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Group of Experts on Benchmarking Transport Infrastructure Construction Costs

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Item 3 of the provisional agenda
Transport Infrastructure Construction costs:
Presentations of terminologies used

Terminology on Benchmarking Inland Waterways Transport Infrastructure Construction Costs

Note by the secretariat

I. Mandate

1. In accordance with its Terms of Reference, the Group of Experts is expected to complete its work within two years (2016-2018) and to submit a full report of its accomplishments (ECE/TRANS/WP.5/GE.4/2016/1). The Group of Experts shall assist in:

(a) Identify models, methodologies, tools and good practices for evaluating, calculating and analysing inland transport infrastructure construction costs;

(b) Identify and list terminologies used in UNECE region for construction costs of inland transport infrastructure, if possible, create a glossary of agreed terminologies and related explanations;

(c) Collect and analyse data in order to prepare a benchmarking of transport infrastructure construction costs along the ECE region for each inland transport mode - road, rail, inland waterways - including intermodal terminals, freight/logistics centres and ports. Analyse and describe the conditions / parameters under which these costs have been calculated on.

2. In carrying out its main tasks, the Group of Experts will, among others, also identify suitable methodological approaches, models and tools for gathering and disseminating information, i.e. conducting studies, distributing questionnaires, using existing studies and

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national strategies, existing best practices in calculating transport infrastructure construction costs, among others.

II. Terminology

3. Alluvial: Something made of gravel/mud/silt/sand deposited and formed by rivers or floods (3).

4. Alluvium: A fine-grained deposit, composed mainly of mud and silt, deposited by a river (3).

5. Apron: Layer of stone, concrete or other material to protect a structure's toe against scouring (3).

6. Aquatic dredged material placement: Dredged material placement options under which the dredged material is submerged under water and remains water (3).

7. Backwater: Water held back in a channel or stream by a dam ballasting in taking ballast water to enable the vessel to clear a bridge, increasing the draught (3).

8. Bar: An elevated region of sediment (sand or gravel) that has been deposited by the flow (3).

9. Barrage: A facility for damming a river to control its water level (3).

10. Bathymetry: The study of underwater depth of water bodies, topography of a water body (3).

11. Bed profile: A curve indicating the elevation and shape of a river bed; may be a longitudinal curve or a transverse curve at a cross-section (3).

12. Canal: Artificially created waterway or channel, mainly for the passage of vessels (3).

13. Catchment Area of the river (drainage area, drainage basin): Includes the whole drainage area of a river and its tributaries, overground and in the ground (3).

14. Categories of navigable inland waterways: Taking into account the 1992 UNECE/ECMT Classification of European Inland Waterways, canals, navigable rivers and lakes the different categories are defined as follows:

By horizontal dimensions of vessels and pushed convoys:

Class (length/beam)

I to III Up to 80/9 m.

IV 80-85/9.50 m.

V a 95-110/11.40 m.

V b 172-175/11.40 m.

VI a 95-110/22.80 m.

VI b 185-195/22.80 m.

VI c 270-280/22.80 or 195-200/33-34.20 m.

VII 285/33-34.20 m and over (1).

In some cases the "carrying capacity of vessels" may be used to classify the navigable inland waterways (1).

15. Chevron: U-shaped river engineering structure with blunt nose and open end facing downstream; the current is diverted along both sides of the structure (3).

16. Connections to other modes of transport: Availability and distance from ports to connections to other modes of transport in km:

(a) Maritime shipping;

(b) Passenger rail connection;

(c) Freight rail connection;

(d) Motorway access;

(e) Airport (1).

17. Cross: section, profile: a plane, generally perpendicular to the centreline of the river or the fairway (3).

18. Dam: A massive wall or structure erected across a valley or river for impounding water (3).

19. Design Low Navigation Level (DLNL): Design navigation level determined with the 1-D hydraulic model associated with the 94 per cent duration of discharges over the 30 - year period (3).

20. Design High Navigation Level (DHNL): Design navigation level determined with the 1-D hydraulic model associated with the 1 per cent duration of discharges over the 30-year period (3).

21. Dike (or dyke): An embankment or a levee for confronting water especially along riverbanks to prevent flooding of lowlands (3).

22. Discharge (Q): The volume rate of water flow, including any suspended solids (e.g. sediment), dissolved chemicals and/or biologic material which is transported through a given cross-sectional area (Q=AxV, where A is cross sectional area (m^2) and V is the mean velocity of water (m/s)) (3).

23. Draft: The depth of a waterway, which determines the size of barge or ship that can travel through it (2).

24. Draught (draft): The vertical distance between the lowest point of the hull or the keel and the maximum draught line (3).

25. Dredge: to excavate or deepen the bed of a harbour, river, or other area of water by scooping out sediment and moving it to a different location. This technique is often used to keep waterways navigable (2).

26. Dredged material: Material excavated from the riverbed (3).

27. Dry dock: An enclosed basin from which the water can be pumped out (a ship gets waterborne into the dock, the dock gates close, water is removed, the ship stays on docking blocks for repairs or cleaning) (3).

28. Fairway axis: Centreline of the fairway (3).

29. Fairway channel: The navigable cross - section of the fairway with the minimum width and depth necessary for continuous navigation (3).

30. Fairway parameters: That is, depth and width of the fairway, vertical clearance and bend radius (3).

31. Flood control: Regulation of flood waters to prevent or minimize inundation of valuable property or land (3).

32. Floodplain (flood plain): An area of land adjacent to a stream or river that stretches from the banks of its channel to the base of the enclosing valley walls and experiences flooding during periods of high discharge events (3).

33. Ford: A shallow sector of the river that stretches across the whole width of the river (3).

34. Free flowing river: Sections of natural rivers which are not impounded due to barrages such as hydropower plants or lock facilities and where water levels can be subject to considerable fluctuations (3).

35. Gauge zero: Elevation of the gauging station with respect to the mean sea level (3).

36. Gauging station: Equipment for measuring the water level of surface water bodies (3).

37. Geodetic survey: A survey that takes figure and size of the earth into account, used to precisely locate horizontal and vertical positions suitable for controlling other surveys (3).

38. Granulometric riverbed improvement: The use of coarse gravel to cover lower zones of the riverbed in order to halt riverbed degradation (3).

39. Granulometry (of the sediment): Size of particles of sediment forming the riverbed (3).

40. Gravel: Unconsolidated rock fragments that have a general particle size range and include size classes from granule- to boulder- sized fragments(3).

41. Groyne (groin): A river engineering structure built at the angle to the river centerline to deflect the flow in to the fairway, esp. during low – water conditions (3).

42. Guide bund: A transverse river training structure aiming to narrow the riverbed and to divert flow into the fairway in order to maintain sufficient depth by increasing the natural sediment transport capacity (3).

43. Hydromorphology: Physical characteristics of the river, including the riverbed, banks, connections with the landscape, including longitudinal continuity and habitat continuity (3).

44. Landing stages: A place solely for vessels to embark or disembark passengers, not part of an inland port (1).

45. Lock chamber: A rectangular space located between gates of a lock in which vessels may be raised or lowered during locking (3).

46. Lock (navigation lock): Hydraulic system to overcome differences in height along a waterway, in which vessels may be raised or lowered by filling up or emptying out one or more lock chambers (3).

47. Lock chambers: An enclosure consisting of a section of canal that can be closed to control the water level. It is used to raise or lower vessels that pass through it (2).

48. Longitudinal dike (training wall): A rock structure parallel to the river center line to confine the flow in the fairway (3).

49. Mean Low Water (MLW): Mean of multi-year minimum water levels (3).

50. Mean discharge: Average quantity of water that flows through a certain cross-section of the river per unit of time on average over a certain period of time (m^3/s) (3).

51. Mean High Water (MHW): Mean of multi-year maximum water levels, the average water level measured at a water gauge over a specific period of time (3).

52. Mean Water Level (MWL): Mean water level over a multi-year period (3).

53. Morphological modelling: Application of specialized software packages in order to determine and predict morphological changes of the riverbed (3).

54. Morphology (of the river bed): Describes the shapes of river channels and how they change over time (3).

55. Multibeam: Specialized equipment for hydrographic surveys used for precise 3D imaging of the riverbed (3).

56. Navigable canal: Waterway built primarily for navigation (1).

57. Navigable inland waterway network: All navigable inland waterways open for public navigation in a given area (1).

58. Navigable inland waterway: A stretch of water, not part of the sea, which by natural or man-made features is suitable for navigation, primarily by inland waterway vessels. This term covers navigable rivers, lakes, canals and estuaries. The length of rivers and canals is measured in mid-channel. The length of lakes and lagoons is measured along the shortest navigable route between the most distant points to and from which transport operations are performed. A waterway forming a common frontier between two countries is reported by both (1).

59. Navigable river: Natural waterway open for navigation, irrespective of whether it has been improved for that purpose (1).

60. Port quay lengths: Total quay length in metres (1).

61. Port: A place for vessels to moor and to load or unload cargo or to disembark or embark passengers to or from vessels, usually directly to a pier (1).

62. Quay wall: Constructed vertical or almost vertical wall to hold waterside cranes (3).

63. Quay: A stone or metal platform lying alongside or projecting into the water for loading and unloading ships (3).

64. Riparian zone (riparian area): The interface between land and a river or stream (3).

65. Riparian country: Country adjacent to a river (e.g. Danube riparian countries are Germany, Austria, Slovakia, Hungary, Croatia, Serbia, Romania, Bulgaria, Moldova, Ukraine, Russian Federation) (3).

66. Riprap (rip rap, rip-rap): Rock armour, rubble, or other material used to armor shorelines, streambeds, bridge abutments, etc. against scour and water or ice erosion (3).

67. River basin: The land area that is drained by a river and its tributaries (3).

68. Riverbed: The bed or channel in which a river flows; the bottom of a river (3).

69. Ro-Ro berth: a location at which a Ro-Ro vessel can berth and load and unload motor vehicles and other mobile Ro-Ro units via ramps from ship to shore and vice versa (1).

70. Statistical port: A statistical port consists of one or more ports, normally controlled by a single port authority, able to record ship and cargo movements (1).

71. Waterway: River, canal, lake or other stretch of water which by natural or man-made features is suitable for navigation. Waterways of a maritime character (waterways designated by the reporting country as suitable for navigation primarily by seagoing inland waterway vessels) are included. Waterways also include river estuaries; the boundary being that point nearest the sea where the width of the river is both less than 3 km at low water and less than 5 km at high water (1).

72. Weir: A dam across a stream of a river, with the purpose of the production of electrical energy by backing up or diverting water flow (3).

III. References

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