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## OGC POI Use Cases

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## **i. Abstract**

<Insert Abstract Text here>

## **ii. Keywords**

The following are keywords to be used by search engines and document catalogues.

ogcdoc, OGC document, <tags separated by commas>

## **iii. Preface**

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Insert Preface Text here. Give OGC specific commentary: describe the technical content, reason for document, history of the document and precursors, and plans for future work. > Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. The Open Geospatial Consortium shall not be held responsible for identifying any or all such patent rights.

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All questions regarding this submission should be directed to the editor or the submitters:

Name Affiliation

# Chapter 1. Scope

## NOTE

Insert Scope text here. Give the subject of the document and the aspects of that scope covered by the document.

# Chapter 2. Conformance

This Best Practice defines XXXX.

Requirements for N target types are considered: \* AAAA \* BBBB

Conformance with this Best Practice shall be checked using all the relevant tests specified in Annex A (normative) of this document.

In order to conform to this OGC® Best Practice, a software implementation shall choose to implement: \* Any one of the conformance levels specified in Annex A (normative). \* Any one of the Distributed Computing Platform profiles specified in Annexes TBD through TBD (normative).

All requirements-classes and conformance-classes described in this document are owned by the document(s) identified.

# Chapter 3. References

The following normative documents contain provisions that, through reference in this text, constitute provisions of this document. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. For undated references, the latest edition of the normative document referred to applies.



Insert References here. If there are no references, state “There are no normative references”.

References are to follow the Springer LNCS style, with the exception that optional information may be appended to references: DOIs are added after the date and web resource references may include an access date at the end of the reference in parentheses. See examples from Springer and OGC below.

Smith, T.F., Waterman, M.S.: Identification of Common Molecular Subsequences. *J. Mol. Biol.* 147, 195–197 (1981)

May, P., Ehrlich, H.C., Steinke, T.: ZIB Structure Prediction Pipeline: Composing a Complex Biological Workflow through Web Services. In: Nagel, W.E., Walter, W.V., Lehner, W. (eds.) *Euro-Par 2006. LNCS*, vol. 4128, pp. 1148–1158. Springer, Heidelberg (2006)

Foster, I., Kesselman, C.: *The Grid: Blueprint for a New Computing Infrastructure*. Morgan Kaufmann, San Francisco (1999)

Czajkowski, K., Fitzgerald, S., Foster, I., Kesselman, C.: Grid Information Services for Distributed Resource Sharing. In: 10th IEEE International Symposium on High Performance Distributed Computing, pp. 181–184. IEEE Press, New York (2001)

#### NOTE

Foster, I., Kesselman, C., Nick, J., Tuecke, S.: *The Physiology of the Grid: an Open Grid Services Architecture for Distributed Systems Integration*. Technical report, Global Grid Forum (2002)

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ISO / TC 211: ISO 19115-1:2014 Geographic information — Metadata — Part 1: Fundamentals (2014)

ISO / TC 211: ISO 19157:2013 Geographic information — Data quality (2013)

ISO / TC 211: ISO 19139:2007 Geographic information — Metadata — XML schema implementation (2007)

ISO / TC 211: ISO 19115-3: Geographic information — Metadata — Part 3: XML schemas (2016)

OGC: OGC 15-097 OGC Geospatial User Feedback Standard. Conceptual Model (2016)

OGC: OGC 12-019, OGC City Geography Markup Language (CityGML) Encoding Standard (2012)

OGC: OGC 14-005r3, OGC IndoorGML (2014)

# Chapter 4. Terms and Definitions

This document uses the terms defined in OGC Policy Directive 49, which is based on the ISO/IEC Directives, Part 2, Rules for the structure and drafting of International Standards. In particular, the word “shall” (not “must”) is the verb form used to indicate a requirement to be strictly followed to conform to this standard and OGC documents do not use the equivalent phrases in the ISO/IEC Directives, Part 2.

This document also uses terms defined in the OGC Standard for Modular specifications (OGC 08-131r3), also known as the ‘ModSpec’. The definitions of terms such as standard, specification, requirement, and conformance test are provided in the ModSpec.

For the purposes of this document, the following additional terms and definitions apply.

This document uses the terms defined in OGC Policy Directive 49, which is based on the ISO/IEC Directives, Part 2, Rules for the structure and drafting of International Standards. In particular, the word “shall” (not “must”) is the verb form used to indicate a requirement to be strictly followed to conform to this standard and OGC documents do not use the equivalent phrases in the ISO/IEC Directives, Part 2.

This document also uses terms defined in the OGC Standard for Modular specifications (OGC 08-131r3), also known as the ‘ModSpec’. The definitions of terms such as standard, specification, requirement, and conformance test are provided in the ModSpec.

The Glossary includes terms from other standards and specifications that, while not normative, are critical to accurately understand this specification.

For the purposes of this document, the following additional terms and definitions apply.

## 4.1. location

identifiable geographic place (Source: ISO19112:2019)

## 4.2. place

identifiable part of any space (Source: ISO19155:2012)

## 4.3. position

data type that describes a point or geometry potentially occupied by an object or person (Source: ISO19133:2005)

## 4.4. spatial reference

system for identifying position in the real world (Source: ISO19155:2012)

## **4.5. stakeholder**

individual or organization having a right, share, claim, or interest in a system or in its possession of characteristics that meet their needs and expectations (Source: ISO1588:2015)

## **4.6. user**

individual or organization that uses the system or software to perform a specific function (Source: ISO25000:2014)

# Chapter 5. Conventions

This sections provides details and examples for any conventions used in the document. Examples of conventions are symbols, abbreviations, use of XML schema, or special notes regarding how to read the document.

## 5.1. Identifiers

The normative provisions in this document are denoted by the URI

<http://www.opengis.net/spec/{standard}/{m.n}>

All requirements and conformance tests that appear in this document are denoted by partial URIs which are relative to this base.

# Chapter 6. POI Use Cases

## 6.1. Choose Restaurant

**Contributed By:** Howard Trickey

**Motivation:** People using a map service that contains POIs may want to find a restaurant to eat in. This is good example of the general use case of finding and choosing POIs with particular services.

### Summary

In order to choose a restaurant to eat in or get delivery from, users need to find restaurants near them and information about those restaurants to help decide which, if any, they want to use.

[Click to view](#) full use case description

### Related Use Cases

#### Roles:

- Restaurant owner or operator
- User (person choosing a restaurant)
- Government entities responsible for regulating restaurants, search services, phones, automobiles

*TODO: link stakeholders to the [Stakeholders Section](#) of this document.*

#### Devices:

Users may want to choose a restaurant using a computer, a mobile phone, or an in-auto navigation system.

#### Data:

The data will be attributes of restaurants such as: location, name, type of cuisine, business hours, price level, etc.

#### Dependencies:

*TODO: Add any dependencies from the [Bibliography](#) and [Terms and Definitions](#) sections of this document.*

#### Requirements:

*TODO: Add requirements from the [Requirements section](#) of this document.*

#### Variants:

Many "Choose X" use cases will be similar, differing mainly in the specialized attributes needed to make a choice for POIs in category X. For example:

- Choose Lodging
- Choose Clothes Store
- Choose Electronics Store

...

#### **Security Considerations:**

A user should not be able to discover what any other particular user did while choosing a restaurant.

#### **Privacy Considerations:**

An restaurant listed must be a publicly visitable place. There may be other privacy laws, in certain countries, that require that a POI listing be deleted upon request by the POI owner.

#### **Comments:**

## **6.2. Construction Site**

**Contributed By:** Timo Ruohomäki, based on innovation projects from the city of Helsinki.

**Motivation:** The last mile has often been found to be the most challenging factor in the logistics chain and the most demanding in terms of achieving the desired service level. This is an issue especially on developing areas, e.g. construction sites.

#### **Summary**

[Click to view](#) full use case description

#### **Related Use Cases**

#### **Roles:**

#### **Devices:**

#### **Data:**

#### **Dependencies:**

#### **Requirements:**

#### **Variants:**

<Describe possible use case variants, if applicable>

#### **Security Considerations:**

<Describe any issues related to security; if there are none, say "none" and justify>

#### **Privacy Considerations:**

<Describe any issues related to privacy; if there are none, say "none" and justify>

**Comments:**

## 6.3. Country Covid Requirements

**Contributed By:** Howard Trickey

**Motivation:** People might want to know what the requirements are related to Covid that they need to be prepared for if they intend to visit a particular country. This use case shows that a POI might be a *whole country*.

**Summary**

A user can use a service to look up, by country name, what the requirements are to visit a country with respect to Covid precautions: vaccinations required, tests required, etc.

[Click to view](#) full use case description

**Related Use Cases**

**Roles:**

- [Functional Beneficiary](#) - the user searching for Covid requirements
- [Maintenance Operator](#) - responsible for keeping the per-country requirements updated
- [Supplier](#) - supplies the Covid requirements for some or all countries
- [Regulator](#) - has input or legal requirements over what constitutes a country

**Devices:**

[Web Browser](#)

**Data:**

- List of the world's countries and a representative geographic point for each
- For each country, an up-to-date set of requirements for vaccination, testing, quarantining, and masking, for entry to and staying in the country.

**Dependencies:**

<Identify any dependencies of this use case. Dependencies are described in the [Bibliography](#) and [Terms and Definitions](#) sections of this document. Each listed dependency should be hyperlinked to its description.>

**Requirements:**

<Identify the requirements derived from this use case. Requirements are described in the [Requirements section](#) of this document. Each listed requirement should be hyperlinked to its description.>

**Variants:**

A variant use case would be looking up other kinds of information about a country - for example, population or economic data.

Another variant use case would be lookup up information over different-sized region classifications - for example, states, provinces, or cities.

**Security Considerations:**

The information about Covid requirements might be harmful (or at least, annoying) to users if wrong, so there should be security mechanisms in place to ensure that only data from authorized sources is shown to users.

**Privacy Considerations:**

Users should be able to assume that their inquiries cannot be tracked back to them, unless the service very clearly warns otherwise.

**Comments:**

## 6.4. Covid Testing Center Use Case

**Contributed By:** <Put your name here>

**Motivation:** <Provide a description of the problem that is solved by the use case and a reason why this use case is important for the users>

**Summary**

<Provide a summary of the use case. The full use case description should be available through the following link>

[Click to view](#) full use case description

**Related Use Cases**

<Identify any use cases which are related to this one and describe the nature of that relation. Include a hyperlink to each use case.>

**Roles:**

<List all stakeholders that are involved in the use case. Stakeholders are described in the [Stakeholders Section](#) of this document. Each listed stakeholder should be hyperlinked to its description.>

**Devices:**

<List the target devices, e.g. as a sensor, solar panel, air conditioner>

**Data:**



<List the type of expected data, e.g. weather and climate data, medical conditions, machine sensors, vehicle data>

**Dependencies:**

<Identify any dependencies of this use case. Dependencies are described in the [Bibliography](#) and [Terms and Definitions](#) sections of this document. Each listed dependency should be hyperlinked to its description.>

**Requirements:**

<Identify the requirements derived from this use case. Requirements are described in the [Requirements section](#) of this document. Each listed requirement should be hyperlinked to its description.>

**Variants:**

<Describe possible use case variants, if applicable>

**Security Considerations:**

<Describe any issues related to security; if there are none, say "none" and justify>

**Privacy Considerations:**

<Describe any issues related to privacy; if there are none, say "none" and justify>

**Comments:**

## 6.5. Electrical Vehicle Charging Stations

**Contributed By:** Timo Ruohomäki, Forum Virium Helsinki Oy

**Motivation:** People driving EV would appreciate up to date information of the nearest available charging station.

**Summary**

There are several operators providing the charging stations, some of them open and some requiring membership. The charging stations also can provide back useful information, e.g. the occupancy status and estimated time of being available. The use case aims to tackle the charging station as a service from several different stakeholders point of view.

[Click to view](#) full use case description

**Related Use Cases**

<Identify any use cases which are related to this one and describe the nature of that relation. Include a hyperlink to each use case.>

**Roles:**

<List all stakeholders that are involved in the use case. Stakeholders are described in the [Stakeholders Section](#) of this document. Each listed stakeholder should be hyperlinked to its description.>

**Devices:**

Vehicle, Charging Station

**Data:**

Operational data of the charging process

**Dependencies:**

<Identify any dependencies of this use case. Dependencies are described in the [Bibliography](#) and [Terms and Definitions](#) sections of this document. Each listed dependency should be hyperlinked to its description.>

**Requirements:**

<Identify the requirements derived from this use case. Requirements are described in the [Requirements section](#) of this document. Each listed requirement should be hyperlinked to its description.>

**Variants:**

<Describe possible use case variants, if applicable>

**Security Considerations:**

<Describe any issues related to security; if there are none, say "none" and justify>

**Privacy Considerations:**

Data originated from the vehicle may contain personal data.

**Comments:**

## 6.6. Indoor Navigation

**Contributed By:** Abdoulaye Diakite

**Motivation:** With the complexification of urban constructions that are increasingly leveraging vertical spaces (high rise and underground), navigating the indoor environment is becoming more and more challenging. While reliable localization system is still the biggest challenge for indoor navigation applications, the perfect map to support smart navigation is yet to be fully defined but PoI plays a critical role in its functionalities. In indoor navigation, a PoI either plays the role of a destination, or a "landmark" on the agent's way to improve the navigation experience.

**Summary**

<Provide a summary of the use case. The full use case description should be available through the

following link>

[Click to view](#) full use case description

### **Related Use Cases**

<Identify any use cases which are related to this one and describe the nature of that relation. Include a hyperlink to each use case.>

### **Roles:**

<List all stakeholders that are involved in the use case. Stakeholders are described in the [Stakeholders Section](#) of this document. Each listed stakeholder should be hyperlinked to its description.>

### **Devices:**

<List the target devices, e.g. as a sensor, solar panel, air conditioner>

### **Data:**

<List the type of expected data, e.g. weather and climate data, medical conditions, machine sensors, vehicle data>

### **Dependencies:**

<Identify any dependencies of this use case. Dependencies are described in the [Bibliography](#) and [Terms and Definitions](#) sections of this document. Each listed dependency should be hyperlinked to its description.>

### **Requirements:**

<Identify the requirements derived from this use case. Requirements are described in the [Requirements section](#) of this document. Each listed requirement should be hyperlinked to its description.>

### **Variants:**

<Describe possible use case variants, if applicable>

### **Security Considerations:**

<Describe any issues related to security; if there are none, say "none" and justify>

### **Privacy Considerations:**

<Describe any issues related to privacy; if there are none, say "none" and justify>

### **Comments:**

## 6.7. Military Use Case

**Contributed By:** Joetta Kreck (AGC) – [Joetta.l.kreck@usace.army.mil](mailto:Joetta.l.kreck@usace.army.mil)

### **Motivation:**

Use POIs to simplify data collection and use.

### **Summary**

POIs are a simplification of a Feature dataset. The selection and population of a POI is mission-specific. There is no standard attribution for a POI Feature. Rather, the POI Feature Type serves as a scaffolding which is attributed based on the data available and the needs of the user.

[Click to view](#) full use case description

### **Related Use Cases**

TBD

### **Roles:**

<List all stakeholders that are involved in the use case. Stakeholders are described in the [Stakeholders Section](#) of this document. Each listed stakeholder should be hyperlinked to its description.>

### **Devices:**

NA

### **Data:**

A Feature dataset which is the source or target of the POI.

### **Dependencies:**

NA

### **Requirements:**

TBD

### **Variants:**

None

### **Security Considerations:**

TBD

### **Privacy Considerations:**

TBD

## Comments:

# 6.8. Houses and Utility Poles

**Contributed By:** Howard Trickey

**Motivation:** A utility company (e.g., electricity supplier) may want to know the location of all of the houses (and other buildings) that it serves, and the utility pole that is closest to each house. This use case shows that a POI might be a private house or some other kind of object that has a location in the world.

## Summary

Employees of the utility company can use a service to look up a house by address, and be presented with the utility pole that is closest to it. They might also look up utility poles closest to a particular address, and from the results, choose one to see all of the houses closest to that utility pole.

[Click to view](#) full use case description

## Related Use Cases

### Roles:

- [Functional Beneficiary](#) - the employee searching for houses or poles
- [Maintenance Operator](#) - responsible for keeping the houses and poles data updated
- [Supplier](#) - supplies data for houses, address-to-latitude/longitude mapping, utility pole locations

### Devices:

[Web Browser](#)

### Data:

- List of all the houses in a region, with address and (latitude,longitude) attributes.
- List of all the utility poles in a region, with (latitude,longitude) attribute.
- Relation closest\_to(house, pole) stating that the given pole is closest to the given house.

### Dependencies:

<Identify any dependencies of this use case. Dependencies are described in the [Bibliography](#) and [Terms and Definitions](#) sections of this document. Each listed dependency should be hyperlinked to its description.>

### Requirements:

<Identify the requirements derived from this use case. Requirements are described in the [Requirements section](#) of this document. Each listed requirement should be hyperlinked to its description.>

### Variants:

This use case could be enhanced with things such as substations and power line routing along the utility poles.

**Security Considerations:**

This may be sensitive data from an infrastructure security point of view, in which case adequate access controls to the service need to be in place.

**Privacy Considerations:**

Probably none. If this service were made publicly available then public laws may require that a person could request that their house be deleted from the database.

**Comments:**

## 6.9. Package Drop-off and Pick Up Services

**Contributed By:** Christine Perey, based on commercial package delivery and return services (e.g., Amazon)

**Motivation:** For commercial or residential customers, package delivery and pick up logistics requires considerable attention to details (e.g., pick up location, time), and tracing (tracking) for efficient space use, billing and insurance purposes. Customers may end up waiting for either a delivery or a pick up that is late, or miss the connection if the delivery is early, and fuel consumption associated with individual addresses may be greater than services using a pooled location (individually-secured containers within a larger container). Some service providers have developed systems to manage a multi-customer delivery and return location.

**Summary**

[Click to view](#) full use case description

**Related Use Cases** This use case is somewhat related to the last mile logistics use case.

**Roles:**

**Devices:**

**Data:**

**Dependencies:**

**Requirements:**

**Variants:**

**Security Considerations:**

There must be unique and secure access codes assigned for the customer dropping off a package and the operator or customer picking up from the same secure cubicle.

**Privacy Considerations:**

Once the customer agrees to terms and conditions of use, the contents of the cubicle must not be disclosed to other customers or delivery personnel.

**Comments:**

## 6.10. POI Publication

**Contributed By:** Koen De Baets, Digitaal Vlaanderen (Government of Flanders)

**Motivation:** A diverse group of (governmental) agencies have data that might be of interest to a broad audience (e.g., citizens, visitors, researchers, other agencies). The publisher wants to make this data publicly available in a uniform and user friendly way.

**Summary** Multiple data sets from different sources, each having its own data model, are mapped and/or geocoded to a single POI data model. The data model should have a set of generic attributes to minimize losing any richness of the source data. All POI's from different sources are combined and available to end users as single service.

In addition, services that search data would be able to present to the user a single result after retrieving data from multiple original data sources.

[Click to view](#) full use case description

### Related Use Cases

<Identify any use cases which are related to this one and describe the nature of that relation. Include a hyperlink to each use case.>

**Roles:** POI Publisher <List all stakeholders that are involved in the use case. Stakeholders are described in the [Stakeholders Section](#) of this document. Each listed stakeholder should be hyperlinked to its description.>

**Devices:** Personal Computers, Mobile

**Data:** Geo-referenced data

### Dependencies:

<Identify any dependencies of this use case. Dependencies are described in the [Bibliography](#) and [Terms and Definitions](#) sections of this document. Each listed dependency should be hyperlinked to its description.>

**Requirements:** Data Source (Provenance) Location Publication Date Version Label Description (including HTML Tags)

<Identify the requirements derived from this use case. Requirements are described in the [Requirements section](#) of this document. Each listed requirement should be hyperlinked to its description.>

**Variants:**

<Describe possible use case variants, if applicable>

**Security Considerations:** None, the sources are public and licensed under open data agreement/policy

**Privacy Considerations:** None, the sources are public and licensed under open data agreement/policy

**Comments:**

## 6.11. Smart Tourism

**Contributed By:** Timo Ruohomäki, Forum Virium Helsinki Oy

**Motivation:** Provide better and up-to-date information services for tourists

### Summary

Smart Tourism is the type of tourism that depends on high level of integration with information systems, possibly in combination with social connections and human interest. Tourism services have a strong link to spatial information systems in providing information on tourist attractions and planning routes between them. The information on tourist attractions can be somewhat dynamic, including opening hours and physical accessibility. Oftentimes with the help of social media services, rating and feedback from visitors is linked to the attractions. The tourism is international by definition, so the information is to be provided in many languages.

[Click to view](#) full use case description

### Related Use Cases

<Identify any use cases which are related to this one and describe the nature of that relation. Include a hyperlink to each use case.>

### Roles:

<List all stakeholders that are involved in the use case. Stakeholders are described in the [Stakeholders Section](#) of this document. Each listed stakeholder should be hyperlinked to its description.>

### Devices:

<List the target devices, e.g. as a sensor, solar panel, air conditioner>

### Data:

<List the type of expected data, e.g. weather and climate data, medical conditions, machine sensors, vehicle data>

### Dependencies:

<Identify any dependencies of this use case. Dependencies are described in the [Bibliography](#) and



[Terms and Definitions](#) sections of this document. Each listed dependency should be hyperlinked to its description.>

**Requirements:**

<Identify the requirements derived from this use case. Requirements are described in the [Requirements section](#) of this document. Each listed requirement should be hyperlinked to its description.>

**Variants:**

<Describe possible use case variants, if applicable>

**Security Considerations:**

<Describe any issues related to security; if there are none, say "none" and justify>

**Privacy Considerations:**

<Describe any issues related to privacy; if there are none, say "none" and justify>

**Comments:**

# Chapter 7. POI Detailed Use Cases

## 7.1. Choose Restaurant Use Case

A user of a map system (on a computer, a phone, in a car, etc.) may want to find a restaurant to eat in or get delivery from. They will have some set of requirements that the restaurant should satisfy for it to be a good choice for them. The user requirements may include some or all of the following:

- Near a particular location in the world (maybe the user's current location, maybe somewhere they are intending to travel to).
- Serves cuisines that the user can eat and likes.
- Is open during the hours the user intends to visit, and/or serve the type of meal (breakfast, lunch, dinner, etc.) the user wants.
- Has service style the user prefers (take-out vs dine-in).
- Has a price level the user prefers.
- Has a bar and/or serves alcohol.
- Has delivery.
- Has order-ahead with pickup.
- Requires reservations or reservations recommended.
- Will have a busyness level that the user prefers at the time of intended visit.
- Has good reviews.
- Accepts particular payment methods.
- Has an ambience the user prefers (family-friendly, upscale, romantic, etc.).
- Has an all-you-can eat buffet.
- Shows sports on TV.
- Has a happy hour.
- Is Handicap-accessible.
- Has available free parking.
- Has Covid-related requirements (vaccination and/or masks).

Given these requirements, the user will want to browse restaurants in a particular locality or in a particular time-from or distance-from a particular (latitude, longitude), and examine whether or not those restaurants have the required attributes.

As a final part of this use case, the user may want to execute the transaction by doing one of:

- Get navigation directions from their current location to the chosen restaurant.
- Place an order for delivery from the chosen restaurant.
- Place an order for pickup from the chosen restaurant and get navigation directions to it.

- Save the restaurant in a list of "favorites".

### 7.1.1. Restaurant Attribute Details

#### Food Served

There are a number of dimensions along which one can describe the food served by a restaurant. Here is an example taxonomy:

- Regional
  - African
    - Cape Verdean, East African, Eritrean, Ethiopian, North African, Seychelles, South African, West African, ...
  - Asian
    - Central Asian
      - Kazakhstani, Turkmen, Uzbeki
    - East Asian
      - Chinese, Japanese, Korean, Mongolian, Taiwanese, ...
    - South Asian
      - Indian, Nepalese, Pakistani, Sri Lankan, ...
    - South-East Asian
      - Burmese, Cambodian, Filipino, Indonesian, Laotian, Malaysian, Singaporean, Thai, Vietnamese, Tibetan, ...
    - European
      - Austrian, Belgian, British, Dutch, French, German, Greek, Irish, Italian, Maltese, Portuguese, Danish, Finnish, Icelandic, Norwegian, Swedish, Spanish, Swiss, Turkish, ...
    - East European
      - Armenian, Bulgarian, Croatian, Czech, Georgian, Hungarian, Lithuanian, Polish, Romanian, Russian, Serbian, Ukrainian, ...
    - Middle Eastern
      - Egyptian, Georgian, Israeli, Lebanese, Persian, Syrian, Turkish, Yemenite, ...
    - North American
      - Californian, Native American, New American, New England, Puerto Rican, Southern US, Southwestern US, Traditional American, Canadian, Cuban, Dominican, Haitian, Jamaican, Costa Rican, Guatemalan, Honduran, Nicaraguan, Salvadoran, Mexican, ...
    - Oceanian
      - Australian, New Zealand, Polynesian, ...
- Cooking style

- Barbecue, Carvery, Grill, Hot Pot, Wok, Down-home Cooking, Fusion, ...
- Dietary
  - Gluten-free, Halal, Health Food, Jewish, Kosher, Macrobiotic, Non-vegetarian, Organic, Raw Food, Vegan, Vegetarian, ...
- Dining style
  - Box lunch, Beer Garden, Buffet, Carvery, Family-friendly, Fast food, Fine dining, Gastropub, Small Plates, Stand bar, Street food, Tavern, Pub, Cafe, ...
- Meal type
  - Breakfast, Brunch, Lunch, Dinner, Late-night Meal
- Dishes Served
  - Fried Chicken, Pizza, Salad, Sandwich, Seafood, Soup, Steak, Noodles, Sushi, Dim Sum, Curry, Fish and Chips, Pancakes, Hamburger, Hot dog, Cheesesteak, Chicken Wings, Coffee, Alcohol, ...

## 7.2. Construction Site Use Case

The last mile has often found to be the most challenging factor in the logistics chain and the most demanding regarding to the service level. This is especially the case in developing areas, e.g. construction sites. The delivery drivers need to consider the nearest parking spot to the recipient, avoid road constructions or use temporary routes and, in large buildings, find the most suitable access point. On construction sites, the suitable loading areas change often and, as a safety measure, the delivery routes need to be planned in advance. The traffic flows and entrance and exit points are included in the detailed site logistics plan.

The logistics plan heavily relies on geospatial referencing. The entrance and exit points, routes within the site and loading areas are all geospatial features. This information may change with short notice, but up-to-date information about the site logistics need to be maintained by the site logistics planner and shared with the logistics operators, drivers and first responders.

In addition to maintaining the location information, logistics planning involves additional attributes that are maintained as part of the process. The entrance and exit points may have opening hours, routes sometimes have weight and height limits and contact information for the loading deck manager and final recipients need to be easily accessible. It is unlikely that a comprehensive list of all the attributes can be created since cases many have unique needs.

## 7.3. Country Covid Requirements Use Case

This use case proposes a service that users can consult via a web browser in order to find out what the rules are for entering, possibly quarantining, and then staying in any of the countries of the world.

A user should be able to enter a country name in a form, and then be shown the following information:

### 7.3.1. For Entry to the Country

- Is there a testing requirement? If so
  - What kind of tests are allowed?
  - What must the test documentation show?
  - Within what time period prior to arrival (or plane boarding) must the test be taken?
  - Are there exemptions to testing? If so, what documentation is needed?
- Is there a vaccine requirement? If so
  - What vaccines are accepted? Are boosters required too, if eligible?
  - What documentation is acceptable?
  - Are there exemptions to testing? If so, what documentation is needed?
- Is there a quarantine requirement? If so
  - Who is required to quarantine?
  - How long is the quarantine period? Is there an early out possibility?
  - What places are acceptable for quarantining in?

### 7.3.2. Once in a Country

- If one gets Covid, are there quarantining requirements? If so
  - *same questions as in previous section for quarantine*
- Are there masking requirements? If so
  - In what places are masks required?
  - Is the type of allowable mask specified?

### 7.3.3. Geopolitical Complications

A complication of this use case is that the set of countries in the world is not well-defined. Some countries' laws prohibit the recognition of other countries. Therefore, depending on where the user of this service is and perhaps where the serving machines for the service is, the set of countries that the service recognizes may be different for different users.

While this use case posits just having a point on a map to associate with each country, a variant might be to outline the borders of a country on a map as part of what is shown to the user. This would open up even more geopolitical complications, as different countries have different laws about what their borders are, and the service may, just as in the previous paragraph, have to adapt the display according to where the user and/or servers are.

## 7.4. Covid Testing Center Use Case

<insert narrative text>

## 7.5. Electrical Vehicle Charging Stations

Electrical vehicle charging stations have become an important element on location services. The information is highly useful extension for the services provided for cars and because of that, higher level of open interoperability would make it easier to maintain information on charging networks that have multiple operators and a growing number of private vendors making their chargers available for public.

There are several ways of viewing what a charging station is: - Charging station as a part of traffic system, having a location and street address - Charging station as a node part of the routing algorithms (e.g. Battery Level on Arrival -indicator) - Charging station as a part of electric utility network - Charging station as an asset with stakeholders, maintenance operations and permits

Open Charger Alliance, an industry organization, has created a widely adopted data standard for the chargers. The [Open Charging Point Protocol](<https://www.openchargealliance.org/protocols/ocpp-16/>) , currently in version 1.6, defines the messaging standard between the charger and the vehicle. While it doesn't define the characteristics of the charger itself, it does provide some dynamic attributes that are expected in charging assistance. As an example, it defines the number of charging positions available for vehicles, their availability, operational status and energy consumption. To access this information, typically a data integration is required with the charging network operator.

### 7.5.1. References:

- [Google Maps for EV](<https://support.google.com/maps/answer/9773205>)

## 7.6. Indoor Navigation Use Case

With the complexification of urban constructions that are increasingly leveraging vertical spaces (high rise and underground), navigating the indoor environment is becoming more and more challenging. While reliable localization system is still the biggest challenge for indoor navigation applications, the perfect map to support smart navigation is yet to be fully defined but PoI plays a critical role in its functionalities. In indoor navigation, a PoI either plays the role of a destination, or a "landmark" on the agent's way to improve the navigation experience. In this document, we select few navigation scenarios and suggest PoI examples that an application (e.g., an navigation app) would need to support them.

### 7.6.1. Scenario 1:

A pedestrian may be looking for a meeting room in a building they are not familiar with. From the entrance to the meeting room, the navigation app may require the description of the:

- Levels
  - Level number
  - Level access (stairs, escalators, lifts)
  - Entrance/exit level

- Rooms
  - Number/Name
  - Functions (e.g., restroom, waiting room, etc.)
- "Landmarks" (strong cues for guidance)
  - printers
  - coffee machines
  - artefacts,
  - Wallpapers,
  - etc.
- Accessible spaces (e.g. unrestricted areas, etc.)

## 7.7. Military Use Case

### 7.7.1. Scenario

One Army unit is deploying to assist with setting up Covid testing and emergency hospitals while another unit is deploying to a war-torn area where infrastructure has been destroyed and potential hazardous materials may have been released. Each unit has a need for Points of Interest (POI), however these POI will be different depending on the mission and the operational setting. A vast feature data set is available with a complex/robust data schema however these end users are seeking situational awareness for their operation and a geospatial engineer team is responsible for leveraging the feature dataset to generate sets of POI to support each mission. These users only require a limited set of features that are easily represented by intuitive symbols and a select set of attributes that support the mission and can be easily displayed on a mobile device. The end user loads the prepared dataset or connects to a service to cache the POI. The end user reviews POI data over imagery and over a map background to familiarize themselves with on the area. In a sparse area the user will turn on a full set of POI while in dense urban areas the user selects from a list of POI to display.

In both scenarios the users also have a need to collect POI via a simple select the symbol from a list and drop it on the map with a second step of select the symbol from the map and add detail via a drop-down menu with a list of list attributes. The collected and revised POI will be uploaded and validated by the geospatial engineer team and persistent information will be added to the master feature dataset.

### 7.7.2. What is a POI?

A POI provides a simplified, mission-specific, view of Feature data.

#### **POI for Situational Awareness**

*A POI is a simplified view of a mission-specific subset of a Feature dataset*

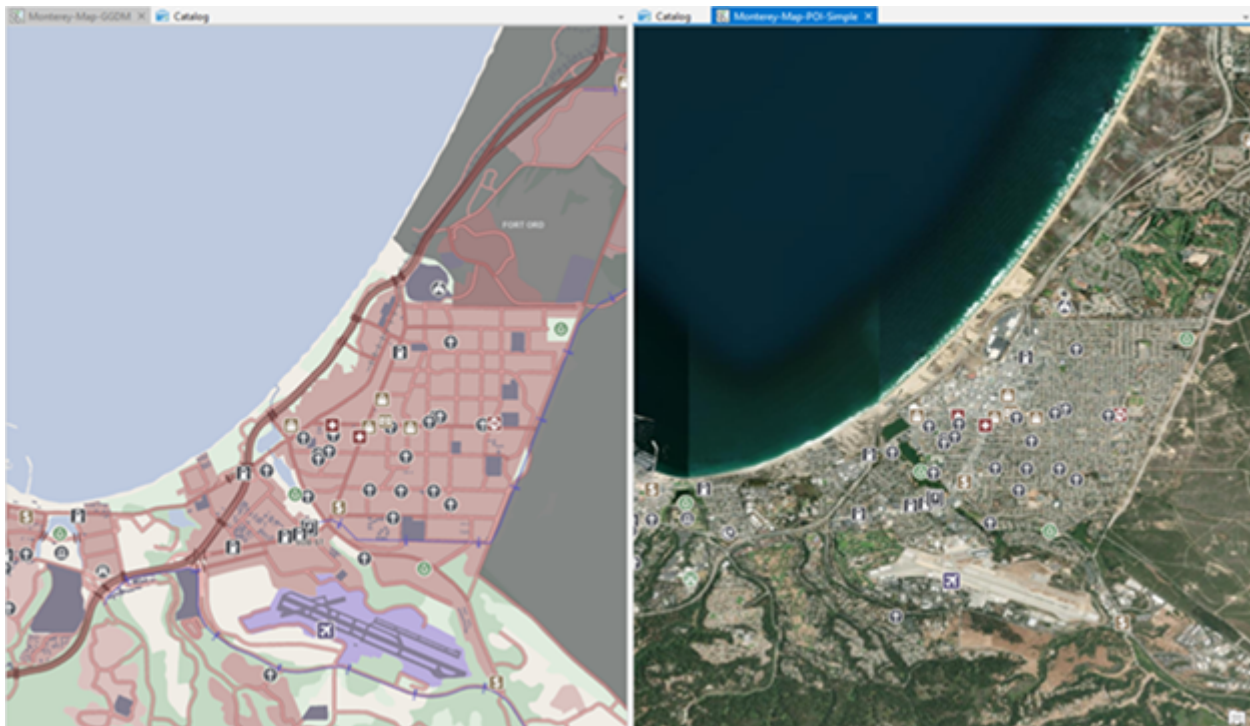
For this military situation awareness use case, POIs are a simplified set of point features that the user community needs visually represented with options to search, filter, and view labels and

attributes. POIs are derived from a more complex geospatial data model and simplified to better enable systems with limited geospatial capabilities. While traditional feature data carries attributes that are often null or contain a “no information” value, POIs should only carry the most relevant and well populated information. In addition to traditional attributes the POI will contains 3 pre-calculate fields that can simplify search, filter, categorize and symbolize the POIs.

## POI for Data Collection

*A POI is a collection of mission-specific Feature Types to be used by field operators to collect data.*

POIs, when combined with an identified symbol set, play a key role in enabling end user data collection. An end user with a known symbol set loaded on a device and a capability to select the icon and place it on the map can perform data collection in the field. The end user may also select the collected symbol and fill form fields with additional details. The collected data may be encrypted and stored on the device, shared across the network, or pushed to the server when connectivity is available.



*Figure 1. POIs for Collection and Use*

The left image in [Figure 1](#) shows POIs dropped on a Feature data set capturing new or enhanced data. The right image shows those POIs dropped on an image for use by operations personnel.

The attributes of these POIs are shown in [Figure 2](#).



Pre-calculate Fields		
LBL_VAL	A value that could be used for labeling such as a name or feature function.	String
SO_ID	Symbol name	String
SIMPLE_DESC	Simplified Description for categorization	String
Existing NAS Attributes		
Descriptive Attributes		
FFN, FFN2, FFN3	Feature Function	Enumeration
ZI005_FNA	Geo Name Info : Full Name	String
ZI037_REL	Religious Information : Religious Designation	Enumeration
ZI037_RFA	Religious Information : Religious Site Type	Enumeration
TTC, TTC2, TTC3	Tower Type	Enumeration
COS	Facility Operational Status	Enumeration
PCF	Physical Condition	Enumeration
HGT	Height Above Surface Level	Real
MFY	Medical Facility Type	Enumeration
MEL	Medical Service	Enumeration
ZI006_MEM	Note : Memorandum	String
FURL	External References	StructuredText
FUFI	Feature Unique Identifier	StructuredText
Metadata		
ZI001_SDV	Source : Source Date and Time	StructuredText
ZI001_SRT	Source : Source Type	Enumeration
ZI004_RCG	Physical Object Metadata : Process Step Information : Resource Content Originator	Enumeration
ZSAX_RS0	Restriction : Security <resource classification>	CodeList
ZSAX_RX0	Restriction : Security <resource dissemination controls>	StructuredText
ZSAX_RX3	Restriction : Security <resource non-intelligence community markings>	StructuredText
ZSAX_RX4	Restriction : Security <resource owner-producer>	StructuredText
ZI002_UFI	Restriction Information : Unique Entity Identifier	StructuredText
GDBV	Geodatabase Schema Version	Enumeration

Figure 2. Military POI Contents

## 7.8. Houses and Utility Poles Use Case

This use case is about the private use of a POI database containing two different kinds of POIs:

- Buildings (houses, commercial establishments, etc.)
- Utility Poles (that carry wires for power, cable, phone, etc.)

A company may want to know where all the houses are, where all the utility poles are, and which utility pole is deemed nearest the "point of attachment" to each of the buildings that it serves. It could use this information to handle requests to add or drop service, or repair service interruption.

An important part of the use case is being able to look up a house by its address. This is not trivial, because there are many ways to express an address and a lookup service should not expect its

users to know the one true canonical way to represent any particular address. Also, in some countries, the addressing system is not all that developed (e.g., use of numbers on roads may not be present much of the time).

There may be the need for a *geocoder* : a function to take any form of address to the (latitude,longitude) represented by that address.

There may be the need for a function that returns all the houses within a given distance of a given (latitude,longitude), and similarly for utility poles.

The other important part of this use case is that it requires the maintenance of a *relation* between POIs: the relation *closest\_to(house, pole)* that says that a given pole is deemed closest to a given house. This might not necessarily be the one that minimizes the distance between the points for the pole and house, because a corner house may be approximately the same distance to two separate poles and the utility company might choose a slightly farther pole to be "closest" for reasons related to, say, house orientation.

## 7.9. Package Drop off and Pick Up Services Use Case

For commercial or residential customers, package delivery and pick up logistics requires considerable attention to detail (e.g., pick up location, restrictions, time), and tracing (tracking) for efficient space use, billing and insurance purposes. Customers may end up waiting for either a delivery or a pick up that is late, or miss the connection if the delivery is early, and fuel consumption associated with individual addresses may be greater than services using a pooled location (individually-secured containers). Space in delivery vehicles can also be calculated and optimized when the package details are associated with the point of interest. Some service providers use systems to manage a "multi-customer" delivery and return location.

The customer needs to be assigned or choose a specific section (locked cubicle) that meets the package needs. Each cubicle is a point of interest within a larger "multi-customer" container, within a secured or outdoor business facility. This means that static metadata such as the street address, open hours of the facility, the latest time for drop off, cubicle's dimensions must be associated with each unit.

In addition to maintaining the static metadata for a cubicle or group of cubicles, there is dynamic data such as the weight of a package (if the cubicle is equipped with weight sensing), a unique access code for a cubicle (to be assigned each time there is a new drop off or pick up scheduled), and time of cubicle access (occupancy status). The dynamic information for each unit (PoI) can be integrated with a real-time route planning system, to release a cubicle for a future customer's use and customer back end (e.g., for billing).

## 7.10. POI Publication Use Case

A diverse group of (governmental) agencies publishes open data which is licensed for public benefit. The original data provider (source) provides data on their own. They can publish it on their web site or they can provide an API so that the government agency can retrieve the data from their server (from the source). Data sets compiled in this manner might be of interest to a broad audience (e.g., citizens, visitors, researchers, other agencies). The public agency wants to make this

geo-located data publicly available in a uniform and user friendly way.

Multiple data sets from different sources, each having its own data model, are mapped and/or geocoded to a single POI data model. The POI data model should have a set of generic attributes to minimize losing any richness of the source data. All POI's from different sources are combined and available to end users as single service.

In addition, services that search data need to present to the user a single result after retrieving data from multiple original data sources.

## **7.11. Smart Tourism Use Case**

<insert narrative text>

# Chapter 8. Stakeholders

The following tables define a list of stakeholder roles based on the onion model (Alexander 2005).

Role	Normal Operator
Scope	Our System
Description	Role that involves giving routine commands and monitoring outputs from the product

Role	Operational Support
Scope	Our System
Description	Role that involves advising normal operators of a product about how to operate it

Role	Maintenance Operator
Scope	Our System
Description	Role that involves maintaining the product

Role	Interfacing System
Scope	Containing System
Description	Role responsible for neighboring systems that have interfaces to and from the product

Role	Sponsor or Champion
Scope	Containing System
Description	Role responsible for initiating development of the product

Role	Functional Beneficiary
Scope	Containing System
Description	Role that benefits from the results or outputs created by the product

Role	Purchaser
Scope	Containing System
Description	Role responsible for having the product developed

Role	Developer
Scope	Wider Environment
Description	Any of the many roles involved directly in product development

Role	Consultant
Scope	Wider Environment
Description	Any of the many roles involved in supporting some aspect of product development, characteristically from outside the development organization

Role	Supplier
Scope	Wider Environment
Description	A role involved in the manufacture and provision of components for the product

Role	Political Beneficiary
Scope	Wider Environment
Description	Any role in public office or private business that can benefit in terms of power, influence, and prestige through the success of the product

Role	Regulator
Scope	Wider Environment
Description	Any role responsible for regulating the quality, safety, cost or other aspects of the product

Role	Financial Beneficiary
Scope	Wider Environment
Description	Any role that can benefit financially from the success of a product

Role	Negative Stakeholder
Scope	Wider Environment
Description	Role that could be harmed by the product physically, financially, or in any other way that might be found justifiable by the authorities

(SOURCE: Alexander, I. F. (2005). A Taxonomy of Stakeholders: Human Roles in System Development. **International Journal of Technology and Human Interaction (IJTHI)** , 1(1), 23-59. <http://doi.org/10.4018/jthi.2005010102>)

# Chapter 9. Devices

The following tables define a list of devices referenced in the POI Use Cases.

Device	Web Browser
Scope	tbr
Description	A generic web browser.

# Chapter 10. Data Categories

The following tables define a list of categories of data, or data types, referenced in the POI Use Cases.

Category	Any
Scope	tbr
Description	Any data type may be used.

# Chapter 11. Requirements

One purpose of a Use Case is to derive operational requirements for the planned solution. These are not requirements in the software development sense of the term. Rather, they are a further refinement of the Use Cases. They capture a set of functional capabilities which, if supported, would be sufficient to enable performance of the tasks described in the Use Cases.

## 11.1. Simple Geometry

A POI is meant to be a simple representation of a point of interest. Therefore, the geometry of a POI must be simple.

1. A POI SHALL include a geometry property
2. The geometry property SHALL be restricted to one of the following geometries from ISO 19107: GM\_POINT, GM\_CURVE, or GM\_SURFACE

## 11.2. Features of Interest

A POI is a representation of a real-world object. Real-world objects are modeled as Features. Therefore, a POI must have one or more associated Features. The POI is a simplified representation of the Feature or aggregate of the Features (if more than one)

## 11.3. Symbology

A POI should support simple symbolization of itself. This symbolization should be customizable based on the norms of the user community.

## 11.4. Mandatory Properties

A POI shall include the following properties.

1. a unique identifier
2. a link to the represented Feature(s)
3. symbology
4. geometry
5. valid date and time

## 11.5. Data Model

A POI SHALL provide access to a data model which allows client software to interpret properties unique to that POI.



## **11.6. Navigation to Feature(s) of Interest**

POI SHALL be designed so that a client can easily navigate to the Feature(s) of Interest or a more expressive representation of same.

# Annex A: Conformance Class Abstract Test Suite (Normative)

NOTE	Ensure that there is a conformance class for each requirements class and a test for each requirement (identified by requirement name and number)
------	--

## A.1. Conformance Class A

### A.1.1. Requirement 1

Test id:	/conf/conf-class-a/req-name-1
Requirement:	/req/req-class-a/req-name-1
Test purpose:	Verify that...
Test method:	Inspect...

### A.1.2. Requirement 2

# Annex B: Title ( {Normative/Informative} )

## NOTE

Place other Annex material in sequential annexes beginning with "B" and leave final two annexes for the Revision History and Bibliography

# Annex C: Revision History

Date	Release	Editor	Primary clauses modified	Description
2016-04-28	0.1	G. Editor	all	initial version

# Annex D: Bibliography

*Example Bibliography (Delete this note).*

The TC has approved Springer LNCS as the official document citation type.

Springer LNCS is widely used in technical and computer science journals and other publications

## NOTE

- For citations in the text please use square brackets and consecutive numbers:  
[1], [2], [3]

– Actual References:

[n] Journal: Author Surname, A.: Title. Publication Title. Volume number, Issue number, Pages Used (Year Published)

[n] Web: Author Surname, A.: Title, <http://Website-Url>

[1] OGC: OGC Testbed 12 Annex B: Architecture. (2015).