Cross-ministerial Strategic Innovation Promotion Program (SIP), 3rd Term Development of Smart Mobility Platforms

Development of a technology and policy package for redesigning urban road traffic

April 2025

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Japan Institute of Country-ology and Engineering

Table of contents

1. Overall study themes of the program

The vision, the goal strategy, and the kind of community the program aims at building

■ The vision and the goal strategy of the “Development of a technology and policy package for redesigning urban road traffic” program

Vision

Create a study environment based on theory and data

Provide data-based scientific evidence to validate the target technologies.

Study feasible actions and put them together into a policy package

Create a package of everything necessary for action-taking, including legal system design and processes, policy implementation methodology and key points.

Assist entities to take action

Engage with various entities in multifaceted manner to help them take proactive action.

Organically combine the three approaches to **support the effort** of governmental organizations and municipalities

Goal strategy

Municipalities

Proactively identify and analyze issues to improve small urban roads, backed by positive consensus of the local community.

To assist

Governmental organizations
(MLIT, National Police Agency, other relevant entities)

Drive various measures related to small urban roads.

Community we aim to build (tentative)

Children can walk to school safely and easily unattended by adults.

Residential roads provide the backbone of local community of people.

Small roads constitute a publicly shared space where people come to visit and enjoy.

*Other keywords: Lingering and resting, Zone 30, vehicle entry restriction, barrier-free design, in-area mobility …

Study and development goals (outcome to be pursued)

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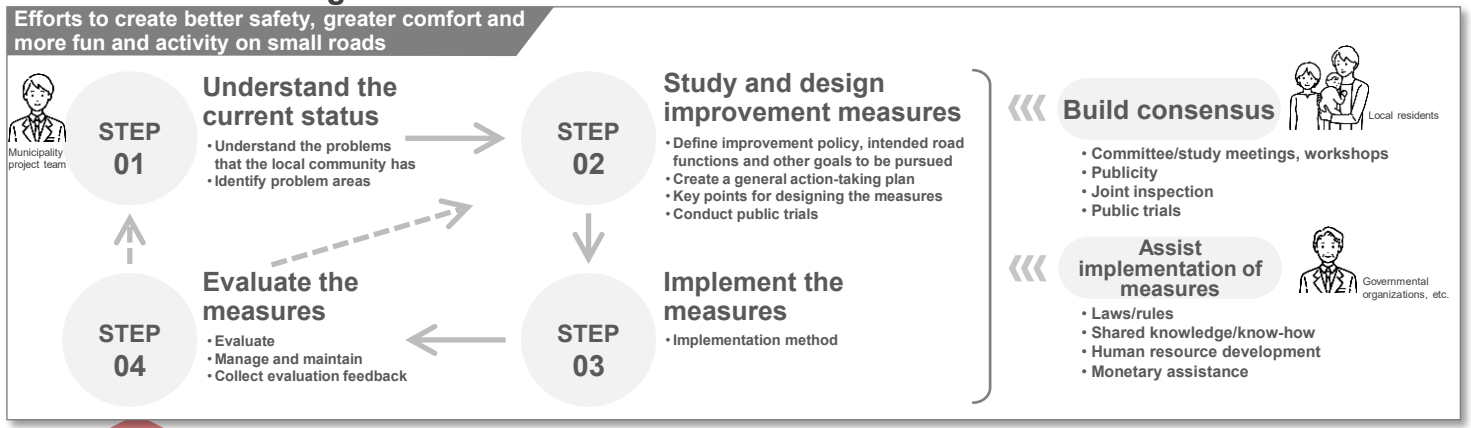
− Typical flow of action-taking −



[Benefits and value to be provided]

"Zero traffic accidents on small roads"

- Understand the current status and issues in effective manner.
- Implement measures and take action in productive way.
- Encourage the field teams to make speedy decisions.
- Assist smooth consensus building and seamless administrative process.

Clearly define the project and what action to take, who will be the user and how the outcome can be used.
Standardize the usage to facilitate public implementation (and proliferation).

<Deliverable>
Policy Package Implementation Guide (tentative)

<End users>
Governmental organizations and municipalities

- Include everything required for action taking, including **how to apply the developed technologies and theories, what thinking approach is called for and how to plan usage detail.**
- **Nationwide promotion of traffic safety improvement and urban road network planning with greater use of digital tools**

[Expected outcome]

Policy package to assist governmental organizations to take proactive action

- To be used for (examples):
- **School road improvement projects**
- **Zone 30** and **Zone 30 Plus** programs
- **Accident blackspots improvement projects,** etc.

- Action-taking entities (examples)
- **Basic local municipalities** and **prefectural police** (and other road administration entities)

Present technical evidence to assist smooth implementation of a legal speed limit of 30 km per hour

<End users>
Governmental organizations

- **The Order for Enforcement of the Road Traffic Act is being revised to specify that "the speed limit on all roads without centerline shall be 30 km per hour".**
- In some cases, **concerns are raised about impacts on the existing road function and gaps from the actual community situation.**

[Outcome to be pursued]
- Currently no **database of roads without centerline exists**. Study is called for to discuss **how such database can be actually created.**
- **Conduct a situation analysis to facilitate** implementation of the legal speed limit of 30 km per hour.
  * Alternative suggestions are raised to specify the speed limit implementation scope to "roads narrower than 5.5 m" or to areas outside urban planning zones.
- Aim at establishing a **fully feasible implementation and evaluation framework.**

Create plans to provide a "Japanese-style" shared space within small road network implementation area

<End users>
Governmental organizations

- **Realize a pedestrian-and-vehicle joint use road network by providing a new road category and defining its structure and traffic management rules. [goal]**
- **Aim at creating a complete action-taking scheme where the legal system is clearly defined and feasibility is warranted.**

Goal strategy toward successful social implementation (roadmap)

POINT

Collaborating with Sub-topic III (provision of accident risk alerts and signal information) can create a **synergy to drive nation-wide implementation.**

POINT

As this program primarily works with nationwide data, **greater implementation of** it can be anticipated if conducted as Sub-topic IV **JMDS use cases.**

Maturity of mobility services XRL

Prepare for social implementation trials

*XRL at hypothesis validation & conceptualization phase

- Propose to define **a new urban road category.**
- **NW placement scheme with pedestrians added.**
- Validation analysis result
  - ➔ Provided as insight to assist **Order for Enforcement of the Road Traffic Act revision.**
- Create a **nationwide road traffic database**
- Basic design of **visualization & tallying tools** + **urban road SIM.**
- Create "version zero" of the **Guidebook.**
- Identify **system- and rule-related issues.**

Complete these steps before the stage gate phase.

Social implementation trials in limited areas

*XRL at target technology identification phase

Identify realistic target technologies in various regions and **start evaluation using digital sand boxes.**

Policy Package Implementation Guide (tentative)

- **Complete the rough draft before the stage gate phase.**
- In parallel to rough draft preparation, **try the package out in two-city model areas** to collect **feedback**.

City A (urban and advanced)

City B (suburban and standard scale)

Present technical evidence to support smooth implementation of 30 km-per-hour legal speed limit.

To be implemented in September 2026

Create plans for a "Japanese-style" shared space within small road network implementation areas.

Collaborate with JAPIC activities

Nationwide implementation

*XRL at social implementation commencement phase

- Create roads and communities that offer better safety, greater comfort and more fun and activity.
- Provide technical, system-wise and business-building **recommendations, and also start social implementation trials in early adoption areas.**
- Aim at **concrete realization of the goal strategy.**

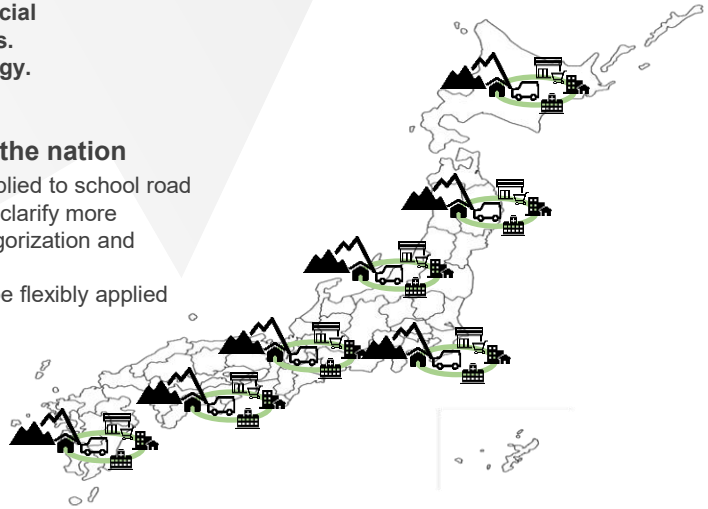
Spread implementation across the nation

- To make the package ready to be applied to school road improvements and Zone 30 projects, clarify more advanced policy detail including categorization and handling of special cases.
- Provide a Guide (tentative) that can be flexibly applied under various conditions.

Proliferation to various areas across the nation

*XRL at social implementation proliferation phase

- Spread the network of roads and communities that offer better safety, greater comfort and more fun and activity.
- **Spread the social implementation wider and guarantee sustainability.**
- **Export the project services outside Japan.**



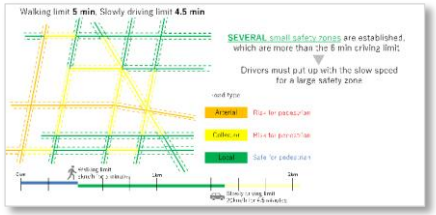
POINT **Interact with related organizations from the preparation phase**: Share the study result and discuss coordination with related policies, etc.

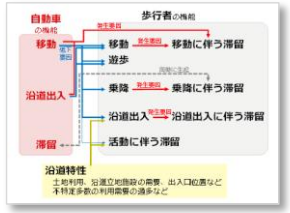
Up to FY 24 (SIP symposium in Japan on June 5) | Stage gate (FY25) | At the end of SIP (FY27) | After the end of SIP (FY 28 and thereafter)

Apply the study result to social implementation trials

Develop urban street network planning scheme

- Incorporate the perspectives of pedestrians, cyclists, and public transit users alongside automobile riders in a functionally hierarchical street network.
- Discuss the street configurations and the parameter settings to identify the optimal pedestrian-protected zones.





Understand the current status and build a policy monitoring system

- Build a database and a sustainable platform that are designed well enough for use by municipalities.

Create a digital sand box

- Develop a virtual evaluation system and identify evaluation metrics from the pedestrian and other relevant perspectives.
- Develop a traffic simulator technology that allows evaluating planar traffic flows (inbound flows to and outbound flows from the area, travel speeds).

Small road safety improvement action-taking scenario

This scenario can be applied when implementing projects like **Zone 30 Plus or Joint inspection of school roads.**

STEP 00 Start working

- Build the system.
- Establish means of communication.
- Select target area(s).

STEP 01 Understand the problems that the local community has

- Understand the problems that the local community has.
- Identify problem areas.

STEP 02 Discuss and design improvement measures

- Define improvement policy, intended road functions and other goals to be pursued.
- Create a general action-taking plan.
- Key points for designing the measures
- Conduct public trials.

STEP 03 Implement the measures

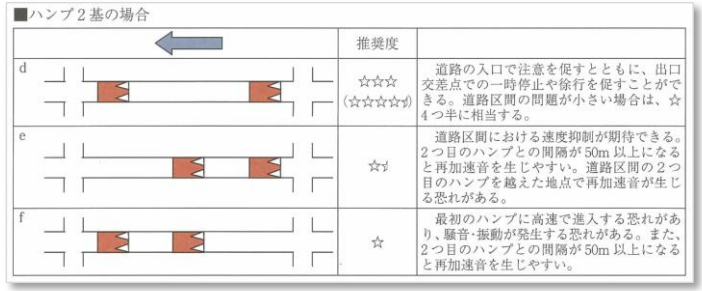
- Implementation method

STEP 04 Verify resolution of the problems

- Evaluate.
- Manage and maintain.
- Collect evaluation feedback to review and improve the plan.

Provide specific safety improvement recommendations and bring them to social implementation trials

- Think about the best spatial interval of speed limiting measures and where they should be placed.



Make sure that the plan is socially acceptable and ready for collaboration and that necessary rules are defined

- Work with relevant governmental bodies to create a guidebook to be used as a basis to review and improve small roads.
- Obtain real-world and virtual results to provide a recommendation package toward legal system revision.

Recommend useful systems and rules

- Identify themes to review and improve governmental and ministerial ordinances, enforcement orders, notifications and guidebooks.
- Provide recommendations (proposals) about how to review and improve existing systems and how to implement the policy package.

Outputs obtained from and to be pursued under each study theme

Output

FY2024

FY2025
Trial operations underway in model areas

FY2027 (end of program)
Recommendations (proposal) to be made about how a city can offer safety, security, convenience, fun and activity

Outcome
The initiative will spread wider so that more roads that are safe, comfortable and fun to use will be created.

Create a study environment based on theory and data

	FY2024	FY2025	FY2027 (end of program)
Develop an urban street network planning scheme.	Theoretical application of the urban street network planning scheme to model areas	Demonstration and empirical analysis of the urban street network planning scheme	**Policy package**: Urban street network planning scheme
Provide specific safety improvement recommendations and bring them to social implementation trials.	Area-specific characteristics analyzed for zoning regulation areas	Proposal to install speed-limiting measures and their requirements definition	**Policy package**: Technical resources to contribute to greater safety
Understand the current status of urban small roads and build a policy monitoring system.	Data items necessary to operate the program tools selected and collected	Creation of a model area visualization tool	**Digital sand box**: Visualization tool (+ management and operation method)
Create a digital sand box.	Basic design of evaluation simulator to determine effectiveness of the measures completed	Creation of an evaluation simulator prototype	**Digital sand box**: Evaluation simulator (+ management and operation method)

Study feasible actions and put them together into a policy package

	FY2024	FY2025	FY2027 (end of program)
Make sure that the plan is socially acceptable and ready for collaboration and that necessary rules are defined.	Policy Package Implementation Guidebook (tentative title) version 0 created	Policy Package Implementation Guidebook (tentative title) version 1 created	**Policy package**: Policy Package Implementation Guidebook (tentative title)
Recommend useful systems and rules.	Themes identified to review and improve governmental and ministerial ordinances, enforcement orders, notifications and guidebooks	Steps proposed to improve issues in existing systems and rules	**Policy package**: Recommendations (proposals) to be made about how to review and improve existing systems and how to implement the policy package

Governmental bodies will take action to drive various small road improvement measures.

Municipality project teams and other entities will proactively identify and analyze issues and thereby continue to improve their small roads backed by positive consensus of the local community.

2. What has been achieved so far, where the program is now and where it is going

1. Development of urban street network planning scheme

- Assuming that pedestrian risks—both while walking along and crossing streets—vary depending on street class, which is defined by automobile functions such as through-movement on arterial streets and land access or parking on local streets, this program discusses **the optimal allocation of street classes in a network to ensure safe pedestrian travel.**

Road hierarchy primarily designed for automobiles in urban areas

Road class	Functions required by automobiles		
	Through	Access	Parking/Stopping
A_U	High speed	Fully access control (land & road)	Very limited (emergency use, etc.)
B_U		Partial access control (land & road)	Limited
C_U		Partial access control (land)	Allowed with space provided
D_U	Low speed	Allowed	Allowed
E_U			
F_U	Vehicle entry is restricted (malls, pedestrian zones).		

Urban streets

Street classes are defined to manage trade-offs among competing functions by assigning functional priorities.

The table is based on "the Guidelines for Planning Functionally Hierarchical Road Networks (Draft) Version 2.0" (Japan Society of Traffic Engineers (JSTE), 2023).

Optimal configuration of street classes for PEDESTRIAN SAFETY

<Objective> Allocate street classes to individual street sections to maximize the area where pedestrians can travel safely.

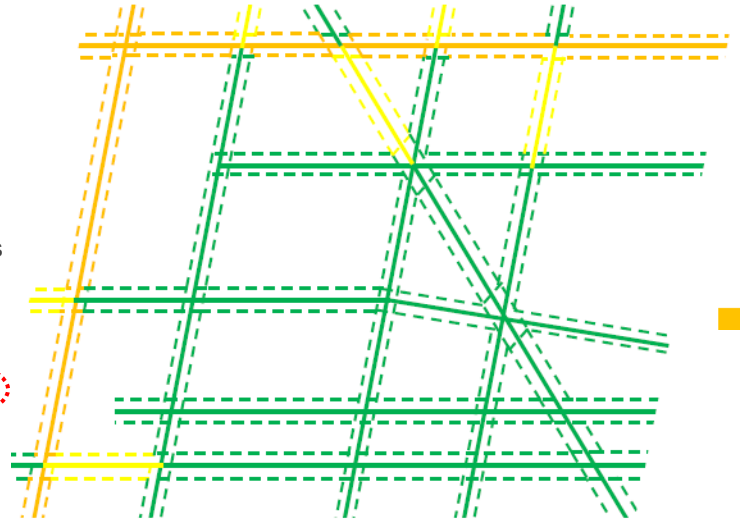
<Constraints>
- Upper bound on travel time that automobile users can tolerate at low-speeds.
- No direct connection between "Arterial" and "Local" streets.

Classify street sections into three (simplified) from the pedestrian perspective.

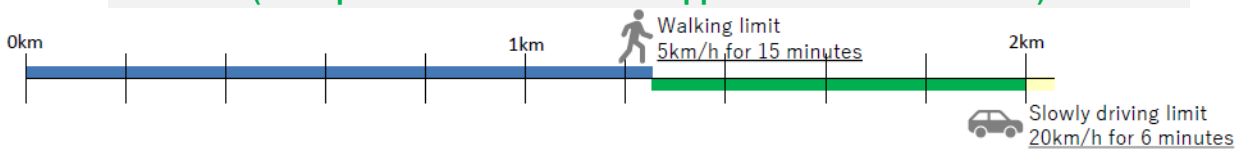
Arterial
Collector
High risk for pedestrians

Local
Low risk for pedestrians

Maximize Pedestrian traffic within areas consisting of Local streets (green lines)



Areas consisting of Local streets are designated as **pedestrian-protected zones where pedestrians are given the highest priority.**
(Example: area suitable for the application of Zone 30 Plus)



A preliminary application of this configuration scheme was conducted in one of the candidate model areas.

1. Development of urban street network planning scheme

- **Update of the street classes is discussed** to incorporate important perspectives from the non-automotive users (with the most critical needs prioritized).
  - **Arterial Streets** (B_U, C_U– high priority on automobile through-movement) should accommodate **pedestrian crossing needs** and **public transit priority where applicable.**
  - **Collector strees** (D_U – high priority on land-access and parking) should accommodate **pedestrian crossing** and **boarding/alighting needs**, while **sufficiently restricting automobile through-movement**.
  - **Local streets** (E_U, F_U– low automobile priority) should prioritize **pedestrian travel and promenade, as well as activities on streets,** while **sufficiently restricting automobile traffic.**

  * It remains important to **validate the complimentary relationship between restricting and ensuring automobile through-movement function: [D_U, E_U, and F_U] vs. [B_U and C_U])**

Road hierarchy primarily designed for automobiles in urban areas

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B_U		Partial access control (land & road)	Limited
C_U		Partial access control (land)	Allowed with space provided
D_U	Low speed	Allowed	Allowed
E_U		Restricted land-access to enhance pedestrian travel, promenade, and activities.	
F_U	Vehicle entry is restricted (malls, pedestrian zones).		

Urban streets

Tentative updated street classes

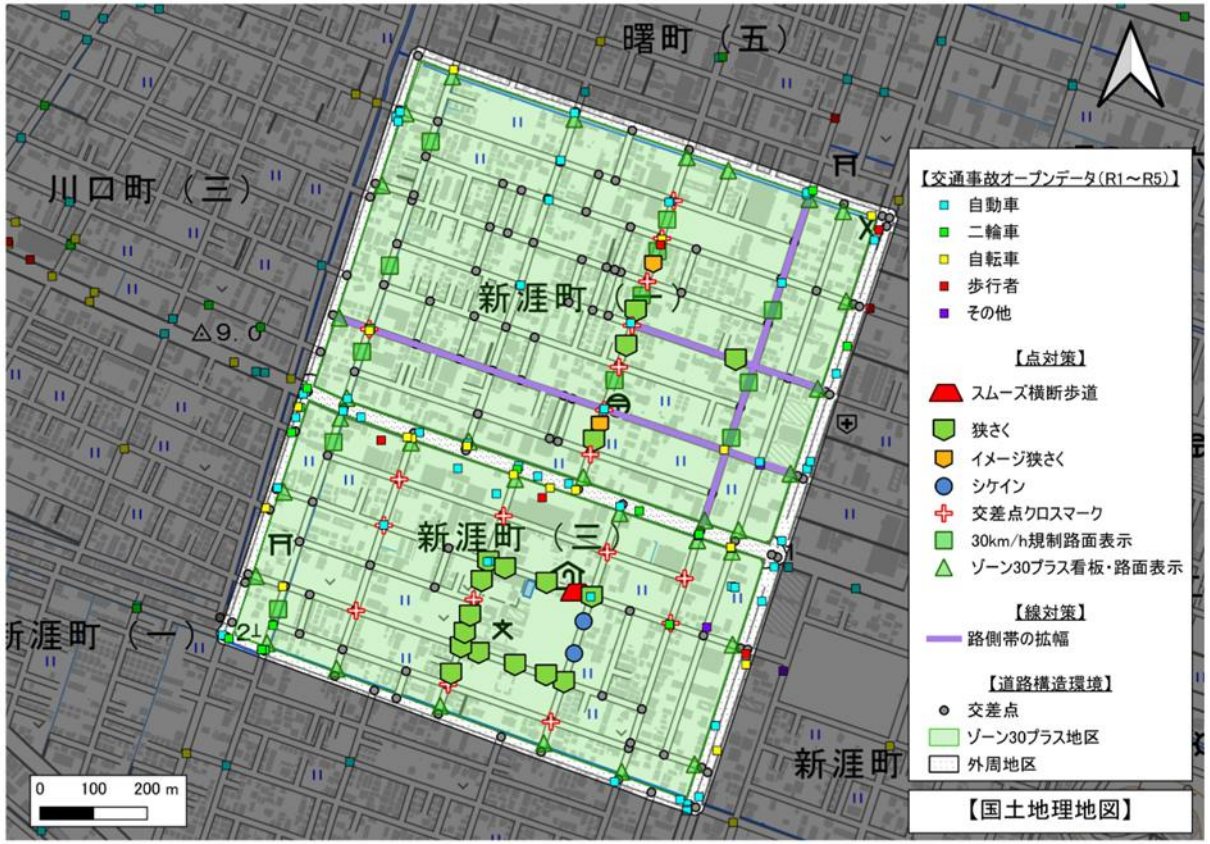
*Subcategories of classes for streets with low automobile priority

	E_U for visit and enjoy	E_U for everyday needs
High-priority Functions	Pedestrian: Promenade Pedestrian: Land-access Pedestrian: Posing on street for land-access Pedestrian: Activities (greater need) Public transit: Boarding/alighting (e.g., community bus)	Pedestrian: Through-movement Pedestrian: Land-access Pedestrian: Activities (greater need)
Mandatory but Low-Priority Functions	Pedestrian: Through-movement Automobile: Parking/stopping (e.g., unloading) Public transit: Through-movement	Automobile: Land-access for residents Automobile: Parking/stopping for residents
Restricted Functions	Automobile: Through-movement	Automobile: Through-movement

2. Specific safety improvement recommendations and their application to social implementation trials

- Targeting a total of 130 areas across the nation with zoning restrictions, we have created a database of **road environment, traffic situation** (*this covers 25 areas only)**, current improvement status and accident occurrence data**, to **analyze the interval and density of physical measures installed**, **the relationship with the perimeter road and other area-specific characteristics** (example: “The greater the area is, the overspeeding occurrence rate tends to be higher”), find and organize insights that can be used for improvement measure planning.

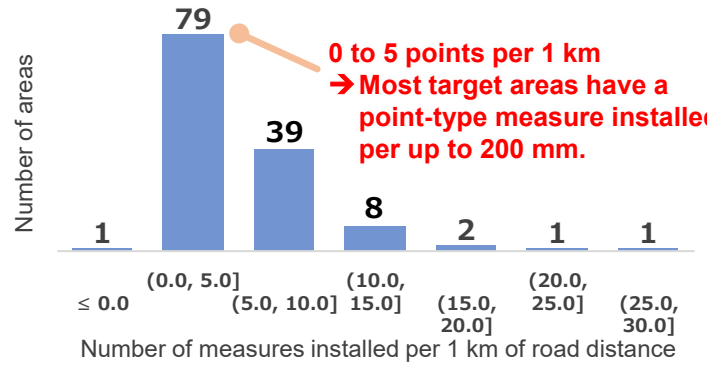
▼Database view example (the area including Shingai-cho 1-chome and 3-chome, Fukuyama City, Hiroshima Prefecture)



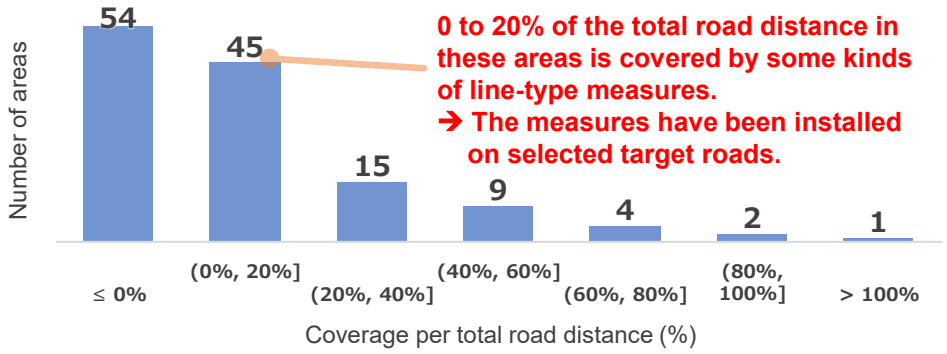
* The database has been created using the following information sources:
- MLIT “Residential Road Traffic Safety Improvement Portal”
- DRM Association “DRM Database”
- MLIT “ETC2.0 Probe Data”
- National Police Agency “Publicly Disclosed Traffic Accident Statistics”

▼Density of measures installed per road distance

− Distribution of point-type measures −



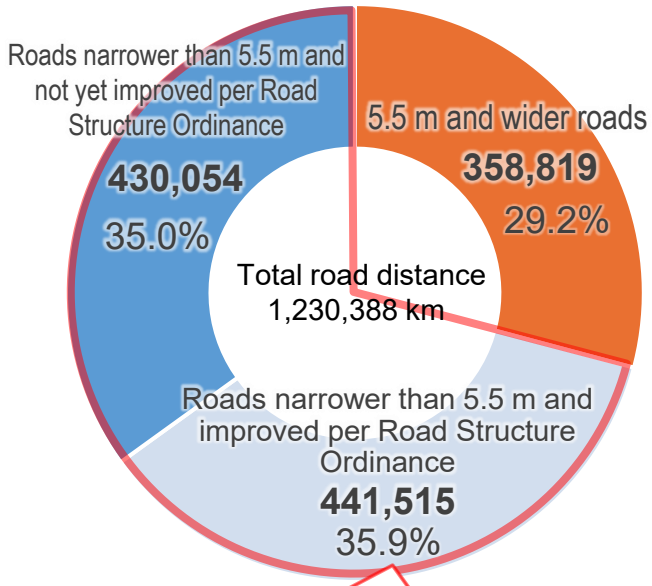
− Line-type measure installation coverage −



2. Specific safety improvement recommendations and their application to social implementation trials

- **When the revision of the Order for Enforcement of the Road Traffic Act that sets the speed limit on all roads without centerline to 30 km was proposed, we have evaluated the anticipated impact of the revision by investigating the existing road traffic situation** using our created database (and **submitted the obtained insights as a public comment**).

▼Total road distance by road width [km]

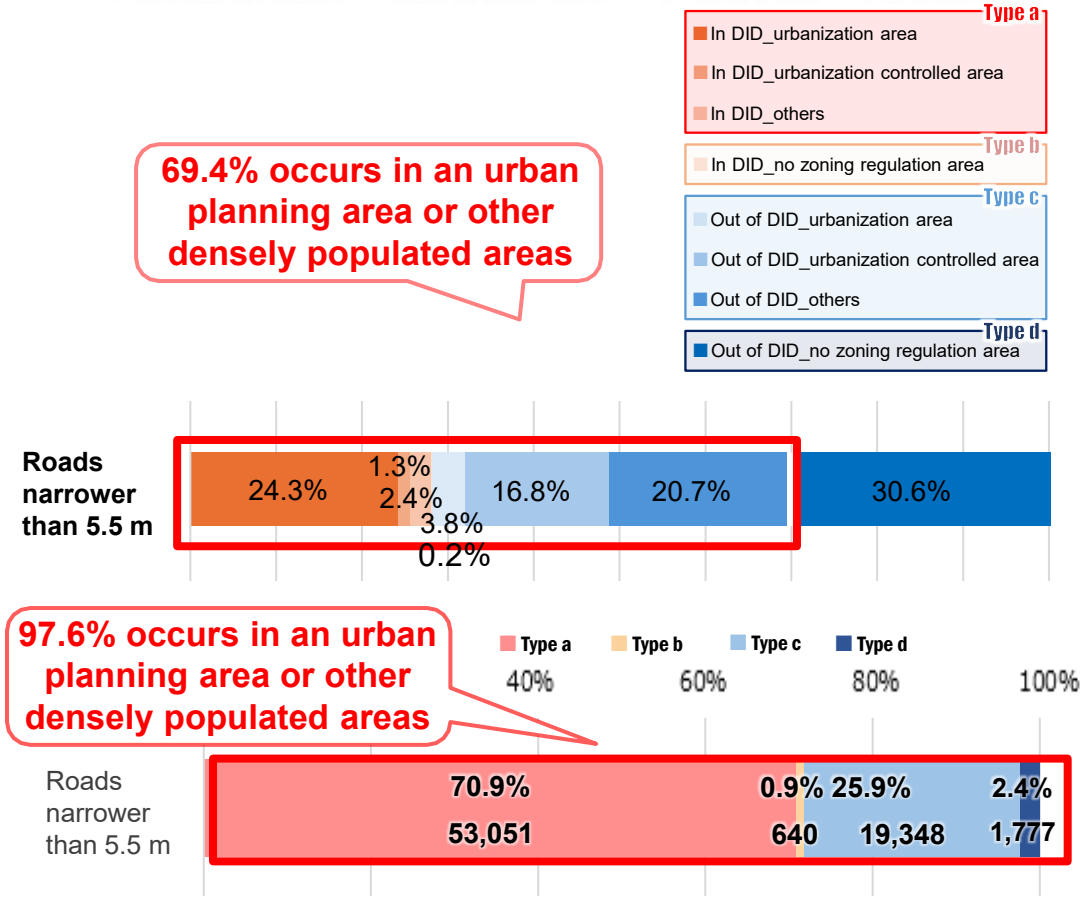


Roads narrower than 5.5 m
871,569 km (70.9%)
Approx. 90 % of roads in this category do not have any speed limit specified.

▼Total road distance by speed limit [km]

Speed limit category	Roads narrower than 5.5 m
Speed limit 100 km/h	5 (0.0%)
Speed limit 80km/h	1,423 (0.2%)
Speed limit 70km/h	7,441 (1.1%)
Speed limit 60km/h	738 (0.1%)
Speed limit 50km/h	1,495 (0.2%)
Speed limit 40km/h	14,536 (2.2%)
Speed limit 30km/h	28,600 (4.3%)
Speed limit below 30 km/h	3,641 (0.6%)
Max variable speed limit (law) - (50) km/h	1 (0.0%)
Max variable speed limit (law) - (40) km/h	3 (0.0%)
Zone-based max speed limit 40km/h	2,768 (0.4%)
Zone-based max speed limit 30km/h	12,654 (1.9%)
Zone-based max speed limit 20km/h	43 (0.0%)
Minimum speed	0 (0.0%)
Drive-slow zone	13 (0.0%)
Zone 30	4,198 (0.6%)
No speed limit specified (legally set to 60 km/h)	582,791 (88.3%)

▼Number of accidents by roadside environment and by road width



3. Understanding the current status of urban small roads and creating a policy monitoring system

- To create a visualization tool that can **tally, compare and visualize various mobility-related data and urban infrastructure data** for the purpose of assuring safety and security on small roads, **we have determined what types of data will actually be required for such visualization tool to work.**
- Concerning the types of information where data collection is expected to be difficult (e.g. which roads are actually school roads, what regulations are in place, whether or not each road actually has a centerline), we interviewed various stakeholders and private businesses to **determine what level of data accuracy can be expected, how much data collection cost will be incurred and whether any technology is available to help collecting these data.**

▼List of data items necessary for the visualization tool to work

Project phase	Category	Necessary data	Collectability	Purpose of data use	Owner	Available data source or data management entity
Area selection and planning phase	Area information	Elementary and middle school districts	○	Define the project range to be studied	National government	Digital National Land Data web page
		Zone 30	△		Prefectural police	Prefectural police department website
		Zoning districts	○	Data by which to determine project implementation necessity	National government	Digital National Land Data web page
		Urban planning areas	○		National government	Digital National Land Data web page
		School roads	△		Municipality	Municipality documents
Understanding the problem that the local community has	Traffic information	Car traveling speeds, amount of traffic	○	Automotive traffic situation on arterial roads (speeds, amount of traffic)	MLIT	ETC2.0 probe data
			○	Automotive traffic situation on small roads (speeds, amount of traffic)	Private	Private data
		Amounts of pedestrian and bicycle traffics (how many pedestrians and bicycles pass)	○	Pedestrian, bicycle and automotive traffic situation on small roads (speeds, amount of traffic)	Private	Private data
			○			
			○			
		Sudden deceleration, sudden steering	○	Potential accident risk spots	MLIT	ETC2.0 probe data
		Traffic accident statistics	○	Accident blackspots	National Policy Agency	National Policy Agency traffic accident statistics
Planning of measures	Traffic regulation	Speed regulation	△	Define speed limits for individual road ranges	Private	Private data
Planning of measures and consensus building	Road information	Road widths	○	Basic speed limit information, vehicle-and-pedestrian interference risks	Geospatial Information Authority	Basic Road Map Database
			△		Private	Private data
		Whether or not the road has a centerline	△	Basic speed limit information, etc.	Private	Private data

▼Looking for available data collection technologies

(example: An application that detects whether or not a road has a centerline)

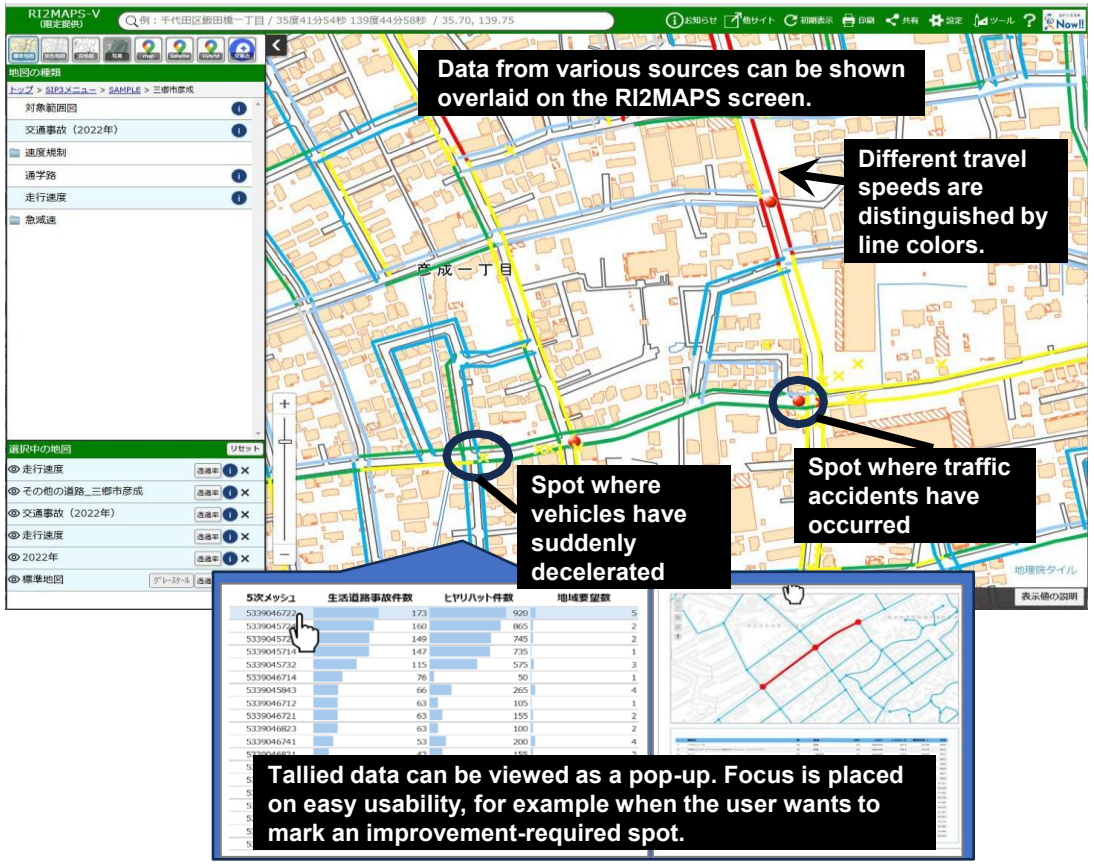
Source: Geotechnologies website (https://business.mapfan.com/blog/detail/2878)

3. Understanding the current status of urban small roads and creating a policy monitoring system

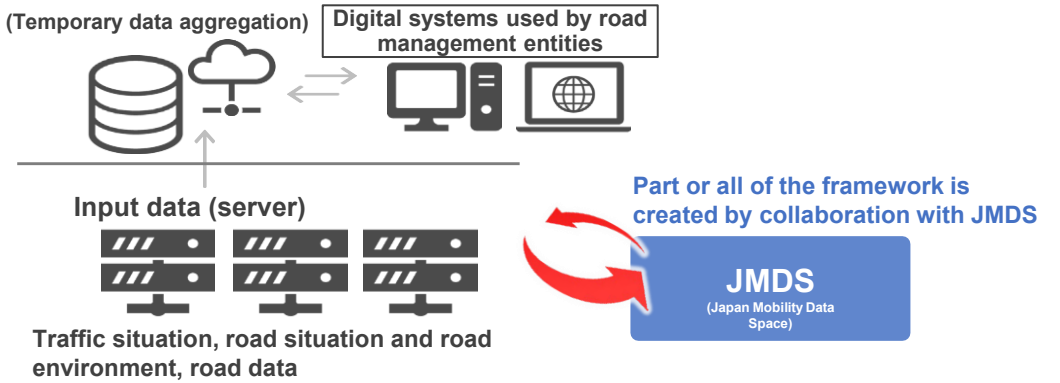
- **Using the "Ri2 MAPS" platform,** we have successfully created a **prototype visualization tool** with necessary functions to enhance safety and security on small roads. Data collected from the candidate model areas has been built into the tool.
- The basic system design is already completed. From the next fiscal year onward, we will continue to **collect necessary pieces of information that are still missing** and also will try to **add simple data tally functions** to the tool.

▼Screenshot of the prototype visualization tool *Some functions are not yet in place.

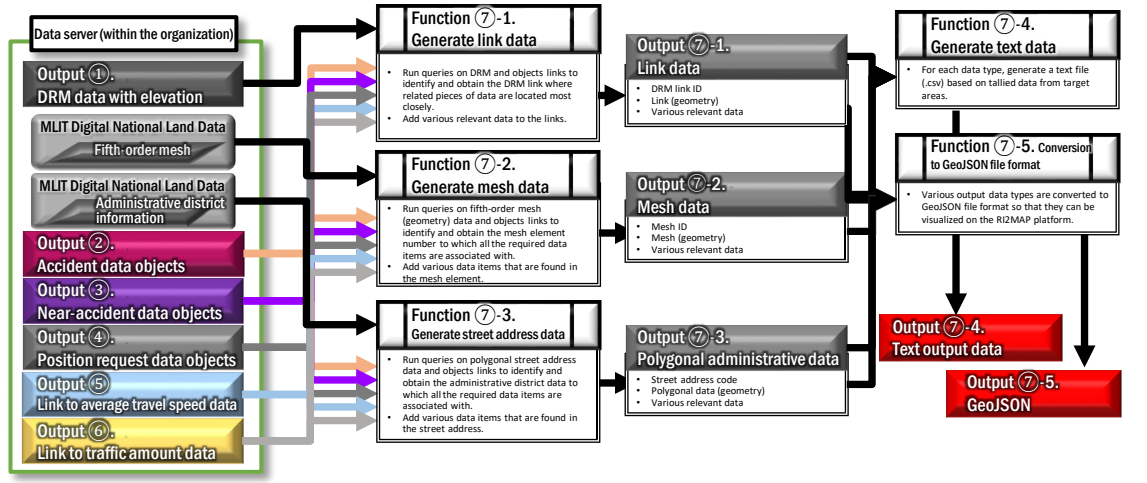
An image of how the visualization tool works (using Misato City as an example)



▼Overview of the visualization tool



▼Basic design of the visualization tool (an example of generative processing of visualization data)



4. Creation of digital sand box

- **After surveying municipalities to learn what actual issues that are facing,** we worked to **determine what functionality would be necessary** in the digital sand box we are going to create.
- We **created models that demonstrate a typical cause-and-effect relationship** where implementation of a measure can actually **improve safety.** Using these models, we **designed the basic simulator configuration.**

▼Identification of necessary functionality based on what actual issues we need to work on

Actual issues

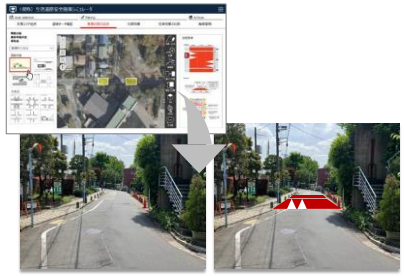
- It is not clarified what measures will produce positive result.
- Effectiveness has been evaluated on linear or point basis, but no established tool or methodology is available that can evaluate overall impact on arterial roads.

Before a measure can be implemented, it is difficult to obtain positive consensus of the community residents.

Digital tools to be built

Measure evaluation simulator (car user perspective)

Measure evaluation simulator (pedestrian perspective)



▼Creation of models demonstrating a typical cause-and-effect relationship that implementation of a measure can actually improve safety

Measure

Features that directly restrict vehicle speed
Examples: Humps, chicanes, narrowings, raised pedestrian crossings, stop signs, maximum speed limits, etc.

Features that indirectly restrict vehicle speed
Examples: Roadway width reduction by installing sidewalks, guardrails, bollards, etc.

Efforts to attract more on-foot visitors by making the area more appealing
Examples: Eliminating power poles, providing parking or temporary stopping spaces, etc.

Features that directly eliminate vehicle access to the area
Examples: Retractable bollards, traffic blockade, closing the road to large vehicles, one-way roads, traffic restriction, allowing cars to pass the location only in the specified way, etc.

Situation created by the measure

Driving comfort is lowered for car drivers. (②)
Travel speed is restricted. (①)
Roadway width is reduced. (①, ⑥)
Pedestrian and vehicle flow lines are separated. (⑥)
Traffic restriction (④)
Drivers want to avoid the road. (②)
Travel time increases due to speed reduction. (①)
Selective preference is lowered. (②)
Amount of traffic is reduced. (③)
Traffic volume increases on surrounding arterial roads (④, ⑤)

– Required modeling logics –

- M①: Logic to achieve travel speed reduction on residential roads
- M②: Logic to cause drivers to want to avoid residential roads
- M③: Route selection that takes into consideration residential road users' preferences
- M④: Use of traffic restriction to turn away traffic from going through residential roads
- M⑤: Increase in the degree of traffic jam loss resulting from having greater amounts of traffic on surrounding arterial roads (and provision of alleviation measures thereof)
- M⑥: Reduction of traffic volume on residential roads and flow line separation to have less interference risks between cars and pedestrians
- M⑦: Reduction of traffic accidents as a result of traffic volume reduction on residential roads

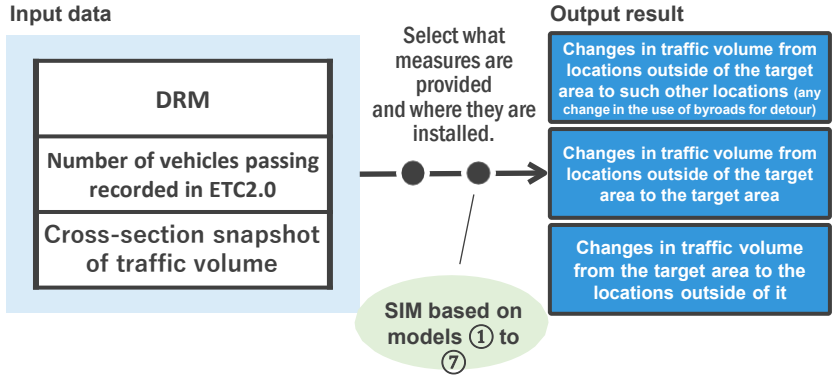
Effectiveness of the measure

- Car traveling noise and vibration in the area are lowered. (⑦)
- Number of accidents is reduced (safety improves).
- Car-and-pedestrian interference risks are reduced.
- Degree of traffic jam loss increases on surrounding arterial roads. (⑤)

4. Creation of digital sand box

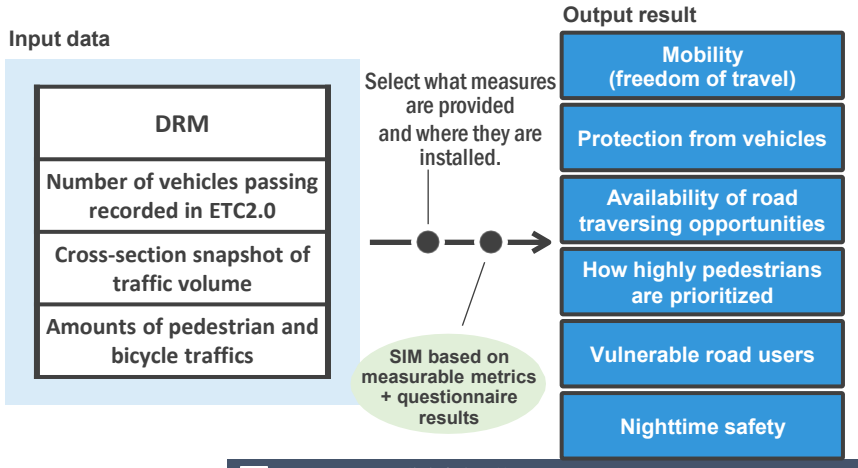
- Based on the study result obtained, we created **simulator output samples** from **car users' and pedestrians' perspectives.**
- From the next fiscal year onward, we will continue collecting necessary pieces of data that are still missing and also standardize the logic models in order to **complete and try out the prototype system.**

▼Evaluation simulator output from the car user perspective



Compare traffic volume before and after the measures are implemented, on surrounding arterial roads as well as locations in and outside the target area, to see if any change is observed.

▼Evaluation simulator output from the pedestrian perspective



Numerically evaluate the degree of perceived safety from the mobility perspective, protection from vehicles, availability of road traversing opportunities, etc.

5. Making sure that the plan is socially acceptable and ready for collaboration and that necessary rules are defined

■ Policy Package Implementation Guidebook (tentative title)

Provide the guidebook as a means to demonstrate how **the technologies and theories developed by the consortium** (visualization tool, evaluation simulators, urban road planning scheme, etc.) **can be implemented, along with their underlining philosophy and the usage detail,** for the purpose of assisting and encouraging **local municipalities** to improve urban small roads in their respective areas.

- The guidebook is meant to be **proactively implemented and continuously improved by the respective model areas.**
- **Refine the guidebook for broader applicability**, taking into consideration differences in **scale between municipalities and their unique characteristics.**
- All measures are to be implemented through **close collaboration between the road administrator and the traffic management authority.**

[Intended outcomes]

- The guidebook is actively used to drive **urban small road improvement projects by municipalities** across the nation.
- The guidebook **assists formation of governmental policies that encourage municipalities to increase their improvement efforts** (through ministerial ordinances, notifications, etc.).
- **Any useful learning, feedback and insights** obtained from the implementation experience in model areas are documented to help **improve guidelines and manuals for broader implementation**.

5. Making sure that the plan is socially acceptable and ready for collaboration and that necessary rules are defined

- **We interviewed a number of municipalities to investigate what specific issues that these municipalities, which will be actually using our Guidebook, are actually facing.**

▼What we learned from surveying municipalities concerning their efforts to improve safety on small roads

City A	City B	Town C	City D
• Numerous different requests come from people in the communities (a total of approx. 5,000 requests are received every year, coming from various entities). • Difficulty to reach positive consensus between different communities is slowing down action-taking effort. • Use of physical devices is often encountered by objection due to concerns for noise, vibration and negative impact on convenience. • Objection is raised due to concern that residential road protection measures may have negative impact on arterial roads.	• ETC2.0 probe data and other technical content is not easily available for use. • Road gradients and other necessary information are hard to obtain without actually visiting the spot. • It is difficult to determine exactly where a physical device can work best. • It takes long time and a lot of work to obtain positive consensus of residents.	• It is difficult to prioritize different areas to determine which ones need improvement most urgently. • A better communication channel is needed that is easy to use for residents and helps obtain their understanding smoothly.	• Numerous different requests come from people in the communities and it is a lot of work to evaluate the actual situation associated with each case (a total of approx. 1,000 requests are received every year). • No methodology is established to objectively determine the urgency of a request or complaint received. • No sufficient accident data is available to start with, and it is also difficult to accurately analyze the data to identify improvement-required spots.

– Difficulties faced by municipalities –

Difficult to see what exactly is the current situation.

No clue to determine what measures will actually produce results.

No way to know what topics should be discussed or shared with stakeholders to drive improvements.

No means of prioritize which issues should be addressed first.

5. Making sure that the plan is socially acceptable and ready for collaboration and that necessary rules are defined

- Based on the specific issues faced by its intended users, the Policy Package Implementation Guidebook (tentative title) should be further **reviewed and improved into a more refined version.**

Chapter		Detail (tentative)	Referential cases, etc.	Remarks
1	**Define the policy and the target area(s)**	• Use the urban road network planning scheme, and take various factors into consideration such as elementary school district divisions and area-specific hazards. • Apply to the model areas with area-specific conditions reflected.	• US, UK and Germany: Road planning, design guidelines, etc. • France (Paris): Elementary school district (1 to 3 km^2 per school)	• The final plan should be based on the scale of the target municipality and its improvement progress status.
2	**Diagnose the current situation**	• Important perspectives for current situation diagnosis; point data elements to look at depending on the regional characteristics etc. • How to read the data analysis result and what to look for	• France (Paris): Current situation diagnosis using multifaceted data	• Eventually proceed to the use of visualization tool.
3	**Design the menu of measures to be implemented**	• Design the implementation menu; select the best combination of measures. • Provide a basis to evaluate feasibility in terms of installability, cost and other factors.	• US: “Quick Project” • France (Paris): Improvement Plan Report	
4	**Discussion and consensus building**	• Define the opinion survey scope, timing and duration. • How to prioritize the opinions and views collected • Publicity channels and tools	• France (Paris): “Map on the Table”, an input form for people to report and share their experience of strolling the city streets	• Digital sand box accuracy improvement through validation in model areas, listing of key points
5	**Finalize the implementation menu**	• Process to select the measures to be implemented • ・・・	• France (Paris): Selection of project leadership and definition of responsibilities	
6	**Physical work and installation**	• Key points in physical work management • ・・・		
7	**Verify effectiveness**	• Understand how effective the implemented measures are. • ・・・	• US: Highway improvement program management process	• Implementation history and other information should be collected and stored in the digital sand box.

Target technologies, theories and know-how

- Urban road network planning scheme
- Visualization tool
- Evaluation simulator
- Policy monitoring system

6. Recommending useful systems and rules

- **Clarify the scope of systems and rules to be studied** and also **review the small road safety improvement actions** conducted in the past and organize the insights obtained.

▼List of systems and rules to be studied

Road Act and other road structure-related laws and regulations

- Road Act
- Road Structure Ordinance
- Explanation and enforcement of Road Structure Ordinance
- Standards for general structure of sidewalks
- Technical standards for installation of projections, narrowings and bends
- Technical documentation on "technical standards for installation of projections, narrowings and bends"
- Order Concerning Road Signs, Road Marking Lines and Other Road Indication Features

Guidelines and manuals

- Residential Road Zone Improvement Manual (now being revised)
- On-road Travel Facilitation Guidelines
- Road Guidelines to Respond to Various Needs
- Others
  - Roundabout Manual
  - Guideline for Creating a Safe and Comfortable Bicycle Use Environment
- Any new manual or handbook?

Measures

- Zone 30 Plus
- Joint inspection of school roads
- Specified roads (barrier-free)

Road Traffic Act and other laws

- Road Traffic Act
- Traffic regulation standards

Plans and other actions

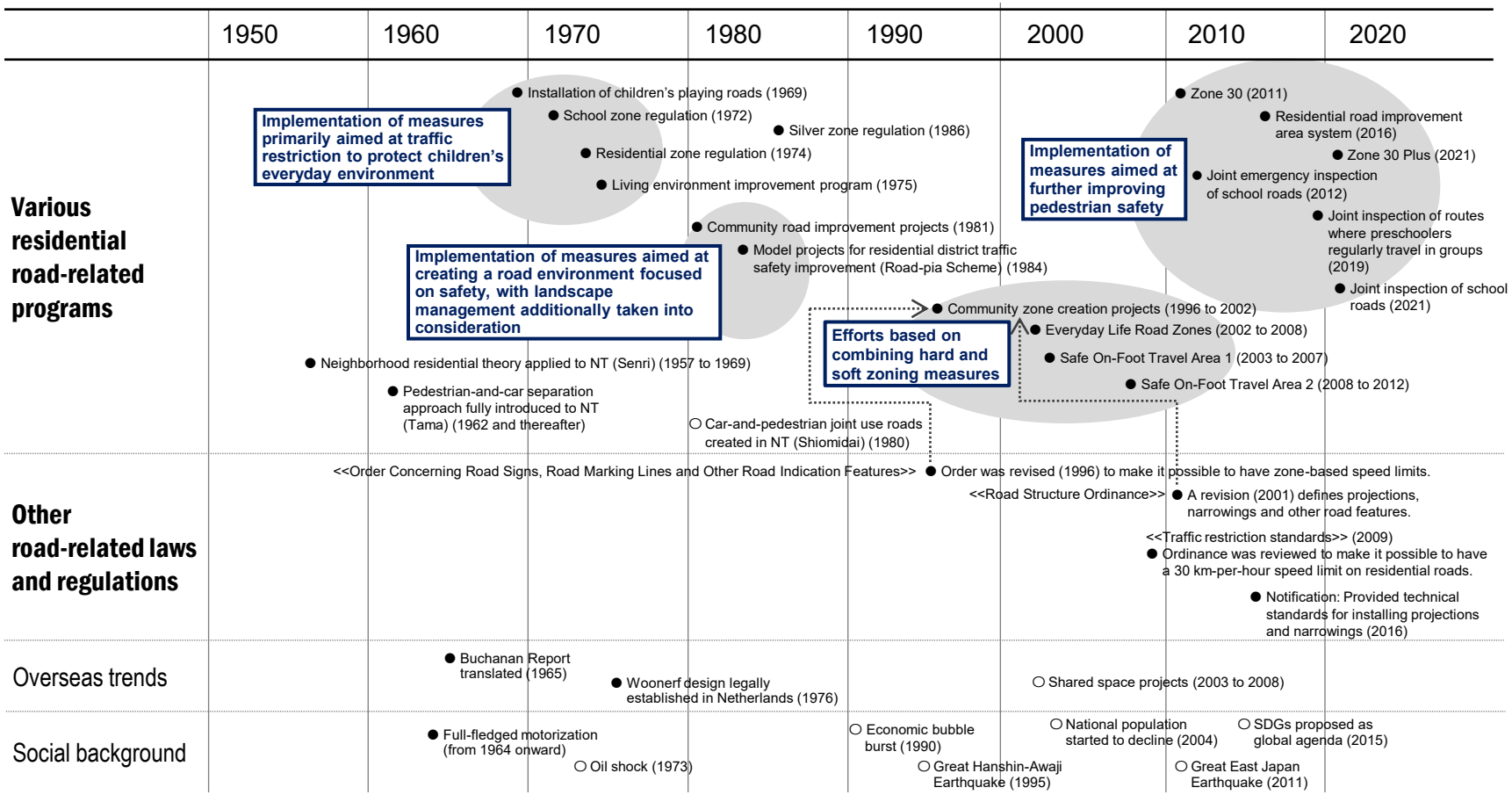
- Traffic safety plans
- Traffic safety implementation plans
- Urban planning master plan
- Barrier-free basic concepts
- Urban traffic plans
- Regional public transportation plans

Others

- Notifications and notices
- Ordinances and regulations
- Parking Lot Act and related ordinances (obligation to provide parking spaces, etc.)

Subsidies and grants made for residential road traffic safety improvement
- Traffic safety improvement project subsidy system (intra-district collaboration)
- Traffic safety improvement project subsidy system (emergency school road protection)
- Disaster readiness and safety improvement grants

▼Review of residential road traffic safety improvement actions conducted in the past



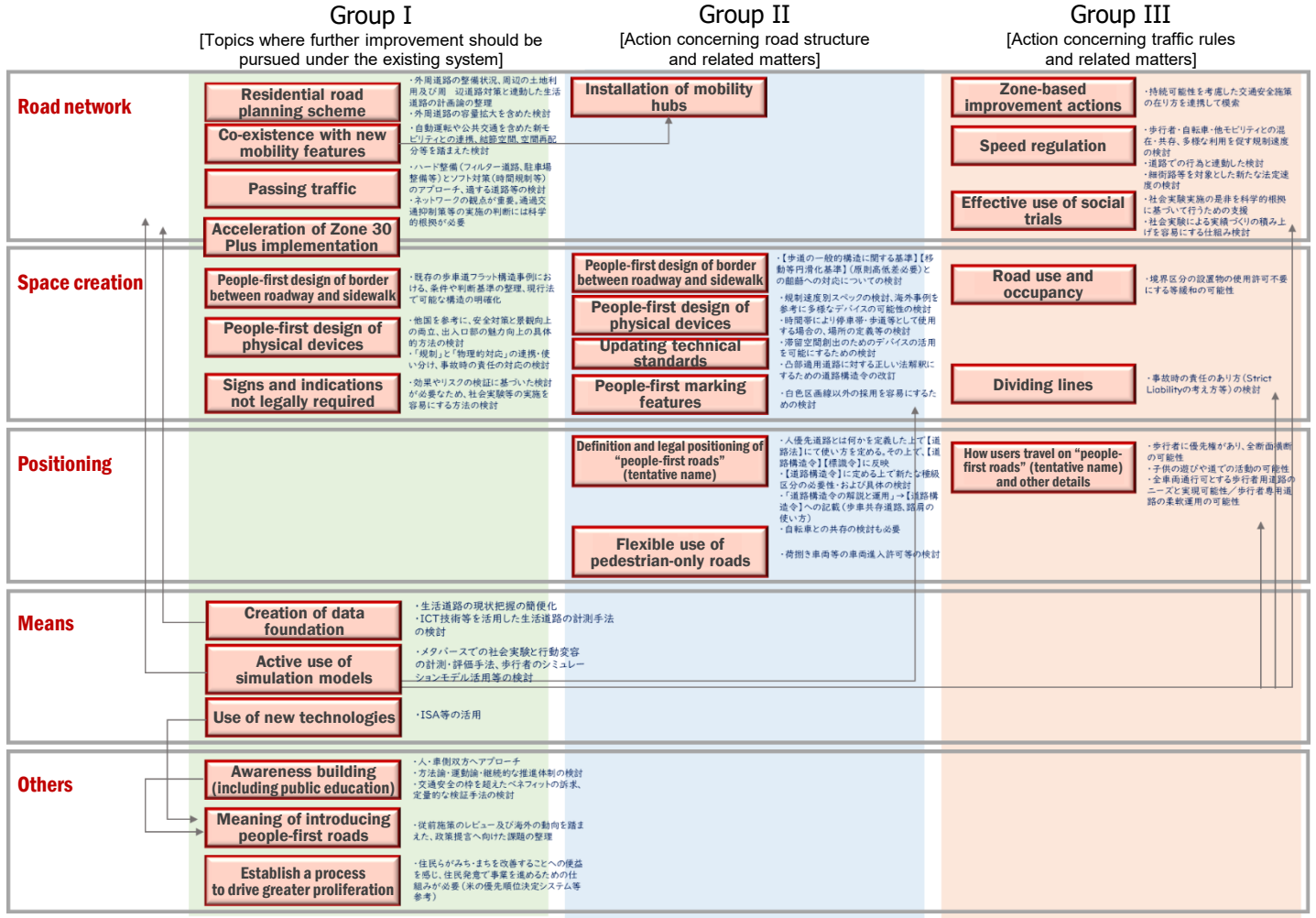
Key: "●" icons are associated with projects, measures or events that are described elsewhere in this document.

Source: "History of Actions Taken Concerning Residential Roads in Japan: Collection of Presentations and Speeches at the Committee of Infrastructure Planning and Management assemblies", by Wakana Hara and Others, Vol 66, 2022

6. Recommending useful systems and rules

- Based on the learnings obtained so far, we **initially investigated what general issues are present** in existing systems and rules.
- **We will study how these issues can be improved** and also will continue to **exchange views with governmental and public organizations to best utilize the insights obtained through this program.**

▼Identification of issues in creating a people-first network of small roads



▼Evaluation of legal issue (example)

*Evaluation of laws and regulations related to having the roadway and sidewalk surfaces at the same height

Laws and regulations that require the sidewalk to be raised above the roadway

[Standards for General Structure of Sidewalks] (summary)
2. Basic rules for sidewalk structure
(1) Sidewalk design and other factors
② **Level of sidewalk**
As a general rule, the sidewalk should be constructed with a height difference of 5 cm between the sidewalk and roadway surfaces.
③ **Curb height**
The curb along the sidewalk should be at least 15 cm higher than the roadway surface to assure pedestrian travel safety.

[On-road Travel Facilitation Standards]*
Article 7. Separating the sidewalk or similar features from the roadway or similar features
2. Curbs installed along the sidewalk or similar structure (excluding vehicle access paths or parts connected to a pedestrian crossing) should be at least 15 cm higher than the roadway surface.

As far as specified by the Road Structure Ordinance, it is allowable to have the sidewalk and roadway surfaces at the same height.
However, other laws and regulations (“Standards for General Structure of Sidewalks”, “On-road Travel Facilitation Standards”) specify that the sidewalk must be constructed higher than the roadway.

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