



Asecap Days 2019

**The emerging landscape of the 5 GHz spectrum:
key issues a road operator should know about**

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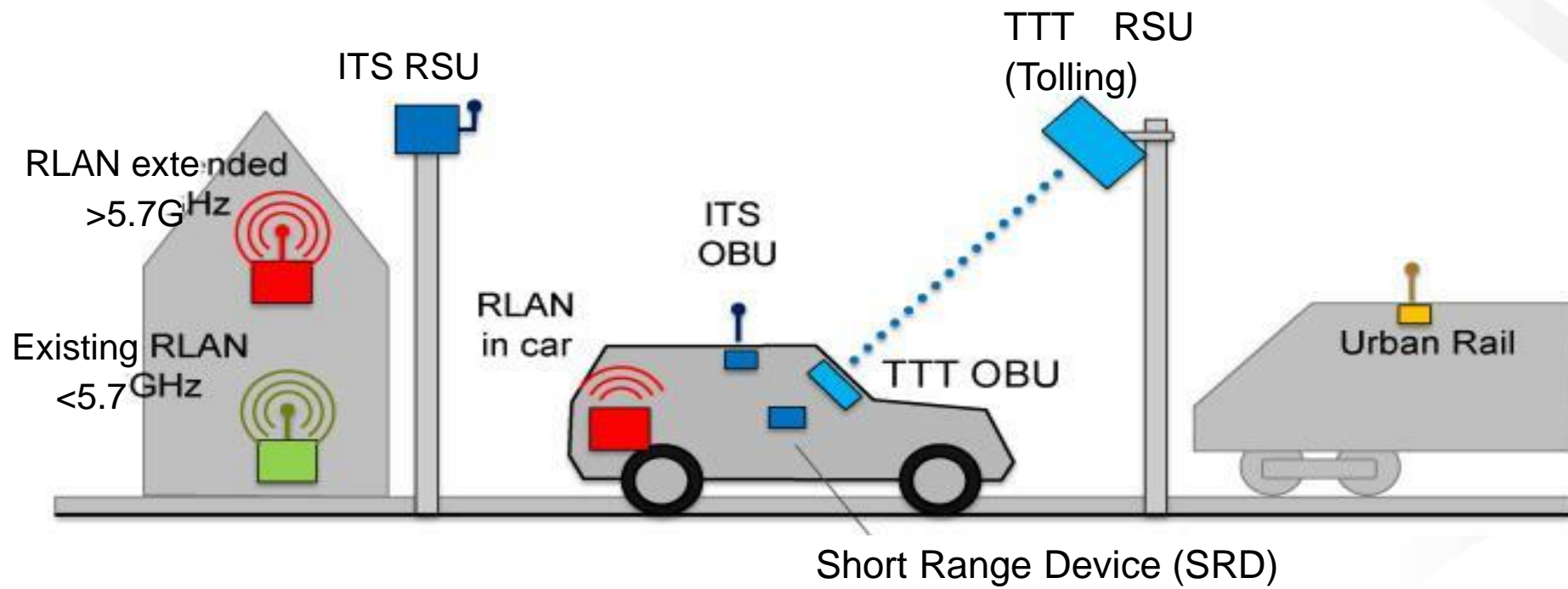
DSCR 5.8: Background

CEN DSRC 5.8 GHz (5.795 – 5.815 GHz) was developed some 25 years ago when the 5.8 GHz spectrum was barely used.

Today: more than 30M OBUs and more than 20K DSRC transceivers in use

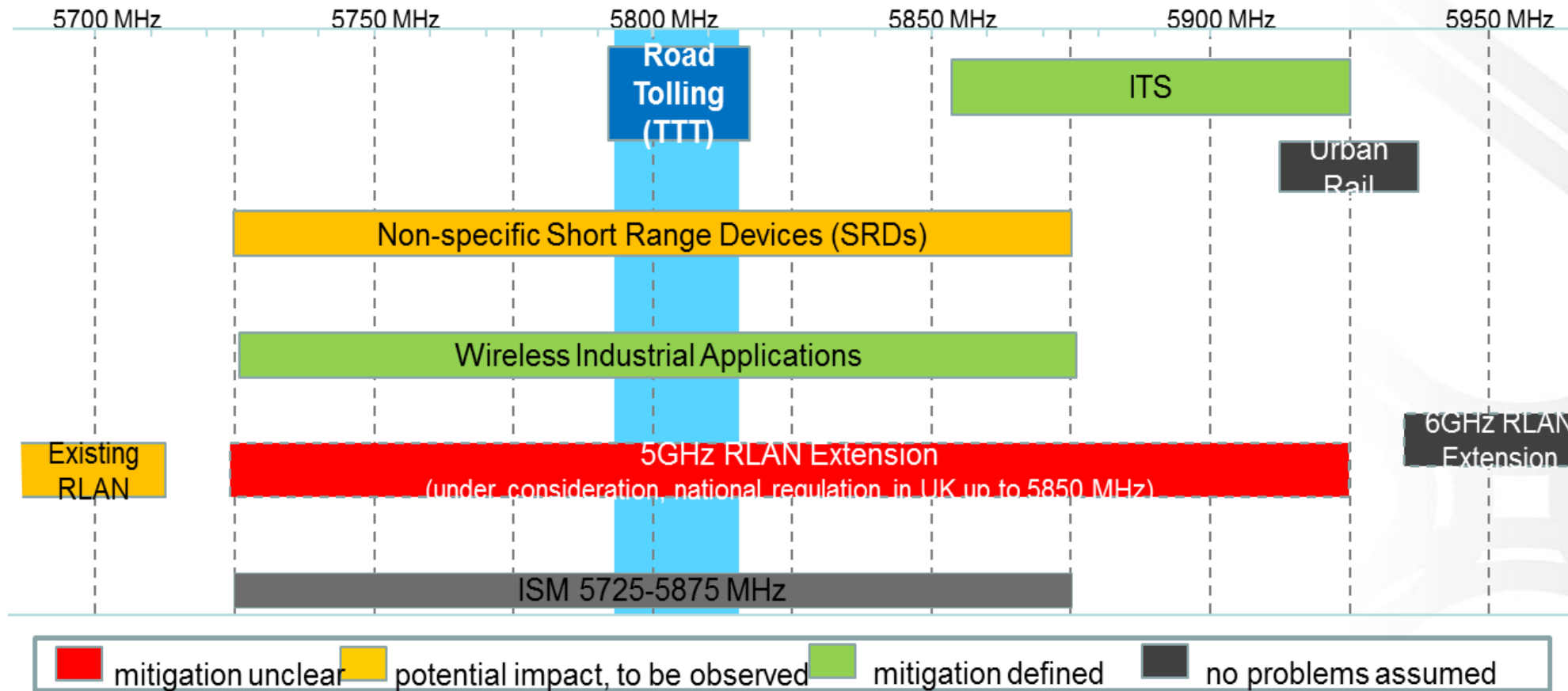


DSRC (TTT) and Potential Interferers





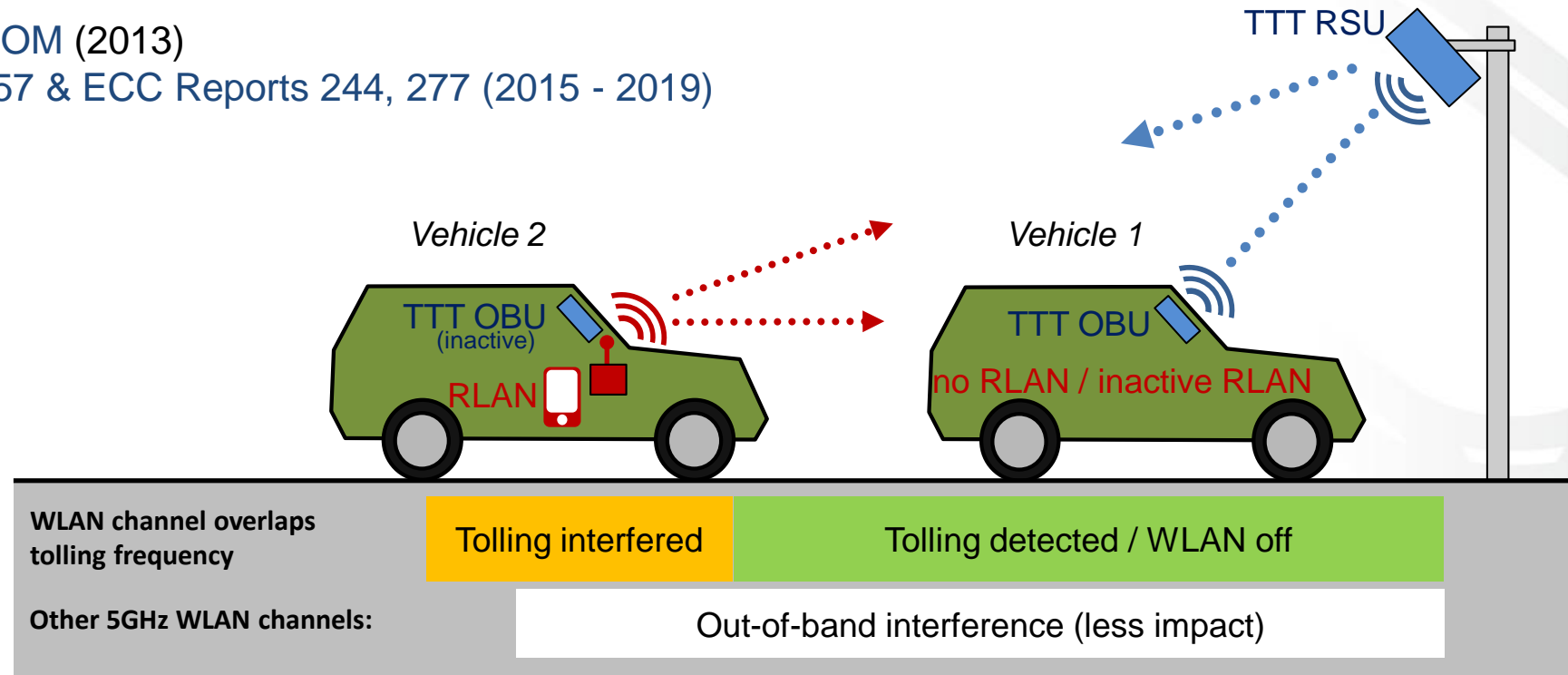
TTT and Potential Interferers – Spectrum chart



TTT and RLAN: Co-existence studies and mitigation techniques

Mandate to CEPT RSCOM (2013)

Studies: CEPT Report 57 & ECC Reports 244, 277 (2015 - 2019)



Proposed mitigation techniques: ETSI TR 103 319 report



TTT and ITS-G5: Co-existence

- V2X communication at 5.9GHz can cause interference with tolling systems using CEN DSRC at 5.8GHz
- Interference may lead to failed CEN DSRC transactions
- a European standard for coexistence has been developed (ETSI TS 102 792)

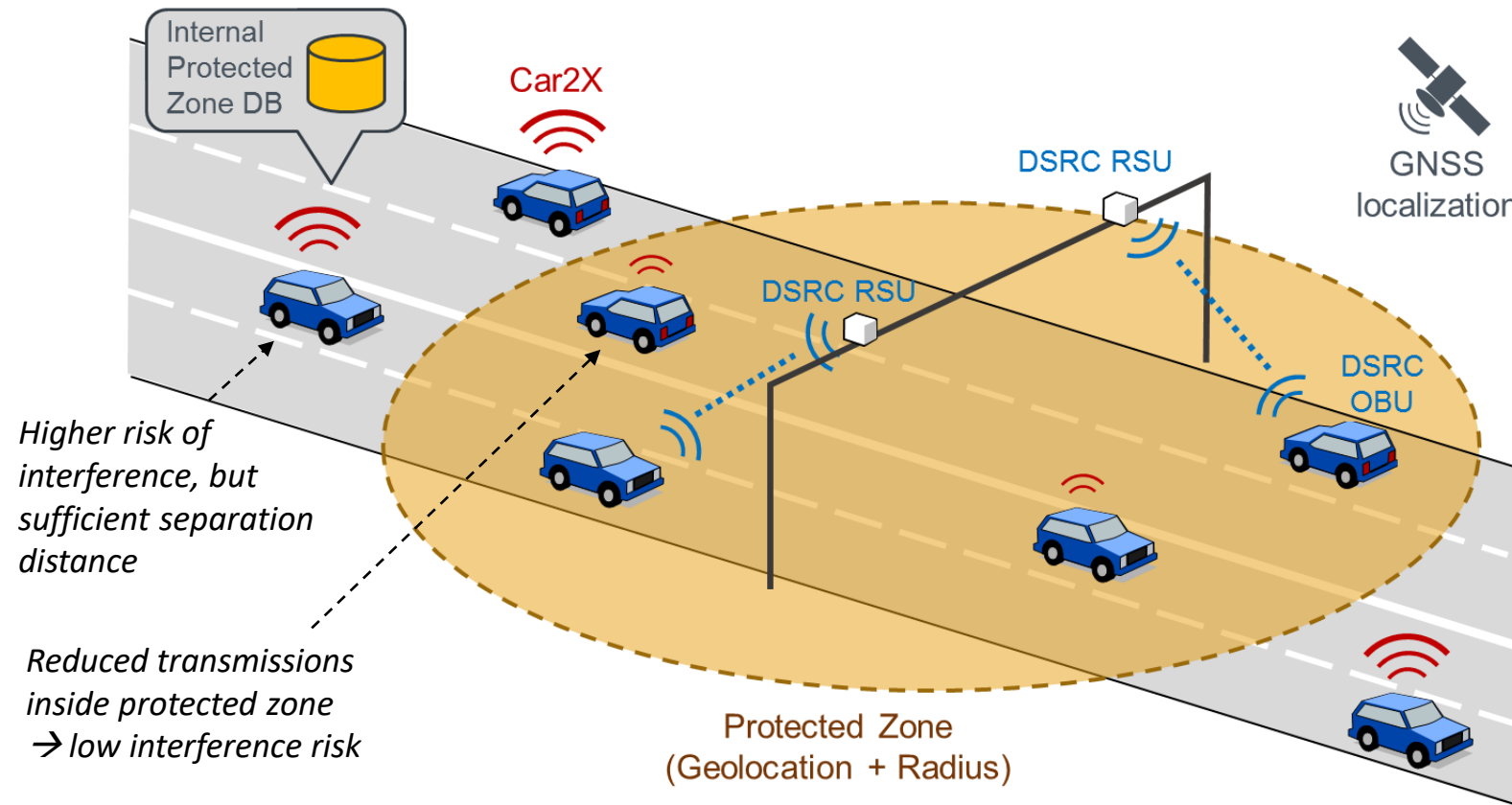


TTT and ITS-G5: Mitigation techniques

- ITS-G5 equipment should work in “coexistence mode” when needed.
- Mitigation techniques as specified in ETSI TS 102 792 are to be used in the vicinity of TTT / DSRC installations (“Protected Zones”). A Protected Zone is defined as circular area around a TTT / DSRC installation, in which ITS stations in vehicles shall activate the coexistence mode in order to minimize interference with the TTT / DSRC. **An ITS station shall detect TTT / DSRC installations based either on:**
 - **The Protected Zone Geolocation Database integrated into the ITS station;**
 - **A TTT / DSRC signal detector.** In this case the ITS station is required to generate Protected Zone data at the position of signal detection and broadcast this data via CAM to surrounding vehicles.

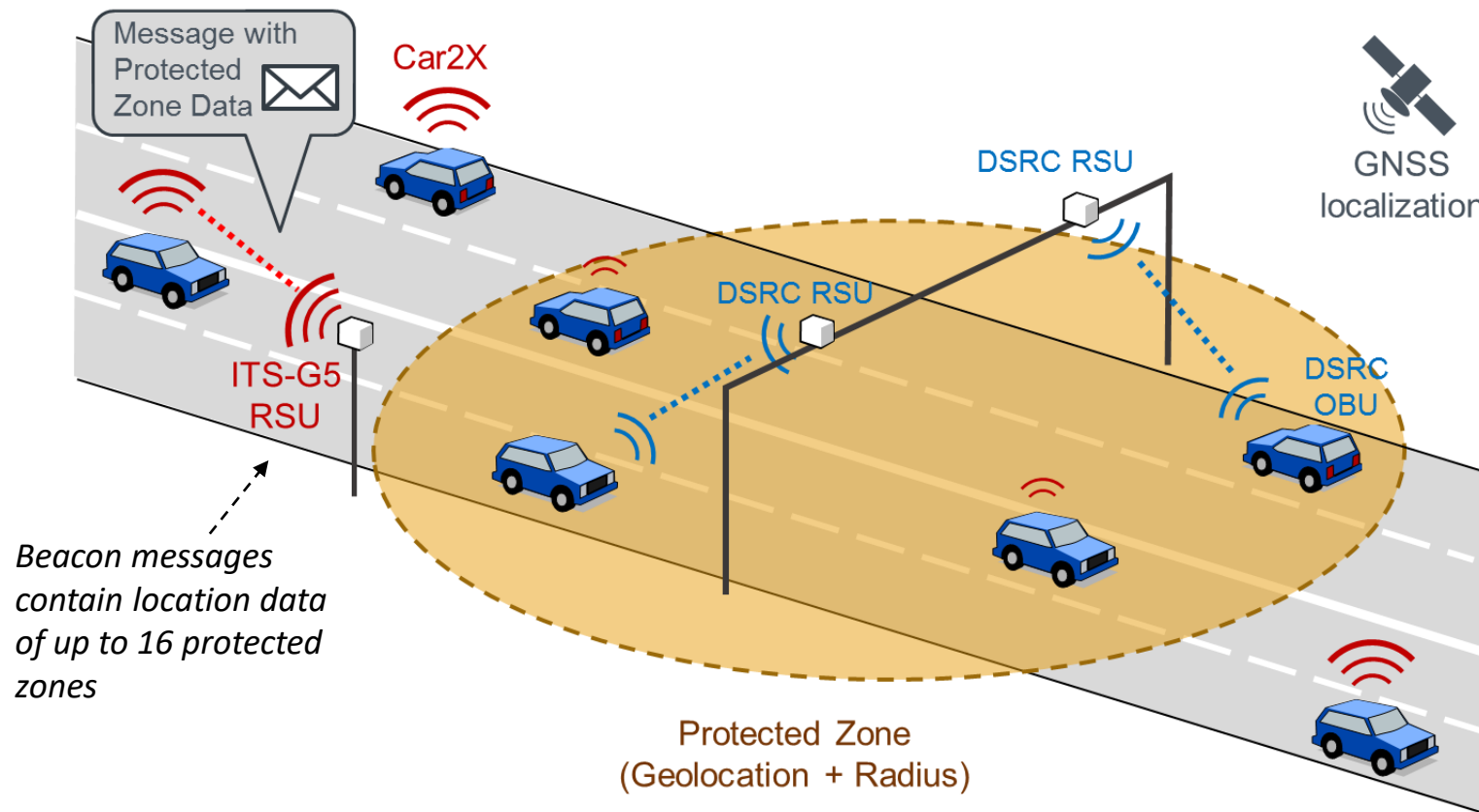
Coexistence via PZ Geolocation Database

Vehicles implementing a Protected Zone Database reduce their ITS-G5 transmissions in the vicinity of tolling installations.



Coexistence via beacons

Protected Zone Information can also be broadcasted via radio transmissions (“ITS-G5 beacons”) - as an alternative method for future installations



New tolling stations can be protected by ITS-G5 beacons. This requires installation of an ITS roadside unit in the vicinity.

Protection measures are required once the ITS penetration rate becomes significant. Interference from single ITS vehicles can be compensated by the CEN DSRC protocol.



Geolocation Database: ASECAP PZDB
(<https://www.asecap-pzdb.com>)

First release created March 2018

Contains over **3500 validated entries** (toll charging points) from **15 ASECAP members**

Each road operator or concessionaire uploads and manages its own protected zone data



Browser: Asecap | URL: https://www.asecap-pzdb.com/zones/current/index

Manage Zones - ASECAP PZDB

[+ Create New](#)

Entries per page: 10 | --select Organizations-- | --select Station Types-- | [Search](#) | [Clear](#) | Include deactivated records

ID	Organization	Station Type	Name	Road km	Expiration Date	Import / Validation Date	Status	Action			
2848	ATTIKI ODOS S.A.	Toll Plaza	KATECHAKI NORTH	M/0.45+000		20/12/2018 14:00:00	valid	<input checked="" type="checkbox"/>	Edit	Delete	Refresh
2849	ATTIKI ODOS S.A.	Toll Plaza	PAPAGOS SOUTH	K/1.79+000		20/12/2018 14:00:00	valid	<input checked="" type="checkbox"/>	Edit	Delete	Refresh
2850	ATTIKI ODOS S.A.	Toll Plaza	PAPAGOS NORTH	M/1.98+000		20/12/2018 14:00:00	valid	<input checked="" type="checkbox"/>	Edit	Delete	Refresh
2851	ATTIKI ODOS S.A.	Toll Plaza	DIMOKRITOS NORTH	K/3.73+000		20/12/2018 14:00:00	valid	<input checked="" type="checkbox"/>	Edit	Delete	Refresh
2852	ATTIKI ODOS S.A.	Toll Plaza	AGIA PARASKEVI SOUTH	X/5.48+000		20/12/2018 14:00:00	valid	<input checked="" type="checkbox"/>	Edit	Delete	Refresh
2853	ATTIKI ODOS S.A.	Toll Plaza	AGIA PARASKEVI NORTH	P/5.98+000		20/12/2018 14:00:00	valid	<input checked="" type="checkbox"/>	Edit	Delete	Refresh
2854	ATTIKI ODOS S.A.	Toll Plaza	GLIKA NERA SOUTH	X/7.99+000		20/12/2018 14:00:00	valid	<input checked="" type="checkbox"/>	Edit	Delete	Refresh
2855	ATTIKI ODOS S.A.	Toll Plaza	GLIKA NERA NORTH	P/8.15+000		20/12/2018 14:00:00	valid	<input checked="" type="checkbox"/>	Edit	Delete	Refresh
2856	ATTIKI ODOS S.A.	Toll Plaza	ROUPAKI EAST	A/8.57+000		20/12/2018 14:00:00	valid	<input checked="" type="checkbox"/>	Edit	Delete	Refresh
2857	ATTIKI ODOS S.A.	Toll Plaza	ASPROPIRGOS EAST	A/11.36+000		20/12/2018 14:00:00	valid	<input checked="" type="checkbox"/>	Edit	Delete	Refresh



A screenshot of a web browser displaying the Asecap portal. The browser's address bar shows the URL: https://www.asecap-pzdb.com/releases/official?release_id=13&countries%5B%5D=84&organizations%5B%5D=211&map=map.

The page features a sidebar on the left with the following menu items:

- Visualization & Reporting (expanded)
 - Official Releases (selected)
 - Working Releases
- Data Export
- Help
- About

The main content area contains a search form with the following fields:

- Release ***: A dropdown menu with the value "REL_20190401075449".
- Country ***: A text input field containing "Greece".
- Organization ***: A text input field containing "GR-ATT, Greece".

Below the form, a note states: "All fields with an asterisk are required." Two buttons are visible: "Export in KML" and "Show Map".

The bottom section of the page displays a satellite map from Google Maps. The map shows a coastal area with a large body of water on the right. Numerous red location pins are placed along the coastline. The map interface includes a search bar at the top left with the text "Χάρτης Δορυφόρος", a person icon, and zoom controls (+, -). The Google logo is visible in the bottom left corner of the map area. At the bottom right of the map, there is a small text overlay: "Εικόνες από ©2019 TerraMetrics | Όροι Χρήσης | Αναφορά σφάλματος χάρτη".



C:\Users\gkiousis\AppData\Local\Temp\Temp1_PZDB_REL_201

C:\Users\gkiousis\AppData\...

File Edit View Favorites Tools Help



Home RSS Mail Print Page Safety Tools ?

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    <longitude>16.3924465</longitude>
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    <expiry_date/>
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    <WIA>1500</WIA>
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    <expiry_date/>
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Thank you !

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