



LIFELINE DANUBE

REGULATION AND RENATURATION OF A EUROPEAN WATERWAY IN
THE 19TH AND 20TH CENTURY



Danube Commission,

est. 1948

provide and develop free navigation on the Danube for the commercial vessels

considered as economic link between the East and the West

only little attention to the 50 designated protected areas along the Danube

Danube River Protection Convention,

1998

recent Austrian renaturation projects on the upper Danube

2010-now:

- Bad Deutsch Altenburg pilot project
- connection of a sidearm in the “Wachau”
- new river bed of the Traisen River

Impact by regulation and power plant building

Number of power plants until 2020: 31 (with a capacity of more than 10 MW)

Deposition of the transported material in reservoirs, which is missing below the dams

the river digs in by 2 centimetre/year



Drying out of the floodplain landscape

In the Danube Floodplain National Park (near Vienna): water level has sunk by half a meter since 1985

Regulation leads to less flooding

River engineering countermeasures

bedload is added in particularly deep places

height of the existing transverse structures (groynes) has been reduced

removal of the embankment







Influence-factor shipping

Shipping channel must be sufficiently deep and wide for pushed convoys or coupled formation

Lock chamber dimensions Danube:

Width 24 meters

Length 230 meters

Space for **two** barges coupled side by side.



Lock- and canal-sizes as a limitation

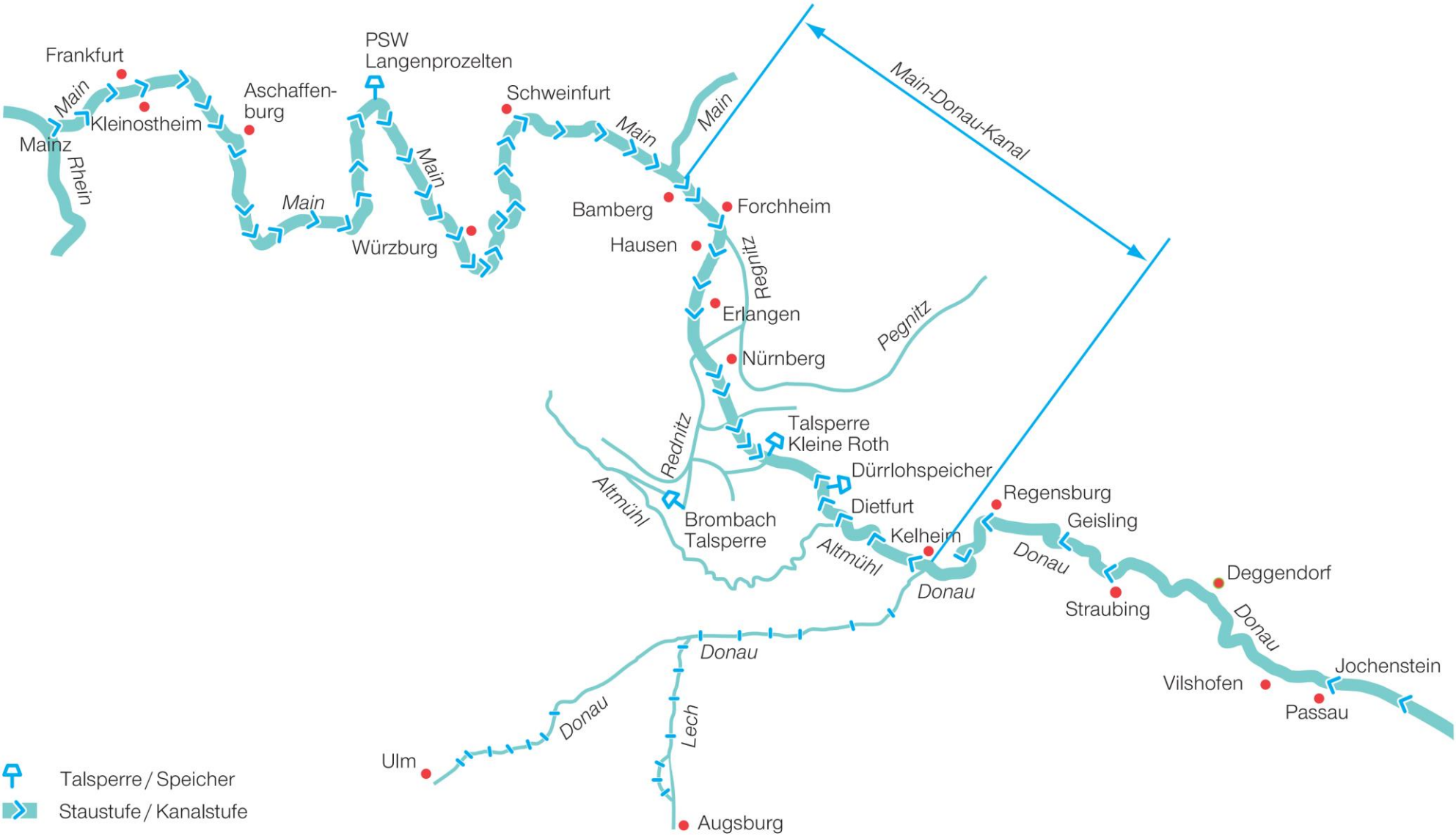
chamber size of the 16 Locks of Main-Danube Canal:

Width 12 metres

Length 190 metres

Space for

one push boat (mostly $L = 32.5$ m or 34.9 m) with
two Europa IIa barges ($L = 76.50$ m, $W = 11.40$ m) coupled
coupled in a row



Lock- and canal-sizes as a limitation for freight transport

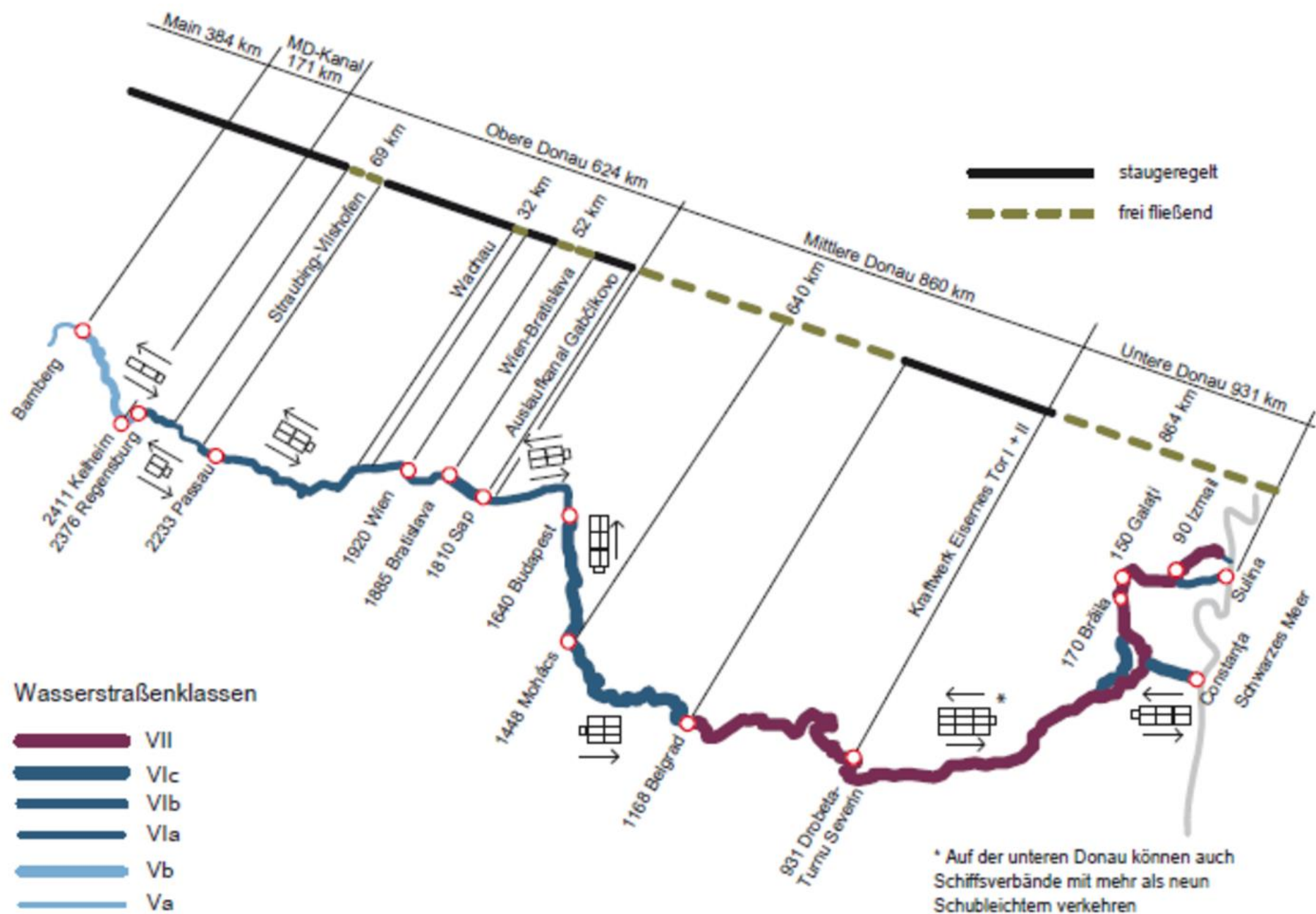
Main-Danube Canal: waterway class Vb

approved for large motor vessels with

maximum length	110 m
width	11.45 m
loading depth	2.7 m

Largest approved vessel: coupled convoy with a length of 187 m and a width of 11.45 m

Common arrangement on the Danube for downstream navigation: pushboat with barges coupled side by side (pushed convoys)



Quelle: via donau

Maximal mögliche Größen von Schiffsverbänden auf der Wasserstraße Donau gemäß Wasserstraßenklassen



	locks MRD canal Class Vb	cargo vessel "European ship" / "Large motor cargo ship"
Length	190 m	85 m / 110 m
Width	12 m	9,5 m / 11,45 m
		One cargo boat Europa IIa
Length		76,50 m
Width		11,40
		dimensions of coupled / pushed convoy
Length		187 m
Width		11,40 m
	Locks upper Danube/Austria Class VI a, b	Pushed convoy
		Lighter Europa IIa
Length	230 m	76,50 m
Width	24 m	11,40 m
		Pushboat class "Linz"
Length		32,5 m
Width		11,40 m
		Dimensions of a convoy with 4 cargo boats
Length		185,5 m
Width		22,8 m

Comparison boundary conditions Danube - RMD Canal