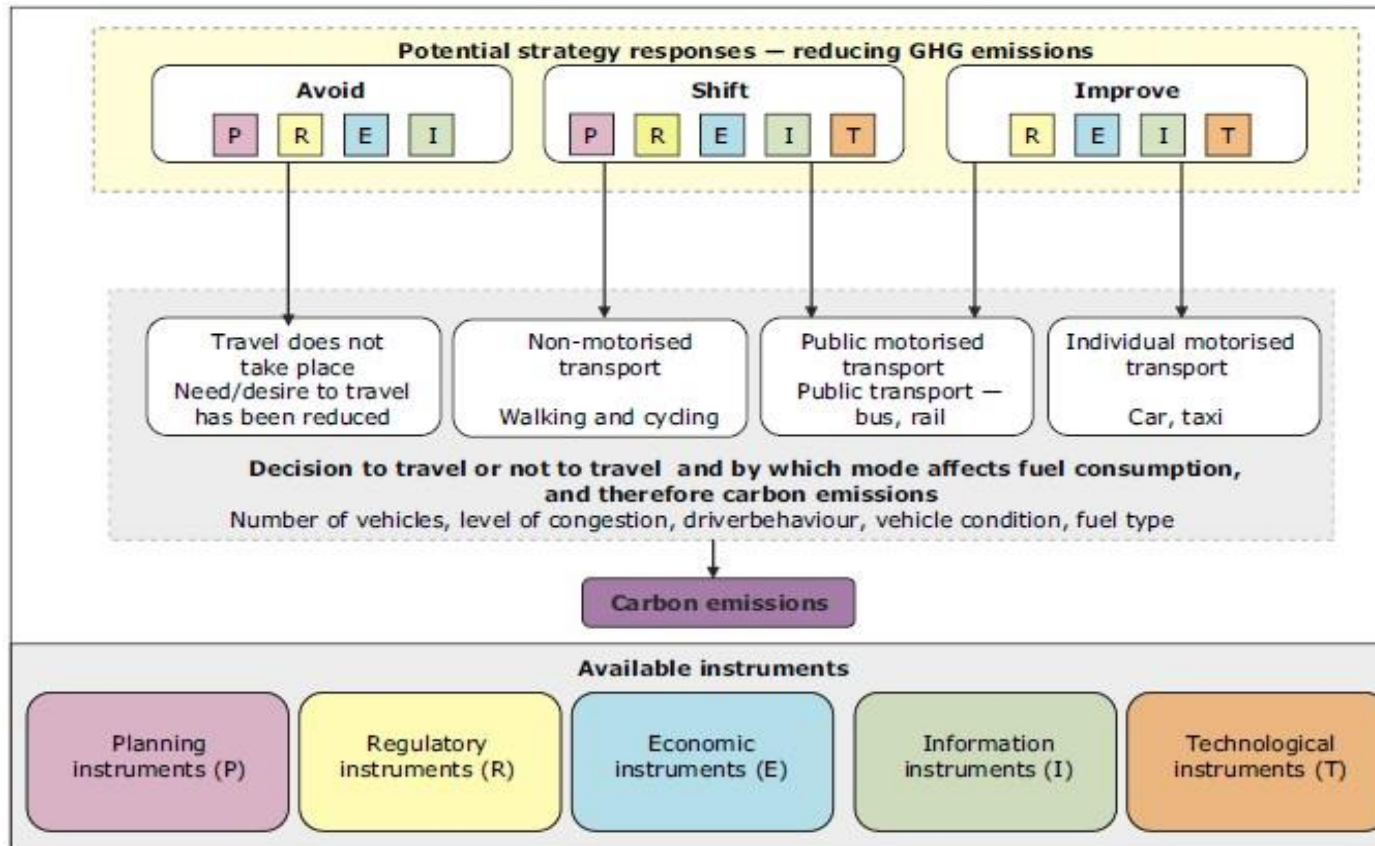


Hindrance of Reducing Transport Energy Consumption - Never Giving up Own Car

Sangjin HAN
Korea Transport Institute

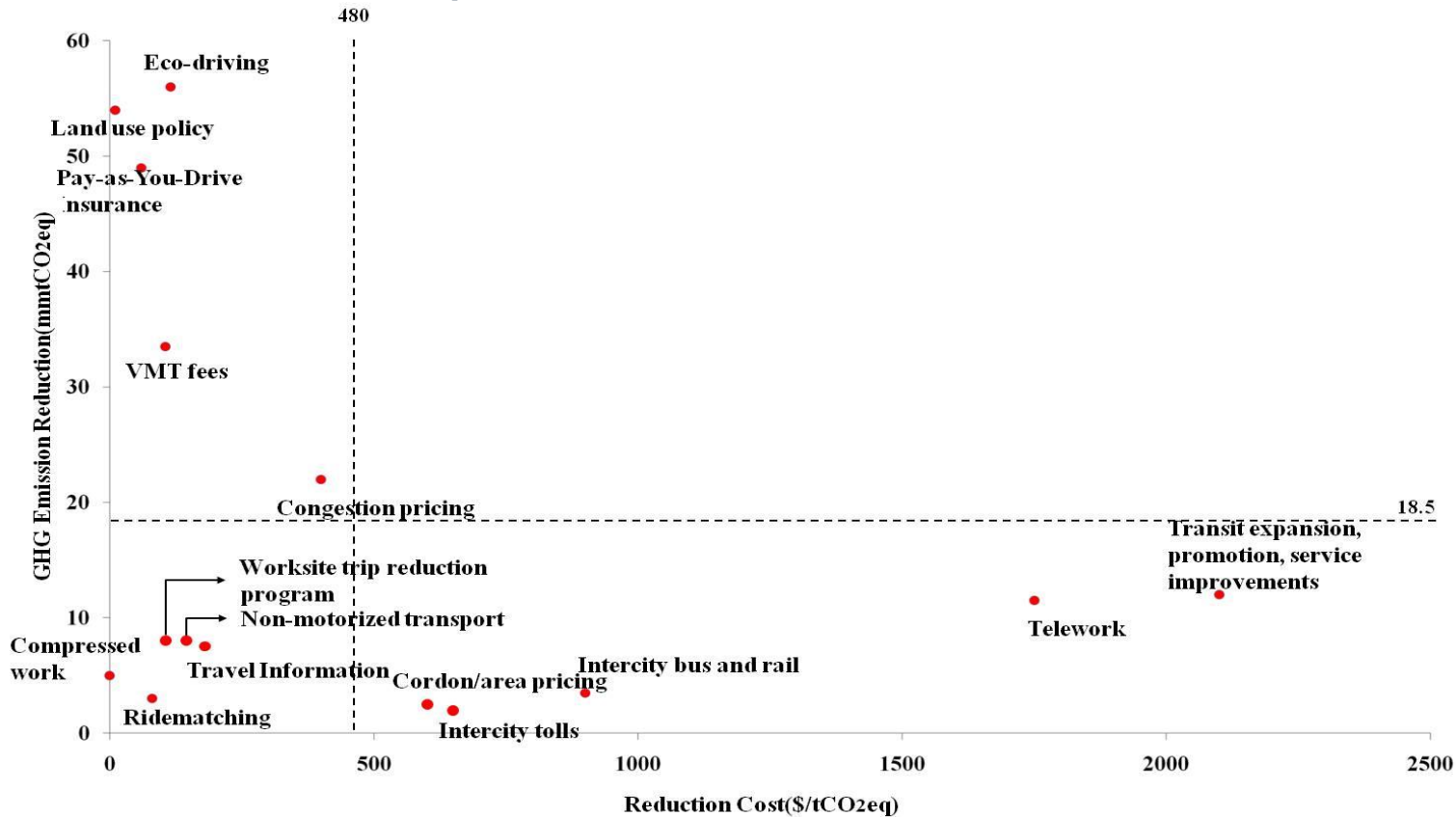
I. Energy Reduction Measures in Transport Sector: ASI 2



Video: Sustainable Transport for All

II. Which Measures First?

Emission reduction per cost : USA



Source: U.S. Department of Transportation, Transportation's Role in Reducing U.S. Greenhouse Gas Emissions Volume 2: Technical Report, 2010

II. Which Measures First ?

		Emission reduction per cost			
		I (low cost, high effect)	II (low cost, low effect)	III (high cost, high effect)	IV (high cost, low effect)
Public Compliance	I (High)	Eco-driving	ITS	Improving fuel-efficiency, Promoting low-pollution vehicles	Biofuels
	II (Moderate)	Pay-as-you-drive insurance	Encouraging walking & bicycles, Modal shift, Car sharing	Express railways	Remote working, Public transport improvements
	III (Low)	Congestion pricing			

III. Which Measures First: Reduction Potential

Reduction Targets in Transport Sector : Available National Reports

	Korea	Japan	Germany	U.K.	USA
Reduction target (MtCO2)	46.52	58.15	112.8	36.6	285
Reduction per person	0.96	0.46	1.37	0.60	0.95
Reduction per GDP per capita	1,876	1,729	3,280	1,026	6,265
Reduction per vehicle	2.83	1.16	2.19	1.13	1.14
Reduction for passenger (MtCO2)	39.75 (85.4%)	40.15 (69.0%)	110.7 (98.1%)	36.6 (100%)	285 (100%)
Reduction for freight (MtCO2)	6.77 (14.6%)	18.00 (31.0%)	2.10 (1.9%)	0	0

II. Which Measures First: Reduction Potential

Reduction Potential by Pillars : Improve > Shift > Avoid

		Korea	Japan	Germany	U.K.	USA
Avoid (16.7)	Traffic demand management	3.7	-	24.7*	-	38.6*
	<ul style="list-style-type: none"> · Congestion pricing · Remote working · Car sharing 	2.3	-	-	-	8.6
		0.4	-	-	-	4.0
		0.9	-	3.5	-	1.1
Shift (19.2)	Walking & bicycle	1.9		6.9	7.1	2.8
	Improving public transport	8.1	5.6	6.2	-	5.4
	Modal shift	14.6	31	2.9	-	-
Improve (59.6)	Improving fuel-efficiency	53.7	49.2	24.6	53.3	-
	Biofuels	4.3	-	14.0	32.8	-
	Eco-driving	8.4		8.8	1.1	19.6
	ITS	5.0	9.5	-	-	2.6

How many people never giving up own cars

I. Credit Card Data Overview

AIM: To analyze spending characteristics using credit card data

<Table 1> An overview of credit card data analysis – “A” credit card case

Category	Details
Data collection period	<ul style="list-style-type: none">• From January 1st, 2017 to December 31th, 2017 (1 year)
Analysis target group	<ul style="list-style-type: none">• Those who only use “A” credit card & their card spending more than USD 500 every month• 288,374 persons (Male: 156, 546 persons, Female:131,828 persons)
Analysis data	<ul style="list-style-type: none">• User’s cumulative card spending during data collection period

<Table 2> An overview of credit card data - “A” credit card case

Category		Data Description
Credit card holders		<ul style="list-style-type: none"> • A membership of credit card : 9 million persons • Personal data : age, sex, job, income, debt rating, asset rating, credit rating, address, contact no., etc. • Card spending data : the amount, the date, the venue (member stores) of card spending
Credit card member stores	General information	<ul style="list-style-type: none"> • A member stores of credit card : 2.3 million stores • Store data : address, business type, owner’s personal data • Sales data : the amount and the date of sales, credit card holders
	Transport business	<ul style="list-style-type: none"> • Mode : airplane, passenger ship, rail, taxi, bus, subway, etc. • Parking : Resting place, parking service, public parking spaces, etc. • Brand-new and second-hand vehicle sales • Vehicle maintenance, rent-a-car, car washing, freight shipping & storage, etc. • Gas stations
Transport data		<ul style="list-style-type: none"> • Toll data (Hi-Pass) : 420,000 /day (2017) • Public transport : 1,380,000 / day (2017)

II. Spending by Categories

<Table 3> Credit card spending on transport cost - “A” credit card case

	Category	Credit card spending (USD/yr)	Portion (%)
Public transport	Taxi	254	12
	Transit	280	13
	Sub total	534	25
Private transport	Toll	99	5
	Gas charge	1134	53
	Vehicle maintenance	341	16
	Parking	15	1
	Sub total	1589	75
	Sum	2123	100

III. Captive and Choice Riders (proportion)

Overallly 15 % of travellers never give up using private cars

<Table 5> Captive riders vs. Choice riders

Captive riders		Choice riders			
Public transport		Private & public transport		Private transport only	
Spending(USD)	Portion(%)	Spending(USD)	Portion(%)	Spending(USD)	Portion(%)
493	33	1,747	52	2,251	15

III. Captive and Choice Riders (proportion)

<Table 6> Captive riders vs. choice riders by sex

Sex	Captive riders		Choice riders			
	Portion (%)	Spending (USD)	Private & public transport		Private transport	
			Portion (%)	Spending (USD)	Portion (%)	Spending (USD)
Male	20.0	580	79.5	1,869	81.4	2,422
Female	80.0	471	20.5	1,277	18.6	1,499
Sum	100.0	493	100.0	1,747	100.0	2,251

III. Captive and Choice Riders (proportion)

<Table 7> Captive riders vs. choice riders by age

Age	Captive riders		Choice riders			
	Portion (%)	Spending (USD)	Private & public transport		Private transport	
			Portion (%)	Spending (USD)	Portion (%)	Spending (USD)
20~29	39.6	597	6.9	1,488	4.5	1,811
30~39	37.0	492	45.3	1,568	32.3	1,853
40~49	17.0	317	33.8	1,821	39.4	2,165
50~59	5.5	341	12.2	2,306	20.0	2,963
60~69	0.8	249	1.7	2,111	3.6	3,400
70+	0.1	52	0.0	950	0.2	1,466
Sum	100.0	493	100.0	1,747	100.0	2,251

III. Captive and Choice Riders (proportion)

<Table 8> Captive riders vs. choice riders by income

Income (USD/yr)	Captive riders		Choice riders			
	Portion (%)	Spending (USD)	Private & public transport		Private transport	
			Portion (%)	Spending (USD)	Portion (%)	Spending (USD)
Under 20,000	11.0	561	0.5	1,184	0.2	1,147
20,000~29,999	49.7	532	19.6	1,451	17.2	1,687
30,000~39,999	30.1	423	34.3	1,709	46.8	2,154
40,000~49,999	6.9	425	22.6	2,017	25.0	2,775
50,000~59,999	1.4	520	10.2	1,892	6.5	2,408
60,000~69,999	0.4	421	5.1	1,683	2.4	2,545
70,000~79,999	0.1	355	2.7	1,633	0.6	2,082
80,000~89,999	0.1	147	1.5	1,613	0.3	1,948
90,000~99,999	0.0	55	0.8	1,819	0.1	2,084
Over 10,000	0.2	165	2.7	1,969	0.8	2,063
합계	100.0	493	100.0	1,747	100.0	2,251

III. Captive and Choice Riders (proportion)

<Table 9> Captive riders vs. choice riders by region

Region	Captive riders		Choice riders			
	Portion (%)	Spending (USD)	Private & public transport		Private transport	
			Portion (%)	Spending (USD)	Portion (%)	Spending (USD)
Seoul	48.5	360	49.0	1,527	2.5	2,015
Busan	30.7	95	51.7	1,917	17.6	2,276
Incheon	28.0	160	62.5	1,773	9.5	2,085
Daegu	13.7	45	47.1	2,063	39.2	2,389
Gwangju	15.9	41	47.0	1,857	37.1	2,009
Daejeon	16.2	83	66.8	1,897	17.0	2,240
Ulsan	11.6	24	40.1	1,882	48.3	2,302
Sejong	5.0	60	64.4	2,343	30.6	2,618