



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 769086



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CITY OF DUBROVNIK

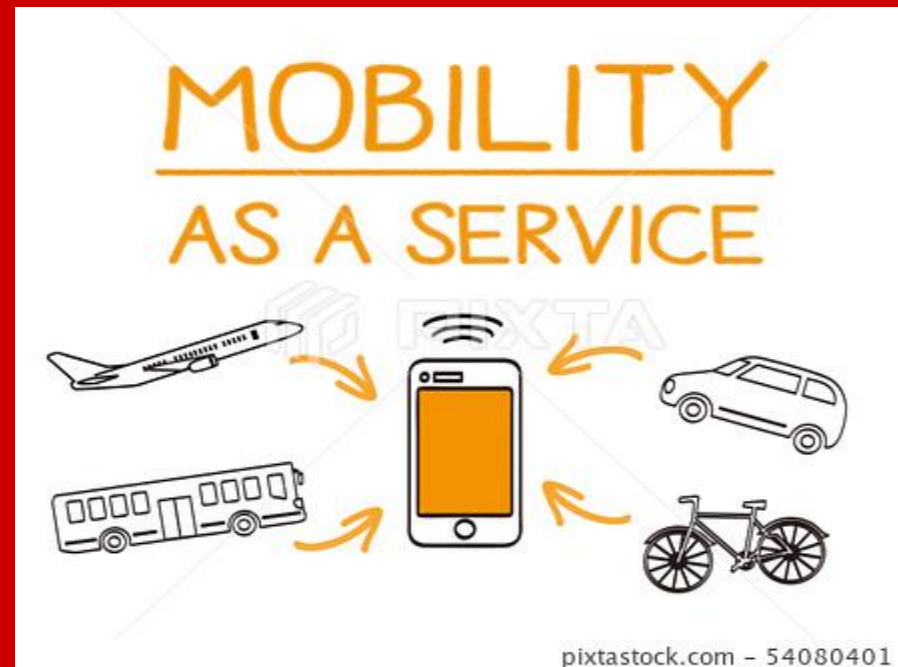


RESPECT
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SVEUČILIŠTE
SJEVER

UNIVERSITY
NORTH

Mobilnost kao usluga



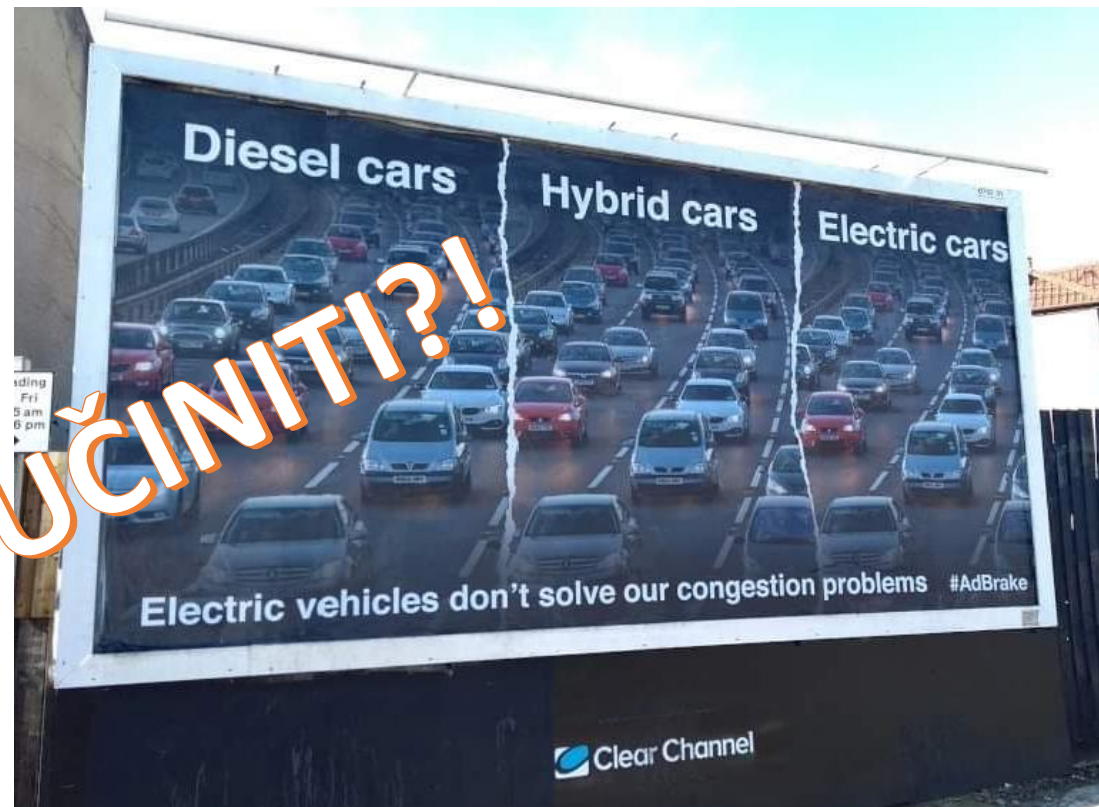
Dubrovnik, 08/10/2021

NEKE ČINJENICE

- EU – motorna vozila = 268 mil osobnih automobila + 40 mil komercijalnih vozila
- osobnih vozila na alternativni pogon - samo 3.4% od ukupne EU flote
- EU danas – urbana područja — 72% populacije (41% gradovi, 31% predgrađa)
- Svijet danas – urbana područja - 50% populacije
- **2050** - 60%

- 1/4 globalnih štetnih emisija dolazi iz transporta
- cestovni promet – čini 83% zagađenja, zagušenja, prometnih nesreća, buke

ŠTO UČINITI?!



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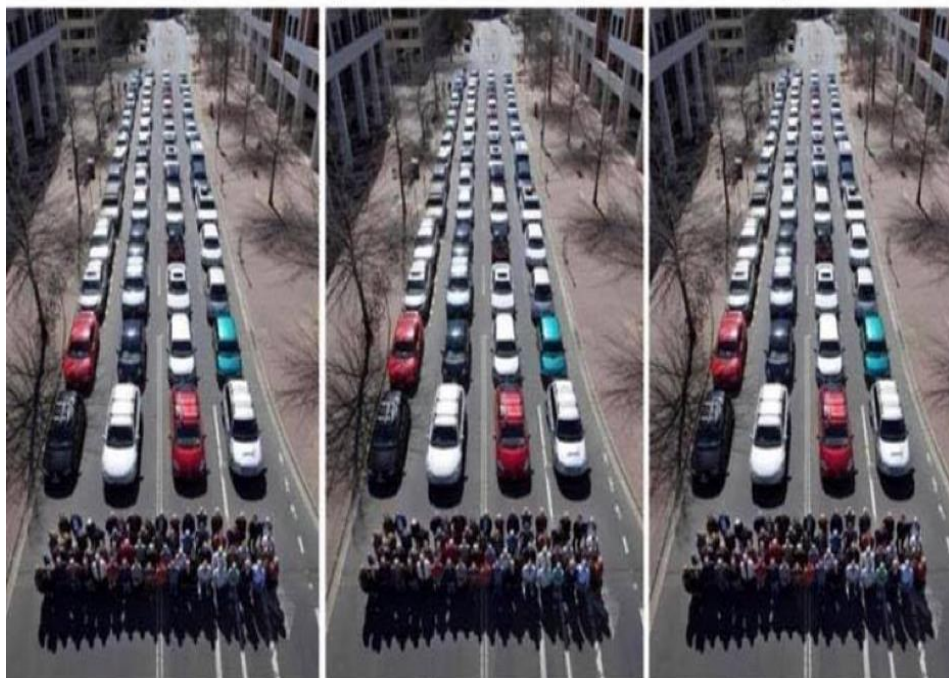
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NEKE ČINJENICE

- domaćinstva trenutno koriste 20% svog proračuna za prijevoz, većinu za automobile
- automobil „stoji” neiskorišten 96% vremena
- najgore – popunjenost automobila pri upotrebi – jedna osoba

Space Required to Transport 48 People



Car

Electric Car

Autonomous Car

ŠTO UČINITI?!

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ODRŽIVA MOBILNOST

- **Održivost** - usredotočuje se na potrebe sadašnjosti bez ugrožavanja sposobnosti budućih generacija za njihove potrebe
- **Mobilnost** – sposobnost slobodnog ili lakog kretanja
- **Održiva mobilnost** - različiti načini prijevoza proizvode manje zagađenja i troše najmanje energije po prijeđenom kilometru uz potpunu sigurnost za putnike
- **Sustav održive mobilnosti** - sustav koji će imati razumne troškove, koji će učinkovito funkcionirati i koji će svim građanima ponuditi izbor između različitih alternativa prijevoza

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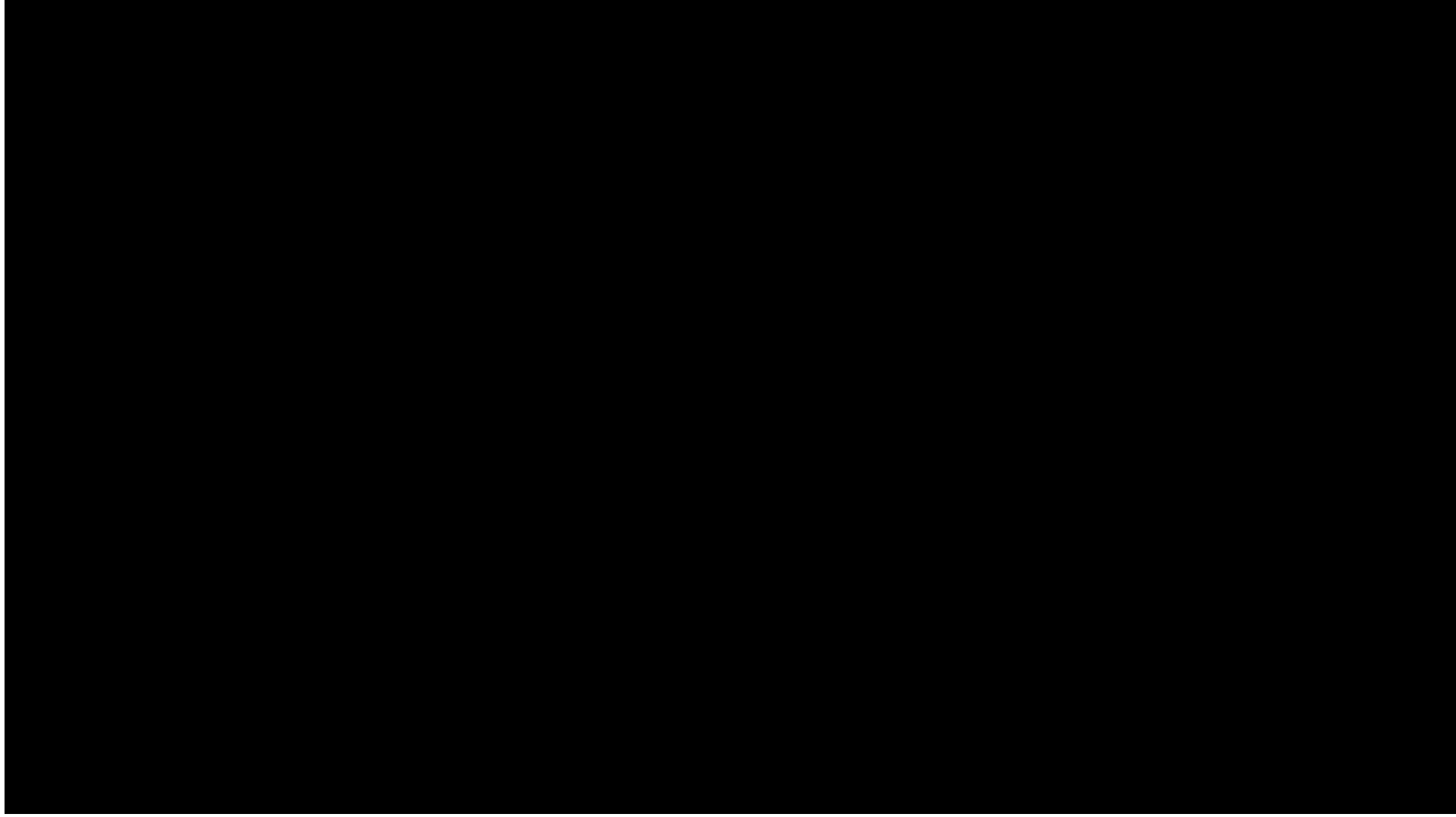
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MOBILNOST U GRADOVIMA

urbana mobilnost

javni gradski prijevoz

individualni prijevoz

teretni promet



ODRŽIVI SUSTAVI PRIJEVOZA U URBANIM SREDINAMA

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Umjesto automobila!!!

MIKROMOBILNOST

0 – 3 km



**BIKE
SHARING**



SREDNJE UDALJENOSTI

3 – 20 km



**RIDE
HAILING**



VELIKE UDALJENOSTI

20+ km



**PEER-TO-PEER
CAR SHARING**



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Javni prijevoz putnika

- najbolji prijevoz u velikim gradovima
- standardno - tramvaji, metro, brze gradske željeznice ili konvencionalni autobusi;
- električni autobusi i moderni trolejbusi
- smanjenje zagušenja, zagađenja zraka i smanjenje buke
- oko 17% gradskih autobusa je električno
- Gradovi EU - Pariz, Prag, Beč i Budimpešta - veliki udio javnog prijevoza



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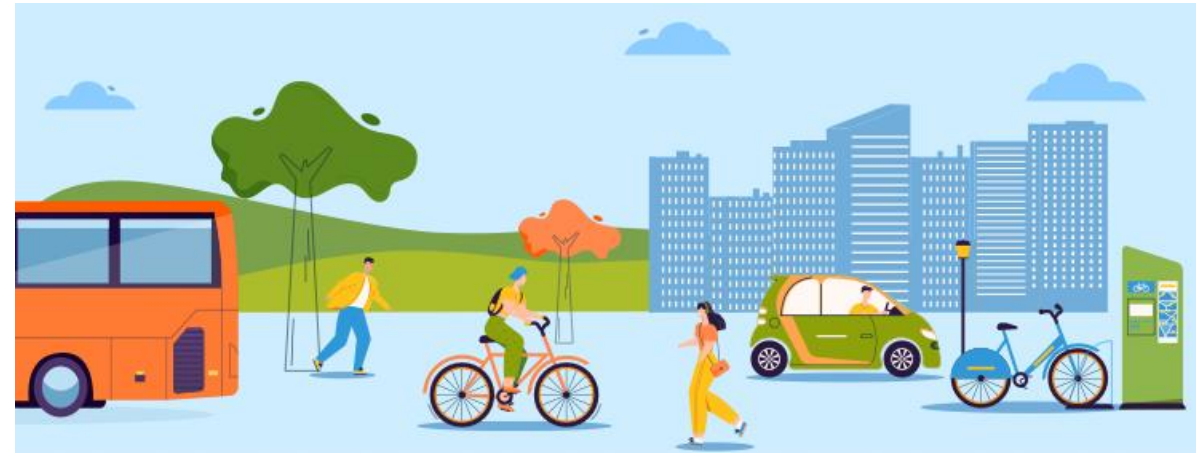
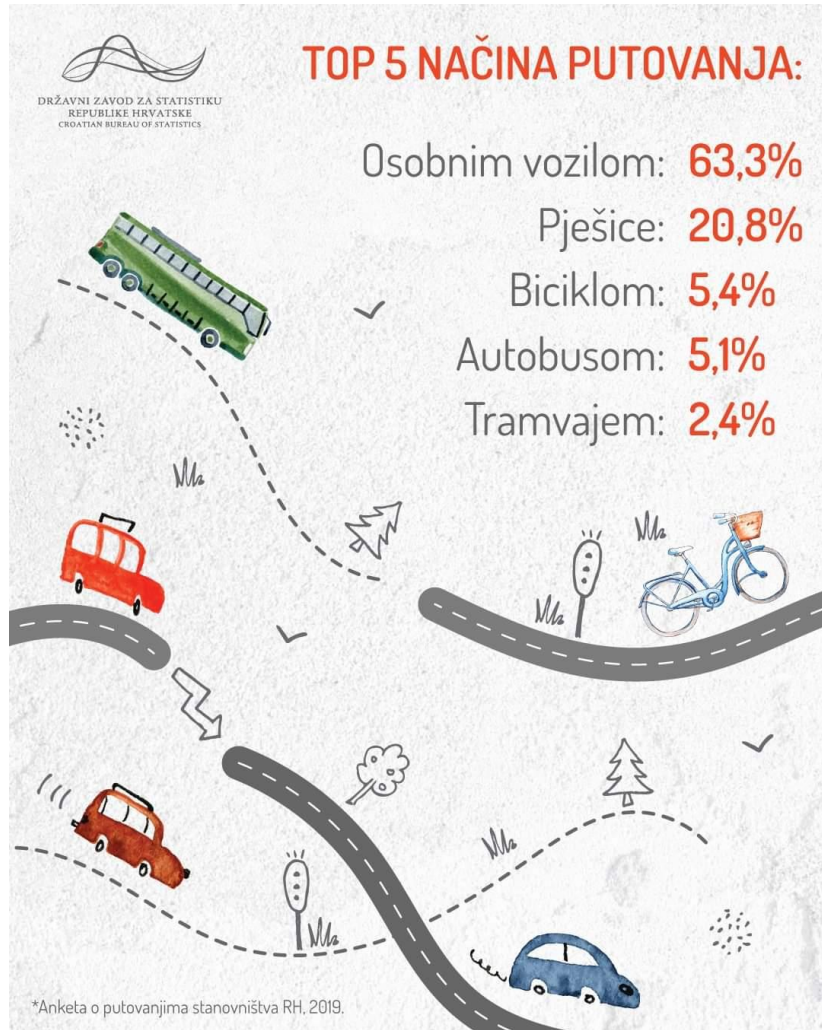
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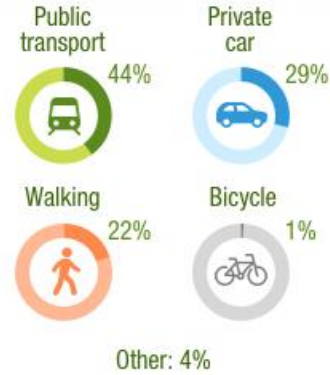
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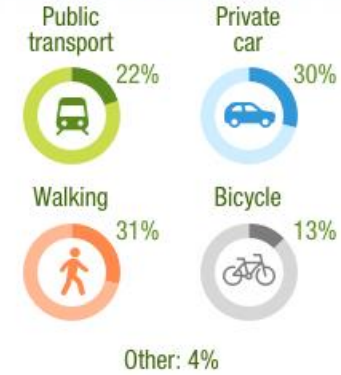
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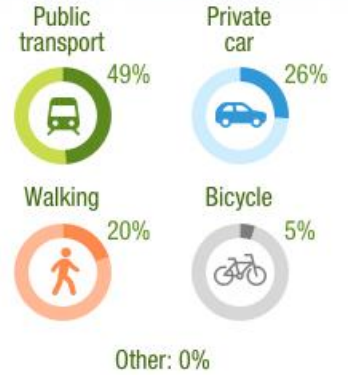
SINGAPORE



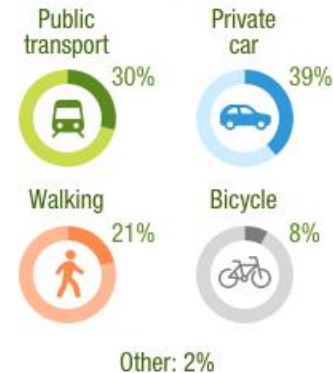
BERLIN



LONDON



HELSINKI



TOKYO



Source: Deloitte.

(Javni) bicikli

- "dijeljenje bicikla" - sustavi javnih bicikala
- više od 500 gradova i preko 50 zemalja kombiniranih flotnih sustava
- više od 2,3 milijuna bicikala
- sustavi javnih bicikala = povećanje prometa biciklista za 20-40%
- + više ulaganja u biciklističku infrastrukturu
- Gradovi EU - Amsterdam i Kobenhavn - veliki udio bicikala

hibrid

e-bike

običan



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Walkability

- mjera koliko je područje prijateljsko za hodanje
- zdravstvene, ekološke i gospodarske koristi
- važan koncept održivog urbanog dizajna



How most traffic engineers see your city



How cities should be designed

COPEN
HAGEN
IZE
EU
Copenhagenize Design Co.
2013

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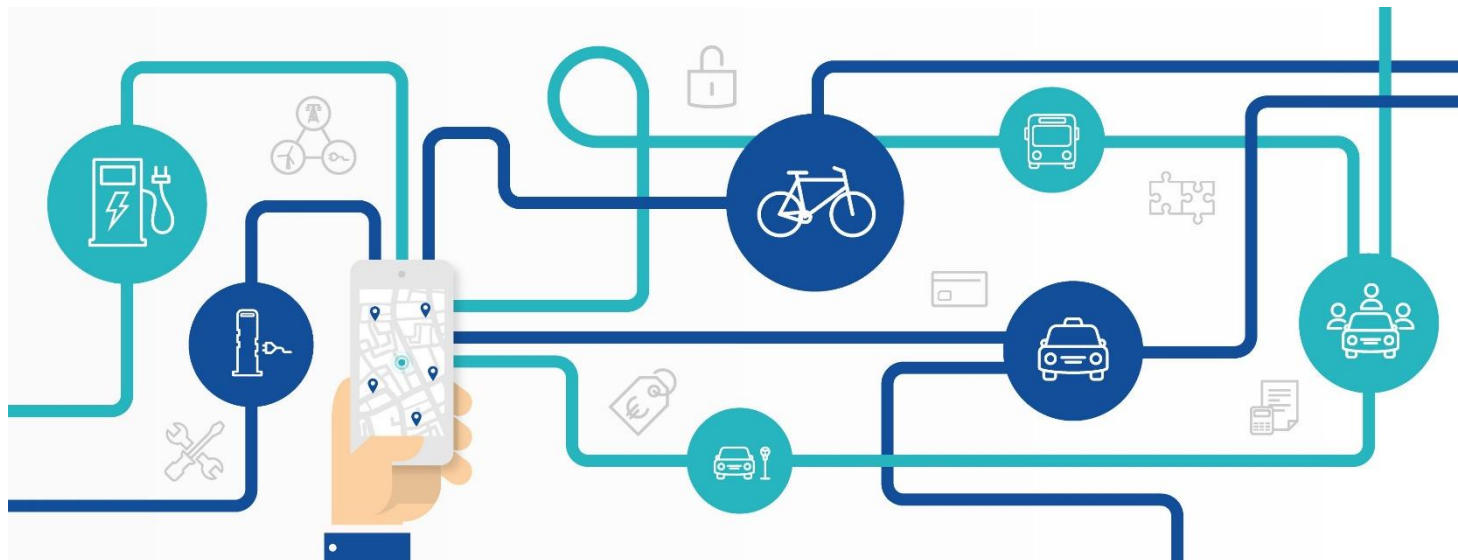


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MOBILITY AS A SERVICE

- ne samo javni prijevoz
- 83 % globalnih putovanja bit će MaaS
- multimodalna putovanja - sposobnost stalnog prilagođavanja putovanja uvjetima u stvarnom vremenu



Uber



waze

whim.



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Što je MaaS?



integracija različitih
oblika prijevoznih
usluga u jedinstvenu
uslugu na zahtjev
korištenjem jedne
aplikacije s jednim
kanalom plaćanja



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Cilj MaaS-a?



svijet u kojem ne morate posjedovati automobil da biste živjeli mobilno i bez muke, u kojem nema potrebe za ograničavanjem vožnje, ali u kojem ljudi umjesto toga imaju bolju alternativu



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Mobility-as-a-Service?

Prva MaaS platforma



- Pilot projekt – 2013-2014 – Gothenburg, Švedska
- ujedinila postojeće prijevozne operatore – javni prijevoz, taksi vozila, sustav dijeljenja automobila i dijeljenja bicikala
- Najniža pretplata na paket usluga bila je dostupna po cijeni od \$185/mjesečno, dok je prosječna cijena bila oko \$280/mjesečno
- Sudjelovalo oko 200 stanovnika
- Efekti primjene - veliki broj domaćinstava tijekom trajanja projekta nije koristio osobne automobile već sistem dijeljenja automobila, a povećao se i udio korištenja javnog prijevoza, biciklističkog prijevoza i pješaćenja.
- Novi pilot projekt – 2018 – Stockholm, Švedska – javni prijevoz, taksi vozila, sustav dijeljenja automobila i dijeljenja bicikala, parkiranje

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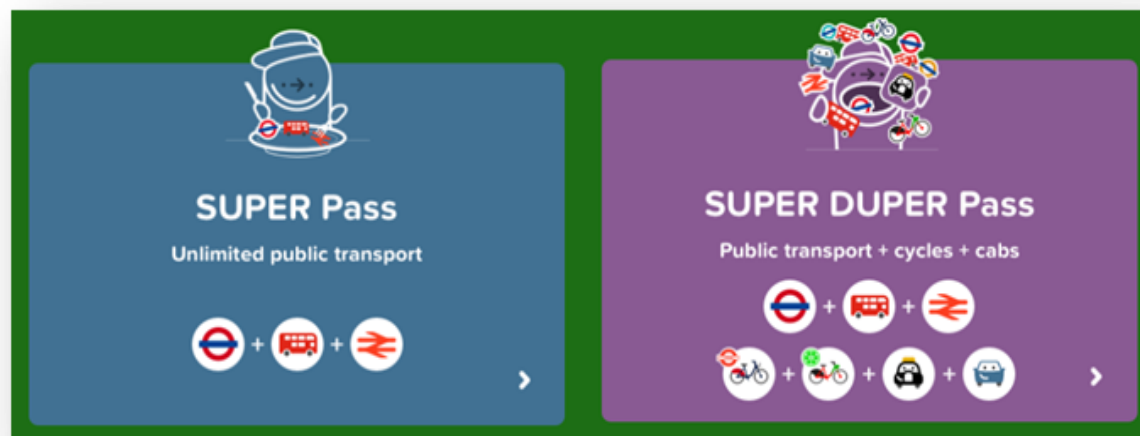
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Kako funkcionira MaaS platforma

Preuzmi aplikaciju	Isplaniraj i rezerviraj putovanje	Bezbržno putuj
Skini besplatan app na mobitel	Odaberi svoj željeni „mod” prijevoza	Budi u pokretu i uvijek imaj svoju kartu u ruci



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Očekivane koristi od MaaS-a

Koristi za korisnike

MaaS pruža efikasne i osobne usluge pametne mobilnosti sa jednostavnom dostupnošću

Koristi za javni sektor

Poboljšana efikasnost cijelog transportnog sustava i efikasna alokacija njegovih resursa, povećanje zaposlenosti u transportnom sektoru, poboljšano upravljanje transportnim sustavom i pouzdaniji transportni sustavi

Koristi za poduzeća

Profitabilna tržišta sa novim uslugama i bilje mogućnosti za tradicionalna tržišta



MaaS i turizam

- prijevoz + hotel → ostali oblici prijevoza
- 75% euroljana koristi samo aplikacije s kartama u stranim gradovima
- 27% ih koristi aplikacije o javnom prijevozu i 21% aplikacije za parkiranje
- 57% euroljana ima 2 ili više aplikacije povezane s prijevozom na svojim mobitelima
- trećina ih koristi barem jednom tjedno
- javni prijevoz, vlak, autobus, taxi, bicikl, skuter, dijeljenje automobila, itd ... putnik može dobiti informacije i putovati drugačije
- Do sada je su MaaS aplikacije povezane samo sa dnevnom mobilnošću

ŠTO AKO?!

- Obilasci s vodičem, turistička mjesta ili mjesta za razonodu, događaji, hoteli itd ...

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ŠTO NAM DONOSI BUDUĆNOST?

Shared Mobility

- 5% svjetskih godišnjih gradskih vožnji odvija se dijeljenjem automobila, vožnjom ili taksijem
- gotovo milijardU ljudi već koristi aplikacije za vožnju
- do 2040. - preko 19% redovnih dnevnih putnika

1 800

cities globally have
car sharing schemes

8 mill.

members are signed up
for car sharing

112 000

vehicles are engaged
in car sharing



Car Sharing

All forecasts by Frost & Sullivan and McKinsey

1/10

new cars sold will be
a shared vehicle in 2030



+16.5%

more people will use
car sharing in 2025

Mikromobilnost

Vozila za mikromobilnost

- e-skuteri i e-bicikli
- e-monocikli i e-skejtboardi

Sigurnosni problem ili transportno rješenje?

- e-bicikli na zajedničkim stazama,
- e-skuteri na pješačkim stazama,
- e-skateboards na cesti ?!

Što promijeniti?

- zakonodavstvo,
- smjernice,
- infrastruktura



84 MILLION
SHARED MICROMOBILITY
TRIPS IN 2018

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Levitirajući samovozeći vlakovi

- voze u Kini
- buka smanjena na 70 dB
- koriste se za povezivanje gradova između 50 i 200 km.
- brzine do 200 km/h



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Autonomna vozila

- ubrzan razvoj autonomnih vozila
- ne bi trebali imati značajan utjecaj na globalne transportne i energetske obrasce do 2030-ih
- trenutno se koristi u zaštićenim područjima (stambena područja, metro, vlakovi ...)



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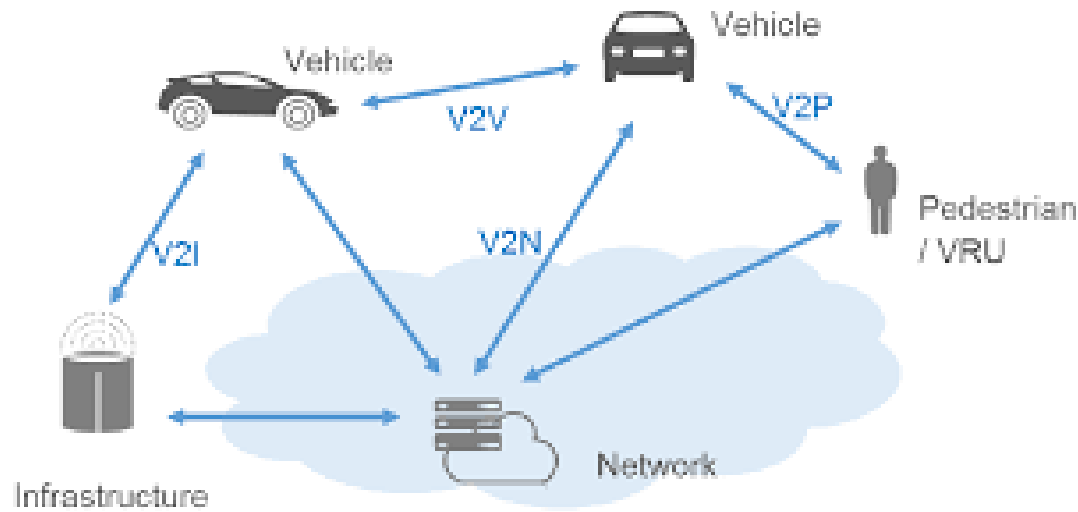


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Kooperativni inteligentni transportni sustavi (C-ITS)

- C-ITS - omogućuju cestovnim vozilima komunikaciju s drugim vozilima, prometnom signalizacijom i cestovnom infrastrukturom, kao i drugim sudionicima u prometu - V2V, V2P, V2I... - V2X
- snažan potencijal - poboljšati sigurnost cestovnog prometa i učinkovitost cestovnog prometa



Život bez semafora i prometnih znakova?!



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UMJESTO ZAKLJUČKA



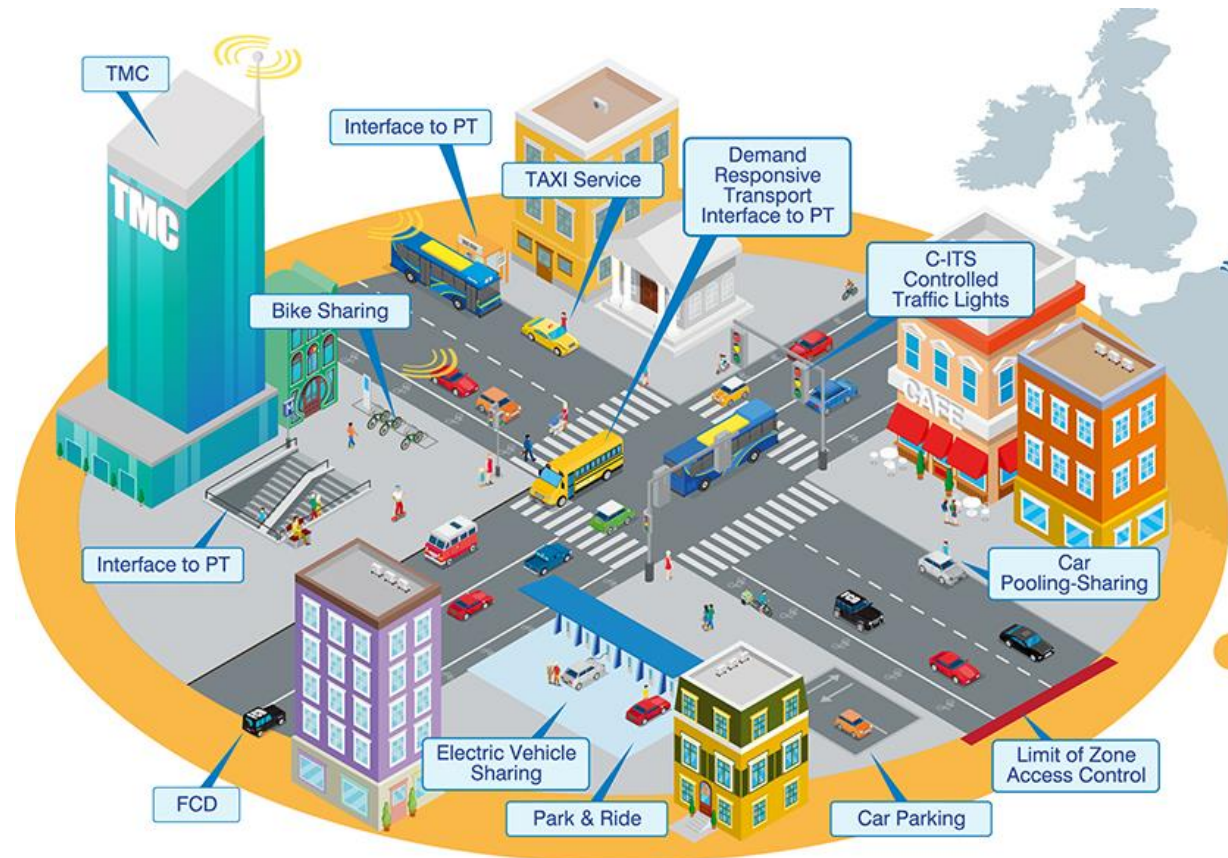
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doc. dr. sc. **Predrag Brlek**

Pročelnik odsjeka za logistiku i mobilnost

Sveučilište Sjever

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Hvala na pažnji!