

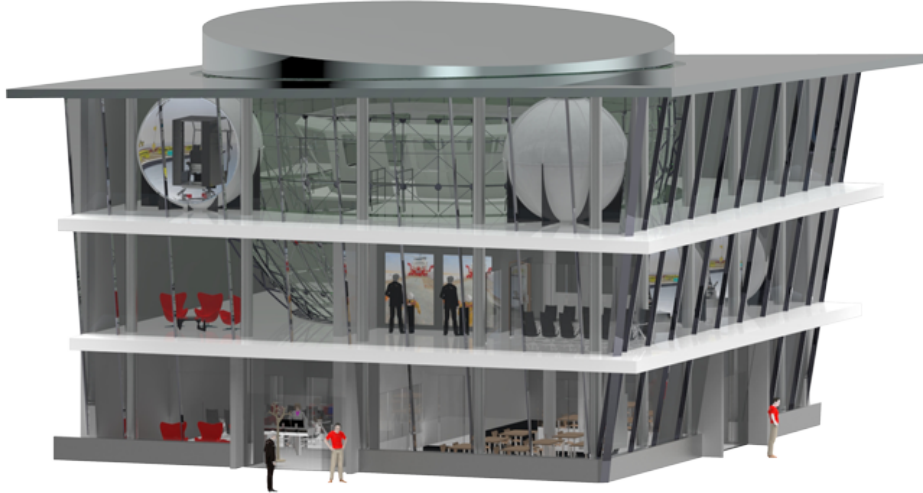
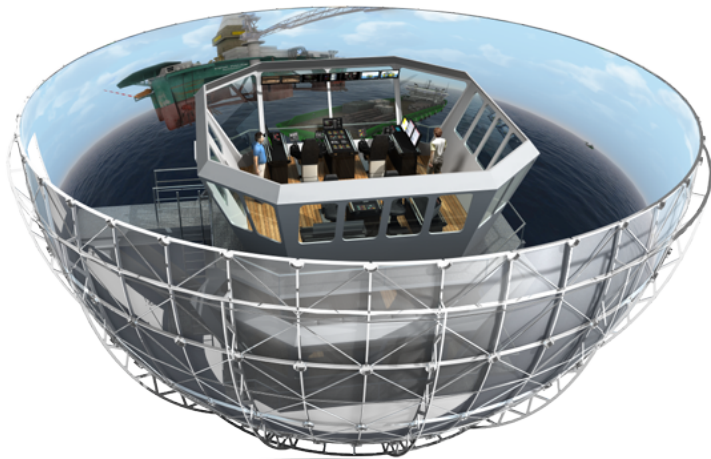
ITS Workshop
HiÅ: 11.02.2015

Smart Samferdsel

Harald Yndestad

2000-> Maritime simulatorer

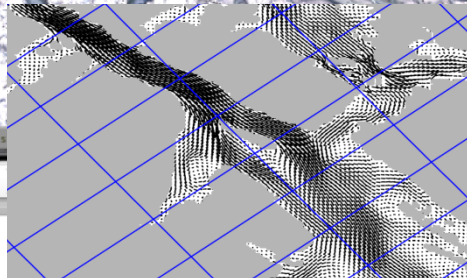
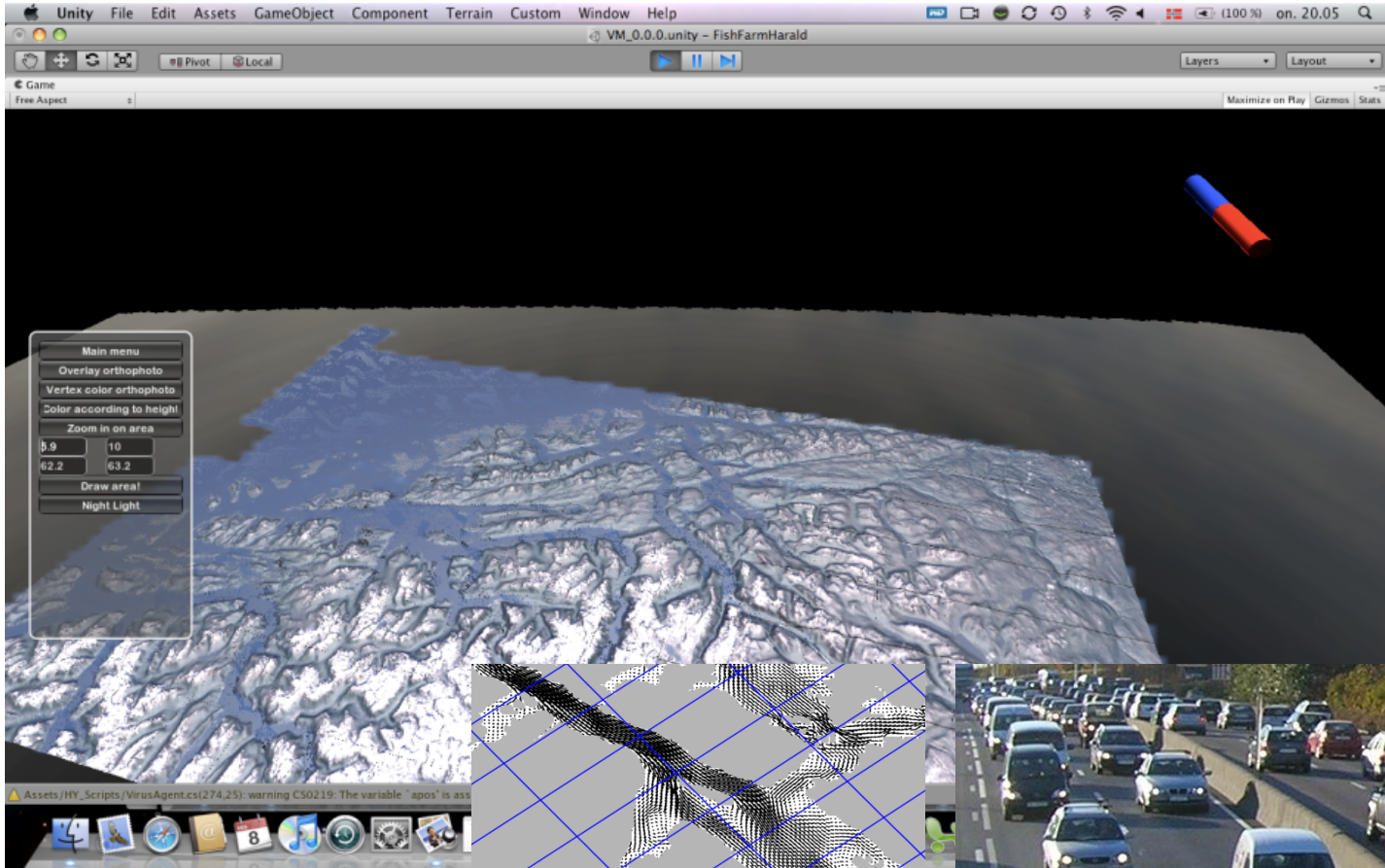
Animasjon, 3D landskap, simulere 3D objekt



2007: Agentbasert Simulering

Kartet som planarena

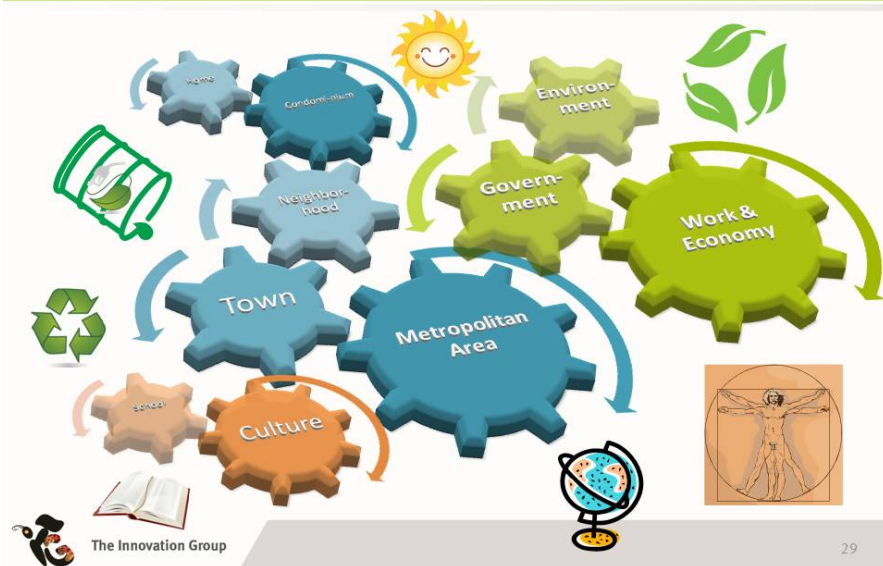
Fra objektorientert simulering, til agentbasert simulering



2012: Smarte Regioner

Optimalisering: energi, veg, vann, avfall,,,

Smart City: a System of Systems of Systems...



Kvalifiseringsprosjekt:
Regionalt forskningsfond
Ålesund Kommune
Vegdirektoratet
Sunnmøres kommuner

Spørsmål:

Er Smart Grid basert på en generisk teknologi og metode?

Er dette overførbart til flere sektorer: F.eks Energi og veg?

2014: 3-nivå Smart Samferdsel utdanning

2009?: Spørsmål fra Kjetil Strand

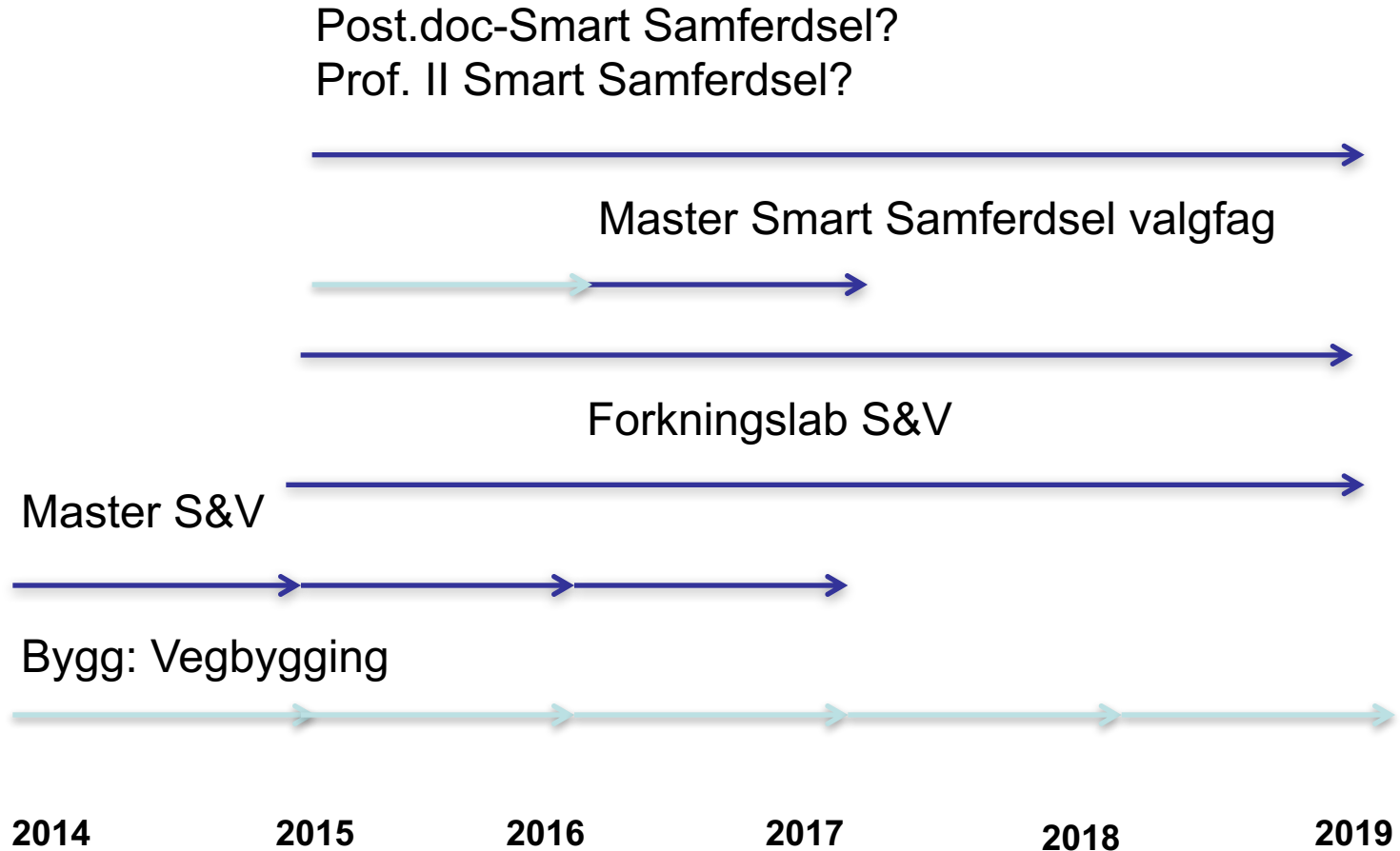
Kan dere lage en master utdanning om veg?

Svar: Ja. Men det er en lang veg fram til det

PhD-studenter Sim & Vis	PhD-studenter Smart Samferdsel	Metodeutvikling
Ett år: Master: Sim & Vis	30 stp Smart Samferdsel 30 stp Master oppgave	Systemforståelse
Ett år: Master i Simulering & Visualisering		
Bachelor-Bygg: Vegbygging		Implementering

2014: Smarte Samferdsel utdanning

Mulig realisering



ERTRAC

Hva er de viktige hovedtema her?

1. Road
2. Urban Mobility
3. Logistics
4. Infrastrukturer
5. Socio-Economic and Behavioural Research
6. Intelligent Transport Systems
7. Automation of Road Transport
8. Energy Programme

Kan vi lage en
konseptmodell
av dette?

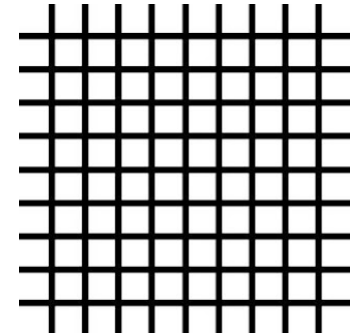


Hva koker dette
ned til?

ERTRAC: Smart Road

Hva er de viktige hovedtema her?

1. Smart Road: Energi, Sikkerhet, kostnader,,,
2. Smart Road:=>Objekt-perspektiv på kontroll
3. Smart Road: Integrasjon av kjent teknologi og metoder
4. Smart Road: En basis komponent i Smart Road Grid
5. Smart Node:=> Objekt-perspektiv på kontroll
6. Smart Road Grid = Smart Road + Smart Node
7. Smart Road Grid:=> System perspektiv på kontroll
8. Systemer har kompleks oppførsel

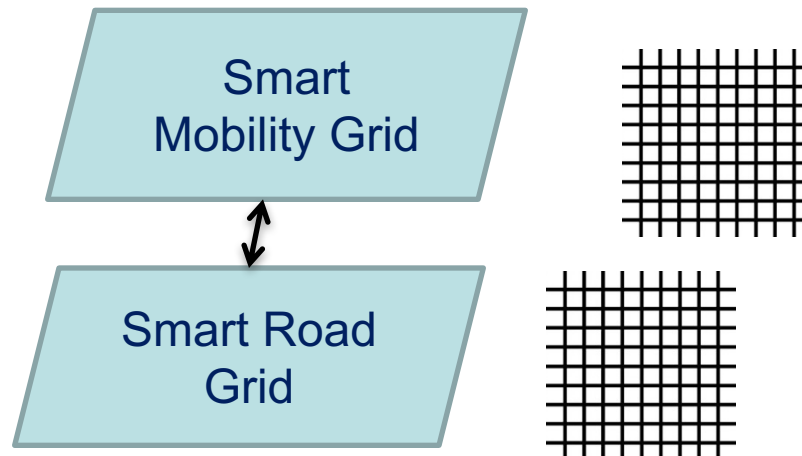


Så.....Er det er Smart Road Grid, vi ser etter?

ERTRAC: Urban Mobility

Hva er egentlig Urban Mobility ?

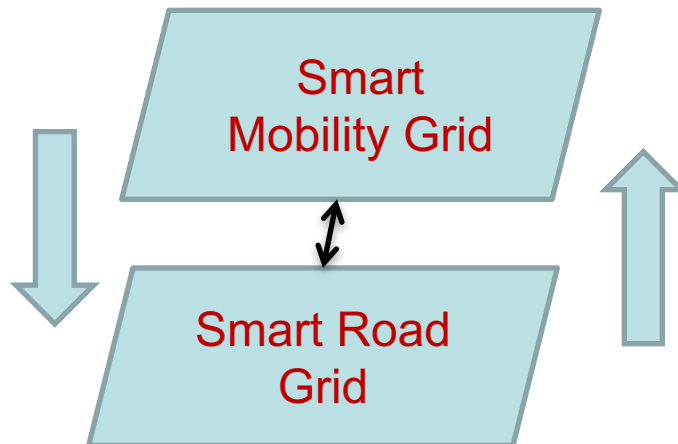
1. Management of Urban Transport Network
2. Smart Transport Service: => Objekt perspektiv
3. Smart Urban Transport: => System perspektiv
4. SUT management = SUT+Smart Urban Nodes



ERTRAC: Logistic

Hva er egentlig Logistic ?

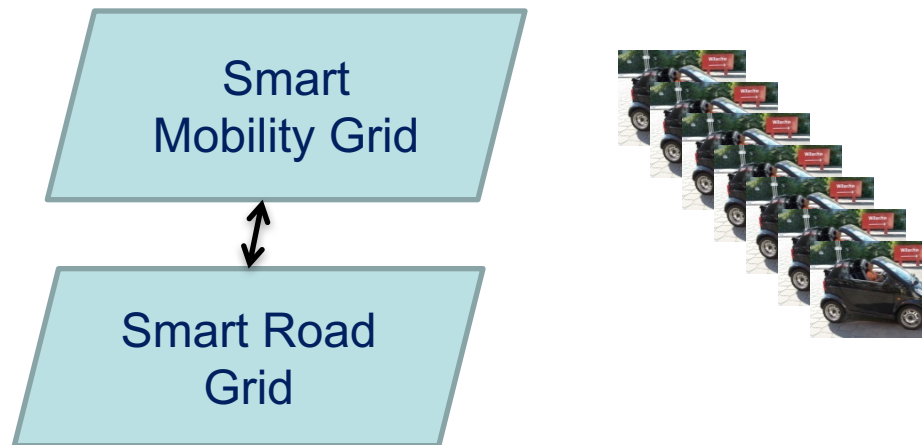
1. SUT management = SUT+Smart Urban Nodes
2. Smart Road Grid = Smart Road + Smart Node
3. Logistic = Integrasjon med brukerens synsvinkel?



ERTRAC: Intelligent Transport Systems

Hva er egentlig ITS?

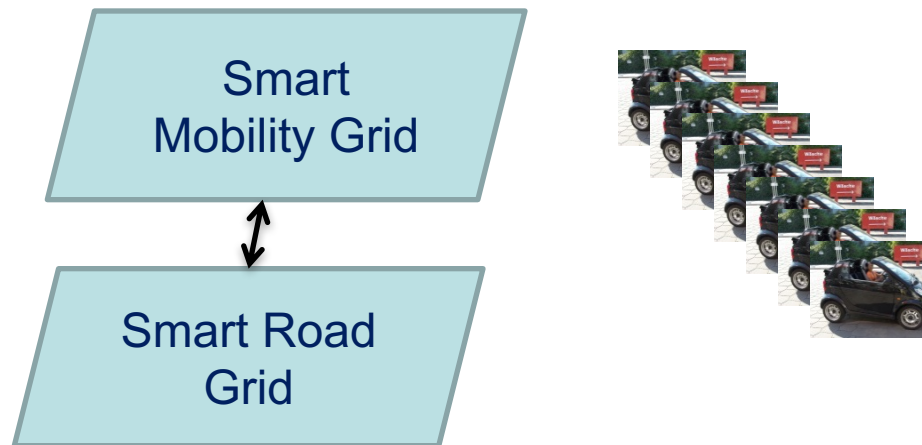
1. Connecting Vehicle in Traffic management
2. Smart Vehicle in Smart Urban Mobility Grid
3. Smart Vehicle in Smart Road Grid
4. A Smart Vehicle:=> Object view of management
5. A Group of Smart Vehicle:=> System view of management



ERTRAC: Intelligent Transport Systems

Hva er egentlig ITS?

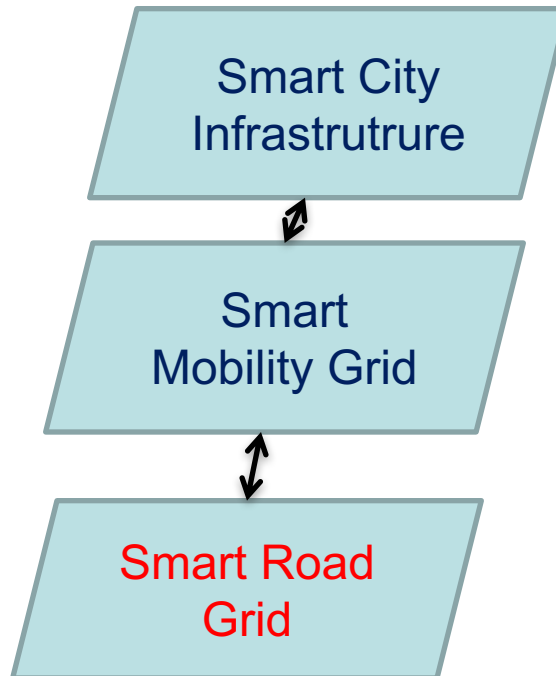
1. Connecting Vehicle in Traffic management
2. Smart Vehicle in Smart Urban Mobility Grid
3. Smart Vehicle in Smart Road Grid
4. A Smart Vehicle:=> Object view of management
5. A Group of Smart Vehicle:=> System view of management



ERTRAC: Infrastructure

Hva er egentlig Infrastructure ?

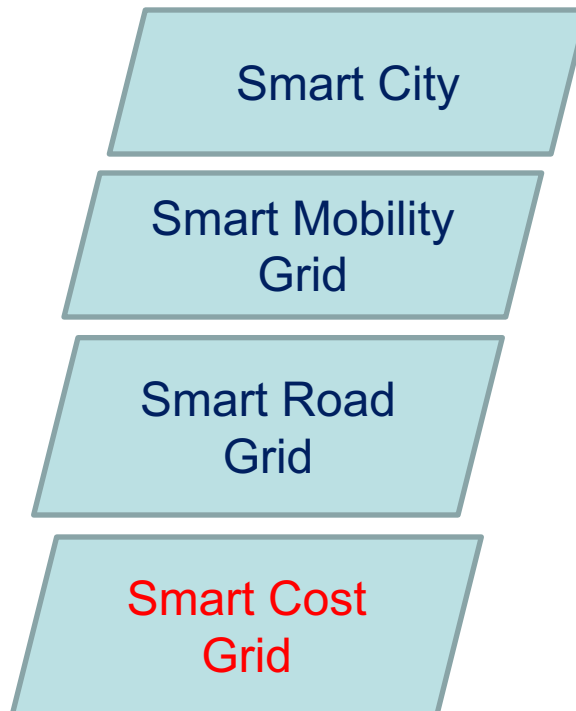
1. SUT management = SUT+Smart Urban Nodes
2. Smart Road Grid = Smart Road + Smart Node
3. Infrastructure = Integrasjon med forvalter synsvinkel?



ERTRAC: Socio-Economic

Hva er egentlig Socio-Economic ?

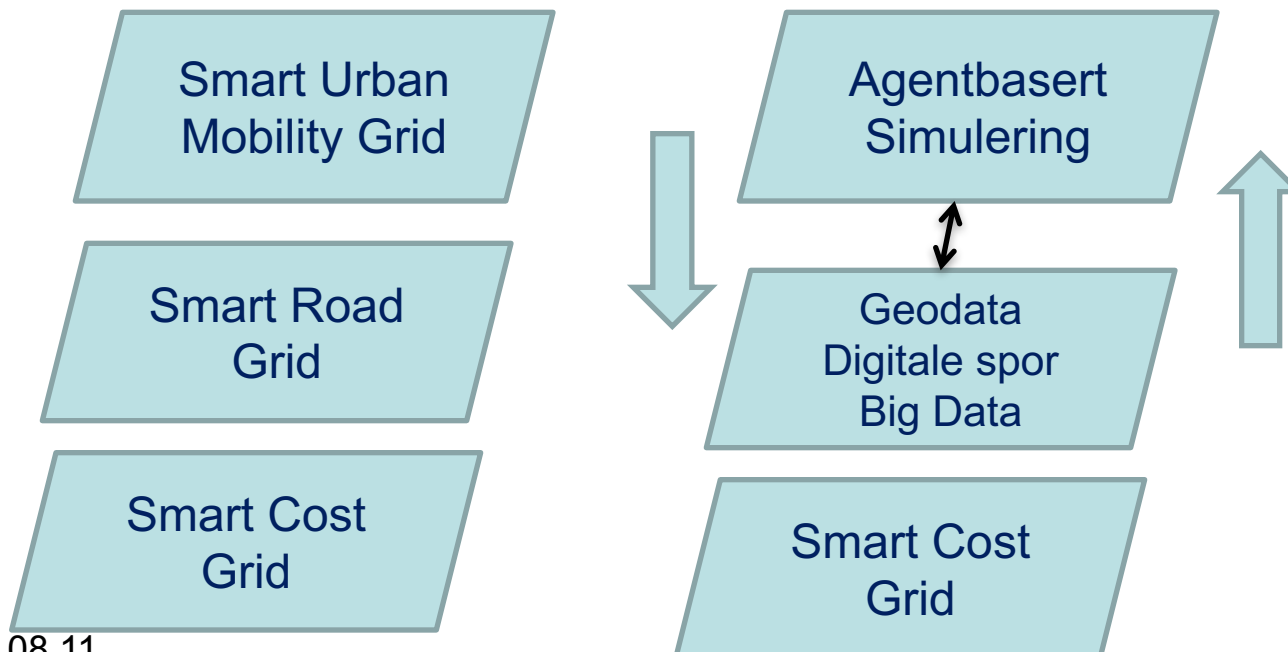
1. SUT management = SUT+Smart Urban Nodes
2. Smart Road Grid = Smart Road + Smart Node
3. Socio-Economic: => Smart Cost Grid
4. Socio-Economic: => Smart Education, Industrialication



ERTRAC: Forskning

Hva er egentlig underliggende forskningstema?

1. Integrasjon av komplekse systemer
2. Smart Road Grid => Smart Energy Grid?
3. Duale perspektiver: Big Data ⇔ Simulatorer
4. Modeller av Små arealer = Skalerbare til store
5. Desentralisert «organisk» modell, kontroll via kostnadsfunksjoner

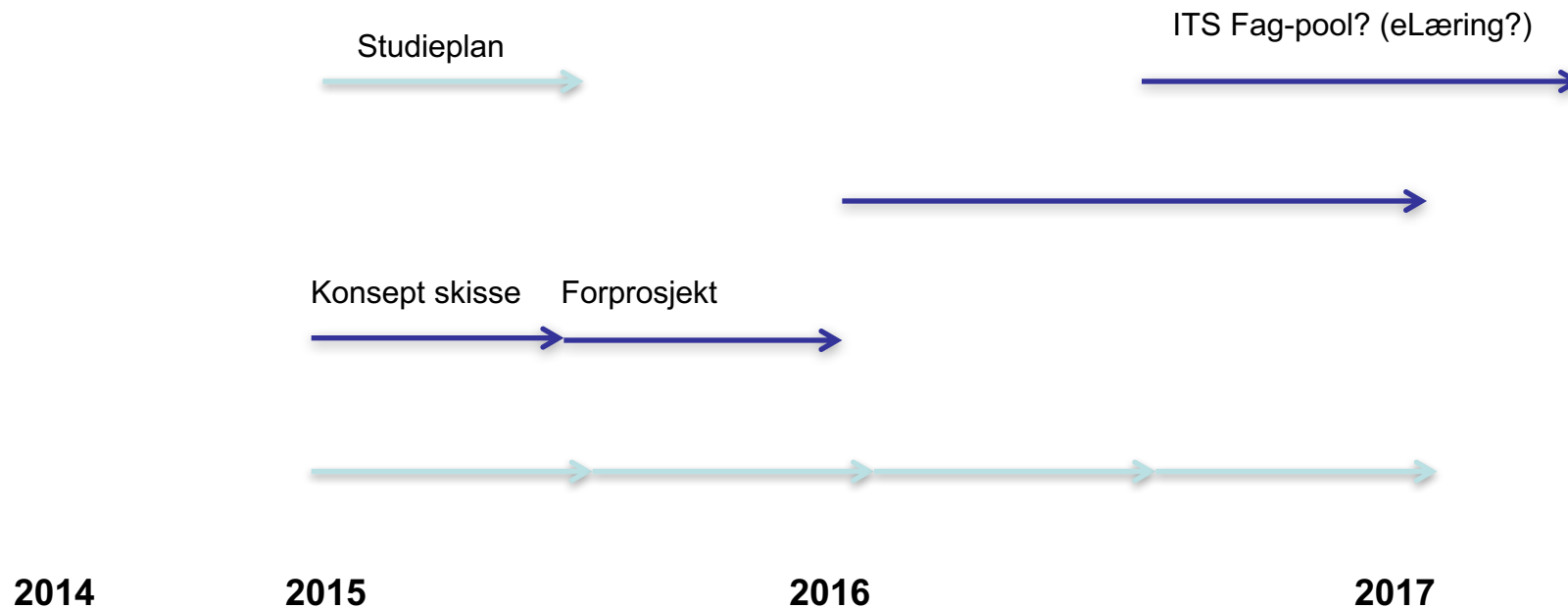


ERTRAC: Undervisning

Hva er de viktige hovedtema i et master program?

1. Road
2. Urban Mobility
3. Logistics
4. Infrastrukturer
5. Socio-Economic and Behavioural Research
6. Intelligent Transport Systems
7. Automation of Road Transport
8. Energy Programme

Ny tidsplan?



Takk for oppmerksomheten

Mer informasjon?

Du finner meg, ved enden av regnbuen

<http://ansatte.hials.no/hy/>

2014: Master Simulering og Visualisering

Master program First year

IE501814	Cybernetics	7,50
IE501414	3D Visualization I	7,50
IE501314	Game-based simulation	7,50
AM521512	Scientific theory and methods	7,50
IE501914	3D Computer Graphics	7,50
IE501714	Swarm Intelligence	7,50
IE501614	Functional Programming and Intelligent Algorithms	7,50
IE501514	Distributed Programming 7,50 O 7,50	
Total:		30.00 cr

Master Program Semester

IE502214	Best practice in Simulation & Visualization	7,50
IE502114	Virtual Worlds	7,50
IE502014	Tonics in Artificial intelligence	7,50
IE502515	Big Data	7,50
IE502414	Master thesis	30,00 cr