

Smart city & smart mobility in Israel

Mapping Report

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1. Introduction

The fields of smart city and smart mobility represent quickly growing sectors in the Israeli high tech scene. While this field was virtually non-existent ten years ago due to the fact that Israel does not have an automotive industry or a particular depth in city planning and civil engineering, it took a steep rise over the last decade with start-ups like Mobileye, Waze, Moovit, Habana Labs and others realising multi-billion dollar exits. In addition to this, most car manufacturers have opened significant R&D centres as well as invested actively in start-ups in Israel. The government has come forth with major initiatives and cities are working to understand what smart city & mobility means for them and how they can support it. Venture Capital has quickly flooded into this new area and the scene is now well developed. One of the most frequently mentioned reasons for this development is that many of the research intensive technologies where Israel has long had a competitive advantage (radar/lidar/sonar, autonomous systems, opto-electric systems, big data etc.) have over the past few years dramatically increased in importance for the mobility industry as it readies itself for a highly connected, electric, shared and autonomous future. Overall, smart mobility solutions are clearly dominating in the start-up & VC scene while smart city is the dominant topic of municipalities. The overlap between the areas is a given in some subfields but not all. In the ensuing mapping, the main actors in this field are described.

In order to conduct a comprehensive overview of the field in Israel, we defined some key questions:

- Is there a government plan regarding the field and if so, how is it implemented?
- Which cities carry out smart mobility projects?
- How does academic research fit in?
- What opportunities do smart mobility startups have in Israel?

Our mapping has concluded that while the state has a plan, we found it difficult to find concrete examples of the execution of this plan in the various cities.

2. Government

[The Fuel Choices and Smart Mobility Initiative](#)¹ is Israel's national program for fuel alternatives and smart mobility, is a joint effort of ten government ministries: Energy, Transport, Economy, Environmental Protection, Science, Finance, Defense, Agriculture, Foreign Affairs, and finally, the Prime Minister's Office, which leads the initiative. It is multidisciplinary in its nature and international in scope. In January 2017, the government of Israel approved NIS 250 million, to be spread over five years as part of the national plan for smart mobility. The program has two main objectives: first, to strengthen Israel as a center of knowledge in terms of smart mobility; and second, to promote innovative solutions for

¹ www.fuelchoicesinitiative.com

transportation in Israel. The national plan for smart mobility complements the national plan for alternative fuels. Some of the main steps of the program:

- Establishing a testing center for Connected and Autonomous Vehicles
- Providing access to open source data and high-resolution mapping in Israel
- Creating a Smart Mobility Research center to encourage collaboration of academia and industry
- Supporting pilot demonstration and deployment project integrating new technologies and operational concepts in the transportation sector with the potential of lessening congestion, reducing traffic accidents, decreasing the use of petroleum and encouraging the use of public transportation.
- Creating a supportive and innovative regulatory framework

Over the last year, two official reports were published regarding Israel's smart mobility plans. The first [report²](#), published in April 2019 by Dr. Roni Bar, National Economic Council, Prime Minister's office: "Israel is preparing for a smart transportation revolution: The economic implications of autonomous, electric, connected and cooperative vehicles". This report presented the cross-cutting implications of smart transport in various fields as a starting point for public discussion and for cross ministry collaboration. The report includes positive and negative conclusions in the following areas: transport and congestion, planning and construction, energy, air pollution and environment, exercise, car accidents, cost of living, state income, local authorities, fertility and labor and security and privacy.

A few months later, in July 2019, another [report³](#) was published by Israel's Government Advertising Agency: "National Strategic Plan to a sustained movement in the urban space". The national plan was developed to offer strategic tools to reduce dependency on private vehicles. This plan complements the strategic plan for the development of public transport at the metropolitan and national level. The program deals with increasing the use of existing means of transport for short distances. Accessibility by means of sustainability in the urban sphere is a necessary link in the chain of mobility for urban, regional and even national mobility. Expanding the use of existing means contributes to the quality of urban life, public health, improves environmental quality, reduces transportation costs and road congestion, increases public transport use, benefits local economic development, and improves road safety.

Parallel to that, the government also financially supports the [EcoMotion community](#) - a joint venture by the Ministry of Economy and Industry, Israel innovation Institute and Fuel Choices and Mobility Initiative - platform for knowledge-sharing, networking and

²Israel is preparing for a smart transportation revolution: The economic implications of autonomous, electric, connected and cooperative vehicles. Dr. Roni Bar, National Economic Council, Prime Minister's office, April 2019. (Hebrew)

³ National Strategic Plan to a sustained movement In the urban space

collaboration. Another national initiative is by [Netivey Ayalon](#) (the Israeli road service management company) that serves as an execution arm of the Ministry of Transportation and as a platform for integrating technologies in the fields of smart mobility.

3. Cities

To answer the second question regarding what cities do in the field of smart mobility, we searched for information on the websites of the ten largest cities in Israel and by using free search.

Tel Aviv has developed a strategic plan for smart transportation - [Tel Aviv smart mobility initiatives](#) in collaboration with Mobi who offers a SaaS solution addressing the problem of traffic congestion to monitor transportation in Tel Aviv. Another collaboration is with Waze in order to better coordinate traffic based on real time data.

Another big initiative is [Israel Living Lab](#), a joint project of the Innovation Authority and the Fuel Choices and Smart Mobility initiative. Their goal is to establish a transportation lab for developing and testing advanced transportation systems. Here are some of their projects:

- **Jerusalem** - serves as a beta-site for advanced technologies including: smart traffic lights as part of the Light Rail project (in collaboration with Axillion⁴), autonomous vehicle technologies (in collaboration with Mobileye) and an advanced communications and IoT platform (in collaboration with Cisco).
- **Tel Aviv** - "Park Atidim" is being transformed into a main testing site for smart mobility technologies. A key partner of this new development is the Renault–Nissan–Mitsubishi Alliance that set up its innovation center at the park.
- **Ashdod** - in collaboration with MIT⁵ the city of Ashdod serves as a beta-site for the testing of advanced technologies in public spaces and city roads. Companies and startups that participated in POCs include: Mobileye, Ituran, No Traffic, Foresight, BWR, GM, etc. all of which worked on the use case of safety.
- **Eilat** - is taking part in the first national pilot relating to energy with Alert gasoil, the technological partner of Truck net. Truck net is an Eilat-based startup working in smart mobility that developed a technological patent that leads to a saving of up to 30% in petrol prices and in that way helps reduce pollution and greenhouse gas emissions.

⁴ [Jerusalem increased ridership by 400% & cut travel time by 47% across its public transit through AI-based and hardware agnostic solutions, which reduces urban congestion and carbon emission](#)

⁵ www.linkedin.com/company/ashdodlivinglab/about/

The Israel Smart Cities Institute was established to facilitate municipal transformation to smart cities leveraging Israeli innovation and technology. By looking at their project list⁶ there aren't any mobility projects going on in the cities in Israel

4. Venture Capital

Venture Capital is very much the life blood of the Israeli start-up scene. As such, according to Geektine⁷, mobility companies raised \$515M in 41 funding rounds in 2018 and the average round size was \$12.56M. The investors are often backed by major industry players such as car manufacturers, Tier 1, 2 or 3 suppliers or family offices whose funds originate from these industries. Below is a selection of the most active investors and prominent start-up exits.

Top Israeli Investors

- [Maniv Mobility](#) - Founded in 2017, manages \$149M, investing primarily in early-stage Israeli startups. 18 portfolio companies, portfolio start-ups working in the mobility industry: Oryx Vision, Autotalks and Otonomo.
- [Canaan Partners Israel](#) - Founded in 2014, manages \$60M, primarily targets seed and early-stage investments. 24 portfolio companies, portfolio start-ups working in the mobility industry: ZenCity and Waze
- [OurCrowd](#) - Global investment platform, was founded in 2012 and has raised over \$1B and invested in 170 portfolio companies and funds, with 29 exits to date. 117 portfolio companies, portfolio start-ups working in the mobility industry: Arbe, Airobotics and Engie.
- [Vertex Ventures](#) - Founded in 1997, with over \$1B under management. 43 portfolio companies, portfolio start-ups working in the mobility industry: Innoviz, Cylus, Fleetonomy and ZenCity.
- [Pitango Venture Capital](#) - Founded in 1993, over \$2 billion under management and investments in more than 250 companies, invests in early-stage, expansion, and late-stage companies in various fields. 98 portfolio companies, portfolio start-ups working in the mobility industry: Via and Optibus.
- [More Ventures](#) - Founded in 2006, manages \$225M, invests in seed and early-stage Israeli technology start-ups. 18 portfolio companies, portfolio start-ups working in the mobility industry: Vayyar and Claroty
- [Amiti Ventures](#) - A U.S.-Israeli Venture Capital firm, founded in 2010, invests at a seed or round A stage. 15 portfolio companies, portfolio start-ups working in the mobility industry: Vayyar, Innoviz and Autotalk.

Global investors that have invested in Israeli mobility start-ups

- [Volkswagen Group](#) - Portfolio mobility companies: Gett

⁶ [Israel Smart Cities Institute - Projects](#)

⁷ [Smart Mobility in Israel](#), Geektine, March 2019

- [Daimler](#) - Portfolio mobility companies: Via and StoreDot
- [Bessemer Venture Partners](#) - Portfolio mobility companies: Otonomo, Oryx Vision, Vayyar.
- [BMW i Ventures](#) - Portfolio mobility companies: Moovit, Claroty
- [Škoda](#) - Portfolio mobility companies: Anagog
- [MizMaa Ventures](#)- Founded in 2016, harnesses early-stage start-ups from Israel and helps them with capital and access to markets in the United States and Asia. 19 portfolio mobility companies among them: Anagog, Aurora Labs and Ottopia
- [InVenture](#) (CVC by Sumitomo Corp) - \$100 mio. fund launched in March 2020 with Sumitomo Corporation focused on smart mobility & cities among other areas. Portfolio mobility companies: Anagog

Notable Israeli exits

- **Waze** - was acquired by Google for \$1.1 billion
- **Mobileye** - was acquired by Intel for \$15.3 billion
- **Argus** - was acquired by the German corporation continental for \$450M
- **Moovit** - was acquired by Intel for \$1 billion
- **Habana Labs** - was acquired by Intel for \$2 billion

In addition, there are dozens of mobility start-ups that have raised > \$50 mio. and are quickly expanding their footprint.

5. Multinationals

As stated in PWC and Startup Nation Central's report⁸, there are more than 500 multinationals engaging in various innovation activities in Israel such as R&D centers, VC funds, acceleration and incubation programs and more. Within the mobility industry, some of the major players are:

- **General Motors:** R&D activities combined with open innovation and a global Corporate Venture Capital arm
- **Daimler:** R&D, open innovation and direct investments in Israeli companies.
- **Volkswagen:** Launched in May 2018 in Israel, Konnect is a unique model for the Volkswagen Group. It acts as a full-suite innovation 'service provider' for the Group brands in Israel to scout and collaborate with Israeli start-ups.
- **Škoda:** [Škoda Auto DigiLab](#) Israel Ltd is a subsidiary of ŠKODA AUTO, located in Tel Aviv and looking for mature start-ups, innovative corporations and universities to collaborate on future business ideas and technological solutions relevant for the automotive industry.
- **Ford:** R&D center and a local \$12m research investment for developing a decision-making system for autonomous cars.

⁸ *The State of Innovation Operating model frameworks, findings and resources for multinationals innovating in Israel*, Startup Nation Central and PWC, April 2019

Additional ones are listed in the graph below:

Figure 12: Overview of selected OEM/OES activities in Israel

		Technology scouting	Local investment	Local R&D center	Comments
OEM	BMW	■	■	□	Several investments, e.g. Moovit
	Daimler	■	■	■	R&D center opened in Q4/2017, startup investments
	Fiat	■	■	■	Several collaborations with startups & regional dev.
	Ford	■	■	□	Invested in SAIPS, tech. scouting activities
	GM	■	■	■	R&D center, founded 2008, today > 250 employees
	Hyundai	■	■	□	Plans R&D center, invested in Autotalks, Technion
	Renault	■	■	■	Launched USD 1 billion VC fund & Innovation Lab
	Seat	■	□	■	Tech scouting operations via Seat Xplora project
	Skoda	■	□	■	Invested in DRIVE, several other investments
	Volvo	■	■	□	Invested in DRIVE, several other investments
	VW Group	■	■	■	Invested in cyber security, Gett, Tel Aviv campus
OES	Bosch	■	■	■	Opened R&D center in 2016, invested in AnyVision
	Denso	■	□	■	R&D center focusing on AI and autonomous driving
	LG	■	■	■	R&D for IoT, wellness devices, entertainment.
	Plastic Omnium	■	■	□	Investment in Elbit Energy, POCeITech
	Samsung / Harman	■	■	■	R&D centers, some acquisitions by Harman

Source: Israel Export Institute, Fuel Choices and Smart Mobility Initiative, Roland Berger

6. University & research related stakeholders

While several smart mobility initiatives are active at the universities and they are definitely leading institutions on some of the most technical aspects of smart mobility (algorithms, battery chemistry, opto-electric systems, etc.), very little of this information can be found online or in reports.

The following is a preliminary list of activities, more can be discovered only through interviews:

- Tel Aviv University: Capsula
- Tel Aviv University: [מכון שלמה שמלצר לתחבורה חכמה](#) (Faculty of Engineering)
- Technion: [Transportation research Institute](#) (TRI)
- Ben Gurion University: [The Center for Integrative Transportation Innovation](#)
- Bar Ilan University: [Smart mobility centre](#)

7. Startup landscape

According to a recent Roland Berger report¹⁰, the Israeli automotive and smart industry is home to more than 500 companies with a wide variety from well-established businesses to young startups still in their founding phase. This variety can be structured in five major

⁹ [Israel's automotive and smart mobility industry Electrified, autonomous and intelligent](#), Dr. Wolfgang Bernhart, Dr. Christian-Simon Ernst October 2018

¹⁰ [Israel's automotive and smart mobility industry Electrified, autonomous and intelligent](#), Dr. Wolfgang Bernhart, Dr. Christian-Simon Ernst October 2018

content clusters: electric mobility, autonomous mobility, smart mobility, conventional vehicle technology, and other topics.

As reported by Viola Venture Capital¹¹, Israel's mobility landscape has grown immensely in recent years. Between 2014-2018, the number of mobility startups founded grew by virtually 100% vs. 2009-13, with the peak year being 2016, accounting for 27 companies founded.



This chart by Geektime present the number of mobility startups by subsector and founding year:

Israeli Mobility Companies Founding by Year, by Sector												
	Un-known	Earlier	2010	2011	2012	2013	2014	2015	2016	2017	2018	Sum
Data & Diagnostics	0	8	2	4	4	4	6	2	10	10	3	53
Delivery	0	0	0	0	0	3	4	2	2	4	0	15
Energy	1	7	0	1	2	3	4	2	6	3	0	29
Fleet Management	3	7	0	0	0	1	0	2	4	2	2	21
Hardware	4	20	1	7	10	8	13	14	12	7	2	98
Navigation	0	6	1	1	0	4	5	6	2	2	1	28
Safety	3	1	0	2	1	0	4	1	6	3	2	23
Software	2	9	4	4	3	4	2	12	10	12	2	64
Other	5	3	1	2	1	5	4	4	2	3	0	30
Sum	18	61	9	21	21	32	42	45	54	46	12	

¹²

8. Mobility hubs

In addition to the previously mentioned stakeholders, a number of additional ecosystem players complete the mapping of smart city & mobility in Israel.

- [Drive TLV](#) - creates effective collaborations between handpicked startups and corporate partners, leading to commercial agreements.
- [Future Mobility](#) - non-profit NGO that seeks to place Israel as a world leader in implementation of Smart Mobility and a knowledge center for the smart mobility revolution. Operate to correlate between the public and the private sector.
- [Beyond Mobility](#) - Israeli - Japanese - German smart mobility hub.
- [Israel Smart Mobility Living Lab](#) - building a digital, collaborative living lab (including a Data Trust) that allows private and public companies in smart mobility to cooperate, share data and innovate. This model is based on the living lab concept developed by [MIT Connection Science](#) under the leadership of Professor Sandy Pentland, a Member of the World Economic Council.
- [U.S.-Israel Future Mobility Center](#) - USIFMC serves as the chief catalyst for collaboration, investment, and innovation between governments, academia, and mobility ecosystems in the United States and Israel. Through strategic partnerships in

¹² [Smart Mobility in Israel](#), Geektine, March 2019

both countries, USIFMC creates and supports the adoption of emerging transportation technologies that will create a more connected and safer future for people everywhere.

9. COVID19 smart mobility & city response

In light of current global events, the industry has quickly adopted several initiatives aimed at dealing with the current situation in the best possible way. From switching events to online formats (Ecomotion) to increased street renovation (Ministry of Transport & Netivey Ayalon) due to fewer vehicles on the road and to autonomous vehicle pilots for medical patient transport (Bar Ilan University). Again, many of these initiatives are led by startups and a list of their activities related to COVID19 can be found below¹³.

Health

- [AdaSky](#): Viper-R - Remote Thermal Fever Detection For Crowded Places.
- [Binah.AI](#): COVID-19 Patients Triage With Remote Video-Based Vital Signs Monitoring.
- [Caaresys](#): Contactless Vital Signs Monitoring System.
- [Continues Biometrics](#): Detects Key Vital Signs And Biomarkers Associated With COVID-19.
- [NanoScent](#): Develops 30 Second Test For COVID-19.
- [Neteera](#): Remote Contactless Vitals Detection For COVID-19 Prescreening And Patient Monitoring. ()
- [UVEye](#): Tracking Passengers Fever While Performing Contactless Vehicle Inspection.
- [Vayyar](#): Touchless Monitoring Of Vital Signs That Can Indicate Early-Stage COVID-19 Symptoms.

Fleets

- [Apollo Power](#): Solar Solution That Eliminates Idle Vehicles' Batteries Self-Discharge.
- [AutoFleet](#): Enable Fleets To Leverage Unutilized Vehicles To Fulfill Deliveries On-Demand.
- [Fleetonomy](#): Launch, Scale And Optimize Delivery, Field Services And Fleet Operations.
- [Moodify](#): Keep The Smell Of The Car Crisp And Fresh When The Car Is Sold Or Reused Months Ahead.
- [Ravin](#): Touchless 360-Degree Vehicle Inspection, Using A Mobile App And Advanced Artificial Intelligence.

Online Car Sales

- [AutoLeadStar](#): Allows Dealers To Deploy COVID-19 Related Services And Messaging Across All Channels With Just One Click.

¹³ Source: [Israeli Mobility Startups' Solutions For Problems Caused By The COVID-19 Crisis](#) / Raz Mayshar

- [GettACar](#): Direct-To-Your-Door, Online Platform That Enables Users To Trade, Finance, And Buy Used Cars.
- [Spinframe](#): Turning Physical Showrooms And Used Vehicle Stock Into A Real-Time Online Experience.

Autonomous operations

- [Arbe](#): Radar System That Enables Safe And Affordable Sensing For Autonomous Delivery Robots.
- [Ottopia](#): Enables The Deployment Of Robots In Surging Sectors - Last Mile Delivery And Healthcare.
- [Phantom Auto](#): Remotely Operate And Monitor Vehicles From Anywhere.
- [SoftRide](#): Retrofit Plug-And-Play Autonomy Kits, Mitigating Labor Shortages And Exposure For Covid-19 Contamination.

Logistics & Deliveries

- [Bringg](#): Out-Of-The-Box Last-Mile Delivery Solution That Helps Businesses Immediately Launch Or Scale Their Delivery Operations.
- [Bringoz](#): Enables Shippers To Efficiently Track, Monitor, And Manage Their Deliveries.
- [Flytrex](#): Essentials Delivered By Drone.
- [GetPackage](#): Sharing Economy Marketplace That Connects Couriers To Senders And Receivers Via A Mobile App.
- [Quay Express](#): Mesh Network For Deliveries.

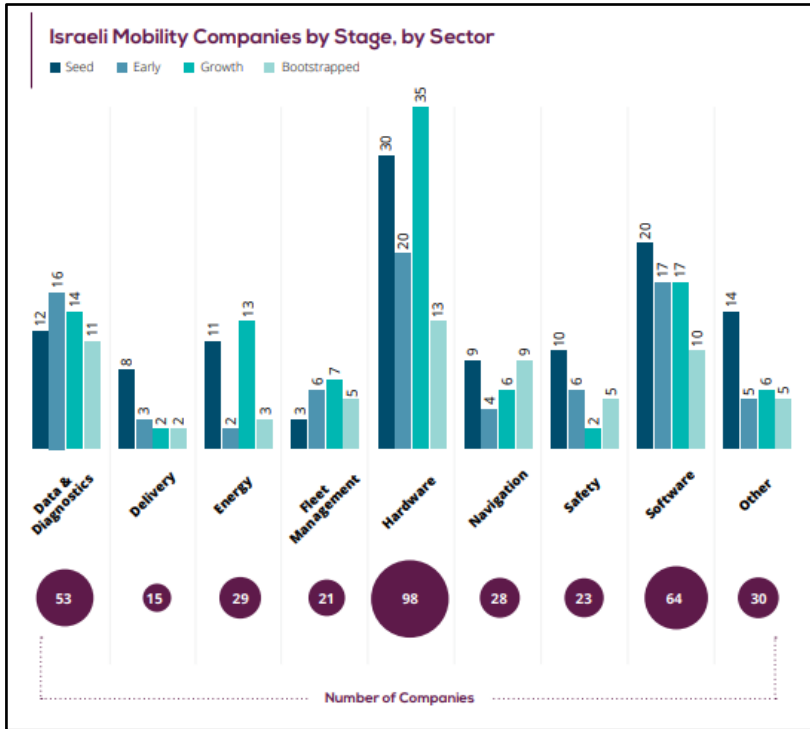
Smart Cities

- [AD-Knight](#): Enables Municipalities To Ensure and Monitor Social Distancing While Preserving Citizens' Privacy.
- [NoTraffic](#): Analyzes Traffic And Helps Agencies Understand And Adapt To Changes Due To The Covid-19 Crisis.
- [VizableZone](#): Contact Tracing Solution For Workplaces To Achieve Business Continuity.
- [WayCare](#): Helping Transportation Agencies To Manage Irregular Congestion Buildup Around Essential Locations.
- [Via](#): Helps Develop Safe, Reliable, And Efficient Transit — Smart Solutions Built For Critical Workers And Essential Services.

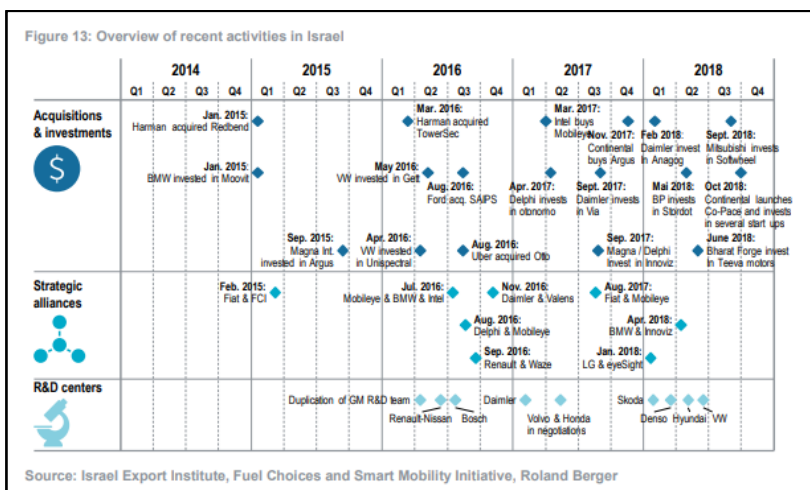
Other

- [BWR](#): Operating Autonomous Shuttles In Critical Infrastructures And Drone Pollination For Agriculture.
- [CYE](#): Offers Tools To Protect New Vulnerable Environments As Remote Work Becomes A Common Practice.
- [Intuition Robotics](#): Social Companion Device Aimed At Helping Seniors Fight Loneliness And Social Isolation.
- [IRP](#): Producing Blowers For Respirators, By Using Ev's Electric Powertrain Knowledge And Expertise.
- [Anagog](#): Helping Brands To Quickly Understand The 'New Normal' Of Their Consumers.
- [Blitz](#): Delivered over 130 electric scooters to restaurants and emergency units

10. Noteworthy start-up & industry maps



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¹⁴ [Smart Mobility in Israel](#), Geektine, March 2019

¹⁵ [Israel's automotive and smart mobility industry Electrified, autonomous and intelligent](#), Dr. Wolfgang Bernhart, Dr. Christian-Simon Ernst October 2018



18 <https://www.vccafe.com/2018/08/08/updated-israeli-startup-landscape-maps-2018/>