



FUTURE MOBILITYIL

The 8 Steps for Solving Israel's Traffic Congestion

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The Plan to Solve Israel's Traffic Congestion Problems – Executive Summary

This plan devised and presented by Future Mobility IL is the most extensive and complete plan to date for this objective. It is presented here after a detailed analysis of its applicability and viability, conducted with many stakeholders. It leans on many researches, from Israel and across the world. It brings together various ideas which have previously been suggested by researchers and other stakeholders. Additionally, it brings forth a number of innovative and original ideas which were discussed with many transportation professionals and whose applicability was tested in several countries.

The plan was presented to a special public advisory committee, put together by Future Mobility IL. It is made up of experts from the transportation industry, academia, former government officials and current and former senior position holders in the field. They all presented their thoughts and comments, which were taken into account in the final formation of the plan.

After the immediate applicability of the plan was examined by officials in the relevant ministries, it is to be presented to decision makers, in order to push it through to immediate implementation soon after the upcoming election in Israel in April 2019 and the forming of a new government.

The plan includes 8 steps:

1. **Promoting Shared transportation**

Shared Transportation is growing across the world as part of the Shared Economy trend. It includes several forms:

- Carpooling – sharing rides in private vehicles
- Ride Hailing- Sharing rides in commercially owned vehicles, by companies such as Gett, Uber and Lyft
- Micro Transit- such as the service offered by Via
- Vehicle sharing- of privately or commercially owned vehicles

Shared transportation is a sound and effective alternative to single driver private vehicle use. It offers a range of changing options, depending on the ride's destinations, the simplicity of use and its price. All these options must be more costly to users than public transportation, in order to encourage the latter's use. However, they need to



be cheap enough to encourage the disuse of vehicles by drivers riding alone. The plan presents several steps to promote this goal :

a) **Passing legislation to standardize and regulate shared rides -**

by amending the bylaw that forbids anyone but taxis to carry passengers for a fee. To make riding in a low occupancy vehicle more expensive, we propose a tax of 2 NIS (about 0.54 US\$) for every ride of a vehicle of 5 passengers or less, excluding taxis. This tax will not be levied on vehicles of 6 passengers or more. Current Taxi license holders will receive a onetime compensation of 20,000 NIS (about \$5000) for the decrease in value of their license do to the opening of the market to competition.

Additionally, in the outlying areas of Israel, away from the 3 main metro areas, **subsidies for shared transportation** will be offered, since this service is not cost effective for operating companies. This service can also replace ineffective public busses services currently operating in these areas. Thus, empty buses than run infrequently will be replaced by subsidized shared transport, so the price for the passenger will remain the same, but the service will be better. This move will also free up bus drivers, who are in need in Israel, to work on fuller routes, reduce costs for the commercial public buses operators, and save public funds, that support them.

b) **Encouraging carpooling-** by making every public transport lane also a HOV (High Occupancy Vehicle) lane, for vehicles carrying 3 passengers or more. Additionally, regular lane will be turned into HOV lanes when the HOV lane is full. Furthermore, public campaigns directed at both employers and employees will be pushed through. They will promote providing preferential parking for carpool vehicles in work places, financial incentives for carpooling, pairing up of employees, and more. Also, the step detailed above the putting a price tag on road section (see further ahead) will also be a significant incentive for carpooling.

c) **Ride services to and from train stations** – operating in 15 or Israel Railway's stations, that will save the need for train passengers to drive to the stations, which are in Israel are often located in the outskirts of cities.

2. Road Pricing and Parking Pricing

a) **Road pricing** - since expanding roads infrastructure does not reduce congestion, we recommend pricing the road's use, according to its capacity. The proposed model includes setting a price for all road sections according to categories: no congestion (0 cost), medium congestion (8 NIS cost), and high congestion (15 NIS



cost). The average expense per driver will be about 2000 NIS a month (\$540). Simultaneously, the annual car licensing fee will be canceled, causing the national treasury a loss of about 4.5 billion NIS, and the gasoline tax will be reduced to an amount that would equal the income from road taxes, a 0/35 NIS reduction.

b) **Parking Pricing-** is one of the most effective measures of reducing congestion in metropolitan areas. Many cities in the world have drastically reduced parking spaces in city centers, and have also switched to parking rates that reflect the external costs that these parking spaces carry. This aspect includes 4 stages:

- 1) A tax write off for public transportation expenses for employees – these are currently taxed. This move will directly benefit all public transportation users. These tax exempt expenses should also include carpooling, ride hailing, shared bicycles and kick scooters etc.
- 2) Taxing parking spaces allotted to employees – currently this is the only benefit given to employees in Israel that is not taxable. Providing a nearby, designated parking space for employees is a direct incentive for them to use their private vehicles. It should be taxed the same way other benefits like meals and bonuses are. The model suggests classify all cities in Israel into 3 categories: congested city, moderately congested and not congested. Every city will have two pricing tiers according to levels of congestion in its various areas.
- 3) Doubling street parking rates – and turning the fixed national rate from a maximum rate to a minimum rate. The low price of street parking today encourages drivers to drive around the city and look for street parking, instead of using parking lots, thus increasing the traffic congestion.
- 4) Incentivizing municipalities to turn parking lanes into public transportation lanes or lanes for two wheeled vehicles (bicycles and scooters) – as detailed in step 6.

3. Developing Public Transportation

Effective and accessible public transportations key to reducing traffic congestion. Undoubtedly, the mass transit system now in construction and planning stages in Israel – underground and above ground light rail, more heavy rail lines through the Ayalon corridor and the Eastern Line- will dramatically improve mobility. However, these systems, even if indeed built, will only be ready for use in many years, and thus existing public transportation in Israel needs to become more effective immediately.



Since paving additional lanes for public transportation takes a while, and is at times impossible, public transport should be promoted even at the expense of private vehicle use. This aspect includes 4 elements:

- a) **More public transportation lanes**- allocating HOVs in every congested road with 2 lanes or more, in cities and in between them, even at the expense of existing general lanes.
- b) **Creating an incentive for more passengers for public bus operating companies** – by subsidizing them per passenger. Currently these companies are indifferent to passenger numbers and thus have no incentive to increase their numbers through various means.
- c) **Allowing public buses operating companies to plan 25% of bus routes.** Today route planning is done entirely by the ministry of transport. If the operators plan a quarter of the routes they would be taking some of the risks upon themselves: rewarded for bus rides numbers exceeding agreed number and fined for if it is lower.
- d) **Installing technologies** that prioritize pedestrians and public transportation - such as smart traffic lights.
- e) **Closing of city centers to private vehicle traffic**- by incentivizing municipalities, as detailed in step 6.

4. **Encouraging the use of bicycles and kick scooters**

They form a preferable, environmentally friendly alternative to short distance travel. Their potential for congestion reduction is immense since they can provide a solution both for an entire commute or for these called first/last mile of the travel, which are often the reason commuters use their car. This aspect includes 5 elements:

- a) **Faster and more extensive allocation of two-wheeler lanes** - by incentivizing municipalities, as detailed in part 6.
- b) **Increased enforcement of traffic laws**, to create a safer riding environment for the two riders and the pedestrians around them. Municipal enforcement officers will be tasked with enforcing all the laws that apply to bicycles and kick scooters.



- c) **Avoiding mandatory registration**, including license plates, for bicycles and kick scooters, with the bureaucracy that goes with it.
- d) **Helmet wearing**- adopting existing European regulation on this matter.
- e) **Incentivizing municipalities to install charging station for shared electrical bicycles and scooters.**

5. **Promoting electrically powered transportation**

Electrically powered transportation will not solve Israel's traffic congestion problems on its own. However, it is the basis for future transport, and countries who will fall behind in using it will also fall behind in adopting autonomous vehicles and other new technologies. Electrical transport is also considerably less polluting than conventionally powered vehicles (with an internal combustion engine). Thus, it is preferable that today's mean of transport will be less dependent on oil products and more on electricity, especially since Israel's electricity production is moving towards natural gas, a cleaner fossil fuel. This aspect includes 7 steps:

- a) **Promoting the penetration of electrical vehicles into the market** – be they private, commercial, taxis, shared rides vans, buses and trucks.
- b) **Setting short term and medium term targets for the percentage of electric vehicles** out of the total fleet in Israel, on top of the current 2030 target.
- c) **Creating certainty in the tax rate on electric vehicles** – by extending the current tax break (10% & 20% purchase tax) for electric and plug in hybrid vehicles until the end of 2022, by law.
- d) **Creating further differentiability within the categories of vehicle when calculating value of usage** for tax purpose, so as to create further preference to electric vehicles.
- e) **Make the government and the public sector leaders** in the purchase of electric vehicles
- f) Promoting the charging infrastructure
- g) Creating awareness campaigns among vehicle importers, fleet managers and the general public.



6. **Incentivizing municipalities to implement smart mobility and congestion reduction measures**

A considerable part of the authorities and roles needed to address traffic congestion and integrate smart transport lies within municipalities. Making them partners and moreover, leaders, in these efforts, is essential to resolving the current transportation crisis. We suggest setting up a call for offers with a budget of 200 million NIS (about \$55 million) that would create incentives for municipalities to promote moves that might be difficult to pass because of the public's initial resistance, including moves that would encourage the integration of smart mobility.

7. **Promoting technology fostering regulation**

for Israel to become a leader in integrating the smart mobility revolution, government should create regulation that fosters and supports technological advances. For this purpose we suggest 2 steps:

- a) **Promoting autonomous vehicle regulation** – adopting currently forming regulation in Europe and the US, while making the needed changes in the relevant existing regulation in Israel and creating partnerships with regulation promoting bodies abroad. Additionally, we propose creating partnerships with leading international autonomous vehicle makers and creating incentives for them to run pilot projects in Israel.
- b) **Setting up a data center for data coming from vehicles-**
over a million cars in Israel already transmit location and speed data. By acquiring data from the companies that collect it, standardizing it and anonymizing it, a data base that would be exceptional on a world level with respect to the number of vehicles it includes, can be created. This database would be free and open code for various uses: developing new technologies, setting up new startups, city transportation planning, a basis for decision making, and more.

8. **Work hours flexibility**

Such flexibility would allow spreading commuter work arrival hours while integrating other work models such as working from home and other flexible models. Enacting these models and giving employees to choose between them can also increase employee productivity while reducing road congestion. We suggest 3 steps for this purpose:

- a) Creating a mechanism for flexible work hours through legislative changes



- b) Extending the time period on which the totaling of overtime hours is calculated to a month, in specific sectors to be determined by the Ministry of Labor.
- c) Setting up a focused regional pilot in which incentives will be given to employers who allow flexible work hours.



Background

The global transportation market is going through drastic changes in the last few years. Decades after the private vehicle revolution that marked the 20th century, the familiar usage patterns, services and riding platforms are in the process of changing dramatically. These changes have been possible thanks to technological advancement, changes in the consumer behavior and the rise in the standard of living¹.

However, despite these changes, the basis of the transportation world has remained solid- privately owned vehicles for private use. Nevertheless, the upcoming sea change, the smart mobility revolution, will undoubtedly lead to a drastic shake up of the vehicle market and transportation as a whole. At the end of this process, the private car ownership model will lose ground and mobility will become more diverse and efficient and will be provided as a service, not through vehicle ownership.

This model would allow passengers to purchase usage rights for a diverse package of mobility options including: underground and above ground rails, light rails, buses, minibuses, vans, taxis, cars, bicycles, scooters and other vehicles owned by numerous companies. It will be possible through extensive real time data processing and offers the passenger an array of mobility solutions according to location, time, personal preference, need and cost. Technological means allow for centralized and quick payment, data processing and combining several mobility solutions in one platform².

Alongside the technological advancement, this change stem from a real need. The proliferation of private vehicle on the road, with an ever increasing demand for access, have brought about heavy traffic congestion at the entrance to major cities and employment centers around the world. With a population of 8.7 million people holding 3.3 million cars, the estimated cost to the economy of traffic congestion in Israel in 2017 is 50 billion NIS (\$13.5 billion)³. The motorization level in Israel in 2017 was at 384 cars for every 1000 people. This represent a low motorization rate compared to Western average but also an increase of 4.1% compared to 2016⁴.

¹ Bernhart, Wolfgang. Ernst, Christian-Simon. Leutiger, Phillip. 2016. Israel's automotive & smart mobility industry – Electrified, Autonomous & Smart. Roland Berger. PP 5, 8-9. December 2016

² Anabel, Jillian. Docherty, Iain. Marsden, Greg. 2018. The governance of smart mobility. Transportation research part A (115). Adam Smith business school University of Glasgow. Institute of transport studies, University of Leeds. .PP 4-5. 2018

³ Omer Moav, Shani Schreiber, 217. "How to reduce road congestion using congestion charges?" Policy Paper, the Aharon Institute for Economic Policy, IDC, December 2017, pp 46.

⁴ "Motor Vehicles in Israel in 2017"; The Israeli Central Statistics Bureau, 2018, p 4
http://www.cbs.gov.il/reader/newhodaot/hodaa_template.html?hodaa=201827141



The continuous rise in the motorization level in Israel, combined with a low number of passengers per car, 1.2 passengers on average during the work week⁵, contribute to the increased traffic congestion. If this rate will not gradually grow, and considering that Israel's birthrate is the highest among OECD countries, current road congestion which is presently the worst in the OECD is expected to worsen much more in coming years⁶. Without a massive intervention, with current population growth and motorization rates, the congestion in main road and its cost to the economy are expected to double and within 3 decades the number of vehicles is expected to double⁷.

The level of transportation in Israel is significantly behind other Western countries with respect to infrastructure development, planning ahead, effective and accessible public transport and flexible regulation that facilitates changes. They are all notably lacking. Instead, Israelis experience increasing congestion on the roads, public transportation that is plagued by problems, mass transit development that will take many years to complete and is very costly, and only partial openness to advanced mobility technologies⁸.

The discontent in the current transport situation in Israel had led many stakeholders to work to create novel solutions to remedy the situation, some of which are already in operation. Among these are:

- Dramatic developments in battery powered private electric vehicles
- Autonomous vehicles
- smart public and shared transport platforms meant to reduce congestion and improve the service to passengers
- light electric two wheeled vehicles that allow quick and exact movement and arrival
- smart data systems in vehicles that allow detailed data analysis and might aid in better transportation planning⁹

All these tools are necessary ingredients in the smart mobility revolution. Some have a way to go before they are fully deployed and operational, and some, like electric

⁵ An average for Sun-Thu, the work week in Israel.

⁶ Trachtenberg, Manuel. Cohen, Shuki. Pardo, Alon. Sharb, Nir. 2018. "Unties the Gordian knot, a short term transportation plan", the Shmuel Ne'eman National Policy Research Institute", the Technion and Tel Aviv University, 2018, pp 3-4

⁷ Omer Moav, Shani Schreiber, 217. "How to reduce road congestion using congestion charges?" Policy Paper, the Aharon Institute for Economic Policy, IDC, December 2017, pp 46.

⁸ Trachtenberg, Manuel. Cohen, Shuki. Pardo, Alon. Sharb, Nir. 2018. "Unties the Gordian knot, a short term transportation plan", the Shmuel Ne'eman National Policy Research Institute", the Technion and Tel Aviv University, 2018, pp 3-4

⁹ Anabel, Jillian. Docherty, Iain. Marsden, Greg. 2018. The governance of smart mobility. Transportation research part a (115). Adam Smith business school University of Glasgow. Institute of transport studies, University of Leeds. PP 5. 2018



vehicles, shared rides and advanced public transport, have a significant presence in many western countries¹⁰.

Israel is a developed country, a member of the OECD, ranked number one in the world in national expenditure on research and development compared to GDP. It also has more than 600 companies in the transportation field, some of which are success startups, but the implementation of the smart transportation revolution in Israel is still far away. Even though international companies operate more than 250 research centers in Israel and more than 100 innovation labs, many of which deal with smart transportation, directly or indirectly, most of the technologies developed in Israel are implemented only abroad¹¹.

Several data reflect the growth in private vehicle ownership, while alternatives to it are not developed as are public transportation and smart mobility. From 2013 to 2016 the number of vehicles rose by 17% while road construction rose by only 5%, brought about increased road congestion so that in 2016 Israel was ranked last among OECD countries in road congestion compared to number of vehicles¹².

Researches about the escalating congestion on Israel's roads price the economic loss caused by it at 50 billion NIS (\$13.5 billion) .due to the loss of work and leisure time, an increase in road accidents and air pollution¹³. A driver entering the Tel Aviv metro area during rush hours wastes 200-250 hours a year that equal to 4-5 work weeks¹⁴. If private vehicle usage increase continues without massive investments in increasing public transportation and other alternatives to private vehicle use, it is predicted that in 2030 drivers will spend 60 minutes more per day in traffic the economic damage from this deterioration will be about 70 billion NIS (\$19 billion) and in 2040, 100 billion NIS (\$27 billion)¹⁵.

Throughout the years in an attempt to solve the transportation crisis in Israel several mass transit schemes have been launched, but they are very expensive and expensive plans and many years will pass until their positive impact on traffic congestion will be felt¹⁶. One of these projects is the fourth railway along the Ayalon River in Tel Aviv

¹⁰ OECD- ITF Corporate Partnership Board. 2017. Shaping the Relationship between Public Transport and Innovative Mobility. Chapter 2: Getting around Cities: Then, Now And In the Future. pp 10, 15-22.

¹¹Bernhart, Wolfgang. Ernst, Christian-Simon. Leutiger, Phillipp. 2016. Israel's automotive & smart mobility industry – Electrified, Autonomous & Smart. Roland Berger. PP 5, 20-21, 42. December 2016

¹² Becker, Ehud, Public Transportation in Israel, Background. 2018. The Knesset Research and Information Center. Presented to the Knesset's Economy Committee ahead of a series of discussions about promoting public transportation

¹³ Omer Moav, Shani Schreiber, 217. "How to reduce road congestion using congestion charges?" Policy Paper, the Aharon Institute for Economic Policy, IDC, December 2017, pp 46.

¹⁴Yotzer, Nitsan, Results of the experiment "Moving to Green", 2017

¹⁵ Omer Moav, Shani Schreiber, Ibid.

¹⁶ Trachtenberg et al, Ibid.



which will allow the maximum number of rails passing through this important hub to rise from 28 to 40, if all goes as planned. This project is expected to cost 5.5 billion NIS (\$1.5 billion) and is expected to be finished in 2024 so it does not provide an immediate alleviation for the current crisis.

The "Fast Lane" project in the greater Tel Aviv area sought to provide alternatives to driving on the roads leading into Tel Aviv through mass transit infrastructure including shuttles from parking lots, free passage for public transportation and shared rides, alongside a payment for quick passage through the lane for private vehicles¹⁷. It is expected to be completed in 2024 and currently offers a partial alleviation to the crisis in the medium term, but in the short term it will increase congestion because of the road works.

Building the lines of light rail in the Tel Aviv metro area is also expected to take several years, with the first line due to open in late 2021 and others in the second half of the decade. Planning of the Metro project which seeks to connect cities further away from the center of the Metro area began in 2017 and construction is expected to be completed 6-10 after construction starts, that is, well into the 2020s¹⁸.

Alongside these mega projects which cost billions and might offer a long term solution, while aggregating congestion in the short term, there are signs of a change of thought in Israel. There is real discourse about more immediate solution to the traffic crisis. Various means such as smart public transportation, motorized bicycles and kick scooters and electric vehicles are slowly making inroads in Israel, and are a foretelling signal of the upcoming change. This is a welcome and much needed development but it is late, compared to developments in most of the OECD countries. This delay might have significant economic ramifications as well as effects on the level and quality of life in Israel.

The upcoming revolution will have a multi-faceted effects: workplace accessibility, cost of living, the choice of where to live, public health, the integration of various populations in the job market, the education system, leisure activities and more. Thus, active and holistic actions must be taken to relieve road congestion by creating alternatives to private vehicle use and adopt novel concepts, suitable for the new transportation challenges. Countries that will successfully apply components of the smart mobility revolution will experience more economic and a rise in the standard and quality of living.

At the cusp of this revolution, whoever will adapt to the upcoming changes and lead with initiatives, openness and innovation – will reap the benefits. Success would mean

¹⁷ Fast Lane Projects, Ayalon Highways, <http://www.ayalonhw.co.il/pages/50.aspx>

¹⁸ NTA, The light rail project in Tel Aviv <https://www.nta.co.il/>



a significant relief in road congestion in Israel, raising the growth and productivity rates and increased economic wellbeing for individuals and society as a whole.

A flexible and efficient regulatory environment must be promoted. One that could read the upcoming changes before they happen, change as needed, incentivize adapting technological innovations and making all transport services more efficient, as well as diverse and smart investment in infrastructure development, taking into account the changes in the transport landscape.

Many moves are now in progress to make Israel a leader in the smart transport revolution. Future Mobility IL proposes a comprehensive and holistic plan that includes 8 different aspects, that can make this vision a reality. It is made up of highly feasible steps and actions that are monetarily viable and are executable in a short term of a few years. Other steps are needed, chief among them is massive investment in mass transit for the long term. We call on Israel's leaders to adopt this plan as soon as possible.



The 8 steps to solve Israel's Road Congestion Problem

Step 1 - Promoting Shared Transportation

1. Allowing paid shared rides

a) Background

Israel's current laws forbid anyone by licensed axis to carry passengers for a fee, except for a payment of 2 NIS (\$0.54) per KM for "participating in gasoline costs", up to 2 rides a day, to allow for carpooling. Companies such as Uber, Lyft, and Chariot and Via, known as Transportation Network Companies (TNC) or Micro Transit, are not allowed to operate in Israel in their standard business model.

While in many countries an accessibility revolution of shared rides is underway, this has not happened in Israel. On the one hand, it is important to wisely manage shared rides so that they form an alternative to private vehicle use and not public transportation use. On the other hand, these companies dramatically improve mobility options within cities, are a major alternative for private vehicle use and are a major element in the mobility revolution. However, taxi license holders, the so called "green numbers", in Israel is set to be hurt by allowing the operation of TNCs, since its values bound to significantly decrease once they begin their operation. In New York, for example, the value of the taxi license "medallion" dropped from \$1.3 million to \$250,000 from 2014 to 2016.

Shared rides service is not economically viable in cities with less than 100,000 residents. However, this service can replace inefficient public transportation in rural areas and outside major cities. Low frequency and empty buses can be replaced by subsidized shared transport, so that the price for passengers will remain the same, but the service will be better. Opening the market place to shared transport and subsidizing it will also free up bus drivers, who are in short supply in Israel, to work on fuller routes, reduce costs for the commercial public buses operators, and the save public funds that support them.

Future Mobility IL suggests a model that partially compensates taxi license holders, enables shared rides and promotes using high occupancy vehicles over small cars.



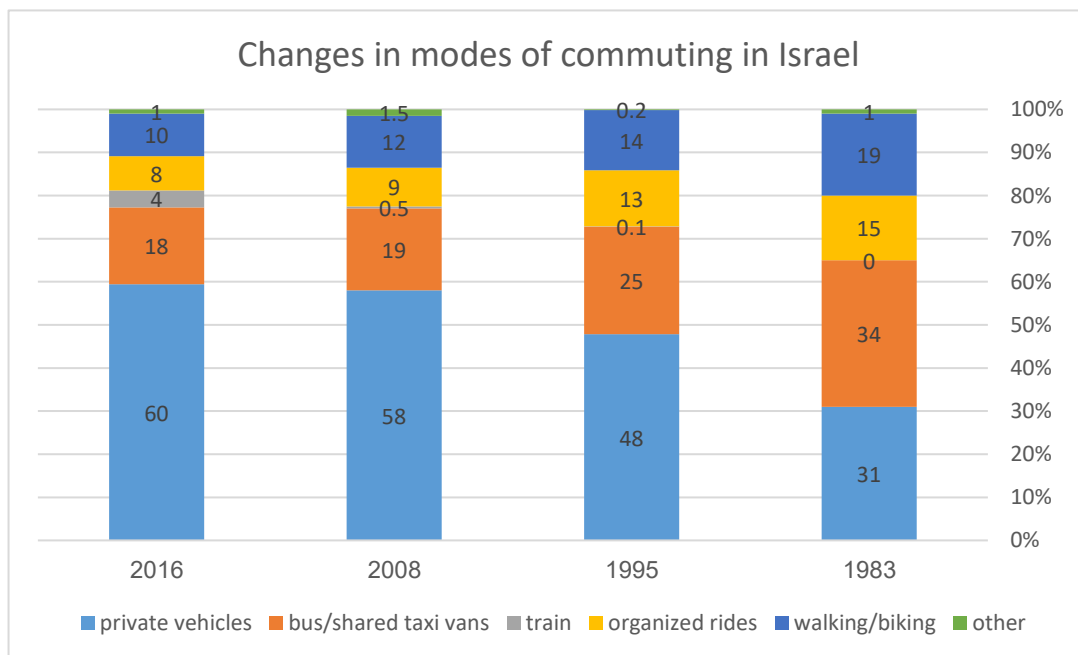
b) Principles of proposed shared rides regulation

- 1) Changing bylaw 84 so that it allows carrying passengers for a fee. Not just by taxis.
- 2) Vehicles that can carry 5 passengers or less will be charged a 2 NIS (\$0.54) tax on each ride.
- 3) Vehicle that can carry 6 passengers or more will not be charged the tax.
- 4) Owners of a taxi operating license will receive a onetime 20,000 NIS (\$5400) compensation and will be allowed to continue to operate the taxi.
- 5) There will be no regulation levied on drivers, as is customary in the world.
- 6) The estimated cost of this move is a onetime expenditure of 400 million NIS (\$100 million) and after that an annual revenue of 200-300 million NIS is expected.
- 7) Subsidizing shared rides in areas with towns smaller than 100,000 residents, where public transportation is inefficient, to replace part of the public transportation service.

2. Promoting carpooling

a) Background

In the past 30 years, the share of intercity commuters has risen by 12%. The population has doubled, but the number of commuters has grown three fold¹⁹. The following graph shows commuting patterns in Israel across 3 decades:



¹⁹ Haim Blich, "Back and Forth, Commuting Patterns", the Taub Center, 2018



Alongside actions to encourage the use of public transport, walking and biking to work, road congestion can be reduced by encouraging carpooling, which would increase the number of people riding in each vehicle. Carpooling is defined as a ride shared by people going to the same destination or to destinations on the same course. The average number of persons per car in Israel is 1.2 during work days²⁰. Calculations done by the Ministry of Transport show that raising this average to 1.5 would solve road congestion in Israel²¹.

Carpooling has several advantages:

- 1) **To the driver** – saving ride costs that are shared with passenger/s
- 2) **To the passengers** - saving ride costs because of avoiding using their vehicle
- 3) **To the economy**- reducing congestion and air pollution
- 4) **To employers** – reducing parking costs and a rise in employee productivity thanks to a reduction of driving related stress

Carpooling does have a few drawbacks:

- 1) A lack of ride flexibility – shared ride require pre-planning and are less amenable to changes and flexibility when needed.
- 2) Difficulty coordinating between passengers and drivers
- 3) No access to the private vehicle during the work day

Thanks to recent changes, carpooling has become a more viable solution to road congestion relief, alongside other solutions. Firstly, technological advances and the development of apps greatly simplify the coordination between potential drivers and passengers. An increase in cloud based computer services, location based navigation services (such as Waze) and other phone apps are just some of the developments that enable the expansion of carpooling.

Secondly, the rise of the "mobility as a service" model also positively affects shared rides. According to this model, ownership of vehicles decreases and rides become a service paid for specifically.

²⁰1.6 on weekends

²¹ Iddo Elmekais, "Reducing traffic congestion through Carpooling, August 2017.



Thirdly, shared economy trends are changing behavior patterns and are making shared rides more socially acceptable.

It is important to note that the insurance regulator in Israel published a clarification in July 2018 stating that a shared ride that meets the transportation laws and by laws is covered under standard car insurance policies and do not require purchasing a new policy.

Future Mobility IL proposes the following steps to promote carpooling:

- a) **HOV (High Occupancy Vehicle) Lanes** –making every public transport lane also an HOV lane, for vehicles carrying 3 passengers or more. Additionally, regular lanes will be turned into HOV lanes when the HOV lane is full. The number of passengers should be set and known ahead of time since a change in the number of passengers makes carpooling less efficient.

Combined with the steps to increase the number of public transportation lanes, we recommend to not wait for the "fast lane" program, set to be completed in 2024, but rather to convert right away regular lanes, parking lanes and road shoulders to carpool lanes, even as a temporary measure until the fast lane program is completed.

- b) **Indirect measures to incentivize carpooling**- Road pricing (see step 1) and parking pricing (see step 3) are expected to have a dramatic effect in boosting carpooling
- c) **Public awareness campaign** – by private companies and by the government, including:
 - 1) Marketing the concept to employers including recommending steps such as allocating parking spaces for carpools, having cars available for employees to use during the work day, having a carpooler of the month competition and other benefits for carpool users.
 - 2) Marketing to the public –the advantages of carpooling mentioned above.

3. Shuttle Services to and from Train Stations

a) Background

According to Israel Railway data, there was a rise of 8.5% in ridership from 2016 to 2017, up to 64.6 million rides, with an average of 245 rides a day. The Israel Railway network includes 60 stations. Currently, the number of trains running cannot increase significantly because most of the train lines in Israel go through the bottleneck of the Ayalon corridor in Tel Aviv. Works to expand



this corridor to allow for another track there will take years to complete and will cost billions.

Israel Railway sees a 150% occupancy as reasonable but today there are times when occupancy goes up to 190%, whereas during off-peak hours it falls much below 100%. Thus, despite the current inability to add more trains, passengers can be added in the off peak hours. Those are before 7:30 AM and after 9 AM in the Tel Aviv area and before 7 AM and after 8:30 AM in areas away from Tel Aviv.

Additionally, in most train stations there is vast scarcity of parking spots and people arriving at the station with their private vehicle have a hard time finding parking. The parking lots fill up early in the morning and late comers are forced to park far away from the station. This situation creates several problems: traffic jams are created at the entrance to the parking lot, commuting time is increased and people avoid using the train due to the parking shortage.

b) Ride Sharing Service Framework

Since paid ride sharing is currently not allowed under Israeli law, companies such as Uber, Via and Lyft cannot operate there under their regular business models. Future Mobility IL proposes a shared ride model to train stations under these parameters:

- 1) Israel Railway will purchase ride service from companies such as Uber or Lyft according to existing law.
- 2) Passengers will not pay for the service, at least until appropriate amendments are made to the law.
- 3) The shuttle service will operate from 6:00 to 20:00, except for a 1.5 hour pause during morning rush hour when it will not operate.
- 4) The service will be offered in 15 major stations, selected by Israel Railway and the shuttle service will be provided by 2 companies that will be selected through a public tender. Each station will have one shuttle company servicing it.
- 5) The service will operate for a year, after which conclusions will be drawn before expanding or extending the service. A university or research



institute researcher will act as an accompanying consultant for this stage.

- 6) The shuttle operators can choose which vehicles to use (cars/vans etc.), but the vehicles should be suitable for no more than 20 passengers.
- 7) The service price will reflect the cost of driver's hourly price. Companies will compete on the number of drivers needed. The terms of service will include the minimal number of shuttle users each month.
- 8) If the actual passenger number will be lower than the one set in the tender, the shuttle operator will be fined according to a formula detailed in it. This will incentivize operators to increase the number of passengers.
- 9) Shuttle operators will supply monthly reports on passenger numbers, and ride data (distance and time).
- 10) Israel railway will determine the maximum distance from the station the shuttle will serve which might change between stations.
- 11) Shuttle arrival times will be synchronized with train departure times so passengers would arrive at the station a few minutes before the train's departure, and the shuttle will be ready for passenger pick up right after the train's arrival.
- 12) This service will initially run until the regulatory changes detailed in step 1 are enacted. The cost of this service is estimated at 200 million NIS (\$54 million) which the government would initially cover.
- 13) Israel Railway would be allowed to charge for parking in the lots near the stations. If it chooses to do so, 80% of the revenue will be earmarked for the shuttle pilot project.
- 14) In the second stage the service will be expanded to all train stations.
- 15) We propose a similar move with intercity bus operators.



Step 2: Road Pricing and Parking Pricing

1. Road Pricing

a) Background

Road congestion stems essentially from resource allocation, that is, a problem of allocating a limited resource, the road, between all those who seek to use it. The most successful appropriation mechanism is through pricing. It creates an equilibrium in a system so that there is no surplus or a deficiency or lines (ques). When demand fluctuates the prices change according to demand. That is why flights and hotels are more expensive during holidays and vegetable prices are lower in the markets at the end of the day²².

The problem of allocating the road resource is addressed today not through prices, but rather by lines, AKA, traffic jams. Creating an equilibrium this way is a bad solution from several respects. It involves a lot of time lost, air pollution and a great loss of the resource that should be allocated. For example, the number of cars that are able to use the Ayalon highway that goes through Tel Aviv at 1PM is double the number of vehicles that go through the same stretch of road at 4 PM. Thus, half of the capacity of the road is not used, just when it is most needed, because of the way the road is allocated to its users. A driver going in and out of the Tel Aviv metro area wastes on average 200-250 hours a year, equal to 4-5 work weeks²³.

The solution is changing the mechanism from lines (ques) to pricing, as is done with most products, alongside all the other steps set forth in this paper.

Moreover, expanding the road network is not expected to alleviate congestion in the long term, since the roads being build are filled up quickly with new cars due to two processes: the population growth and the motorization level increase. Israel's population is growing at a rapid pace compared to other developed countries, so substantial annual investment is needed just to keep up the status quo. The other process is a latent demand for road space. Many researches show that as the available road space grows, so does the demand for it. Thus, paving more roads will not solve the problem, and anyway, expanding the roads is not always possible²⁴.

²² Yotzer, Nitsan, Results of the experiment "Moving to Green", 2017

²³ Ibid.

²⁴ Omer Moav, Shani Schreiber, Ibid.



The price mechanism can be launched by levying congestion charges ("fine"), as is done in London for example, in one of several ways such as toll rings, regional charge plans or a continuous charging system. Conversely, incentives ("rewards") could be given to drivers who avoid using the road capacity that is lacking, while fixing the usage price for the road for each trip.

It is evident that taxes on vehicles in Israel are relatively high today so more taxes on drivers are not recommended. However, one tax can be alternated with another so the tax system serves the goals for which it was established, pricing the externalities that car usage produces.

b) The main elements of Road Pricing

1) Pricing road capacity according to the following parameters:

- a. Road congestion, to be measured by average vehicle speed. Each road would be categorized into one of 3 categories:
 - i. Very congested – driving cost would be 15 NIS (\$4)
 - ii. Moderately congested - 8 NIS (\$2.2)
 - iii. No congestion – free
- b. 3 time slots during the day – 7:00-10:00, 10:00-20:00, 7:00-20:00
- c. Significant discounts or free passage will be given to vehicles carrying 3 passengers or more and to public transportation

2) Payment of up to 300 NIS (\$80) a month (3600 a year)

3) Set prices

- a. Usage rates, including maximum monthly payment, will vary in the first two years every 6 months.
- b. After that, rates will be updated every two years.
- c. Pricing will not change according to congestion in real time, since certainty about the cost of the ride before starting it, and simplicity of the model are important.

4) No residents' Discounts

Residents who live near the congested area will not receive discounts on the road prices. They will have better public transportation available to them so they can easily enjoy the full amount of the incentive. The principle of paying for using the road's capacity dictates that every user pay for it.

5) Measurements with a device in the vehicle

There are several options for measuring:



- a. A third of the cars in Israel already have a device through which they could be monitored.
- b. In other vehicles the choice would be between a:
 - i. Connection through the smartphone and a Bluetooth sticker sent to the driver's home
 - ii. Independently installing a device in the car that would arrive at the driver's home, or installing it at garages at a very low cost.
- c. There is no need for infrastructure on the roads, like cameras, but instead usage of existing advanced technologies is preferred.
- d. The data collected from the vehicles will not be used in an identifiable way and it will all be anonymized. Thus there will be no tracking of the drivers' activities beyond measuring the distance driven to calculate the incentive, so their privacy will be preserved.
- e. Responsibility for installing the device will lay on the vehicle owner. A vehicle owner who will not install the device will be charged 300 NIS a month.

6) Method of payment

There will be a real time account on the app and on the website and a monthly invoice by mail or email. The balance will be trackable throughout the month.

7) Abolishing the annual car licensing fee

Except for luxury vehicles, where it would be reduced by 1000 NIS. This step will go into effect as soon as the program is launched.

8) Reducing the tax on Gasoline

- a. A 0.35 NIS (\$0.10) reduction right away
- b. The tax level would be determined each year depending on the total revenue from road pricing. If total revenue would exceed 1.5 billion NIS, there will be an additional reduction. If it will be less than 1.5 billion, the gasoline tax will go up accordingly.

9) Total Cost

- a. The total cost of this step is estimated at 6 billion NIS (\$1.6 billion) at its incept.
- b. The total estimated revenue from the plan's is also estimated to be 6 billion NIS



- c. Revenue higher than this amount will be offset by reducing the gasoline tax.

After applying this model, we recommend examining models that would encourage a daily vehicle insurance model, and not only an annual one, to incentivize vehicle owners to not use their vehicles on some of the week days.



2. Parking Pricing

a) Background

Much like road congestion is a problem of misallocation of a resource in demand, so is parking a scarce and limited resource in major cities. A policy of meeting parking demands leads to increased consumption of this resource followed by increased use of private vehicles. This policy is not sustainable, contributes to road congestion, to the loss of open space and does not alleviate the situation, since demand increases together with growing supply. According to Ministry of Finance estimates, the external cost of free or low cost parking adds up to 5.2 billion NIS a year (\$1.4 billion), in 2013 prices.

Many cities around the world have changed their parking policy and have enacted pricing mechanisms and progressive policies to reduce traffic congestion. Among them are Helsinki (1970s), Amsterdam and London (1990s), Oslo, and many others. Thus, as demand for road capacity must be managed, so must parking demand.

Future Mobility IL proposes a model of pricing the usage of the busiest roads, while repealing and reducing other vehicle related taxes: abolishing the annual vehicle fee, except on luxury vehicles, and reducing the tax on gasoline. According to this model, drivers who would avoid using the busiest roads even some of the weekdays would benefit from lower car expenses overall, and drivers who would continue to use them would pay only slightly more. Applying this model, together with the other steps of our plan, is expected to alleviate traffic congestion by about 50%.

Additionally, Future Mobility IL proposes a parking pricing model that includes several steps for rightly pricing parking, together with reducing the number of parking spots in congested cities.

b) Principles of Parking Pricing

1) Taxing the parking benefit

Today, parking benefits are a tax deductible expense for the employer, and tax free to the employee. This discriminates against employees who do not take advantage of this benefit and do not use their private vehicle. It is also the only non-taxed benefit, unlike for example, meals, shuttle service and clothing that is not uniform.



We suggest determining a normative value for a parking spot, with prices varying by from city to city and a dual rate within cities, one for areas with high parking demand and another for less in demand areas.

This proposal is based on the recommendation of the inter-ministerial commission for "green" taxing from 2008. Thus, it is not a new proposal, but it is more relevant than ever. The expected revenue from this step is 500 million NIS annually (\$135 million).

2) Making public transportation expenses tax deductible

Today employees are taxed on transportation reimbursements, including public transportation. We propose that these funds will not be considered income for tax purposes, to encourage the use of public transportation.

3) Incentivizing municipalities to turn parking lanes into public transportation lanes or lanes for two wheeled vehicles (bicycles and kick-scooters) – as detailed in Step 6.

4) Doubling street parking rates – and turning the fixed national rate from a maximum rate to a minimum rate, so that each municipality can choose its rate, above the minimum. This will only be applied in town and cities with more than 50,000 residents. Municipalities currently have the authority to wave parking fees for its residents, but they cannot determine their parking rates. The low price of street parking today encourages drivers to drive around the city and look for street parking, instead of using parking lots, thus increasing the traffic congestion.

The maximum hourly parking rate in Tel Aviv is 6.2 NIS (\$1.7) which is significantly lower than the free market rate. In other cities the rates are even lower: 5.7 NIS in Jerusalem and Be'er Sheva, 5 NIS in Hadera, 3.63 in Nes Ziona etc. The minimum price should be similar to that charged by private parking lots. When street parking is much cheaper than lot parking, cruising the street looking for it is the rational choice for drivers. Collectively, this creates traffic congestion, road accidents, gasoline waste, and air pollution and negatively affects the wellbeing of pedestrians²⁵. Thus, parking prices in large cities should be doubled and municipalities should be allowed to charge a rate higher than the minimum set by the central government.

²⁵ Omer Shprintzak, Sapir Gozlan, "Parking Policy in Main Cities", July 2017.



It should be noted that in 2016 an amendment to the Building and Planning Law regarding parking spots in building passed. It changed the number of spots that each building plan lays out for a building from a minimum number to a maximum number. The law set a significant reduction of parking standards for commercial and business uses as opposed to residential uses, since owning a private vehicle in household is considered a more basic need. We believe that once the steps set forth here are implemented, the residential parking standard should also be lowered.



Step 3: Promoting Public Transportation

1. Background

Effective and accessible public transportation is a key part in the general transportation mix of any country and it holds significant influence on the standard and level of living of all individuals. It assists in raising productivity and work wage, reducing the gaps between different strata of society, reducing road accidents and air pollution and increasing leisure time, among another things²⁶. Without effective and accessible public transportation, individuals who can afford it will likely choose to purchase a vehicle to make up for the gap, thus, increasing road congestion, along with its destructive influences on the economy and the state.

In Israel, even though public transportation ridership is at 850 million a year, only 26% of commuters choose public transport while 69% choose their private vehicle²⁷. This is contrary to Europe, where public transport usage rate are much higher, for example, 50% in Madrid, 47% in London and 46% in Berlin, as opposed to 20% in Tel Aviv and 22% in Haifa²⁸. Due to these low usage rate and the rise in the motorization level, the average commute in Israel has risen from 15 minutes in 2006 to 40 minutes in 2016. Despite this change, public transportation has not been able to supply a quicker commute than private vehicles and surveys show that only 5% of its users do so by choice, their satisfaction level is low and most of them choose it only out of economic necessity²⁹.

A rise in the use of public transportation will have far reaching effects on individuals and on the economy as a whole. Thus, this should be a central target for any plan that seeks to promote transportation solutions in Israel. In order to increase the public transportation usage rate we propose these main steps:

2. Public Transportation Lanes

a) Background

The gap between public transportation investment in OECD countries and Israel is 86%. This translates into a gap in the average speed of public transport in Israel, 16-19 KPH, compared to an average of 25 KPH in OECD countries³⁰. It is well reflected in the investment in public transportation as a percentage of the

²⁶ Flug, Karnit, "Public Transportation in the Knesset Day", Bank of Israel, 3.7.2018, pp 16

²⁷ Bank of Israel Press Release – Public Transportation in Israel and in Europe, March 2018, p 3.

²⁸ Flug, Karnit, "Public Transportation in the Knesset Day", Bank of Israel, 3.7.2018, pp 11

²⁹ Bank of Israel Press Release – Public Transportation in Israel and in Europe, March 2018, p 3-7.

³⁰ Ronen Yaniv, 2013. Investments in Public Transportation in Israel and The World, the Knesset's Research and Information Center, pp 2-3



development budget of the Ministry of Transport: 46% of it was spent on the paving of city and intercity roads, 26% on rails, 26% on mass transit systems and only 1% on public transportation lanes³¹. Analyzing this meager investment compared with the division of ridership between the various public transportation methods that year demonstrates the imbalance: 744 million rides on buses, 64 million rides on trains and 42 million on light rail³². Bus ridership is more than ten times greater than train ridership, despite the disproportionate investment.

In the 2018 budget, the development in bus infrastructure remains low, 2% out of a development budget of more than 13 billion NIS (\$3.5 billion). Investment in mass transit infrastructure continues to grow in 2018 and it took up 29% of the development budget. This is in accordance with one of the four goals the Ministry set forth for itself in 2018, the building of a mass transit system to alleviate road congestion³³.

To achieve this goal a number of mega projects were launched: several light rail lines in the Tel Aviv metro area, a fast lane at the entrance to Tel Aviv, adding a fourth rail along the Ayalon River, starting construction of a light rail between Nazareth and Haifa, and extending the Haifa BRT line. Additionally, a new heavy rail line, east of the existing shore line is planned, as well as a network of metro lines in greater Tel Aviv³⁴.

The projects demonstrate a change in attitude and policy in the Ministry of Transport that has directed many resources to mass transit projects. However, it is evident that investment in the "classic" and most useful means of public transport, buss, with the most ridership than any other public transportation means available in Israel, remains significantly low.

Thus, alongside the above mentioned projects that will cost billions and will take years to complete, it is highly important that bus services in Israel are improved. These improvements can be obtained at a low cost and relatively quickly.

In 2000 the Ministry of Transport launched its public transportation reform which lead to an increase both in ridership and in the number of buses on the road.

³¹ Ministry of Transportation, 2018. Use of 2017 budget, from the 2018-2019 budget, pp 4
https://www.gov.il/BlobFolder/reports/takziv_2019/he/takziv2019.pdf

³² Ya'ar Amir, "The Collapse of Public Transportation in Israel", The Public Transportation Companies Forum. Presented at the Public Transportation Day Conference, pp 3-5

³³ Ministry of Transportation, 2018. Use of 2017 budget, from the 2018-2019 budget, pp 2, 6
https://www.gov.il/BlobFolder/reports/takziv_2019/he/takziv2019.pdf

³⁴ Israel State Budget Proposal for 2019, presented to the Knesset, February 2018, pp 197-198



Between 2006 and 2016 the number of buses on the road grew from 5,600 to 9,024 and the mileage driven by buses rose from 403 million KM to 597 million KM³⁵.

In 2012 the Ministry published its strategic plan for public transportation that budgeted 250 billion NIS (\$68 billion in 2019 rates) for it over 25 years, 10 billion NIS a year. The actual amount that was invested each year in public transportation since 2013 has been 5 billion NIS a year, about half the original amount³⁶. Thus, it is not surprising that despite the gradual rise in the number of buses on the roads, usage of private vehicles is 3 times higher than that of buses³⁷.

Part of the reason for that is that most bus lines are perceived by the public as "inefficient". Their speed is lower than that of private vehicles, and there is a serious shortage of critical bus infrastructure such as night parking lots for buses, operational lots, designated lanes, terminals and drivers. Investment in all these is critical, on top of increasing the number of buses on the road³⁸.

Thus, many changes are needed in this field. Some of them are elaborate and complicated to execute. We recommend major, executable steps which will provide some relief in the short and medium term that will increase ridership on buses and so reduce the number of vehicles on the road and road congestion. The cost of these steps is much lower than that of the mass transit mega projects, but the effect will be evident and immediate.

The steps in this plan, most notably road pricing and carpool promotion, will encourage an immediate switch to HOV lanes whose clear advantage is making the road more efficient as a resource, making it a main policy tool for road congestion relief.

Presently, the responsibility for HOV lanes on intercity road rests with the Ministry of Transport, and HOV lanes within cities are the municipality's responsibility.

³⁵ Ya'ar Amir, The Collapse of Public Transportation in Israel", The Public Transportation Companies Forum. Presented at the Public Transportation Day Conference, pp 3-5

³⁶ Ehud Becker, Promoting Public Transportation in Israel, a report by the Knesset's Economy Committee, July 2018, pp 10.

³⁷ Becker, Ehud, Public Transportation in Israel, Background. 2018. The Knesset Research and Information Center.

³⁸ Ya'ar Amir, The Collapse of Public Transportation in Israel", The Public Transportation Companies Forum. Presented at the Public Transportation Day Conference, pp 3-5



b) Public Transport and HOV Lanes in Inter City Roads

Israel had 5 major highways leading to the main metropolitan areas: 1, 2, 4, 5, and 20. They are all congested during morning and afternoon/evening rush hours and all lack HOV lanes. On highway 4, for example, during morning rush hour, between the Bar Ilan interchange and Givat Shmuel, about 72 buses pass per hour, with an average occupancy of 40 passengers. So, in this road segment, 2,880 people pass through on buses. During the same time period, 6,075 private vehicles pass through this segment, meaning 30% of the passengers on this road use only 3% of its space. If there was a public transport lane from the Shiva interchange to the Geha interchange, the bus ride would take 20 minutes instead of 40 minutes during rush hour, a 50% time save³⁹. Such a lane is planned, but it is expected to be completed only in late 2021.

On highway 5 the morning rush hour driving time from the Kesem interchange to Giliot has increased by 45% in recent years, to about 50 minutes. A public transport lane in this section will shorten the ride to about 15 minutes, a 70% time save, and also draw drivers to leave their cars at home. The planned public transportation lane here is expected to be completed in late 2020⁴⁰. Until it is complete we propose turning one of the existing lanes to an HOV/public transport lane.

About 100,000 vehicles pass through Highway 1 each day. During morning rush hour 281 buses with an average occupancy of 75% go through it, i.e. about 10,000 passengers. During the same time about 7,000 cars go through the road. More than half of the passengers going through Highway 1 use only 9% of it. If there was a public transport lane on this road, the trip time would be reduced from 85 minutes to 40 minutes. The upgraded route of Highway 1 was recently opened, after an investment of about 2.4 billion NIS. However, the upgrade did not include a HOV lane so the driving time on it has not been reduced⁴¹.

Highway 2 is a clear proof of the efficiency of inter-city public transportation lanes. Such a lane exists from the Poleg interchange south towards Tel Aviv. It shortened the ride to Tel Aviv by 30% and led to a 20% increase in public transport usage within 9 months after its opening in early 2018. However, an HOV lane was not allotted going north so commuters face congestion when they return home in the afternoon or evening. It is estimated that allotting an HOV lane in this section

³⁹ 15 Minutes, the status of public transportation lanes. pp 1-3

⁴⁰ Ibid.

⁴¹ 15 Minutes, "an HOV on Highway 1 Now" <http://15minutes.co.il/%D7%A0%D7%AA%D7%A6-%D7%A2%D7%9C-%D7%9B%D7%91%D7%99%D7%A9-1-%D7%A2%D7%9B%D7%A9%D7%99%D7%95/>



would reduce the drive time in the morning from 27 minutes to 16 minutes, a monthly save of about 4 hours for each commuter⁴².

In 2016 an HOV program called Mahir La'ir ("quick into the city") was launched. It brought together 17 municipalities and its goal was to create many KM of public transportation lanes within cities and in between them in the greater Tel Aviv area ("Goosh Dan"). It included highways 2, 4 and 5 where thousands of cars pass each day. Despite its official launch, as of January 2019, not a single public transport or HOV lane has been allocated through it. In the case of inter-city roads the decision on allocating these lanes lies solely with the Ministry of Transport which is in charge of their maintenance. However, concrete decisions are yet to be made on this matter. For highway 5 a decision has been made to allocate one lane as a paid toll lane similar to the one operating the entrance to Tel Aviv from Highway 1. This lane will take 5 years to complete instead of an HOV lane which can be created within months⁴³.

Data shows that allocating a public transportation lane, even at the expense of an existing lane, dramatically reduces ride time for public transport users. Thus, it increases their number and reduces the number of private vehicles on the road, reducing congestion and increasing average speed.

c) Public Transport and HOV Lanes in City Roads

Differently from intercity lanes, the decision on allocating HOV lanes with cities and the responsibility for creating them rests solely with the hands of municipalities. In 2011 the government decided to create the National Authority for Public Transportation and metropolitan authorities for public transportation. The authority was only set up in 2014 and no metropolitan public transportation authority has been established yet. The above mentioned Mahir Ba'ir program that was launched in 2016 has yielded very few HOV lanes as of January 2019. The Ministry of Transport has announced it would boost the program's implementation, but some cities, such as Kfar Saba and Kiryat Ono have said that they are ready to allocate HOV/public transportation lanes, and it is the Ministry's lack of support that is holding back the implementation⁴⁴.

The city that had created the most public transportation/HOV lanes is Ahdod which has allocated 10.5 km of them and is planning 10 additional km. It also plans to

⁴² 15 Minutes, "The status of public transportation lanes", Presented to MK Eitan Kabel.

⁴³ 15 Minutes, "Public Transport Lanes and Terminals – Crucial Bus Infrastructure", presented to the Economy Committee of the Knesset, 2018

⁴⁴ 15 Minutes, Public Transportation Report, Terminals and Connectivity, pp 1-4



build 2 public transportation terminals that allow for additional bus lines to be added, as well as 40 smart bus stations that can receive and transmit real time info. This change was entirely promoted by the Ashdod municipality and places it at the top of the 18 city list compiled by the public transportation advocacy NGO "15 minutes" that ranked Israeli municipalities according to their commitment to promote public transportation⁴⁵. It exemplifies the abilities of a city to promote public transport if it chooses to do so.

Most cities in Israel however, have yet to allocate public transportation lanes, even though they have the authority to do so, and the need for it is clear, thus, hurting the viability of public transport in their territory. In this situation the Ministry of Transport has the authority to declare certain roads as "vital", and limit certain vehicular transportation on them in order to reduce air pollution. However, it has yet to use this authority and has never ordered a city to turn a lane into an HOV lane⁴⁶.

d) The principles of public transportation lane allocation and its prioritization in infrastructure planning

- 1) **A government decision ordering that every busy street with two lanes or more, within cities or in between them, should have at least one public transport lane, should be passed.**
- 2) **HOV lanes should be allocated on highways, even at the expense of private vehicle lanes.** The goal is reducing congestion through increasing the number of passengers on public transportation and reducing the number of private vehicles on the road.
- 3) **Technologies that prioritizes public transportation should be installed immediately** as was done for the Jerusalem light rail and the Haifa BRT. Connecting the traffic light system and busses would also form a solid base for the proliferation of Vehicle to Infrastructure use in Israel.

⁴⁵ 15 Minutes, Ranking of Cities According to Public Transportation Lanes, pp 1-4

⁴⁶ 15 Minutes, Public Transportation Report, Terminals and Connectivity, pp 4-5



3. Extending the incentive for increasing the number of passengers among public transportation operators and providing them with flexibility to plan bus routes.

a) Background

The Ministry of Transport is the only authority that determines the routes of public bus lines in Israel, which operate through private companies. The lines are divided into clusters and the company operating each cluster is selected through a public tender. The ministry is the one dictating to the operators the lines, their frequency and the hours of operation⁴⁷.

For the various operators to be in business, the operation must be profitable on the one hand but also economical as a public service. For this purpose, an incentive mechanism by the state is applied on the public transportation operators in the form of subsidies given as reimbursements of the cost of operation per kilometer and the number of passengers. In 2017, the subsidy budget was 6.5 billion NIS (\$1.75 billion). Of this amount, 3.8 billion were allocated to buses, 1.6 billion to trains and the rest to support discounts to various population groups, such as students and elderly people, and to finance special travel arrangements, such as monthly passes and travel for military personnel⁴⁸.

In 2000, the Transport Ministry launched a public transportation reform whose goals were improving service, reducing costs and traffic congestion. It also opened public transportation to competition. Until 2001, 95% of public transport in Israel was operated by two companies – Egged and Dan. Since then, 10 new operators have started operations in 30 different clusters⁴⁹. A review of the reform that examined the years 2003 – 2015 revealed that it indeed led to a savings of 37% - 50% in the costs of operating and in the subsidies. It also showed significant changes in the extent, quality and level of service and a decrease of 15%-20% in fares.

In 2011, the budgeting model of the public transportation operators changed to a model of cost per km, plus a share of profits paid to the state. This means that the state compensates the operator according to the cost of operation per km, estimated at 10-12 NIS for a new operator and around 14 NIS for the veteran

⁴⁷ Becker, Ehud, Public Transportation in Israel, Background. 2018. The Knesset Research and Information Center. P 3.

⁴⁸ Almagor, Orly. Becker Ehud, 2018. "Israel is Standing – Promoting Public Transportation", a final account of the Knesset Economy Committee. 3.7.18 pp 16

⁴⁹ Ministry of Transport, the National Authority for Public Transportation" 2018. *Plan for Competition in the public buses sector 2018-2030*, a rough draft for public comments pp 2-7



operators, who are bound to labor agreements and long term subsidies. Operators are also entitled to an additional subsidy of about 0.5 NIS per passenger up to a certain number of passengers indicated in the tender which they won. Once this number is surpassed, the subsidy rises according to a scale set in the tender, which might reach 1.5 NIS per passenger.

For example, in the Dan Darom cluster in Be'ersheva, the operator will receive a 0.45 NIS subsidy for every passenger up to the 22 million passengers per year. Above this number and up to 24 million passengers, the company will receive 1 NIS for each passenger and above 24 million it will receive 1.5 NIS per paying passenger (not including discounted passengers, such as military personnel)⁵⁰. Conversely, in the Petah-Tikvah-Rosh-Ha'ayin cluster, up to the 20 million passengers the company will receive 0.4 NIS for each passenger, and above this threshold only 0.6 NIS. The new tenders include a subsidy of 2 NIS per passenger on average⁵¹.

Additionally, companies bidding for the tender propose profit shares to be paid to the State out of their expected future profits from operating the clusters they are bidding on. Thus, they raise their chances to win by also giving away part of their future revenue. The operators also compensate the State at an average of 0.6 NIS per passenger if there is a gap between the actual number of passengers and the minimal number of passengers stipulated in their operation agreement⁵².

Accordingly, between 2013 and 2016 the state received from the public transportation operating companies 2 billion NIS (\$540 million)⁵³. This mechanism creates a situation where the operators suffer heavy losses and the existing subsidy, while meant to encourage picking up more passengers, does not allow them to ameliorate the service and focus it on the passengers. Therefore, there is an urgent need to change the subsidy mechanism to the public transportation operators with regard to passenger number increase.

⁵⁰ Ministry of Transport, 2015, Tender 2014/22 for operating bus services in the Be'er Sheva area pp 115-116

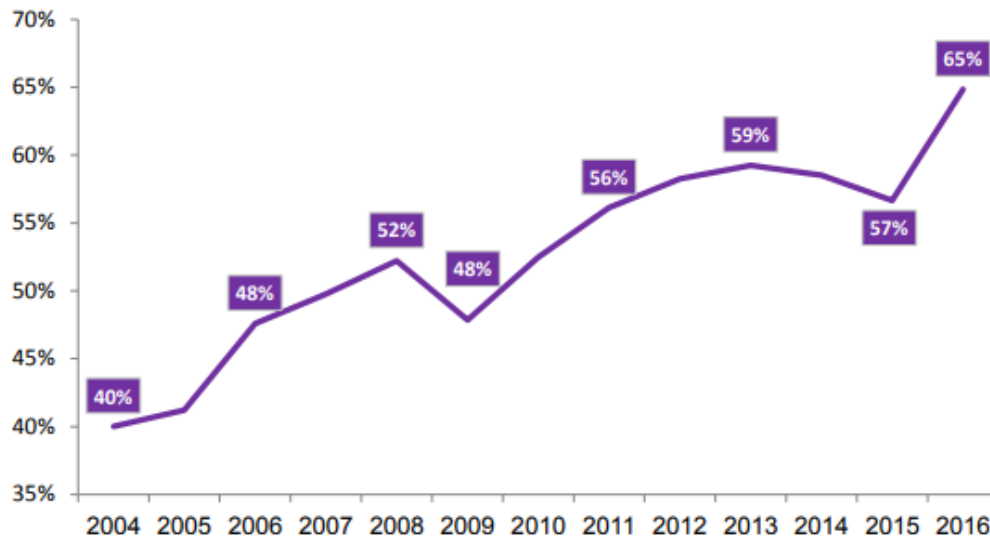
⁵¹ Ministry of Transport 2014. Tender 17/2014 for operating bus services in the Petach Tikva area 2014, pp 118

⁵² Ministry of Transport, 2015, Tender 2014/22 for operating bus services in the Be'er Sheva area pp 116-117

⁵³ Ya'ar Amir, The Collapse of Public Transportation in Israel", The Public Transportation Companies Forum. Presented at the Public Transportation Day Conference, pp 3-5



The rate of government subsidy out of public transportation costs:



Source: Ministry of Transport and the National Authority for Public Transportation, a Plan for Competition in the Bus Sector, 2018

b) Forms of public transportation subsidies

To review the needed change in the subsidy mechanism, we will first examine the kinds of subsidies which currently exist that represent the division of the economic risk between the State and the operators according to two main risk factors:

Manufacturing risk linked to the level of production expenses of a stable output regardless of the number of passengers, when output is defined as the frequency of operation, for example, the number of buses per hour.

Revenue risk linked to the level of the revenue received from selling public transport services. According to these risks, there are two kinds of subsidies in the contract between the State and the public transport operator. One is the "net cost contract", in which the operator takes upon itself the manufacturing risk, the revenue risk and the cost of providing the services.

From the State's point of view, this contract is advantageous because it involves a low risk level. Also, because the operator's revenue is dependent on the number of passengers, these contracts create, under certain conditions, operator motivation to respond to market needs and supply a high level of service. All the tenders published between 2000 and 2010, were of this type.

However, a study that examined the efficacy of tenders in Israel during those years found that these types of contracts did not actually provide such motivation



because the payment of a subsidy as a lump sum not linked to the level of service or the number of passengers, only increases the overall profit of the operator and does not reduce its motivation to lower the level of service.

Research conducted in Sweden showed that "net cost" tenders that combine per passenger subsidy may in certain combinations of tariffs and frequencies increase the number of passengers. However, setting an incentive level that is too low will not drive the operator to increase the number of passengers as indeed happened in Israel⁵⁴.

Thus, it was recommended between 2011 and 2013 that all new contracts will be diverted to a "total cost contract". In these contracts, the operator takes upon itself the production risk while the State carries the revenue risk. From the regulator's point of view these contracts are advantageous because the cost of supplying services through them is lower and the level of control and the availability of information they provide are higher. These contracts allow for an integration between various operators without the need for elaborate accounting mechanisms with them. However, their drawback is the high risk level to the State due to the revenue risk. Due to the fact that in "total cost contracts" the operator revenue is not dependent on the number of passengers, service operators may be insensitive to market needs and provide a low level of service.

From the operator's point of view, these contracts are advantageous because of the low risk level they impose upon them and the high level of control over operating costs it provides them, with this being the main factor that determines profits. The disadvantages for them are the high level of competition they create because of the high number of operators drawn to the low risk level, the low level of control it gives them vis a vis the transportation authority and the low motivation to create business ventures. To overcome the operator's inherent lack of motivation problem, these tenders include incentives to increase the number of passengers in the cluster, which may reach 10% of the total operator revenue. This incentive mechanism, if used at the right amount, might motivate the operators to increase the number of passengers⁵⁵.

In the final account, the operator carries the cost of operation according to service frequency, hours of operation and bus line routes as dictated by the tender it won

⁵⁴ Talit, Gal, Ida, Yoram, 2014. Regulating Public Transportation Services in Israel, the Ya'akov Hazan Center for Social Justice and Democracy, Van Leer Institute, Jerusalem, p 20.

⁵⁵ Ibid, pp 17-21



from the Ministry of Transport, without being accountable for the number of passengers or the level of service they receive. Currently, average occupancy on buses is 30 passengers, and in rural areas even less. During off peak daytime hours, many buses drive empty, but the compensation to the bus operating companies is maintained, based on operation costs of about 10 NIS per km.

Under these conditions, when the subsidy is given regardless of the number of passengers while the fares have decreased dramatically in recent years, the operator has no interest in increasing the number of passengers, since it will not increase their revenues significantly. This mechanism, enacted in 2011, has failed, and since then the level of service has decreased as has the profitability of the entire sector. We propose switching to a mechanism that provides total costs and per passenger subsidies. This move has been recently adopted by the Ministries of Transport and Finance and per-passenger subsidization has begun to be implemented in new public transportation operating tenders.

To create an interest in improving service and increasing the number of passengers, public transportation operators must be allowed to plan 25% of the service in each cluster. Also, we recommend building an incentive system that would encourage them to increase passenger occupancy on buses. For this purpose additional subsidies must be budgeted. Currently, public transportation operators are not financially able to provide a high level of service and quick and efficient rides, mainly due to road infrastructure that allows a quicker ride for private vehicles. Hence, bus frequency during rush hour needs to increase, along with and any other way that would increase the average of bus passenger occupancy.

c) Principles of increasing the incentives to raising the number of passengers by public transport operators and providing them with flexibility to plan bus routes:

- 1) The 2 NIS per passenger subsidizing mechanism should be implemented immediately above 95% occupancy compared to the number of passengers in the previous year and in all existing tenders. In new service lines we propose setting a scaled subsidy rate of 2 – 10 NIS determined by occupancy, paid per passenger. This move is expected to motivate public transportation operators to actively increase the number of passengers.
- 2) In new tenders operators must be allowed to plan 25% of bus lines in each cluster while the majority of the planning (75%) would still be planned by the Ministry. This move will allow increased efficiency of the lines and flexibility for



the operators to use the appropriate vehicle size. Today, the vehicle size is determined by the Ministry of Transport, as are the routes and other parameters. Operators will be incentivized to increase the number of passengers and will be fined when the passenger number in the cluster decreases.

4) Closing main roads in cities to private vehicles

a) Background

Closing of main roads in cities to private vehicles has environmental benefits – reducing emissions and air pollution; economic benefits – reducing traffic congestion and road accidents; and social benefits – urban planning that puts pedestrians and cyclists at the center and improves the quality of life.

The most famous example of closing a major artery in a city center is closing a section of Broadway in New York City, which also includes Times Square, and turning it into a pedestrian walkway. Under a scheme of the New York Transit Authority from 2009, four kilometers of Broadway were closed to private vehicle traffic, sidewalks were enlarged, street furniture for pedestrians was installed and bike lanes were added on the roads. Broadway is a street bustling with vehicles and pedestrians and before the scheme, private vehicles crawled along it due to heavy traffic congestion and pedestrians had to walk on the road because the sidewalks were too narrow and unsuited to the number of pedestrians.

The changes on Broadway improved traffic flow, increased safety and created new spaces for pedestrian and bicycle movement. Pedestrian volume on the street grew by 11%, the number of cyclists grew by 16% during the week and by 33% on weekends. The area changed from a place where people want to find parking to a place where people want to be. People even prefer sitting in the designated areas on the street than sitting in the park. The number of casualties among drivers and passengers dropped by 63% and the number of pedestrian casualties dropped by 35%. Travel time and speed of travel in most directions also improved by a few percent. In a satisfaction survey, 74% of respondents like Broadway's new configuration and 20% of business owners thought it had improved business in the city, while no one thought had negative effects⁵⁶.

An older example is the closing off to private vehicles of the center of Pontevedra,

⁵⁶ "Broadway Boulevard: Transforming Manhattan's Most Famous Street"
<https://www.pps.org/article/broadway-boulevard-transforming-manhattans-most-famous-street-to-improve-mobility-increase-safety-and-enhance-economic-vitality>



a city of 80,000 in northwestern Spain. In the 1990s, 52,000 vehicles drove through the city streets each day. In 1999, Miguel Lorres was elected mayor and proceeded to close the city center to cars and “reversed” the pyramid so that pedestrians received top priority followed by bicycles and public transportation and only then private vehicles.

According to city data, the number of cars in the historic center dropped by 97% since 1999. Car movement in the areas around the center dropped by 77% and by 53% in the city as a whole. The change brought with it additional benefits: since 2011 there has not been one fatal casualty in road accidents, the air quality has improved, children began playing in the streets and adults were able to move around more easily. Most of the vehicles that do travel through the city are commercial vehicles making deliveries, driving slowly and carefully. The secret to this success is responding to a variety of aspects such as accessibility, safety and pollution through a holistic plan⁵⁷.

In recent years, more cities have implemented similar moves. Oslo city center is going car-less by cancelling parking spaces and extending the bike lane system by 65 km⁵⁸. Paris declared back in 2014 that by 2020 pedestrian areas would be enlarged at the expense of private vehicles⁵⁹.

b) Principles of closing off central city arteries to vehicular traffic
Municipalities should be incentivized to close off significant activity centers to private vehicle traffic and instead grant preference to pedestrians, bicyclists and public transportation. This move should be carried out through publicity and advocacy campaigns and through government support of municipalities of over 50,000 residents that would encourage them to implement this move.

⁵⁷ "For me, this is paradise: life in the Spanish city that banned cars".

https://www.theguardian.com/cities/2018/sep/18/paradise-life-spanish-city-banned-cars-pontevedra?CMP=share_btn_link

⁵⁸ Katherine Katract, *Oslo couldn't ban cars, so it canceled parking*, *The Guardian*

⁵⁹ Laker, Lora *Taking the city in their own hands – cities are shifting how they view pedestrians* *The Guardian*



Step 4: Encouraging the use of two-wheelers (bicycles and kick scooters)

1) Background

In Israel like in many places in the world, the use of two wheel electric vehicles, bicycles and kick scooters is increasing rapidly. It is estimated that over 200,000 of them move through the city streets. In London, the overall number of bicycle rides has doubled since 2014 when the electric bike trend began. In Paris, 6 companies for shared electric bicycles/kick scooters are currently operating and in the U.S. competition for the hearts and pockets of riders increases daily. A common forecast is that in 2023 no less than 40 million two-wheeled vehicles will be sold worldwide compared to 35 million today. In Israel where 60% of employees live within riding distance of their workplace and traffic congestion gets worse every day, this is an ideal solution.

Drivers who are of age to obtain a driver's license who choose to ride electric two-wheelers create benefits for the national economy by choosing to give up driving to work in their private vehicle. Not only do they save time in traffic and their productivity rises, but also, every ride replaces a vehicle which would have added to traffic congestion and air pollution. With congestion rising from year to year, tens of thousands of private vehicle rides saved each day are extremely beneficial and the state should adopt a proactive approach towards increasing the use of two-wheel vehicles.

Along with these benefits, regulators must define clearly the terms of usage of two-wheeled vehicles and enforce them effectively. The ever-growing use of them has created a situation where the rules are not clear and pedestrians, bikers and four-wheelers are mixed with one another and existing rules are not enforced.

The main risk factor for accidents involving electric two-wheeled vehicles is the current chaos between them, cars and pedestrians. Even when riders ride at the permitted speed and follow all safety rules, the risk of an accident is high as long as there isn't a separate lane for them, for cars and for pedestrians. The increasing use of these vehicles demands adapting infrastructure in the quickest and most efficient way to prevent real dangers. A plan to pave hundreds of kilometers of bike paths does exist but it is being implemented very slowly and so it is not catching up with the urgent need to regulate this issue.



Bicycles and kick scooters are means to replace private vehicles and not walking so diverting road lanes to bike lanes is preferable to diverting sidewalks. Municipalities should quickly pave hundreds of kilometers of two-wheel lanes.

2) Principles of the move to promote the use of two-wheel vehicles (bicycles and kick scooters)

- a) **Accelerated allocation of two-wheeler lanes:** This should be done immediately, whether through expropriation of a lane currently used by private vehicles, where possible, marking a path on an existing sidewalk where it is wide enough, or through paving a designated two-wheeler lane. Ideally, all three options should be used. Municipalities should be incentivized to create these lanes through a budget that would cover more than lane creation costs.
- b) **Enforcement:** Effective enforcement will lead to the removal of law-breaking riders from the roads and the paths and create a better environment for other riders, pedestrians and car drivers. Existing legislation on this matter is reasonable but it is often not enforced, leading to chaos and turning a blind eye in the case of minors riding, carrying an additional rider and modifying the vehicles to make them faster. Current enforcement tools should be significantly enhanced and new enforcement tools should be created, such as the existing "Guardians of the Road" program for electric bicycles and the use of new technologies, such as placing cameras and analyzing accident data.
- c) **Avoiding setting up a bureaucratic system of licensing and requiring license plates:** Setting up such a system is meant to enable reaching the hitting rider in the case of an accident but it is not expected to reduce the number of accidents. It is not recommended to set up an elaborate bureaucratic system of licensing every two-wheel vehicle since this will dramatically reduce the desire of the public to purchase such vehicles and thus would hurt the public interest of reducing road congestion and pollution levels.

It is an expensive proposition which would lead to an increased bureaucratic burden and drive potential cyclists back to using their private vehicles. Moreover, if the two-wheeler data would be managed on the municipal level, an expensive and elaborate network to share information between municipalities would be needed. Many riders travel between different cities since these vehicles serve both the 'first mile and the last mile' solutions and not only for urban travel. Thus their contribution to reducing road congestion is significant.



- d) **Wearing a helmet:** On the one hand wearing a helmet dramatically reduces the risk of a head injury in the case of an accident. On the other hand, world experience shows that in countries where wearing a helmet is not mandatory, such as in the Netherlands, the number of bicycle accidents is actually lower. In most Western countries, there is no mandatory requirement for adults to wear a helmet. Thus, we propose examining this issue thoroughly and broadening existing regulation only if there is enough evidence that this would increase rider safety. Requiring wearing a helmet is an important step but it should be done after consulting with experts in the field from Israel and the world.

- e) **Incentivizing municipalities to set up public charging stations for electric bicycles and kick scooters:** Shared two-wheeler services are gaining momentum and are offering an efficient green alternative to private vehicle use for short distances. These vehicles require charging to allow continuous use. For this purpose, we propose incentivizing municipalities deploying charging stations in central locations. The cost of this move is estimated at 20 million NIS.



Step 5: Promoting Electric Transportation in Israel

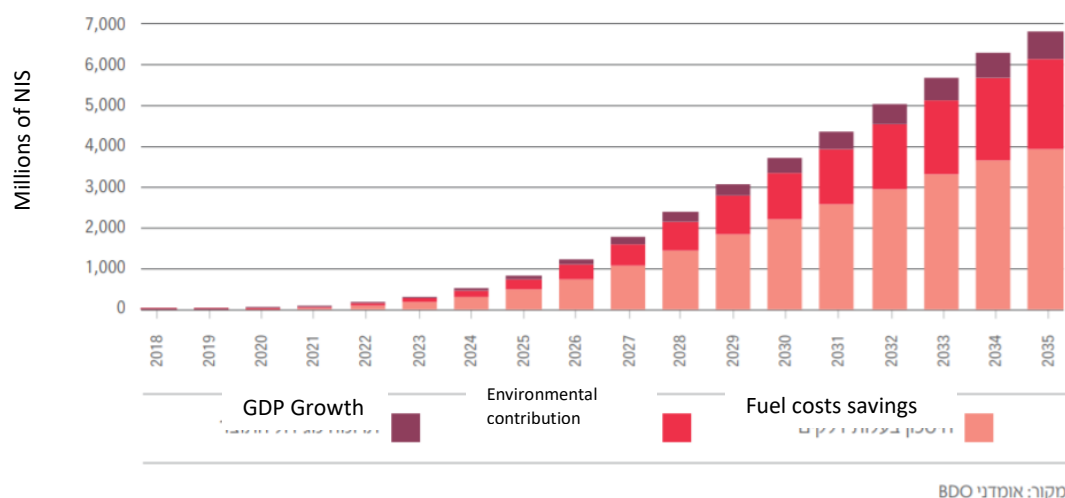
1) Background:

While Israel is still recovering from the national trauma of the failure of the electric vehicle venture Better Place, the world auto market is quickly advancing towards the electric vehicle revolution, powered a combination of economic and regulatory motives. In the past five years, battery prices have dropped by 60% while its driving range has doubled. Estimates are that within five years, the purchase price of an electric vehicle will be identical to that of a gasoline powered vehicle, without taking into account tax benefits to green vehicles.

Israel, as a small, isolated densely populated country blessed with large reserves of natural gas for electricity production, with relatively inexpensive electricity rates and high gasoline prices has a clear advantage for using electric vehicles compared to other developed countries. Despite this, Israel is falling behind compared to Western countries in electric vehicle usage. Norway, where 35% of vehicle sold in 2017 were electric or hybrid, shows that there is no inherent technological or consumer barrier for electrical vehicle purchase and that through supportive government policy significant penetration rates can be achieved today.

According to a study carried out by BDO Consulting, the total contribution to the national economy by 2035 from switching to electric vehicles will be 12 -28 billion NIS⁶⁰.

The benefit to the national economy from switching to private electric vehicles:



⁶⁰ BDO, the electric car revolution 2018-2030, 2018



The infrastructure of electric charging is currently available mostly in the private sphere and nearly non-existent in the public one.

Israel has 2.85 million private cars. Every year about 270,000 new cars are purchased and about 160,000 are disposed of. The number of electric vehicles purchased in Israel is negligible. In 2017 only about 0.05% were electric vehicles and about 0.5% were plug-in vehicles. In the first quarter of 2018, this rate continued but there was a slight increase to 1.4% plug-in vehicles sold. Non-plug-in hybrid vehicles have a better penetration rate and they account for 10% of all purchases in the first quarter of 2018 and accounts for 3% of all the vehicles in Israel. The array of models and brands of hybrid vehicles is increasing but the selection of electric vehicles is still very limited. Today, a tax break worth 1,000 NISs on the deductible amount for car use for tax purposes is in effect. This translates to only about 100 – 150 NISs a month for the employee as the following chart demonstrates.

Tax rate	Model	Car price	Taxable value %	Taxable value	Updated taxable value (after discount)	Original tax	Tax	difference in tax
32%	Zoe Intense	144,000	2.48%	3,571	2,581	1,143	826	95
	Hyundai i25	116,000	2.48%	2,877	2,877	921	921	
47%	Zoe Intense	144,000	2.48%	3,571	2,581	1,678	1,213	139
	Hyundai i25	116,000	2.48%	2,877	2,877	1,352	1,352	

Recently, the Ministry of Energy declared that starting in 2030 the import of gasoline or diesel-powered vehicles will not be allowed in Israel. This is an important and substantial step in the effort to reduce air pollution, but this plan must include several other components currently missing.

Electric transportation includes not only private vehicles but also buses, whose conversion to electric power will have a significant effect on the level of pollution and noise level in the cities. In recent years, electric bus use is growing around the world. Despite the limited travel range of electric vehicles that may discourage people from using them, the range of a city bus is limited and pre-determined according to its route and its work load so charging times can be planned accordingly. Additionally, bus fleets park at the end of the day in designated lots so it is relatively easy to solve the issue of charging infrastructure⁶¹.

For example, in the U.S., the Public Transport Authority in the Antelope Valley, serving 45,000 people in the Los Angeles area seeks to become the first such company with an entirely electric bus fleet. At the end of 2018 it stopped using

⁶¹ "why electrifying transportation should start from public Transportation", Doron Vadai, May 2018



diesel-powered buses and replaced them with 80 electric buses. It received federal funding for this purpose as well as \$46 million from the State of California⁶². San Francisco announced in May that they will begin purchasing only electric buses in 2025 and will have a totally electric fleet by 2035.

In Israel, electric buses were first used in 2017. This was possible thanks to a 23 million NIS grant from the Ministry of Environmental Protection that allowed for the purchase of 62 electric buses, including 25 Egged buses in the Haifa area and 21 Dan buses in Tel Aviv⁶³. The move has not been completed because of a delay of the arrival of the buses in Israel and incomplete charging infrastructure.

Electric trucks is sector still in development. Tesla is expected to launch electric trucks in 2019, Mercedes has ten of them in pilot stage until 2020 and BYD offers such trucks, as well. McKinsey Consulting predicts that light and medium weight electric commercial vehicles, such as pick-up trucks and various kinds of light trucks could reach 8 – 34% of the market by 2030.

This large range depends on market conditions: market needs and maintenance costs versus diesel engines. Maintenance costs of electric vehicles are lower but the purchase price is much higher. For example, a BYD waste collection truck currently costs \$300,000. City air pollution prevention regulation might accelerate or slow down with the adoption of electric commercial vehicles. The McKinsey Report found two factors limiting the electric vehicle market – a limited selection of models and fast charging technology that is not fully developed.

2) Principles of the Move to Encourage the Penetration of Electric Vehicles:

a) Promoting electric buses and electric trucks

1. **Buses and mini buses** – incorporating mandatory integration of electric buses into public transportation operating tenders at an increasing rate up to 100% in 2030
2. **Waste collection trucks** – supporting the penetration of electric waste collection trucks in municipalities
3. **Other trucks** – supporting pilots through incentives for the import of electric trucks

⁶² Taub, Eric, "Buses, Delivery Vans and Garbage Trucks Are the Electric Vehicles Next Door", New York Times, 21.6.2018

⁶³ Electric buses, Israeli Ministry of Environmental Protection website



4. **Shared taxi vans** – requiring that at least 50% of the fleet in shared taxi van tenders be electric
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- b) Setting Targets for the Short and Medium Term**
 1. **Short term target – 2022** – 25% of new vehicles in Israel will be fully electric
 2. **Medium target – 2025** – 30% - 50% of vehicles on the roads will be fully electric
 3. **Long term target – 2030** – 100% of vehicles will not be gasoline powered
 - c) Locking in the Purchase Tax Benefit (10% and 20% purchase tax) and the Deduction Rate Benefit for Fully Electric and Hybrid Plug-in Vehicles until 31.12.2022.**
 1. A gradual increase until full taxation
 2. Leaving the benefits for hybrid and plug-in vehicles as temporary
 3. Soft incentives: reduced toll roads fare and lower city parking rates (under the authority of the municipality)
 - d) Increasing the differentiability of the taxable value of electric cars provided by the employer.** The difference in the taxable value of electric cars should be raised to about 2,000 NIS so that employees would receive an additional 500 – 750 NIS a month. This hike can drive to choose electric vehicles as the vehicle provided to them by the employer.
 - e) Government and the Public Sector as Leaders:**
 1. Allow the choice of an electric vehicle to those entitled to an employer entitled vehicle
 2. Declare the purchase of 200 electric vehicles for the government fleet each year
 3. Declare the purchase of 200 electric vehicles for the Ministry of Defense fleet each year, requiring ministers and general directors of ministries to use electric or hybrid plug-in.
 4. Confirming the recommendations following government decision 2592
 5. Requiring the public sector-statutory authorities, government corporations and local governments to enact similar policies



f) Charging Infrastructure

1. Promote a move in cooperation with the Israel Electric Company to regulate the installation of designated electricity meters in a short period and through a simple transparent procedure
2. Promote the option of a subdivision of electricity consumption in public areas and charging proportionately based on specific consumption
3. Increasing awareness for existing solutions
4. Promoting a mechanism that will not allow building residents' boards to resist or to create unreasonable obstacles for installing charging stations in private parking
5. Accelerate the confirmation of the proposed revision and its publication to various stake holders and the general public

g) Marketing and Information Campaigns Among Vehicle Importers, Fleet Managers and the General Public – meant to encourage the penetration of electric vehicles to Israel while presenting its environmental, economic and societal benefits



Step 6: Incentivizing Municipalities to Integrate Smart Transportation and Congestion Reduction

1) Background

Municipalities in Israel currently hold many transportation related authorities, such as the allocation of HOV lanes, cancelling parking spots, installing smart traffic lights which give priority to pedestrians and cooperating with shared vehicle companies. The enlistment of municipalities to improving transport in Israel and incorporating smart mobility is critical. The residents of municipalities which will seriously promote this issue will enjoy a higher quality of life and better accessibility. To get municipalities on board it is not enough to cover the costs of diverting lanes into HOV or two-wheeler lanes, but rather more aggressive incentives are needed.

A meaningful and successful example of a city that implemented a holistic plan for reducing traffic congestion is Seattle. It is a 4 million people metropolitan area which used to suffer from intolerable traffic congestion. In 2006, it launched a program that included cooperative initiatives with major employers, incentives for residents who would give up their vehicle, reduced the economic benefit of using private vehicles and a massive investment in expanding public transportation for which large public support enlisted.

Following the mass shift to public transportation, the number of cars in the city shrunk by 4500 since 2010 and the number of daily rides in public transport rose by 41,000. Seattle also encourages its residents to carpool. To this end, it supported the RideShare platform that includes creative city specific solutions. Among them, for example, is VanShare which connects public transportation stations, such as train, bus and ferry, and allows travelers to share city operated van rides. Seattle also installed a smart traffic light system equipped with sensors that identify the number and kind of vehicles in each lane and managed traffic signals according to traffic flow⁶⁴.

Another example is Toronto. It declared a comprehensive plan for reducing traffic congestion for 2016 – 2020. Its vision is “maximize safety, efficiency, reliability and sustainability of the transportation network through innovation and technology

⁶⁴ Harari, Keren, Calcalist, "The City that beat Traffic Congestion"
<https://www.calcalist.co.il/local/articles/0,7340,L-3734048,00.html>



for all its users while reducing its environmental impact.” The program gives special attention to the needs of all residents – pedestrians, bicycle riders, public transportation users, drivers, emergency services and commercial deliveries. The various projects in the program are categorized under nine strategic aspects: smart transportation system, research and engineering, responses to various scenarios, curbside management, coordinating construction and infrastructure work, supporting all kinds of transportation, including public, pedestrian and two-wheeled, continuous maintenance and transportation operating centers⁶⁵.

In California, legislation passed back in 1990 called the ‘Congestion Management Program’ (CMP). The program implemented proposition 111 for financing statewide transportation which required local municipalities to implement congestion relief measures to offset the implications of regional transportation systems development. Its goal was to transfer decisions regarding land use, transportation and air quality to the local and regional level. It demanded that every county appointed a congestion management authority and stipulated that counties that would not meet their requirements would lose their share of the gasoline tax⁶⁶. Thus, in many counties in California, such as Santa Barbara⁶⁷, San Mateo⁶⁸ and San Joaquin⁶⁹ congestion management programs are issued annually.

In Israel, Ashdod was selected in 2013 as a model city for sustainable transportation and it launched an extensive program called "Reway: smart roads for future mobility". It includes integrating smart sensors on the city's roads; advanced cyber optics infrastructure; smart cameras on new buses; digital bus stations and a command and control center that would merge with the emergency command center in Ashdod.

The program includes several projects:

- **Rebus** for public transportation: a network of public transportation lanes for smart buses; using BRT, a quick bus system and new stations
- **Rebike** for bicycle riders: a network of 23 kilometers of bicycle lanes that will connect to various neighborhoods of Ashdod to the city's centers and employment hubs; operating shared bike services
- **Rewalk** for pedestrians: creating a 13 kilometer network of walking paths and planting 1,000 along them. In 2017, Microsoft, Mobileye, M.I.T. and

⁶⁵ Toronto congestion management plan (CMP) 2016-2020

⁶⁶ Is California's Congestion Management Program at the end of the road, February 12, 2014, The planning report

⁶⁷ http://www.sbcag.org/uploads/2/4/5/4/24540302/2016_congestion_management_program_doc_final.pdf

⁶⁸ <https://www.menlopark.org/DocumentCenter/View/303/Transportation-Demand-Management-TDM-Guidelines>

⁶⁹ <https://www.sjcog.org/DocumentCenter/View/4260/-2018-Adopted-RCMP-PDF?bidId=>



the municipality of Ashdod announced the establishment of a hub to develop technologies in the transportation field so that Ashdod would become a research and development center for future transportation.

These are just a few examples of municipalities that have decided to adopt pro-active policy to change their transportation conditions. Such change improves the city's environment and positively affects its quality of life and economic activity.

2) Principals of the Move to Incentivize Municipalities to Integrate Smart Transportation and Congestion Reduction

- a) Issuing a call for municipalities to sign up for a share of a hundred million NIS annual grant for this purpose. The grant will offer municipalities the ability to develop a plan for reducing traffic congestion and incorporating smart mobility.
- b) The program can include public transportation lane allocation; bicycle paths; shuttles to employment centers; closing off city centers to private vehicles; cancelling curbside parking in favor of HOV lanes; joint ventures with companies, such as shared vehicles, technology companies, etc.
- c) Municipalities of lower socio-economic ranking will receive priority in the grant distribution.
- d) The grants will be open to municipalities with more than X residents.
- e) Preference will be given to programs where HOVs and two-wheeler lanes are a substantial component. Grant money will be distributed over three years according to the rate of project advancement and their implementation.
- f) The grant amount given to each municipality will be higher than its project cost so that implementing the program will be profitable for the municipality.



Step 7: Regulatory Infrastructure for Promoting Technology

1) Background

Vehicles with partial autonomous capabilities are already being sold and are on the roads. Vehicles with advanced autonomous capabilities are currently in road test stages, but they still require driver supervision and can only deal with limited scenarios. Most car manufacturers project that by the early 2020s vehicles that will drive autonomously in 90 - 95% scenarios will be available. To enable mass marketing of autonomous vehicles, suitable regulatory environments must be developed. Today, several countries have created supportive regulation for the experimental stages, most notably California, but there is still no legal framework for commercial activity of autonomous vehicles. Legislators, including Israeli ones, will have to set out guidelines for aspects including safety, manufacturing standards, licensing, insurance, traffic laws, etc⁷⁰.

2) Promoting Autonomous Vehicle Regulation

a) Background

The automation of vehicles began back in 1958 with the advent of cruise control⁷¹. It continued to develop with the anti-brake lock system in the 70s and a stability control system in the 90s. Since then, autonomous innovations seeking to reach full automation, where a driver will no longer be needed, have continued. Today, about 30 companies around the world are developing autonomous vehicles, including Tesla, GM, Mobileye, Toyota, Microsoft, Apple and Google. Some estimates claim that by 2035 there will be about 50 million autonomous vehicles on the road around the world⁷².

The vehicle autonomy is not necessarily absolute. The organization of automotive engineers, SAE⁷³, defines six levels of autonomous driving.

Level 0 is without automation control and with total human control

Level 1 includes specific support abilities to the driver, such as a warning when deviating from the lane.

On **Level 2** are partially automated vehicles that can operate two systems together, for example steering and braking. At this level, the driver must still be in control of the vehicle.

⁷⁰ The Innovation Report 2017, Innovation Authority

⁷¹ "Regulation of Autonomous Vehicles", an MA Paper guided by Prof. Yehuda Levy Pe'or, Hebrew University of Jerusalem 2017

⁷² Autonomous vehicles- The legal landscape in the US and Germany, Norton Rose Fulbright, July 16

⁷³ Society of Automotive Engineers



Level 3 is conditioned automation. Here, the driving functions are totally automatic but it is expected for the driver to respond and intervene according to system warnings.

On **Level 4**, the driver can safely engage in other activities during the ride but a human driver is still required in case there is a need to take over the car.

Level 5 is total autonomy in which the vehicle can drive on its own without a human driver and also knows how to fix malfunctions.

The state's main regulatory role regarding autonomous vehicles is managing risks, safety and responsibility issues. The proliferation of autonomous vehicles requires a change in vehicle regulation as there are many lacunas and question marks that will need to be addressed through existing regulatory bodies.

In the U.S., transportation regulatory policy is divided into two levels – the federal level - the Transportation Department and the National Highway Traffic Safety Administration (NHTSA), and the state level. In 2016, the federal government announced its intention to invest \$4 billion in R & D for autonomous vehicles and for building suitable infrastructure as part of a ten year program. In addition to the monetary investment, the government committed to accelerating the creation of regulatory guidelines for autonomous vehicle manufacturers and to removing regulatory blocks that prevent their development. Since 2016, the Department of Transportation and the NHTSA publish a document with regulatory guidelines annually. The guidelines are not law so they are not yet binding for auto makers and independent driving system developers. They are voluntary guidelines since the field is still developing.

On the state level, there is regulation as far as licensing, registration, enforcement of traffic laws, insurance and responsibility. In California, the Department of Motor Vehicles passed bylaws regarding responsibility in the case of an accident or a fault in autonomous vehicles. In June 2018, California allowed autonomous driving companies to carry passengers in the State. Arizona and Texas are also experiment labs for autonomous vehicles. In 2017, the German government published an ethical code in the field of autonomous vehicles and they are the first country to do so. This followed the approval of legislation that permitted the driving of autonomous vehicles on German roads as long as there is a driver who can take over the vehicle if necessary.

In Israel, in 2017, the Ministry of Transport published a procedure for the approval of experiments in vehicles for research and development of automated technological systems. The GM development center in Israel carries out



experiments on public roads in prototypes of Cadillacs with high level autonomous driving systems. Additionally, in October, 2018, Intel announced that it would launch in Tel Aviv a driver-less shuttle service pilot in cooperation with Volkswagen and its Israeli importer Champion Motors. Today, according to the agencies, Mobileye has six test autonomous vehicles in Jerusalem with a goal of expanding the fleet to 35.

b) Principles of Promoting Autonomous Vehicle Regulation

1. An extensive review of world regulation, specifically in the U.S. and Europe, in preparation for the autonomous vehicle
2. Extensive review of the existing regulation in Israel which is blocking the penetration of autonomous vehicles
3. Joining with stakeholders who are advancing pro-autonomous vehicle regulation in the world and applying the needed regulation changes in Israel
4. Creating partnerships with international corporations that are developing autonomous vehicles and incentivizing them to carry out pilots in Israel

3) Creating the World's Biggest Transportation Information Center

a) Background

The transportation revolution leans heavily on data. Smart transportation systems, like the information services for public transport, monitoring and managing speed limits, smart parking, smart traffic lights, etc., are based on collecting data that is processed and analyzed and turned into concrete conclusions and the basis for decision making. Without extensive and comprehensive information, transportation infrastructure cannot be planned and transportation as a whole cannot be managed⁷⁴. Using data enables a wide array of applications both for transportation planning and for the transportation industry.

So, for example, collecting and analyzing city traffic data reflects road usage patterns and vehicle movement over time. Once these patterns become clear, cities can make strategic decisions on how to efficiently combine and coordinate resources, such as traffic lights, parking and public transportation stops to reduce congestion and raise the level of safety and efficiency of city transport.

⁷⁵Also, extensive collection of data will allow integration of machine learning based systems to make strategic decisions in real time. Moreover, using various data

⁷⁴ https://ac-els-cdn-com.ezproxy.bgu.ac.il/S2210670717309757/1-s2.0-S2210670717309757-main.pdf?_tid=37afb322-47a3-4437-973f-846199a4ae8a&acdnat=1545861954_8a4e997f6d27459692b98cf2e28714a5

⁷⁵ How Data and cities can shape the future of mobility, Nancy Torres, December 12, 2017



sources together with new technologies can advise regarding what, when and how to implement regulation on the local and the national level⁷⁶. Using and expanding existing data, along with building smart infrastructure for new traffic data will help cities and countries form the basis for a future of autonomous inter-connected vehicles.

Autonomous vehicle technology continues to develop and these vehicles will use sensors to directly communicate with each other. They will also communicate with city infrastructure to optimize traffic flow, pay a toll or find parking. A smart network of vehicles connected to 'everything' (V2X) and supplying data will eventually lead to a more efficient city.

The model proposed by Future Mobility IL includes a tender for the selection of a company that will gather information from vehicles through data providers. These providers would not necessarily work exclusively in this field but they would be creating this data through their activity. Implementing this step would make Israel one of the most attractive places for the operation of companies in transportation and related fields. Based on this information, new companies could emerge or it might drive international companies to operate in Israel. It would also help government, national and local, to better manage and plan traffic.

b) Principles of the Move to Create Traffic Data and Disseminate it freely

1. The government will pay a company that will acquire the information from information providing companies, process it while standardizing it and make it accessible for free through open code for various uses. The information will be anonymous so that privacy will not be compromised.
2. The available information will be both raw (but anonymous) and processed for research and the drawing of conclusions.
3. The project will include at least a million vehicles in Israel.

⁷⁶Fenwick, M., Kaal, W. A., & Vermeulen, E. P. (2016). Regulation Tomorrow: What Happens When Technology Is Faster than the Law. *Am. U. Bus. L. Rev.*, 6, 561.



Step 8: Work Conditions Flexibility

1) Background

Road congestion, especially during the rush hours at the beginning and end of the work day, is a major problem facing big cities in the world. Workplaces that offer flexibility in working hours reflect a new developing approach: managing congestion through voluntary behavioral change. Flexible workplaces combine the various options of work hour flexibility to reach a more holistic approach and achieve transportation benefits, such as spreading out rush hours and organizational benefits, such as raising employee productivity and satisfaction⁷⁷.

In 2009, Brisbane in Australia launched the ‘flexible workplace pilot’ whose results showed the advantages of this holistic approach and its effect on driver behavior and rush hour congestion. The pilot was a month long and included 20 private and public organizations which employ 900 workers in Brisbane’s business center. Participants were offered three options for work flexibility: work hour flexibility, a condensed work week or working from home. During the pilot, morning rush hour travel (7 – 9 a.m.) was reduced by 34% and evening rush hour travel (4 – 6 p.m.) was reduced by 32% among participants. Thus, an estimated 6,100 private vehicle kilometers were avoided⁷⁸. 92% of participants said they would like to continue the flexible work arrangement; an increase of 68% was reported in employee productivity and an 80% increase in work-life balance.

A study by the Center for Economics and Business Research in the UK and CITRIX found that an increase in flexible work conditions can save employees in Britain 7.1 billion pounds a year and more than half a billion hours due to travel costs and travel time, as well as increase UK GDP by 0.7%. It also found that flexible work conditions might increase the work force by bringing back people into it many who are unemployed because their life circumstances that force them to remain at home⁷⁹.

In the U.S., the Department of Transport launched the ‘city partnership agreement’, a plan meant to reduce road congestion. Metropolitan areas submitted requests for the funding of aggressive congestion management, with

⁷⁷ Cleary, N., Worthington-Eyre, H., & Marinelli, P. (2010, September). More Flex in the City: A case study from Brisbane of spreading the load in the office and on the road. In Australasian Transport Research Forum (ATRF), 33rd, 2010, Canberra, ACT, Australia.

⁷⁸ Flexible Workplace Program- Brisbane Central Pilot Report, September 2009, The Nielsen Company

⁷⁹ The productive value of the untapped workforce: A study into the potential economic impacts of a flexible working culture, Report for Citrix, November 2014



one of the steps being working from home, the step which requires the least infrastructure investment. The Telework Enhancement Act from 2010 guides federal authorities to develop flexible work patterns, wherever possible. In Minnesota, for example, 48 employers and more than 4,000 employees participated in such a program call "e-workplace" to promote flexible work conditions and reduce travel during rush hours. The project provided support to employees for building a telework plan, regulating work policy and evaluating the results of the move for employers. Participants saved an average of 44 travel hours a year, equal to a full work week, while reducing 7.46 million kilometers of travel⁸⁰.

Countries such as Britain, Canada, New Zealand and Ireland have mechanisms defined by law that set appropriate processes and clear criteria for regulating flexible work conditions on the company level⁸¹. As part of these programs, an employee submits a request to the employer for flexible work conditions. The employer might approve or decline the request according to set parameters within a defined timeframe and rejection of the request must have reasonable grounds defined by law.

Flexible work arrangements are divided into three main groups: work hour flexibility, work pattern flexibility and work place flexibility. Singapore offers an incentive program for businesses to apply flexible work arrangements. A business can receive up to 160,000 Singapore dollars (\$120,000 U.S.) for allowing such arrangements and additional funds might be available for applying other employment principles the government program supports.

In Israel, the Work Hour Law does not include flexible work arrangements. However, in July, 2017, a law was proposed for flexible work arrangements but it has yet to be discussed in the ministerial legislation committee. In a survey among employees conducted by the Israeli Institute for Democracy in June 2018 about work condition flexibility, most respondents expected it to have a positive influence on them in the work place, regarding all parameters examined: general satisfaction, level of pay, the degree of absenteeism and sick days, productivity and the company's performance as a whole. All this, was in addition to the positive impact such a move would have on road congestion⁸².

⁸⁰ Lari, A. (2012). Telework/Workforce flexibility to reduce congestion and environmental degradation? *Procedia-Social and Behavioral Sciences*, 48, 712-721.

⁸¹ A comprehensive Review of Various Countries Mechanisms, Neta Moshe, " Work life balance in Various countries", The Knesset Research Center 2015

⁸² A Survey among salaried Employees about employment flexibility, June 2018, the Israel Democracy Institute.



Period of Reference and Work Hours:

The method of calculating the overall hours is defined in the "Work Hours and Rest Law" that addresses several parameters: defining the number of work hours, the period of reference and compensation for overtime. One of the main parameters relevant to flexible work conditions is the period of reference, the time period on which the total work hours is calculated for overtime purposes. The period of reference in Israel today is daily, and employers are required to pay overtime after more than 8.4 hours of a work day in a five-day work week, regardless of the number of days and hours the employee worked during the rest of the week. The law can set different times for this calculation – week, month, year or any other period. In Israel, the period of reference is much shorter than in other countries. For example, in the U.S. the period of reference is weekly, in Sweden - monthly and Germany - semi-annual and in Poland - annual.

Changing the period of reference to be longer has the potential to hurt employee rights and wellbeing, especially that of the weaker and more vulnerable employees⁸³. They could be hurt by converting overtime hours into 'regular' hours because of flexibility, reducing the employee's compensation for them. In light of this, different reference periods can be determined according to various economic sectors, depending on their potential benefit and their vulnerability to suffer due to a reference period.

1. Principles of the Move for More Flexible Work Hours

a) Creating a mechanism for flexible work condition arrangements, by adopting the proposed law 'flexible work arrangements'

The proposed law suggests an arrangement that allows for flexibility in work hours, location and the way the work is carried out, to be determined by the employer. This includes flexibility regarding the time work begins and ends, the way work hours are divided daily, weekly, monthly or annually, whether the work is being done partially or wholly at the employee's home, an extension of the workplace or anywhere that is not the usual workplace. The proposed mechanism includes a detailed procedure for applying for work hour flexibility request by the employee, defining possible considerations for denying the request by the employer, as well as an appeal procedure.

⁸³ The Work and Rest Hours Law and Workforce Flexibility Mechanisms, The Israel Democracy Institute, 2018.



A study conducted by the Israel Democracy Institute led by Prof. Yotam Margalit suggested applying the law gradually instead of immediately and to all sectors. Additionally, it proposes simplifying the bureaucratic procedure of the flexible arrangement request. According to the law, if the employer declines such a request the employees may submit an appeal which requires the employer to meet with them within 14 days. The study suggests waiving this requirement. It further proposes that the authority to discuss flexible work arrangements should be given to a designated authority at the Ministry of Labor and not to the regional labor court. We recommend adopting the proposed law and integrating the changes proposed in the research.

- b) **Extending the period of reference for work and rest hours to a month, and sectors to be determined by the Minister of Labor**
- c) **A focused regional pilot and incentives to employers to adopt a flexible work hour model**

As part of the pilot, a central employment area, such as Ramat HaChayal, will be selected and employers in the area will be enlisted to adopt the flexible employment model. To assist them, support will be given to build a flexible employment program and for working out the new policy with employees. An incentive will also be given to compensate for the resources invested in the pilot (including advertising, for example). The pilot will allow examining and measuring the influence this move will have on road congestion in a certain area, like the pilot conducted in Brisbane and Minnesota, in order to examine its implementation in additional places.



Decisions that need to be made for the implementation of this plan:

1) Shared transportation

- a) Allowing charging passengers for rides
- b) Compensating taxi license owners with a one-time 20,000 NIS compensation
- c) Taxing rides in vehicles with a capacity of five passengers or less 2 NIS per ride
- d) Converting every public transportation lane to an HOV lane for 3 passengers or more
- e) Operating shared rides to and from train stations

2) Road pricing and parking pricing

- a) Enacting road pricing in Israel
- b) Cancelling the annual vehicle licensing fee except for luxury vehicles
- c) Reducing taxes on gasoline by 0.35 NIS a liter and determining that it would change according to the State's revenue from road pricing
- d) Doubling curbside parking prices and making them minimum prices
- e) Making employee public transportation expenses tax exempt, including shared bikes, taxis, etc.
- f) Taxing employee parking benefits

3) Promoting public transportation

- a) Promoting a government decision that on every busy city and inter-city road of two lanes or more, at least one lane will be allocated solely to public transportation
- b) Giving a subsidy of 2 NIS per passenger to public transportation operators starting at 95% of the total rides performed in the previous year. New tenders will offer a subsidy of 2 – 10 NIS per passenger according to a rising scale
- c) Allowing public transportation operators to plan 25% of service routes in each cluster
- d) Incorporating technologies which give preference to pedestrians and public transportation, such as smart traffic lights
- e) Closing off city centers to private vehicles through incentivizing municipalities

4) Encouraging the Use of Bicycles and Kick-scooters

- a) Accelerated creation of designated lanes for two-wheeled vehicles
- b) Increased enforcement of traffic laws
- c) Incentivizing municipalities to set up charging stations for shared electric bicycles and kick scooters in cities



5) Promoting Electric Transportation

- a) Subsidizing the purchase of electric buses, commercial vehicles and waste collection trucks and encouraging pilots for electric trucks
- b) Promoting market penetration of electric transportation, including private vehicles, taxis, buses and trucks
- c) Setting targets of electric vehicle sales: 25% in 2022, 50% in 2025, along with the target already set of 100% in 2030
- d) Providing certainty on electric vehicle taxation: locking in the purchase tax benefits (10 and 20% purchase tax) and the deduction rate benefit for fully electric and hybrid plug-in vehicles until December 31, 2022
- e) Increasing the differentiability of the taxable value of electric cars provided by the employer (increasing the benefit by 1,000 NIS)
- f) Government and public sector as leaders
- g) Promoting charging infrastructure
- h) Marketing and public awareness campaign among vehicle importers, fleet managers and the general public

6) Incentivizing Municipalities to Integrate Smart Transportation for Congestion Reduction

Allocating 200 million NIS a year to incentivize large municipalities to integrate smart transportation and congestion reduction, including: closing off city centers to private transportation, converting curbside parking to HOV or two-wheeler lanes, cooperating with companies that supply smart mobility solutions, creating bike lanes, and more.

7) Advancing Regulatory Infrastructure that Promotes New Technologies

- a) Monitoring evolving regulation regarding autonomous vehicles in Europe and the U.S.
- b) Creating partnerships with entities promoting regulation in leading countries
- c) Creating partnerships with leading companies in the world that are developing autonomous vehicles and encouraging them to perform pilot tests in Israel
- d) Establishing a vehicle data center so that information from a million cars would be accessible for free for various uses

8) Work Hour Flexibility

- a) Legislation changes that would allow flexible work conditions
- b) Extending the period of reference for work and rest hours to a month in sectors to be determined by Minister of Labor
- c) Performing a focused regional pilot and providing incentives to employers for adopting a flexible employment model



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