

Transport MRV

- Republic of Korea

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SANGJUNE PARK

The Korea Transport Institute



Contents

I. ROK's Ambitions

II. Generals of Transport

III. Transport Statistics of ROK

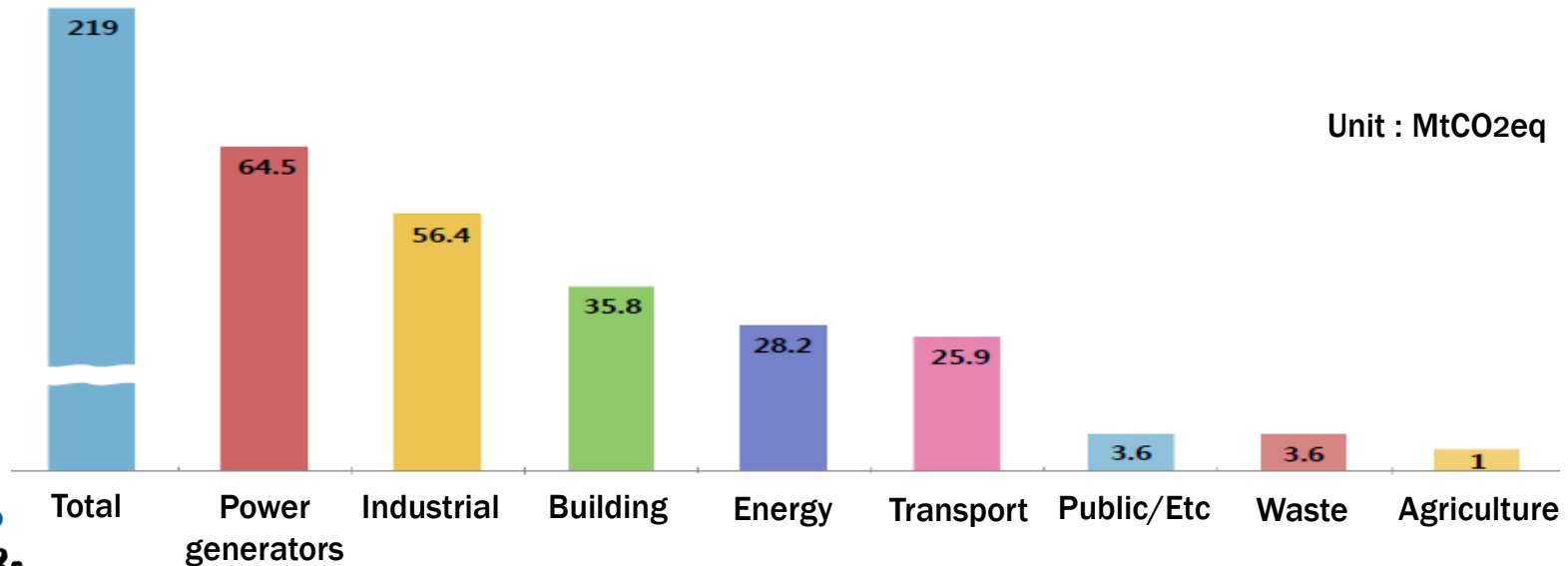
IV. Implications

I. ROK's Ambitions

1. National GHG reduction target

- Paris Agreement for POST-2020

- ROK's INDC : **37%** of BAU(Business-of-Usual) by 2030
- Domestic reduction **25.7%**, Overseas reduction **11.3%**

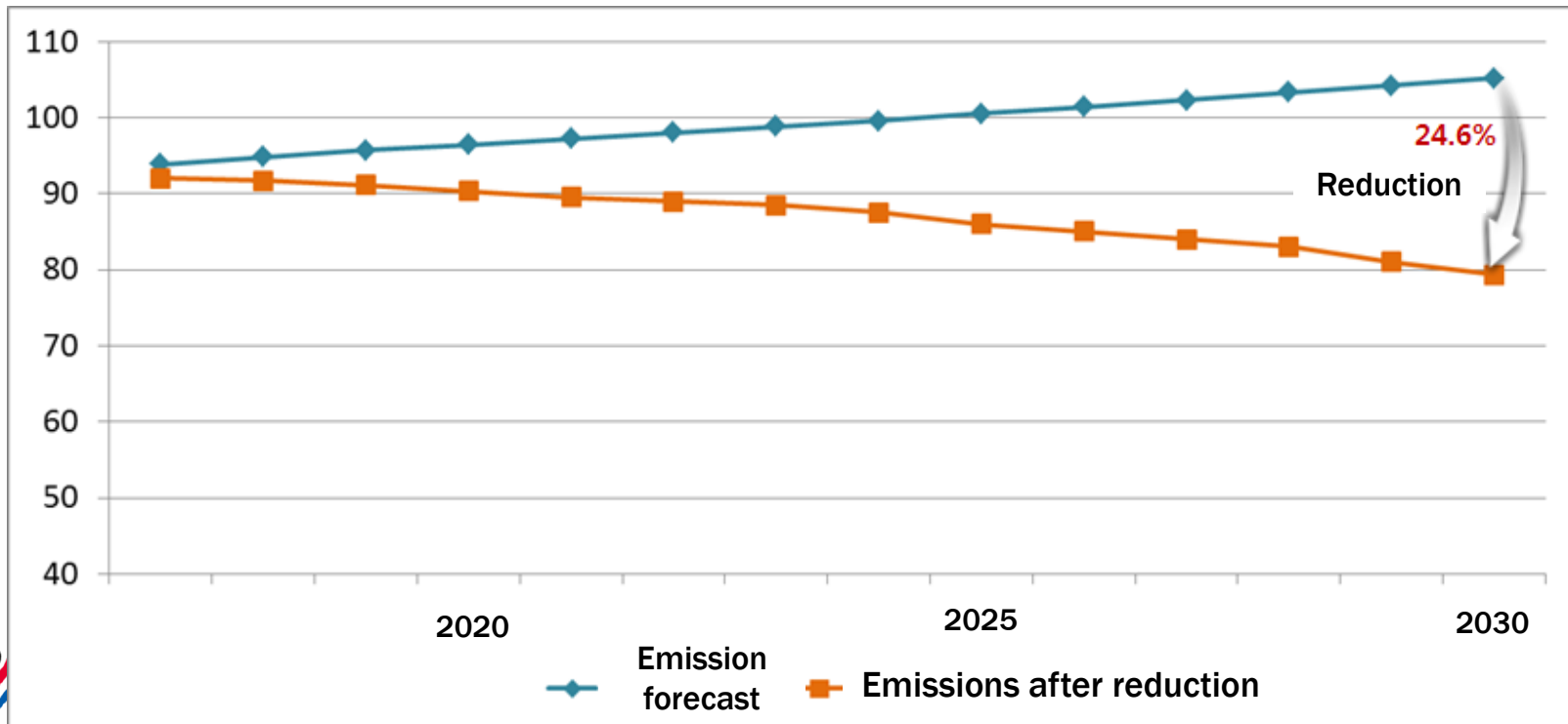


I. ROK's Ambitions

2. 2030 National GHG Reduction Roadmap

- **Transport Sector GHG Emissions**

- Forecast of GHG emissions from the transport sector will increase by an annual average of 0.9% until 2030, **expect 105.2 million tons.**
- 2030 Greenhouse gas reduction targets are reduced by **24.6% (25.9 million tons) compared to BAU in 2030** through technological and policy reduction measures.



I . ROK's Ambitions

3. GHG Reduction plan for transport sector

- **Technical Reduction Implementation : 22.0 MtCO₂eq**
- **Policy Reduction Implementation : 3.8 MtCO₂eq**

Classification	Contents	Reduction amount
Technical Reduction Implementation	Improve average fuel efficiency of automobile	22.0MtCO₂eq
	Introduction of Fuel Efficiency Standard for commercial vehicles	
	Expansion of biodiesel blending (RFS)	
	Introduction of wired and wireless charging electric bus system	
	Improve energy efficiency in shipping sector	
Policy Reduction Implementation	Expansion of public transportation	3.8MtCO₂eq
	Transport Demand Management(car-sharing etc)	
	Green Logistics Efficiency Plan	
	Air transportation efficiency plan	

I . ROK's Ambitions

▶ Improvement on the fuel efficiency of passenger cars

	2015	2016(10%)	2017(20%)	2018(30%)	2019(60%)	2020(100%)
Fuel Efficiency (km/L)	17	17.7	18.5	19.2	21.4	24.3
GHG emissions (g/km)	140	135.7	131.4	127.1	114.2	97

I . ROK's Ambitions

▶ Diffusion of Green cars

(Unit :
thousand)

구분		'18	'19	'20	'21	'22	'23	'24	'25
EV	EV	86	136	200	268	340	417	498	580
	Charging Stations	830	1,000	1,400	1,500	1,900	2,300	2,800	3,300
FCV	FCV	2.5	5.1	9	15	24	38	61	100
	Charging Stations	30	50	80	90	110	130	160	210

I . ROK's Ambitions

▶ Mixture of Biodiesel

(Unit : %)

	2017	2018	2019	2020	2025	2030
Mixture rate(%)	BD 2.5	BD 3.0	BD 3.0	BD 3.0	BD 4.0	BD 5.0

I . ROK's Ambitions

▶ Introduction of Electric buses



〈Fig 1. On Line Electric Vehicle(bus)〉

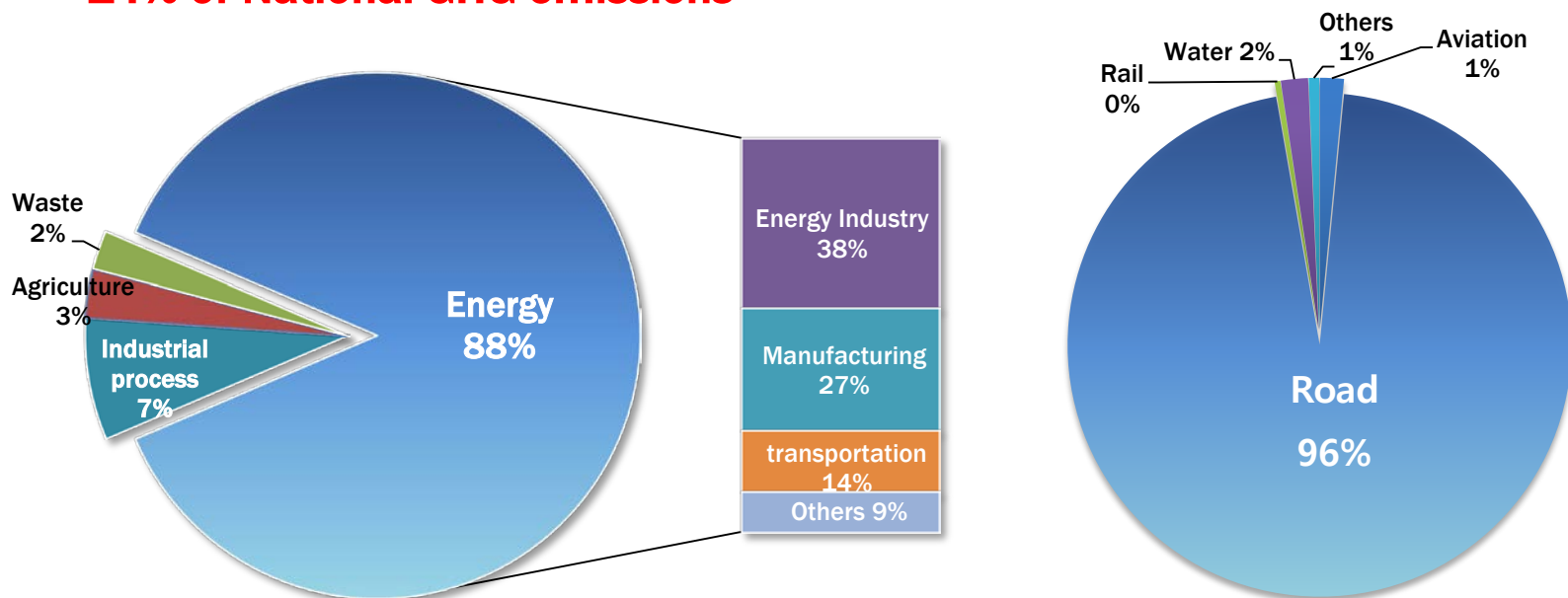


〈Fig 2. Electric bus in Jeju island〉

II . Generals of Transport

1. GHG emissions in Transport sector

- **14% of National GHG emissions**



< Table 1) Emissions of GHG in domestic transport sector (Unit :thousand tCO2)

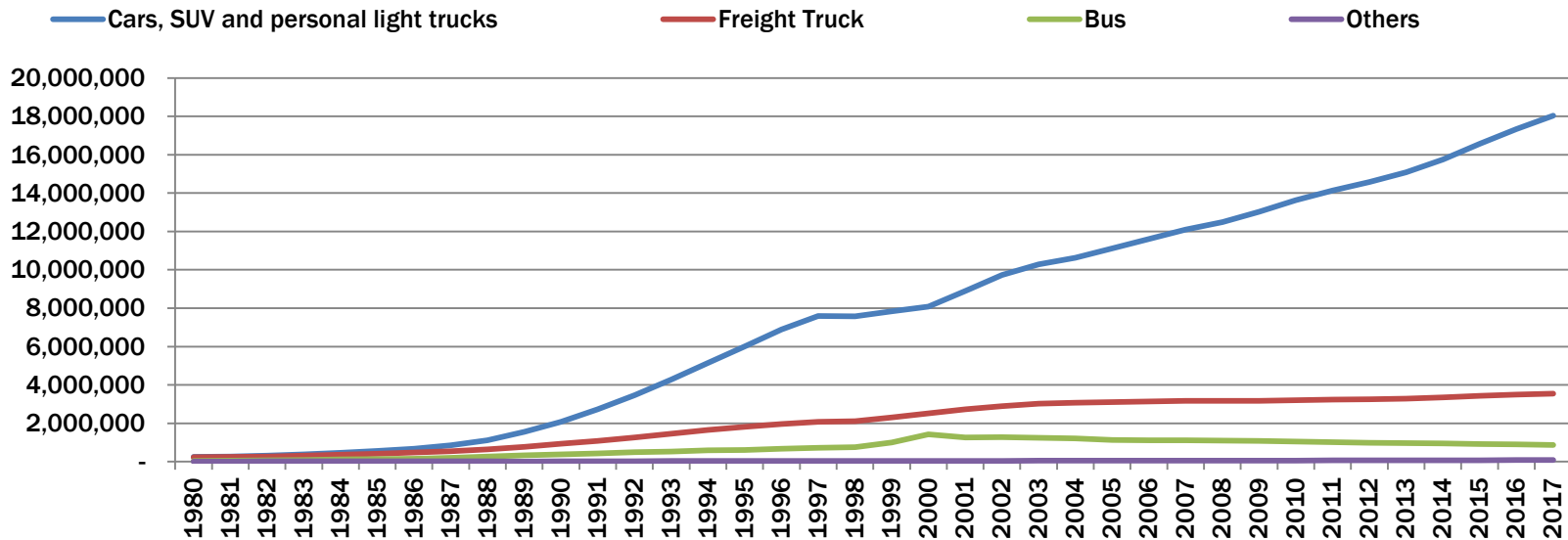
Classification	1990	1995	2000	2005	2010	2015
Water	824	1,332	1,410	1,035	1,141	1,453
Road	30,902	58,534	64,489	76,861	81,102	90,125
Rail	877	938	970	808	556	342
Aviation	2,441	3,632	2,750	2,775	2,269	1,637
Others	449	292	291	334	380	629
Total	35,493	64,728	69,910	81,813	85,448	94,186

II . Generals of Transport

2. Transport sector - Road

- **22.5 Million cars in 2017**

- Growth rate of 3.7% since 2000



< Table 2> Vehicle Registration (Unit : Million)

Classification	1980	1990	2000	2005	2010	2015	2017
Cars, SUV and personal light trucks	0.2	2.1	8.1	11.1	13.6	16.6	18.0
Freight Truck	0.2	0.9	2.5	3.1	3.2	3.4	3.5
Bus	0.0	0.4	1.4	1.1	1.0	0.9	0.9
Others	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Total	0.5	3.4	12.1	15.4	17.9	21.0	22.5

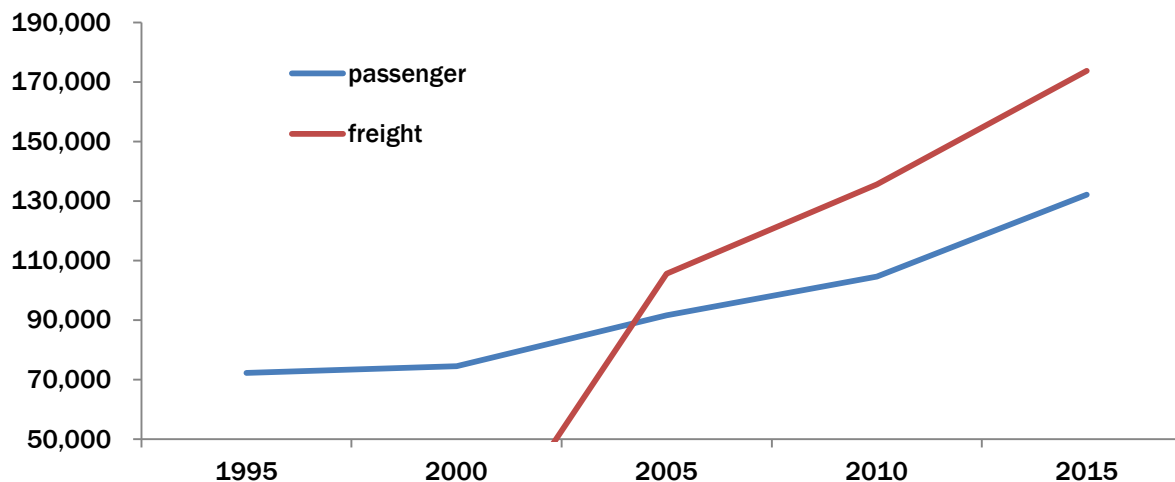
II . Generals of Transport

2. Transport sector - Road

- Domestic Road transport

(Unit : Millon passenger-km, Millon ton-km)

Classification	1995	2000	2005	2010	2015
Passenger	72,325	74,573	91,666	104,671	132,222
Freight	-	-	105,673	135,648	173,815



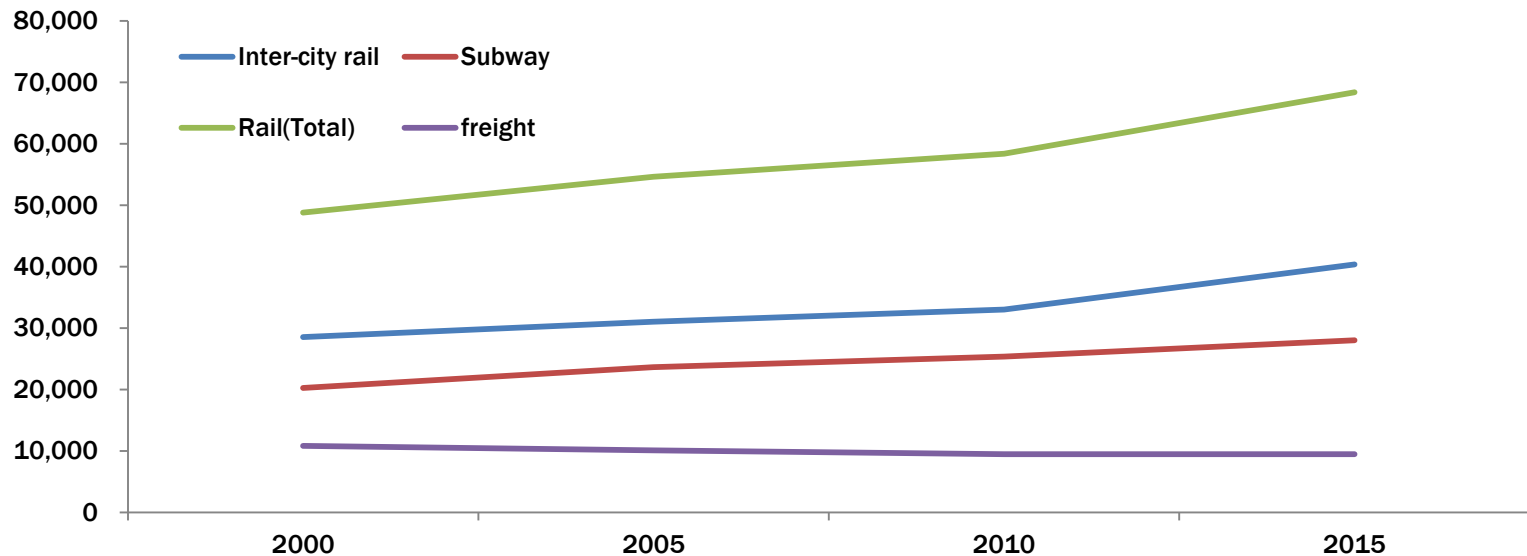
II . Generals of Transport

3. Transport sector - Rail

- Domestic Rail transport

(Unit : Millon passenger-km, Millon ton-km)

Classification		2000	2005	2010	2015
Passenger	Inter-city rail	28,528	31,004	33,012	40,343
	Subway	20,268	23,637	25,369	28,028
	Rail(Total)	48,796	54,641	58,381	68,371
Freight		10,803	10,108	9,452	9,479



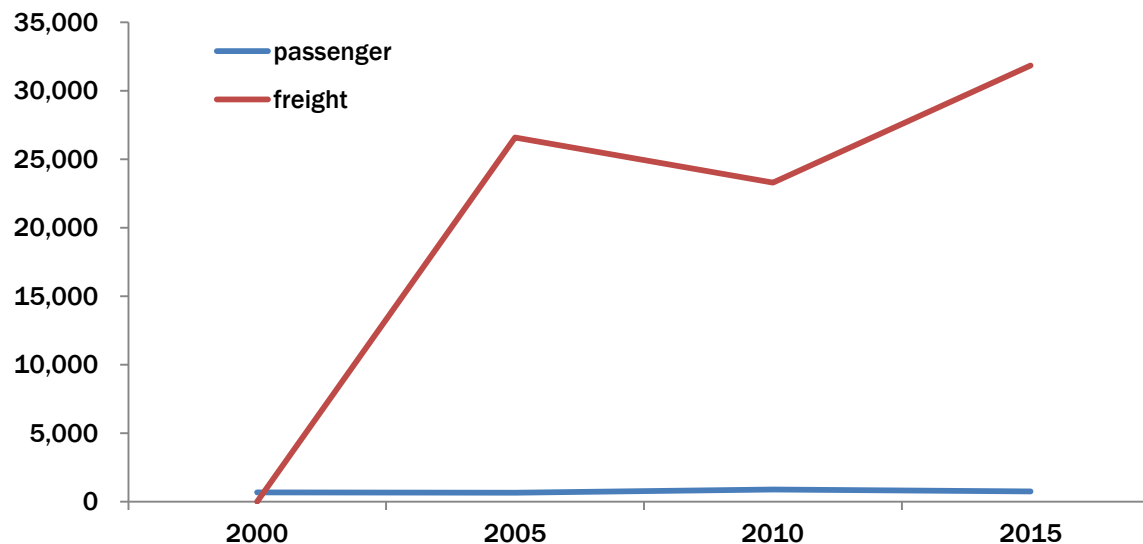
II . Generals of Transport

4. Transport sector - Maritime

- Domestic Maritime transport

(Unit : Millon passenger-km, Millon ton-km)

Classification	2000	2005	2010	2015
Passenger	672	668	883	757
Freight	-	26,590	23,281	31,841



II . Generals of Transport

5. Transport sector - Aviation

- Domestic Air transport

(Unit : Millon passenger-km, Millon ton-km)

Classification	2000	2005	2010	2015
Passenger	8,039	6,594	8,011	10,707
Freight	167	151	107	112



III . Transport Statistics of ROK

1. Road

- **Institute in charge : Ministry of Land, Infrastructure and Transport (MOLIT) / Korea Transportation Safety Authority**

Classification	Collection data	Data collection	Administration	Renewal
Registered vehicles	Fuel type, Vehicle type	Vehicle Registration System	Ministry of Land, Infrastructure and Transport	Monthly
Vehicle-Kilometer	Fuel type, Vehicle type	VIMS	Korea Transportation Safety Authority	Yearly
Transport	Passengers, Freight Passengers-km, Freight-km	Report from operating companies	Ministry of Land, Infrastructure and Transport	Yearly

〈 Table 3〉 Road transport statistics data

Classification		2001	2005	2010	2014
Registered vehicles (Each, Million)	All	12.9	15.4	17.9	20.1
	Cars, SUV and personal light trucks	8.9	11.1	13.6	15.7
	Freight Truck	2.7	3.1	3.2	3.4
	Bus	1.3	1.1	1.0	0.9
Vehicle-Kilometer (Billion km)	Cars, SUV and personal light trucks	1901.8	2042.1	1874.4	2055.2
	Freight Truck	628.3	705.6	627.6	604.7
	Bus	302.7	260.5	212.9	207.3
Transport (Thousand)	Passenger transport by Passenger Cars	-	-	-	16,824,460
	Buses Passengers	66,176	76,546	91,287	104,990
	Taxis Passengers	4,770,450	3,824,166	3,780,759	3,682,950

III . Transport Statistics of ROK

2. Rail

- Institute in charge : Korea Rail Corporation, MOLIT

Classification	Collection data	Data collection	Administration	Renewal
Registered Rails	Vehicle type		Korea Railroad	Monthly
Vehicle-Kilometer	Passengers, Freight			
Transport	Passengers, Freight Passengers-km, Freight-km			

〈 Table 4〉 Rail transport statistics data

Classification		2001	2005	2010	2011	2012	2013	2014
Registered Rails (Each)	All	20,888	21,496	20,773	20,805	20,933	20,677	19,640
	KTX	-	920	1,110	1,110	1,160	1,160	1,160
	Other RailCar	17,904	18,320	17,149	17,087	16,991	16,711	15,644
	Subway	2,984	3,176	3,718	3,942	3,966	3,996	3,996
	Others	19	19	17	16	16	16	16
Vehicle-Kilometer (Million km)	Passengers	699	1012	1109	1188	1205	1292	1262
	Freight	600	567	524	524	547	483	464
Transport (Millions, Tonnes)	Railways Passengers	851	951	1061	1119	1152	1225	1263
	Railways Freight	45	42	39	40	40	40	37
	Subway Passengers	2,527	2,021	2,282	2,399	2,444	2,559	2,587

III . Transport Statistics of ROK

3. Aviation

- Institute in charge : Ministry of Land, Infrastructure and Transport

Classification	Collection data	Data collection	Administration	Renewal
Registered Aircraft	Vehicle type	Airportal system	Ministry of Land, Infrastructure and Transport	Monthly
Vehicle-Kilometer	Total Vehicle-Kilometer			
Transport	Passengers, Freight Passengers-km, Freight-km			

〈 Table 5〉 Aviation transport statistics data

Classification		2001	2005	2010	2011	2012	2013	2014
Registered Aircraft (Each)	All	278	294	514	550	590	623	655
	A transport plane	177	182	242	264	289	306	322
	Others	101	112	272	286	301	317	333
Vehicle-Kilometer (million km)	Total Kilometer	58.1	47.8	57.5	59.8	61.7	64.6	63.6
	Passengers	21.8	17.2	20.2	21.0	21.6	22.4	24.6
Transport (Million, Tonnes)	Passengers-km	7,873.4	6,593.8	8,010.6	8,394.8	8,709.8	9,093.0	9,469.6
	Freight	0.4	0.4	0.3	0.3	0.3	0.3	0.3
	Freight-km	167.9	150.6	106.6	114.9	108.6	104.2	110.7

III . Transport Statistics of ROK

4. Maritime

- Institute in charge : Korea Maritime Institute

Classification	Collection data	Data collection	Administration	Renewal
Registered ship	Vehicle type		Korea Maritime Institute	Monthly
Vehicle-Kilometer	Freight			
Transport	Passengers, Freight Passengers-km, Freight-km			

〈 Table 6〉 Water transport statistics data

Classification		2001	2005	2010	2011	2012	2013	2014
Registered ship (Each)	All	6,586	7,119	9,041	9,396	9,435	9,360	9,313
	passenger ship	175	205	203	212	221	224	233
	Cargo ship	6,411	6,914	8,838	9,184	9,214	9,136	9,080
Vehicle-Kilometer (Million km)	Freight-km	36,443.0	26,590.0	23,281.0	27,220.0	25,804.0	30,476.0	29,848.0
Transport (Tonnes-kilometres, Million)	Passengers	9.3	11.1	14.3	14.3	14.5	16.1	14.3
	Passengers-km	555.0	668.0	883.0	981.0	922.0	1,012.0	896.0
	Freight	143.4	119.4	124.2	122.9	117.0	120.4	117.9
	Freight-km	36,443.0	26,590.0	23,281.0	27,220.0	25,804.0	30,476.0	29,848.0

III . Transport Statistics of ROK

5. Energy Consumption

- Institute in charge : Korea Energy Economic Institute

Classification	Collection data	Data collection	Administration	Renewal
Transport mode	Energy Consumption by Sector	Korea Petroleum Corporation	Korea Energy Economics Institute	Yearly


〈 Table 7〉 Energy transport statistics data (Unit : Thousand TOE)

Classification		2001	2005	2010	2011	2012	2013	2014
Road	Gasoline	7,847	7,512	8,498	8,578	8,855	8,802	8,804
	Diesel	12,988	15,537	14,519	14,510	14,831	15,563	16,056
	LPG	3,945	4,704	5,293	5,035	4,862	4,753	4,454
Rail	Diesel	339	280	195	177	177	156	130
	Electricity	194	224	188	193	194	186	172
Aviation	Aviation fuel	2,208	2,810	3,438	3,448	3,721	3,725	3,948
Water	Diesel	559	478	415	385	363	372	311
	B-B	3,614	3,453	2,673	2,769	2,593	1,895	1,859

IV . Implications

- **Still more works to do for transport MRV**
 - linking fuel consumption to activity data
 - < = based on empirical study and survey

- **To build a high-level framework for transport MRV**
 - using ICT
 - Big data analysis



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감사합니다
Thank you

spark@koti.re.kr