

Shuttles - from early pilots to commercial deployment

SIP-adus Workshop

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DRIVE SWEDEN



Drive Sweden

The Swedish Strategic Innovation Programme for future connected, automated and shared mobility services

Our task

is to drive the development towards sustainable mobility solutions by creating and piloting efficient, connected and automated transportation systems

50% government funding | Expected duration 12 years

With support from

VINNOVA



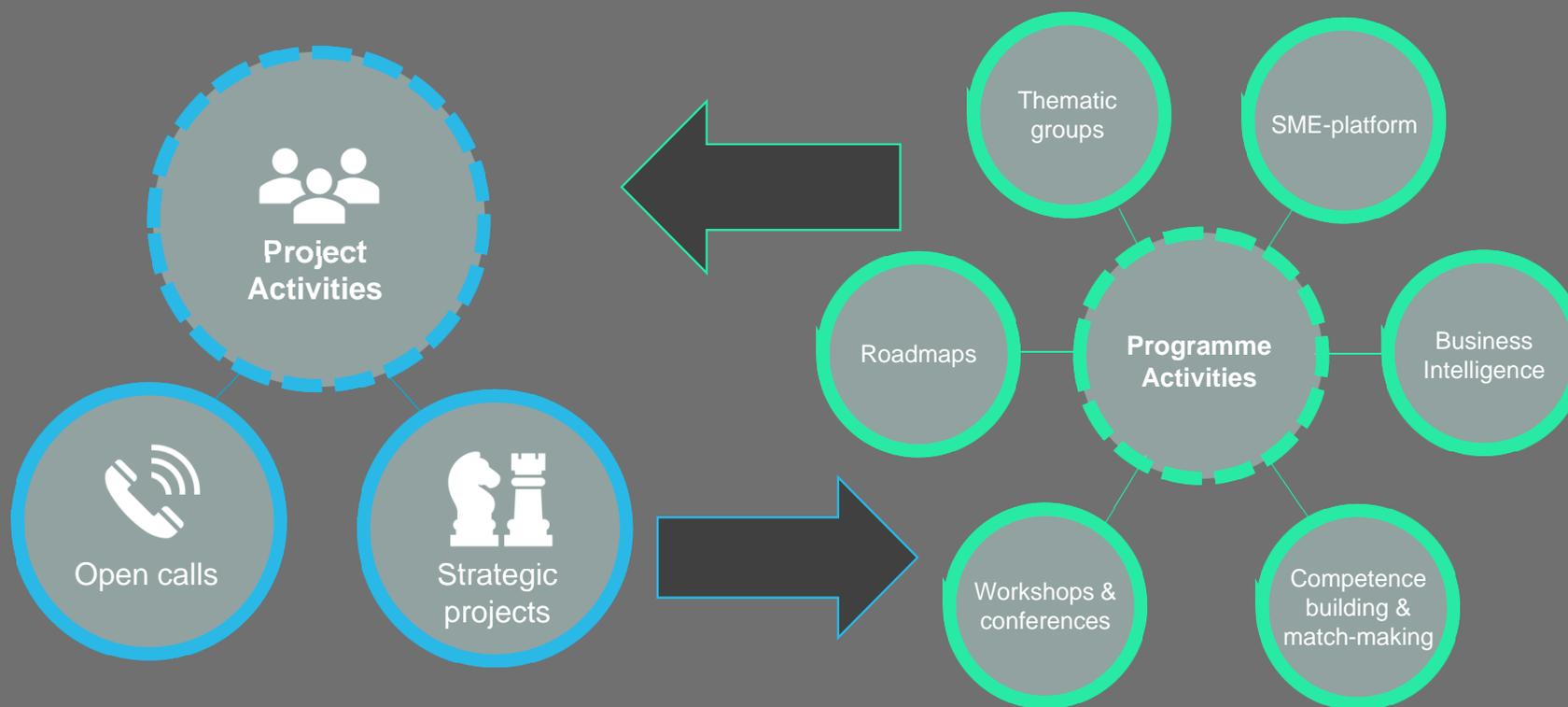
FORMAS

Strategic
innovation
programmes

DRIVE SWEDEN



Drive Sweden is a cross-functional collaboration platform providing general Programme activities and specific Projects



Three main Swedish shuttle trials

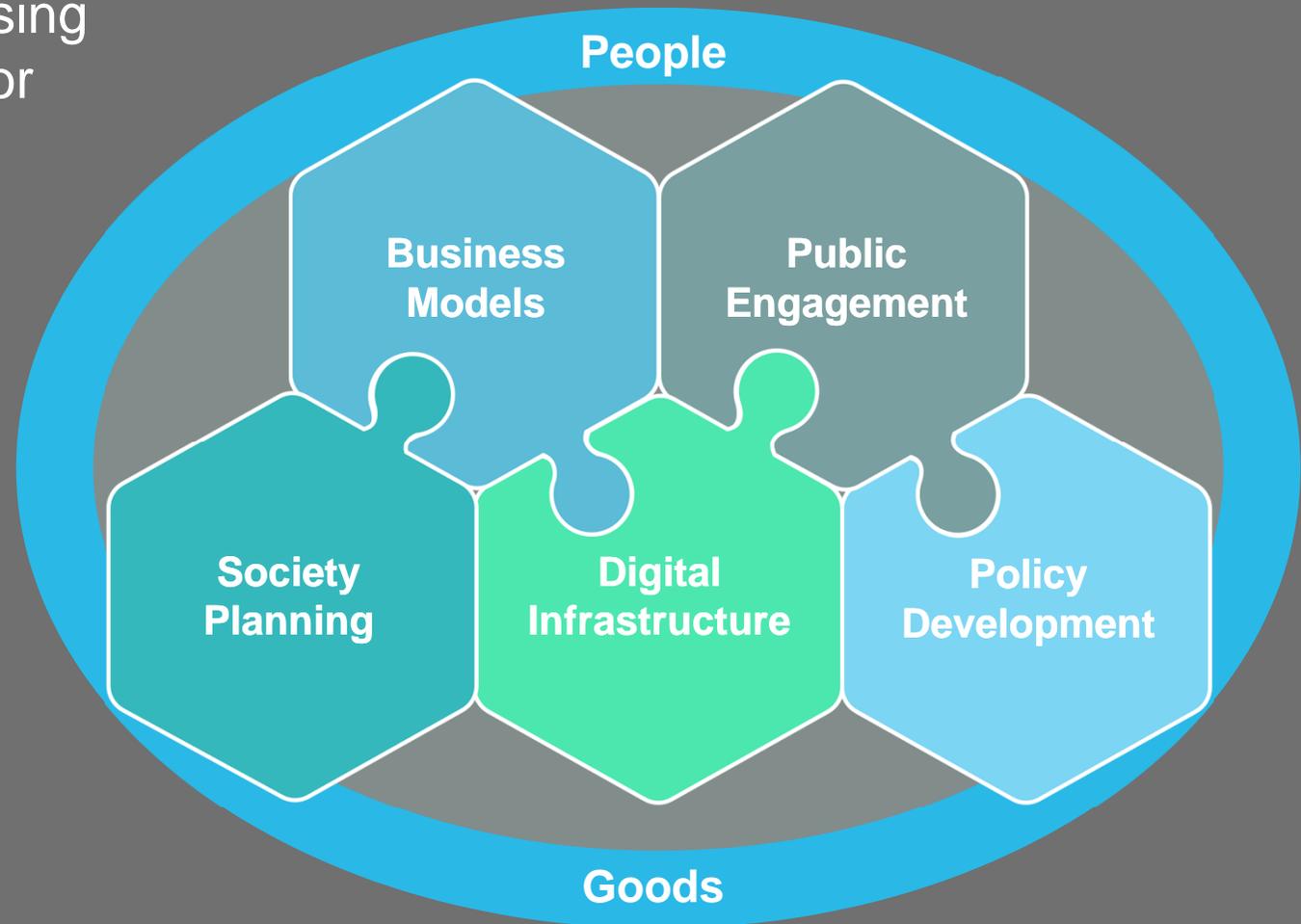


They all have in common:

- On public roads in mixed traffic, in urban areas
- Pilot projects involving all stakeholders, including public transit authorities/operators
- Pilots integrated with existing commercial public transportation services
- Operational during all seasons
- Pilots also serving as platforms for further research on a variety of topics
- Less focus on actual vehicle performance

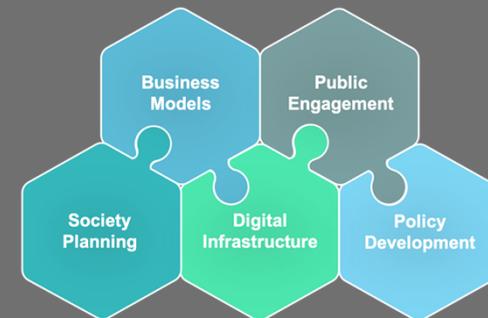


Drive Sweden works in five Thematic Areas, addressing external factors critical for success.



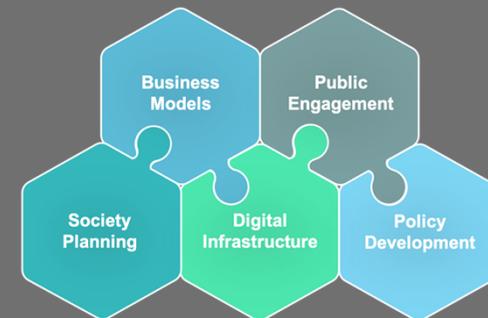
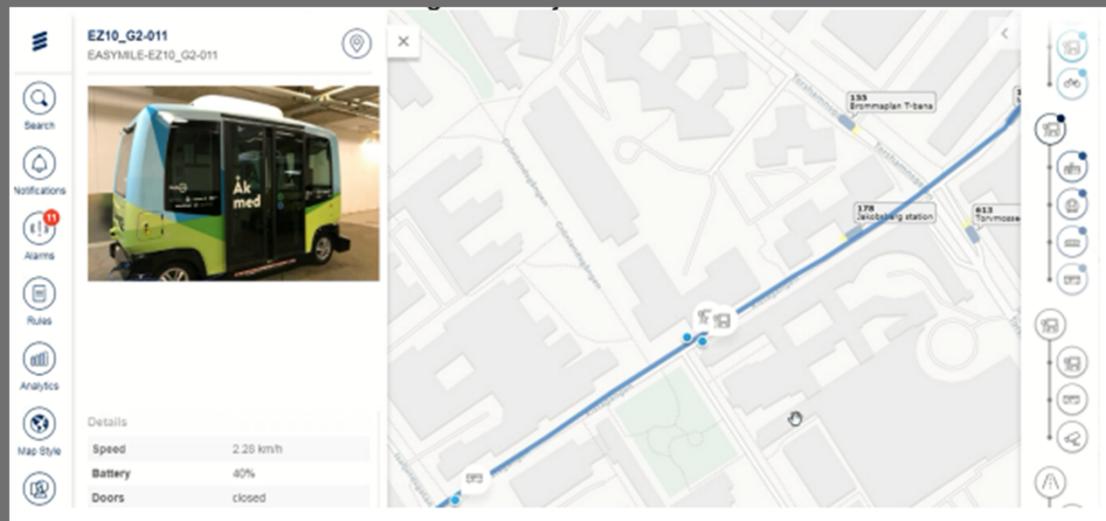
Main findings – Policy Development

- The application process to obtain the first AV trial permit lasted 13 months; much longer than expected
- Using a Policy Lab-style dialogue between all stakeholders, this has since been reduced substantially
- Lots of policy work remains. Making the 'safety driver' redundant is a top priority



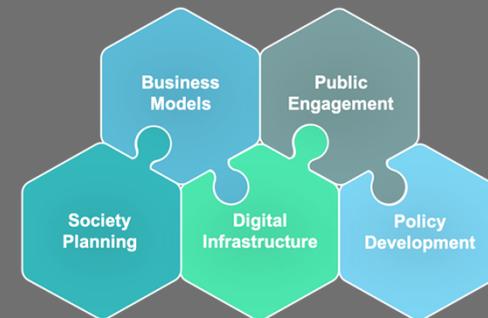
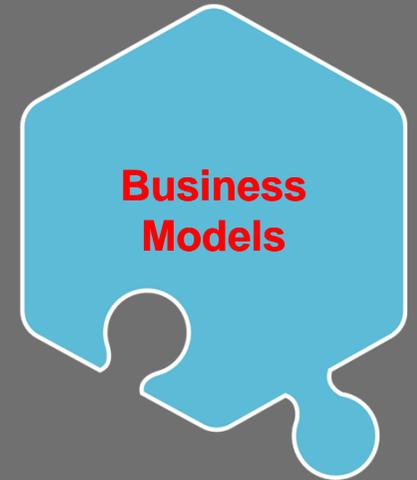
Main findings – Digital Infrastructure

- Critical to have shuttles connected and monitored using 5G
- Data shared via Drive Sweden's Innovation Cloud, enables collaborative innovation
- Real-time data from e.g. traffic signals highly desired



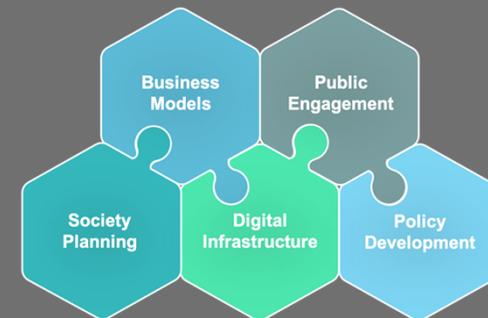
Main findings – Business Models

- Not being obliged to have a 'safety driver' is critical for a sustainable business case, but other operational resources also need to be automated
- Important to integrate shuttle services in the general public transportation ticketing system
- Traveller surveys indicate willingness to pay extra for the first/last mile service, particularly during bad weather



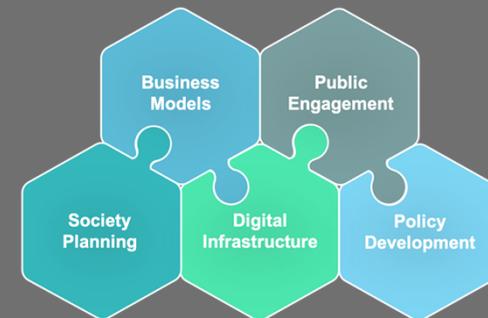
Main findings – Public Engagement

- Over 25,000 travellers have taken the opportunity to test ride during the initial pilots
- General acceptance has been very high
- Before/after surveys showed that only the efficiency rating dropped after the trip
- Safety concerns, general fear of AVs or any other negative impacts have been marginal
- The pandemic had consequences on traveller volume



Main findings – Society Planning

- Shuttles require dedicated passenger pickup spots that do not interfere with regular traffic
- For this kind of automated vehicles, unplanned changes in infrastructure become big obstacles
 - Even marginal changes like non-mowed grass caused operational disturbances
- The Stockholm trial has progressed into a full commercial deployment to serve a new dense city development



Outlook for shuttles?

- Shuttles will likely be considered a useful means of first/last mile transportation & for On-Demand
- However, this requires:
 - Improved vehicle performance
 - Increased top speed, smoother stops, less sensitive to changes in infrastructure etc.
 - Regulations allowing removal of the safety driver



Thank you!

Links to additional information:

Stockholm

- <https://www.drivesweden.net/en/projects-5/auto-pilot-barkarby>
- https://www.drivesweden.net/sites/default/files/content/bilder/slutrappport_autopiloten_i_kista_r ev_5_1.pdf

Gothenburg

- <https://www.drivesweden.net/en/projects-5/shared-shuttle-services-s3>
- <https://s3project.se/en/start-2/>

Linköping

- <https://ridethefuture.se/>
- <https://www.transdev.com/en/news-en/transdevs-autonomous-shuttles-linkoping-sweden-one-year/>