

Wir machen Schifffahrt möglich.



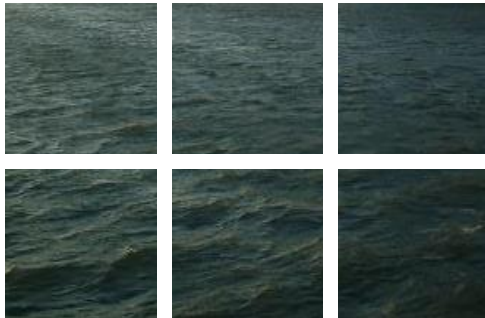
Symposium 2016  
Vlaamse Waterbouwers

Aanbesteden **2.0** Een nieuwe dynamiek bij het uitschrijven  
van overheidsopdrachten



WSV.de

Wasser- und  
Schifffahrtsverwaltung  
des Bundes



Project Management –  
Latest Activities in Germany  
**THILO WACHHOLZ (D)**

## Agenda:

- Federal Waterways in Germany: transport routes and blue link
- Construction of Major Projects Reform Commission
  - Report of Federal Reform Commission construction of major projects Planning and realization of mega-Project
  - Federal Action plan for major projects
- Internal Investigations and decisions
  - Schedule to optimize projects on budget, time and quality
- Two examples
  - Standardization
  - Phased introduction of Building Information Modelling
- Brief resume

## Federal Waterways in Germany: transport routes and blue link

Water-borne transport has main advantages of for both

- ➔ national economies ➔ low macroeconomic costs per to-km
- ➔ the environment ➔ additional function of waterways as an environment for living and recreation.

Thus Germany pays great attention to water-borne transport, in an effort to cope with the predicted traffic increase in an environment-friendly and cost-effective way.

The Federal waterway network in Germany comprises about 7,350 Km of inland waterways, of which roughly 75 % are rivers and 25 % canals. The Federal waterways also include some 23.000 Km<sup>2</sup> of costal waters.



## Federal Waterways in Germany: transport routes and blue link

The main freight inland waterway network includes

- ➔ Rhine with tributaries Neckar, Main, Mosel and Saar
- ➔ Danube,
- ➔ Weser, Elbe and Oder,
- ➔ The wet East-West thoroughfare is formed by the canal network
  - ➔ linking the Rhine and the Oder ➔ Mittelland Canal
  - ➔ Linking Rhine and Danube ➔ Main-Danube Canal



There are more than 100 sea and inland ports in Germany country.  
 56 of the 74 metropolitan areas in Germany are linked via waterways.

This forms an essential component of the "wet" Trans-European Transport Network (TEN-T) and, accordingly, must be designed and maintained in an effective and efficient condition.

Bottlenecks in the network must be eliminated to increase its capacity.

## Federal Waterways in Germany: transport routes and blue link

### Introducing **W**asser- und **S**chifffahrts**V**erwaltung (WSV)

Part of the Ministry of Transportation and Infrastructure → Berlin  
falls under the Directorate of Waterways and Shipment → Bonn



### The WSV

- consists of regional field offices, sections and specialist departments.
- is responsible for engineering, construction, operation, maintenance of the federal waterways all over Germany.
- has about 11.000 employees, engineers, operators o. workers.
- The installations along the Federal waterways include, among others, 450 locks and 290 weirs, two ship lifts operated by the Waterways and Shipping Administration, 15 canal bridges and many dams.





## Federal waterways

- **23 000 km<sup>2</sup>** maritime waterways
- **7 300 km** inland waterways
  - 2 540 km free flowing rivers
  - 3 030 km rivers with barrages  
(weirs, locks, mostly with  
hydroelectric power plants)
  - 1 730 km canals
  - approx. 450 lock chambers, 300  
weirs, 4 ship lifts, 8 flood barrages,  
1300 bridges, 1100 km lateral  
dams, ....

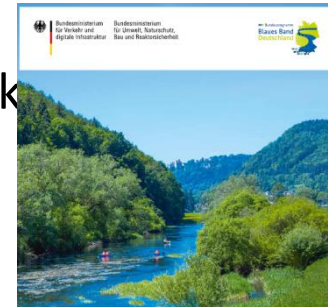


## Federal Waterways in Germany: transport routes and blue link

Water - more than just for transport, also for society and nature

Waterways fulfil a number of other functions:

- Supplying drinking and domestic as well as irrigation water
- feeding power stations, used for waste water disposal and for the removal of floodwater, and they offer amenities for fishing.
- In addition to providing a habitat for aquatic flora and fauna, the Federal waterways are valued highly as places of rest and recreation for the population.
- With an interconnecting network of nearly 10,000 Km of Federal and state inland waterways, Germany is an attractive region for watersports in the heart of Europe.



Bundesprogramm  
Blaues Band Deutschland  
Ein neuer Blick auf unsere Wasserstraßen und ihre Auen

## Construction of Major Projects Reform Commission

Many major projects are not delivered within budget or on schedule  
 Here are a some current profile public building projects with significant cost and schedule overruns:

Central Stations (Stuttgart 21)  
 Airports (Berlin BER)  
 opera houses (Elbphilharmonic Hamburg)  
 motorway viaducts (Mosel valley)  
 Sealocks (Brunsbüttel)



It was questioned, if there are structural lack in planning and implementation. The public is increasingly the ability of politics, administration and economy is being challenged to successfully carry out large-scale projects.





## Construction of Major Projects Reform Commission

To ensure that

- ➔ the public develop greater confidence in major projects,
- ➔ public funds are spent efficiently and
- ➔ the good international reputation of the German planning and construction industries is preserved

the Federal Ministry of Transportation and Infrastructure founded the **"Construction of Major Projects Reform Commission" in April 2013.**

It was a Commission of 36 high-level experts from industry, academia, the public sector and associations. It has identified shortcomings and developed proposed solutions and recommendations for action as to how true-cost pricing, cost transparency, efficiency and the ability to meet deadlines can be improved in the field of major projects.



## Report of Reform Commission construction of major projects

In **June 2015**, after two years of intensive review of current practices and policies, the commission has released a range of recommendations for improvements in major projects delivery.



- ➔ no single cause can be made solely responsible for failures in major project delivery, such as overrunning costs or time.
- ➔ It's the complexity of construction of major projects that demands
- ➔ a more informed and better coordinated client
- ➔ more thorough planning making
- ➔ best use of digital technology and processes,
- ➔ transparent and sufficient visibility of project cost, time and risks
- ➔ as well as an open communication with the public.
- ➔ a collaborative culture is needed
- ➔ from the user needs analysis to operations across the entire supply chain from the client, planners, contractors, consultants .

## Report of Reform Commission construction of major projects

The report of the Construction of Major Projects Reform Commission therefore calls for a strong, fair and aligned framework for procuring, planning, constructing and operating assets in the built environment. In particular, this involves complying with ten recommendations:



1. Cooperative planning in a team
2. **First plan, then build**
3. **Risk management and capturing risks in the budget**
4. Contract to be awarded to the tenderer who represents best value for money, not to the cheapest
5. **Cooperative project partnership**
6. Out-of-court-settlements of disputes
7. Mandatory value for money assessment
8. **Clear processes and responsibilities / centres of excellence**
9. **Greater transparency and control**
10. **Use of digital methods – building information modelling**

Report of Reform Commission construction of major projects

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### **3. Risk management and capturing risks in the budget**

Identification, analysis and assessment of risks and the development of appropriate countermeasures should be made mandatory.

Risk management should be based on standards like ISO 31000 and DIN EN 31010.

It should start in the analysis of requirements, continue throughout the project and be monitored and documented.

Risks that have occurred in ongoing projects should be captured and made available in databases.





## Report of Reform Commission construction of major projects

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### **5. Cooperative project partnership**

At start of a project, all parties involved should commit at executive level to project management based on a culture of cooperation, in which all contracting parties consider themselves to be equal partners.

To provide strong incentive mechanisms for that, there should be legal rules explicitly governing the permissibility of bonus/malus arrangements and the use of target price systems.



## Report of Reform Commission construction of major projects

### **8. Clear processes and responsibilities/centres of excellence**

Clients should carefully consider how to organize project management

Make sure the project control tasks and ensure the necessary personnel, expertise and practical experience for the functions.

Clients should have personnel of their own for tasks that cannot be delegated. He should define the project schedules, decision-making channels and responsibilities.

This also includes establishing the requisites and procedure for approving plan modifications.

Client who does not have adequate personnel and expertise should use centres of excellence. The public sector should create appropriate centres of excellence.



Report of Reform Commission construction of major projects

## **9. Greater transparency and control**

Clients should create a structure that ensures clearly defined control.

Independent and continuous management controlling should be established to review costs and deadlines.

Clients should conduct timely, open and continuous public participation, including information about costs, deadlines, modifications and risks, but not until sufficiently robust plans are available.

## **10. Use of digital methods – building information modelling**

Clients - like all other parties involved in a project – should make more use of digital methods, such as building information modelling (BIM).

They can significantly support the planning of the project, through the visualization of project variants, the preparation of consistent planning through collision tests and the smooth execution through simulation.



## Federal Action plan for major projects

The work of the commission will continue in order to maintain a strong, innovative and high quality construction in Germany.



The Federal Ministry of Transport and Digital Infrastructure has already started several measures to address the issues identified by the reform commission.

First of all Federal Minister of Transport and Digital Infrastructure launched the Federal Action plan for major projects

**The aim** of this action plan is to usher in a culture change in the field of major projects.

More collaborative partnerships are to produce more cost transparency and a better ability to meet deadlines, clear agreements on conflict resolution, that helps **to deliver more projects within budget and on time.**

Minister Dobrindt presenting the action plan





## Federal Action plan for major projects

The Report of the Reform Commission helped to create proposed solutions and derived action.



From this, a "10 point action plan" was developed:

1. Use of digital methods – Building Information Modelling
2. First plan, then build
3. Risk management and capturing risks in the budget
4. Greater transparency and control
5. Cooperative planning in a team
6. Contract to be awarded to the tenderer who represents best value for money, not to the cheapest
7. Cooperative project partnership
8. Out-of-court settlement of disputes
9. Mandatory value for money assessment
10. Clear processes and responsibilities/centres of excellence

## Federal Action plan for major projects

One of the recommendations made by the Reform Commission is:  
More use of the opportunities presented by digitalization.

The methodology of digital five-dimensional planning – three dimensions plus costs and deadlines – is described by BIM.

There are pilot projects – two road, two rail and one waterway projects – in which the Federal Ministry of Transport and Digital Infrastructure is deploying BIM:

- 3 Bridges
- 1 Tunnel
- 1 Ship-lock

A centre of excellence for BIM will be established.

The action plan also follows the recommendation of a transparent, open risk management system in four pilot projects.



## Federal Action plan for major projects

The experts will continue to monitor the implementation of the recommendations.

Next step is an implementation of all aspects of the action plan into a Guild line for major projects with:  
practical method clues, pattern, checklists and methods proposals

In the fields of project organization and project controlling, planning and risk management, tendering and contracting as well as partnership collaboration.



## Internal Investigations and decisions

➔ Schedule to optimize all projects on budget, time and quality

Similar problems are also recognized at a number of smaller projects the Waterways and Shipping Administration in Germany (WSV).

Therefore Ministry and WSV have set a project group "Project Planning". Their task is to formulate WSV specific concrete recommendations for planning acceleration, quality improvement planning, improved punctuality and better cost transparency.

The working group "Project Planning" has its work executed from March 2014 until autumn of 2014.





## Internal Investigations and decisions

➔ Schedule to optimize all projects on budget, time and quality

Objectives of WSV to correct the current situation:

- In future many more projects need to be planned for construction in a shorter time.
- The quality of planning needs to be improved.
- The regional planning must better meet the strategic and national goals of Ministry and WSV.
- On the change of boundary conditions during the planning need to be addressed at an early stage and responsibly.
- WSV and Ministry must be put in a position to be able to control on time.
- In addition, the financial and personnel scheduling requires a better quality of cost estimates and a better respect of cost estimates and schedules.



## Internal Investigations and decisions

➔ Schedule to optimize all projects on budget, time and quality

The analysis of the project group gave 11 topics, which were described in detail. Based on the descriptions objectives were formulated and it was investigated systematically, what measures and structures actually can achieve the goals.

The basic finding is that the organizational arrangements for investing activities of WSV are qualitatively and quantitatively useful and sufficient, but the application and interpretation of the rules and regulations practiced very inhomogeneous.

The main problem is the lack of sufficient human resources with adequate quality level.



## Internal Investigations and decisions

➔ Schedule to optimize all projects on budget, time and quality

As a result of the WSV investigations specific concrete recommendations are formulated which focus on the following topics:

- 1 planning security (common understanding)
- 2 human resources
- 3 cooperation with higher authorities
- 4 collaboration with specialist agencies
- 5 planning approval
- 6 planning Management
- 7 cost certainty
- 8 riskmanagement
- 9 internal regulations
- 10 review and approval flow
- 11 rules on procurement



## Internal Investigations and decisions

➔ Schedule to optimize all projects on budget, time and quality

Some of the topics are similar to the report of the Major Projects.

A major focus here will be seen in the planning security, cost certainty and project and risk management.

Moreover, the expert group monitored the implementation of the recommendations over more than one year and evaluated the proposals.

That evaluation show mostly all recommendations are in action. But there is still a long way to go.

Two of the proposals shall be mentioned:

➔ Standardization

➔ BIM

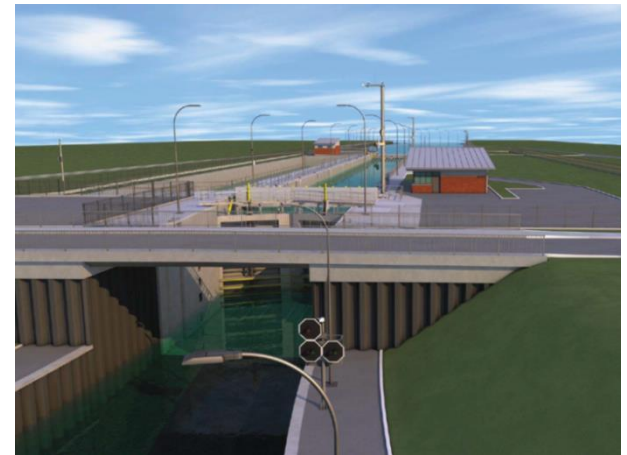




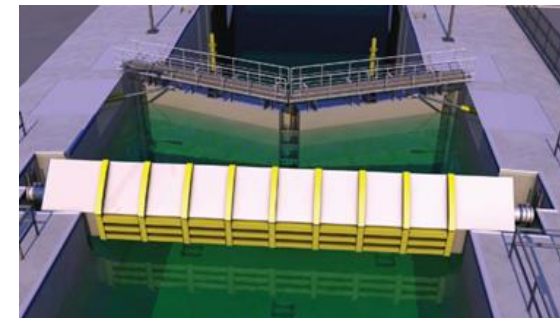
## Standardization

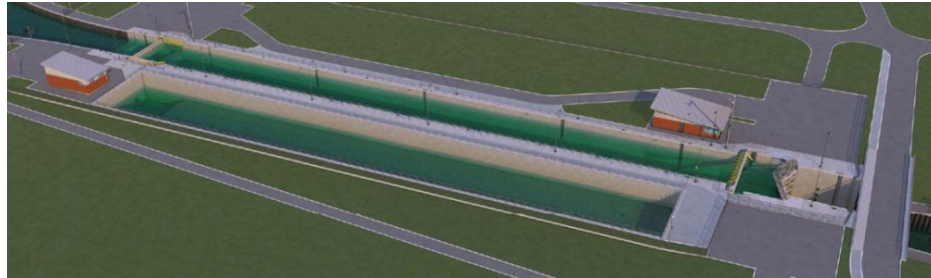
The main reasons to standardize were being faster in design and renovation and to save money.

- reduction of costs
- avoidances of general mistakes in design
- abbreviates periods for the planning
- simplify development
- easily construction permit
- adoption of best practice



The aim is a catalogue and it's still under development. The first approach were the locks as a starting point. We made a design for those 5 locks, will evaluate them and then will become the standard. We are working on the implementation now. There is a huge project running.





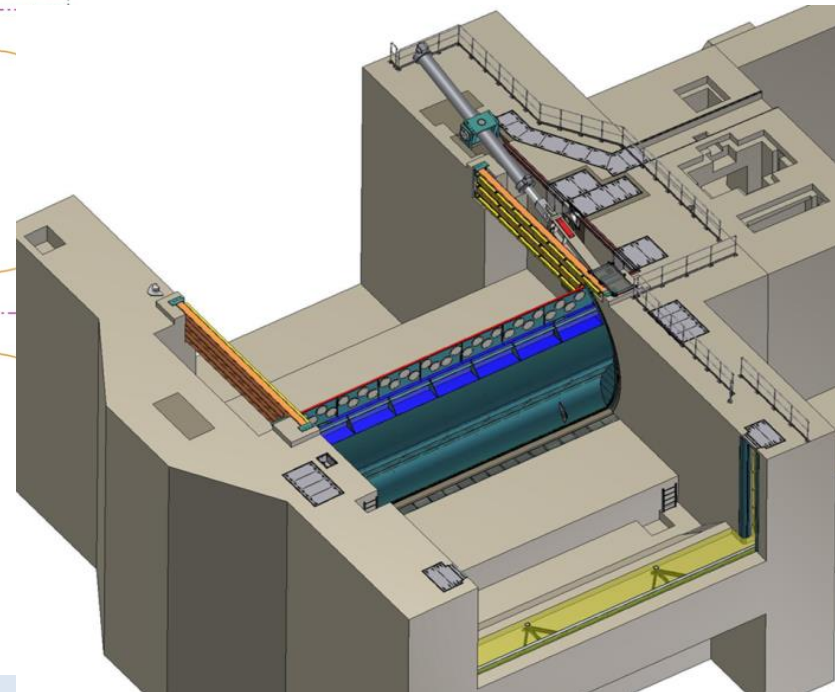
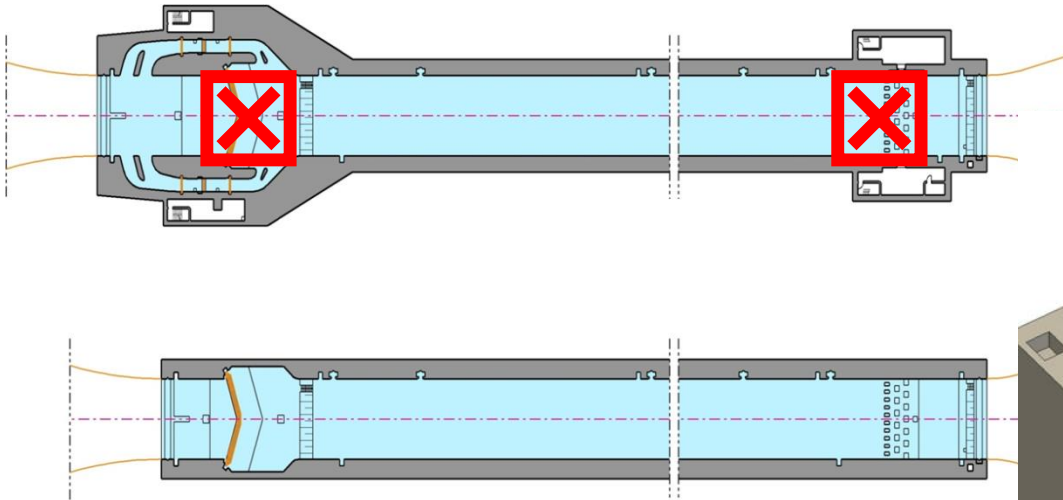
## Standardization

The WSV strategy for standardization

- WSV has a problem with the situation of the infrastructure:  
around 50-100 navigation locks, weirs and culverts need to be replaced in the coming ~30 years. In that perspective a WSV-project on standardization was initiated by the Ministry of Transportation and Infrastructure.
- Several expert groups had to come up with one solution for each aspect. In Germany, prescribing the standardization is a top-down-process. This approach was successful for locks, a similar approach will be followed for weirs.
- The main goal was to assemble the best practices of all regions and put this into a standardized technical design e.g. for navigation locks.

## Standardization

Result: redesign of complex solutions (culverts, valves, concrete works, pit)



## Phased introduction of BIM until 2020

To encourage the greater use of digital methods such as BIM, the Federal Government has developed a phased plan that gradually creates the conditions that will enable greater use to be made of BIM in the planning and delivery of major projects. To this end, in particular, digital requirements have to be defined, standards harmonized and strategies for using BIM in planning and construction developed.



Federal Minister Dobrindt launched an initiative for the digitalization of the construction industry. He will make planning and building with BIM mandatory for the infrastructure projects. The use of these planning methods will be optimized by means of pilot projects.

Press conference with Minister Dobrindt on the Forum for the Future of Digital Planning and Building



## Phased introduction of BIM until 2020

The phased plan provides for the introduction of BIM in three steps: Following a preparatory phase until 2017 and a pilot phase until 2020, BIM is to be applied to all new projects of the Federal Ministry of Transport and Digital Infrastructure from 2020 onwards.



Prior to this, the required legal and technical framework conditions and standards will be established.

The ministry wants to make digital planning and building a nationwide standard. As a major client, the public sector must take a lead here and promote a cultural shift. Therefore, it is established the Construction of Large-Scale Projects reform commission and formulated the clear principle: “Build digital before building in reality.”

With this phased plan, a part of the action plan for major projects adopted by the Federal Cabinet is implemented.

## Brief resume

- Germany also has many major projects not delivered within budget or on schedule; quality is in principle not the problem;
- Comprehensive expert groups allow great and emphatically turnarounds
  - Large scale action plans need long lasting periods
- Small / internal investigations will lead to nearly the same results
  - They could be realized much quicker
- Very important for us are:
  - Clear processes and responsibilities/centres of excellence
  - Cooperative project partnership
- Our main objects are now: standardization, risk-management and BIM
- The main problem is the lack of sufficient human resources with adequate quality level.





# Thank you for your attention