

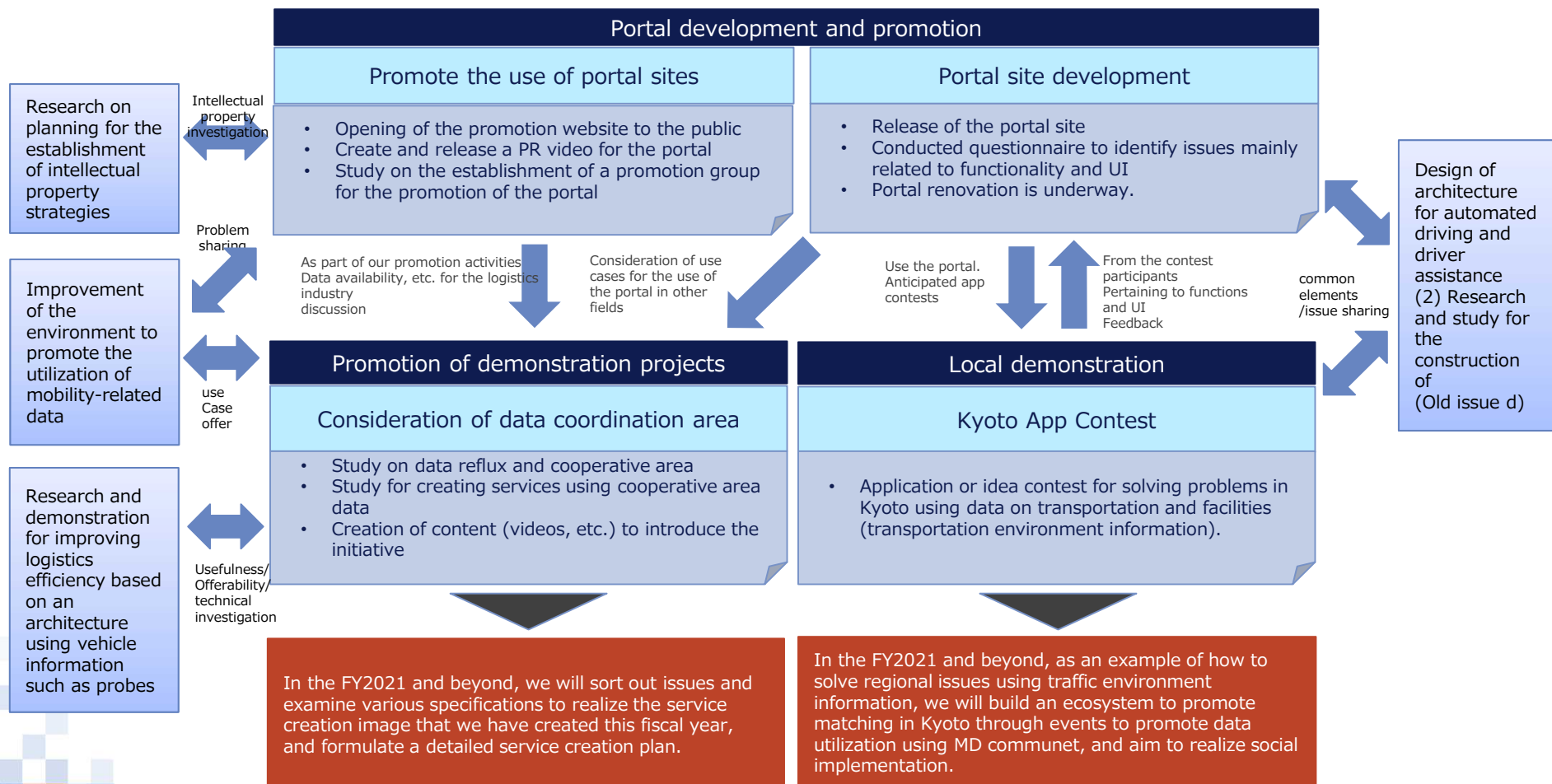
**"Strategic Innovation Program (SIP) Phase II  
Automated Driving (System/Service Enhancement)  
Research for Design and Development of Automated Driving/Drive Assistance Architectures  
Entrusted Business for Development of a Portal Site to Promote the Exchange of Geographic Data  
"Verification Experiments at the Tokyo Waterfront Area"  
"Research to Organize and Develop Geographic Data and Urban Traffic Condition Data for  
Linkage between Mobility Service and Logistics Service"  
Report (summary version)**

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# Introduction: Overview of the project in FY2020

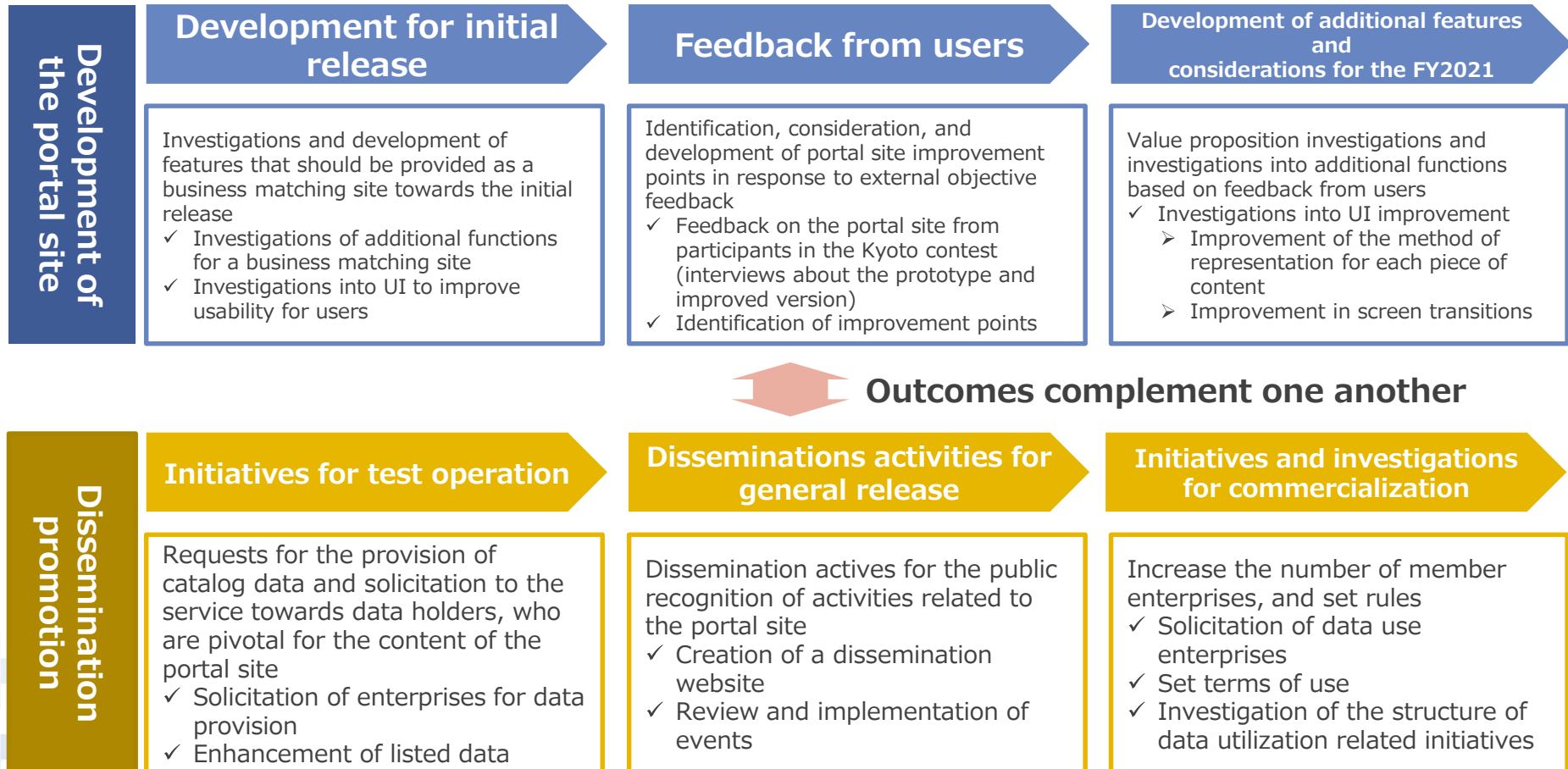
- In FY2020, efforts were made to establish, operate, and promote the portal.
- In order to promote the use of portals, we promoted a demonstration project to utilize data held by companies as a cooperative area, and held an application contest to widely disseminate to the public the creation of services to solve social issues.
- In promoting various activities, we collaborated with other related projects of the 2nd SIP.



# 1. Portal development and promotion

# Outline of the implementation of portal site development and dissemination promotion activities Overall picture

- Based on objective feedback from users, we identified improvement points and conducted investigations into additional functions and improvements in the portal site towards general release
- Looking ahead to commercialization, we solicited users and data providers to the service, and we conducted dissemination activities to gain widespread public recognition.



# 1.1 Development of the portal site

# Development for primary release Implementation plan

## Consideration of additional functions in consideration of business matching sites

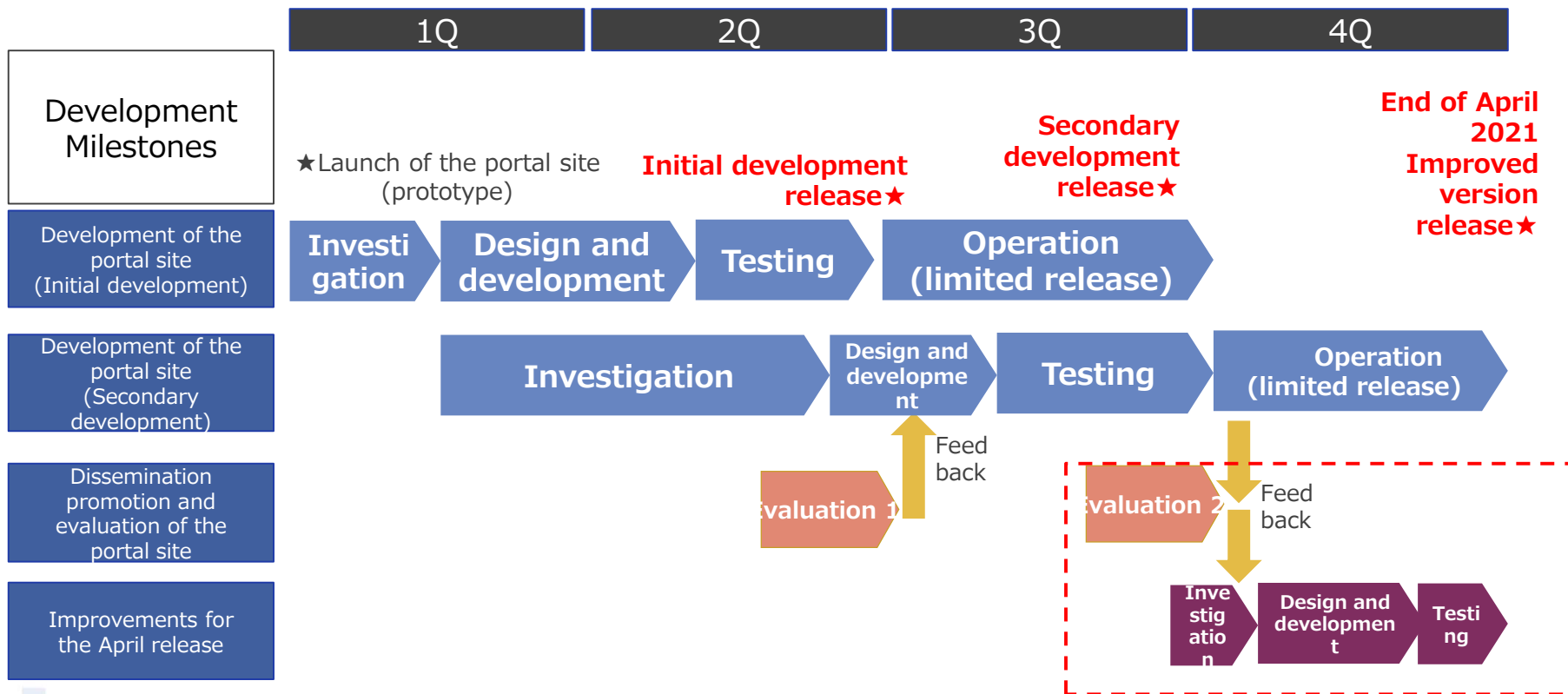
- For FY2020, while taking the fact the portal site will be released to some members into consideration, we set a development policy **with a focus on improving the matching rate and usability for users.**
  - ✓ Approach 1: Initiatives to increase the amount of data handled (data set, seeds/needs) in order to increase matching parameters
  - ✓ Approach 2: Improve ease of matching through innovations regarding ease of use and UI
  - ✓ Approach 3: Continuous improvements to usability from user feedback and operational issues

Approach 1 Increase the amount of data handled	Build a comprehensive machine learning model	Through creating a <b>comprehensive machine learning model that includes both data sets and needs/seeds</b> , create the possibility of new matching that combines needs and data sets (=seeds that have been specified).	FY 2020	
	Periodic collection of metadata ※See details later	To <b>dynamically reflect</b> the renewal of metadata <b>on the portal site</b> , <b>regularly harvest external metadata and create a catalog</b> by combining this with our metadata.		
Approach 2 Improve the ease of matching	Relevance according to human intuition	<b>By incorporating abstract criteria such as human intuition</b> as well as mechanical criteria such as the similarity of text descriptions, we became able to <b>encourage users' imagination and associations.</b>		FY 2021
	Prompt metadata description at data registration ※See details later	Metadata for data sets and seeds/needs can be registered in a free format. However, <b>we will induce users to unify each data description to a certain extent.</b>		
	Change the content of log output	To make this the recommended input, make changes so that it outputs information of the user who has accessed the log. We are intent to implement future improvements to recommendations by using the information that is output here.		
Approach 3 Ongoing improvements to usability	Functions will be improved using feedback from users and operational issues	<ul style="list-style-type: none"> <li>- <b>Reflect the opinions of contest participants</b> (improvements responding to complaints that it is hard to view and difficult to understand)</li> <li>- Tuning of automatic classification and display of similar data, add "provision" to facet items and apply the new design</li> <li>- <b>Reflect the opinions of contest winners and data providers</b></li> </ul>		
	Change the dataset representation to a more intuitive format	<ul style="list-style-type: none"> <li>- The visual representation UI <b>was changed from text-based to thumbnail images making it more intuitive.</b></li> <li>- Made improvements so that <b>each thumbnail displayed at the linkage destination is also obtained</b> for externally linked data</li> <li>- Tuning of the amount of information displayed at one time.</li> </ul>		
	- Improve the usage flow from the perspective of catalog users	<ul style="list-style-type: none"> <li>- <b>Optimization of usage flows</b> including the dissemination promotion website</li> <li>- <b>Redefine screen configuration</b> according to the usage flow</li> <li>- <b>Unify the design</b> with the dissemination promotion website</li> </ul>		

# Development for primary release Implementation plan

## Functional development schedule

- In phase one of development, we primarily reflected the results of the evaluation conducted in FY2019 in the addition of CKAN-format data collection functions (periodic harvesting of metadata).
- In phase two of development, we renewed screen design, improved matching accuracy, and added functions for setting the scope of data disclosure. In addition, we also reflected the opinions we received from contest participants at the portal site evaluation.
- We have begun the registration of actual data in the operation of the limited release from the third quarter, and we are conducting investigations for further improvements looking ahead to the release of the improved version in April.



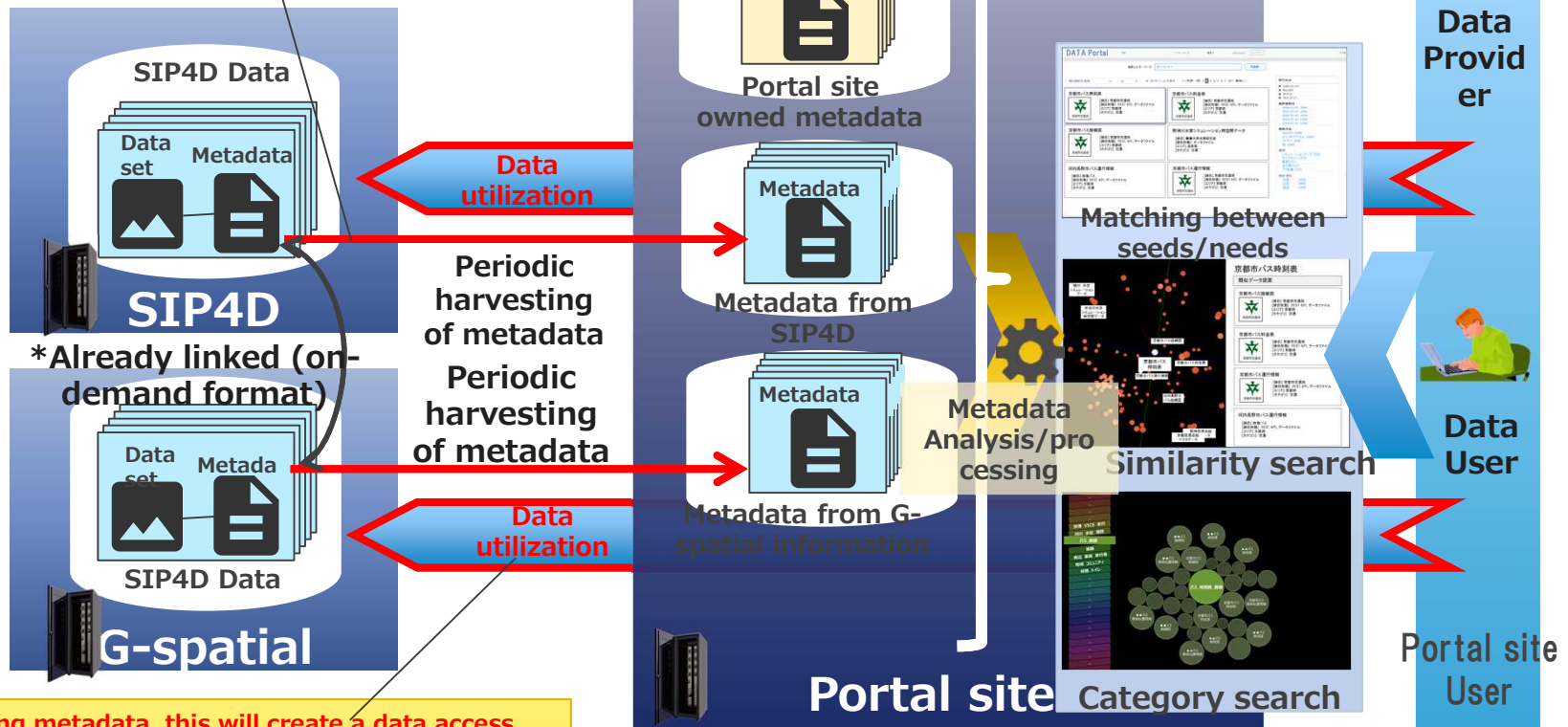


# Development for primary release Implementation results

## Periodic harvesting of metadata

- By collecting (harvesting) external metadata on a regular basis, it is possible to dynamically reflect metadata updates on the data provider side on the portal site.

We will periodically harvest metadata by calling the CKAN API that is already provided at the link destination from the MDP.



By linking metadata, this will create a data access route through the MDP catalog, which will lead to the potential promotion of the utilization of linked data.

# Development for primary release implementation results

## Metadata description guidance for data registration

- By providing a function that suggests data that has already been registered, it facilitates registration by the data registrant and increases the relevance of the data to other data by guiding the description.

(\*) 情報名

NTTDサンプルAPIデータ

(\*) 提供方法

REST-API  データファイル  書類

概要

NTTDが提供する江東区豊洲地区の地理情報データ。

(\*) カテゴリ

国土・気象  人口・世帯  労働・賃金  農林水産業  鉱工業・鉱業  
 商業・サービス業  企業・家計・経済  住宅・土地・建設  エネルギー・水  
 運輸・観光  情報通信・科学技術  教育・文化・スポーツ  
 司法・安全・環境  社会保障・衛生  国際  その他

タグ

× 地

地質

追加

A. Based on the description, **similar data is searched from a machine learning model, and already registered data is displayed.** Allow the registrant to refer to the description.

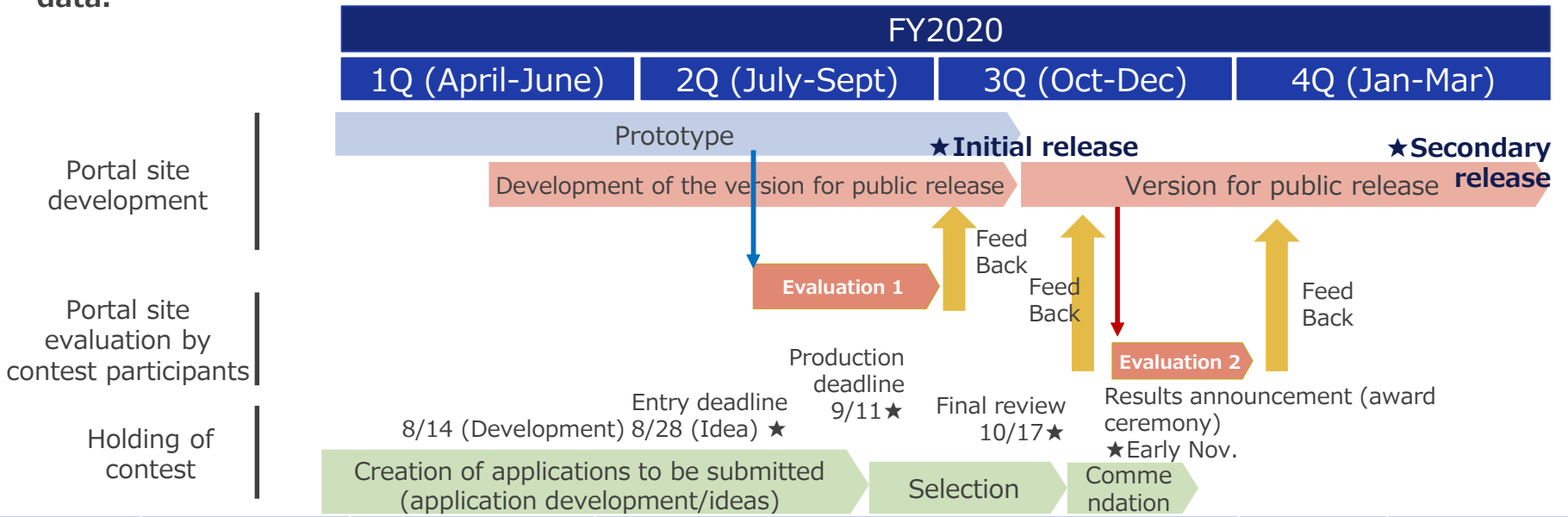
B. **Allow the registrant to optionally set similar data** (currently, the level of similarity is calculated with machine learning from the description, along with settings such as category and tag) Candidates for similar data are proposed from similar data calculated by current machine learning.

C. **Suggest tags that are already registered** from the text being entered by **utilizing full text search technology** (already possible for certain items such as tags).

# Evaluation of the portal site

## Implementation plan

- The contest participants and contest evaluators were asked to actually operate the portal site, and evaluation was conducted by questionnaires and interviews on how the portal site could contribute to data search for application development and as a mechanism for distribution and utilization of the company's data.



	Implementation period	Evaluator	Primary concerns	Target for evaluation	Main evaluation method
<b>Evaluation 1</b>	After the deadline for contest applications (After 9/4)	<ul style="list-style-type: none"> <li>Route navigation provider</li> <li>Data provider</li> <li>Local authority</li> </ul>	<ul style="list-style-type: none"> <li>Portal site functions and usability (searchability of data, etc.)</li> <li>Possibilities and issues as a system that leads to the distribution and utilization of data</li> </ul>	<ul style="list-style-type: none"> <li>Prototype</li> </ul>	<ul style="list-style-type: none"> <li>Questionnaire</li> <li>Interview</li> </ul>
		<ul style="list-style-type: none"> <li>Contest participant</li> </ul>	<ul style="list-style-type: none"> <li>Portal site functions and usability (searchability of data, etc.)</li> <li>Data presented and provided by the portal site, API, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Prototype</li> </ul>	<ul style="list-style-type: none"> <li>Questionnaire</li> <li>Interview</li> </ul>
<b>Evaluation 2</b>	After the announcement of results (After late Nov.)	<ul style="list-style-type: none"> <li>Contest winner</li> </ul>	<ul style="list-style-type: none"> <li>Portal site functions and usability (searchability of data, etc.)</li> <li>Data presented and provided by the portal site, API, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Initial version for public release</li> </ul>	<ul style="list-style-type: none"> <li>Interview</li> </ul>

# Evaluation of the portal site Implementation plan

## Evaluation design

- We organized the draft portal site evaluation items according to the attributes of the evaluator, created a questionnaire, and conducted a questionnaire study.

### Evaluators and functions for evaluation

	Evaluator	Evaluation Role	Number of evaluators (estimated)	Evaluation timing		Relevant functions*				
				Evaluation 1	Evaluation 2	A	B	C	D	E/F
1	Contest participant (Development enterprise/idea enterprise/university)	Data User	Around 10 to 20 people	✓		×	✓	✓	✓	×
2	Contest winner		Around 5 people		✓	×	✓	✓	✓	×
3	Route navigation provider (Jorudan, Navitime Val Laboratory Corporation, Ekitan)		Around 4 providers (At least one person from each company)	✓		×	✓	✓	✓	×
4	Data provider (Bus, train, distribution, facility)	Data Provider	Around 5 providers (At least one person from each company)	✓		✓	×	✓	✓	×
5	Local authority (Kyoto City)	Local Authority	At least one person	✓		✓	✓	✓	✓	×

\*Relevant functions

- A: Registration of data information catalog
- B: Utilization of data information catalog
- C: Matching between seeds/needs and communication space

- D: Common features for log-in, homepage, etc.
- E: Account creation
- F: Operation control

# Evaluation of the portal site Implementation plan

## Evaluation perspective

- We specified success factors (merit=value) for the project linked to the definition and conception of the value that the portal provides that we investigated in the last fiscal year  
 \*This time, we will evaluate the sections of the portal site inside the red-dotted line

### Specify objective and provided value

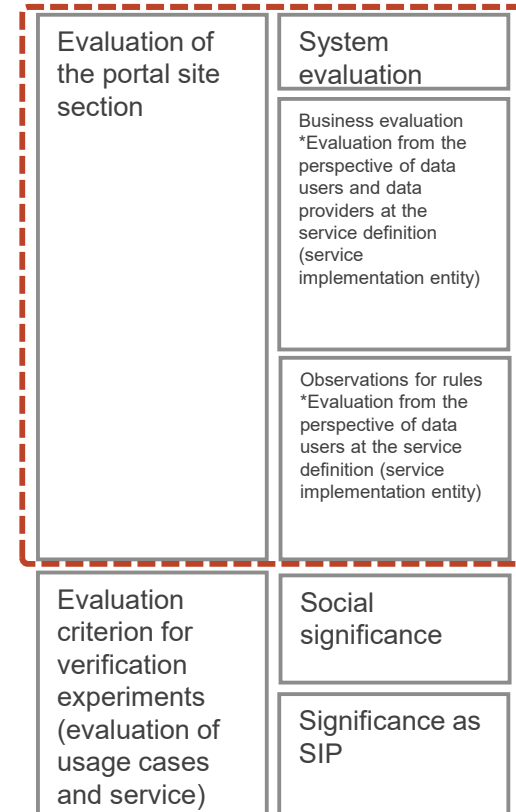
The below items listed in FY 2018 Report Summary Version, "2.4 Value for SPF Users", are positioned as requirements for the request

- Functions
- Interface
- Data
- Business
- Rules

### Method and provided content (define functions)

Requirements	Requirements (merit=value) *Based on the FY2018 Report Summary Version
Functions	- Each data is managed in a way that is easy to overlay on a map (for example, being able to obtain multiple data for a specific time frame for the desired area)
Interface	- When collecting multiple data, there is no need to separately develop interfaces, and an API with a standardized specification in SPF can be used to reduce the development workload for integrators.
Data	- By obtaining information from SPF, information from reliable information providers can be obtained.
Business	- As SPF provides diverse data, new business ideas are likely to come about, such as discovering new products and entering new markets using various types of information.
Rules	- Information will be made easier to handle by standardizing the scope of use (industry, use) for the information provided by SPF and the concept of ownership of the deliverables produced based on the information.

### Project success factors (evaluation)



# Evaluation of the portal site Implementation plan

## Evaluation Items

- In accordance with the success factors, we defined the aspects for evaluation items as, 1. System aspects, 2. Business aspects, and 3. Rules aspects

Category	Proposed evaluation items
System aspects	Seeds/needs registration functions
	Data attributes (static/dynamic)
	Catalog search functions
	Functions for referencing category representation term by automatic classification
	Functions for referencing the level of data similarity
	Features for catalog registration
Business aspects	When looking at the functions for referencing category representation term by automatic classification, whether all of the related data and information is included in the same category (recall rate)
	When looking at the functions for referencing category representation term by automatic classification, whether any unrelated data or information (noise) is not included in the same category (relevance=accuracy)
	Whether there are any terms that have been split unnaturally or unintended terms in the category representation terms
	When looking at similar data, is all of the related data and information proposed? (recall rate)
	When looking at similar data, is there no unrelated data or information (noise) being proposed? (relevance=accuracy)
	Are there enterprises that are considering doing business using portal site data?
	Do data providers feel that they want to provide to the portal site exclusively? (conformity, reproducibility)
Rule aspects	Is the information made easier to handle by standardizing both the scope of use (industry, use) for the information provided and the concept of ownership of deliverables produced based on the information?

# Evaluation of the portal site Implementation results

## Feedback from Users and Extraction of Areas for Improvement

- We conducted interviews with primary participating enterprises who actually used the portal site as well as contest participants, and we established a response strategy.

	Feedback points	Response strategy
Participants	<ul style="list-style-type: none"> <li>The granularity of registered data is inconsistent, and the rules are unclear. (This seems to lead to answers that registered data is difficult to objectively understand, hard to search, and difficult to compare with other data.)</li> </ul>	<ul style="list-style-type: none"> <li>Investigate the establishment of rules for the granularity of registered and linked data</li> <li>Consider layering and formalizing the handled data set descriptions</li> </ul> <p style="text-align: right;"><b>Continue to explore ways to improve functionality</b></p>
	<ul style="list-style-type: none"> <li>Improved data retrievability in catalog searches (especially when it's harder to find data that you registered yourself compared to that registered by the data registrant)</li> </ul>	<ul style="list-style-type: none"> <li>Add "Information Provider" to the filter items, and create a method for specifying with one click</li> </ul> <p style="text-align: right;"><b>Implemented in the phase two development release</b></p>
	<ul style="list-style-type: none"> <li>The display and operation method for the automatic classification graph and 3D similarity data search are difficult to understand and use. (remove duplicates of displayed data, usability for changing viewpoints)</li> </ul>	<ul style="list-style-type: none"> <li>Solve the issue of missing titles for the 3D display of similar data (automatically hide leading numbers, extensions, and other strings)</li> <li>Aggregation of mixed titles/replace with <u>municipal titles with prefectural titles</u></li> <li>Improvement in display and operation methods, noise removal (on-going implementation)</li> </ul> <p style="text-align: right;"><b>Implement in the phase two development release</b> <b>Scheduled for April 2021</b></p>
	<ul style="list-style-type: none"> <li>Rules regarding the use of the site and the overall handling of data are unclear.</li> </ul>	<ul style="list-style-type: none"> <li>Clarification of the policy. Make improvements so that rules conform throughout the whole site, including the portal site public release website.</li> </ul> <p style="text-align: right;"><b>Scheduled for April 2021</b></p>
	<ul style="list-style-type: none"> <li>It is difficult to understand how to enter data during registration.</li> </ul>	<ul style="list-style-type: none"> <li>Include examples of entries on the registration screen and add assistance measures</li> </ul> <p style="text-align: right;"><b>Implemented in the phase two development release</b></p>
Prize winner	<ul style="list-style-type: none"> <li>I am used to Google search, so having the search bar at the beginning is natural.</li> </ul>	<ul style="list-style-type: none"> <li>Optimize screen flow</li> </ul> <p style="text-align: right;"><b>Scheduled for April 2021</b></p>
	<ul style="list-style-type: none"> <li>There is a large amount of visualized information. It would be good if we could apply filters.</li> </ul>	<ul style="list-style-type: none"> <li>Adjust the visual representation of displayed information and the number displayed</li> </ul> <p style="text-align: right;"><b>Scheduled for April 2021</b></p>
	<ul style="list-style-type: none"> <li>When classifying data, I would like to display the meaning of clusters as a representation similar to human intuition or perception.</li> </ul>	
	<ul style="list-style-type: none"> <li>Use entity information (the meaning of items) to make decisions when coming up with ideas</li> </ul>	
Data provider	<ul style="list-style-type: none"> <li>I would like push notifications when a comment is added to registered data. Not noticing the comments could lead to opportunity loss.</li> </ul>	
	<ul style="list-style-type: none"> <li>I want a flag for public or private comments.</li> </ul>	
	<ul style="list-style-type: none"> <li>It would be good to analyze needs based on browsing and search history by tagging user attributes.</li> </ul>	
	<ul style="list-style-type: none"> <li>If each data is linked to instances, the use of data that is actually used together may be promoted.</li> </ul>	<ul style="list-style-type: none"> <li>We plan to investigate how and when to implement.</li> </ul>

# Development of additional functions, etc., and consideration for the FY2021 Development in the second period

## Improvement of data searchability

- Improve the searchability of data by adding "information provider" to the refinement items and building a system that allows both data providers and data users to identify data providers with a single click.

The screenshot shows the MD communet website interface. At the top, there is a navigation bar with links for TOP, 新着データ (New Data), データ検索 (Data Search), データ分析 (Data Analysis), and 新規ユーザ登録 (New User Registration). There are also language selection buttons for JP and EN, and a ログイン (Login) button.

The main content area features a search bar with the text "検索したキーワード" (Searched keywords) and a 検索 (Search) button. Below the search bar, there are filters for "最終更新日 昇順" (Sort by last update date) and a page indicator showing "1" of 7 pages. The search results are displayed in a list format, with the first result titled "MY CITY FORECAST" from the organization "NIED".

The sidebar on the right contains a filter menu with the following items:

- 絞り込み (Refinement)
- データベース (Database)
- カテゴリ (Category)
- タグ (Tag)
- 情報提供者 (Information Provider)** - This section is highlighted with a red box and contains a list of providers with their respective counts:
  - インクリメントP株式会社 (6)
  - ダイナミックマップ基... (4)
  - (3)
  - 地方自治体データ登録... (3)
  - 株式会社ゼンリン (2)
- もっと見る (View more)
- 提供方法 (Provision Method)
- 最終更新日 (Last Update Date)
- 登録者 (Registered User)



# Development of additional functions, etc., and studies for the FY2021 2nd phase development Assistance with user data entry

- By adding input support functions such as input examples on the registration screen and suggestions for tags that have already been registered, we have made it easier to enter information in a free format.

The image displays two screenshots of the MD communet web application interface, illustrating improvements in data entry assistance.

The first screenshot shows the "ニーズ入力" (Needs Input) screen. A red box highlights the "エリア" (Area) dropdown menu, which is currently set to "未選択" (Not Selected). A red callout box labeled "Input Example" points to this dropdown. Below the dropdown, there is a text input field and a "+" button. A blue button labeled "入力内容の確認" (Check input content) is also visible.

The second screenshot shows the "公開APIデータ入力" (Public API Data Input) screen. A red box highlights the "タグ" (Tag) input field, which contains the text "地" and "地質". A red callout box labeled "Keyboard input (Suggest previously registered tags)" points to this field. The screen also features a "カテゴリ" (Category) dropdown menu and a grid of category buttons, including "国土・気象", "人口・世帯", "労働・資金", "農林水産業", "鉱工業・鉱業", "商業・サービス業", "企業・家計・経済", "住宅・土地・建設", "エネルギー・水", "運輸・観光", "情報通信・科学技術", "教育・文化・スポーツ・健康", "行政", "社会保障・衛生", and "その他".

Improvement of the screen image of the first stage of development

# Development of additional functions, etc. and study for the FY2021 Development for the FY2021 Review of improvement policy

- Based on the evaluation results, for the FY2021, we established an improvement strategy of **improving the flow from the dissemination promotion website to the portal site, to the data catalog, and representing content in a more intuitive manner**, with the expectation that the portal site will be used by more users.

## Intuitive representations of the data catalog

- Change representations based on objects such as text and figures to representations based on thumbnail images
  - For each data set that was collected externally, modify so that a representative thumbnail image is obtained
- Adjust information that is visualized
  - Adjust the amount of information displayed by applying filters for visualized information. Make it easier to see and get to the data you want to find

## Improve usage flow from the user's perspective

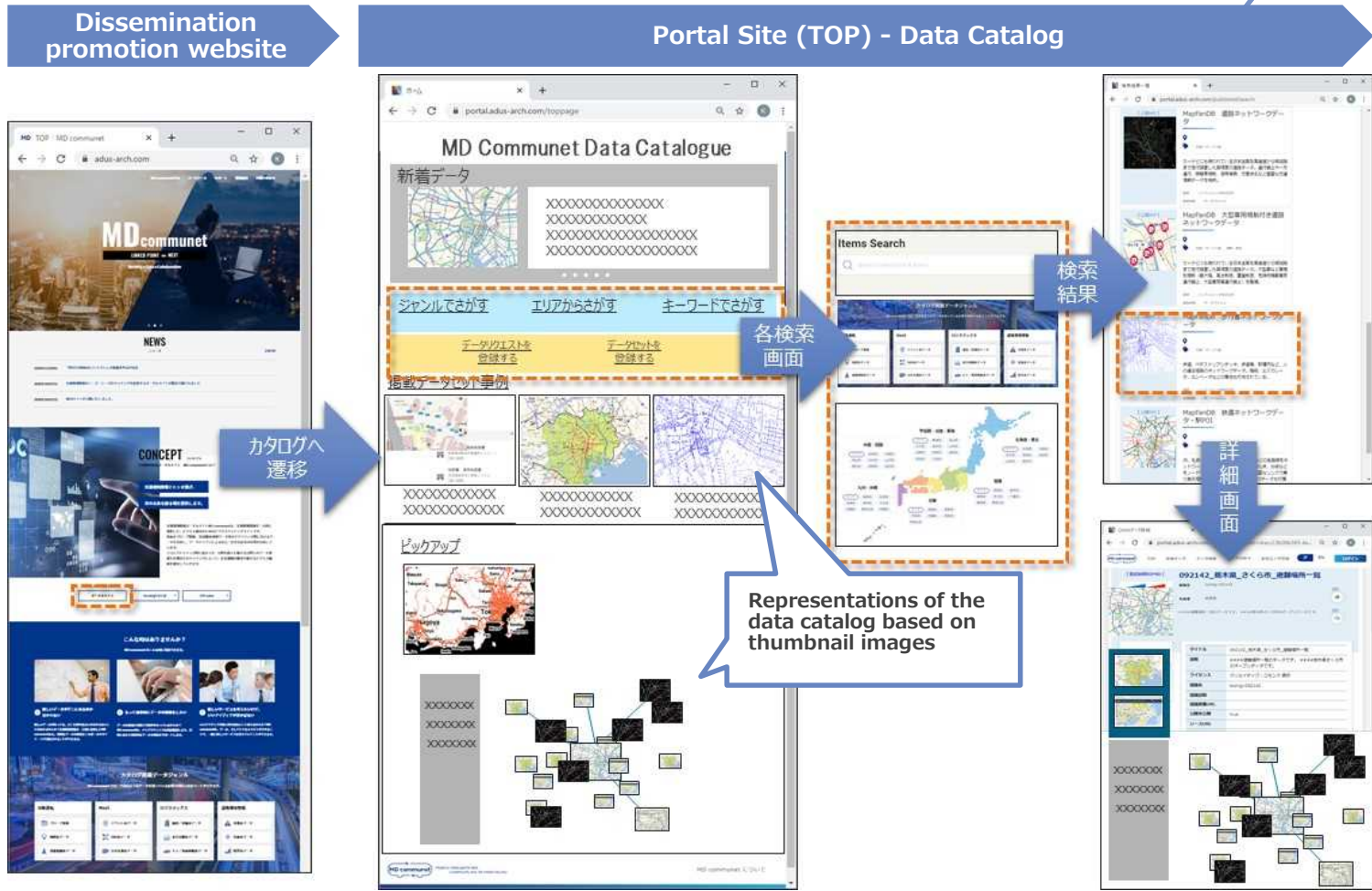
- Clearly define the roles of the dissemination promotion website and the portal site, and optimize the routing to the data catalog.
  - Review the definition of each screen and screen transition
  - Integrate with the dissemination promotion website (for example, improve the design)

 Integrate the dissemination promotion website and the portal site, and work to optimize access to the data catalog and significantly improve the displayed information and UI

# Development of additional functions, etc. and study for the FY2021 Development for the FY2021 Portal site after improvement (image)

- As the line to the portal site is complicated, the design will be improved to allow direct transition from the promotion website to the catalog search.
- By changing to a thumbnail image-based representation, we aim to achieve an intuitive UI.

Optimize the path to the data catalog



## 1.2 Promotion of portal sites

# Promotion activity policy

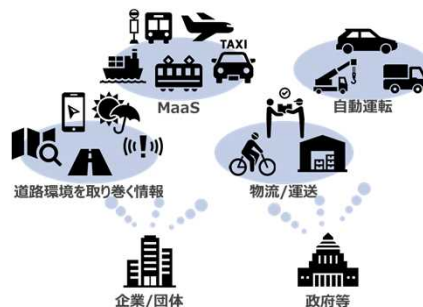
- As the portal site is scheduled to be released this year, it was decided to carry out various dissemination and promotion activities for the purpose of expanding the data, increasing the number of participating companies, and raising awareness of the portal site in order to make it known to the world that it is an attractive portal site.
- Based on the results of the previous year's project, the project was designed to be "unique to MD Communit" with an eye to future business development. The goal is to clarify the points of appeal and to have both the public and private sectors agree on this initiative.

## Making friends to create MD communit together



- ✓ To find partners who endorse the efforts of MD communit and can create it with us together
- ✓ Conduct investigations into the promotion system based on data utilization activities using MD communit
- ✓ Establishing terms of use that allow for smooth transactions between users.

## Data listing unique to MD communit



- ✓ In order to promote the use of data, we will collect traffic environment information from various companies and publish it as catalog data.
- ✓ Collect information on the transportation environment from a wide range of public and private sources, and publish the unique data of MD communit as catalog data.

## Increase awareness of MD communit



- ✓ Create opportunities to communicate information about MD communit
- ✓ Conduct various promotional activities such as exhibitions, events, and news releases

# FY2020 Promotional action plan

- Activities were detailed in preparation for the first release of the portal site and the second release at the end of April, which are major milestones in the FY2020 plan. Activity policies and tasks were identified for the content of activities, and preparations were made to ensure that they would be released.

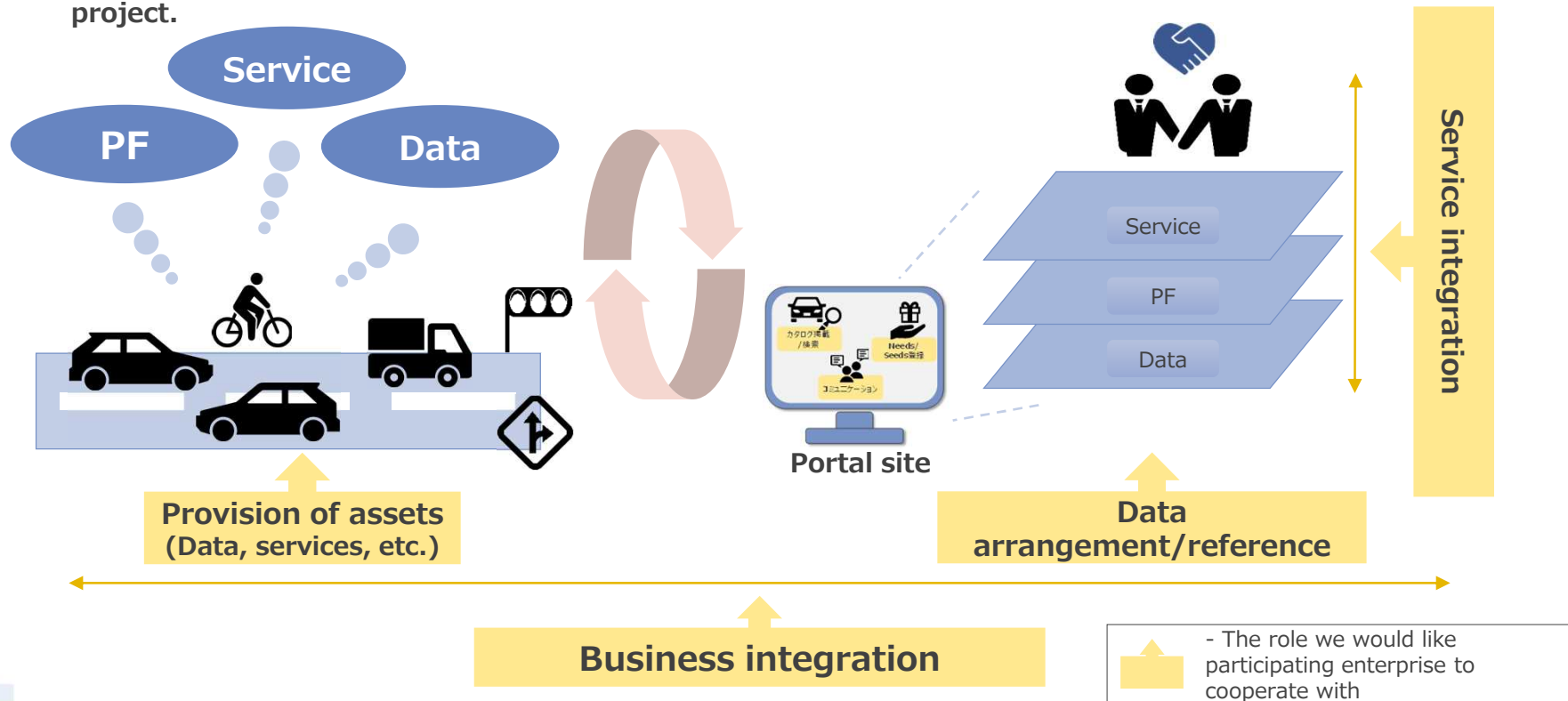
Target of activities	Action Plan		Main Activities
User	<b>To expand catalog data Efforts</b>	<ul style="list-style-type: none"> <li>Agree to publish the data on the portal site to the data providers (target: companies participating in the first phase of SIP and interviewees in FY2019)</li> <li>Publication of additional catalogs for primary participating companies</li> <li>Reaching an agreement with the secondary participating candidate companies to post the information on the portal site</li> <li>Publication of catalogs of companies that are candidates for secondary participation</li> </ul>	<ul style="list-style-type: none"> <li>Re-visit hearing sites in previous years / reach agreement on publication</li> <li>Confirmation of specific data specifications</li> <li>Additional discussion with primary participating companies</li> <li>Additional Catalog Listing</li> </ul>
	<b>Acquire participating companies</b>	<ul style="list-style-type: none"> <li>Obtain agreement to participate from data providers (target companies participating in the first phase of SIP and interviewees in FY2019).</li> <li>Selection of candidate companies for secondary participation</li> <li>Exchanging opinions and building consensus on use with candidate companies for secondary participation</li> <li>Coordination and contract for participation</li> </ul>	<ul style="list-style-type: none"> <li>Re-visit hearing sites in previous years / reach agreement on publication</li> <li>P16 Visit candidate companies / reach consensus on listing</li> <li>Confirmation of specific data specifications (creation of registration forms)</li> </ul>
<b>Contracts/ Rules</b>	<b>Formulation of portal site terms of use and contracts</b>	<ul style="list-style-type: none"> <li>Formulation of terms of use for the portal site</li> <li>Individual coordination with participating companies (if necessary)</li> <li>Conclusion of contracts with participating companies based on the terms of use of the portal site</li> </ul>	<ul style="list-style-type: none"> <li>Development/maintenance of terms of use for this portal site</li> <li>Conclusion of contracts with participating companies</li> </ul>
Internet portal (Promotion HP/) (Portal)	<b>Consideration of contents for promotion website</b>	<ul style="list-style-type: none"> <li>Planning, production, and publication of promotion websites                             <ul style="list-style-type: none"> <li>✓ Consensus building within the SIP on the content of the promotion website</li> </ul> </li> <li>Publication of use cases                             <ul style="list-style-type: none"> <li>✓ 2019 results for issues b, c, and d are posted as use cases.</li> <li>✓ Consideration and target selection for posting new use cases for the second release</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Planning and production of content for promotion websites</li> <li>Organize the empirical results of issues b, c, and d and make use cases</li> </ul>
	<b>Setting the public range of the portal</b>	<ul style="list-style-type: none"> <li>Open to companies participating in SIP Phase 1, data providers, and interviewees</li> </ul>	<ul style="list-style-type: none"> <li>Consideration of publication method/information to publishers</li> </ul>
Event Support	<b>Promotional events</b>	<ul style="list-style-type: none"> <li>Idea generation event using Prof. Shirasaka's idea generation method at Keio University</li> </ul>	<ul style="list-style-type: none"> <li>Event planning/preparation/implementation</li> <li>Attract participating companies</li> </ul>
	<b>SIP results briefing</b>	<ul style="list-style-type: none"> <li>Experiencing the portal site at the SIP results briefing</li> </ul>	<ul style="list-style-type: none"> <li>Event planning/preparation/implementation</li> </ul>

# MD communit identification of appeal points

- It is necessary to establish a world view that we will create with the companies who will participate in MD communit to identify the appeal of MD communit. Therefore, based on the purpose of the project and the concept that was put forth in the previous fiscal year, we reorganized the world view aimed for by MD communit and the value it provides.

## Ecosystem to be formed by this project

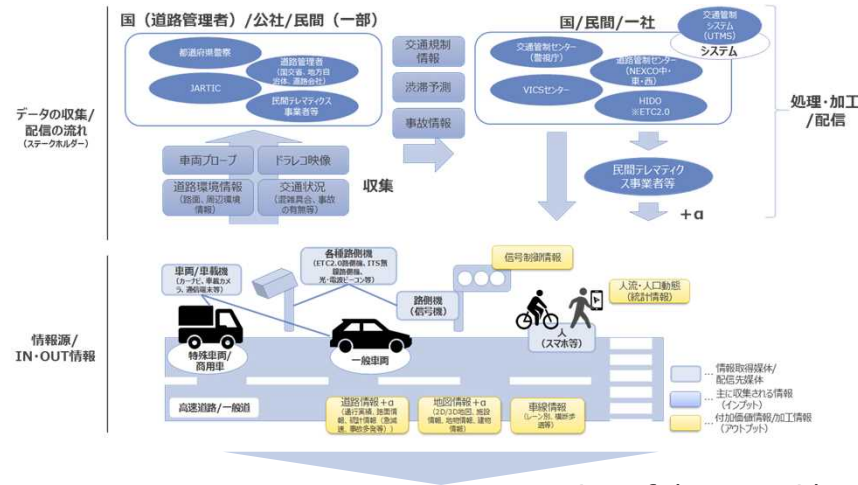
- ✓ We will form an ecosystem for creating and facilitating data utilization businesses by using the assets and specialized capabilities of the various enterprises and groups that will participate in this project.



# Identification of stakeholders in this project

- We organized and investigated both public and private stakeholders necessary to bring about the ecosystem that MD communit is aiming for. In addition to the companies summarized in the previous fiscal year, we added new enterprises that we saw from these investigations, and initially, we selected potential companies focused on those related to SIP

## Survey of public and private data holders



## Mapping of data providers and users that we should focus on going forward

### Mapping of companies organized in the previous fiscal year

レイヤ	関連する事業社のカテゴリ					
	メーカー	地図/ナビ (地図情報、ナビ)	物流 (宅配、運送、業務車両)	輸送 (バス、タクシー)	道路/インフラ	学宮
制度/ルール層			事業者団体 (UITS)		UTMS協会 HIDO	SIPサイバー 警察庁 大学 研究所
データ利用層/サービサー	日立オートモティブシステムズ アソシー フェイス ソニー パナソニック トヨタマスター ZDC	シロタン ナビタイム トヨタマスター パソ	日通総研 ZDC	JapanTaxi NTTインテ	WILLER EXPRESS JAPAN NIPPO	
プラットフォーム層		交通情報センター Here Monet 三電電機	高士通		SIPND	
データ提供層	OEM パナソニック HALEX インクワット	パナソニック アルバイ 通電モータ センテック	日通総研	JapanTaxi 東京電研バス 京急電鉄	JARTIC VICIS	凡例 ...候補 ...実施済 ...次回候補

ユーザー属性	2020年度末 (公開まで)				2021年度以降 (公開以降) ※4Q に優先順位を付け声掛け			
	12月	1月	2月	3月	1Q	2Q	3Q	4Q
B to B to C (G to B to C含む)		Unery Agop	デンソー	クラウドデータバンク	NTTデータ ソフトバンク システムサイン アルブレイン アドバンスソフト 日本情報通信 アールシステム システム	パソ NTTデータ管理システム その他 東京大学 HIDO	Yacoub NEC ZMP CHADMO UTMS	東士通 日立 NEC ZMP タロー ソノワ
B to C (G to C含む)	西日本鉄道 (new route) 日野自動車	WILLER EXPRESS いげ	トヨタ自動車 MONET	トヨタ自動車 MONET Mobility Technologies akappa ナビタイム Shoju	クルル研究所 本田技研工業 日産 DaNA	マップ 三電電機 DaNA SOMPO Mobility Axi	交通情報 UDトラック Tair IV ITS JAPAN	NTTコム WHILL 国交省 (付運機) NTTコム



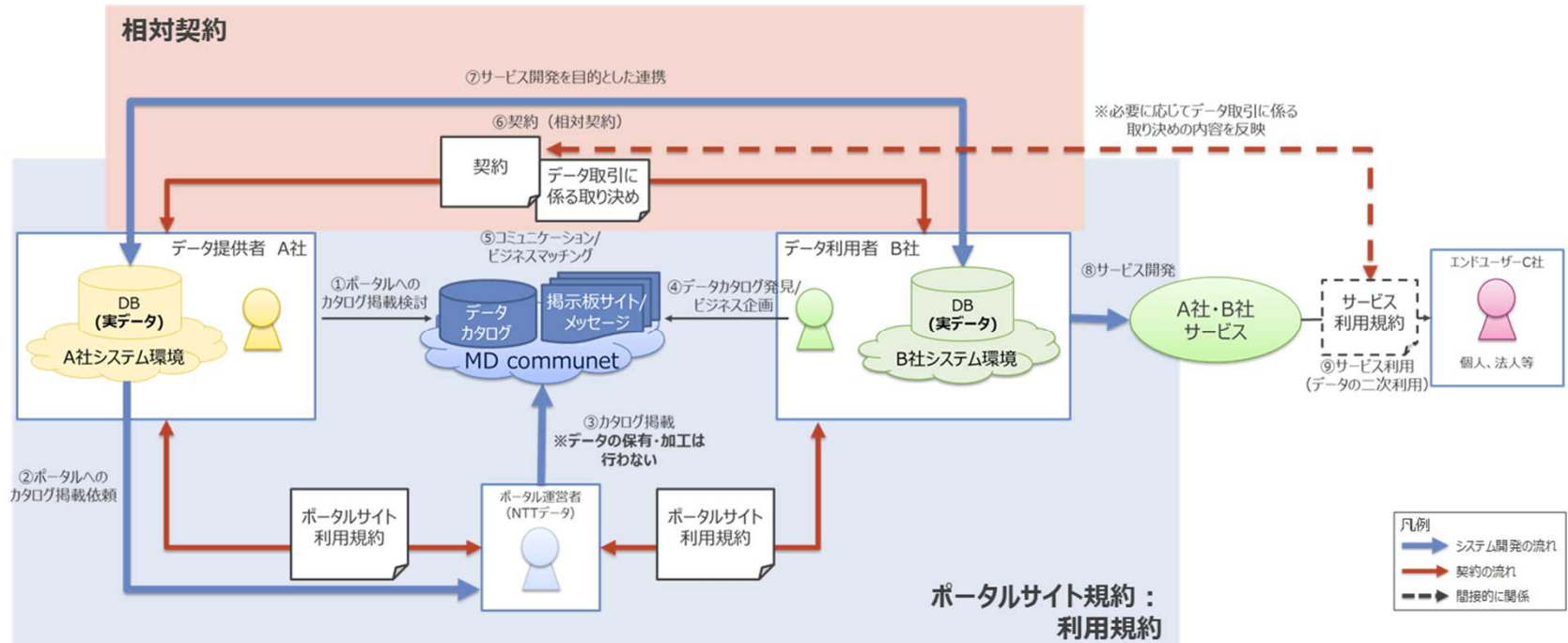
# Development of terms of use for portal sites

- The terms of use for MD communit were developed for the use of the portal site. In developing the terms of use, we referred to the terms of use used in the platforms of other SIP themes, and existing terms of use and guidelines such as the Ministry of Economy, Trade and Industry's Guidelines for Contracts on the Use of AI and Data.

## <Overview >

- As a portal site, the scope of service provision is mainly business matching.
- For data transactions after business matching, it is assumed that a relative contract will be concluded between the data provider and the data user.
- In principle, the rights to the provided data belong to the data provider.

## Scope covered by the image and terms of use of the portal site



# Creation and publication of a promotion website

- It is necessary to have a tool to introduce MD communit to the candidate businesses and to have them widely recognize and be interested in it in the future development of dissemination. To this end, we created a promotion website and opened it to the public.
- After the release of the MD communit promotion website, we were able to use it as a tool to increase awareness and introduce our products by linking it to various news releases and SIP automated driving related websites.



**Promotion website: now open**  
Click here to read the QR code.



# Organizing MD communit events

- In order to promote awareness of MD communit and the possibilities of utilizing mobility data, an event was held to rediscover the value of mobility data, experience idea generation methods, and meet potential partner companies through idea generation in a semi-closed environment.
- The event not only achieved the above, but also generated ideas for future business and connections between companies, and we will continue to hold such events in the future.

## Event Design

### 1.2 ホームサイトの普及促進 MD communitイベント 目的

- MD communitイベント（アイデア発想ワークショップ）の目的
- モビリティデータの活用可能性を知ること、参加者にモビリティデータの価値に関する気づきを得て頂く
  - アイデア発想の手法を体験してもらい、参加者に自社の新規ビジネス創出のために活用して頂く
  - 参加された企業をまたいワークキングを通じて、パートナーとなり得る企業を発見する機会として頂く

インプット	アウトプット
<p>市場背景</p> <p>未来のクルマ社会、自動運転への期待</p> <p>事例・ユースケース</p> <p>交通機関情報や車両情報を活用した事例紹介</p>	<p>テーマ</p> <p>MD communit 掲載データ</p> <p>ヒト・車両移動データ (高精度3次元)</p> <p>決済データ 防災データ</p> <p>公共交通データ 気象データ</p> <p>SNSデータ 施設設備データ</p> <p>データを掛け合わせることで出てくるサービス・アイデアを発想することを目的</p> <p>※テーマは今後幅広い大規模発生と決定予定</p>

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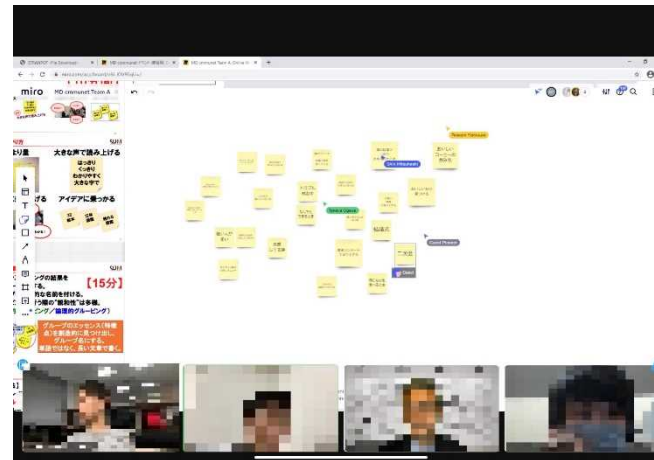
### イベント全体の流れおよび参加者に体験して頂きたいこと

ワークショップを通じて、参加者に①、②、③を体験して頂くことのできるようなイベント構成および企画内容といたく、企画立案およびテーマ設定にご協力をお願いいたします。

#### <ワークショップの流れ>



## Scenes from the event



# SIP Interim results briefing

- At the SIP interim results briefing, we introduced MD commuNet through video and exhibition panels, and provided a demonstration of the portal site. We were able to have many visitors understand MD commuNet and promote its spread in the future.
- Through this exhibition, it is thought that services and tools that make it easy for people to imagine that current efforts can contribute to solving social issues are necessary for future development of dissemination and promotion.

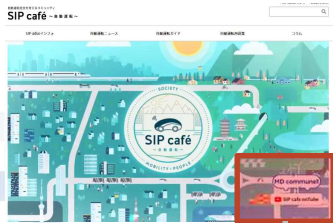


# Results of external promotion activities

- To raise the awareness of MD communit, we conducted various promotion activities. From FY2021 onwards, we will actively conduct promotion activities in line with each phase.

Description	Date	Remarks
Cabinet Office press release NEDO/NTT Data news release	October 27, 2020	Implemented for each company
Release of dissemination promotion website	October 27, 2020	Link posted to SIP café
Published in the November edition of the NTT Technical Journal	November 2, 2020	
SIP-adus Workshop 2020 Progress Report Meeting	November 10, 2020	
Published in SIP café news	November 10, 2020	PR video released from Jan 16
NTT Data Innovation Conference	January 28, 29, 2021	*Was available on archive until February 26
MD communit Event	March 23, 2021	
SIP Progress Report Meeting	March 25, 26, 2021	

In collaboration with SIP Café



# List of participating companies

- In order to promote the use of data, it is important to collect transportation environment information from various companies and publish it as catalog data. As a result, 9 companies and 2 organizations agreed to join MD communit as members.
- In the future, with the aim of creating new services by data users, efforts will be made to involve potential data users in the business.

Increment P  
FEEL THE SPACE

 **NTTInfraNet**

 G空間情報センター

  
ジョルダン

**ZENRIN**


**ZENRIN  
DataCom**

 **DYNAMIC  
MAP  
PLATFORM**

**docomo**  
*InsightMarketing*

**Pioneer**

  
**HALEX**  
HAPPY LIFE EXPERT

生きる、を支える科学技術  
 **防災科研**  
NIED

In alphabetical order

# List of data categories for which catalog data has been or will be acquired

- Through catalog data provision from participating enterprises and interviews with companies, we were able to obtain over 6000 items of catalog data, and through approaching enterprises, we were able to get prospects for obtaining advanced data such as that from on-board probes.

#	Data category	#	Data category	#	Data category	#	Data category
1	<b>Information from on-board probes (trucks)</b>	21	<b>Public transportation operation information (trains, buses, etc.)</b>	41	Pedestrians in the vicinity, anticipatory information	61	<b>Traffic signs</b>
2	Information from on-board probes (taxi)	22	<b>Traffic jam information</b>	42	Construction site route information	62	<b>Public facility/Commercial facility</b>
3	<b>Information from on-board probes (bus)</b>	23	<b>Traffic restriction information (width/height/weight restrictions)</b>	43	Accident vehicle location information	63	Carry-in port (for trucks)
4	Information from on-board probes (construction vehicles)	24	<b>On-board camera information</b>	44	<b>Parking lot information</b>	64	Parking lot (for trucks)
5	<b>Information from on-board probes (general traffic)</b>	25	Points to be avoided	45	<b>Local event information</b>	65	Place to rest (for trucks)
6	Information from on-board probes (special vehicles)	26	VICS information	46	<b>Availability of cycle sharing</b>	66	<b>Restaurant information</b>
7	High-level traffic information (traffic information by lane)	27	<b>Traffic jam forecast information</b>	47	Sites where emergency vehicles are currently dispatched	67	<b>Taxi company information</b>
8	<b>Data of accident prone locations</b>	28	Video from the drive recorders of commercial vehicles	48	Neighborhood agreement information	68	<b>Specific local information</b>
9	<b>Weather conditions</b>	29	Information from roadside cameras	49	Doorstep information	69	<b>Public wireless networks, WiFi spots</b>
10	<b>Information on Twitter</b>	30	<b>Lane restriction information (static)</b>	50	Driver rest areas	70	<b>Information about specific areas</b>
11	<b>Network data about pedestrian spaces</b>	31	<b>Drive information</b>	51	<b>Toilet information</b>	71	<b>Map data (car navigation system)</b>
12	<b>Mobile spatial statistics (population distribution)</b>	32	<b>Prediction for human flow and traffic</b>	52	Crossing information (graphic rendering data)	72	<b>3D point cloud data</b>
13	<b>Information on locations prone to sudden deceleration</b>	33	Traffic lights for pedestrians	53	Rest spots (benches)		
14	<b>Digital national land information (inundation areas (rivers and tsunami))</b>	34	<b>Information on past disasters</b>	54	<b>Barrier/barrier-free information</b>		
15	<b>Information on roads with risk of flooding</b>	35	<b>Information on disasters that are currently occurring</b>	55	Traffic light information (dynamic)		
16	3D maps (road width/vehicle height limit)	36	Status of roadside trees	56	Level crossing information (dynamic)		
17	3D maps (pedestrian crossings)	37	<b>Information on underground installations (location, depth)</b>	57	<b>Traffic jam statistics data</b>		
18	3D maps (lane data)	38	Drivable routes according to vehicle size	58	<b>River water levels</b>		
19	<b>3D maps (fundamental geospatial map)</b>	39	Parked vehicle information	59	Lane restriction information (semi-dynamic)		
20	<b>2D maps</b>	40	Surrounding vehicles, anticipatory information	60	Powerline height		

**Bold text: Acquired data (or expected)**

# Benefits of participating in the MD communit initiative and future challenges

- To further clarify how data users will use collected data, in addition to initial participant enterprises who are already using the limited release version, we conducted interviews and held discussions about how to use the portal site with potential participant enterprises whom we approached for participation.

Type	Value	Issues
Data providers	<ul style="list-style-type: none"> <li>✓ <b>Sales Channels</b> for new data (including PR)</li> <li>✓ We can learn <b>about the needs of users</b></li> <li>✓ <b>Matching with other sectors</b> (enterprises/organizations/local authorities, etc.)</li> <li>✓ Expectations for use as a <b>matching tool</b></li> </ul>	<ul style="list-style-type: none"> <li>✓ <b>Data processing</b> issues</li> <li>✓ Lack of <b>community functions</b></li> </ul>
Data users	<ul style="list-style-type: none"> <li>✓ Can <b>reduce the effort needed to search for data</b></li> <li>✓ <b>Matching with other sectors</b> (enterprises/organizations/local authorities, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>✓ <b>Enhance data</b> (completeness/collaboration with local authorities)</li> <li>✓ <b>Enhance sample data</b></li> <li>✓ Create <b>closed community functions</b></li> </ul>
Data platforms	<ul style="list-style-type: none"> <li>✓ <b>Develop new markets</b></li> <li>✓ <b>Matching with other sectors</b>, usage case creation</li> </ul>	<ul style="list-style-type: none"> <li>✓ <b>Improve environments</b> that data can be used (particularly for other sectors)</li> <li>✓ <b>Step up from verification experiments to business</b></li> </ul>



# Interviews about future business models

- When investigating future promotion systems and business models, we interviewed initial participating enterprises about what kind of portal site functions and systems are required.

Type	Requirements demanded (for functions)	Requirements demanded (for systems)
Data provider	<ul style="list-style-type: none"> <li>✓ Differentiation with other portal sites</li> <li>✓ Provision of processed data through the portal site</li> <li>✓ One-stop transactions including agreement/payment</li> </ul>	<ul style="list-style-type: none"> <li>✓ Establish a business model and structure that can be operated even after the SIP period</li> </ul>
Data users	<ul style="list-style-type: none"> <li>✓ Standardization of APIs and data formats</li> <li>✓ Improvement in data completeness</li> </ul>	<ul style="list-style-type: none"> <li>✓ Establish a system that can implement measures for standardization and promote them</li> <li>✓ Collaboration with local authorities, open data organizations, and civic tech</li> </ul>
Data platforms	<ul style="list-style-type: none"> <li>✓ Mechanisms where collaboration is possible without significant modifications to functions (ease of collaboration)</li> <li>✓ Create systems where platforms can develop other areas through collaboration.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Organize business models for collaboration with membership-based data platforms (scope of data disclosure, usage fees, etc.)</li> </ul>

# Consideration of business model and promotion system

- **Based on the aforementioned interviews, we investigated the business model and the promotion system. From the FY2021 onwards, we will conduct investigations focusing on the below three points and proceed so that they can be reflected in the system.**

- ✓ With regard to data providers, while they are optimistic about listing on the portal site to increase sales channels, they are also expecting certain value that can only be obtained by listing on the portal site.
  - **We need to closely examine the value we can provide in addition to listing it on the catalog.**  
E.g., Data storage and data processing such as privacy practices
- ✓ From the perspective of data users, they want not only data completeness but also have data in an easy-to-use format.
  - **We will conduct assessments in the FY2021's operations for the promotion system and others, such as conducting data standardization and data format conversion in the form of intermediate processing on the portal site.**  
E.g., Coordination with local authorities and civic tech organizations, and investigations into promotion system for standardization
- ✓ If we pursue differentiation from other portal sites, business matching could possibly become one factor in differentiation.
  - **We will construct systems for providing value on the portal site, including intervening as consultants when necessary for semi-closed business matching.**

# Initiatives for the FY2021

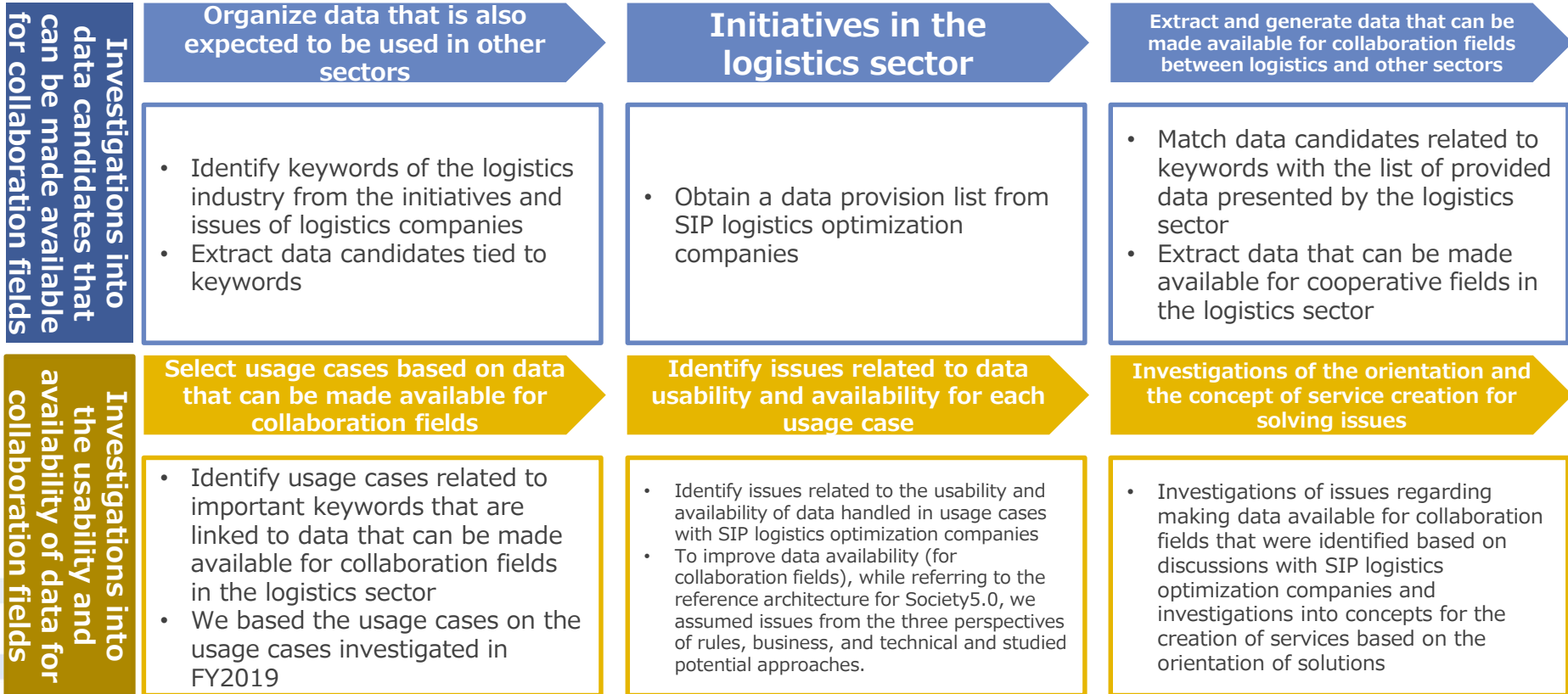
- In this fiscal year, as part of the dissemination and promotion activities for the release of the portal site, we have mainly carried out promotional activities to attract and recognize data providers to promote data expansion and MD communit initiatives, and the maintenance of the terms of use.
- In the FY2021, we will make improvements based on feedback from users, such as promoting matching on the portal site, creating services and tools for more effective promotion, and reviewing the operation of the portal site after it is opened to the public.

Target of activities	Action Plan	
Business Matching	Efforts to expand catalog data	<ul style="list-style-type: none"> <li>• Expansion of government-derived data</li> <li>• Improving the comprehensiveness of traffic and environmental information catalog data</li> </ul>
	Acquire participating companies	<ul style="list-style-type: none"> <li>• Attracting Data Users</li> <li>• Further expansion of data providers</li> </ul>
	Expansion of use cases	<ul style="list-style-type: none"> <li>• Creation of business matching use case examples</li> <li>• Creating data x data matching use case examples</li> </ul>
Structure/Rules	Portal site operation	<ul style="list-style-type: none"> <li>• Review of operations after general release</li> <li>• Establishment of a support system for portal site users</li> </ul>
	Examination of promotion system	<ul style="list-style-type: none"> <li>• Verification of the portal site business model (profitability, etc.)</li> <li>• Interviews with users of the portal site</li> <li>• Recommendations and initiatives for issues that need to be resolved for data provision and use</li> </ul>
Promotional Activities	Promotional Events	<ul style="list-style-type: none"> <li>• Conducting various online and offline events and seminars</li> </ul>
	Promotion and deployment tools	<ul style="list-style-type: none"> <li>• Creation of tools and other materials to introduce MD Communit's services in an easy-to-understand manner</li> </ul>

## **2. Promotion of the demonstration projects: Study of the cooperative area of data**

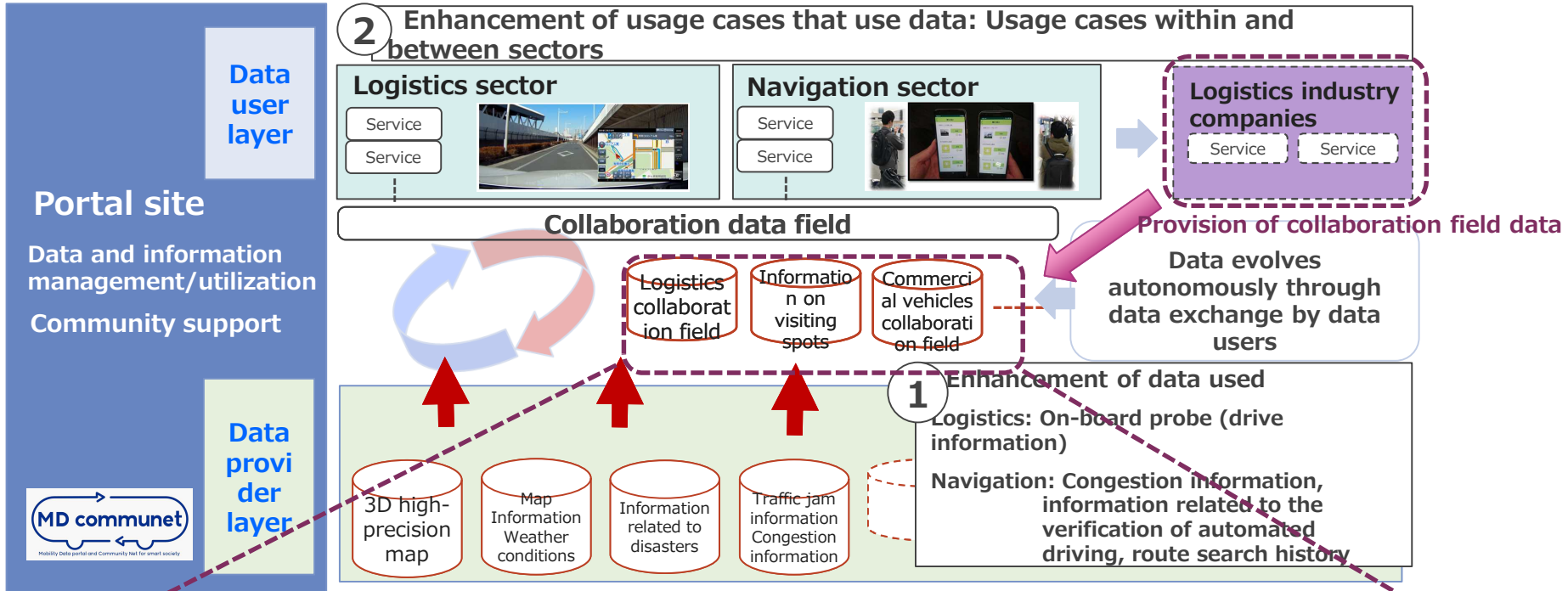
# Outline of implementation Overview

- For the purpose of the utilization and collaboration on cooperative data in the logistics sector that will result in solving cross-industry societal issues, we extracted possible data candidates for collaboration fields related to the initiatives and issues of logistics companies, based on investigations into the issues that the logistics industry is facing.
- Based on discussions regarding studies and verification of the optimization of logistics based on an architecture that utilizes vehicle information such as SIP probes (hereafter, SIP logistics optimization), we investigated service creation concepts that utilize the portal site taking into account issues and the direction of the solutions for issues related to the usability and availability of the above data candidates.



# Survey and research content and procedures (summary)

- For this fiscal year, for collaboration data candidates that will solve cross-industry issues, we identified issues in achieving the provision of collaboration field data so that the specific data generated in the logistics industry can be utilized and used on the portal site.



## Implementation process

### 1. Study enhanced data

Investigate the architecture for utilizing on-board probes  
Reorganize candidates for collaboration fields

### 2. Study usage cases within and between sectors

Verification for SIP logistics optimization companies/  
confirmation of verification data

Reconfirm usability

Confirm availability

Organize issues  
Study the flow of data provision

Theoretical testing with sample data

Investigate technical processing specifications

Investigate the specification when data is provided

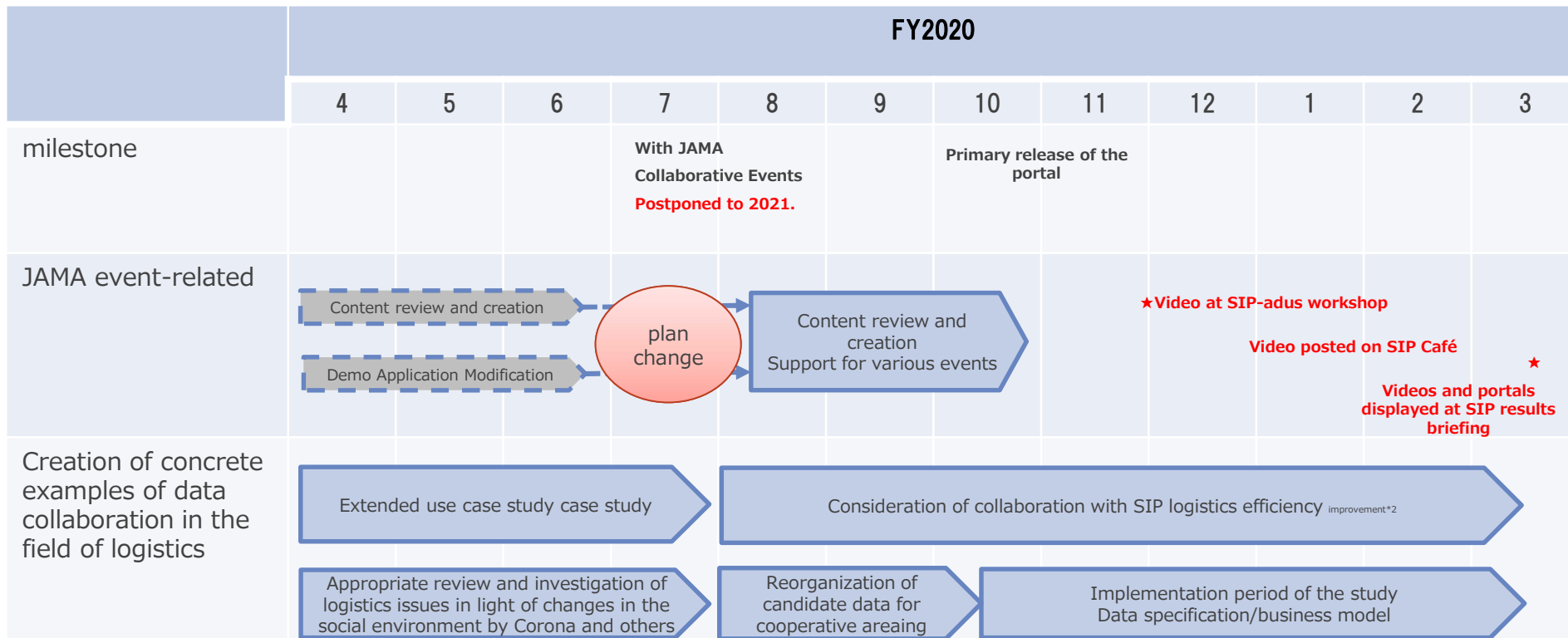
Specification review during collection/generation

Draft data specification for collaboration fields

Draw up detailed plans for FY2021's verification (Utilization verification for other sectors)

# Survey and research content and procedures (overall schedule)

- Since the collaboration event with JAMA was postponed, we made a video introducing MD communit and released it at promotional events such as SIP-adus workshop, SIP-Café\*1 and interim results presentation.
- Promoted the creation of data linkage cases at the level of specific data items in cooperation with the contractor of SIP Logistics Efficiency Improvement\*2.



1 SIP café article: <https://sip-cafe.media/info/5449/> SIP café onTube: <https://youtu.be/F6sOBwkFwIU>

2 Strategic Innovation Program (SIP) Phase 2 / Automated Driving (System and Service Expansion) Research and Demonstration for Improving Logistics Efficiency Based on Architecture Using Vehicle Information such as Probes

# Details and procedures of the research and study (study policy for the cooperative area data candidates)

- In order to explore the possibility of generating and providing candidate data for the cooperative area in the logistics field that can be used in other fields, we confirmed the types of data and the data specifications of the data targeted in the demonstration of the logistics service measures for SIP automated driving.

Data Request candidate

## Collaboration field data list (data that is also expected to be used in other sectors)

Driving behavior related/carry-in port /drive information by vehicle type/  
Load/unload waiting status/place to rest

Study details

## Extract and generate possible data for collaboration fields between logistics and other sectors

Example of data to be generated: Vehicle attributes x break time x location  
information=place to rest where large vehicles can stop

SIP logistics efficiency improvement side business Implementation details

Acquire information that will help confirm daily inspection items

Vehicle sensor information

Acquisition of information that helps to ascertain load weight

Load weight gage

Grasp the actual condition based on analysis of operation data and share the information

Digital tachometer/location information  
Tablet operation



# Contents and procedures of the research and study (study of data processing methods for the cooperative area)

## List of cooperative area data (which are expected to be used in other fields)

- We identified keywords from FY2019 interviews with logistics companies, guidelines related to logistics, initiatives that are considered beneficial or have gained attention from a CSR perspective, and we set investigations into data candidates which are expected to be used in the logistic sector as a foundation.

Keyword	Overview (Opinion of logistics companies regarding keywords, CSR information, information for various guidelines)
Carry-in port information	- It is rare to conduct a new delivery to a building with a carry-in port. However, this information is useful for first-time deliveries. - When using a trailer, you want to know the route to the carry-in port. However, as of present, information to the carry-in port (including the route) is not shared.
Load/unload waiting information	The sharing of the load/unload waiting information is currently only carried out on an individual level among drivers, so efficiency can be improved by sharing this information. Furthermore, since the time to receive loads is highly related to delivery volume, it will also be necessary to share this information.
Place to rest information	This is useful because it takes time to search for rest stops when delivering to new locations. However, it will be necessary to pay attention to parking lot vacancies.
Information on vehicle width and height	- This has a high usage value in pre-departure route setting. This is useful as commercially available navigation systems do not include information on vehicle height - It would be beneficial if information was included on whether it was possible to turn. This is theoretically possible if vehicle length is added.
Drive information	- This has a high usage value in pre-departure route setting. It would be useful to respond to dynamic information and to link this with width and height information. - Efficiency can be achieved if traffic-related information that is shared between drivers is made available. Also, drivers do not consider this competitive field information.
Information on road construction	Because information is not centrally managed by the police, Ministry of Land, Infrastructure, Transport and Tourism, local authorities, and construction companies, etc.
Information on collapsed structures	During disaster relief, as road conditions are sometimes confirmed by phoning facilities such as hospitals by phone to check road conditions, it would be useful to have information on collapsed structures.
Service Area/Parking Area Information	The issue of there not being many rest areas for trailers at service and parking issues is significant. It would be beneficial if information regarding vacancies at service and parking was shared.
On-board devices with an on-board communication function that combines a drive recorder and a digital tachograph	- In addition to the parking location and speed information that was previously collected using digital tachographs, we will gradually install integrated on-board devices to all delivery vehicles that collect operation data such as travel paths created from driving video collected by drive recorders and information gained from GPS antennas - Automate the registration of locations where near-misses were experienced, and set drive start and end
White Logistics	In support of the "White Logistics Movement," an initiative from enterprises involved in logistics, we are working on improving logistics with mutual understanding and cooperation from stakeholders, including business partners, to bring about high-productivity logistics and work style reform. (Ministry of Land, Infrastructure, Transport and Tourism, Ministry of Economy, Trade and Industry, Ministry of Agriculture, Forestry and Fisheries)
List of White Logistics initiatives	Of the participating enterprises, which initiatives are being thoroughly implemented? - Specific implementation efforts are not clearly stated.
Guidelines aimed at improving long working hours and the trading environment through cooperation between consignors and transport companies	Guidelines that describe specific measures for the improvement of the logistics industry - Since these guidelines were developed jointly by the government and the private sector, we decided there was no issue in assuming that logistics companies are promoting their initiatives based on these guidelines. (Ministry of Land, Infrastructure, Transport and Tourism, Ministry of Health, Labour and Welfare, Japan Trucking Association)
Pallet information	As pallets are often lost, if location information is shared about where each pallet is located, efficiency can be achieved by one company collecting them all without having to collect them individually.
Congestion information	As this is an initiative to plan deliveries avoiding congested times, congestion information is returned as statistical information to improve accuracy.

# Contents and procedures of the research and study (study of data processing methods for the cooperative area)

## List of cooperative area data (which are expected to be used in other fields)

- Of the data extracted from usage cases investigated up until FY2019, we defined usages cases for this fiscal year from keywords applicable to data that can be made available for collaboration fields presented by SIP logistics optimization companies.

Data categories identified as useful in use cases considered through FY2019.	data-name	Keywords.	Relationship with vehicle information, which is a candidate for data utilization on the SIP logistics efficiency side
Map Information	2D map	Information on loading docks, waiting areas, resting spots, vehicle width and height, and Passage performance information	–
Driving behavior (probe information)	Position	Information on loading docks, waiting lists, resting spots, and traffic records	○
	Speed	Waiting information and traffic performance information	○
	Emergency brake	Passage performance information	○
	Sudden acceleration	Passage performance information	○
	Sharp turn	Passage performance information	○
Probe information (truck)	Position (immediate)	Passage performance information	○
Probe information (construction vehicles)	Position (immediate)	Passage performance information	–
Probe information (bus)	Position (immediate)	Passage performance information	–
Advanced probe information	–	Passage performance information	–
Road Information	breadth	Vehicle width and height information	–
	Height	Vehicle width and height information	–
	Traffic record	Passage performance information	○
Traffic Information	Vehicle control	Road construction information	–
	Traffic control	Road construction information	–
	Congestion (e.g. traffic)	Congestion Information	–
Public facilities information	Position	Loading port information, waiting information	–
	Exit and entrance	Loading entrance information	–
	Rest Spot	Information on rest spots, SA/PA information	–
Public Restroom Information	Position	Rest Spot Information	–
Disaster Prevention Information	Road conditions	Collapse Information	–
	Earthquake	Collapse Information	–
	Rainfall	Collapse Information	–
Congestion Information	–	Congestion Information	–

### Usages cases for FY2020

- Generate place to rest information
- Generation of drive information
- Generation of carry-in port information

We left out load/unload waiting information as it would be the same data processing process as places to rest and carry-in ports.

# Implementation (hypothesis testing for data collaboration area)

## Setting of use cases

- (1) Data distribution using vehicle information as an asset, which is a candidate for data utilization in the SIP logistics efficiency improvement side, and (2) Issues related to the utilization of data extracted from the asset were examined by setting up use cases.
- In selecting use cases, from among the use cases for data use in each field (logistics, local government, construction, navigation, automobile, and infrastructure) studied up to the last fiscal year, those that are considered to be capable of cross-sectoral utilization for operations that handle vehicles are selected.

## Defined usage cases

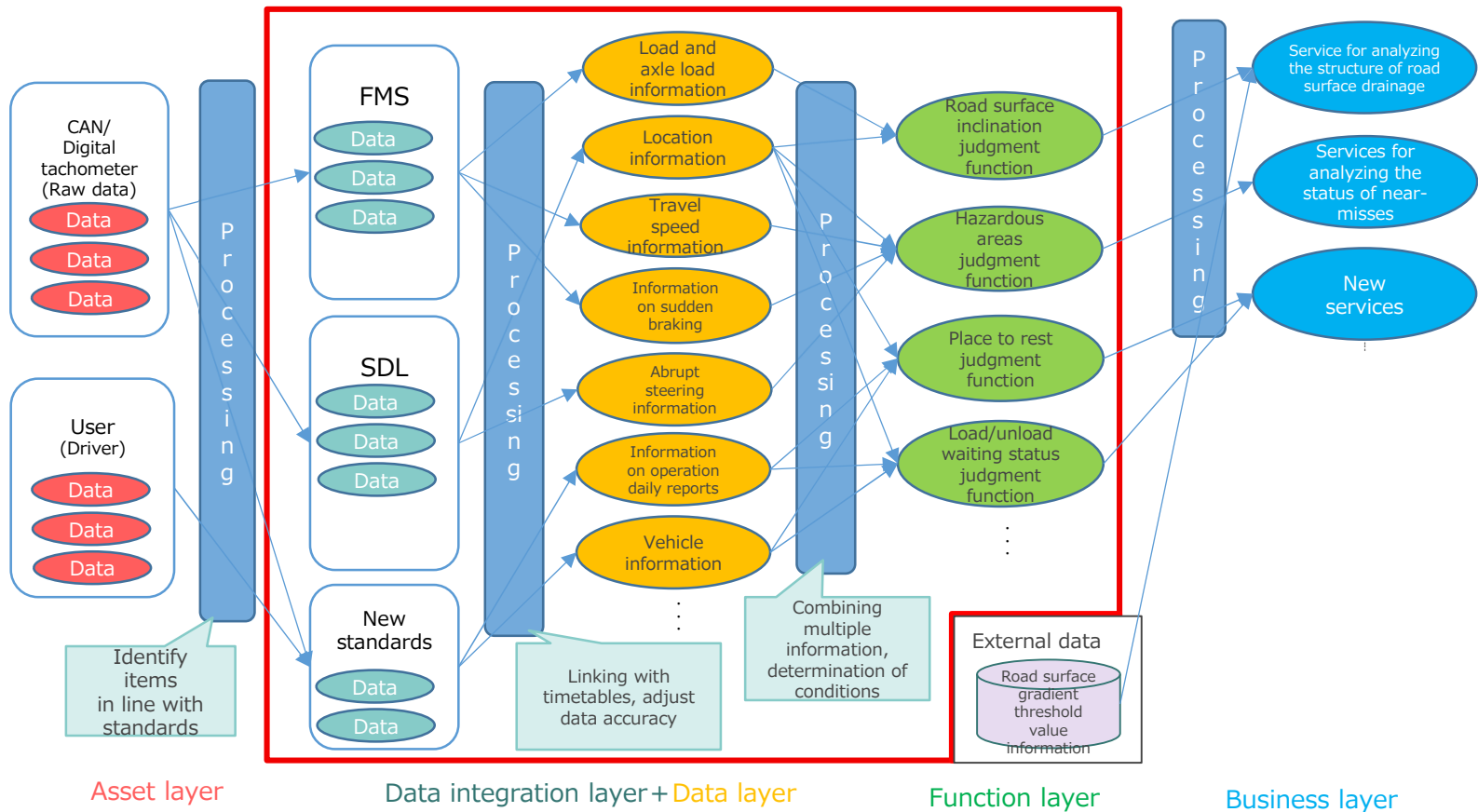
No.	Usage cases	Outline
1	Generation of rest spot information	We will identify places to rest that can be used by trucks by linking the GPS of digital tachometers and spot information
2	Generation of drive data	We will identify drive data by car type by linking the GPS of car navigation systems and the direction of travel with road link information
3	Generation of carry-in port data	We will identify spot (delivery location) carry-in ports by linking the GPS of digital tachometers with spot information and road link information.

# Details of implementation (hypothesis building for the cooperative area of data)

## Study of data processing and combination methods

- The vehicle probe data that is actually acquired is difficult to handle in its original state due to the privacy information it contains and the huge amount of data items and data volume.
- Therefore, we assumed that by processing and matching with other data, we could explore the possibility of providing data and increase the value of data use

### Flow of processing and combining information from on-board probes

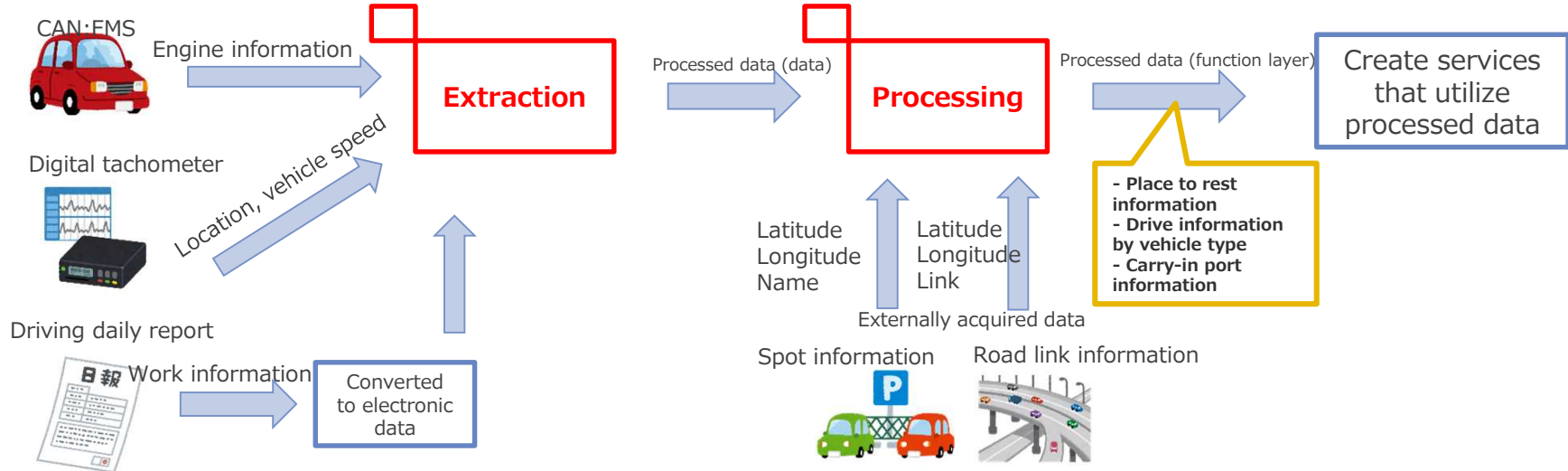


# Details of implementation (hypothesis building for the cooperative area of data)

## Study of data processing outline

- The overview of data processing was investigated by extracting data from assets, processing it, and creating services through using processed data as a series of flows. We assumed that the extraction process would conduct searches and bind asset data, and the processing process generates valuable data by combining processed data with data obtained externally.

## Data extraction and processing flow



# Implementation (Hypothesis building for data transformation into cooperative area)

## Perspectives on issues for the cooperative area of data

- Based on the list of data items of "available vehicle information" provided by SIP logistics optimization companies, we investigated the usability and availability of data handled in usage cases up until now.
- To improve data availability (for collaboration fields), while referring to the reference architecture for Society5.0, we estimated issues from the three perspectives of rules, business, and technical, and studied potential approaches.

## The three perspectives for making data available for cooperative field

### Rules

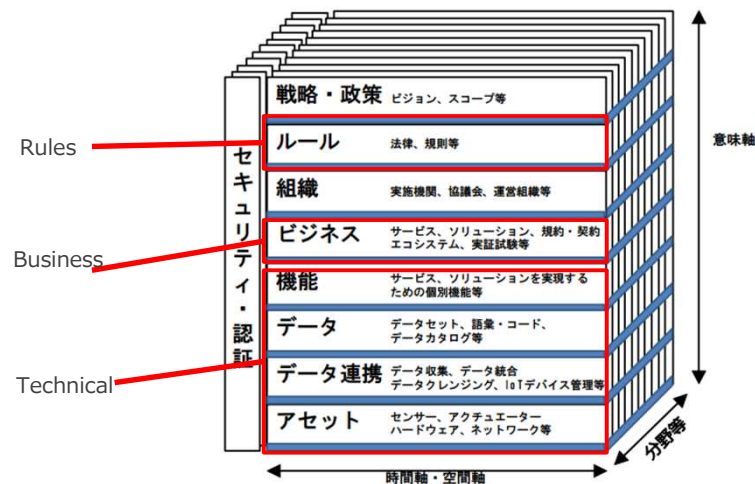
Laws, regulations (E.g., Personal Information Protection Act, trade secrets)

### Business

Services, terms, and agreements, business practices

### Technical

Data utilization and processing for each usage case



Society 5.0 リファレンスアーキテクチャ (内閣府資料より)

# Details of implementation (hypothesis verification toward the cooperative area of data)

## Issues and approaches toward the cooperative area of data defined for each use case

- Regarding the asset level data used for the usage cases set (provision of place to rest information drive information, carry-in port information), after deciding an extraction strategy, we constructed a hypothesis pertaining to issues and initiatives aimed at making data available for collaboration fields and held discussions with SIP logistics optimization companies.

### Issues and initiatives aimed at making the set data available for collaboration fields for each usage case

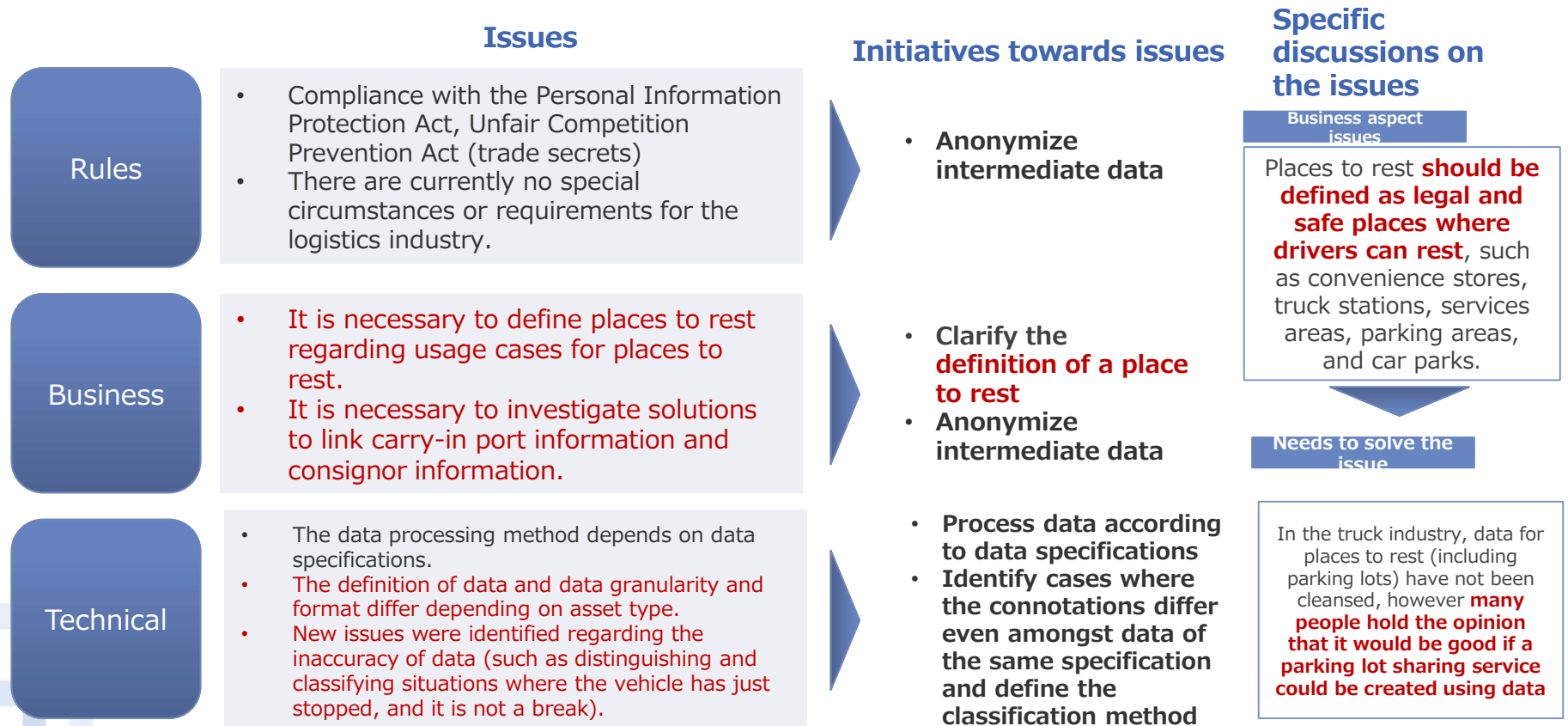
Usage cases	Asset level data to be used	Extraction method	Issues and initiatives for making data available for cooperative fields					
			Rule aspects	Addressing issues	Business aspects	Addressing issues	Technical aspects	Addressing issues
Provision of information on places to rest	Vehicle current location, speed, status	During rest, only location information is used For speed, only 0 km/h used	1.Necessary to make sure that individuals cannot be identified (adherence to the Personal Information Protection Act and the Unfair Competition Prevention Act)	1. Anonymize intermediate data 1-1. Delete vehicle ID 1-2. Truncate time information by the hour	1.Need to make identifying driver's total rest time and rest frequency impossible	1.Only information of the location where the driver is in rest status is provided	1.Improve the accuracy of location data 2.Determine that the vehicle is stopped 3.Digitalization of driving operation records	Conduct data processing in line with data specifications
	Drive time, duty time, rest time, break time (daily, biweekly, monthly, annually)	Only rest time information used						
	Driving operation record	Information when the shift lever is in P used						
Drive data	Vehicle number	Used to link data between assets			1. Need to make linking carriers and consignors impossible 2. Need to make the analysis of a sequence of driver traveling status impossible	1. Anonymize intermediate data 1-1.Delete vehicle ID 1-2.Truncate time information by the hour 2.Delete vehicle ID	1.Improve the accuracy of location information 2.Link multiple assets of the same vehicle (navigation system, digital tachometer, etc.) 3.Method for acquiring travel direction	
	Vehicle current location, speed, status	Used to ascertain vehicle travel status						
Carry-in port	Vehicle current location, speed, status	Information from five minutes before the vehicle has stopped used			1.Improve the accuracy of location information 2.Method for acquiring ignition data			
	Driving operation record	Information of the ignition switch turning to "OFF" used						

# Implementation (hypothesis testing for data collaboration area)

- New issues for business and technical aspects were identified through discussions with SIP logistics optimization companies.
- From the FY2021 onward, after investigating methods for solving these issues, we will proceed with creating data specification proposals for collaboration fields and verification of data collaboration between different sectors.

## Results of hypothesis verifications based on discussions with SIP logistics optimization companies

\*Red text represents the new issues identified from discussions.



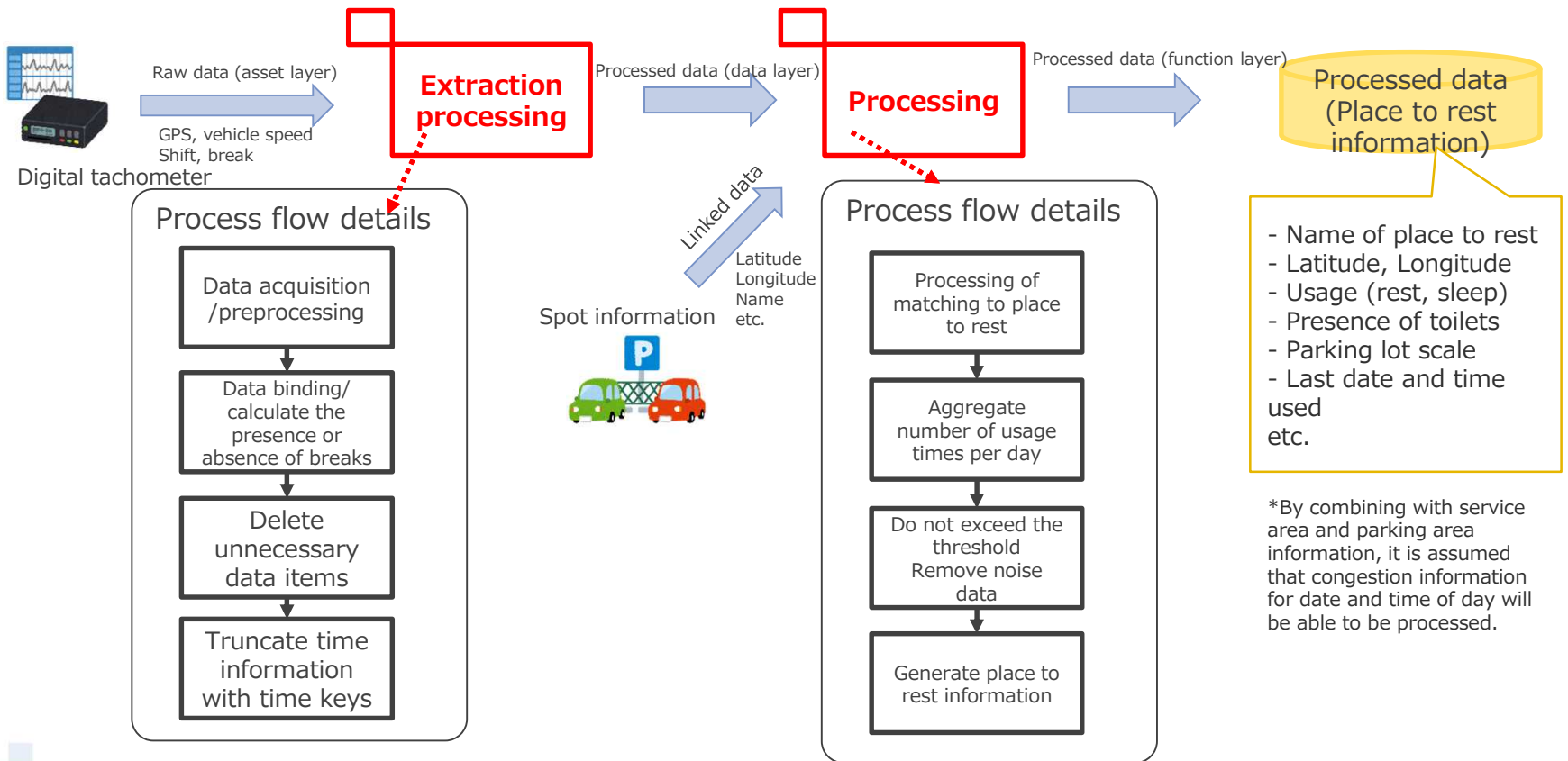


# Details of implementation (hypothesis testing for the cooperative area of data)

## Use case 1: Generation of rest spot information

- We investigated usage cases that will help to solve the issue of not sharing information on places to rest where a truck can be parked.
- Information on places to rest used daily by drivers in the logistics industry such as roadside stations, convenience stores, and gas stations is generated using data from digital tachometers.
- As a result, we predict it will be possible to search for nearby places to rest using the navigation system and to incorporate places to rest onto the route in advance.

### Process for generating information on rest spot

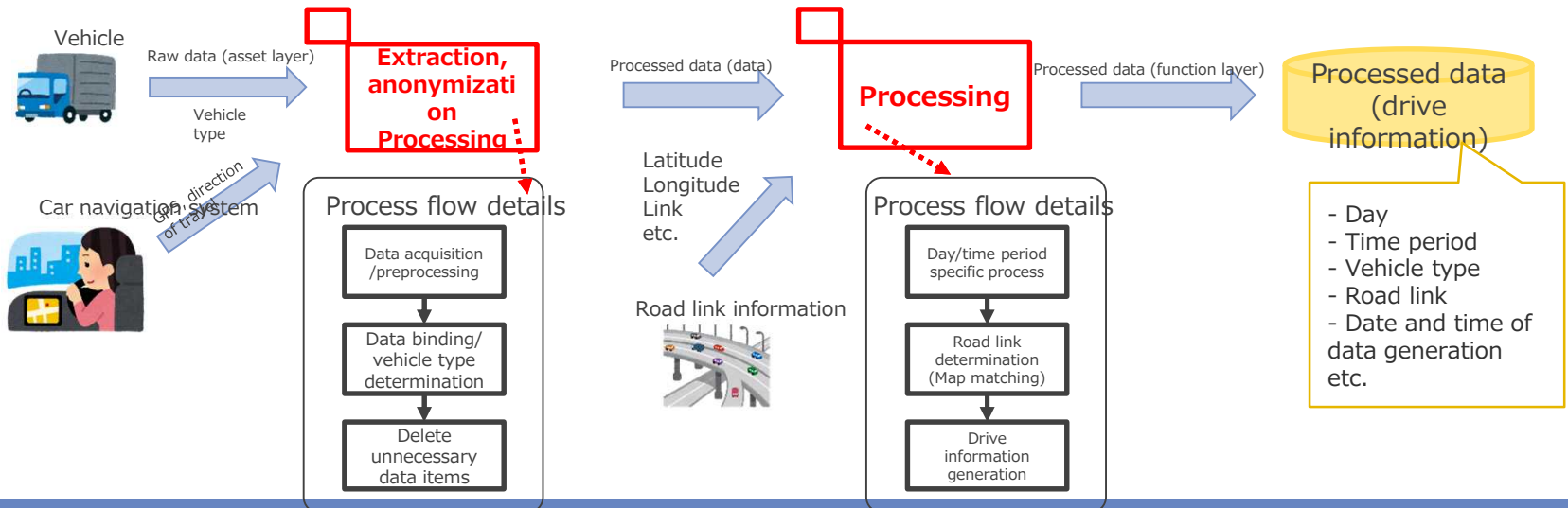
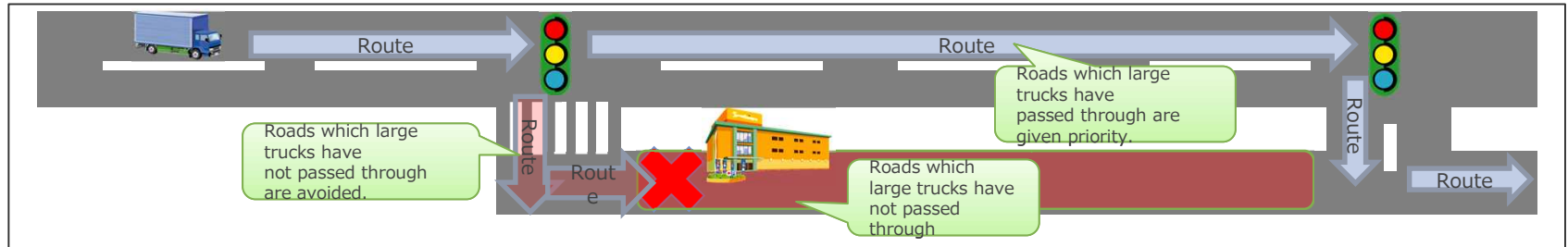


# Details of implementation (hypothesis testing for the cooperative area of data)

## Use case 2: Generation of drive data

- We investigated usage cases that contribute to solving problems such as stress caused by driving on unfamiliar roads and an increase in the risk of accidents caused by entering roads that are difficult to pass in areas for deliveries to areas that truck drivers do not know well.
- Drive information by vehicle type that shows roads that have been passed by vehicle type such as large and medium-sized vehicles is generated by using navigation systems and vehicle data.
- As a result, we expect it will be possible to set routes that have been driven by drivers of the same vehicle type.

## Process for generating drive information

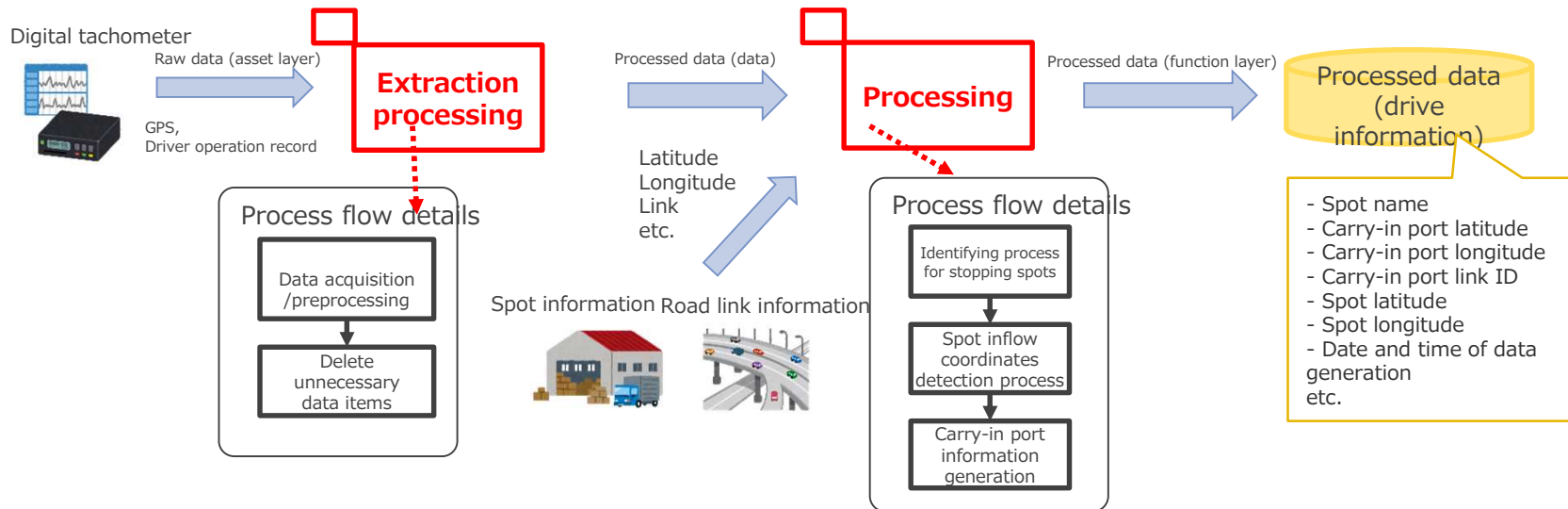
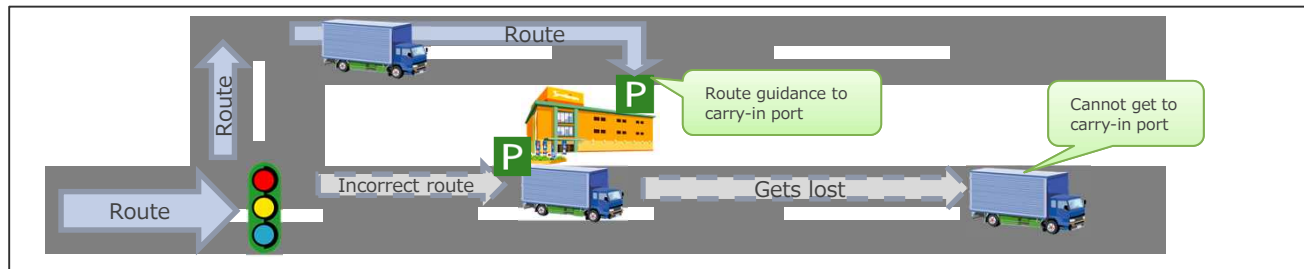


# Implementation (Hypothesis testing for data coordination area)

## Use case (3): Generation of carry-in port data

- We investigated a usage case to help solve the issue of truck drivers getting lost on nearby roads when the route to the carry-in port is not clear for deliveries to areas that they do not know well. Carry-in port information that shows the exact carry-in port is generated using data from the digital tachometer.
- As a result, we expect this to make it possible for drivers to travel to their destination without getting lost and lead to improvements in the efficiency of delivery services

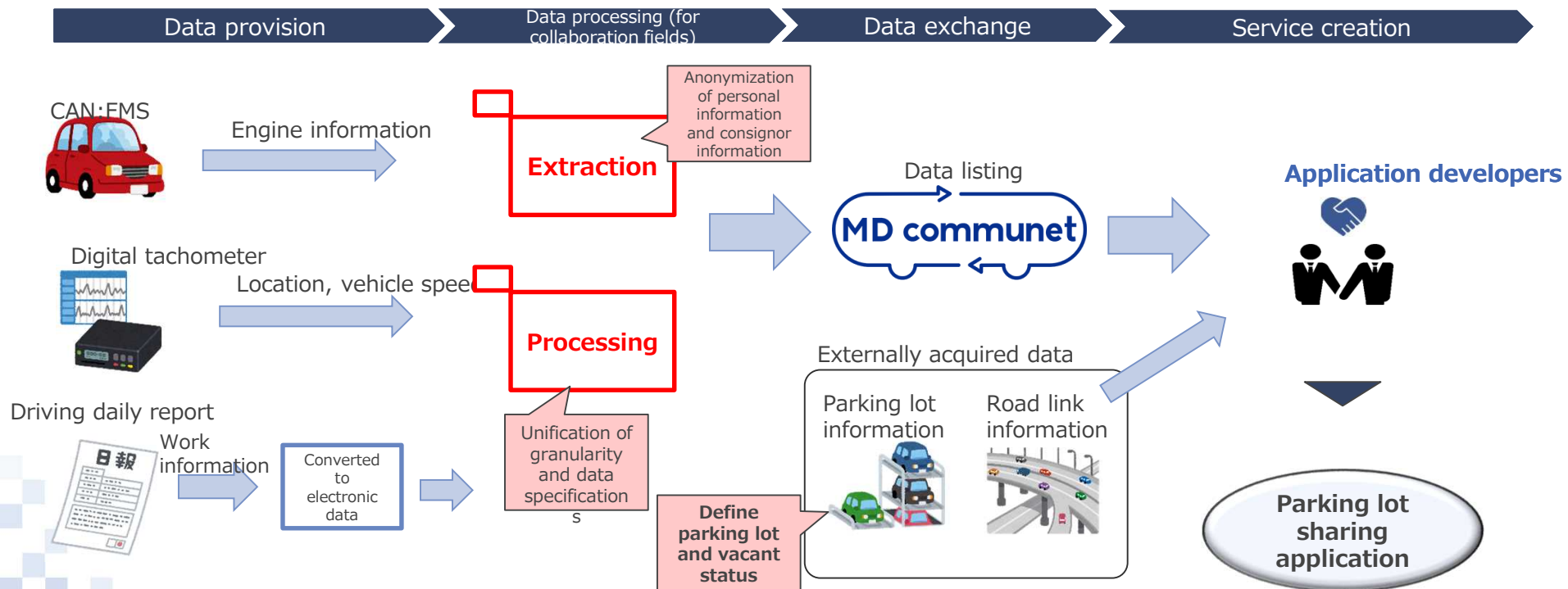
### Process for generating carry-in port information



# Implementation (Hypothesis testing for data collaboration area)

- Investigations of issues regarding making data available for collaboration fields that were identified based on discussions with SIP logistics optimization companies and investigations into concepts for the creation of services based on the direction of solutions.
- According to the above companies, there is a need in the truck industry for a parking lot sharing service that uses real-time parking lot vacancy information, so we investigated the concept of creating a service that uses MD communit.
- In the FY2021 and beyond, we plan to work on other use cases based on the realization of the above use case.

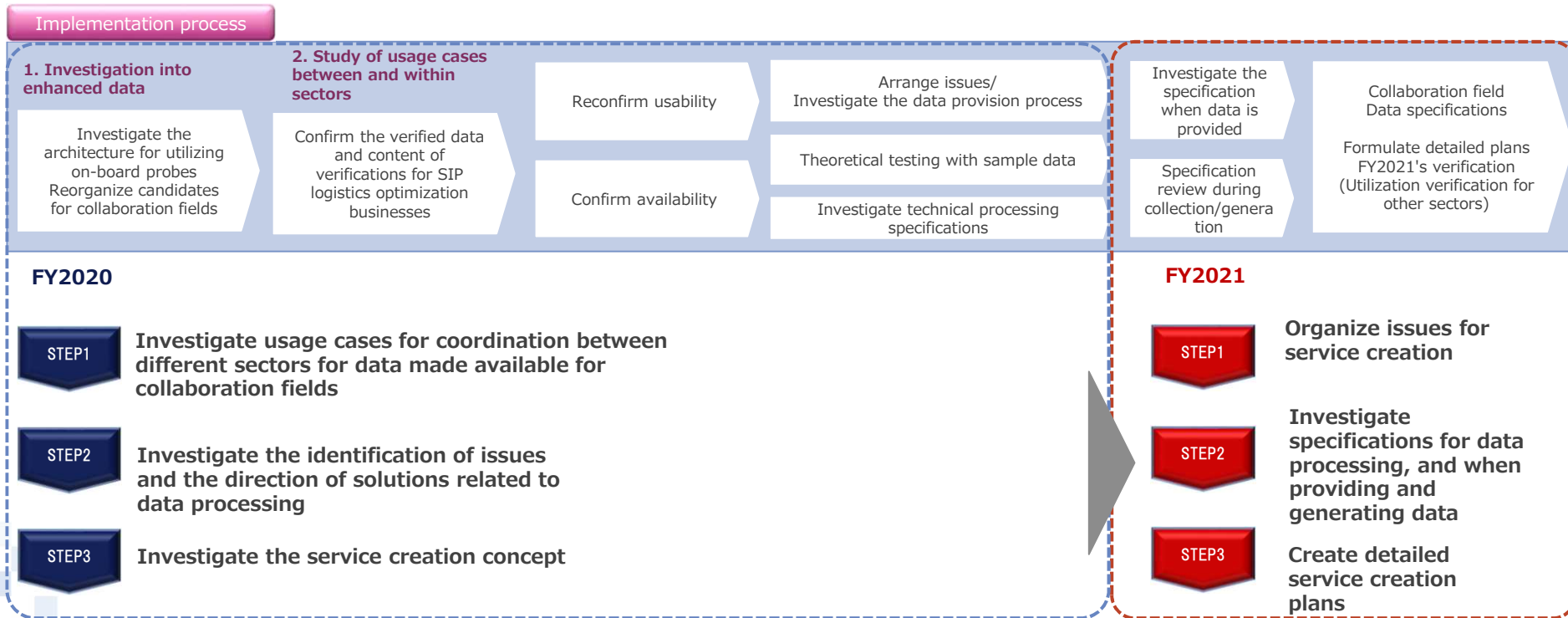
## Service creation concept based on the direction of solutions to issues identified for rules, business, and technical aspects



# Initiatives for the FY2021 and beyond

- This fiscal year, we held investigations into service creation concepts that use MD communit after conducting investigations for coordination between different sectors for data made available for collaboration fields between different sectors and identifying issues related to data processing.
- In the FY2021, we plan to formulate detailed service creation plans by organizing issues and investigating various specifications for the realization of the service creation concept that was implemented this fiscal year.

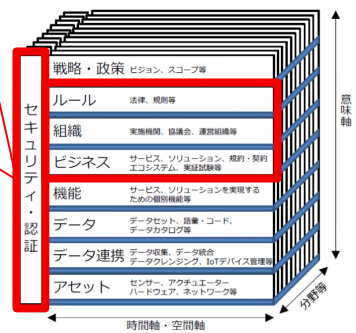
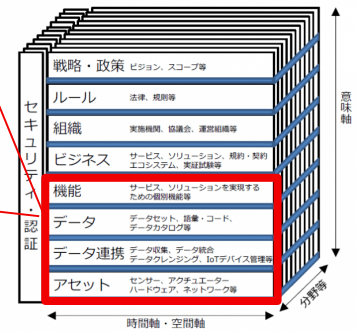
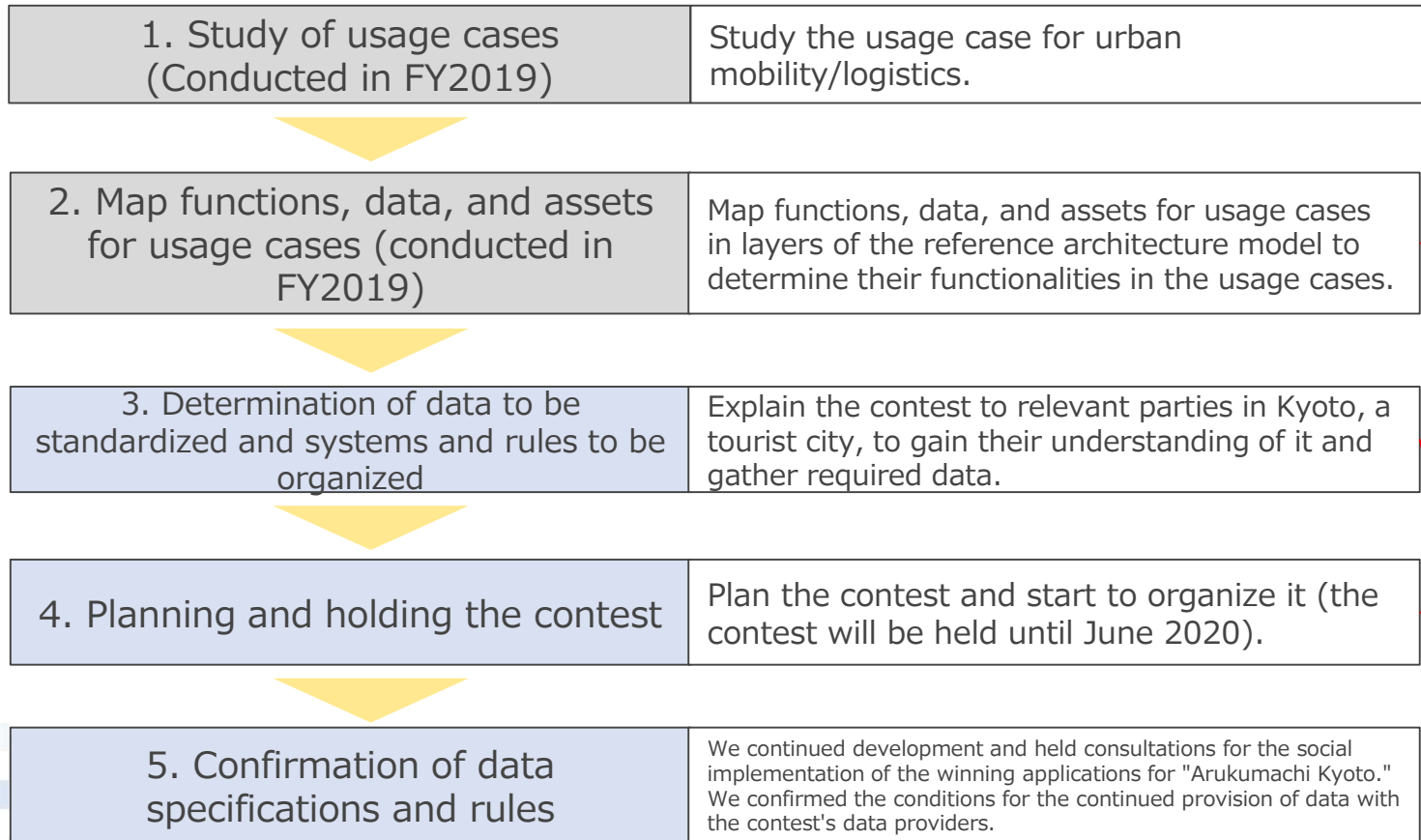
## Initiatives for the FY2021 onwards



# 3. Local Demonstration: Kyoto App Contest

# Survey and research content and procedures

- We assumed some usage cases to solve problems of urban mobility/logistics and started to plan a contest for solving overtourism problems by using information about traffic conditions, transportation timetables, estimation of congestion, and tourist sites in Kyoto where overtourism causes disruption (the contest is scheduled to be held in June 2020).



# Extraction of data, systems, and rules to be developed and standardized

## Procurement of necessary data

- The contest secretariat provided the following types of data to contest participants: When obtaining data, we went through the process of first explaining in person or through email about the data we wanted to be provided. Then we had the actual data provided after exchanging agreements with companies that set forth matters such as provision duration, conditions for provisions, and costs.

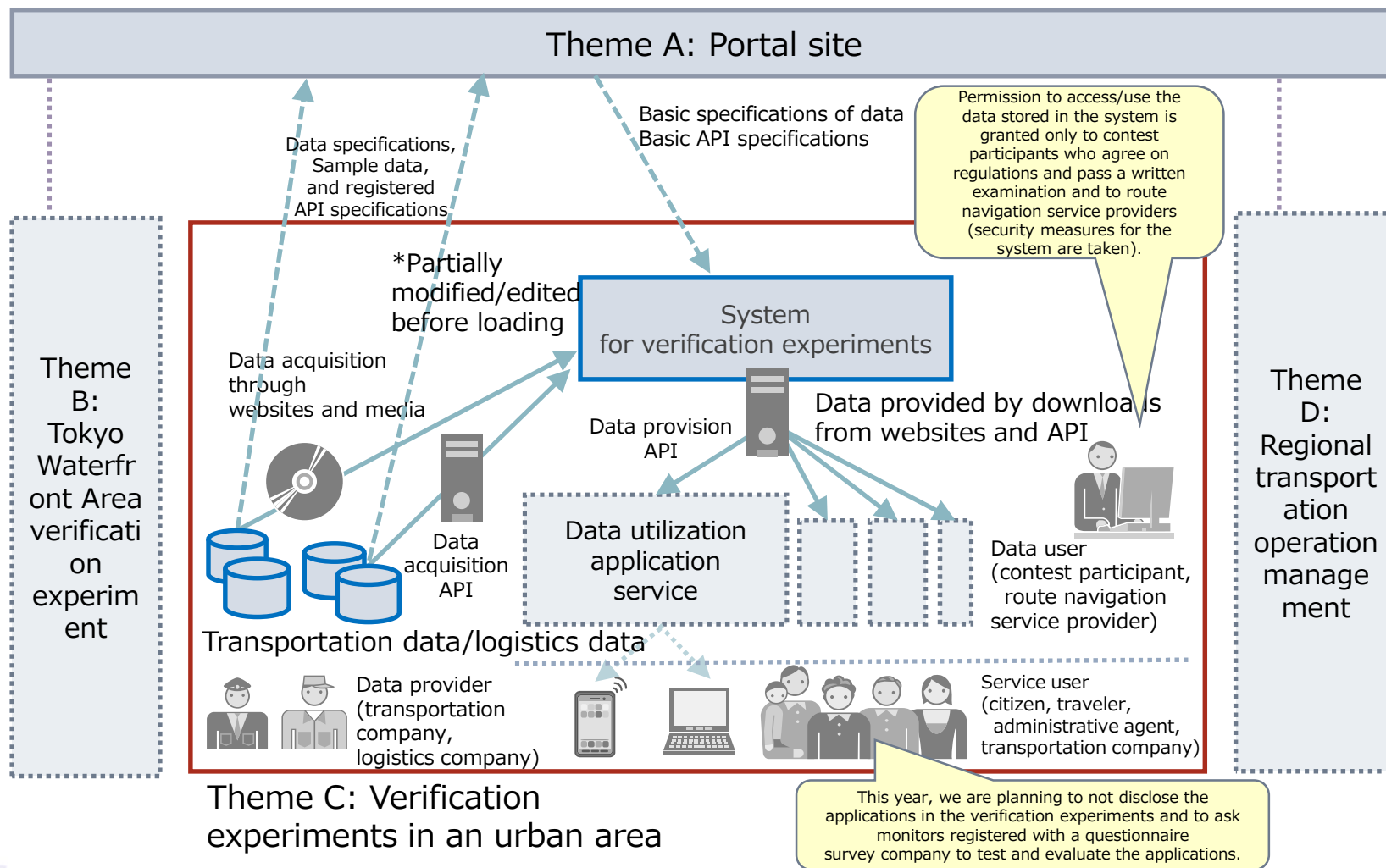
Category	Content of data	Providing company
Transportation	Kyoto Municipal Subway: Stations, routes, timetables, fares	Kyoto Municipal Transportation Bureau
	Eizan Electric Railway: Stations, routes, timetables, fares	Eizan Electric Railway Co., Ltd.
	Keifuku Electric Railroad: Stations, routes, timetables, fares	Keifuku Electric Railroad Co., Ltd.
	Kyoto City Bus: Bus stops, routes, timetables, fares	Kyoto Municipal Transportation Bureau
	"	Jorudan Co., Ltd.
	Kyoto City Bus: Vehicle location data	"Arukumachi Kyoto" System/consortium on providing bus/train transfer information
	Kyoto City Bus: Vehicle location API	Jorudan Co., Ltd.
	Kyoto Bus: Bus stops, routes, timetables, fares	Kyoto Bus
	Yasaka Bus: Bus stops, routes, timetables, fares	Yasaka Bus
	Hankyu Bus: Bus stops, routes, timetables, fares	Jorudan Co., Ltd.
	Kyoto City Park and Ride: Parking lot data	Kyoto City Municipal Planning Bureau
Logistics	Data for stores and services for sending and temporary storage of luggage	"KYOTO Raku Mobei Contest" secretariat
Facility	Prediction of congestion in Kyoto City	Yahoo Japan Corporation
	Prediction of congestion in tourist seasons in specific areas of Kyoto City (for limited periods only)	Yahoo Japan Corporation
	Tourist spot in Kyoto City	Kyoto City Tourism Association
	API for center introduction services	Zenrin CO., LTD.
	Statistics logs for congestion @data	Zenrin CO., LTD.



# Extraction of data, systems, and rules to be developed and standardized

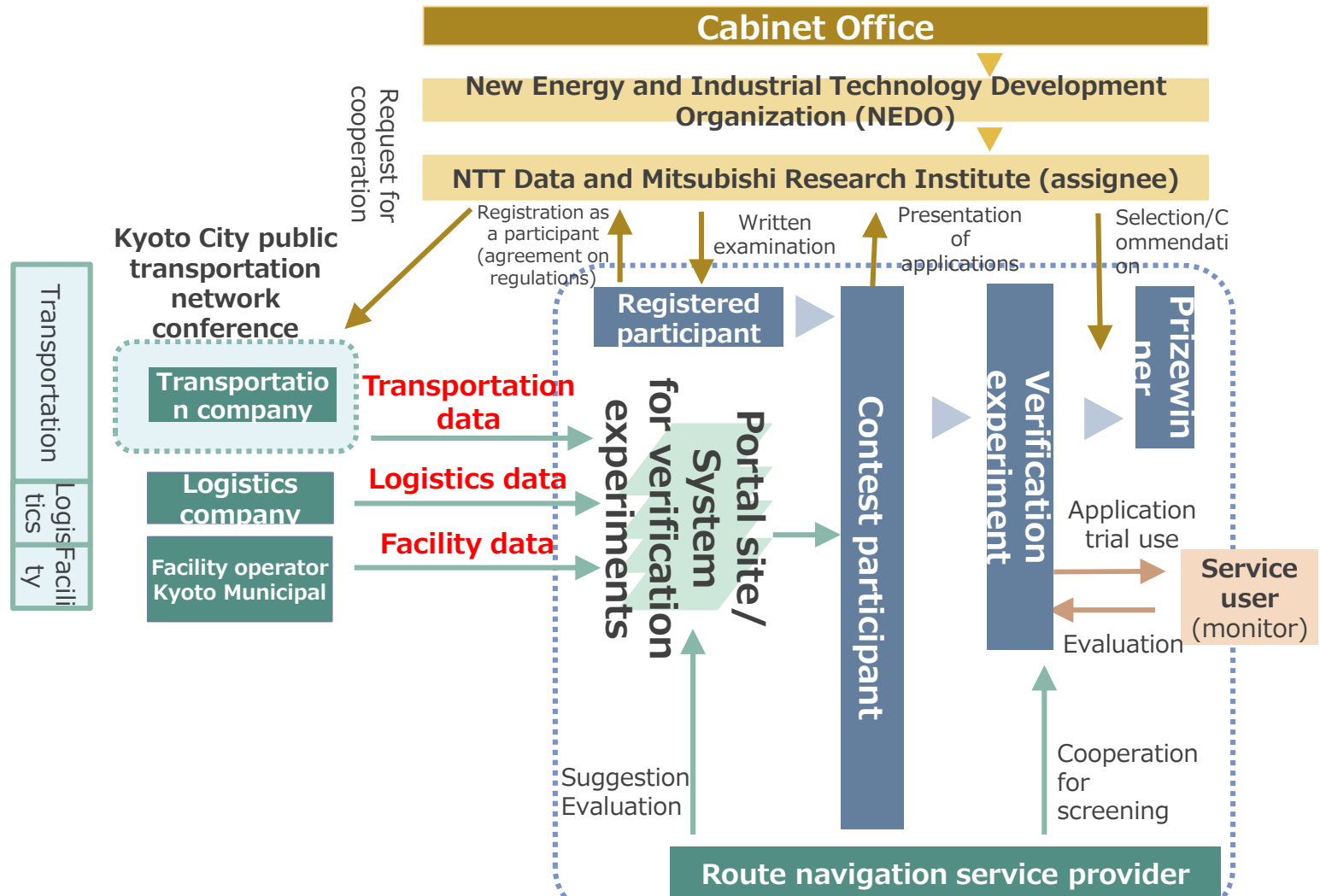
## Development of mechanisms for data acquisition and utilization

- We developed and introduced a system for the verification experiment in urban areas. An overview is shown below



# Planning and implementation of application contests

- Based on the studies described in the previous sections, to solicit applications and ideas on solving overtourism and transportation problems in Kyoto City, we decided to organize a contest and hold it from February 2020 to June 2020, as shown schematically below.



# Planning and implementation of application contests

- On February 14, 2020, we held a press release and launched the "Kyoto Raku Mobi Contest."

Description	Duration
<b>Entry deadline</b>	<b>Application development category: Friday, August 21, 2020</b> <b>Application idea category: Friday, August 28, 2020</b>
Traffic environment information disclosure	Until the contest is over
Pre-event (Explanation of the issues Kyoto is facing and the traffic environment information)	First event: Saturday, June 13, 2020 Second event: Saturday, July 18, 2020 Mentoring subsequently held for applicants as necessary
<b>Deadline for presentation of applications</b>	<b>Application development category: Wednesday, September 9, 2020</b> <b>Application idea category: Friday, September 11, 2020</b>
Preliminary screening/verification experiment	From September 2020 to October
<b>Final review</b> (final review meeting, screening committee meeting) *Kyoto and online meeting	<b>Saturday, October 17, 2020</b> <b>13:00 to 18:00</b>
<b>Award Ceremony</b> *Kyoto and online meeting	<b>Saturday, November 7, 2020</b> <b>10:30 to 12:00</b>

\*Verification experiment: Contest applications that pass the initial screening will be evaluated using a monitor prepared by the secretariat.

\*Final review: Applicants who pass the initial screening will give a presentation to the screening committee.

# Planning and implementation of application contests

- The contest is comprised of the two categories below, and we solicited applications and ideas that contribute to solving the issues Kyoto is facing, and that must have used the data related to transportation and facilities provided by the secretariat (traffic environment information).

## A) Application development category

With an awareness of implementation and utilizing the data provided by the secretariat, entrants develop **android applications that will solve the issues faced by Kyoto,** and compete on the level of data utilization, level of contribution to solving the issues, and ease of use.

## B) Application idea category

With an awareness of implementation and utilizing the data provided by the secretariat, applicants **come up with and submit ideas to solve the issues faced by Kyoto,** and compete on the level of data utilization and the level of contribution to solving the issues.

# Planning and implementation of application contests

- The contest took the form of entrants submitting applications that will realize an ideal situation and solve the issues faced by Kyoto, such as those below.
- In anticipation of the effects of the novel coronavirus and issues for Kyoto, once the pandemic has come to an end, we also made possible the submission of applications that solve these issues.

## Conflicts between routes used by citizens and routes used by tourists

A large number of tourists get on public transportation (e.g., transit buses) running on routes to famous tourist sites, and there are conflicts between routes used by citizens and routes used by tourists.

Route navigation to avoid routes used by citizens is needed.

## Concentration of tourists at specific spots

"Overtourism," or perceived congestion or overcrowding due to too many tourists, is a major problem.

Measures such as suggesting tourist sites with information about congestion are needed.

## Large luggage carried by tourists into transportation

Tourists carrying large luggage make crowding worse in buses.

Measures to promote "luggage-free sightseeing" are needed to ease the crowding by changing the attitude of tourists who think they must always carry their luggage while traveling.

## Information about congestion and delays not matching actual circumstances

Tourists often make complaints such as "the routes of public transportation are complicated, and bus routes are hard to understand" and "I got on the wrong bus"; this indicates that the current transportation guidance is not satisfactory for tourists.

Also, transportation guidance with information about expected congestion and traffic conditions or solutions are needed.

# Planning and implementation of application contests

- We held the final review on Saturday, October 17, 2020 and award ceremony on Saturday, November 7, 2020, and gave out seven awards. The first prize for the application development category, "Arukumachi Kyoto Award," was given to an application that utilizes traffic environment information to aid sightseeing, and the first prize for the application idea category "SIP Automated Driving Award" was given to the application that provides new value when waking empty-handed.

## Award Ceremony



## Prize winners and their applications

Arukumachi Kyoto Award (Application development category, first prize)	Teruki Matsuoka	(Temporary name) Kyoto Tourism Assistance
SIP Automated driving award (Application idea category, first prize)	Advanced Institute of Industrial Technology Eriko Musashi, Daisuke Kawanishi NTT Data Frontier Corporation Yuya Hatanaka	An application that makes you want to walk empty-handed -Teburan-
Award for improvement in congestion of transportation (Sponsored by NAVITIME)	Asakura Laboratory, School of Environment and Society, Tokyo Institute of Technology, Yuki Yamashita	Tekuteku Kyoto Tour
Transportation guide improvement award (Sponsored by Val Laboratory Corporation)	Nippon Information and Communication Corporation	Yoritabi Tourist information application optimized for transit routes
Award for improvement in area congestion (Sponsored by Yahoo)	System Science Co., Ltd.	Komikomi Spot
Handsfree sightseeing promotion award (Sponsored by Kyoto City Tourism Association)	Denso Corporation	Etrip
Monitor award	Nippon Information and Communication Corporation	Yoritabi Tourist information application optimized for transit routes

### Application development category, first prize application



### Application idea category, first prize application



#### Main Function

- Based on luggage storage services, the app recommends "hidden sightseeing spots" from location information of tourist attractions and statistical congestion data.
- You can use the app as a citizen user or supporter.

# Planning and implementation of the application contest (Reference) Outline of the winning entries

## (Reference) Overview of the winning application

Application development category, first prize application

### (Temporary name) Kyoto Tourism Assistance, Teruki Matsuoka

Application overview: By entering your departure location and time, the sightseeing spots you will visit and the time you will spend at each spot, bus and train transfer times, along with walking routes, are displayed. Users who haven't decided their route can also create sightseeing plants from "Recommended Routes." An application that reduces tourist concentration through controlling sightseeing routes, access time, and recommended routes.

#### 観光スポットを表示する機能

■地図上に観光スポットを表示し、詳細を知りたい場合は「京Navi」サイトに誘導します。



#### 公共交通機関情報を表示する機能

■地図のバス停アイコンを押すと、バス停時刻表や路線経路・バス停発着時刻を閲覧できます。



#### 観光ルートを作成する機能

■出発地点・時刻、周辺観光スポット、滞在時間を指定すると、全行程のバス・地下鉄乗り換え時刻、歩行ルートをまとめた観光計画が作成できます。



#### お勧め観光ルート

■特に行先を決めていない利用者には、「お勧めルート」から観光計画を作成することができます。



Source: "Kyoto Tourism Assistance" presentation materials, Teruki Matsuoka

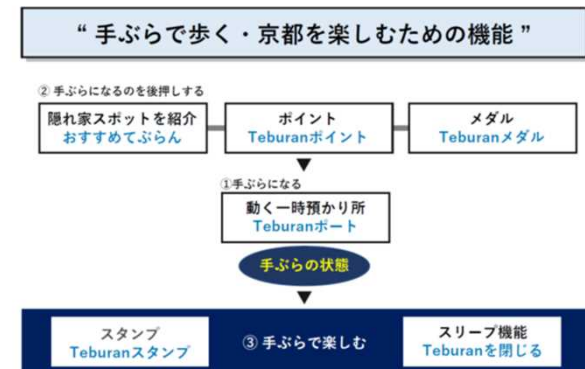
Application idea category, first prize application

### An application that makes you want to walk empty-handed -Teburan-

Advanced Institute of Industrial Technology, NTT Data Frontier Corporation, Eriko Musashi, Daisuke Kawanishi, Yuya Hatanaka

Idea overview: Based on a luggage storage service, the application reduces congestion at popular sightseeing spots and encourages the discovery of new tourist attractions using unique location information and statistical congestion data. Also, by making it possible to use the application as a citizen user or supporter, the application also encourages participation in tourism volunteering, micro tourism, and the discovery of local att

Teburanは「手ぶらで歩いて」新たな価値を提供するアプリです



Source: "An application that makes you want to walk empty-handed -Teburan-" presentation materials  
Eriko Musashi, Daisuke Kawanishi, Yuya Hatanaka

# Planning and implementation of the application contest (Reference) Outline of the winning entries

## (Reference) Overview of the winning application

Award for improvement in congestion of transportation (Sponsored by NAVITIME)

**Tekuteku Kyoto Tour**  
Asakura Laboratory, School of Environment and Society, Tokyo Institute of Technology, Yuki Yamashita

Idea overview: Based on congestion information, guides tourists to avoid concentration and routes used by citizens and suggests routes that incorporate walking as much as possible. The app raises tourist's awareness of Kyoto further by providing information on shopping districts and detailed information on the areas around famous tourist areas according to the route. The application will recommend nearby luggage storage and delivery services for people with large luggage.



Transportation guide improvement award  
(Sponsored by Val Laboratory Corporation), Monitor award

**Yoritabi: Tourist information application optimized for transit routes**  
Nippon Information and Communication Corporation (Yohei Harada)

Application overview: By users entering their location and destination, the application introduces attractive sightseeing spots and stores along the route and recommends detours to the user. The app makes possible attractive initiatives such as store owners issuing discount coupons to customers who are likely to visit their store. The app provides opportunities for the discovery of new attractions and enables the acquisition of returning customers.

1. Top画面
2. 寄り道リスト
3. 観光スポット詳細



Source: "Yoritabi: Tourist information application optimized for transit routes" presentation materials  
Nippon Information and Communication Corporation (Yohei Harada)

Source: "Tekuteku Kyoto Tour" presentation materials, Yuki Yamashita



# Planning and implementation of the application contest (Reference) Outline of the winning entries

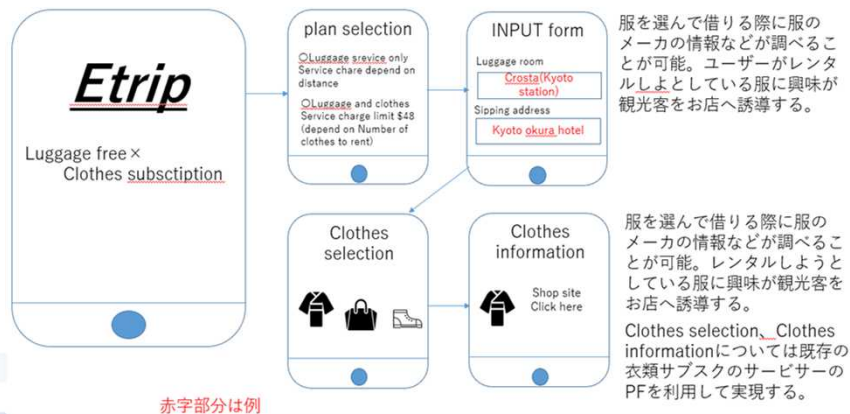
## (Reference) Overview of the winning application

"Handsfree sightseeing" promotion award  
(Sponsored by Kyoto City Tourism Association)

### Etrip: Denso Corporation

Idea overview: Reduce the expensive image of Crosta (luggage storage service) by adding a clothing subscription service. An app that provides the new value proposition of combining sightseeing with fashion, where tourists enjoy fashion, is tailored to the tourist area, while at the same time solving the issues related to tourism with overnight stays (extra luggage caused by bringing extra change in clothing and washing clothes at the accommodation). The application also enables users to purchase clothing they want to keep.

タビマエ (アプリ画面)



Source: Etrip presentation materials, Denso Corporation

Award for improvement in area congestion  
(Sponsored by Yahoo)

### Komikomi Spot: System Science Co., Ltd.

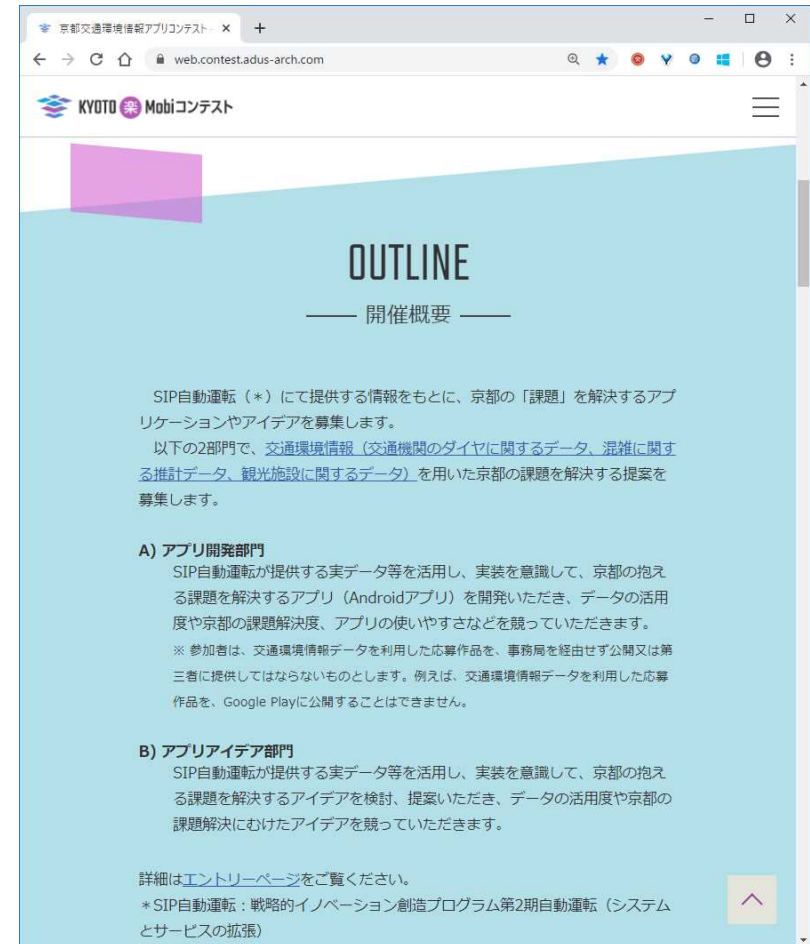
Application overview: Based on AI predictions, the application displays how you can take photos in five stages at photo spots in each sightseeing area. Users visually confirm the congestion at the place they want to go beforehand, and the application contributes to solving congestion and tourist concentration by enticing users to avoid congestion as they can search for other recommended areas and times that are not crowded.



Source: Komikomi Spot, presentation materials, System Science Co., Ltd.

# Planning and implementation of the application contest (Reference) Contest announcement page and dedicated website that have been opened to the public

- (Reference) Website announcing and outlining the contest



"KYOTO Raku Mobi Contest" website - <https://web.contest.adus-arch.com/>

# Confirmation of data specifications and rules

- Regarding the API and data investigated and verified this time, from the perspective of coordination with data provision companies, we did not put in place an API for integration on the system, and we took the policy of placing the static data in the verification experiment environment.

SIP phase one results	Items that require special attention	Response for this investigation and research
Data specification (Service platform format edition)	<ul style="list-style-type: none"> <li>- Format unification (provide common headers)</li> <li>- Data format (CSV format)</li> </ul>	<ul style="list-style-type: none"> <li>- We did not set up an information provision API and took the policy of placing the static data in the verification experiment environment.</li> <li>- For transportation data, we cleansed data based on adherence to (GTFS-JP) standard bus information format set forth by MLIT.</li> <li>- We did not covert data when it was provided in a format outside of CSV format (TSV format).</li> <li>- It is conceivable that going forward, we will collect opinions through interviews and questionnaires with contest participants and route navigation service providers regarding data format.</li> </ul>
Information provisioning API data specification	<ul style="list-style-type: none"> <li>- Request format</li> <li>- Response format</li> <li>- Divided transmission of data</li> <li>- Error code</li> </ul>	<ul style="list-style-type: none"> <li>- From the perspective of coordination with data provision companies, we did not put in place an information provision API and instead took the policy of placing the static data in the verification experiment environment.</li> </ul>
Information acquisition API data specification	<ul style="list-style-type: none"> <li>- Request format</li> <li>- Response format</li> <li>- Divided transmission of data</li> <li>- Error code</li> </ul>	<ul style="list-style-type: none"> <li>- We put in place an information acquisition API for some data.</li> <li>- The specification sent data in JSON format not CSV format.</li> </ul>

\*Regarding the provision of data to contest participants, we set up and provided an API on a trial basis. However, as a result of investigations, it turned out that one part of the specification differed from the SIP Phase one investigation results.

# Confirmation of data specifications and rules

## Issues related to data creation (1/2)

- Of the data provided by data providers, data relating to public transportation was processed into GTFS-JP at the contest secretariat and provided to contest participants.
- There were various issues when processing the data to GTFS-JP data, and solving these issues could lead to the constant provision of public transportation data.

### Issues related to data

- The data we received was system data or in PDF format, so analysis, decomposing, and organization took time.
- Some of the kana readings for bus stops were missing.
- It is difficult to decipher route codes.
- Understanding the definition of depots (whether there is passenger embarkation or not)
- Discrepancies in the representation of stop names in timetable data, fare table data and stop data.  
Timetable data: XX-Mae  
Fare table data: XX-Mae (XX)  
Stop data: XX-Mae(XX)
- When linking the timetable and fare table, when the fare table is divided by each branch number even for the same route, linking is necessary.

# Confirmation of data specifications and rules

## Issues related to data creation (2/2)

(Continued from previous section)

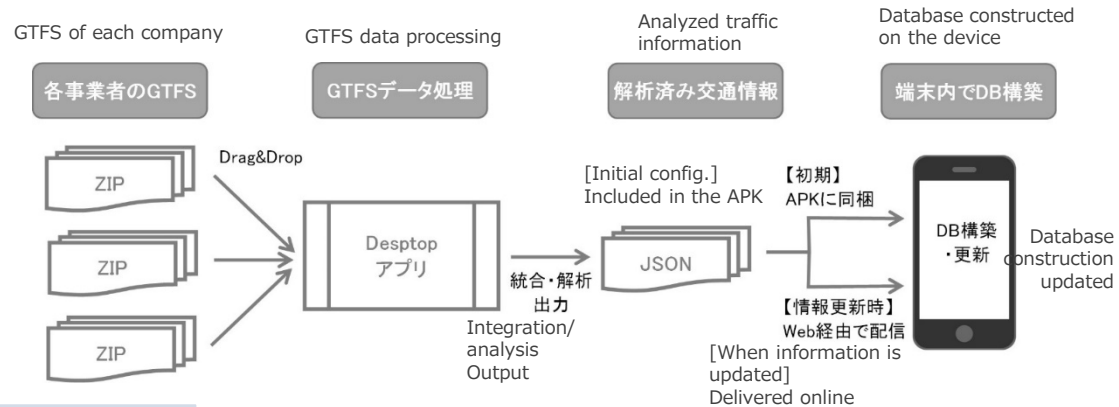
<b>Issues related to information that has not been digitalized</b>	<ul style="list-style-type: none"><li>• Latitude and longitude information was insufficient. (We purchased information from map makers and made multiple markers for central points (e.g., longitude and latitude of the area of the median strip of roads and the center of crossroads))</li><li>• To handle stations as one piece of information, there is the need to decide rules regarding where to place the representative point for longitude and latitude.</li><li>• When route maps (actual routes for operation) differ from official routes, there needs to be a GTFS rule for representation.</li><li>• It would be possible to provide more accurate information if arrival and departure platforms are linked with schedules.</li></ul>
<b>Issues with practical initiatives</b>	<ul style="list-style-type: none"><li>• The discount for transferring when using an IC card cannot be set.</li></ul>
<b>Issues if data is to be provided after the contest</b>	<ul style="list-style-type: none"><li>• Share expertise regarding how to cleanse and handle GTFS-JP data between companies.</li><li>• Divide costs and roles for routine maintenance when schedules are revised, etc.</li><li>• Share responsibilities when there is inadequate data.</li><li>• Cleanse insufficient data for the cleansing of GTFS-JP data.</li><li>• Coordination between companies related to the data cleansing and maintenance for interconnected direct operation lines.</li></ul>

# Confirmation of data specifications and rules

- We held discussions with the creators of the winning applications for Arukumachi Kyoto, and we outsourced operations from consultation to application development for the social implementation of the application. The developed application is shown below.

## GTFS data processing (desktop application)

We compiled JSON files that have analyzed and integrated GTFS beforehand on the initial start-up, and we built a transportation information database on an android device.



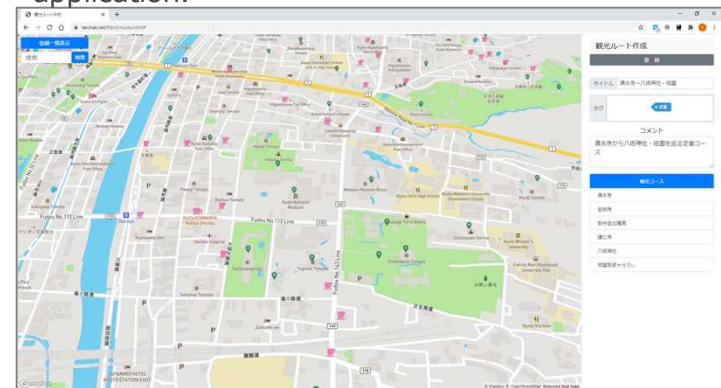
## (Temporary name) Kyoto Tourism Assistance (android application)

For the android application, as a smartphone application to assist travel and tourism within Kyoto, we implemented functions that show map and environment information, functions that show transportation routes and timetables, and search functions for travel routes (sightseeing routes).



## Sightseeing route creation (web application)

We created a web application for registering and editing "Recommended Routes" used on the Android application.



# Confirmation of data specifications and rules

- We confirmed the conditions for the ongoing provision with the data providers for the contest, including transportation companies.

Direction	Results of negotiations
<p>KYOTO Raku Mobi Contest Data used by the winning application</p>	<ul style="list-style-type: none"> <li>• We held individual negotiations with the provider of the relevant data, and we extended the contract duration of the agreement that was concluded for the purpose of using data in the contest until March 2021 (the contract duration of this project). As a result, we made adjustments so that data could be used for the continued application development of the winning application.</li> </ul>
<p>Ongoing data use after the contest</p>	<ul style="list-style-type: none"> <li>• Transportation companies, in particular, were of the opinion that it was not an issue to provide materials to the secretariat regarding schedule data at a certain point of time, like this time. However, this was on the assumption that in this situation, information is only being released to contest participants and the secretariat taking responsibility for information quality.</li> <li>• With regard to the sharing of costs and workload, it was suggested that transportation companies would potentially cooperate with contest opportunities if they were in line with the direction of the GTFS response and other measures being considered by individual companies in the future.</li> </ul>

# Extraction of data, systems, and rules to be developed and standardized

## Innovations and challenges in data procurement

- The following steps were taken in procuring data for the realization of the application contest.
- The main issues that were identified from the items that were devised in each case and the issues to be addressed in the future are that the continuous provision of data and the promotion and cooperation of local governments are essential.

Implemented items	Items we devised	Issues
Preliminary briefing concerning data provision	<ul style="list-style-type: none"> <li>• With support from local authorities, we created opportunities to explain the project to local companies.</li> <li>• We directly visited companies who would potentially cooperate with us and held concrete explanations using materials.</li> </ul>	<ul style="list-style-type: none"> <li>• Companies that, regarding data provision, needed to confirm with affiliated enterprises and multiple internal departments took time to come to a decision.</li> </ul>
Creation of terms of use for data	<ul style="list-style-type: none"> <li>• We created terms of use while referring to data terms of use used in contests that had already been held.</li> <li>• Before visiting, we sent a template file, and during the preliminary briefing regarding data provision, we reviewed and explained any unclear points.</li> </ul>	<ul style="list-style-type: none"> <li>• It took to have the terms of use confirmed by each company.</li> <li>• As the scope of data usage was limited to the contest, the division of responsibility was conducted by the secretariat, but for practical use clarifying this aspect will be increasingly important.</li> </ul>
Negotiations regarding data provision	<ul style="list-style-type: none"> <li>• We organized the information we wished to receive before making the request.</li> <li>• We coordinated so that we could receive data included in the above information in the format that is cleansed in at each company.</li> </ul>	<ul style="list-style-type: none"> <li>• As some companies outsourced the digitalization and utilization of data to third parties, negotiations regarding data provision with these third parties took time.</li> </ul>
Provision of catalog data (metadata)	<ul style="list-style-type: none"> <li>• We created a template at the secretariat while taking into account the data we planned to receive, and we had data providing companies check its content.</li> </ul>	<ul style="list-style-type: none"> <li>• We were unable to organize the content of catalog data and the disclosure schedule in a planned manner. As a result, we made requests intermittently, which confused and put a strain on data providers.</li> </ul>
Data provision	<ul style="list-style-type: none"> <li>• When data was difficult to decipher, we received lectures from providing companies regarding the data.</li> <li>• In the case of data types where a standard format is not determined, we created a data format at the secretariat.</li> </ul>	<ul style="list-style-type: none"> <li>• When the company did not have the data we anticipated, the secretariat had to newly procure data.</li> <li>• When the data was updated, such as schedule revisions, updating is easier when the difference is displayed.</li> </ul>
Following up after data provision	<ul style="list-style-type: none"> <li>• We held questionnaires regarding the cleansed data to the contest participants and gave feedback on the results of which to the companies.</li> <li>• We invited lecturers and held workshops where they gave explanations about data usage cases and how to create data.</li> </ul>	<ul style="list-style-type: none"> <li>• Workshops and feedback of contest outcomes were held online due to the spread of the novel coronavirus. However, it is highly likely that better feedback could be obtained by also using in-person meetings to fully grasp the impression of companies.</li> </ul>



# Initiatives for the FY2021 and beyond

- It is possible that the second contest will be held in Kyoto in order to promote the portal site (MD Communit) in the FY2021.

Purpose of constructing an architecture for SIP automated driving

For SIP automated driving, to realize an automated driving society, we are working on the generation and distribution of traffic environment information which is essential for automated driving. We will construct **an ecosystem to promote matching between those who own information and those who will use it** so that a wide range of users can use traffic environment information for various services.

Development orientation of the portal site (MD Communit)

Entity responsible: NTT Data

By the end of SIP phase two (FY2022), we will develop the **portal site that can conduct searching and matching of traffic environment information (MD Communit=MDC)**, and proceed with its application

1. Develop functions such as data search/matching.

2. Collect traffic environment information to be utilized with MDC, and enhance the provided data and API.

3. Conduct wide-ranging dissemination promotion of MDC towards related parties.

4. Develop an MDC operation scheme that is sustainable even after the conclusion of SIP.

- Continuous provision of traffic environment information  
- MDC operation entity

Orientation of continued initiatives in Kyoto (contests, etc.)

Entity responsible: Mitsubishi Research Institute

With the solving of regional issues using traffic environment information as one example, through events that promote data utilization using MDC (e.g., contests), we will **develop an ecosystem to promote matching in Kyoto and aim the social implementation of the ecosystem's outcomes.**

\*In addition to the initiatives of the first contest, **we will promote exchange between data providers, MDC, participants, and we will aim to involve existing Kyoto organizations.**

1. Have participants use MDC and implement the outcomes in society.

2. Collect traffic environment information in Kyoto to be utilized with MDC, and receive the continued provision of this information.

3. Encourage Kyoto data providers, participants, and local authorities to use MDC.

4. Develop a data utilization scheme in Kyoto that is sustainable even after the conclusion of SIP.

## 4. Achievements and future Challenges

# Achievements and Future Challenges (1/2)

- The results of this year's project and issues for FY2021 and beyond are summarized below.

## Results of this year's project

Problem  
a

### Portal site development

- Enhanced search functions, user support, and UI improvements were implemented to improve user convenience.
- By opening the portal site to some companies, we were able to have users touch the portal site and get a live evaluation from the users.

### Promote the use of portal sites

- Efforts were made to improve the attractiveness of the portal site, including expansion of the data handled, solicitation of data providers/users, and implementation of events.
- As an activity on the rule side for the general release, the terms of use were developed (currently under Rv by users).
- Initiatives for off-site business matching were implemented by holding idea generation events and other events.

## Issues for the future

### Portal site development

- Based on the evaluations from users, points for improvement have been extracted in terms of searchability and portal site design/UI. It is necessary to continue to reinforce the improved points by adding functions, etc., and to examine the role and positioning of the portal site in promoting the utilization of mobility data, and to examine and develop the necessary functions, etc.

### Promote the use of portal sites

- Interviews with users have revealed some of the issues that data providers/users face in the utilization of mobility data (e.g., the value of data (what kind of data is needed), the destination of utilization (specific use cases) is unclear, and there is no know-how to provide/utilize data). Therefore, in order to solve these issues, it is necessary to consider the activities that should be undertaken as part of dissemination and promotion, and to conduct activities that contribute to the promotion of business matching.

# Achievements and Future Challenges (2/2)

(Continued from previous section)

## Results of this year's project

### Issue b

- In order to utilize and collaborate in the field of logistics with cooperative data that leads to the solution of social issues common to the industry, we extracted data candidates that can be made into a cooperative area related to the efforts and issues of logistics companies, based on a survey of the issues faced by the logistics industry.
- Based on discussions with the SIP Research and Demonstration for Improving Logistics Efficiency Based on Architecture Using Vehicle Information such as SIP Probes (hereinafter referred to as SIP Logistics Efficiency), issues related to the usefulness and deliverability of the above data candidates and the image of creating services using the portal based on the direction of solving the issues were discussed.

### Issue c

- We realized the collection of data to be posted on the portal site from coordination with various parties.
- Traffic environment information and development environment were developed, and an application contest was held.

## Issues for the future

- From the FY2021 onward, we will sort out the issues and examine various specifications to realize the service creation image that we have created this fiscal year, and formulate a detailed service creation plan.

- As an example of how to solve regional issues using traffic environment information, we aim to build an ecosystem for promoting matching in Kyoto through events (contests, etc.) that promote data utilization using the portal site, and to implement the results in society.

# Collaboration with other SIP themes

- Describe below the collaboration with other themes implemented in this year's project.

SIP themes of the collaborators	trustee	Details of cooperation implemented this year
Research and study on the design and construction of architectures for automated driving and driver assistance (former proposal d)	Nippon Koei Co., Ltd. /PACIFIC CONSULTANTS CO., LTD./Higway Industry Development Organization	Discussions on the commonization of information (GTFS, etc.) required for operation management and other databases and candidate data to be posted on the portal for practical use. Ongoing discussions to expand the data posted on the portal in consideration of ensuring connectivity with other transportation systems and utilization in other fields in each region to be introduced.
Research and demonstration for improving logistics efficiency based on an architecture using vehicle information such as probes	Nittsu Research Institute and Consulting, Inc.	Sharing of logistics industry issues, demonstration details, and demonstration use data Discussions on data and use cases that are candidates for the cooperative area, and identification of issues
Improvement of the environment to promote the utilization of mobility-related data	Mitsubishi Research Institute, Inc.	Provide use cases from previous years' studies. Discussions to identify issues for implementation of the use cases Participated as a member of the Mobility Data Utilization Promotion Study Group
Research on planning for the establishment of intellectual property strategies	Yokohama National University	IP research on portal software, IPC code extraction To provide information about MD Communit's data handling and service provision methods