

Twister Solutions

Emergency Response for Storm Events

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GEO1005 - SDSS

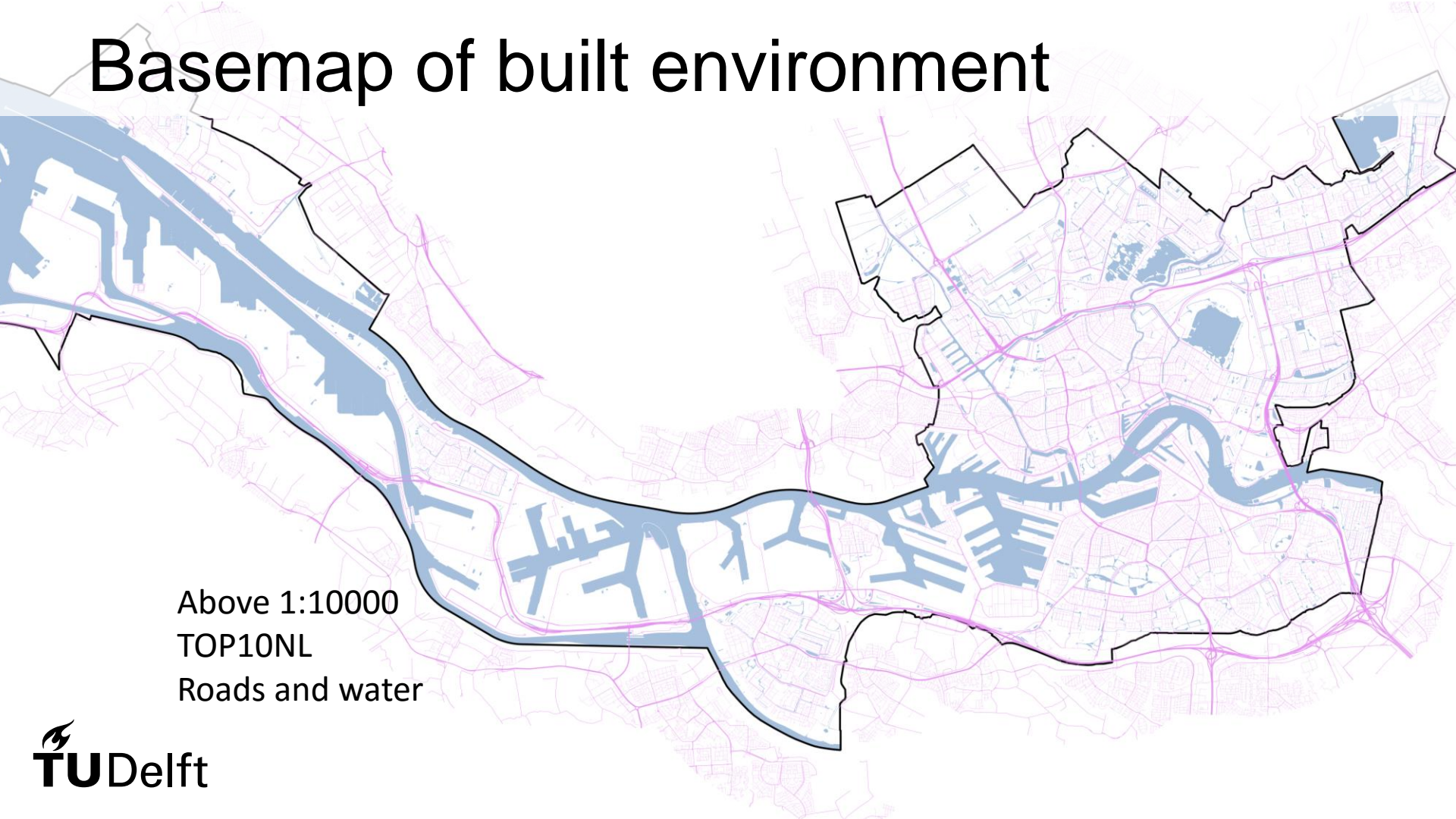
Twister Solutions SDSS

- Emergency response application for severe storm events
- Common Operational Picture for police and firefighters
- Intuitive user interface with simple actions
- Robust and foolproof use in stressful work environment

Twister Solutions SDSS

- The user is in charge of dispatching police or fire brigade assets to incidents
- The user gets an overview of the type of each incident and the closest department
- The user decides in which order incidents are handled and gets updates from agents in the field when incidents are resolved

Basemap of built environment



Above 1:10000
TOP10NL
Roads and water

Basemap of built environment



Below 1:10000

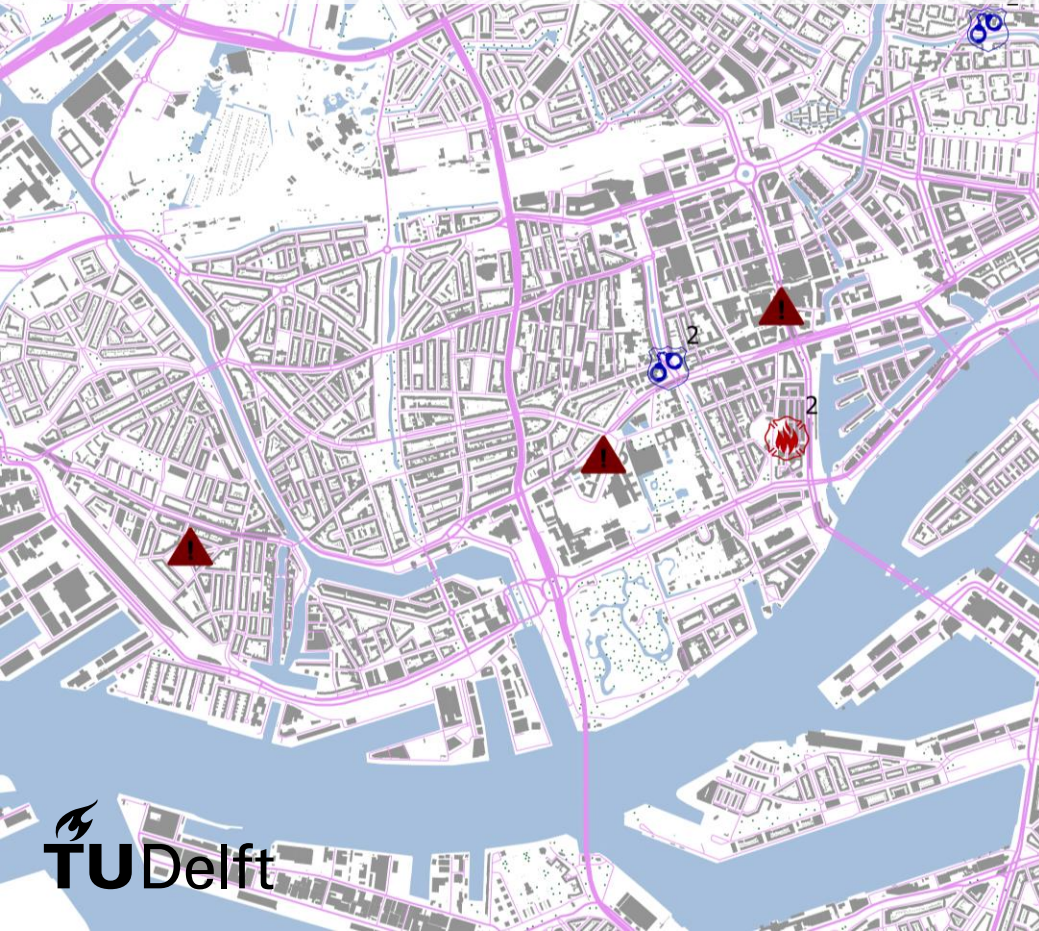
TOP10NL

Roads, water, trees and powerlines

BAG

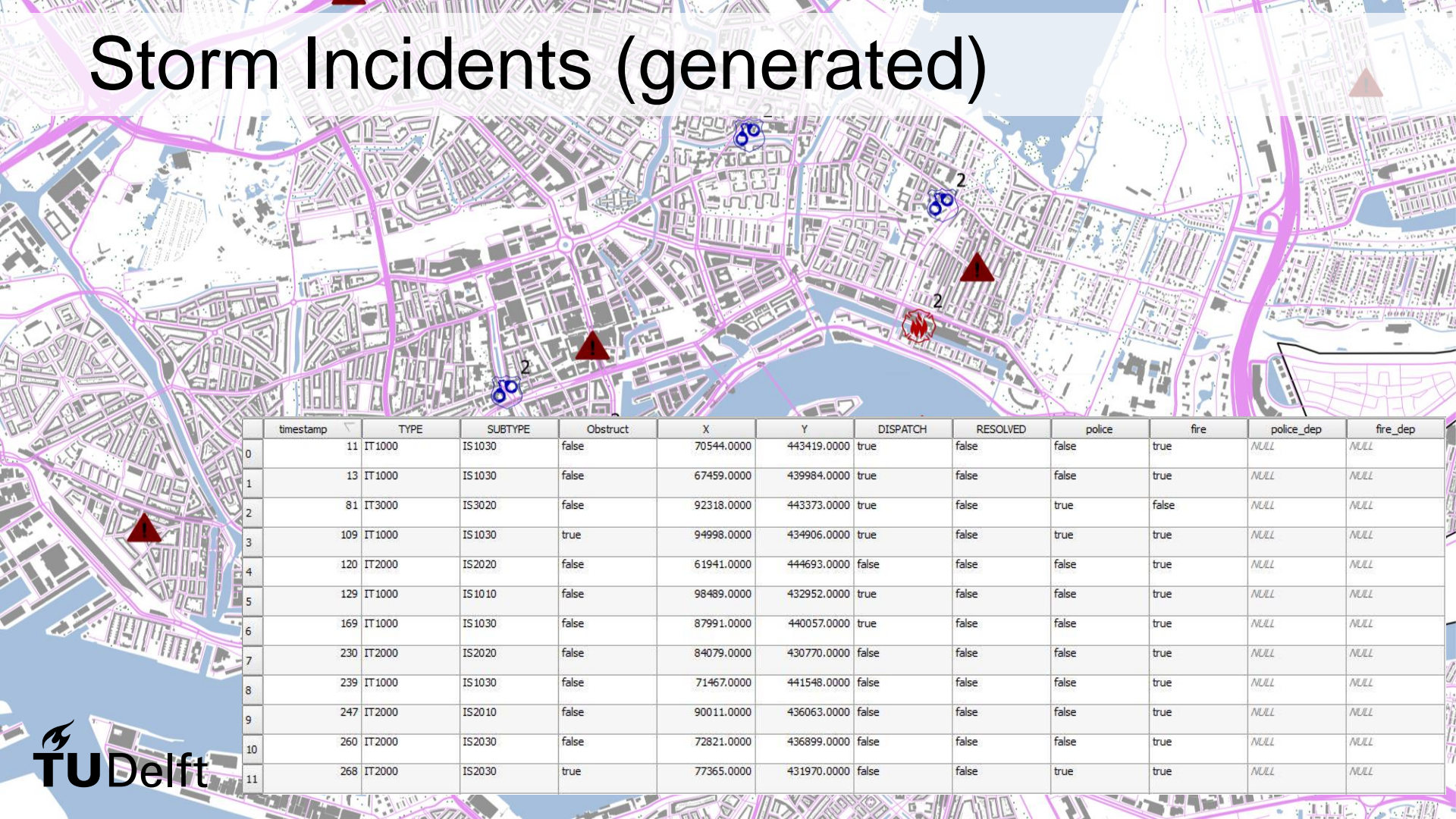
Buildings and addresses

Emergency Locations (Top10NL/OSM)



| | osm_id | timestamp | name | type | Assets |
|----|------------|-------------------|----------------------|--------------|--------|
| 0 | 98120553 | 2015-05-03T12:... | Zeehavenpolitie I... | police | 2 |
| 1 | 207094531 | 2014-09-15T20:... | Eendrachtsplein | police | 1 |
| 2 | 684822986 | 2013-07-13T13:... | Kazerne Frobens... | fire_station | 1 |
| 3 | 768544041 | 2010-06-10T11:... | Koninklijke Marec... | police | 1 |
| 4 | 1195377082 | 2014-08-31T13:... | Kazerne Pottums... | fire_station | 2 |
| 5 | 1195577034 | 2014-08-31T13:... | Kazerne Mijnshe... | fire_station | 0 |
| 6 | 1196112602 | 2013-07-13T13:... | Kazerne Bosland | fire_station | 2 |
| 7 | 1196132886 | 2011-03-11T00:... | Crooswijk | police | 2 |
| 8 | 1746700246 | 2012-05-09T14:... | Bureau Taborstraat | police | 2 |
| 9 | 1759017318 | 2012-05-19T22:... | Kazerne Prins Ale... | fire_station | 2 |
| 10 | 2184618514 | 2013-03-03T22:... | Kazerne Botlekweg | fire_station | 2 |
| 11 | 2184618521 | 2013-03-03T22:... | Kazerne Elbeweg | fire_station | 1 |
| 12 | 2184618524 | 2013-03-03T22:... | Kazerne Mercy... | fire_station | 2 |
| 13 | 2190128940 | 2013-03-07T19:... | Kazerne Butaan... | fire_station | 2 |
| 14 | 2383240651 | 2013-07-13T13:... | Kazerne Baan | fire_station | 2 |
| 15 | 2383253498 | 2013-07-13T13:... | Hoek van Holland | police | 2 |
| 16 | 2383253499 | 2013-07-13T13:... | Kazerne Plancius... | fire_station | 1 |

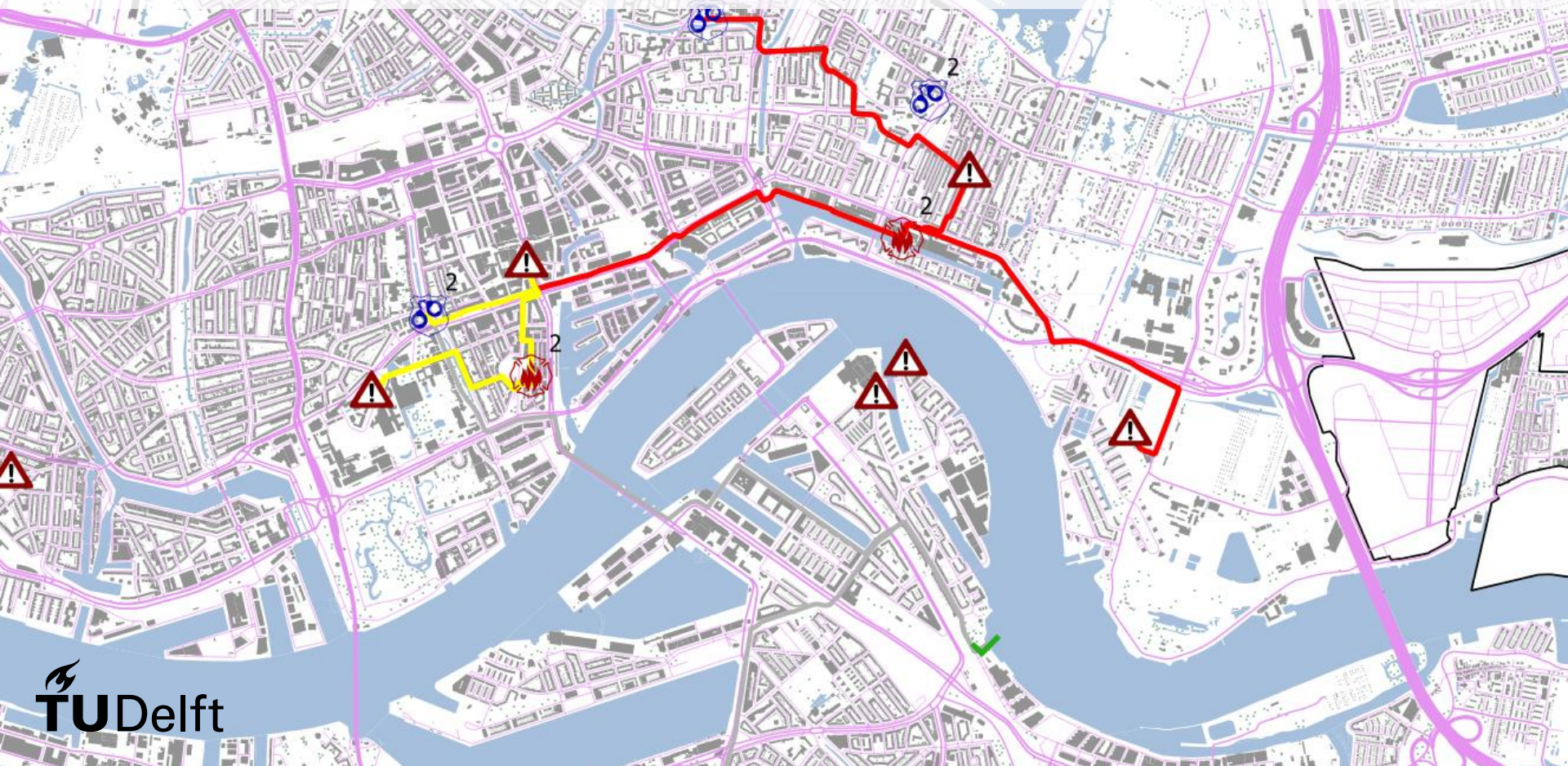
Storm Incidents (generated)



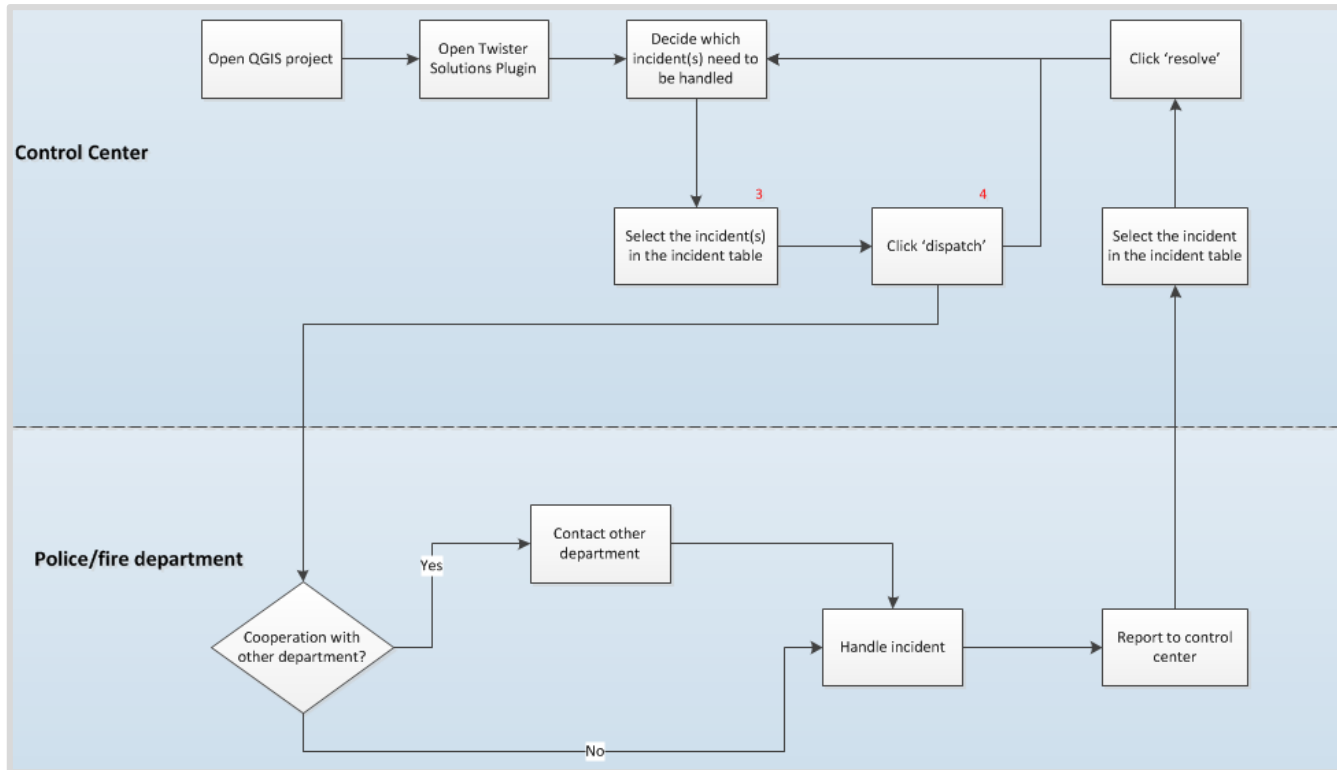
A map of a coastal urban area, likely Rotterdam, showing a network of roads and waterways. Several red triangles, representing storm incidents, are placed on the map. Some of these triangles are accompanied by the number '2'. Blue bicycle icons are also visible on the map, indicating specific locations or points of interest. The map is overlaid with a grid of incident data.

| | timestamp | TYPE | SUBTYPE | Obstruct | X | Y | DISPATCH | RESOLVED | police | fire | police_dep | fire_dep |
|----|-----------|--------|---------|----------|------------|-------------|----------|----------|--------|-------|------------|----------|
| 0 | 11 | IT1000 | IS1030 | false | 70544.0000 | 443419.0000 | true | false | false | true | NULL | NULL |
| 1 | 13 | IT1000 | IS1030 | false | 67459.0000 | 439984.0000 | true | false | false | true | NULL | NULL |
| 2 | 81 | IT3000 | IS3020 | false | 92318.0000 | 443373.0000 | true | false | true | false | NULL | NULL |
| 3 | 109 | IT1000 | IS1030 | true | 94998.0000 | 434906.0000 | true | false | true | true | NULL | NULL |
| 4 | 120 | IT2000 | IS2020 | false | 61941.0000 | 444693.0000 | false | false | false | true | NULL | NULL |
| 5 | 129 | IT1000 | IS1010 | false | 98489.0000 | 432952.0000 | true | false | false | true | NULL | NULL |
| 6 | 169 | IT1000 | IS1030 | false | 87991.0000 | 440057.0000 | true | false | false | true | NULL | NULL |
| 7 | 230 | IT2000 | IS2020 | false | 84079.0000 | 430770.0000 | false | false | false | true | NULL | NULL |
| 8 | 239 | IT1000 | IS1030 | false | 71467.0000 | 441548.0000 | false | false | false | true | NULL | NULL |
| 9 | 247 | IT2000 | IS2010 | false | 90011.0000 | 436063.0000 | false | false | false | true | NULL | NULL |
| 10 | 260 | IT2000 | IS2030 | false | 72821.0000 | 436899.0000 | false | false | false | true | NULL | NULL |
| 11 | 268 | IT2000 | IS2030 | true | 77365.0000 | 431970.0000 | false | false | true | true | NULL | NULL |

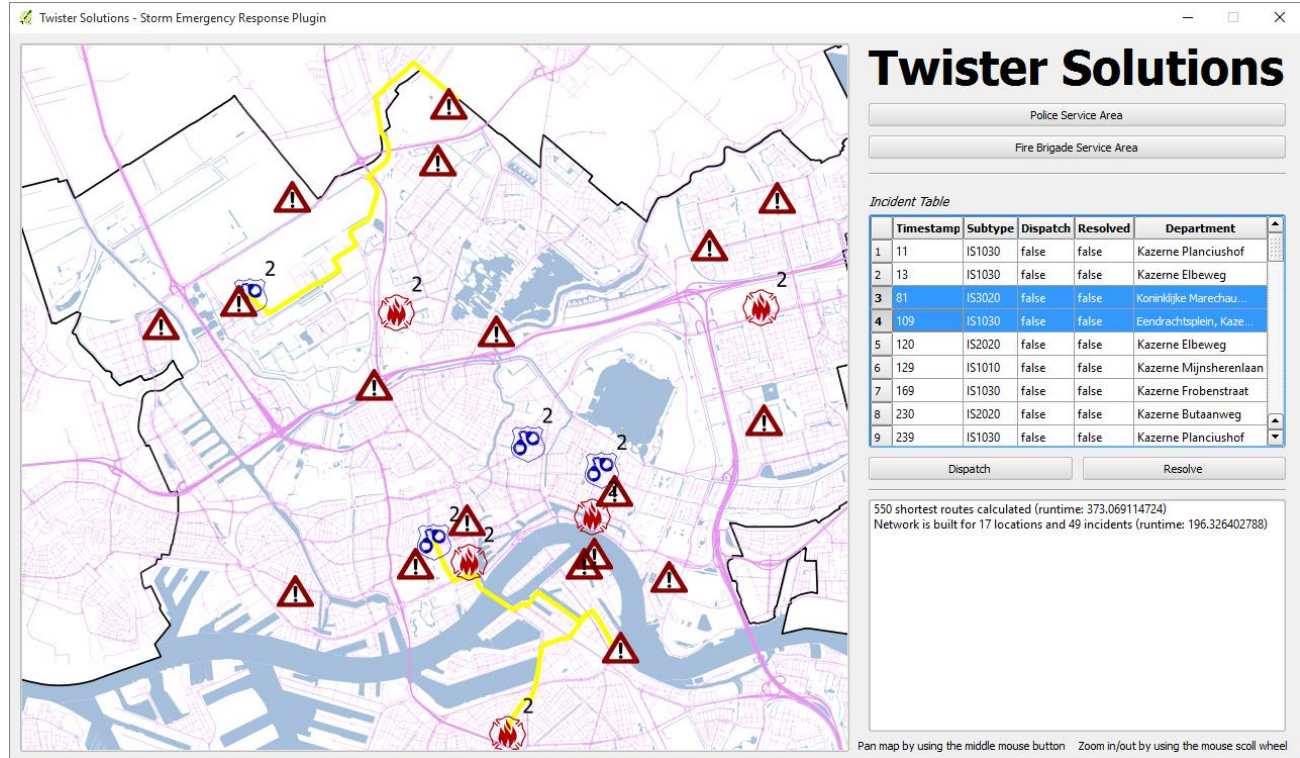
Shortest Routes (calculated)



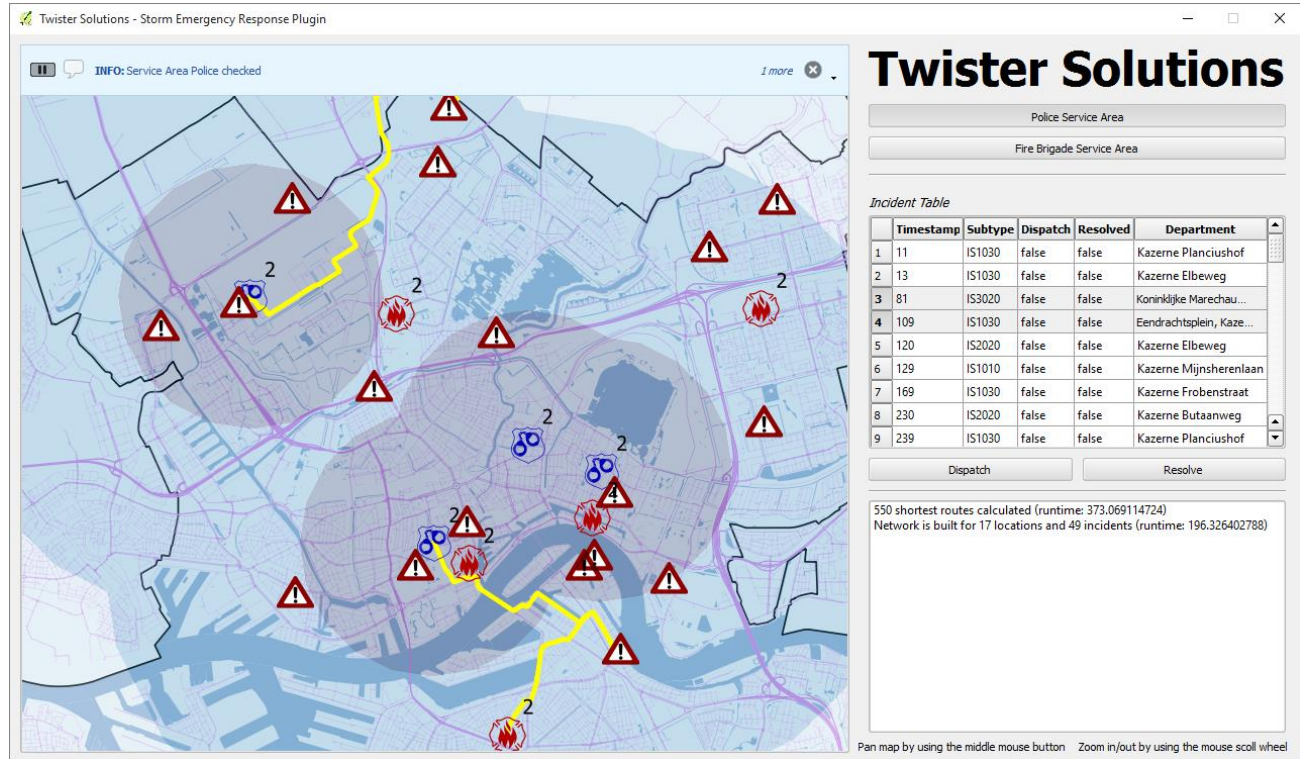
User Experience Workflow



User Interface: Map Canvas



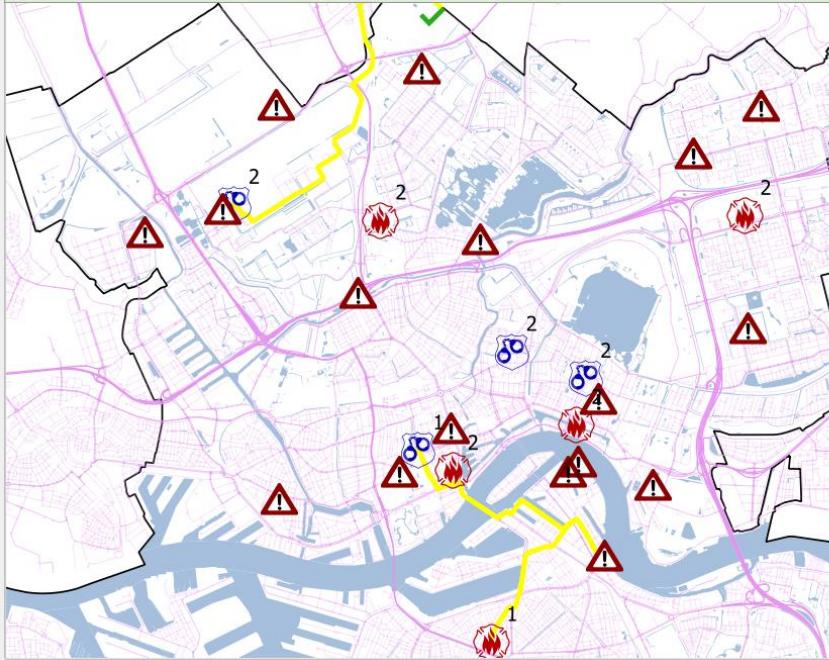
User Interface: Service Area



User Interface: Dispatch/Resolve

Twister Solutions - Storm Emergency Response Plugin

SUCCESS: Incident(s) resolved, more detail in log window 2 more



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Police Service Area

Fire Brigade Service Area

Incident Table

| | Timestamp | Subtype | Dispatch | Resolved | Department |
|---|-----------|---------|----------|----------|--------------------------|
| 1 | 11 | IS1030 | false | false | Kazerne Planciusshof |
| 2 | 13 | IS1030 | true | false | Kazerne Elbeweg |
| 3 | 81 | IS3020 | true | true | Koninklijke Marechau... |
| 4 | 109 | IS1030 | true | true | Eendrachtsplein, Kaze... |
| 5 | 120 | IS2020 | true | false | Kazerne Elbeweg |
| 6 | 129 | IS1010 | false | false | Kazerne Mijnsherenlaan |
| 7 | 169 | IS1030 | false | false | Kazerne Frobenstraat |
| 8 | 230 | IS2020 | false | false | Kazerne Butaanweg |
| 9 | 239 | IS1030 | false | false | Kazerne Planciusshof |

Dispatch Resolve

Incident with timestamp 81 already resolved
Incident with timestamp 81 already resolved

Incident with timestamp 81 already resolved
Department Koninklijke Marechaussee has resolved incident 81, Assets +1

Department Kazerne Elbeweg is dispatched to incident 120, Assets -1
Department Kazerne Mijnsherenlaan is dispatched to incident 109, Assets -1
Department Eendrachtsplein is dispatched to incident 109, Assets -1
Department Koninklijke Marechaussee is dispatched to incident 81, Assets -1
Department Kazerne Elbeweg is dispatched to incident 13, Assets -1
550 shortest routes calculated (runtime: 373.069114724)
Network is built for 17 locations and 49 incidents (runtime: 196.326402788)

Pan map by using the middle mouse button Zoom in/out by using the mouse scroll wheel

User Interface: Reassigning Deps

Twister Solutions - Storm Emergency Response Plugin

✓ SUCCESS: Incident(s) resolved, more detail in log window 2 more

If after a dispatch departments have no assets anymore, new routes are calculated and new departments are assigned to incidents

After a resolve departments have new assets available, and new routes are calculated and new departments are assigned to incidents

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Police Service Area

Fire Brigade Service Area

Incident Table

| | Timestamp | Subtype | Dispatch | Resolved | Department |
|---|-----------|---------|----------|----------|--------------------------|
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Dispatch Resolve

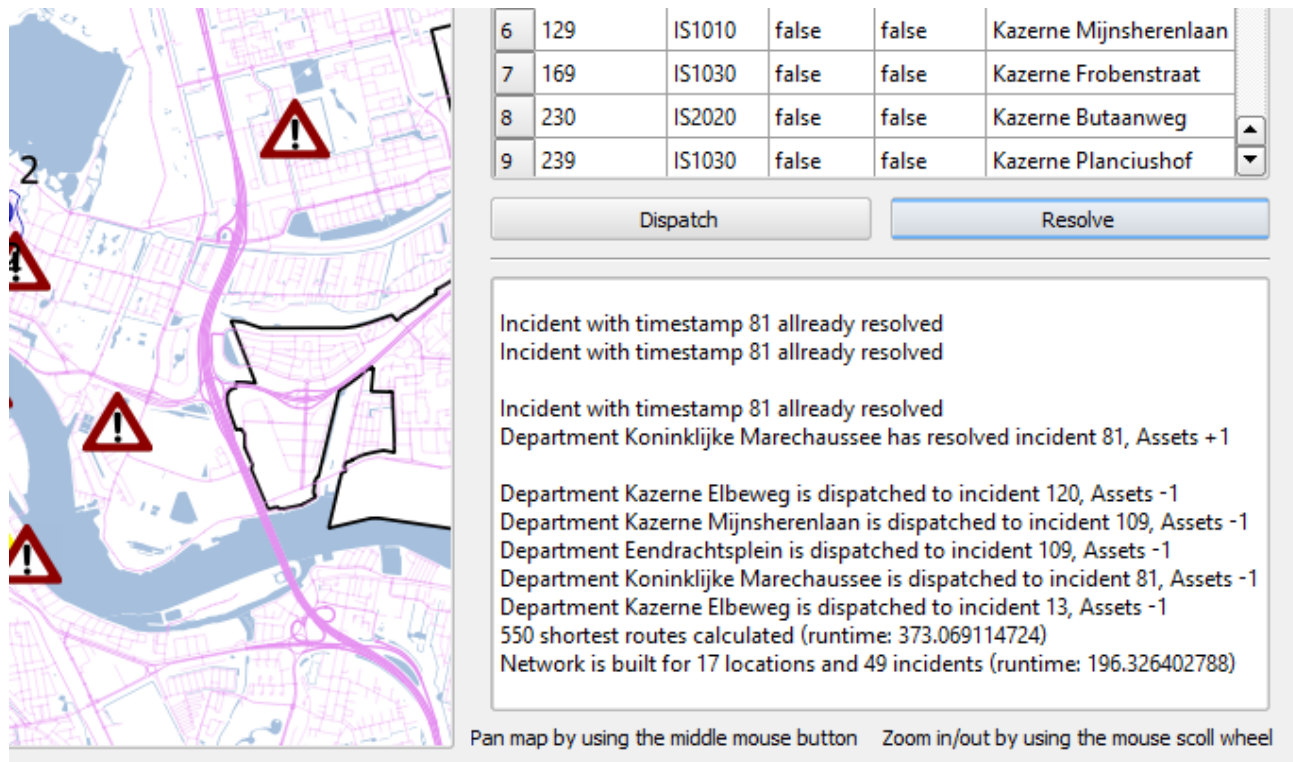
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Department Eendrachtsplein is dispatched to incident 109, Assets -1
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Pan map by using the middle mouse button Zoom in/out by using the mouse scroll wheel

User Interface: Reporting/Log



| | | | | | |
|---|-----|--------|-------|-------|------------------------|
| 6 | 129 | IS1010 | false | false | Kazerne Mijnsherenlaan |
| 7 | 169 | IS1030 | false | false | Kazerne Frobenstraat |
| 8 | 230 | IS2020 | false | false | Kazerne Butaanweg |
| 9 | 239 | IS1030 | false | false | Kazerne Planciushof |

Dispatch

Resolve

Incident with timestamp 81 already resolved
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Incident with timestamp 81 already resolved
Department Koninklijke Marechaussee has resolved incident 81, Assets +1

Department Kazerne Elbeweg is dispatched to incident 120, Assets -1
Department Kazerne Mijnsherenlaan is dispatched to incident 109, Assets -1
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Department Kazerne Elbeweg is dispatched to incident 13, Assets -1
550 shortest routes calculated (runtime: 373.069114724)
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Twister Solutions: Future Work

- Prioritizing incidents based on subtype or location (obstructing network)
- Real-time support for handling incidents
- Incorporating weather data to put assets in reserve
- App for in the field with route and dispatch info and one button to report back to control center

DEMO

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Emergency Response for Storm Events

Thank you for your attention