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Introduction

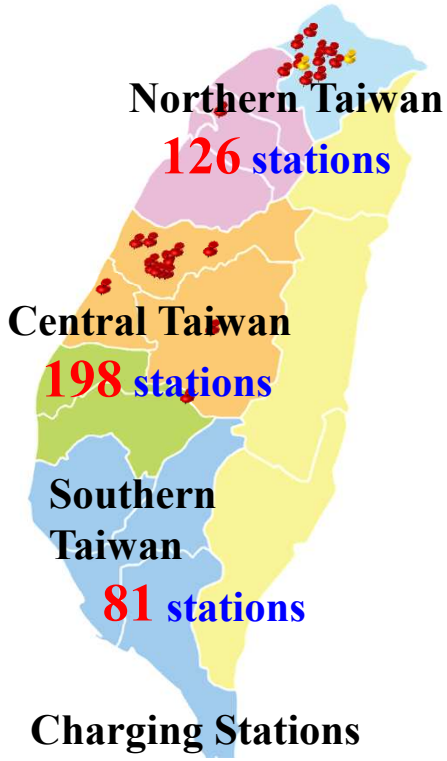
EV Pilot Run Projects in Taiwan

- **4 Projects had been approved,** which EVs are used for**:**
  - Personal/Business Rental
  - Shuttle Service
  - Government Fleet
  - EV Sharing
  - Tourist
  - Company Fleet

❖ **405 AC Charging stations** have been set up and **223 EVs** are running now.

❖ **More Applications** are under discussion :

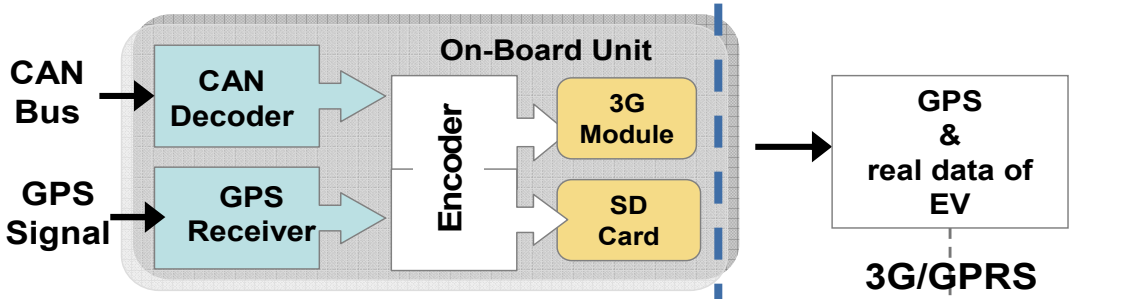
- Postal service
- Logistics
- City E-Bus



Related Work

EV Trial Project	Country	Brief	The purpose of data analysis
EV Project	USA	Run in 21 major cities and metropolitan areas. It's the largest deployment of electric vehicles and charge infrastructure in history.	In order to build and study mature EV charging infrastructure in U.S. regions.
CABLED	UK	This was part of a UK-wide demonstrator program, brought together by the Technology Strategy Board and involving a total of 340 vehicles, in which the West Midlands played a major role.	To understand how they were used in real life and to assist in the planning of the further expansion of the supporting infrastructure.
Shanghai international EV demonstration Zone	China	It is willing to build an industry commanding height which cover the whole car manufacturer and part manufacturer, R&D, trade and exhibit, automobile culture and competition.	The driving data collection in this project is to confirm the driver's security, the acceptability of EVs, and the practicability of EVs.

Data Collection and Analysis in Taiwan i-EV Pilot Project(I)



Data Collection：

1.Raw data transfer to OBU

2.OBU transfer the data to DB via Internet

3.The raw data are pre-processed

Data Analysis：

1.The data

2.OBU transfer the processed data to DB via Internet

Data Collection and Analysis in Taiwan i-EV Pilot Project(II)

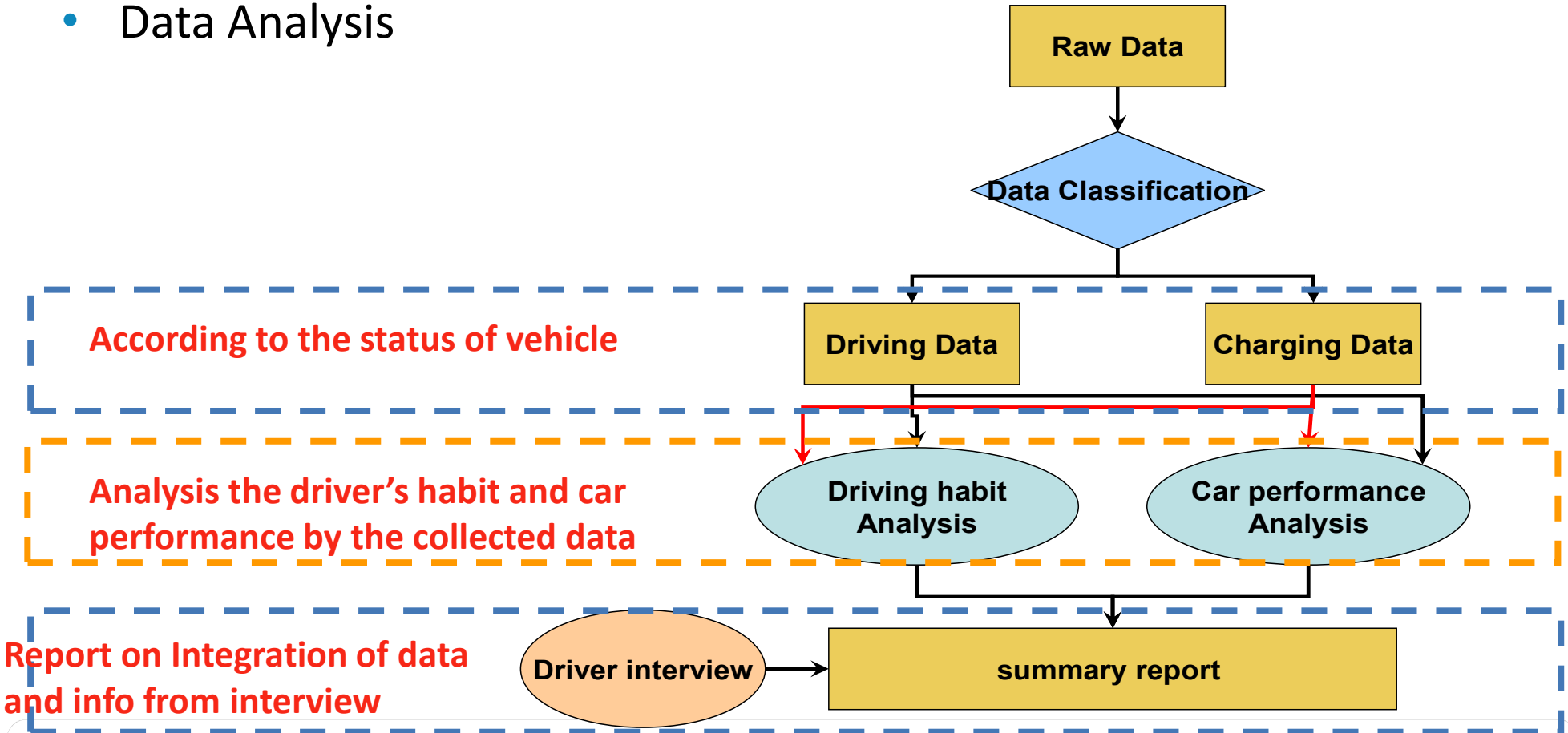
- Data Collection
  - Collect the data
    - Two way：Collect data by OBU and manual log

	record by drivers	record by OBU
data parameter	data/time, mileage,SOC	odometer, SOC, speed, date/time, event info
frequency	recorded per trip	recorded per second

  - Make sure the data useful and reasonable
    - Correct the data is out of range
    - Handle the missing data

Data Collection and Analysis in Taiwan i-EV Pilot Project(III)

- Data Analysis



Data Collection and Analysis in Taiwan i-EV Pilot Project(IV)

- The comparison of the data evaluation method between Taiwan i-EV Pilot Project and pilot project in the word
  - data parameters collected in pilot projects

parameter	Taiwan i-EV Pilot Project	the EV Project	CABLED	Shanghai International EV Demonstration Zone
event info	v	v	v	v
date/time	v	v	v	v
odometer	v			v
speed	v		v	
battery SOC	v			v
location	v	v	v	
external temperature			v	
EVSE info		v		

Data Collection and Analysis in Taiwan i-EV Pilot Project(V)

- The comparison of the data evaluation method between Taiwan i-EV Pilot Project and pilot project in the word
  - analysis result in pilot projects

parameter	Taiwan i-EV Pilot Project	the EV Project	CABLED	Shanghai International EV Demonstration Zone
the mileage per trip/day or between charging	v	v	v	v
the distribution of speed per trip	v	v	v	v
the distribution of starting time per trip	v			v
the distribution of battery SOC per charging event	v	v		v
charging frequency per day	v	v		v
the distribution of starting time per charging event	v			v
carbon emission	v			v

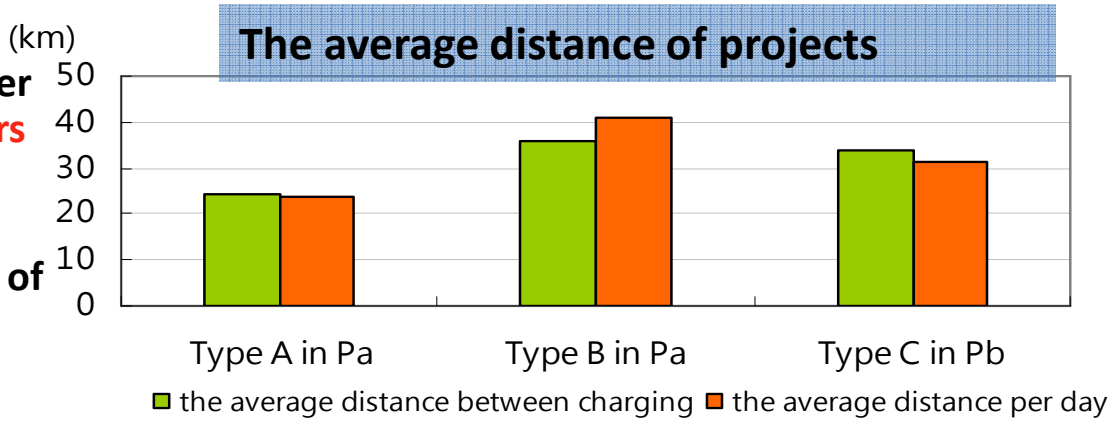
The analysis result in Taiwan i-EV Pilot Project(I)

- Project information

		Project a		Project b
car	type	A	B	C
	quantity	10	10	20
	range	100km@LA4	179km@LA4	160km@LA4
	weight	1111kg	2010kg	1520kg
	battery capacity	16 kWh	45 kWh	24 kWh
usage		rental car		government car
area		city/suburb		city

The analysis result in Taiwan i-EV Pilot Project(II)

- The average distances between charging and per day are similar. This phenomenon infers the cars are charged once per day, and the charging locations are the destination.
- The distances users use are less than the range of the car
- User didn't fully utilize the battery. User may have range anxiety, or limit to the usage.



	Project a	Project b
average energy consumption per day(kWh)	A:7.55 B:17.71	6.29
battery SOC at the start of charging	63.26%	60.90%
battery SOC at the end of charging	94.69%	92.73%

the usage of battery

- Type B is the heaviest, and the energy consumption is more than the others.
- The battery SOC at the start of charging is more than 60% in two of the projects. User didn't fully utilize the battery because of range anxiety and usage limitation.

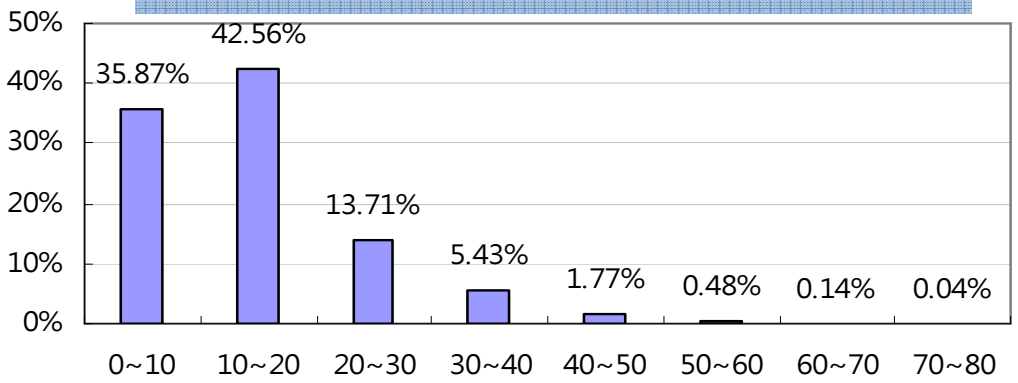
The analysis result in Taiwan i-EV Pilot Project(III)

average speed of projects

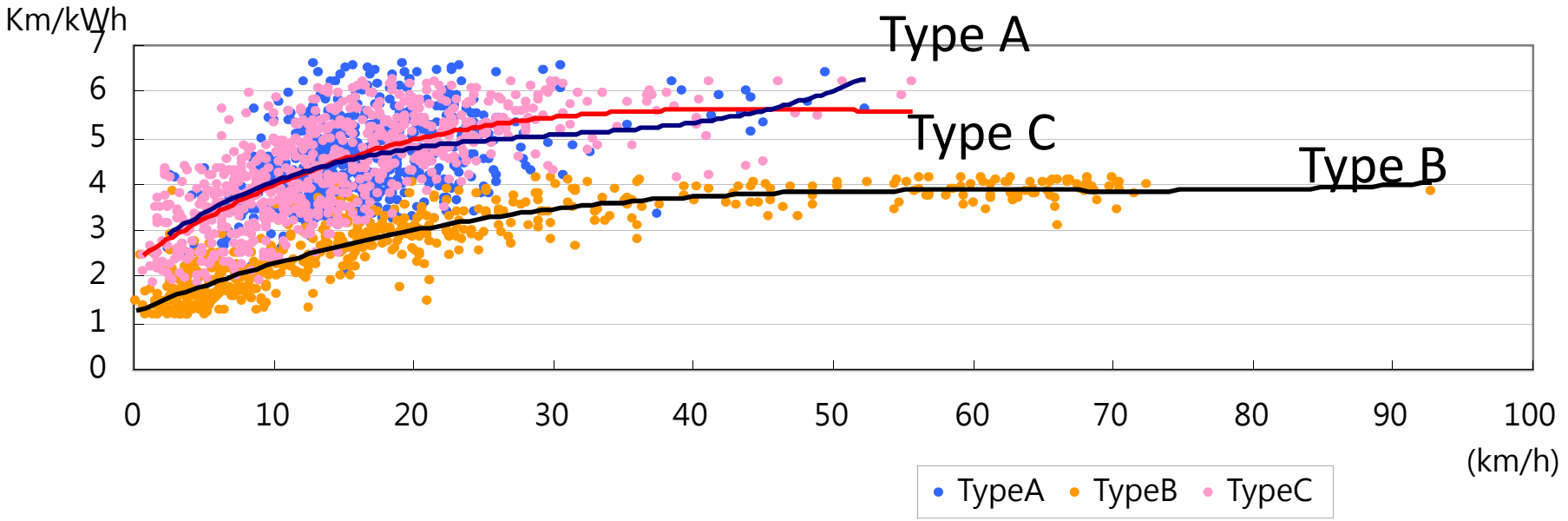
	Project a	Project b
average speed(km/h)	A:17.04 B:17.73	14.98

- **Because the average speed is not fast , the vehicle in the projects is in the city.**
- **It's indicated the government car always runs in the city or users driver EVs only when the trip in the city.**

the distribution of speed in project b



The analysis result in Taiwan i-EV Pilot Project(IV)



Conclusion

- The result of pilot project
  - the EV drivers didn't fully utilize the vehicle. It shows the user have less reliance on EVs by now.
- With Taiwan pilot projects
  - The general public can drive the EVs in practice.
  - The EV industry realize what users need and improve the car's design to be suitable for users.
  - provide the driving data to the government adjust and make the policy to popularize the EVs and let the public accept the EVs more.

Thanks for your attention

EV Testing Capability of ARTC

EMC Lab
(Completion 2012)

New

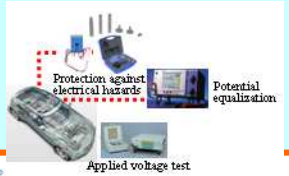
Battery Pack Abuse Test Lab
(Completion,2013)

New

Battery Pack Reliability Test Lab
(Completion,2012)

New

Electric Safety Lab
(Completion,2011)



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