



# Evaluation of Road Safety Performance Indicators for Local Governments

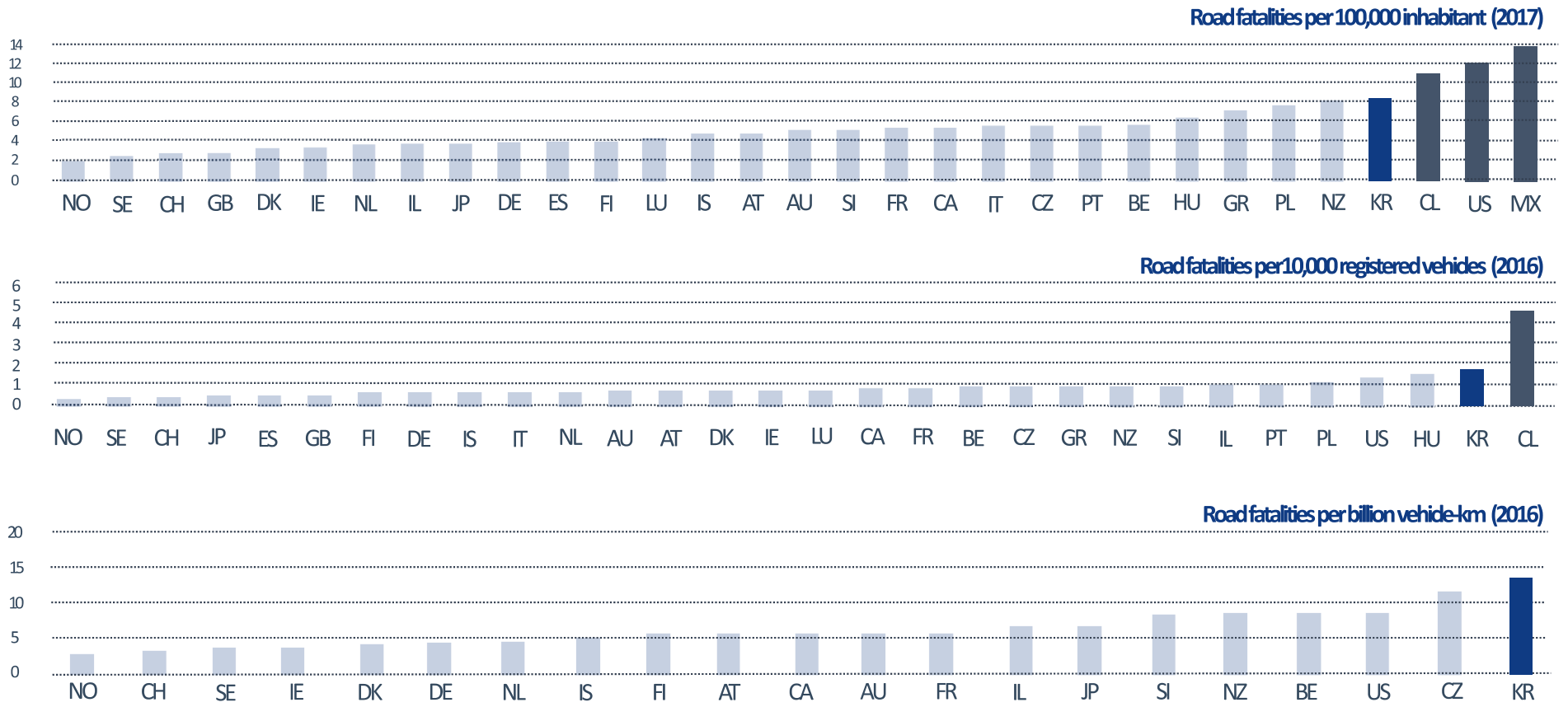
Sangjin HAN

2019. 6. 14.



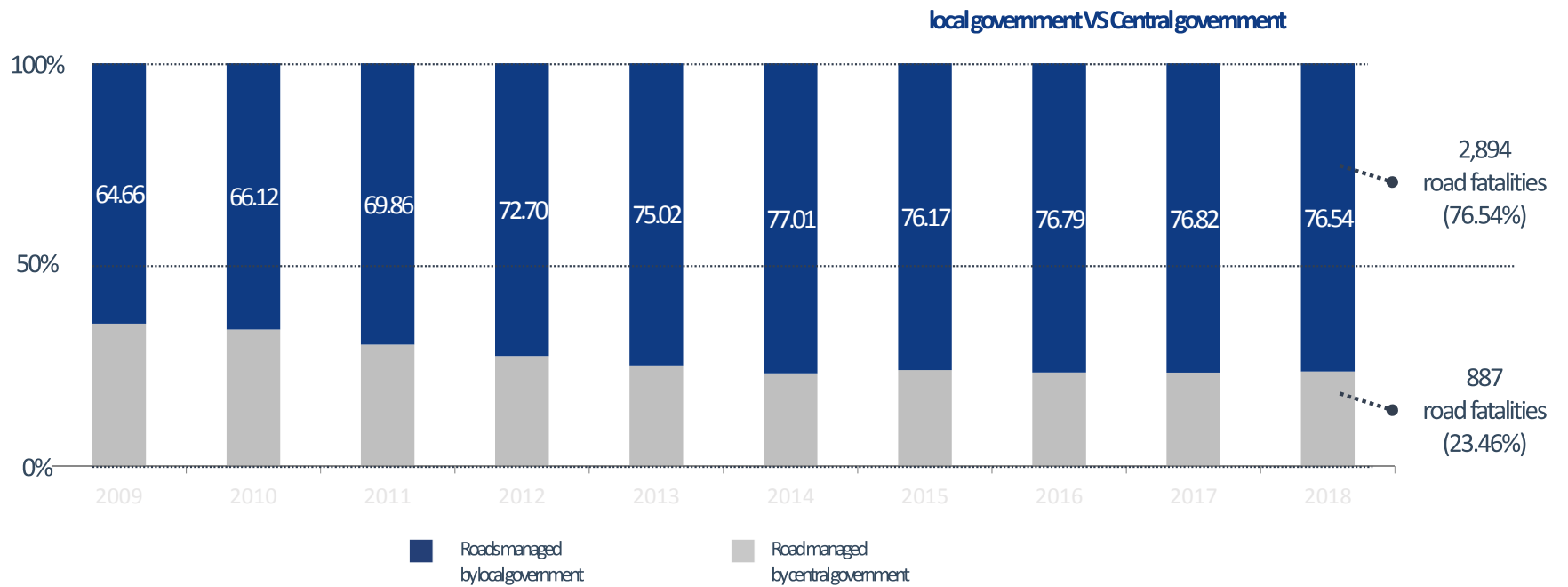
## 1. Introduction

## Korea shows the highest road fatality rate among OECD member countries



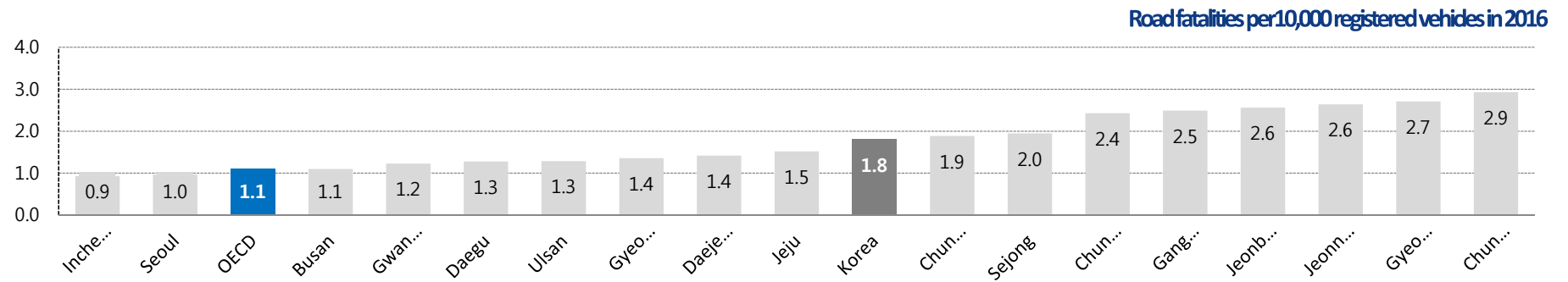
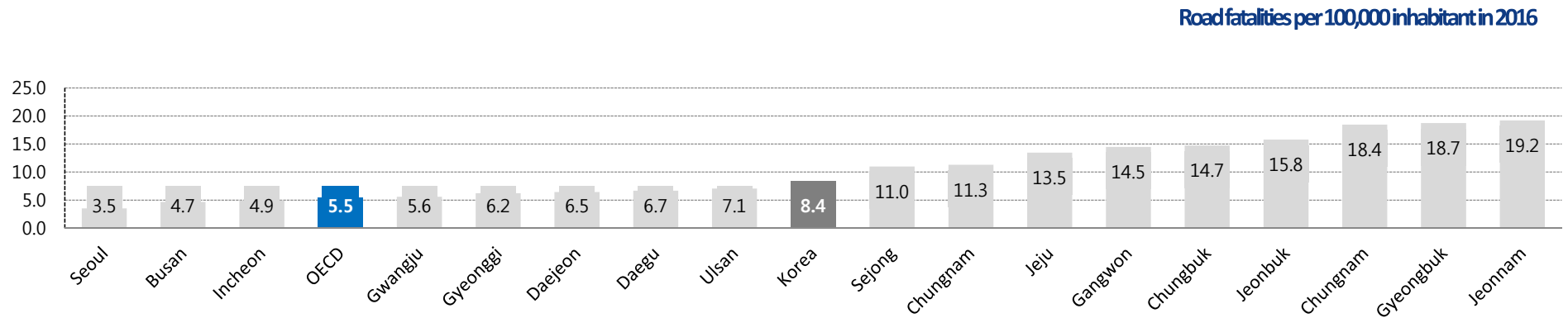
## Local governments are responsible for higher fatality rates

- 76.54 percent of total road fatalities occurred on the roads managed by local governments in 2018.
- The proportion has been increased by 11.9% between 2009 and 2018.



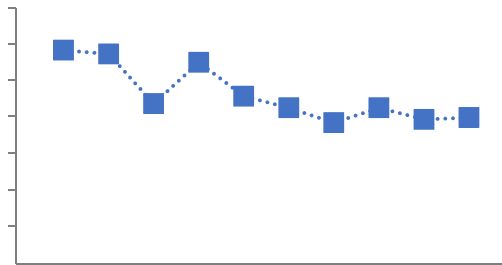
## The difference of road safety performance between local governments

- The least performing case show 5.5 times higher rates than the best one.

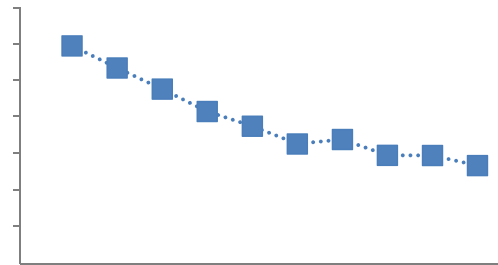


## The trend of road fatalities in road managed by local government('09~'18)

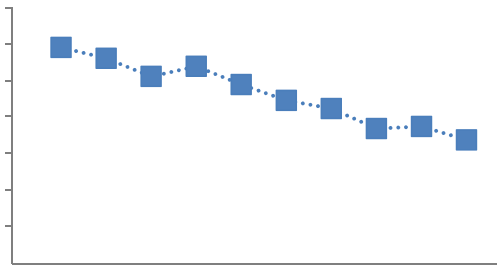
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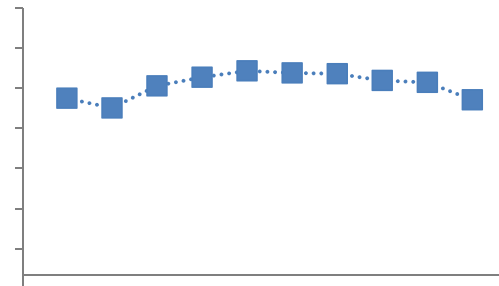
<Motorways>



<National High ways>



<Province roads>



<Urban roads etc. >

## Objectives

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**01.**

**“Developing Road Safety Performance Indicators”**

**02.**

**“Eveluation of the safe system in local governments”**

**03.**

**“Monitoring system to road safety policies”**



## **2. ROAD SAFETY MANAGEMENT SYSTEM**

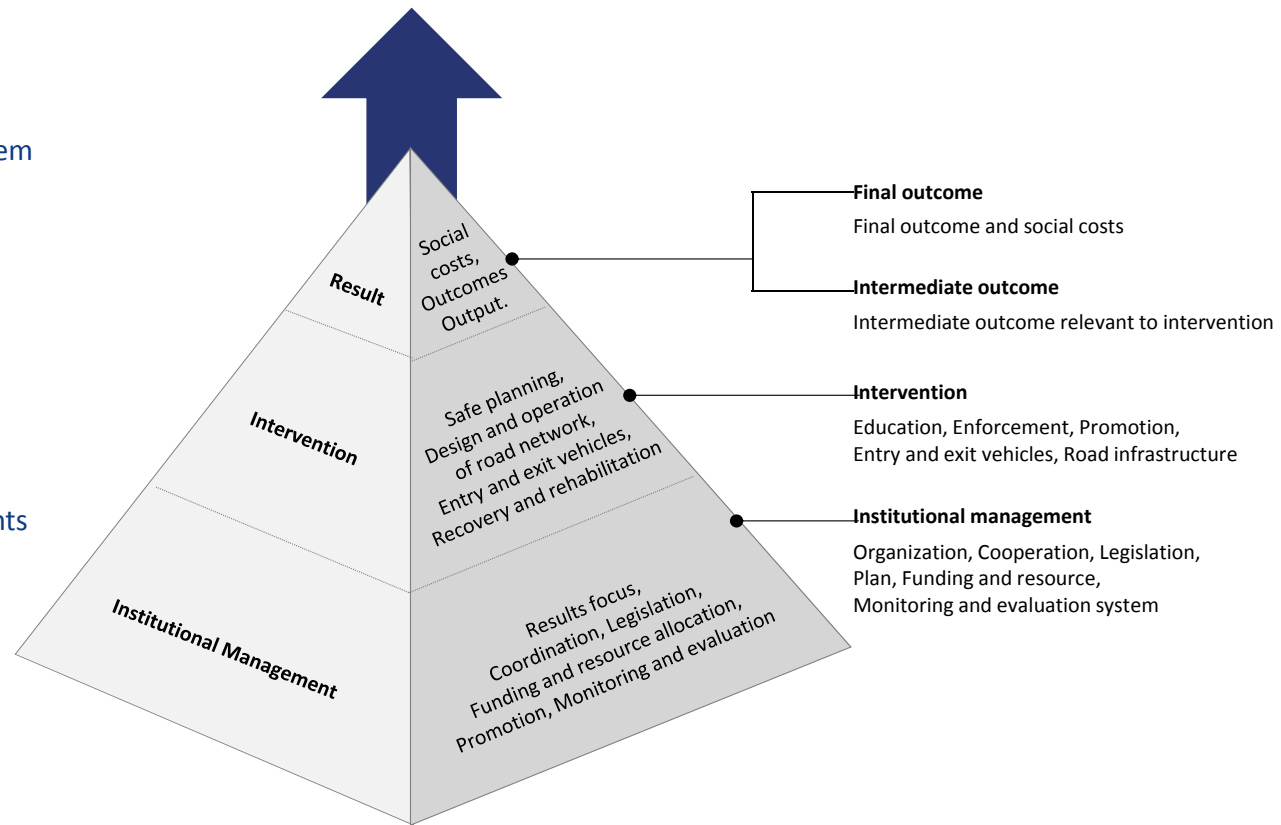


## Road Safety Management System

Management system to realize the concept of Safe System

## Road Safety Performance Indicators

as measures that are causally related to road crashes or serious injuries, used in addition to a count of accidents or injuries to indicate safety performance or to understand the process that leads to accidents.



## How to develop road safety performance Indicators?

### The structure of Road Safety Management System



#### Institutional management

- Existence of responsible organization and road safety officials
- Existence of a coordination agency and active cooperation between relevant bodies
- ⋮



#### Intervention

- Road safety education programs
- Traffic enforcement
- ⋮



#### Intermediate Outcome

- Speeding and drink drive
- Usage of Digital Tachograph (DTG)
- ⋮



#### Final Outcome

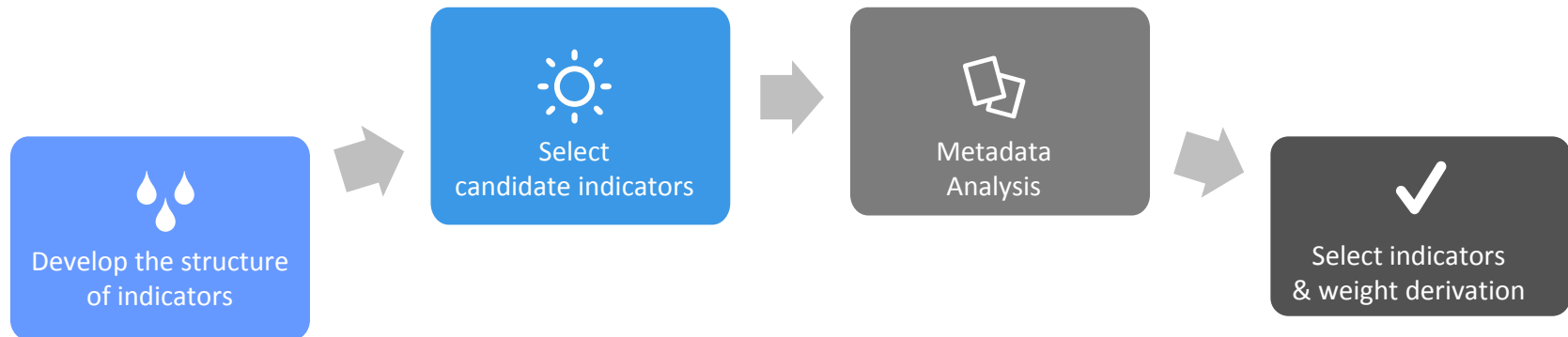
- The number of road fatalities
- The number of road casualties
- ⋮



### **3. ROAD SAFETY PERFORMANCE INDICATORS**

## Process for developing indicators

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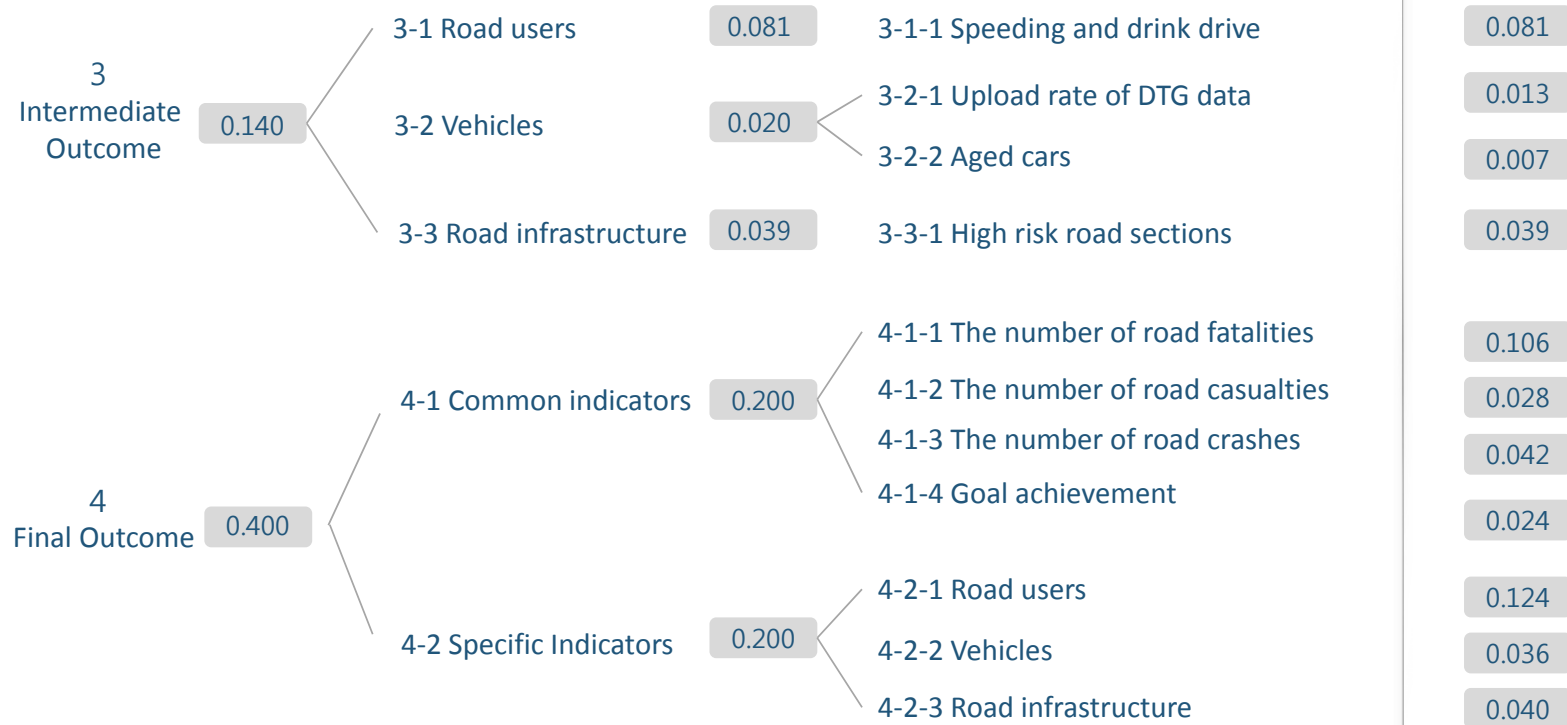


## Road Safety Performance Indicators

1 Institutional management	0.270	1-1 Organizational Structures	0.089	1-1-1 Existence of responsible organization and road safety officials	0.072
				1-1-2 Existence of a coordination agency and active cooperation between relevant bodies	0.017
		1-2 Local ordinances	0.049	1-2-1 Road safety ordinances	0.049
		1-3 Plans	0.051	1-3-1 Road safety action plans and implementation	0.051
		1-4 Funding	0.054	1-4-1 Level of road safety budget	0.054
		1-5 Promotion	0.027	1-5-1 Promotion of local road safety plans and monitoring progress of road safety	0.027
2 Intervention	0.190	2-1 Road users	0.129	2-1-1 Road safety education programs	0.053
				2-1-2 Traffic enforcement	0.044
				2-1-3 Media promotion for road safety	0.032
		2-2 Vehicles	0.025	2-2-1 Use of digital tachograph (DTG) to improve safety of commercial vehicles	0.025
		2-3 Road infrastructure	0.036	2-3-1 Road infrastructure safety projects	0.036

## Road Safety Performance Indicators

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## Possible values and description

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### 1-1-1. Existence of responsible organization and road safety officials

Values and descriptions
A: Have responsible organization with more than 5 road safety officials in local government
B: Have responsible organization with less than 5 road safety officials in local government
C: Have more than 2 road safety officials without a responsible organization (officials belong to other transport related unit)
D: Have less than 2 road safety officials without a responsible organization
E: No road safety official, no responsible organization

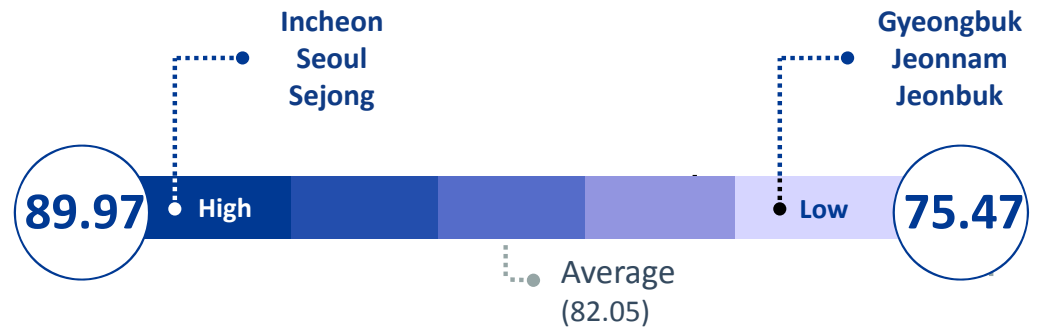
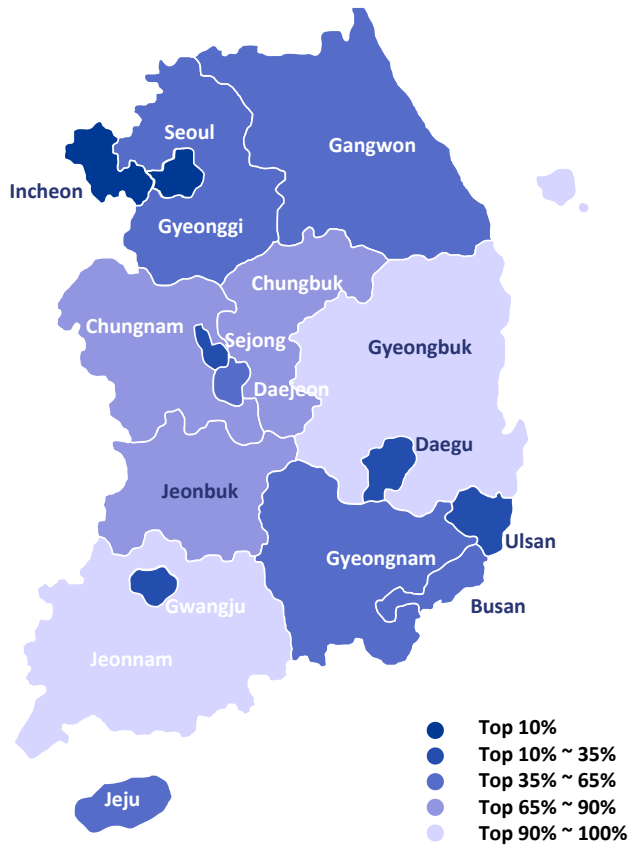
### 1-4-1. Level of road safety budget

Values and descriptions
A to E according to the range of road safety budget allocation (1,000 KRW per Road Safety Coefficient)
$*RSC = \sqrt[3]{\text{Number of vehicles} \times \text{population} \times \text{road length in km}}$

## 4. EVALUATION OF LOCAL GOVERNMENT IN KOREA



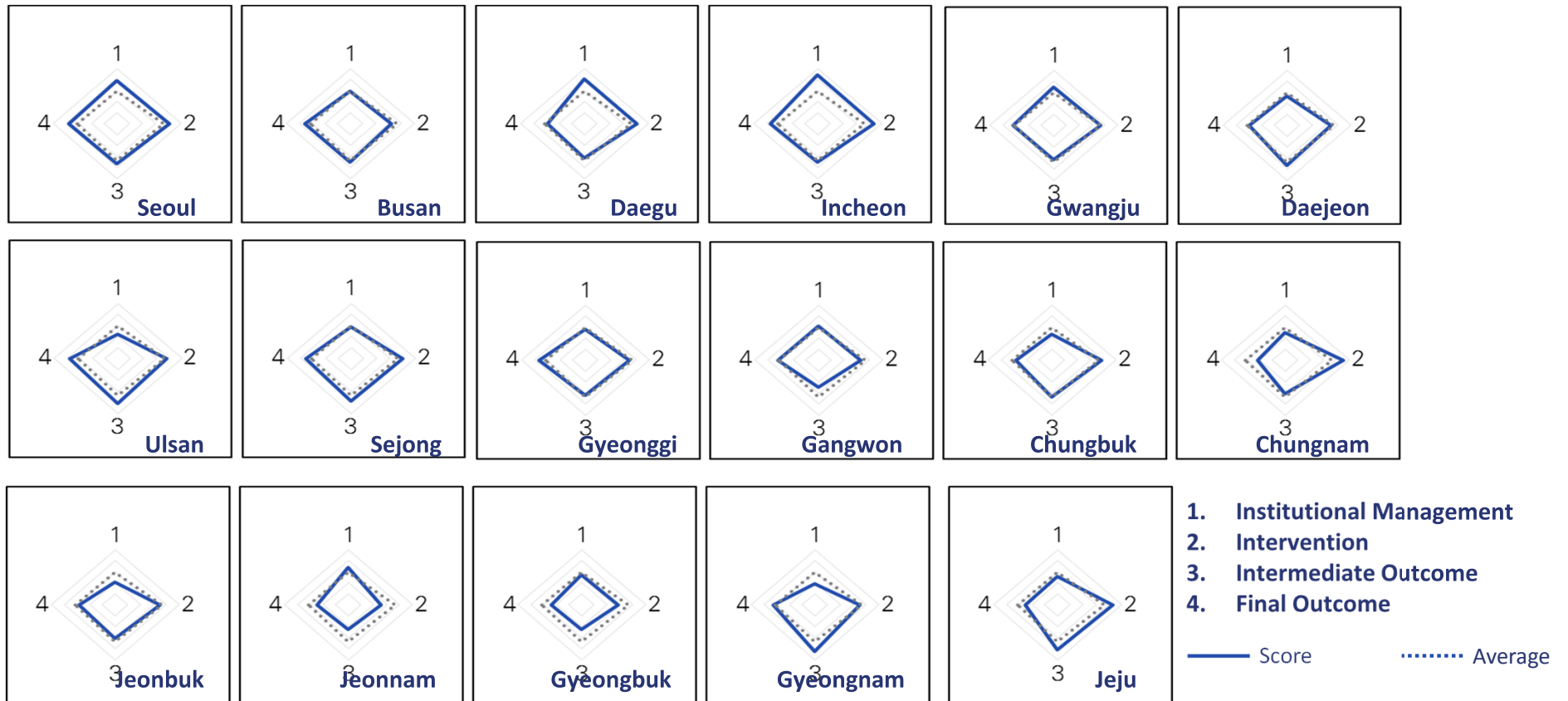
## Overall Score in 2017



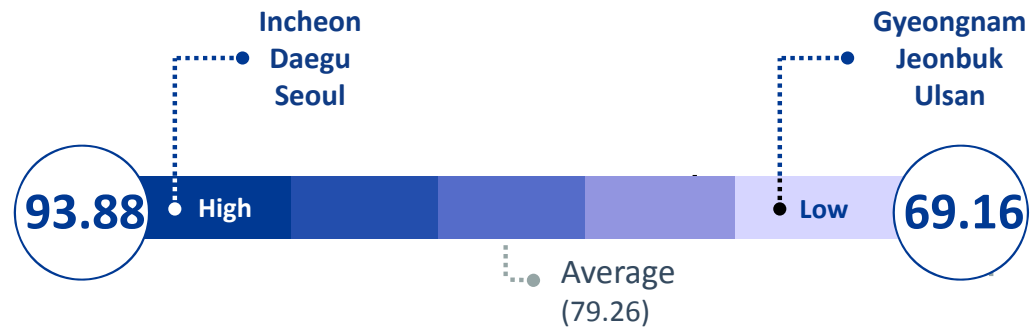
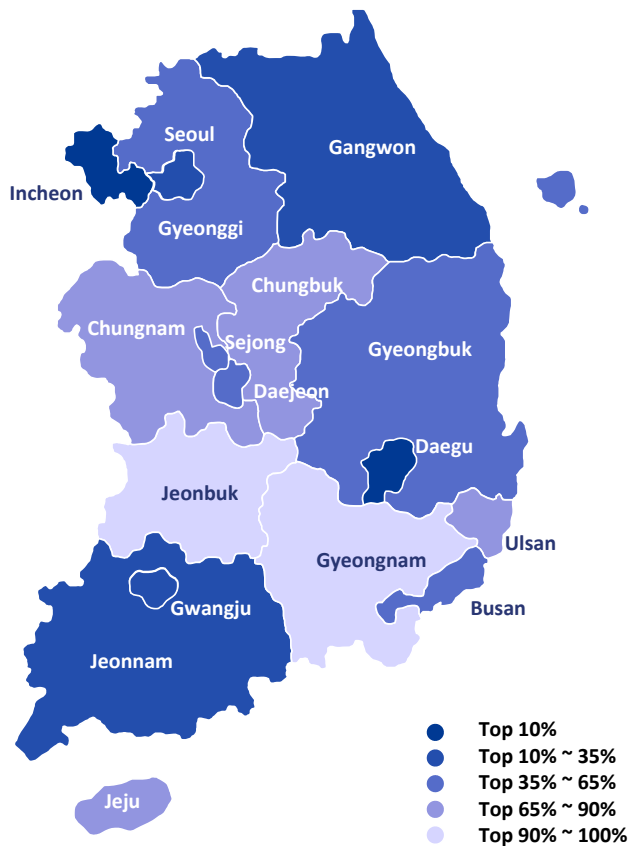
Metropolitan City			
Local government	Score	Local government	Score
Incheon	89.97	Ulsan	84.13
Seoul	88.86	Gwangju	83.65
Sejong	85.02	Busan	83.32
Daegu	84.56	Daejeon	80.68
<b>Average</b>		<b>85.02</b>	

District			
Local government	Score	Local government	Score
Gyeonggi	83.16	Chungnam	78.52
Gangwon	81.15	Jeonbuk	77.85
Gyeongnam	80.99	Jeonnam	76.97
Jeju	80.94	Gyeongbuk	75.47
Chungbuk	79.63	<b>Average</b>	<b>79.41</b>
		<b>Average</b>	<b>82.05</b>

## Distribution of Overall Score in 2017



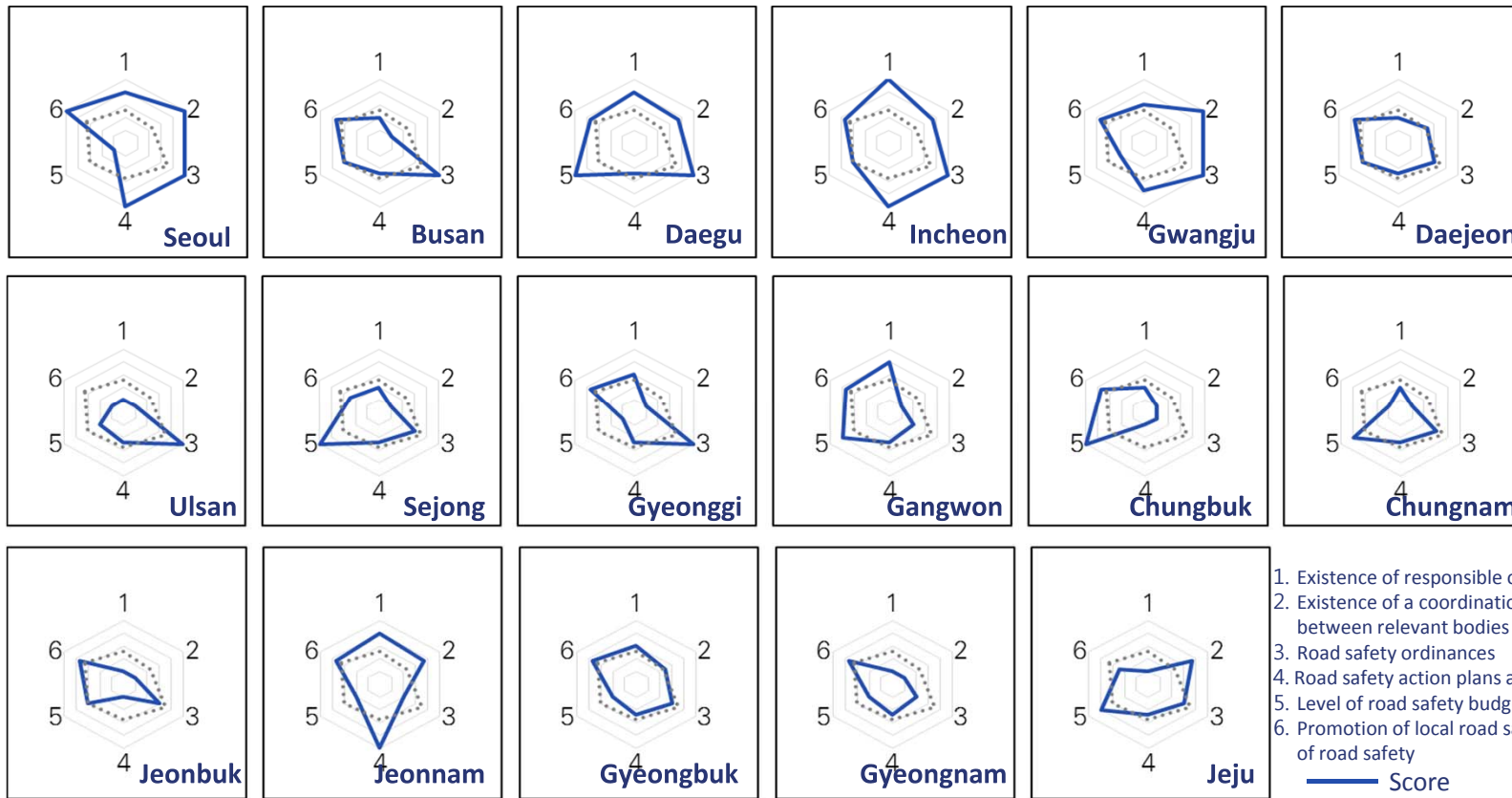
## Institutional Management Score in 2017



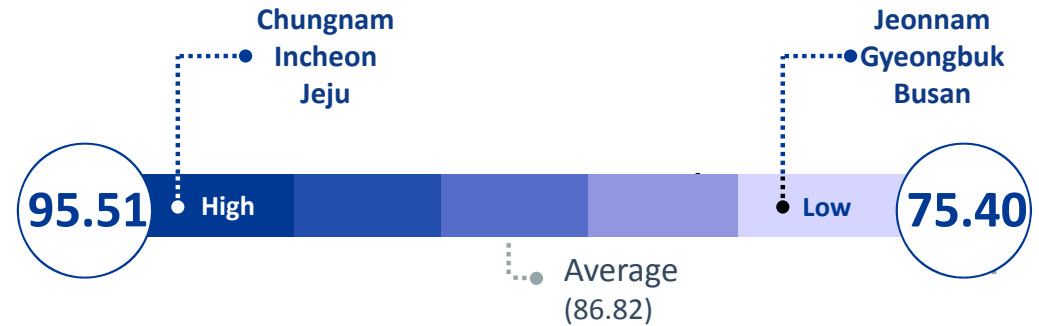
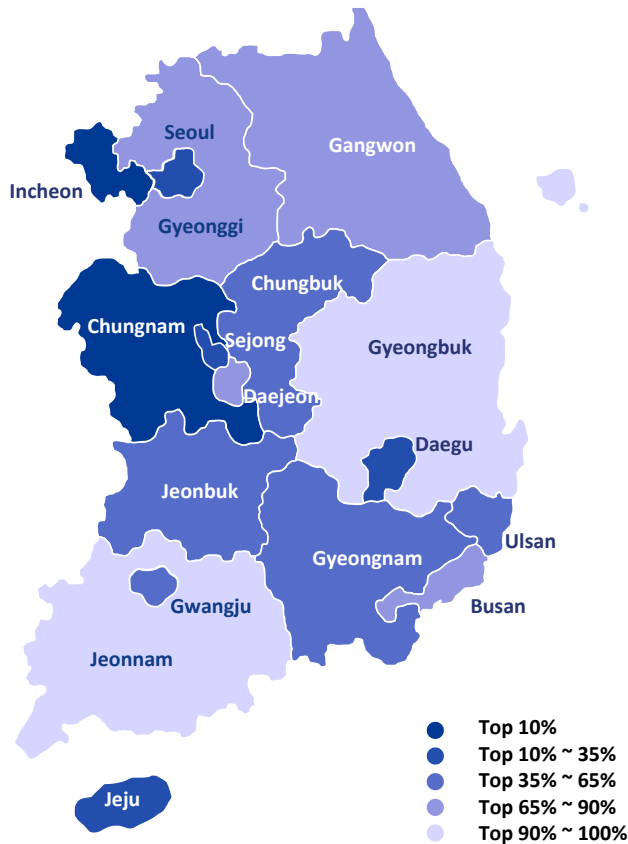
Metropolitan City			
Local government	Score	Local government	Score
Incheon	93.88	Busan	79.23
Daegu	90.27	Sejong	78.33
Seoul	89.33	Daejeon	76.51
Gwangju	84.89	Ulsan	71.86
<b>Average</b>		<b>83.04</b>	

District			
Local government	Score	Local government	Score
Jeonnam	83.81	Chungnam	74.93
Gangwon	81.17	Chungbuk	73.37
Gyeonggi	77.90	Jeonbuk	70.30
Gyeongbuk	77.18	Gyeongnam	69.16
Jeju	75.36	<b>Average</b>	<b>75.91</b>
<b>Average 79.26</b>			

## Distribution of Institutional Management Score in 2017



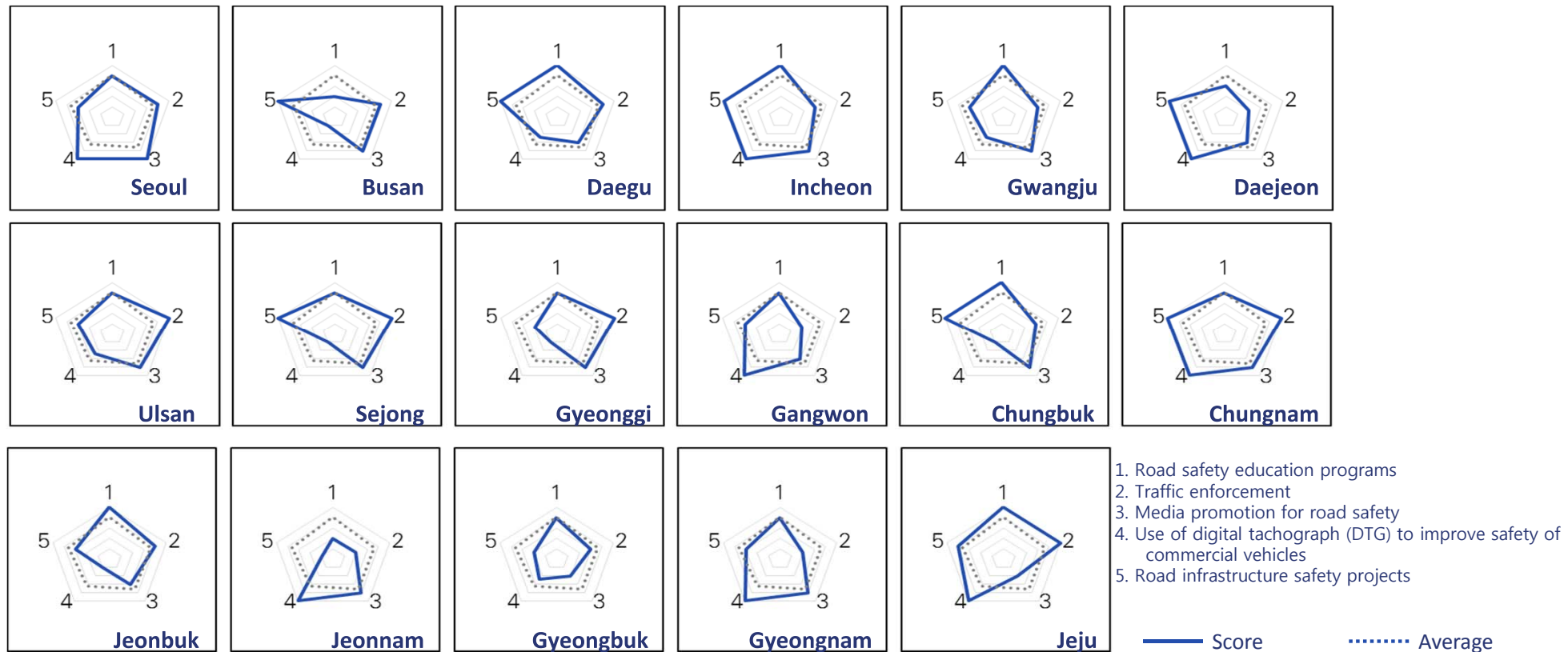
## Intervention Score in 2017



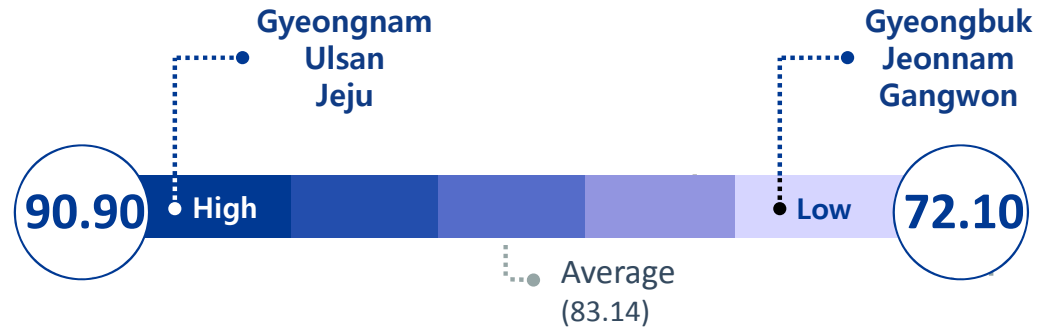
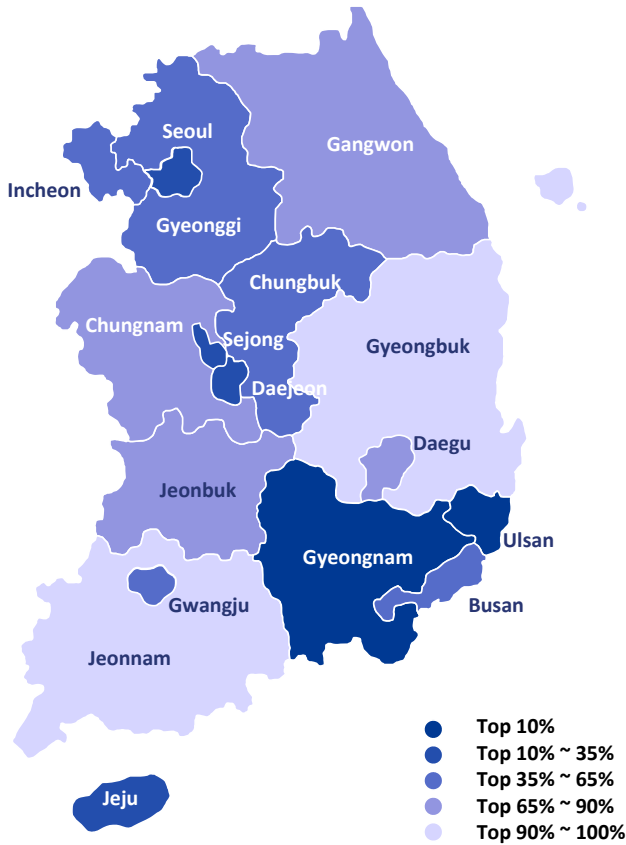
Metropolitan City			
Local government	Score	Local government	Score
Incheon	93.68	Ulsan	88.33
Seoul	91.10	Gwangju	86.50
Daegu	90.91	Daejeon	84.09
Sejong	90.31	Busan	82.42
<b>Average</b>		<b>88.42</b>	

District			
Local government	Score	Local government	Score
Chungnam	95.51	Gyeonggi	84.61
Jeju	93.00	Gangwon	83.08
Chungbuk	88.48	Gyeongbuk	78.41
Jeonbuk	85.29	Jeonnam	75.40
Gyeongnam	84.78	<b>Average</b>	<b>85.40</b>
<b>Average 86.82</b>			

## Distribution of Intervention Score in 2017



# Intermediate Outcome Score in 2017

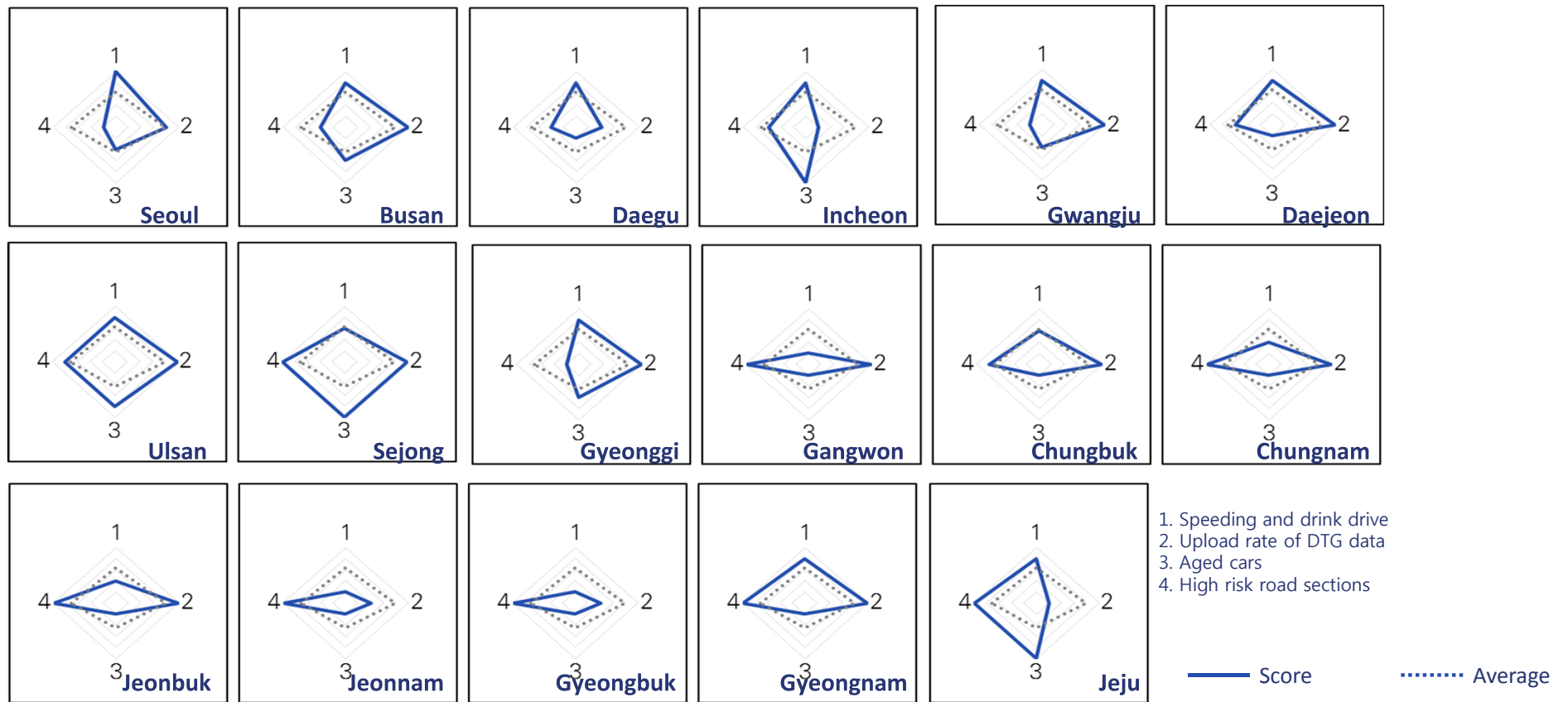


Metropolitan City			
Local government	Score	Local government	Score
Ulsan	90.90	Incheon	85.00
Sejong	88.40	Busan	84.80
Daejeon	86.60	Gwangju	81.50
Seoul	86.40	Daegu	81.10
<b>Average</b>		<b>85.59</b>	

District			
Local government	Score	Local government	Score
Gyeongnam	92.20	Jeonbuk	80.60
Jeju	90.60	Gangwon	74.80
Chungbuk	83.60	Jeonnam	72.10
Gyeonggi	82.00	Gyeongbuk	72.10
Chungnam	80.60	<b>Average</b>	<b>80.96</b>

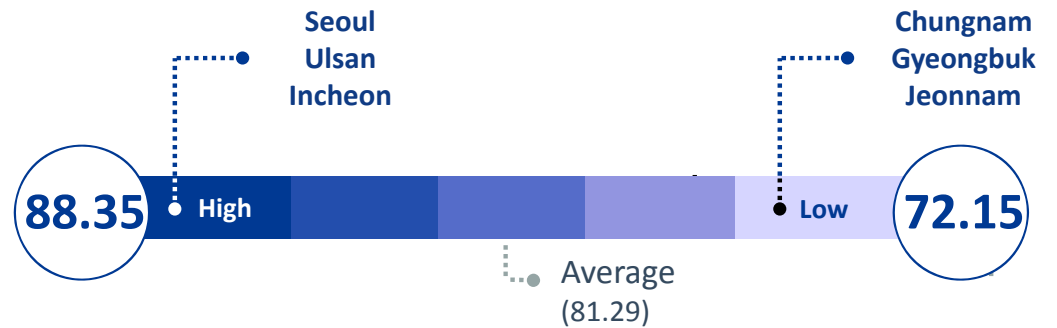
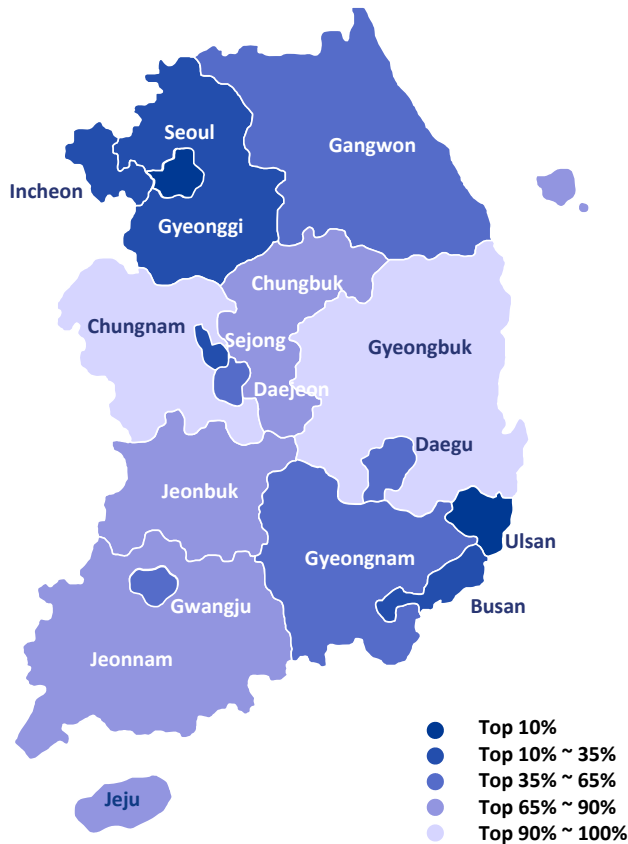
**Average 83.14**

## Distribution of Intermediate Outcome Score in 2017





## Final Outcome Score in 2017

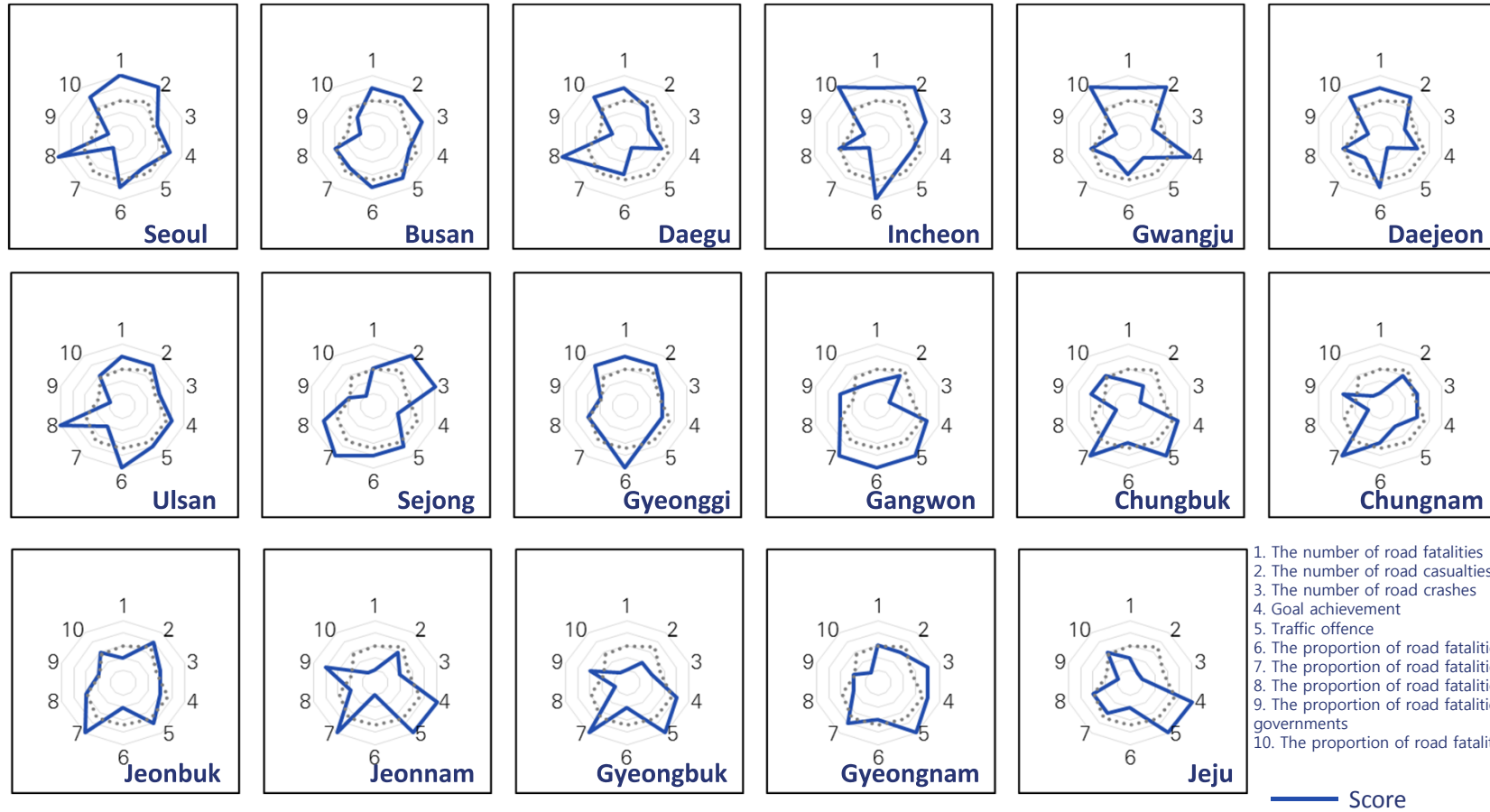


Metropolitan City			
Local government	Score	Local government	Score
Seoul	8835	Sejong	8585
Ulsan	8805	Gwangju	8220
Incheon	8730	Daejeon	7980
Busan	8600	Daegu	7890
<b>Average</b>		<b>84.56</b>	

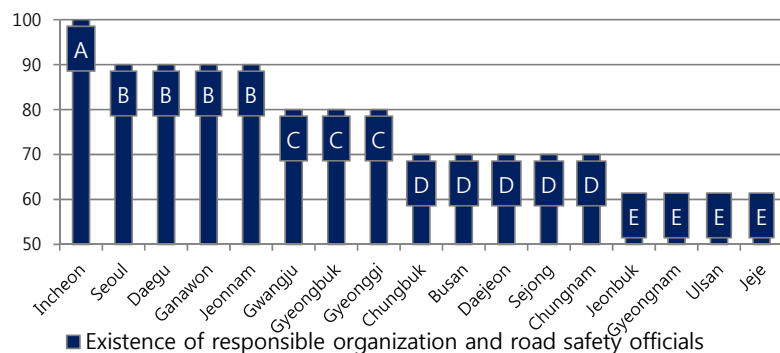
District			
Local government	Score	Local government	Score
Gyeonggi	8645	Jeju	7560
Gyeongnam	8325	Jeonnam	7480
Gangwon	8245	Gyeongbuk	7410
Jeonbuk	7845	Chungnam	7215
Chungbuk	7825	<b>Average</b>	<b>78.39</b>

**Average 81.29**

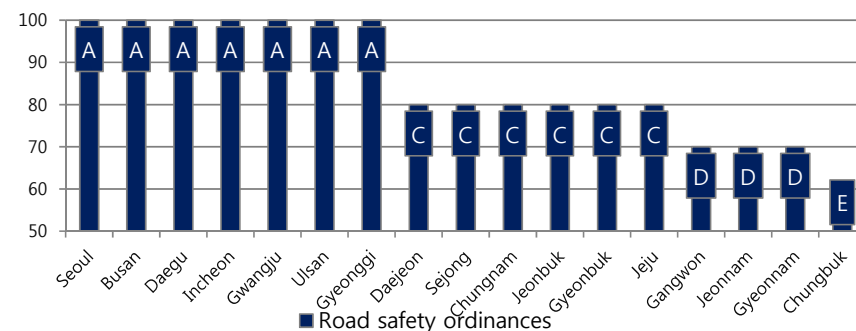
## Distribution of Final OutcomeScore in 2017



## Indicator scores in 2017



Values and descriptions	Grade	Score	Local governments
Have responsible organization with more than 5 road safety officials in local government	A	100	Incheon
Have responsible organization with less than 5 road safety officials in local government	B	90	Seoul
Have more than 2 road safety officials without a responsible organization (officials belong to other transport related unit)	C	80	Gwangju
Have less than 2 road safety officials without a responsible organization	D	70	Chungbuk
No road safety official, no responsible organization	E	60	Jeonbuk



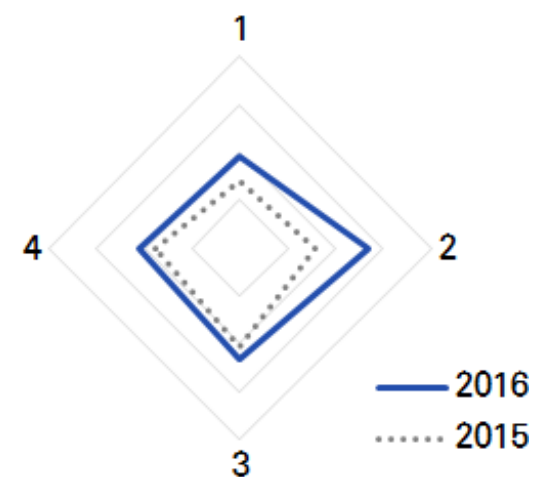
Values and descriptions	Grade	Score	Local governments
Four or more local ordinances for safety policies such as school zones, pedestrians, vulnerable road users and so forth	A	100	Seoul
Three or more local ordinances for safety policies such as school zones, pedestrians, vulnerable road users and so forth	B	90	-
Two or more local ordinances for safety policies such as school zones, pedestrians, vulnerable road users and so forth	C	80	Daejeon
One or more local ordinances for safety policies such as school zones, pedestrians, vulnerable road users and so forth	D	70	Gangwon
No local ordinances for road safety policies	E	60	Chungbuk



## 5. COMPARISON OF SCORES BY YEARS

## Overall Scores

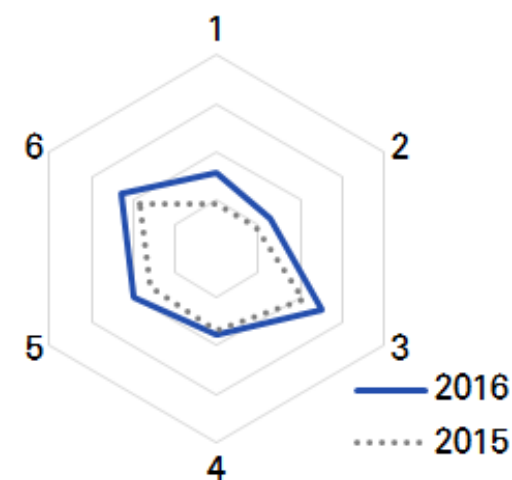
Year	Overall	Institutional Management	Intervention	Intermediate Outcome	Final Outcome
2016	82.05	79.26	86.82	83.14	81.29
2015	76.09	73.86	75.97	80.70	77.69
Change (%)	7.8	7.3	14.3	3.0	4.6



1. Institutional Management
2. Intervention
3. Intermediate Outcome
4. Final Outcome

## Institutional Management

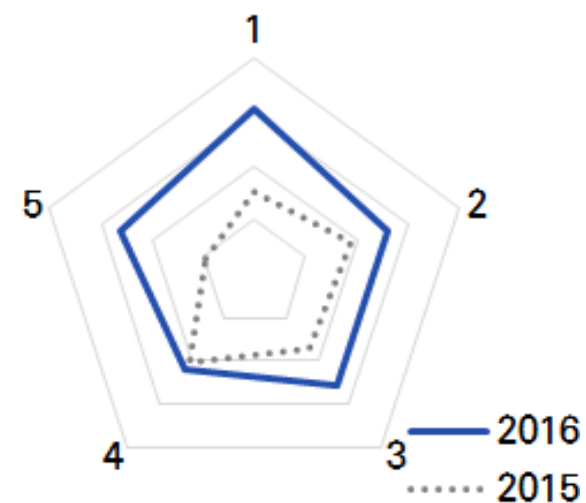
Indicators	2016	2015	Change (%)
Existence of responsible organization and road safety officials	75.88	69.41	9.3
Existence of a coordination agency and active cooperation between relevant bodies	72.71	69.47	4.7
Road safety ordinances	85.29	80.59	5.8
Road safety action plans and implementation	77.71	76.88	1.1
Level of road safety budget	80.00	75.88	5.4
Promotion of local road safety plans and monitoring progress of road safety	83.06	78.41	5.9
<b>Institutional Management</b>	<b>79.26</b>	<b>73.86</b>	<b>7.3</b>



1. Existence of responsible organization and road safety officials
2. Existence of a coordination agency and active cooperation between relevant bodies
3. Road safety ordinances
4. Road safety action plans and implementation
5. Level of road safety budget
6. Promotion of local road safety plans and monitoring progress of road safety

## Intervention

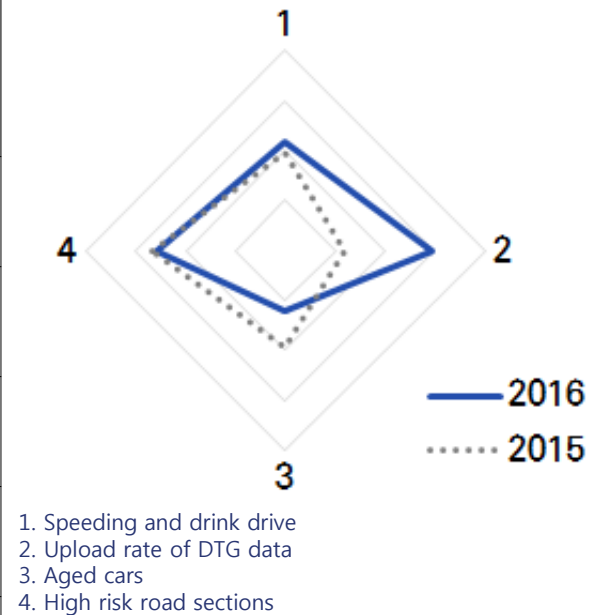
Indicators	2016	2015	Change (%)
Road safety education programs	90.59	75.29	20.3
Traffic enforcement	85.88	78.82	9.0
Media promotion for road safety	85.88	77.06	11.5
Use of digital tachograph (DTG) to improve safety of commercial vehicles	82.12	80.53	2.0
Road infrastructure safety projects	86.47	69.41	24.6
<b>Intervention</b>	<b>86.82</b>	<b>75.97</b>	<b>14.3</b>



1. Road safety education programs
2. Traffic enforcement
3. Media promotion for road safety
4. Use of digital tachograph (DTG) to improve safety of commercial vehicles
5. Road infrastructure safety projects

## Intermediate Outcome

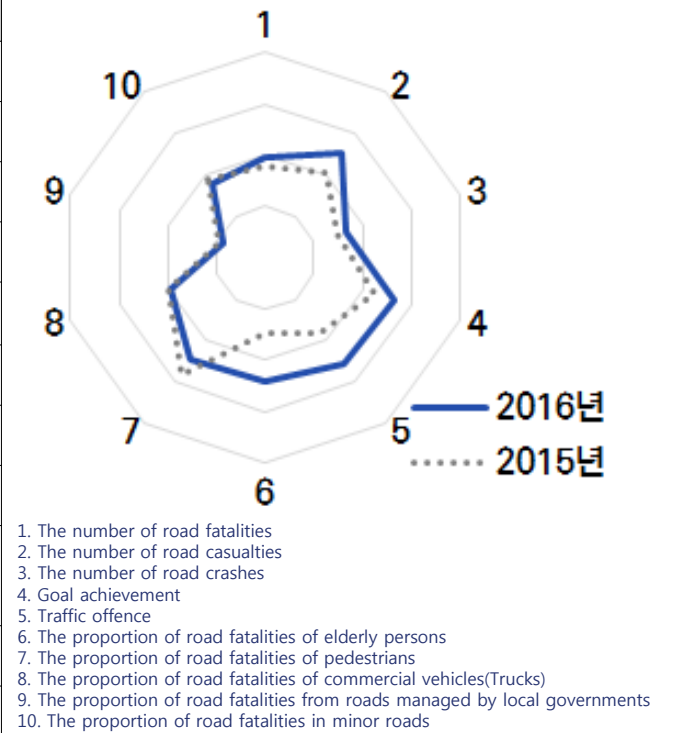
Indicators	2016	2015	Change (%)
Speeding and drink drive	81.76	79.41	3.0
Upload rate of DTG data	89.41	71.76	24.6
Aged cars	72.35	79.41	-8.9
High risk road sections	85.88	86.47	-0.7
<b>Intermediate Outcome</b>	<b>83.14</b>	<b>80.70</b>	<b>3.0</b>





## Final Outcome

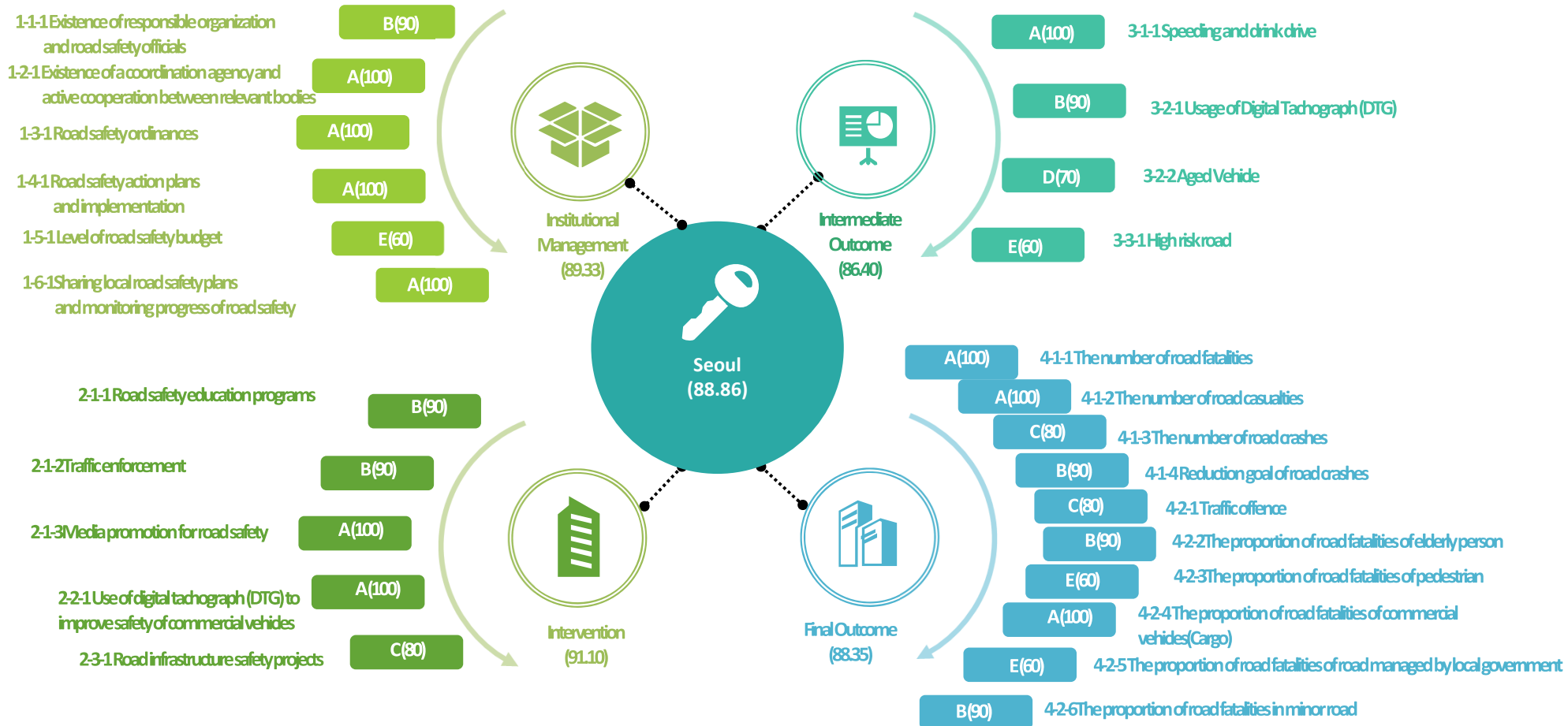
Indicators	2016	2015	Change (%)
The number of road fatalities	79.41	77.65	2.3
The number of road casualties	85.29	80.59	5.8
The number of road crashes	76.47	74.71	2.4
Goal achievement	86.47	82.35	5.0
Traffic offence	85.88	78.24	9.8
The proportion of road fatalities of elderly persons	84.12	74.71	12.6
The proportion of road fatalities of pedestrians	84.71	88.24	-4.0
The proportion of road fatalities of commercial vehicles(Trucks)	79.41	80.00	-0.7
The proportion of road fatalities from roads managed by local governments	68.82	69.41	-0.9
The proportion of road fatalities in minor roads	77.65	78.82	-1.5
<b>Final Outcome</b>	<b>81.29</b>	<b>77.69</b>	<b>4.6</b>





## 6. CONCLUSION AND DISCUSSION

## Result : Seoul



## Conclusions and Discussion

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- ◆ Comparison of the number of fatalities, casualties, and crashes are not good enough.
- ◆ Safety Performance Indicators can monitor efforts of local governments for road safety.
  - Some local governments have set Road Safety Divisions officially (Daegu, Sejong, Jeonnam etc.)
  - Some local governments declared to allocate more budget for road safety (Jeonnam)
- ◆ Local governments can benchmark how to improve road safety by comparison.
  - Low score of SPIs should be improved (more road safety budget in Seoul)
- ◆ Central governments can hint how to assist local governments.
  - Need to promote installation of dedicated road safety departments etc.
- ◆ Possibly can be applied in other countries by modifying indicators.