge developing countries big cities

Develop universal introductory models

suitable for micro-mobility that can be applied abroad

- Revitalize the Japanese economy by taking a leading position on these new markets
- Helps Japanese companies to find new exports opportunities while competing with vehicles fitting to new forms of mobility

References

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Thank you for your attention

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