



# Finland's Journey in Lean Construction

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# AGENDA

- ❑ The Finnish Way, - what have we done 2008-2016
  - Towards better integration
  - Studying Lean Construction together
  
- ❑ Project case Tampere Tunnel
  
- ❑ Project case Oulu University Hospital
  
- ❑ Lessons learnt



# Finland



- ❑ Population: 5.5 million
- ❑ Area: 338 424 km<sup>2</sup>
- ❑ Municipalities: 317, 10<sup>th</sup> Kouvola 86 000 inhabitants
- ❑ Construction market: 29 billion euro (2015)
- ❑ Public Sector market 7,5 billion euro (2014)
- ❑ Infrastructure sector market 6,3 billion euro (2015)





**LEAN CONSTRUCTION**  
I N S T I T U T E - F I



The Finnish Association of Building Owners  
and Construction Clients



The Confederation of Finnish Construction Industries RT



The Finnish Association  
of Consulting Firms  
SKOL



The Finnish Association of Architects (SAFA)



TAMPERE  
UNIVERSITY OF  
TECHNOLOGY



UNIVERSITY OF OULU

# Some History

## Research project of the Project Alliance 2007/2008, no piloting

### LCI comes to Finland 2008

- Lean principles, Integrated project deliveries and Lean Construction tools and methods started to achieve understanding

### LIPS in Karlsruhe Germany 2009, Jim Ross introduced the Project Alliance

- EU-legislation challenge in the public sector

### LIPS in Washington DC 2010

- We might be able to challenge the EU-legislation

### LIPPI in Brisbane Australia 2011

- First Project Alliance has been established, several others coming

### LIPS in Tampere Finland 2012

- We have four alliance projects

### LIPS in Nottingham 2013

- We have six alliance projects and some hybrids, more coming
- LCI-Finland has 4,5 M€ R&D project 2013-2015

### LIPS in Berkeley 2014

- We have 16 alliance projects including some hybrids, much more coming
- LCI-Finland has 4,5 M€ R&D project 2013-2015

### LIPS in Barcelona 2015

- We have over 34 IPD-projects most of pure alliances, more coming
- LCI-Finland will start the third joint R&D project 2016-2018

### LIPS in Elsinore 2016

- We have over 40 IPD-projects, more coming
- LCI-Finland has started the RAIN-project 2016-2018

# THE FINNISH WAY #1

## - TOWARDS BETTER INTEGRATION





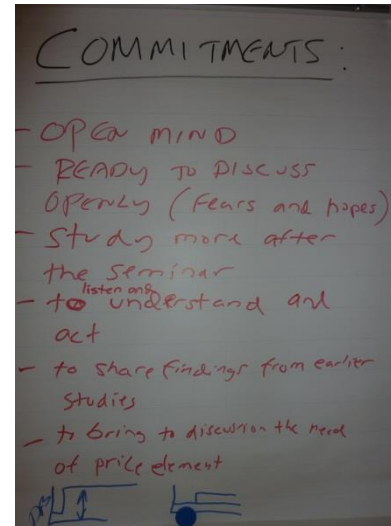
## First Pilot projects

- Liekki-project (Railway renovation), **Finnish transportation Agency**
- Tampere Tunnel, **City of Tampere, Finnish Transportation Agency**
- Vuolukiventie campus renovation, **University of Helsinki**

# Changing culture is the issue - Building trust, trust, trust

## Dialogue inside the owners side

- ❑ Started in May 2010
- ❑ Core team started to develop the Finnish approach for Alliancing in June 2010
- ❑ Wider coaching in two workshops in November 2010
- ❑ More coaching during the selection process

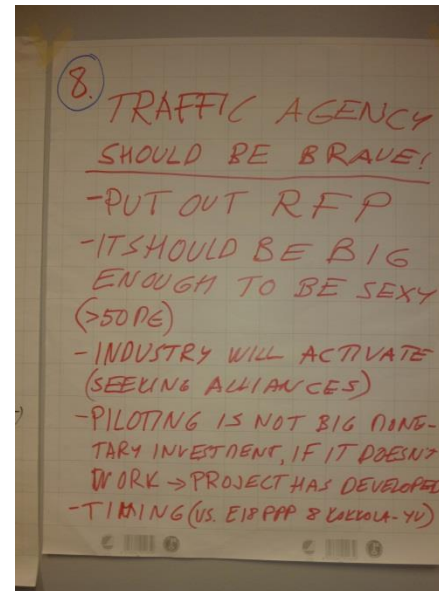
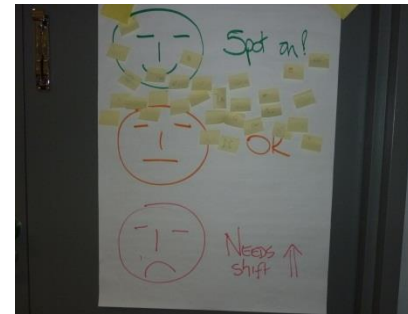




# Changing culture is the issue - Building trust, trust, trust

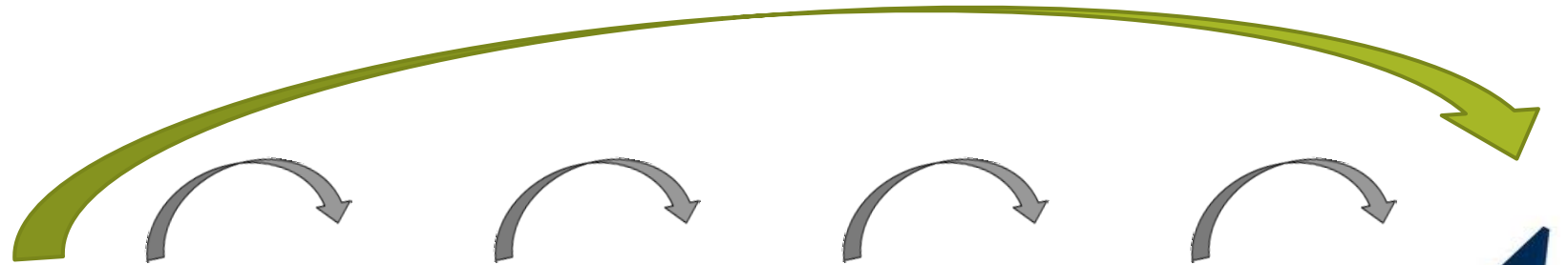
## Dialogue with the industry

- ❑ Started in May 2010 (1-day workshop)
- ❑ General Information of the pilot projects in September 2010
- ❑ Workshop with the industry in November 2010. Focus on commercial framework and selection criteria
- ❑ More workshops during the selection process



# High Performance Building / Infrastructure

Information - resources – processes - technology



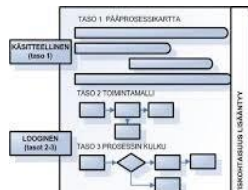
**Information  
BIM**

Simulation &  
Visualisation



**Organisation  
& Big Room**

Cooperation &  
Collaboration



**Processes**

Production  
Management



**Real estate &  
infrastructure  
systems**

Integrated  
Systems



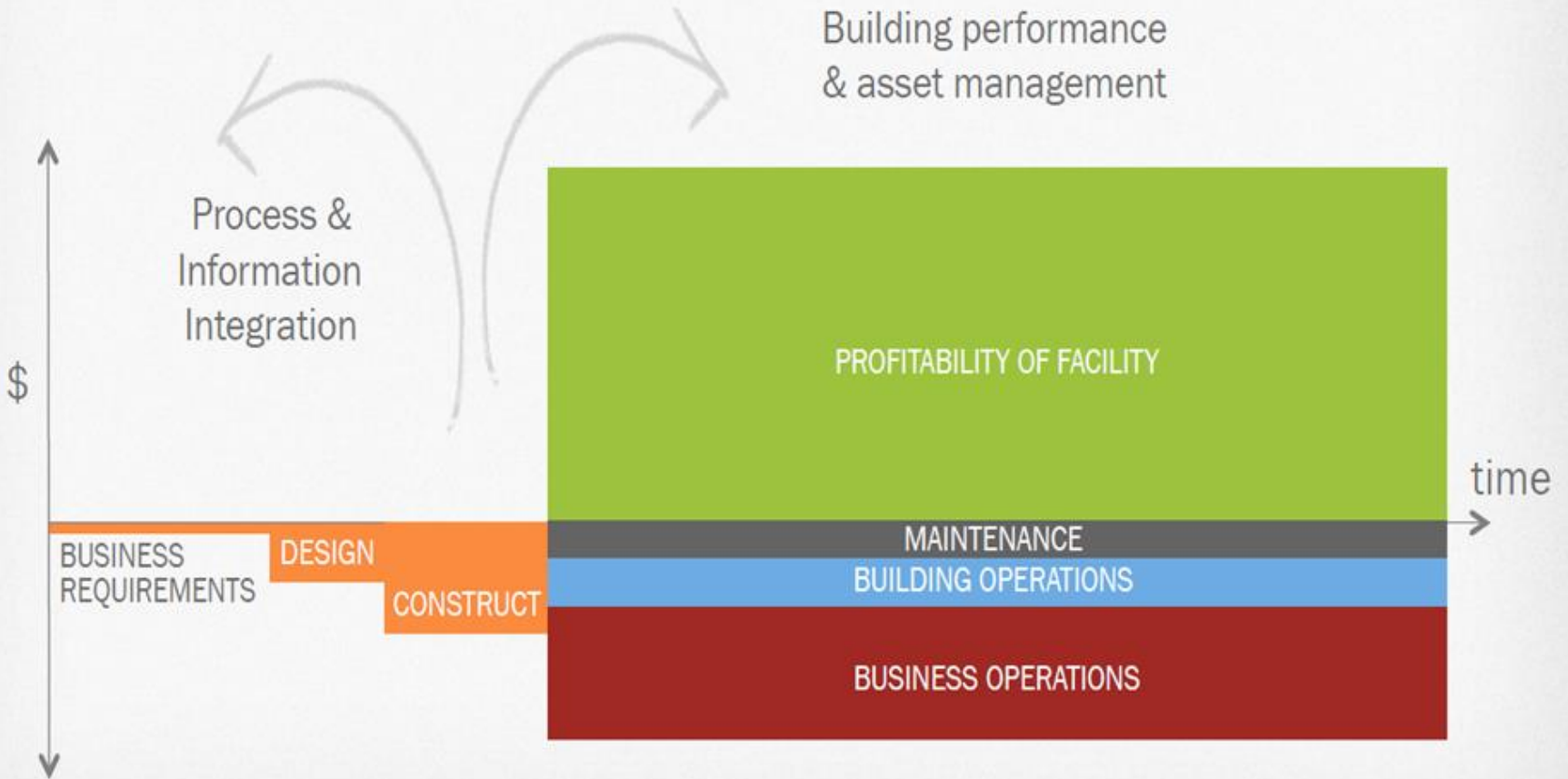
**High  
Performance  
Building / Infra**

Measurable  
Impacts

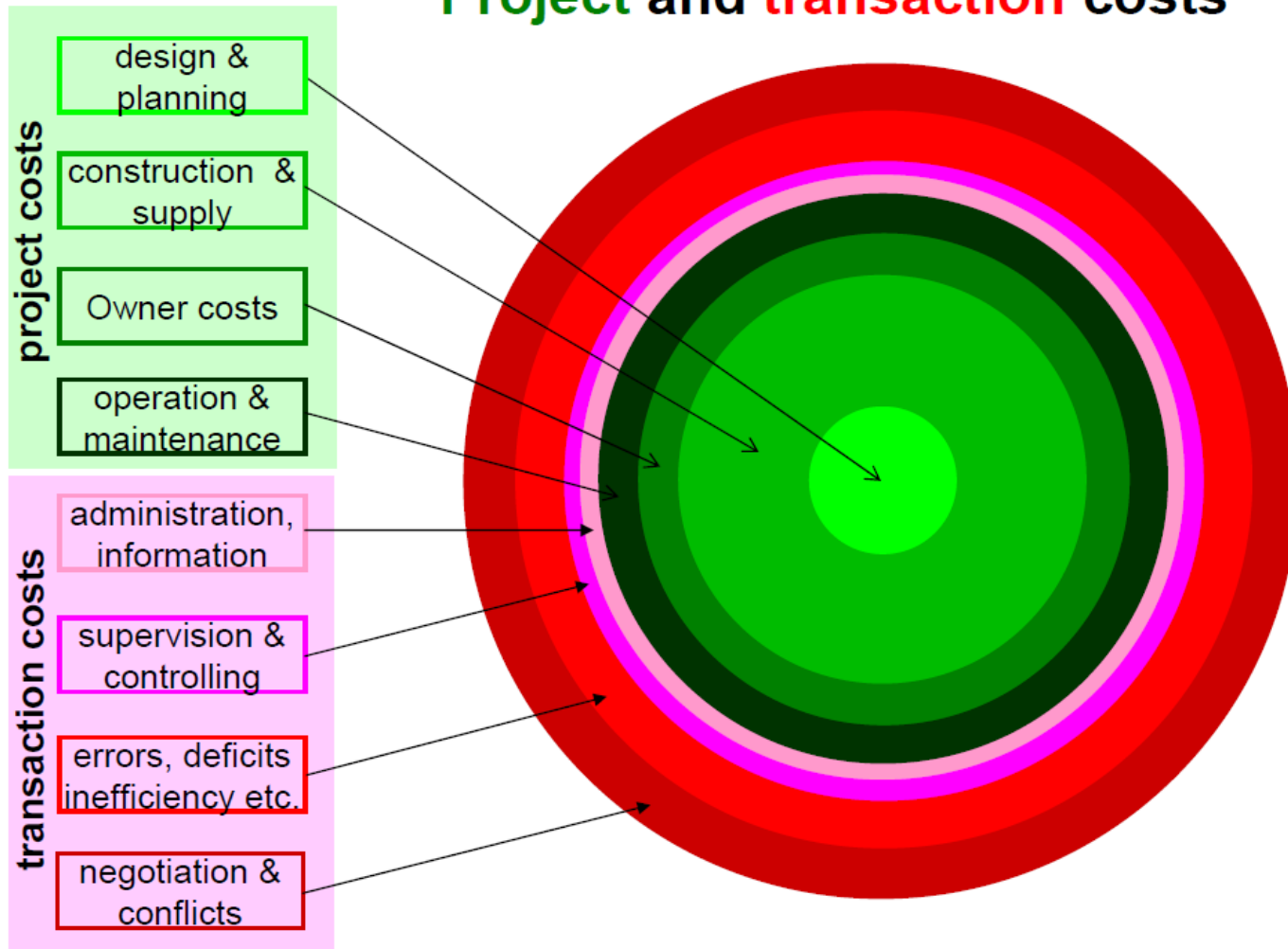
Integrated contracts – Integrated commercial model – integrated action plans

Source: DPR Construction

# WHOLE LIFE VALUE

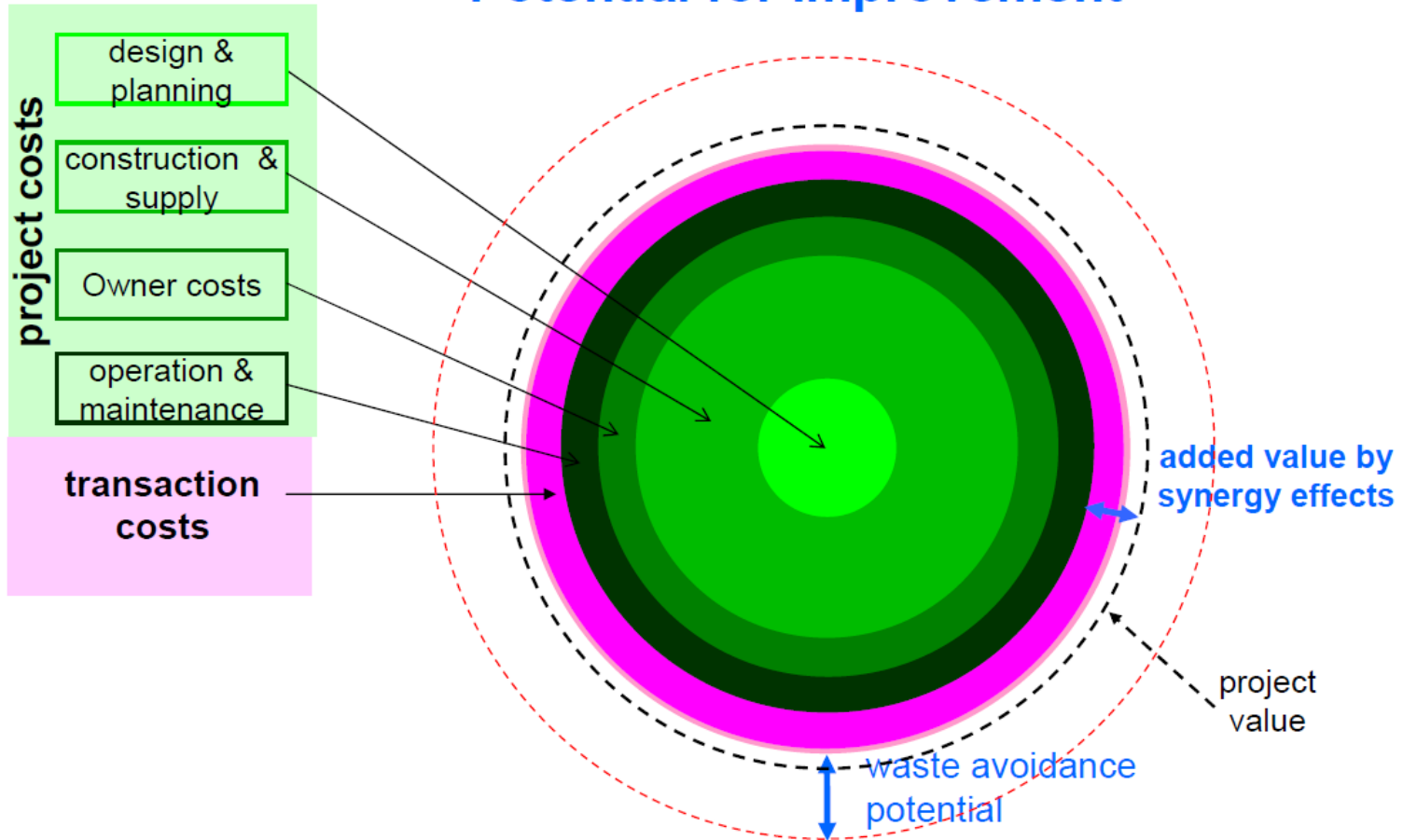


# Project and transaction costs



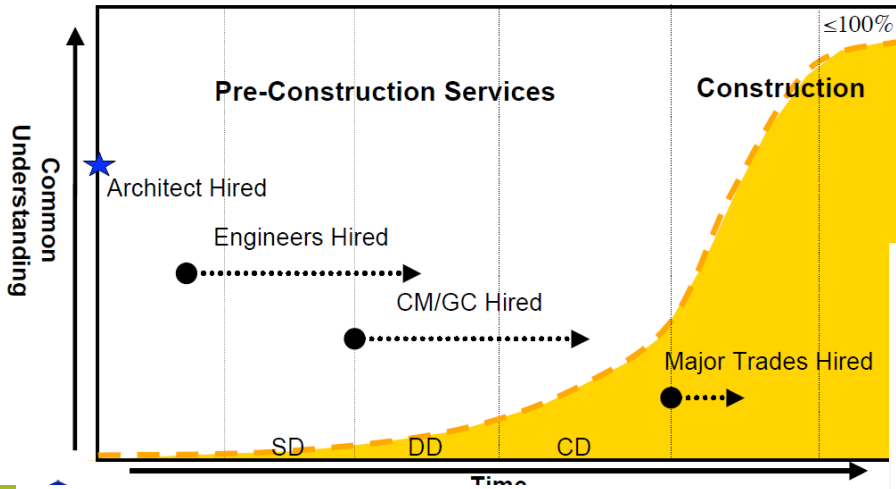
Source: Bertram Zichel

# Potential for Improvement



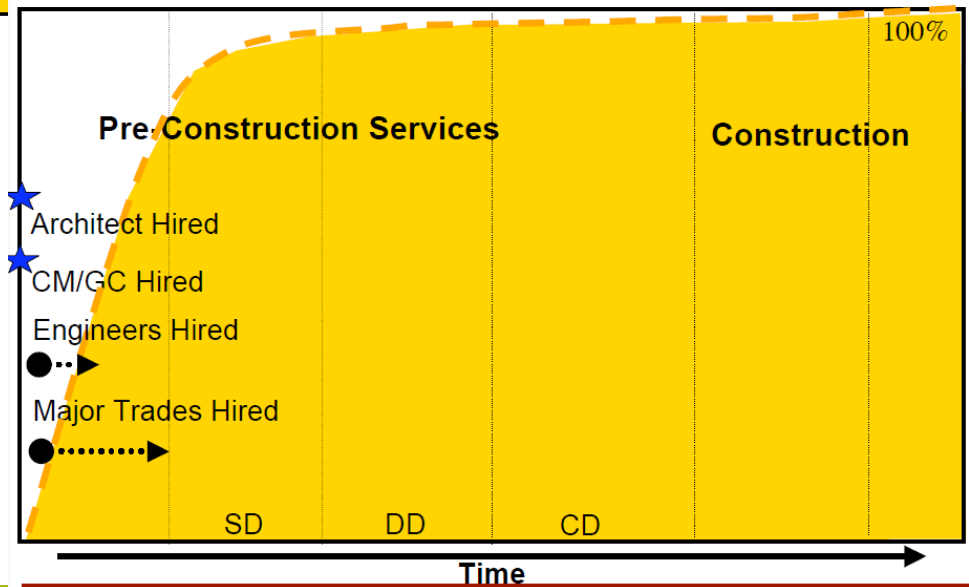
Source: Bertram Zichel

# Traditional Project Delivery Level of Common Understanding

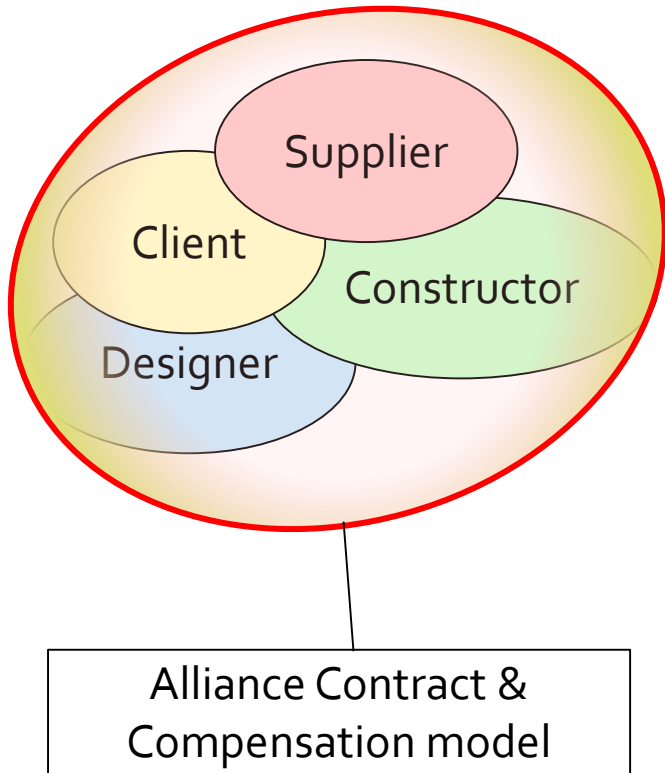


**This is one of the keys!**

# Integrated Project Delivery Level of Common Understanding

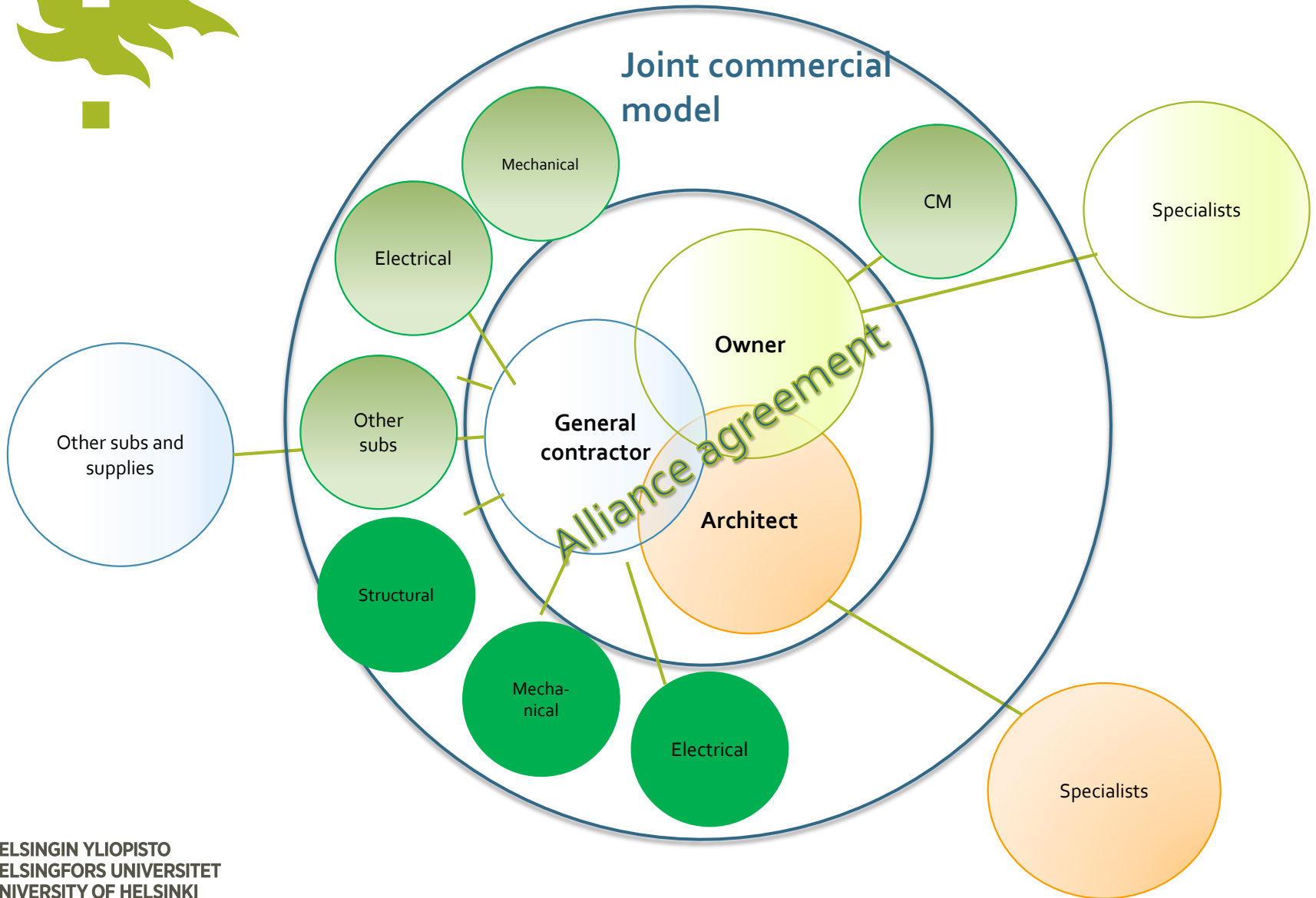


# Elements of IPD-project



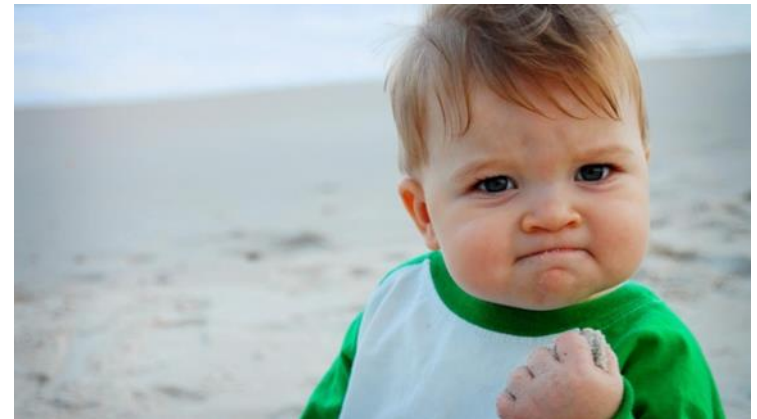
- ✓ Early involvement
- ✓ Joint organization
- ✓ Shared objectives
- ✓ Shared risks and rewards
- ✓ Alliance contract
- ✓ Commercial compensation model
- ✓ Fully open-book commercial transactions
- ✓ Commitment on continuous improvement to achieve outstanding outcomes

# University of Helsinki - Tiedekulma





# Cultural change is quite huge!



2010

The Finns chose Project Alliancing to be the IPD model and wanted to implement it to the Finnish market,

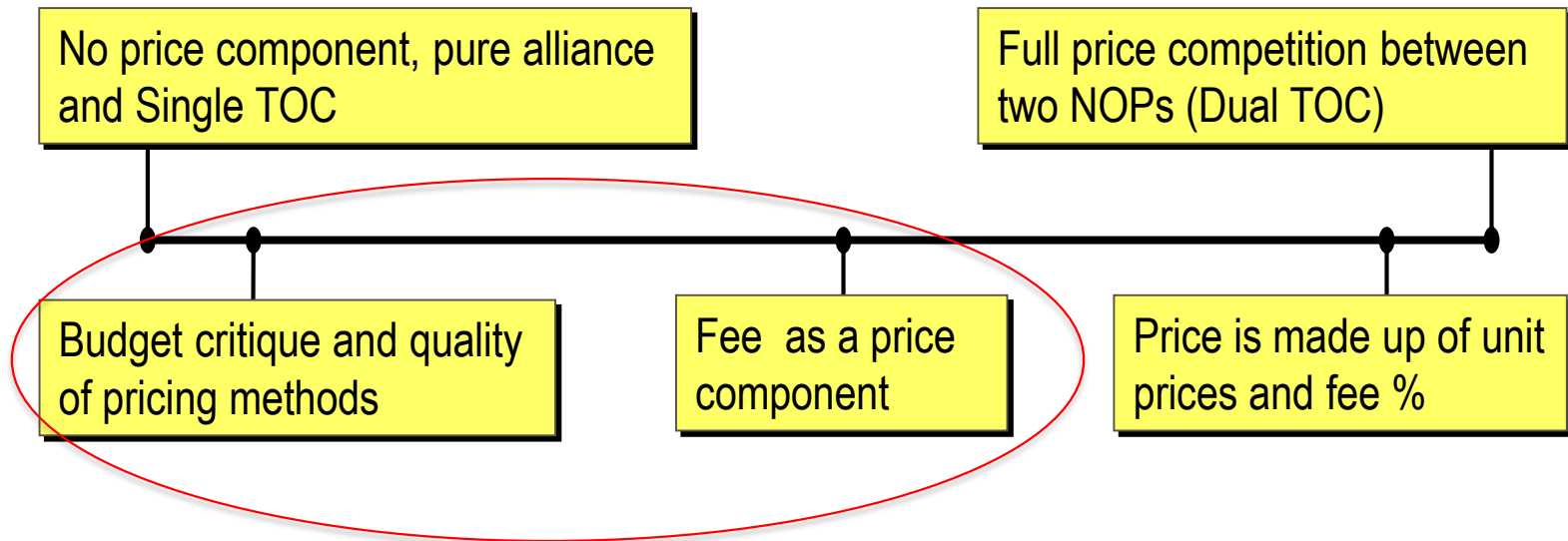
**but**



The Alliance contracting model in Australia has two aspects, which are not in line with European Union legislation:

- There is no need to use price in comparison
- There is no need to write out verbal comparison about every comparison criteria

# We need price component in EU





Tampereen kaupunki

Lemminkäinen

 A-INSINÖÖRIT

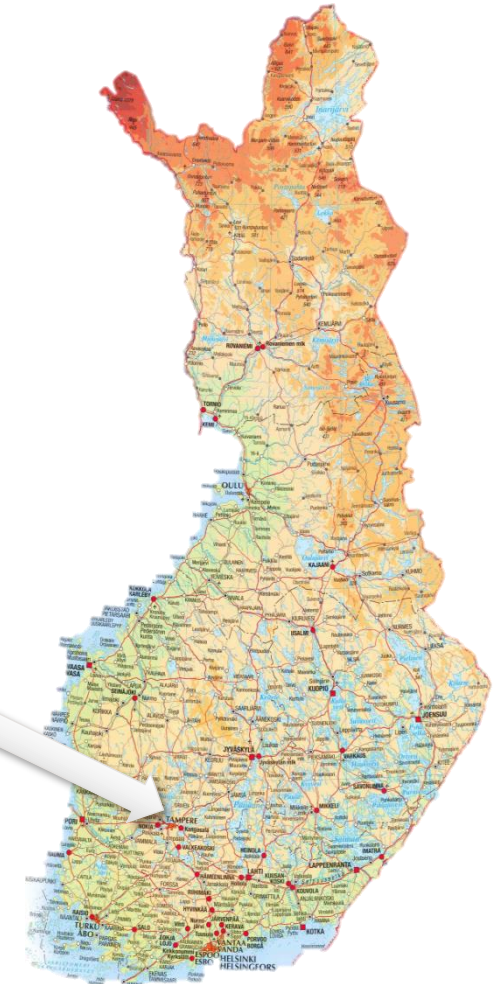
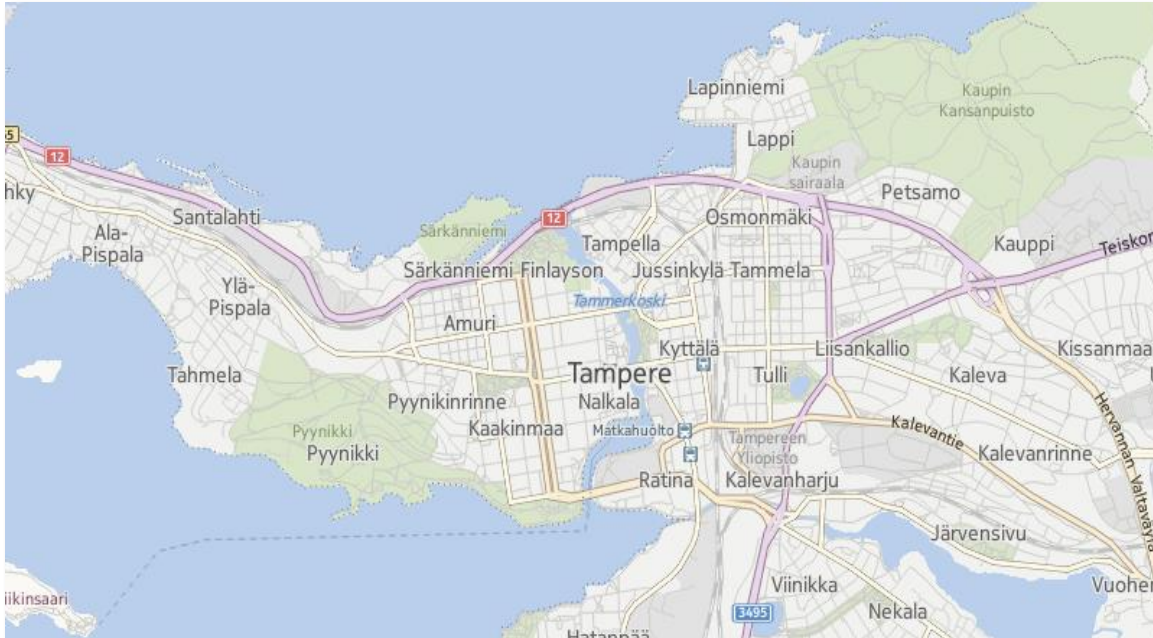


INSINÖÖRITOIMISTO  
SAANIO & RIEKKOLA OY

## Alliancing Contracts in Tampere Tunnel Project, Finland

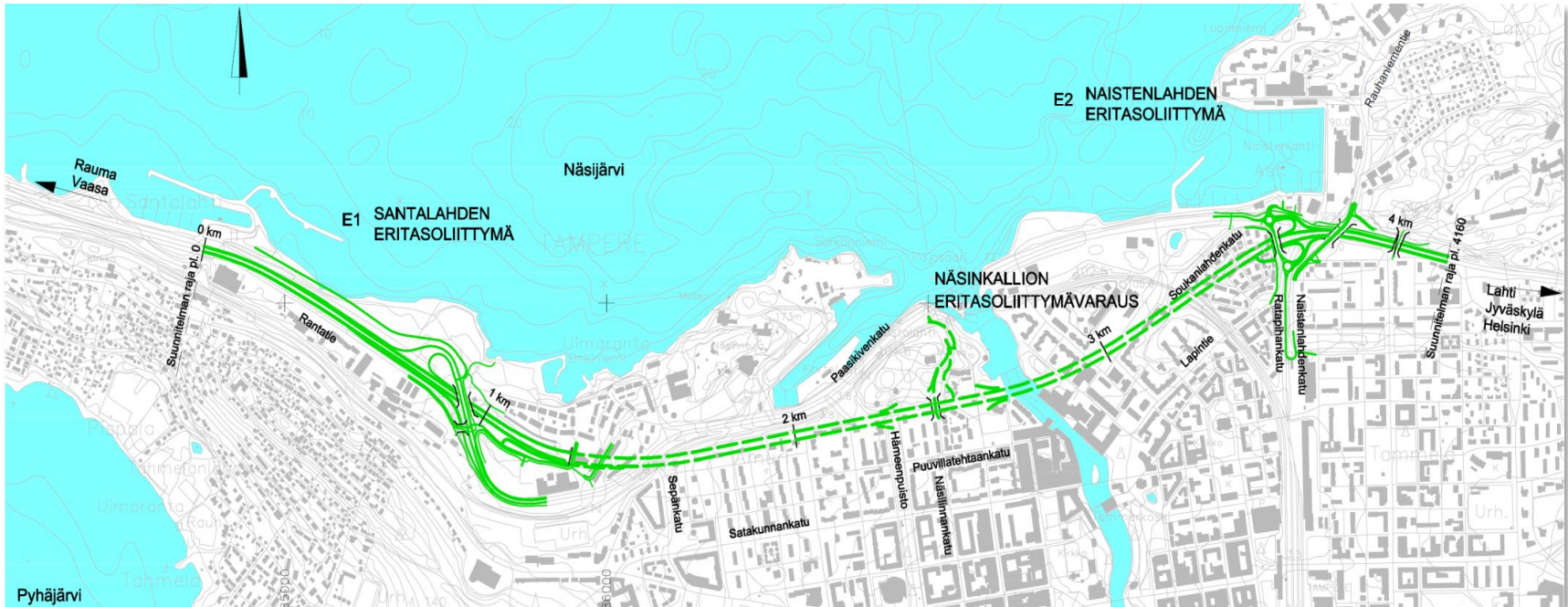
Pekka Petäjäniemi  
Director  
Finnish Transport Agency

# The City of Tampere (Tammerfors)



- **Largest inland city in Scandinavia**
- **230 000 inhabitants and 100 000 jobs**
- **Tampere Tunnel**
  - Is located in the centre of Tampere.
  - Is a part of the nationwide road network and the main road 12

# Scope of Works



- 2 pieces of one-way 2,3 km road tunnels in the middle of the Tampere city center
- Interchange in both ends and provision for one in the middle
- 4,2 km highway and 4,0 km streets, 7 new bridges



# Ranta-Tampella 2013





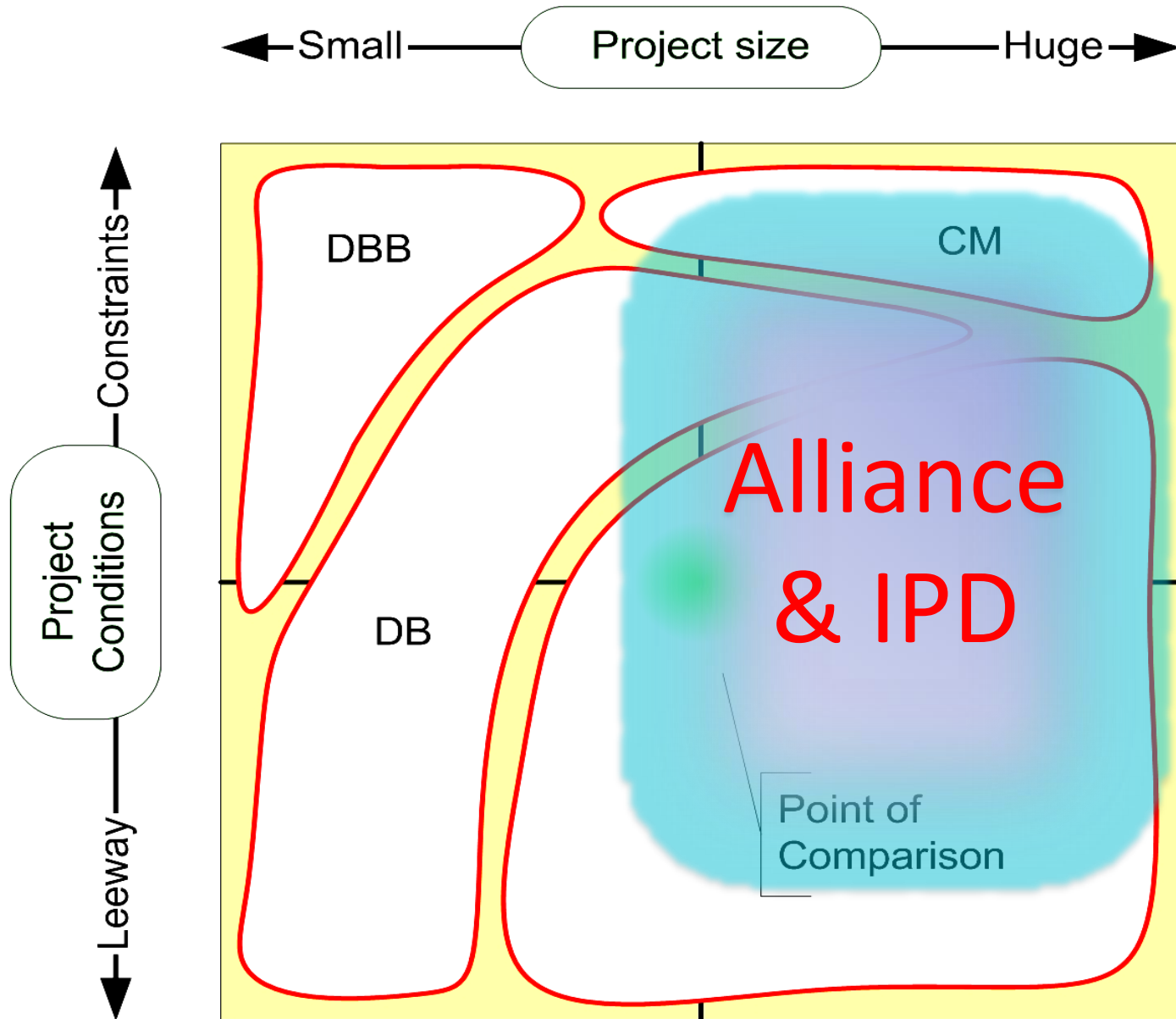
# Ranta-Tampella 2025



# Contract Models in FTA – all in use

- **D-B-B = Design Bid Build**, all the phases under separate agreements, traditional method used all around the world
- **D-B = Design-Build**, Design and Build phases are combined to the same agreement, coming more popular method
- **CM = Construction Management**, provides Owner with a central focal point for managing and administering all phases of project construction. Treats planning, design, construction as integrated tasks
- **DBOM / DBFO= Design-Build-Operate-Maintain** phases are combined to the same long term agreement / private financing is combined to the DBOM-agreement, also known as **PPP**
- **Alliance, Integrated Project Team (IPD)** = Owner and one or more service providers (designer, constructor, supplier etc.) are working as an integrated project team

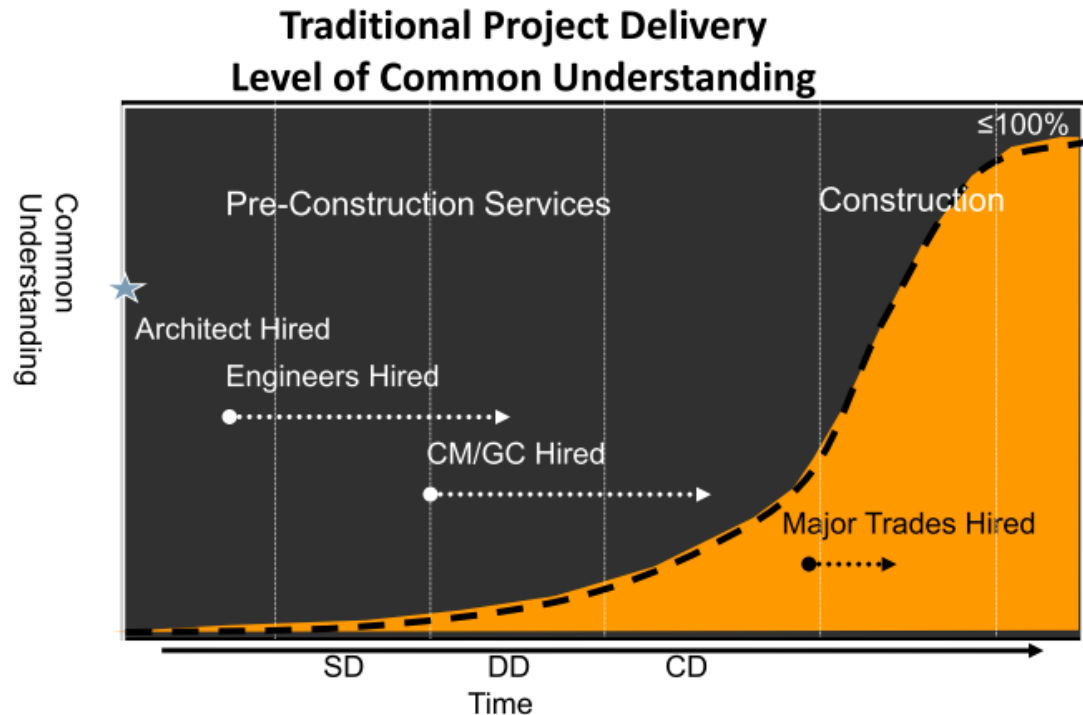
# Applicability of Procurement Methods



# Traditional project delivery

- Lowest price
  - Confrontation
  - Extra works
  - Problems with time schedules
  - Owner and service providers do not have common goals
  - => Prerequisites for VfM do not exist

=> Low productivity

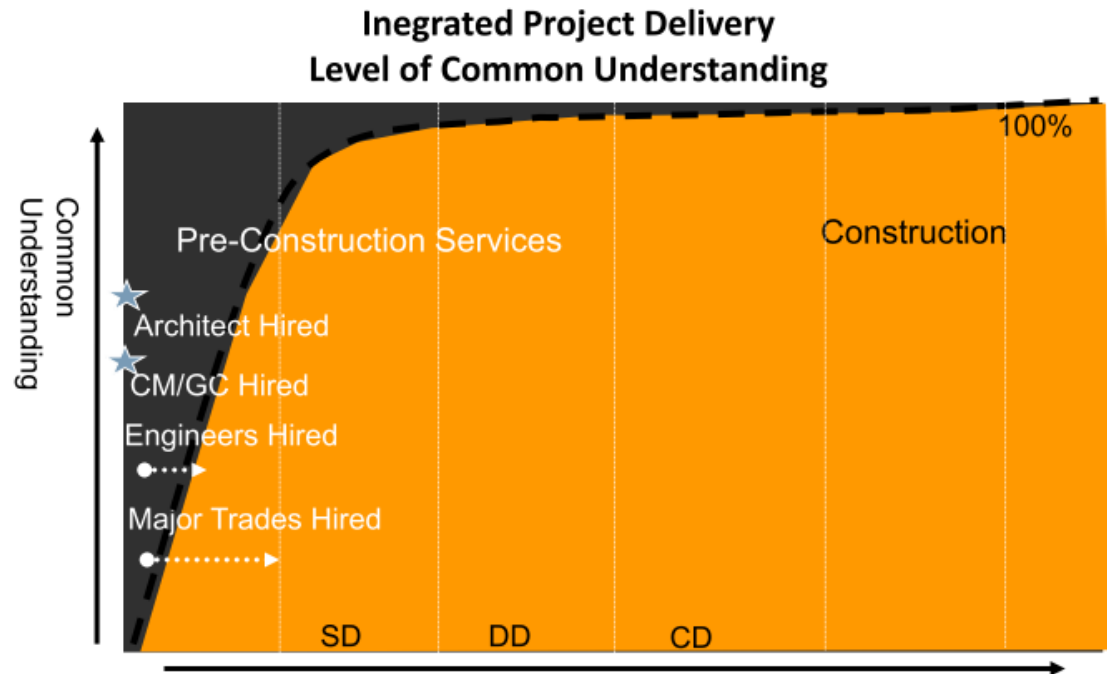


# Integrated teams

## – most suitable for Tampere Tunnel!

- Integrated teams, integrated project delivery, project alliance
- Early Contractors involvement
  - Shared goals
  - Better supply chain management
  - Real possibilities for innovations
  - Enables better VfM approach in project management

=> Prerequisites for increasing productivity exists



# Case Tampere tunnel Project: Strategic Decisions

The decision was made to execute the project:



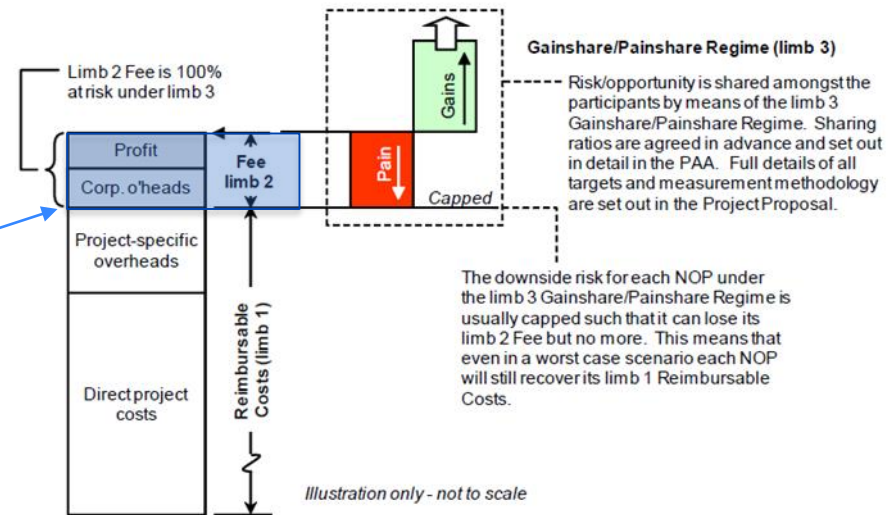
# Establish Alliance

## European Union procurement legislation

According to the EU directives and Finnish legislation:

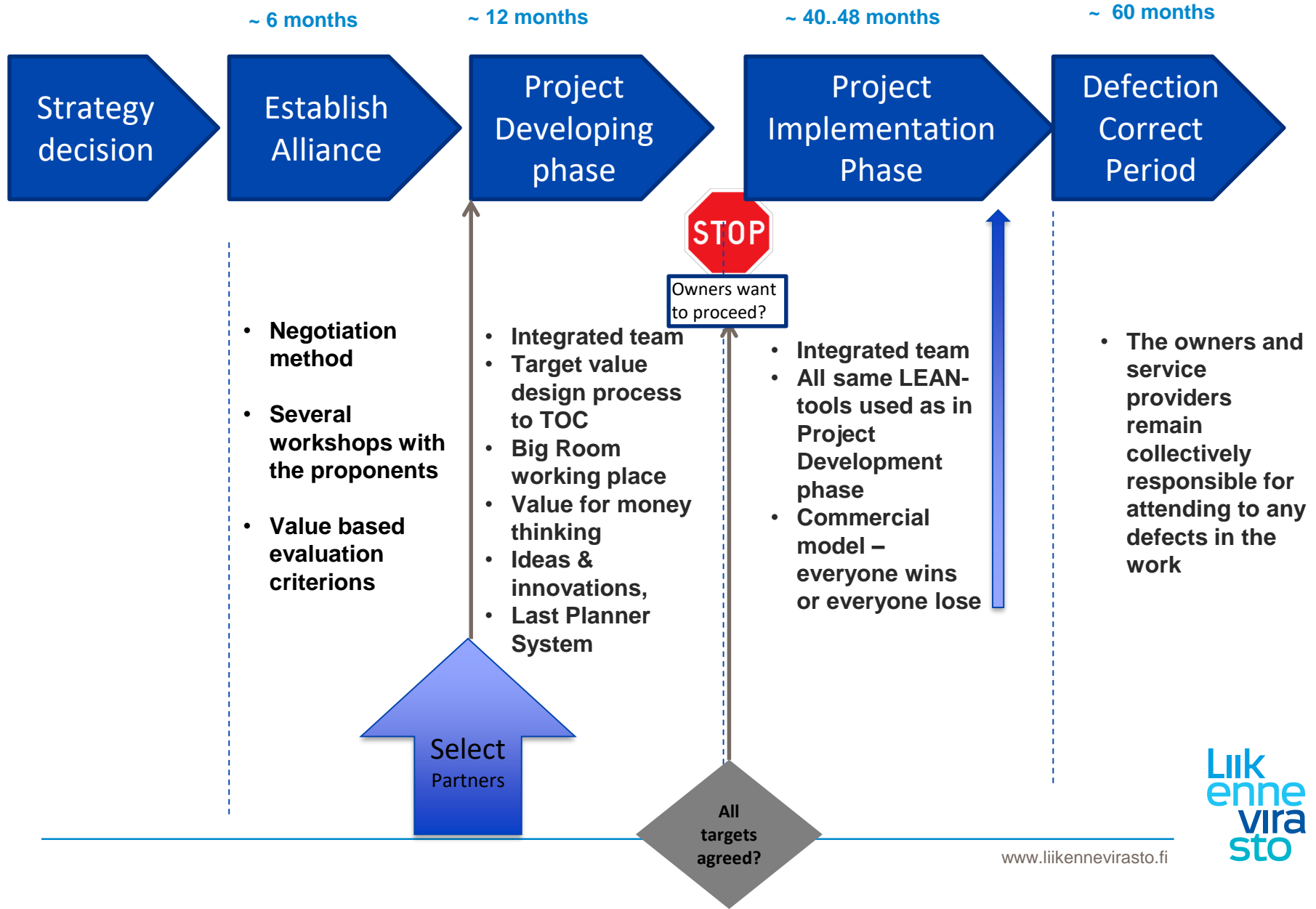
- The price should be used, when contracting authority is making comparison of tenders
- Two possible selection criterias:
  1. The lowest price, or
  2. the most economically advantageous tender (so-called quality and price)
- In Tampere, the **limb 2** was used as a price element.
- Contracting entities should write out justifications for every comparison criteria

The “3-limb” NOP compensation model



Project Alliancing  
Building on the Australian experience – May 2010 Helsinki

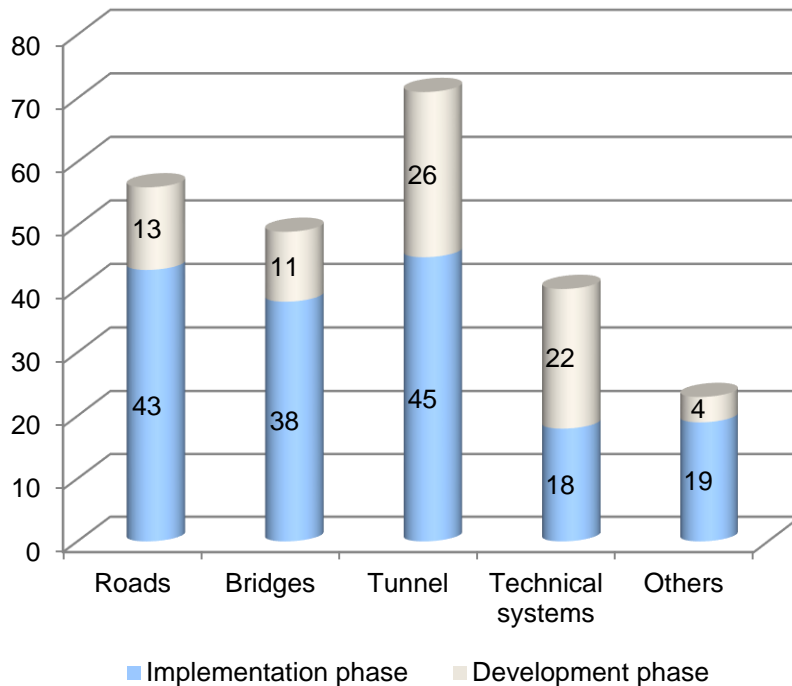
# The Phases of the Tampere Tunnel Project





# What has been achieved so far & Lessons learnt

**More than 200 ideas → More than 30 innovations (VfM over 20 M€)**



**Technology groups have taken the responsibility to develop the ideas**

- **Clear evidence of innovation promotion, but ideas have to be systematically developed into innovations**
- **Less waste with internal processes since Alliance can define, plan and prepare what is best for the project => right things in the right time**
- **One and only Big room is a must**
- **Rather workshop than a meeting**
- **Quick and unanimous decision making is not a problem even with 5 parties in an Alliance**
- **You get what you measure (KRA)**

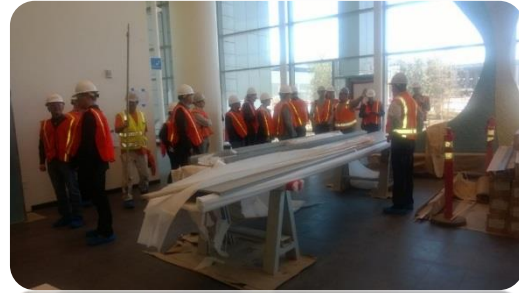
## Value for Money – via Objectives

Key Result Area (KRA)	Objective for Alliance	Results expected
<b>Cost effectiveness</b>	The Project will be delivered cost effective with innovations for solutions and working methods. Alliance brings Value for Money for Owners.	<b>Target cost will be realized</b>
<b>Lead –Time (Time Scale)</b>	Project will be on schedule in use. The Time Scale for Construction Work has been optimized.	<b>Project delivery 6 month ahead</b>
<b>Environment</b>	The final Project and damages/troubles during construction for environment shall minimize.	<b>No unexpected troubles</b>
<b>Quality</b>	The Quality of Design and Construction shall be Outstanding.	<b>Quality requirements will be met</b>
<b>Safety</b>	Work and Traffic Safety shall be high level	<b>Safety will be in acceptable level</b>
<b>Traffic</b>	Disturbance for Common Traffic shall minimized under Construction and there is allowed no disturbance in Tunnel after construction.	<b>Hardly measurable changes in Traffic volumes</b>
<b>Public Image</b>	Public image shall be positive	<b>Outcome of all above</b>

**THE FINNISH WAY #1**  
**- TOWARDS BETTER INTEGRATION**  
**CONTINUES.....**



**We believe, when we are developing our culture..**



**Together we are stronger**



# Group project 2013-2016

## Integrated Project Delivery for Finnish Public Owners

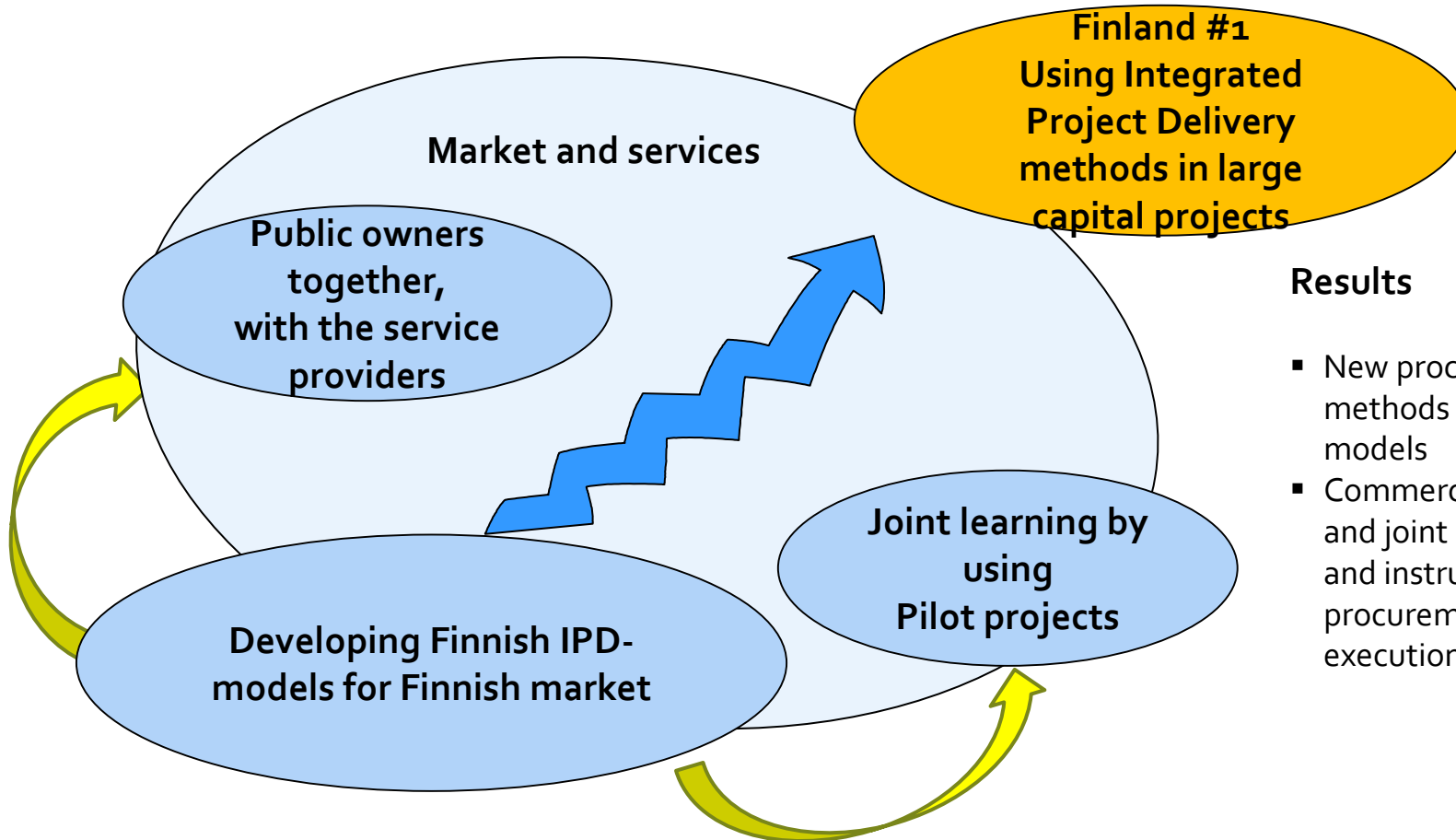
- ✓ 11 public organizations
- ✓ Key Question: How the Finnish public owners will develop and manage the new way to delivery projects using IPD models?



# Mission

## Consequences

- Better customer satisfaction
- Developing the culture within the industry
- Productivity improvement



## Results

- New procurement methods for IPD-models
- Commercial models and joint agreements and instructions for procurement and execution

**1) From sub optimization to optimize the whole with new rules**

- Early integration
- More innovations
- Shared goals, risks and opportunities
- Joint agreement with the key organizations and commercial model which support cooperation
- Sustainability and flexibility

**2) Improve collaboration between public owners**

- A. Developing procurement methods and documents
- B. Cooperation in project level

**3) Developing knowledge, management, leadership and decision making**

- Knowledge and culture
- Project management and interaction
- Decision making in new project developing methods

# Pilottihankkeet <sup>1</sup>

Pilotti	Laajuus ja aikataulu	Sopimusosapuolet	Hankintamenettely	Miten hankittiin
<b>Vt6 Taavetti-Lappeenranta</b> tieyhteyden parantaminen	76 M€ 28 km 05/2014-2017/18	Liikennevirasto, Pöyry Finland Oy ja Ramboll Finland Oy sekä Skanska Infra Oy	Kilpailullinen neuvottelumenettely, 1- (suunnittelu) ja 2-vaiheinen (rakentaminen)	Suunnittelijat ryhmittymänä ja päätoteuttaja erikseen 4-5 kk:n välein
<b>Kainuun Uusi Sairaala</b> Korjaus- ja uudisrakennus-hanke	120 M€ 47.000 brm2 06/2014-2020	Kainuun SOTE, Sweco, Skanska Rakennus Oy ja Caverion	Neuvottelumenettely, 1-vaiheinen	Suunnittelijat, päätoteuttaja ja LVI-urakoitsija ryhmittymänä
<b>Helsingin yliopiston</b> hallintorakennuksen uudistaminen	18 M€ 12.600 brm2 10/2014-2017	Helsingin yliopisto, JKMM-Arkkitehdit Oy ja SRV Rakennus Oy	Arkkitehtikilpailu ja kilpailullinen neuvottelumenettely, 1-vaiheinen	Pääsuunnittelija ja päätoteuttaja erikseen yhtä aikaa
<b>Syvälahden koulun</b> allianssiurakka	25,8 M€ 9.000-11.500 brm2 10/2014-2018	Turun kiinteistöliikelaitos, Versta Arkkitekhdit Oy sekä NCC Rakennus Oy ja Caverion Suomi Oy	Kilpailullinen neuvottelumenettely, 1-vaiheinen	Suunnittelijat aiempien sopimusten perusteella erikseen ja päätoteuttaja erikseen



# Pilottihankkeet <sup>2</sup>

Pilotti	Laajuus ja aikataulu	Sopimusosapuolet	Hankintamenettely	Miten hankittiin
<b>Oulun Lasten ja naisten sairaalan</b> (LaNa) rakentaminen	60-70 M€ 23.800 brm2 2015-2019	PPSHP, Tierna-suunnitteluryhmä	Neuvottelumenettely, 1-vaiheinen	Suunnitteluryhmä ja vuotta myöhemmin valittavat rakennuttaja, rakentaminen ja LVI-urakointi erikseen
<b>Tammelan stadionin rakentaminen</b>	Jalkapallostadion, P-halli ja asuinkiinteistöt liiketiloineen 2013-2017/19	Tampereen kaupunki, JKMM-Arkkitehdit Oy ja Lemminkäinen Talo Oy sekä myöhemmin valittava stadionin päätoteuttaja	Arkkitehtikilpailu ja kehityskumppanuus sekä neuvottelumenettely, 1-vaiheinen	Pääsuunnittelija ja Lemminkäinen Talo Oy erikseen, stadionin suunnitteluryhmä ja päätoteuttaja ryhmittymänä, investorit hankkeen parhaaksi
<b>Pohjankartanon koulun ohjelma-allianssi</b>	n. 10 M€ 13.600 brm2 05/2015-	Liikelaitos Oulun Tilakeskus, Oulun Tekninen liikelaitos, Oulun Sivistys- ja kulttuuripalvelut, UKI Arkkitehdit Oy, Ramboll Finland Oy, Insinööritoimisto Ylitalo Oy, Pohjanmaan Talotekniikka Oy, Paikallis-Sähkö Oy, Fidelix Oy ja Vison Oy	Neuvottelumenettely, 1-vaiheinen	Suunnittelijat ja TATE-urakoitsija ryhmittymänä, päätoteuttajana jatkaa A-osan aiemmin saneerannut kaupungin tekninen liikelaitos
<b>Jakomäen keskiosan kehittäminen</b> , koulun peruskorjaus ja laajennus sekä asuntotuotanto	30 M€ (koulu) 100-500 asuntoa 12/2014-2018/19	Helsingin Tilakeskus, Valvontakonsultit Oy ja parhaillaan kilpailutettava ryhmittymä	Neuvottelumenettely, 1-vaiheinen (kesken)	Hankekehitys ja kaavoitus sekä julkisen rakentamisen ja asuntotuotannon suunnittelijat ja päätoteuttajat ryhmittymänä, investorit hankkeen parhaaksi

# Pilottihankkeet 3

Pilotti	Laajuus ja aikataulu	Sopimusosapuolet	Hankintamenettely	Miten hankittiin
Kunnossapitoalue 2 – radan turvalaitteiden kunnossapitourakka	25,8 M€ 520 raide-km 10/2015-2022	Liikennevirasto ja VR Track Oy	Neuvottelumenettely, 1-vaiheinen	Kunnossapidosta vastaava toimija ryhmittymänä
Tesoman Hyvinvointikeskuksen palveluallianssi	Tesoman hyvinvointikeskuksen terveydenhoito- ja sosiaalipalvelut 140 M€ / 10 v 3/2016-2027	Tampereen kaupunki ja kilpailutettava terveydenhuollon ja sosiaalipalvelut tuottava ryhmittymä	Neuvottelumenettely, 1-vaiheinen	Palveluntuottaja ryhmittymänä, kolmannen sektorin toimijat myöhemmin hankkeen parhaaksi
Leppävaaran koulukeskuksen peruskorjaus ja uudisrakentaminen	30-35 M€ 15.000km <sup>2</sup> 2016-2020	Espoon Tilapalvelut-Liikelaitos ja myöhemmin kilpailutettavat suunnittelijat ja päätoteuttaja	Neuvottelumenettely, 1-vaiheinen	Suunnittelijat ja päätoteuttaja ryhmittymänä

# Rinnakkaishankkeet

Pilotti	Laajuus ja aikataulu	Sopimusosapuolet	Hankintamenettely	Miten hankittiin
Tampereen raitiotie	250 M€ 28 km 6/2015-2022	Liikennevirasto, Pöyry Finland Oy sekä YIT Rakennus Oy ja VR Track Oy	Neuvottelumenettely, 2-vaiheinen	Suunnittelusta, toteutuksesta ja 5-7 vuoden ylläpidosta vastaava toimija ryhmittymänä
Helsinki-Vantaan lentoaseman asematason allianssiurakka	100 M€ 11/2014-2020	Finavia ja Destia Oy	Neuvottelumenettely, 1-vaiheinen	Palveluntuottaja ryhmittymänä





OULU  
UNIVERSITY  
HOSPITAL



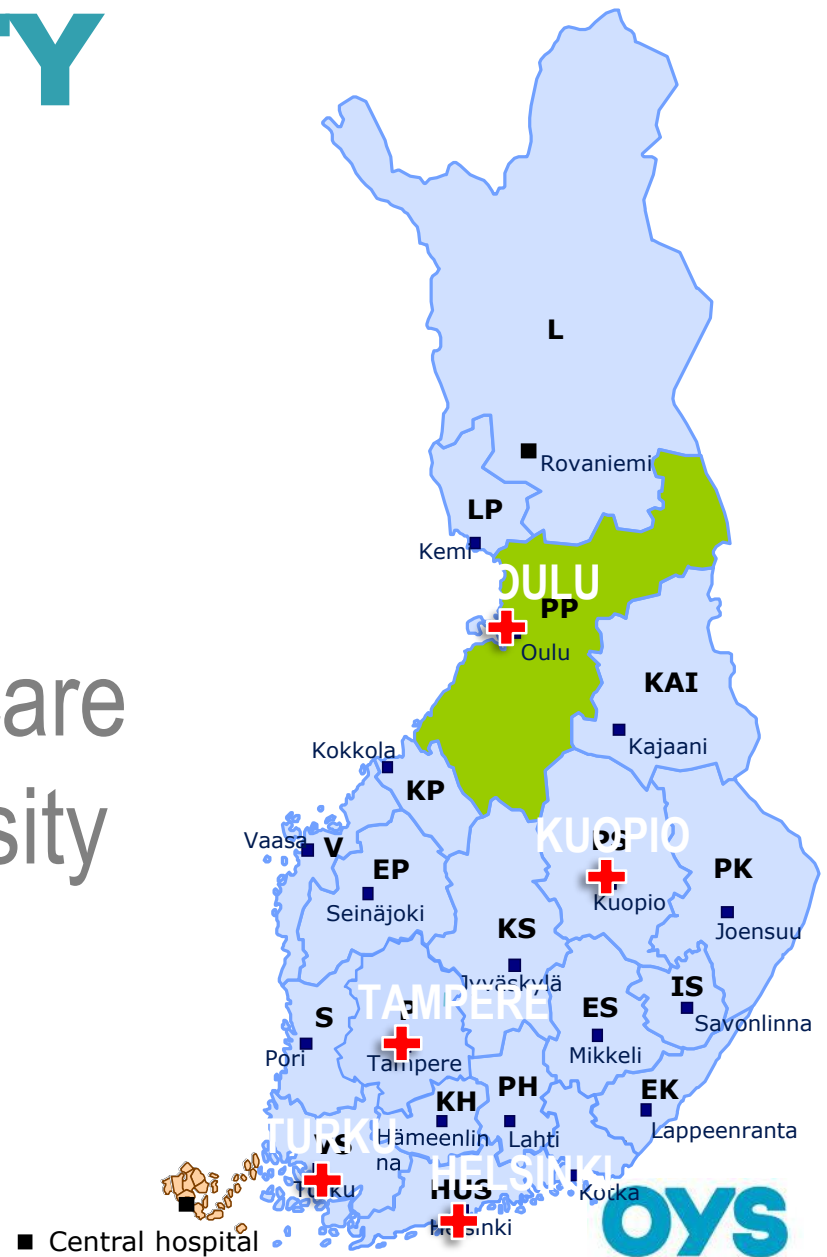
# CASE: OULU UNIVERSITY HOSPITAL FUTURE HOSPITAL 2030

Programme Director  
Kari-Pekka Tampio  
LIPS 2016  
September 2016  
Helsingør, Denmark



# 5 UNIVERSITY HOSPITALS

In Finland most advanced and highly specialised medical care is provided by university hospitals



# OULU UNIVERSITY HOSPITAL RESPONSIBILITY AREA - ERVA

Covers over **50%** of Finland

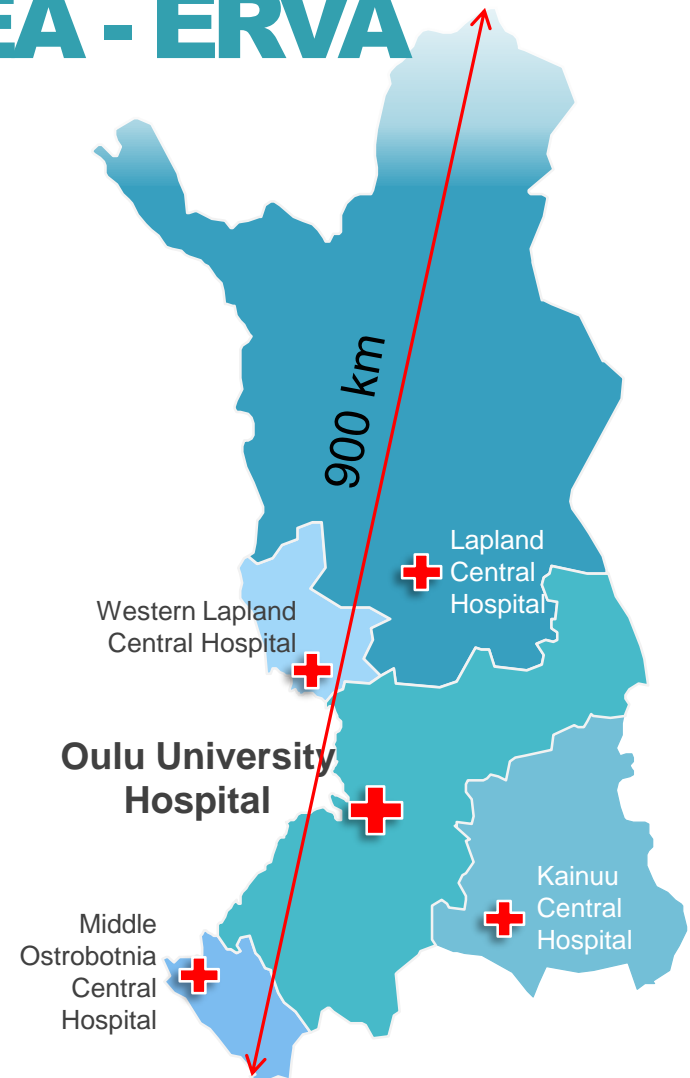
(~ 170 000 km<sup>2</sup> ; 18,1 as. / km<sup>2</sup> )

(Danmark 43 094 km<sup>2</sup>; 129,5 as. / km<sup>2</sup>)

**740 000** inhabitants (5,5 vs. 5,7 milj)

## Oulu University Hospital

Opened	1972
Budget	~570 M€ (2015)
Investments	20 – 50 M€ / a
Staff	7 000
Beds	985 (1 200)
New referrals	128 000 /year
Treated patients	120 000 /year (different individuals)
In-patient days	290 000 /year (365 000)
Out-patient visits	470 000 /year



# OULU UNIVERSITY HOSPITAL

Future  
hospital from  
the early 70's

Design and architecture in the 60's

Launch in the early 70's

250 000 m<sup>2</sup>

No longer optimally meets care requirements (structure, facilities, technology)

Extensive repairs needed

Water damage and other problems

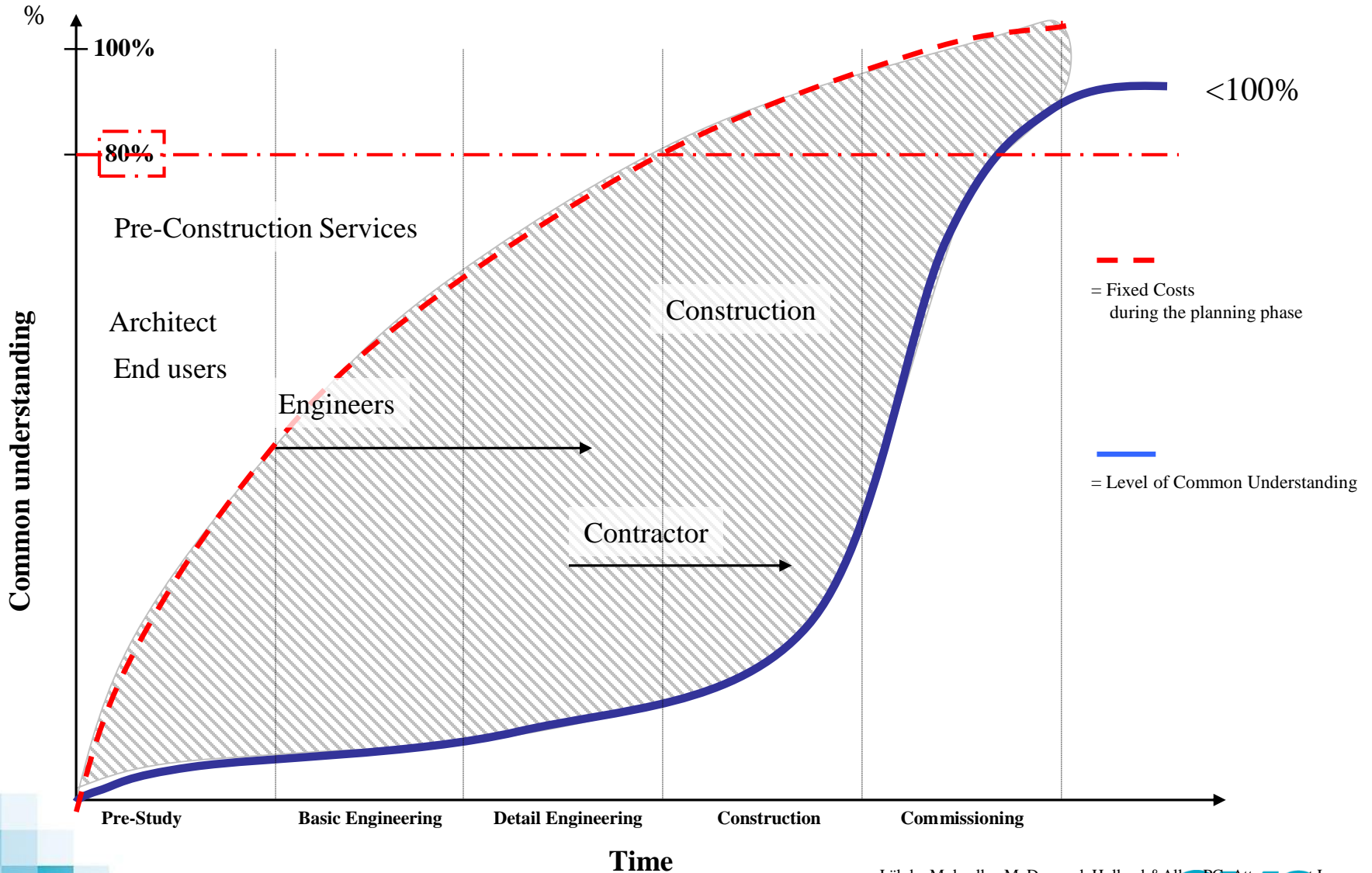


# FUTURE HOSPITAL OYS 2030

- ✓ Budget app. 500 Million euros
  - ✓ ca. 2-3 % of LCC (30 years)
- ✓ By developing operations
  - ✓ reduce operational costs
  - ✓ potential savings 5,6 Billion euros ( 30 years)
- ✓ 6- 8 separate projects
  - ✓ Implementation with a running hospital
  - ✓ Productivity demands 10 – 15 %
- ✓ New premises and technical solutions
  - ✓ potential savings in maintenance costs about 40 %/a

# Traditional Project Delivery

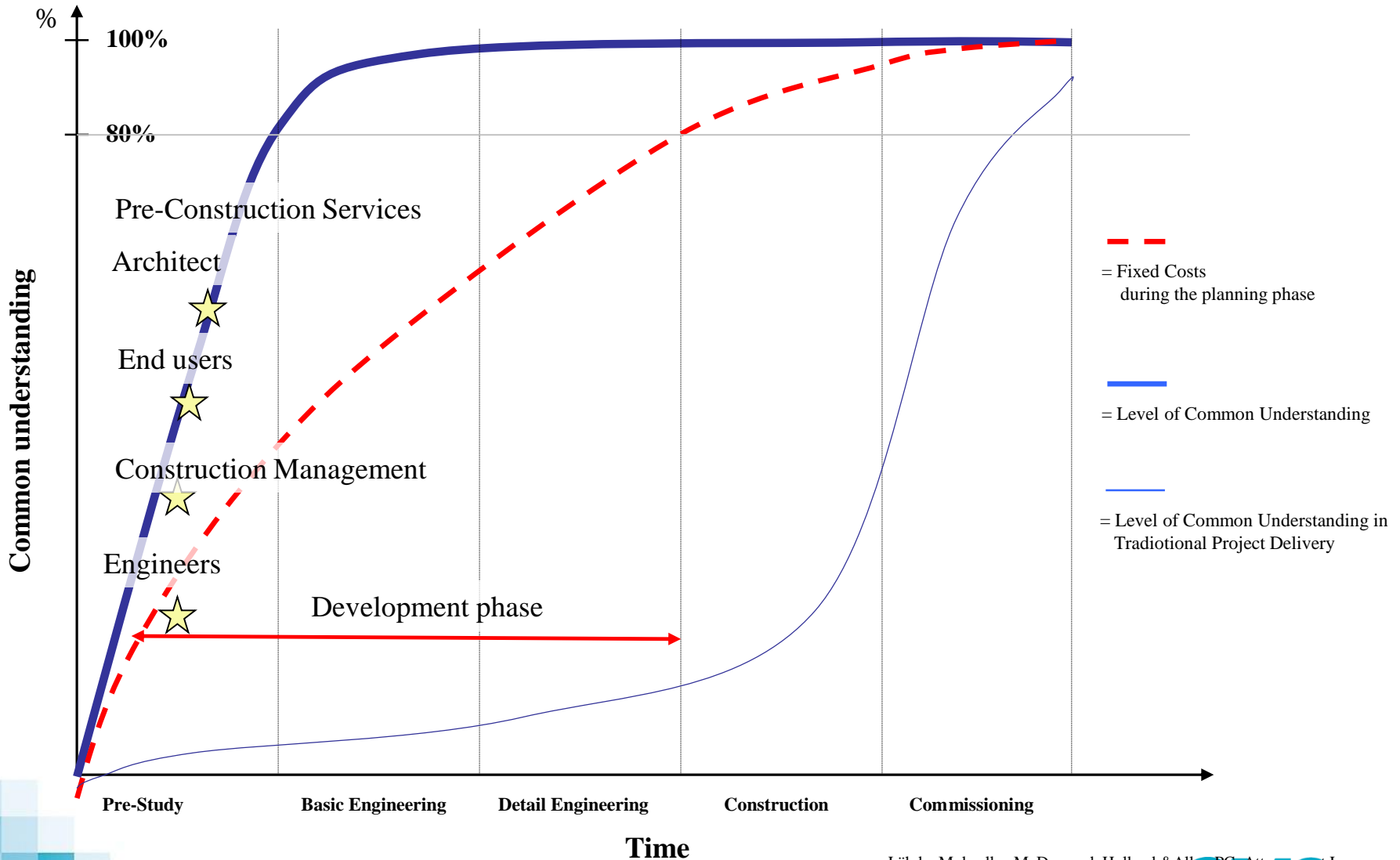
## Level of Common Understanding



Lähde: Mukaellen McDonough Holland & Allen PC, Attorneys at Law

# Integrated Project Delivery

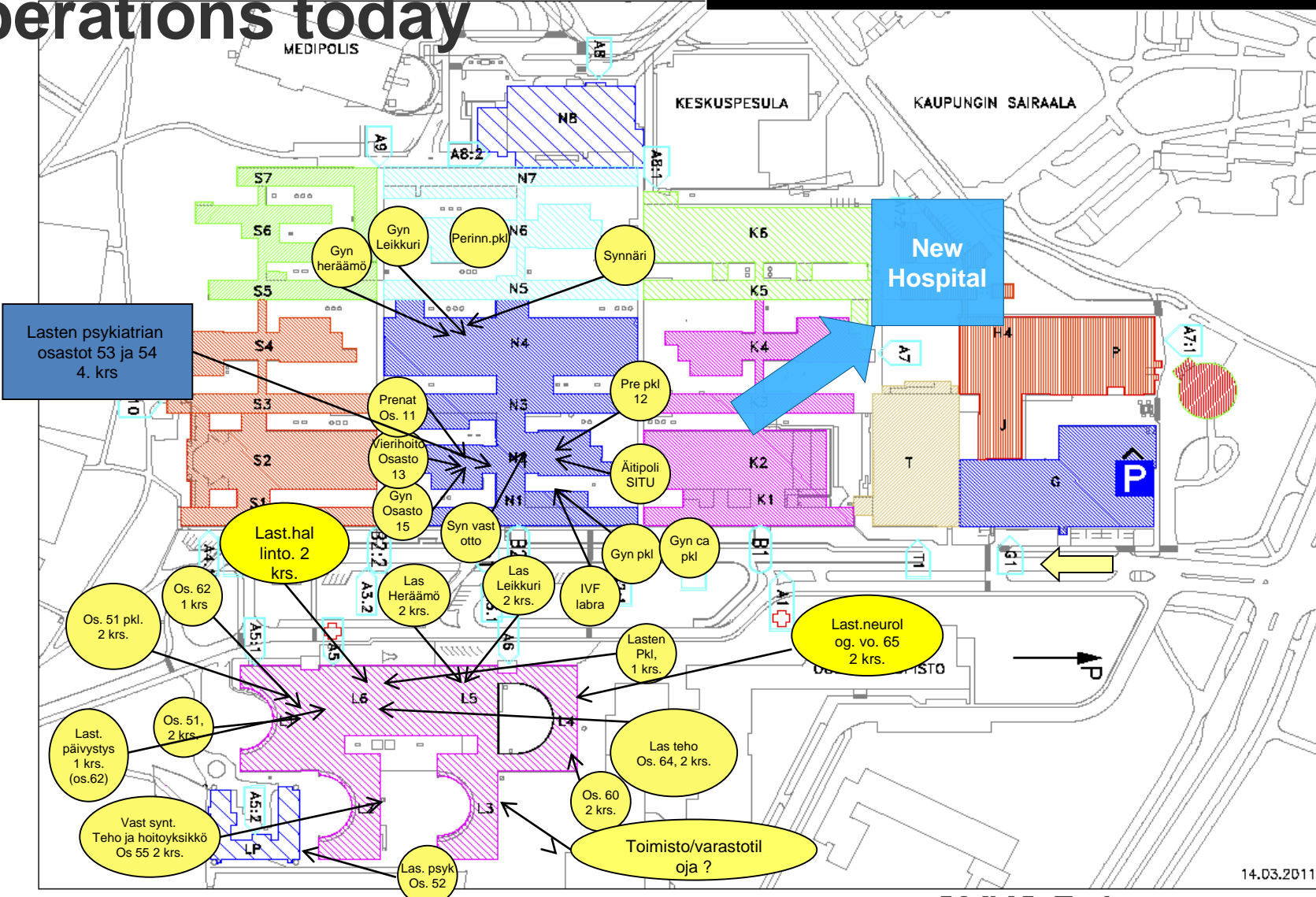
## Level of Common Understanding



Lähde: Mukaellen McDonough Holland & Allen PC, Attorneys at Law

# Case: New hospital for Women and Children Operations today

*Now: 21 units*



14.03.2011

# Scope of the work

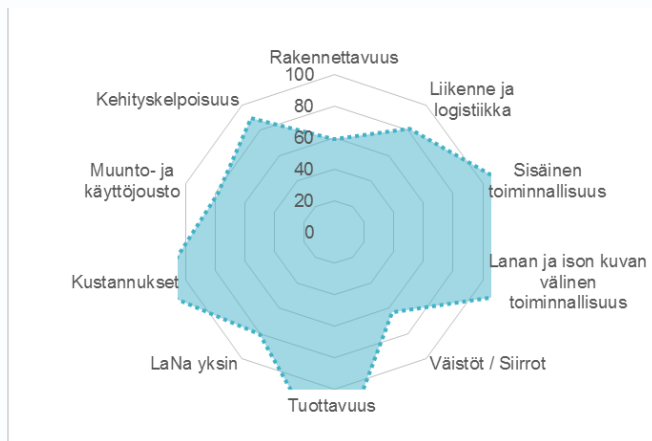
- *all units into the same building*
- *similar units has been integrated*
- *productivity min. 10% (-50 htp/a)*
- *increasing volumes (reform)*
- *(childbirths from 4000 to 6000 /a)*
- *ca. 24 000 brm<sup>2</sup>*
- *budget 70 Meur*
- *Development phase on going*
- *Excecution phase 2017 - 2020*





# Bringing User Experience to Development and Planning phase

- User oriented VALO™-planning method
  - Operational processes in workshops together with personnel and architects
  - Valo™-sessions in CAVE
  - Opinions using zef-questionnaires
  - Analyzing results using "Tähti" –evaluation
- Model rooms



## Typical in our projects

- Big room (communication)
- Last Planner (KISS)
- Workshops (~~meetings~~)
- Adaptability (flexibility)
- Open building principles
  - base building (€)
  - infill (change management)
- BIM (visualisation)
- TVD (not only € ?)

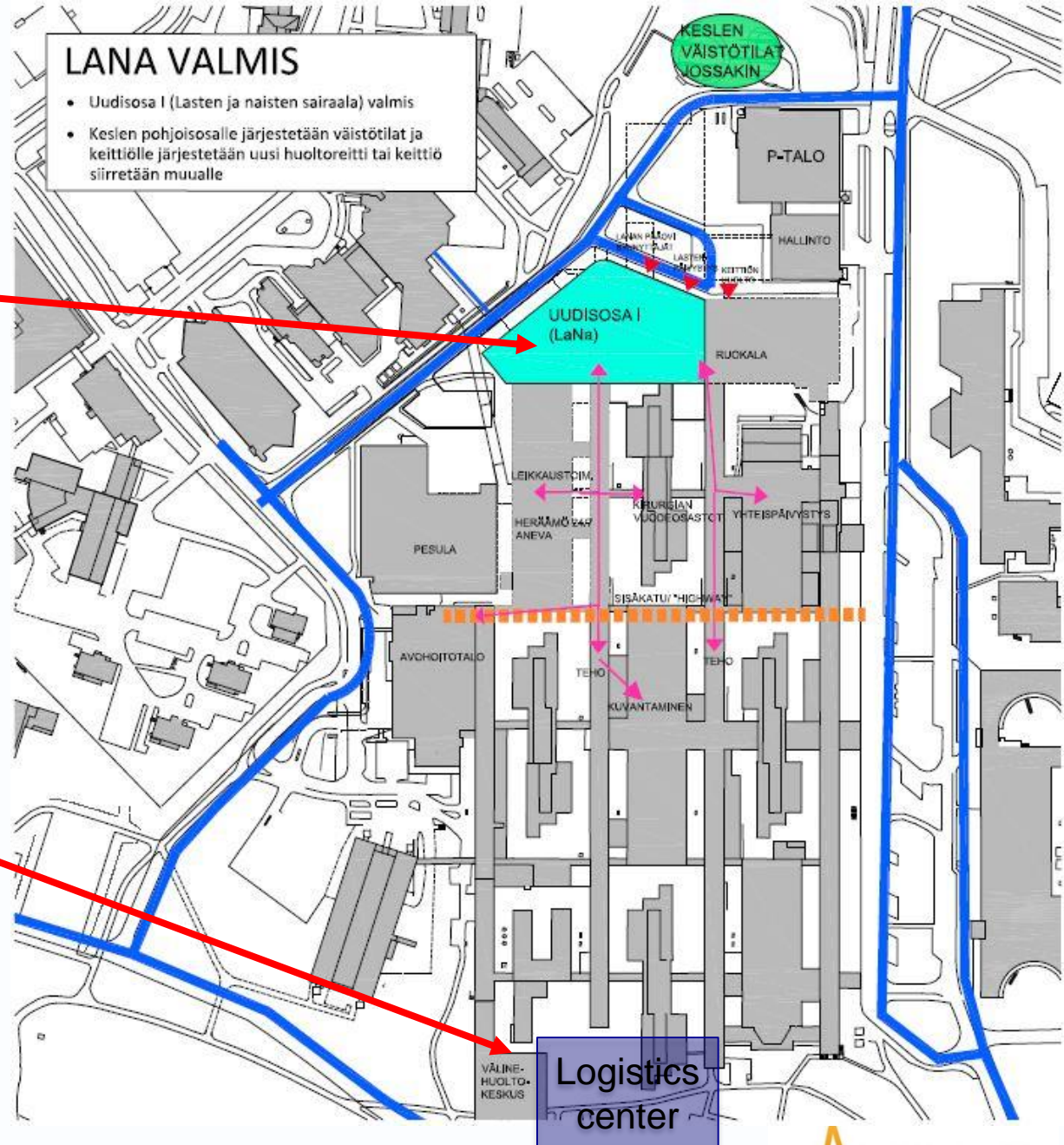




### LANA VALMIS

- Uudisosa I (Lasten ja naisten sairaala) valmis
- Keslen pohjoisosalle järjestetään väistötilat ja keittiölle järjestetään uusi huoltoreitti tai keittiö siirretään muualle

KESLEN  
VÄISTÖTILAT  
JOSSAKIN



Logistics center

☐ New hospital for Children and women

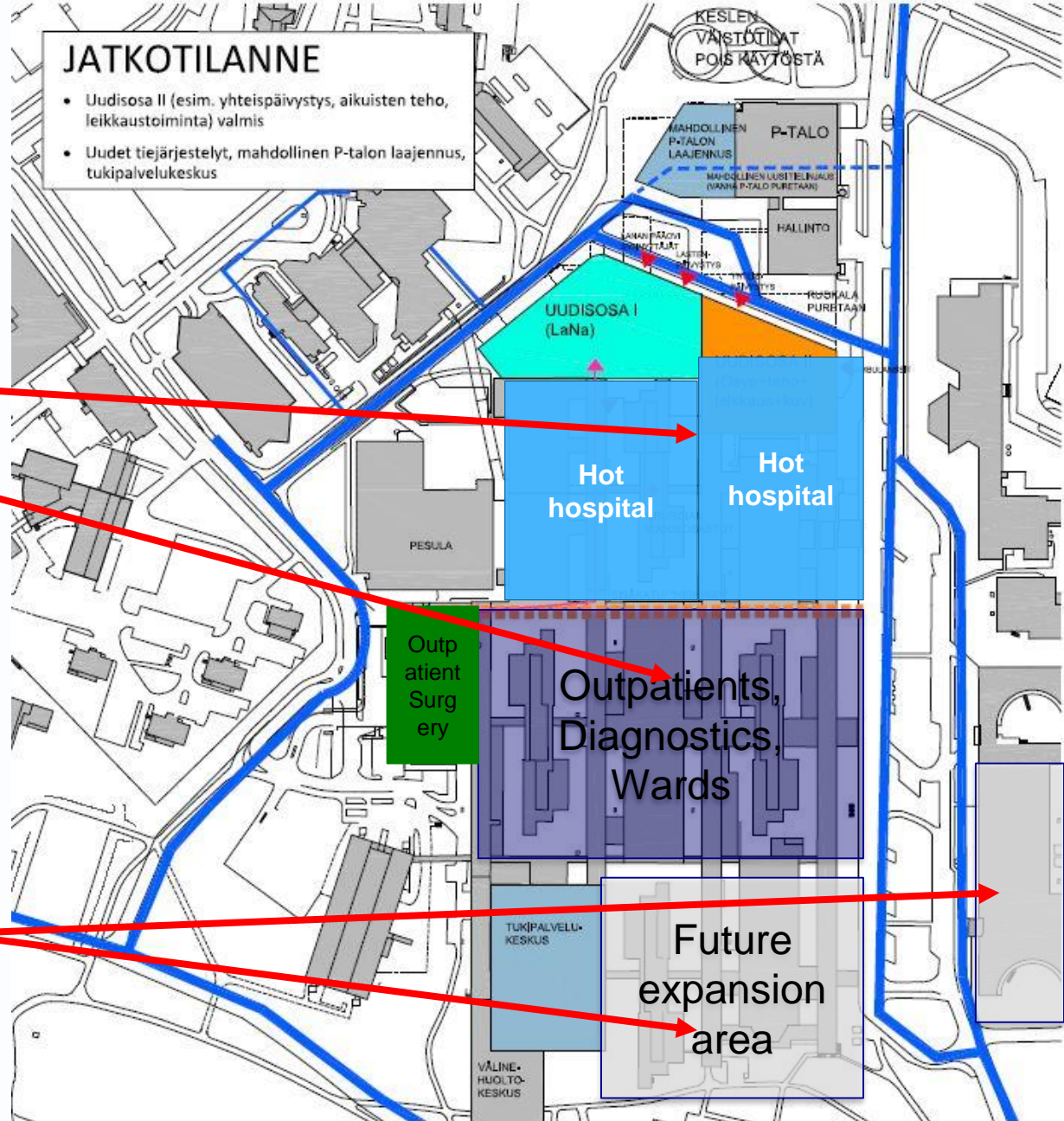
- Under construction years 2017 – 2019
- Complex implementation with a running hospital

☐ Logistics center

- Under construction years 2017 – 2018
- Complex implementation with a running hospital

2030

- Hot hospital (acute 24/7)
  - Emergency, ICU, Surgery
- Outpatients, diagnostics
  - Wards
- Area for Future expansions



# FIRST PROJECT – LESSONS LEARNT

## HOSPITAL FOR CHILDREN AND WOMEN

- ✓ Operational planning started 2011
- ✓ Basic study together with architects started 2013 (“traditional way” in order to get idea about the concept and investment costs) => waste of money
- ✓ Integrated team (8 companies) of architects and engineers together with construction consultants purchased 2014 using negotiation method with several workshops (“pre”-early involvement / hybrid ; aiming to build alliance)
  - ✓ 10 months preparation phase – developing the project (scope and target price) together with experts (involving own personnel and integrated team) => Target price approved in council => Let’s go decision
  - ✓ 8 months more developing; pre - developing phase
  - ✓ MC purchased and Alliance established after 6 months of go – decision.
    - ✓ using negotiation method with several workshops (e.g. Target price and Scope of the Work; evaluation and feedbacks => committed)
  - ✓ Alliance worked together 2 months
    - ✓ L&O in positive way; Scope – time – cost – project management
    - ✓ Lack of knowledge in team building and management (IPD)
    - ✓ Target setting – understanding - stakeholders

# LESSONS LEARNT- SO FAR IN THE BEGINNING OF OUR JOURNEY

- Operations ahead – how long time to plan (& how far) future operations?
  - Health care and medical science development
  - Technology (virtual hospital, smart hospital, IOT, ICT,.....)
- Value for the money - when to build a team – how early involvement ?
  - Does the level of common understanding grows just like that?
  - How to build, manage and empower the team?
- User involvement and commitment for future change
  - User oriented vs. operational point of view or perhaps ....?
- To wait or not to wait – reform in public social & health care sector
- Joint organization
  - Right people and talents and knowledge for management and leadership
- Shared objectives
  - Understanding and commitment
- Target price setting vs. rewards
  - Based on trust
  - Any risks?

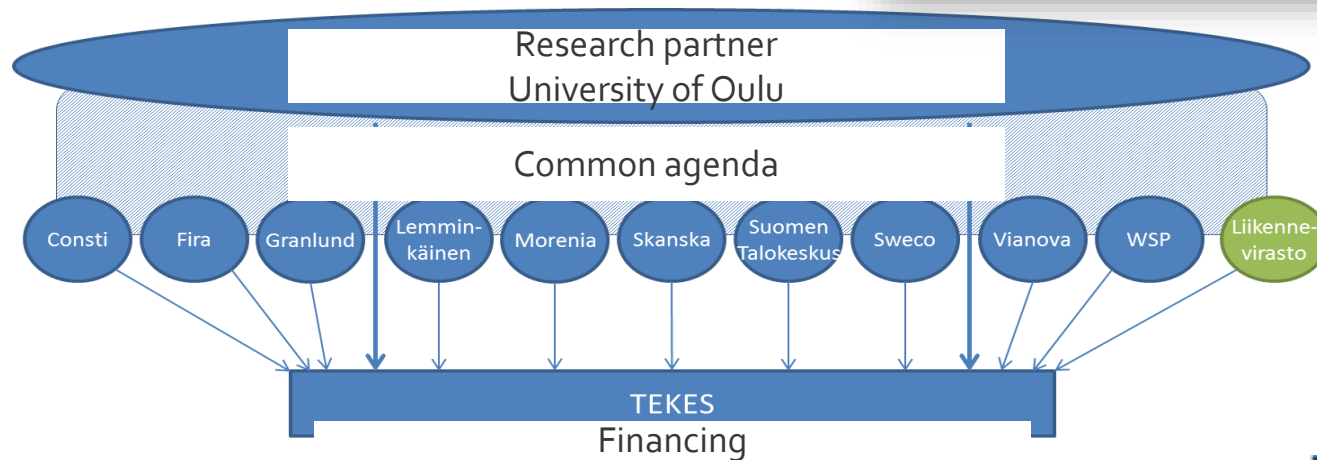
# THE FINNISH WAY #2 - STUDYING LEAN CONSTRUCTION

## Together



# LCIFIN Research Projects

- ✓ LCI<sub>1</sub> & LCI<sub>2</sub>
- ✓ 12 organizations
- ✓ Financing 8,0 M€
- ✓ Duration 2010-2015



# LCIFIN<sub>2</sub> R&D 2013-2015

Doctoral theses	2 (3)
Master theses	> 30
Lower degree theses	> 15
Scientific articles	11
Conference papers	14
Presentations	numerous



# Why LCIFIN research projects?

- We believe that Lean and lean construction are powerful philosophies and give us theoretical and practical platform to develop the whole industry
- We need forums where we can study together and share common understanding and lessons learnt
- We need to bring academy and industry closer to each other
- We need participants who represent the whole value chain  
We can across the borders in joint R&D projects
- $1+1 > 2$





# LCIFIN – How do we work?

- ✓ Every organization has their own pilot projects
- ✓ Half day theme workshops every month
- ✓ Excursions in Finland and abroad
- ✓ LCIFIN Annual Conference
- ✓ Tens of presentations in international conferences

Work package	Theme	time	Organizer
Project definition	Integrated project deliveries	4.3.2013 at 12	FIRA
Lean design	BIM ja LEAN I	9.4.2013 at 12	Vianova
Production	Reliable production (LPS, takt time)	29.4.2013 at 12	Consti
Lean Supply	Lean Construction ja Lean supply	29.5.2013 at 9	Morenia
Project definition	Requirements drives the whole construction process	19.6.2013 at 9	Sweco
Production	Value stream mapping	28.8.2013 at 9	Suomen Talokeskus
Lean design	BIM ja Lean II	25.9.2013 at 12	WSP
Lean design	Target Value Design	30.10.2013 at 9	Granlund
Lean design	Working in the integrated project team, Big room	2.12.2013 at 8	Lemminkäinen
Production	Prefabrication, standardizing	9.1.2014 at 9	Skanska



# LCIFIN – achievements

The screenshot shows a web browser window displaying the LCIFIN website. The browser's address bar shows the URL <http://projekti.com/lcifin/en/>. The website features a navigation menu with links for Home, About, Research Projects, Resources, Contact, and In Finnish. Below the navigation menu is a dark grey section titled "Lean Construction" containing six icons and labels: LCI-Finland, Research projects, Researchers, Publications, Links, and In Finnish. A paragraph of text describes the organization's mission. To the right, a section titled "Other Lean Construction Institutes" lists Australia, Denmark, Germany, Ireland, Israel, Norway, UK, and USA. The footer contains links for CONTACT, ABOUT, and LOGIN, along with a Windows taskbar showing the date 13.9.2015 and time 13:54.

Lean Construction Institute Finland (LCI-Finland) is an open, independent and not-for-profit organization. Our mission is to research, develop and apply lean thinking and lean management principles in the construction industry and to find the best practices applicable to our member organizations.

**Other Lean Construction Institutes**

- Australia
- Denmark
- Germany
- Ireland
- Israel
- Norway
- UK
- USA



### Asiakas haltuun asiakkuudenhoitomallilla

Talokeskuksessa käytöön otetun asiakkuudenhallintamallin tavoitteena on asiakassuhteen kokonaisvaltainen hoito ja asiakkaaseen liittyvän tiedon parempi hallinta yhtiön toimintatarjojen...

Lue lisää



### Asiakslähtöiset palvelusopimukset

Talokeskuksen LCIFIN2-hankkeen päätavoitteena on alkuun saada kokonaispalvelumalli, joka mahdollistaa palvelukokonaisuuksien tuottamisen asiakkaalle sähköisesti siten, että kaikki kiinteistöihin liittyvä tieto löytyy yhdestä paikasta.

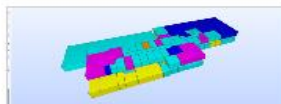
Lue lisää



### Asukaslähtöinen tiedonhallinta

Taloyhtiökorjauksissa, erityisesti putkimonteerissa, asiakasprosessi työllistää paljon ja vaatii asiakkaan palvelukokemuksen. Toisaalta asiaan liittyvät tiedonhallinnan työkalut ovat kehitymättömiä eivätkä useinkaan tuota asukkaiden tarpeen näkökulmasta oikeaa lopputulosta. Kehityshankkeessa analysoitin asiakasprosessia asiakasarvon näkökulmasta...

Lue lisää



### Avoin rakentaminen tietomallipohjaisessa LVI-suunnittelussa

Avoin rakentamisen periaate on jakaa rakennus kiinteään osaan ja muuttuvaan osaan joiden väliset riippuvuudet pyritään minimoimaan. Tavoitteena on rakentaa käyttäjien mukauttelevin tarpeita vastaava tilaa kustannustehokkaasti ja nopeasti. Avoin rakentaminen...

Lue lisää



### Firan Last Planner systeemi

Firan tuotannonohjaukseen esittämällä Last Plannerin työkalulla on mahdollista yhdistää vakiointi ja Last Plannerin työkalulla luoda Firan tuotantotilanteen Last Plannerin työkalulla...

Lue lisää



### Firan prosessinohjaus ja -kukinta

Prosessinohjaus on Firan keskeinen osa-alue. Prosessinohjaus on Firan prosessinohjaus ja -kukinta. Firan prosessinohjaus ja -kukinta...

Lue lisää



### Firan suunta-lehti ja tuotannon suuntauspäivät

Kulttuurin muutos on yksi Firan LCIFIN2-projektin työpaketeista, jonka merkitys on vain nousus konsernin kasvaessa ja projektin edeessä. Tuotannon suuntauspäivillä halusimme työskennellä yhdessä koko Firan toiminnan ja tuotannon kehittämiseksi. Tuotannon suuntauspäivät...

Lue lisää



### HUKKA POIS: Lean Six Sigma

Lean Six Sigma menetelmän oppiminen tuotavuuden parantamiseksi. Pyrkimyksenä kouluttaa ihmisiä mittamaan analysoimaan parantamaan ja varmistamaan tuotantoa. Tavoitteena parantaa Lemminkäisen kilpailukykyä.

Lue lisää



### Integroitu toteutus korjaushankkeessa

Integroitujen projektitoimistusten periaatteita haluttiin soveltaa "pienehköissä" 5-10 ME kokoluokan korjaushankkeissa ja kehittää siihen kevyempää mallia jossa kuitenkin toteutuvat integroidun projektin perusperiaatteet. Constin kehitystyö ja Yliopiston oma tutkimushanke yhdistyivät Franzentian korjaushankkeessa...

Lue lisää



### Kalustotoimituksen tehostaminen Lemminkäinen Infra Oy

Sujava kalustotoimitus kalustokeskuksesta työmaalle. Huolehdittaan että tuotanto lähtee tehokkaasti käyntiin ilman viivettä kaluston saavuttua kohteeseen.

Lue lisää



### Last Planner korjausrakentamisessa

Last Planner on jo pitkään rakentamisessa sovellettu yhteistyöhön ja visuaaliseen perustuva työkalu työajan aikataulusuunnitteluun ja -ohjaukseen. Consta testasi työkalua ja tutki sen soveltuvuutta omaan tuotantonsa erityistapaauksiin, kuten pienehköissä tilamuutoksissa ja...

Lue lisää



### Moduulirakentaminen, Tampereen Rantatunneli

Moduulirakentamisen tavoitteena on hyödyntää moduulirakentamisen perustavaa tuotantotapaa käytönoton aikaistamiseksi sekä yleiskaatolaiton nopeuttamiseksi ja hallinnan parantamiseksi. Kohteeksi moduulirakentamiselle valittiin Tampereen Rantatunneli (toteutetaan Allianssimallilla).

Lue lisää

THIS IS A HUGE CULTURAL CHANGE!!

# RAIN- Project

Fira

SWECO 

 PÖYRY

Liikennevirasto

talokeskus 

RAMBOLL

Lemminkäinen

OULUN  
  
YLIOPISTO

 TAMPEREEN  
TEKNILLINEN  
YLIOPISTO



Granlund

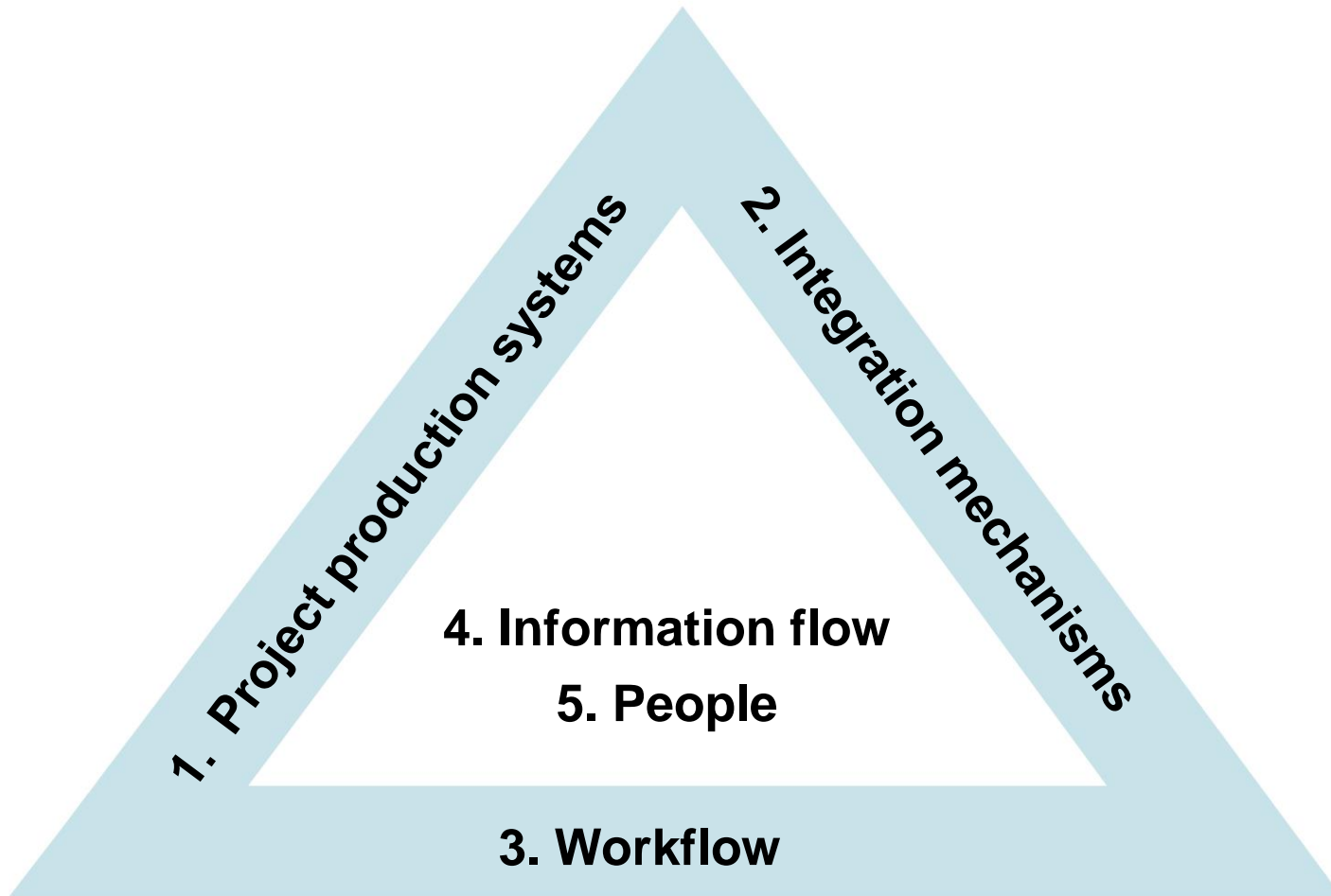
VR TRACK

YIT

CONSTI

- 2,5 years joint program-> October 2018
- Five themes
- Joint R&D budget 450 000 €
- Companies together over 2 M€

# RAIN Themes (work packages)



# Conclusions?!

**Nothing**

*teaches us better than our own*

**experiences!**

## **11.00-12.30: Finland's Journey with Lean Construction**

- Experience the Journey that the public sector in Finland has undergone with Lean Construction ✓
- Hear about the key learnings in the process ✓
- Learn about the steps and mistakes in Finland's journey with Lean Construction

# We need to focus



- Integrate Owners team always before starting procurement
- Value for money statements
- Tendering costs (consulting companies)
- Commercial model (consulting companies)
- Continues improvement in procurement processes and selection criteria – rise the bar
- Focus on people (much more)
- TVD-process and target cost
- Market will divide to those who will learn and those who are against...
- Reflections





# Where might we be now?

## Industry level

### Project level

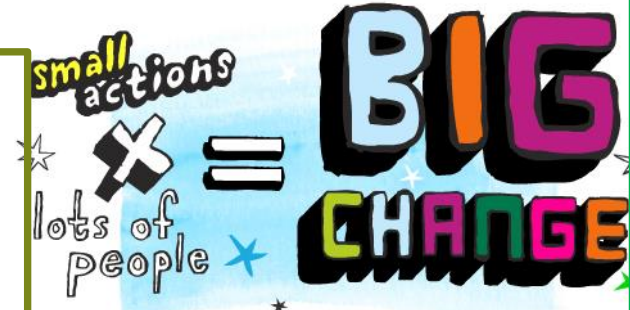


### The Foundation

- ✓ IPD Procurement
- ✓ IPD commercial models and agreements
- ✓ IPD phases
- ✓ Lean principles and some tools



- ✓ Build the culture – develop people
- ✓ Owners: Determine objectives and value for your projects
- ✓ Use lean tools and methods to understand value and reducing waste
- ✓ Develop and use technology which support the objectives



- ✓ New strategies
- ✓ New business models and opportunities
- ✓ Focus to operational and lifecycle value
- ✓ Something we don't understand yet
- ✓