

DEVELOPING MULTIPURPOSE INFRASTRUCTURE FOR CLIMATE RESILIENCE

from Practice to Principles

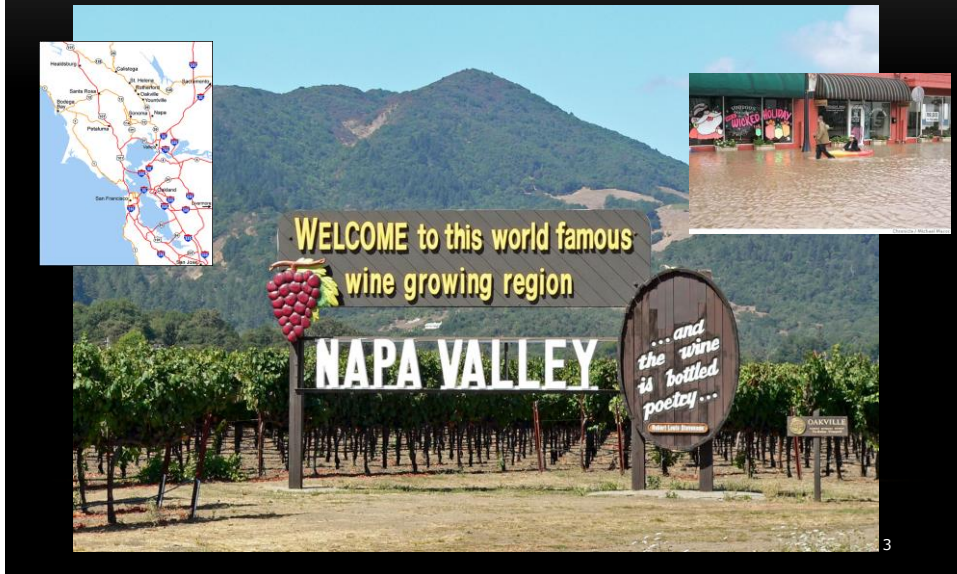
Arjan Hijdra

Sr specialist Waterway Development - Rijkswaterstaat
PhD Candidate Spatial Sciences – University of Groningen

*In a world of zero transaction cost,
land use value would maximize instantaneously*

Ronald Coase 1960

NAPA, CALIFORNIA — THE MOST FLOODED CITY OF THE USA



NAPA, CA — FROM PRACTICE...

- Records dating from 1862 describe twenty-seven significant flooding events.
- A large flood in February 1986 revived public interest in finding a remedy.
- A traditional plan to widen the river channel proposed by the United States Army Corps of Engineers was presented in 1995 and roundly rejected.
- In 2005, the Napa river overflowed and flooded the entire downtown area and thousands of acres all over Napa County
- More than 4,000 residents were evacuated and 1,000 homes were flooded or destroyed.
- The 2005 flood was the 23rd most serious flood of the Napa River on record since 1865.

NAPA, CA – FROM PRACTICE



5

NAPA, CA – FROM PRACTICE...

- A group of special interests called Friends of the River formed.
- From January 1996 until May 1997, this coalition representing business, agricultural and environmental concerns met and achieved a consensus on a "living river" plan.
- Voters in the County of Napa narrowly approved an increase of .5 percent of the sales tax in a March 1998 election to fund the Napa River Flood Project

6



NAPA, CA — FROM PRACTICE...

- In the downstream project area, dikes have been removed and tidal marshlands have been restored; bridges have been replaced to remove obstacles to water flow;
- riverbank terracing has been done to provide more room for large volumes of water;
- a dry bypass channel will be excavated to create a shortcut for fast moving floodwaters to pass through the Oxbow area
- The riverfront has been redeveloped
- The city has attracted more than 1 billion us\$ in investments, mostly in tourist sector.

PRINCIPLES

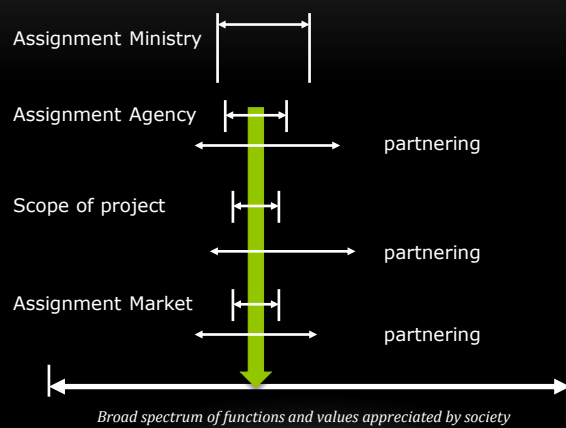
An organization develops a product and delivers it to the public.

This model has three distinct elements:

- (1) the organization,
- (2) the development of a product, and
- (3) capturing or claiming the value of this product.

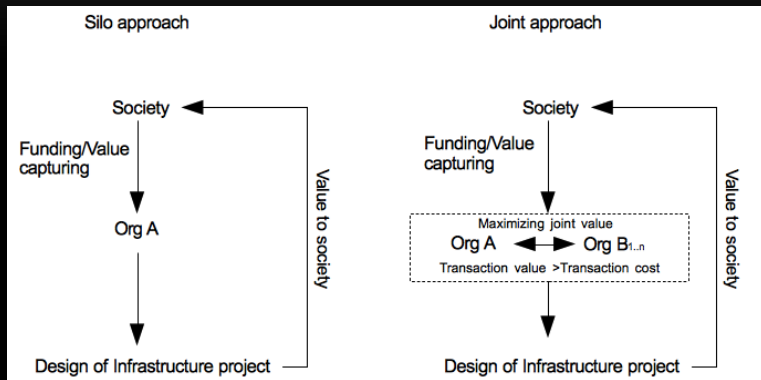
9

PRINCIPLES



10

PRINCIPLES



Hijdra, Woltjer, Arts, Land Use Policy, 2014

11

PRINCIPLES – MAXIMIZING JOINT VALUE

Transaction costs

- (a) Exploring cooperative options
- (b) Preparing agreement
- (c) Inter-agency coordination
- (d) Intra-agency coordination
- (e) Education and Training
- (f) Monitoring interagency delivery/efforts
- (g) Transaction enforcement
- (h) Activities to build trust

Transaction Benefits

- (a) joint assets value surplus,
- (b) complementary skills, routines, capabilities,
- (c) payoff x increased by y,
- (d) economies of scope,
- (e) economies of scale,



12

PRINCIPLES - DESIGN OF INFRASTRUCTURE

Value relates to;

- (a) Functional effectiveness of the design
- (b) Spectrum of functions included
- (c) Esteem value: design aesthetics
- (d) Esteem value: symbolic value
- (e) Value in time: life cycle cost optimization
- (f) Value in time: build-inflexibility(preparing for uncertainties)
- (g) Value in time: adaptive, step by step, approach

13

PRINCIPLES — MAXIMIZATION JOINT VALUE



3 conditions must be met:

Positive balance

>BATNA (Best Alternative To
Negotiated Agreement)

Value capturing ability —

- (a) Reduced cost/risk
- (b) cost/risk sharing
- (c) Increased return flows
- (d) Additional return flows
- (e) Strategic benefits
(reputation, skills, knowledge, access to new opportunities)

14

FINDINGS

- Besides the NAPA case a variety of cases has been studied. Miami river, New Orleans Inner harbor navigation canal, Zuidwillemsvaart, Beatrixlocks, lock Eefde
- From a rational economic perspective significant transaction cost can be allowed, the value of partnering will often outweigh these costs
- From an institutional perspective transaction costs can be problematic and have to be limited. This is obstructing value-deals.
- Deploying tools or applying methods to limit transaction cost can be very helpful to get the process going (Coase)
- Trading houses showed to be such a helpful method
- Value creation in the design can help to stimulate the process
- Value capturing requires special attention as it is key in creating value.

15

Arjan Hijdra

arjan.hijdra@rws.nl



university of
 groningen

2014 | 400 years



16