

Collecting data on the construction costs of inland waterways

Group of Experts on Benchmarking Transport Infrastructure
Construction Costs

Ninth session

30 September 2019

Victoria IVANOVA, UNECE



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LEGEND

— Free floating waterways
— Shallow waterways
— Shallow waterways with locks
— Shallow waterways with locks and locks


UNECE Working Party on Inland Water Transport (SC.3)

- Working Party on Inland Water Transport (SC.3)
- Working Party on the Standardization of Technical and Safety Requirements in Inland Navigation (SC.3/WP.3)
- Informal Expert Groups


Working Party on Inland Water Transport (SC.3)




UN legal instruments relevant to IWT




IWW infrastructure, navigation rules



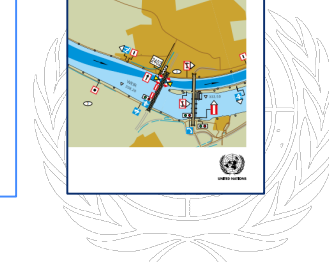
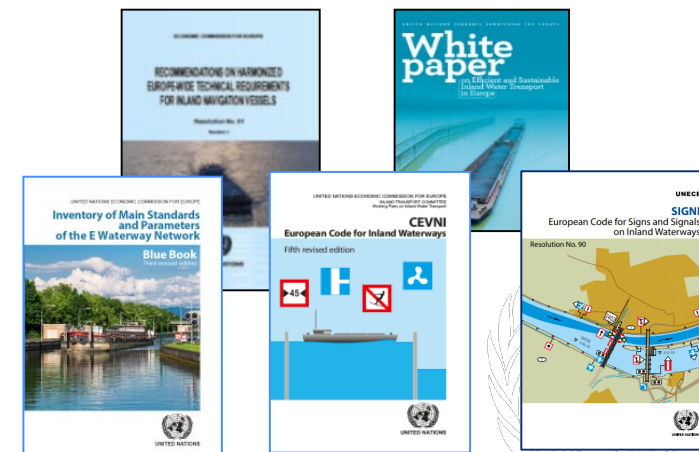
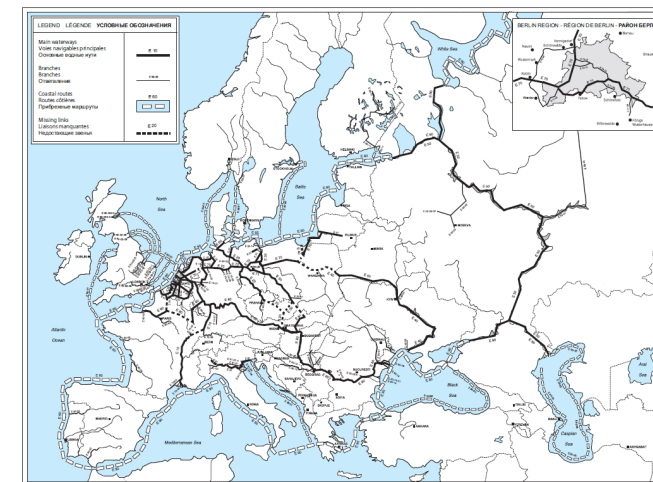
Harmonizing standards and norms



Promoting River Information Services



Maps and databases







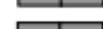
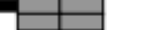


Inland waterway types

- Free-flowing waterways
- Canalized waterways
- Artificial canals



CEMT classification of inland waterways (resolution No. 30)

Waterway type Type de voie navigable Тип водных путей	Waterway class Classe de voie navigable Класс водных путей	Motor vessels and barges – type of vessel: general characteristics Automoteurs ou chalands – type de bateau : caractéristiques générales Самоходные суда и баржи – тип судна: общие характеристики					Pushed convoys – type of convey; general characteristics Convois poussés – type de convoi : caractéristiques générales Толкаемые составы – тип состава: общие характеристики					Minimum height under bridges Hauteur minimale sous les ponts Миним. высота под мостами 2/	Symbol on maps Symbole sur les cartes Обозначение на карте	
		Designation Dénomination Наименование	Max. length Longueur max. Максим. длина	Max. beam Largeur max. Максим. ширина	Draught Tirant d'eau Осадка	Tonnage Tonnage Тоннаж		Length Longueur Длина	Beam Largeur Ширина	Draught Tirant d'eau Осадка	Tonnage Tonnage Тоннаж			
			L(m)	B (m)	d (m) 7/	T (t)		L (m)	B (m)	D (m) 7/	T (t)			H (m)
Of regional importance d'intérêt régional Регионального значения	west of Elbe à l'Ouest de l'Elbe к западу от Эльбы	I	Barge – Péniche - Баржа	38.50	5.05	1.80-2.20	250-400					4.00	————	
		II	Kampine– Campinoise – "Кампин"	50-55	6.60	2.50	400-650					4.00-5.00	=====	
		III	Gustav Koenigs – "Густав Кенигс"	67-80	8.20	2.50	650-1000					4.00-5.00	=====	
	east of Elbe à l'Est de l'Elbe к востоку от Эльбы	I	Gross Finow – "Тросс Финоу"	41	4.70	1.40	180					3.00	————	
		II	Type BM-500 – Типа БМ-500	57	7.50-9.00	1.60	500-630					3.00	=====	
		III	6/	67-70	8.20-9.00	1.60-2.00	470-700		118-132	8.20-9.00	1.60 - 2.00	1000 – 1200	4.00	=====
of international importance d'intérêt international Международного значения	IV			80-85	9.50	2.50	1000-1500		85	9.50 5/	2.50 - 2.80	1250 – 1450	5.25/7.00 4/	=====
	Va			95-110	11.40	2.50-2.80	1500-3000		95 - 110 1/	11.40	2.50 - 4.50	1600 – 3000	5.25 /	=====
	Vb								172 - 185 1/	11.40	2.50 - 4.50	3200 – 6000	7.00 / 4/	=====
	Vla								95 - 110 1/	22.80	2.50 - 4.50	3200 – 6000	7.00/9.10 4/	=====
	Vlb		3/	140.00	15.00				185 - 195 1/	22.80	2.50 - 4.50	6400 – 1200	7.00/9.10 4/	=====
	Vlc								270 - 280 1/	22.80	2.50 - 4.50	9600 – 1800	9.10 4/	=====
									195 - 200 1/	33.0-34.20 1/	2.50 - 4.50	9600 - 1800		=====
VII								8/	285	33.0-34.20 1/	2.50 - 4.50	14500 - 27000	9.10 4/	=====

Construction and upgrading of inland waterways



Construction of new waterways



Modernization and equipment



Reconstruction and upgrading of the existing waterways



Source: <https://maritiemnieuws.nl>

Maintenance of the existing waterways:
Rehabilitation, dredging, canalization



International regulatory background (examples)

ECMT (2006)

PIANC InCom Working Group 141

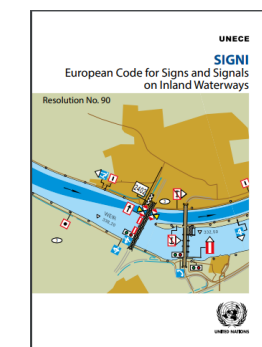
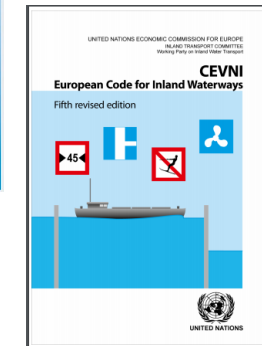
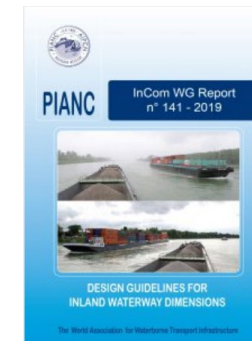
Design Guidelines for Inland Waterway Dimensions

UNECE:

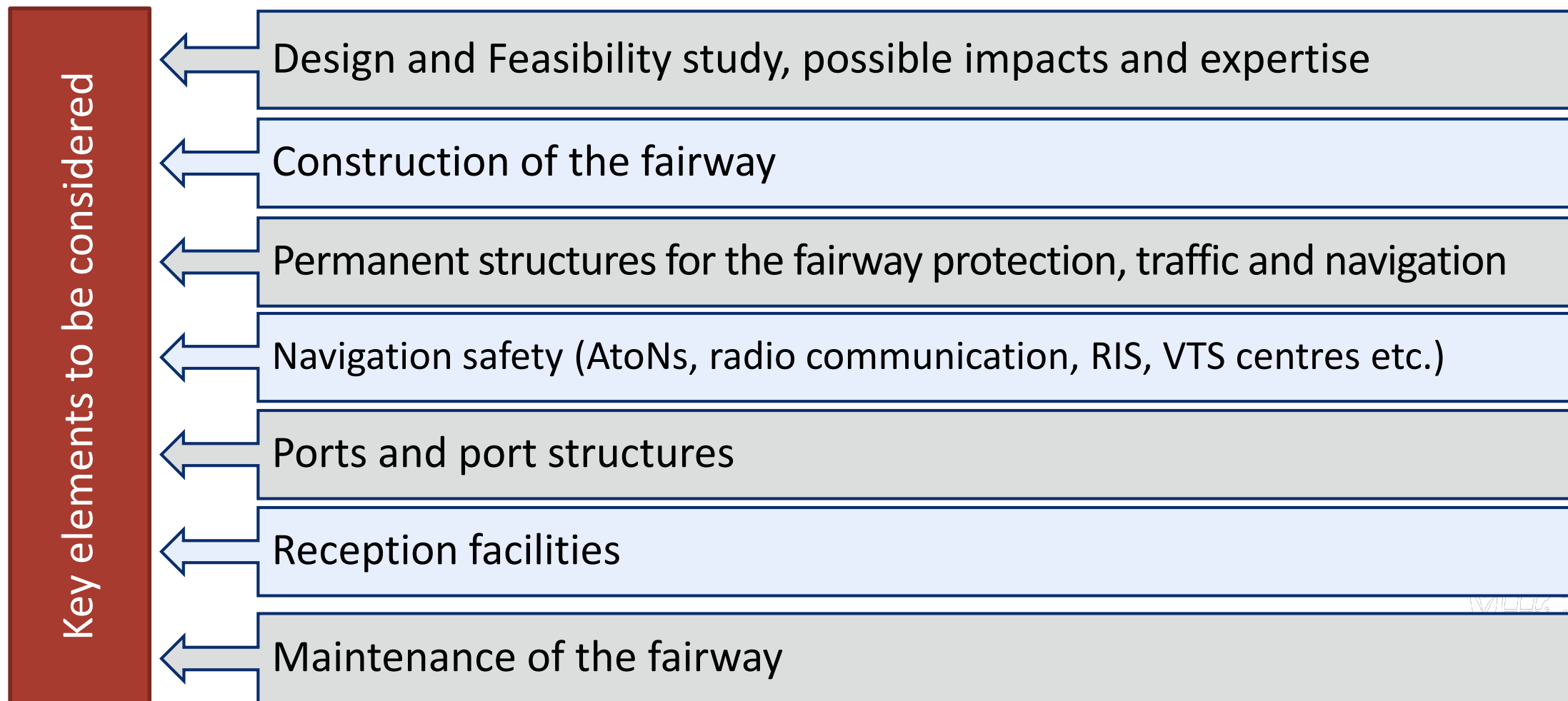
- The AGN Agreement
- The Blue Book, resolutions Nos. 30, 49
- CEVNI
- SIGNI

European Union:

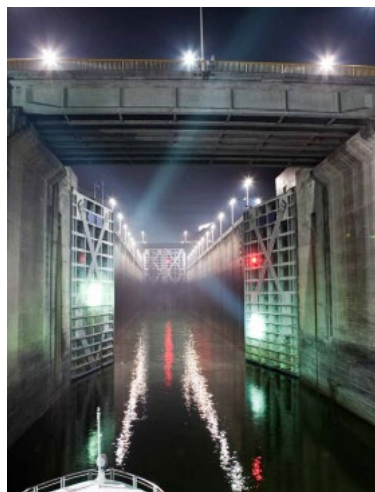
- Water Framework Directive
- TEN-T regulations



Main elements essential for the waterway operation



Examples of marking and permanent structures on inland waterways



Proposal for IWW construction cost items (Informal document WP.30/GE.4 (2018) No. 4)

MAIN COST/INVESTMENT ITEMS	Breakdown Items
1) LAND EXPROPRIATION	Expropriation
2) MOBILISATION	
2) ENGINEERING WORKS	Engineering Works For Detailed Design Site surveys, investigations, model works
3) CANAL EXCAVATION & DREDGING (INCLUDING TRANSPORTATION AND DISPOSAL)	Excavation on land
	Dredging for sea
4) CONSTRUCTION OF OUTER PROTECTION BOUNDARY OF SEA FILLING AREAS	Construction of protection structure along the outer boundary of sea filling areas
5) CANAL BANK & BOTTOM PROTECTION	Protection Type A
	Protection Type B
6) IMPERVIOUSNESS OF CANAL	Imperviousness Type A
	Imperviousness Type A
7) AUXILIARY STRUCTURES AT ENTRANCES OF THE CANAL	Construction of Quays
	Construction of Breakwaters
	Construction Dolphins
8) EMERGENCY AND WAITING MOORING BASINS	Construction of Quays
	Construction of Breakwaters
	Construction Dolphins
9) STREAMS CONNECTIONS	Stream Connection Type A
	Stream Connection Type B
	Stream Connection Type C
	Stream Connection Type D
	Stream Connection Type E

MAIN COST/INVESTMENT ITEMS	Breakdown Items
9a) ROAD ALONG BOTH SIDES OF CANAL	
10) CANAL OPERATION AND MAINTENANCE STRUCTURES	Construction of pilots building
	Construction of operation towers including radar, VHF, etc
	Construction of tug-boat connection areas
	Establishment of lighting, marking, etc, along canal
11) CONSTRUCTION OF YACHT HARBOR(S)	Construction of Quays
	Construction of Breakwaters
	Construction of Floating Piers
	Construction of Backyard
12) CONSTRUCTION OF LOGISTIC HARBOR(S)	Construction of Quays
	Construction of Breakwaters
	Construction Dolphins
	Construction of Backyard
13) CONSTRUCTION OF LOGISTICS CENTER	Construction of Logistics Center Buildings
	Construction of Logistics Center Infrastructure
14) RELOCATION OF INFRASTRUCTURE CROSSING BY CANAL	Relocation of water supply infrastructure
	Relocation of astewater infrastructure
	Relocation of power infrastructure
	Relocation of telecommunication infrastructure
	Relocation of oil and natural gas infrastructure
	Relocation of Railways
	Relocation of Highways

- May need further clarification

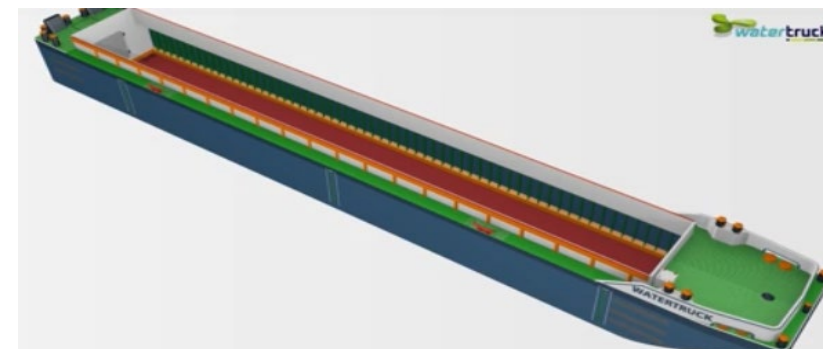
Additional cost items that might be addressed

- **Engineering works (dredging, remedial work, sweeping, hydrographic surveys)**
- **Construction works (reinforced concrete, stone, gravel, metal, wooden structures): bridges, locks, dams, weirs, reservoirs, junctions, quays, landing stages, berths etc.**
- **Energy and water supply**
- **Radio communication, RIS centres and equipment**
- **Onshore reception facilities for wastes generated by vessels**
- **Freight terminals**
- **Fairway maintenance works**
- **Upgrading and modernization**



New challenges

- AIS coverage
- Automation:
 - Development of unmanned shipping technologies
 - Remotely operated vessels
 - Vessels with reduced crew
- Onshore control centres
- Good Navigation Status concept



Thank you for your attention!

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