

GENERAL DYNAMICS

European Land Systems–Bridge Systems

COMBAT ENGINEERING CONFERENCE

WARSAW 2024





Vincent Macrander

Sales Director Bridge Systems

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✉ Vincent.Macrander@gdels.com

- Age: 58
- Married – one son
- Law degree - University of Amsterdam
- Since > 30 years' experience in defence industry

From military helicopters to armoured vehicles for land forces and since three years responsible as Sales Director for GDELS – Bridge Systems in Germany Kaiserslautern

Hcp 12.8



Charles Mansfield

Program Manager Bridge Systems

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✉ Charles.Mansfield@gdels.com

- Age: 43
- Married – three children
- Masters in Business, Degree in Science
- 21 Years experience in the Royal Australian Engineers

Multiple deployments and operations from war-like through to Humanitarian Support task around the world.

5 years in military capability and acquisition programs

Average Rugby Player



Alexander Rieger

Director Engineering

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- Age: 49
- Married – two children
- Diploma in Structural Engineering
- 12 Years experience as a military engineer
- 18 years defence business

More hair than Charles

1. Speed is of the essence
rapid deployment enabled by our bridges
2. Multi-tasking
bridges for forward combat/ rear passage of lines operations and disaster relief
3. Interoperability



What are the “new” challenges to Militaries having Assured Mobility and Freedom of Maneuver?

- Glass battlefield (Drones, Phones, and other tech)
- Long range accurate strike (Drones and conventional munitions)
- Increased lethality / destruction at range
- Drone swarms / multiple attack types increase success
- AI supported targeting / planning
- Increased urbanization
 - Channeling effect
 - Increased options for gap creation
 - Civilian populations



Problem analysis - Result



Quicker detection



Reduce detection to targeting time



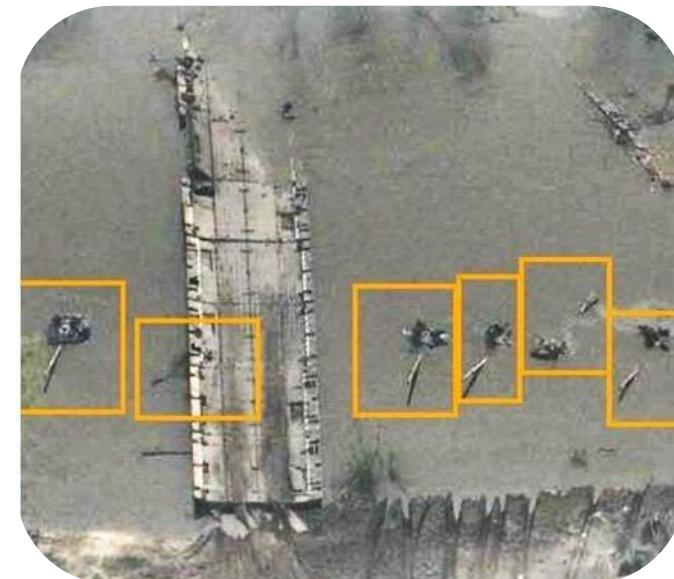
Quicker and more effective destruction



Predictable crossing sites

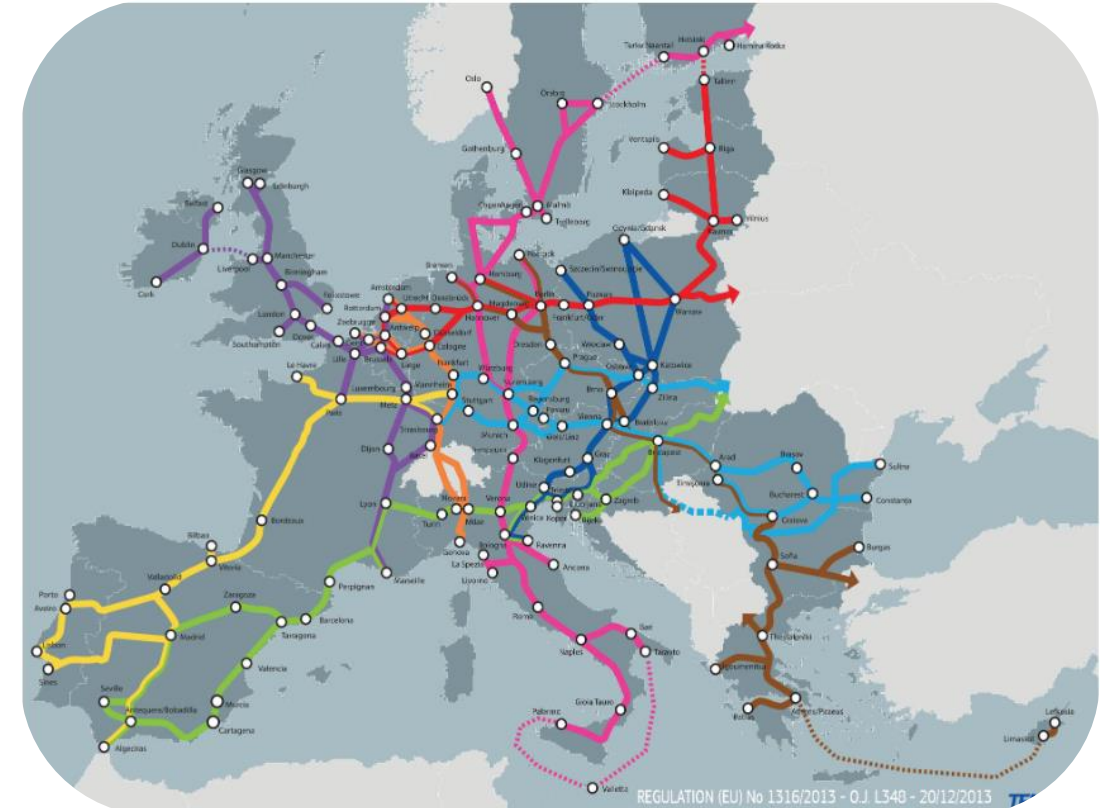


Targeting of logistic support routes easier






Main Routes in Europe


- What are targetable?
- What are vulnerable to disruption?
- What are vulnerable to rear action to target Logistic Support?
- How many
 - Bridges
 - Gaps
 - Culverts
 - Cities / towns
 - Shaping obstacles ...



CEPA Military Mobility Project – one example: Le Havre → Tallin


Logistical challenges:


-  Fastest route: 2'674 km
-  43 hours (average speed: 60 km/h)
-  4-7 refueling stops required




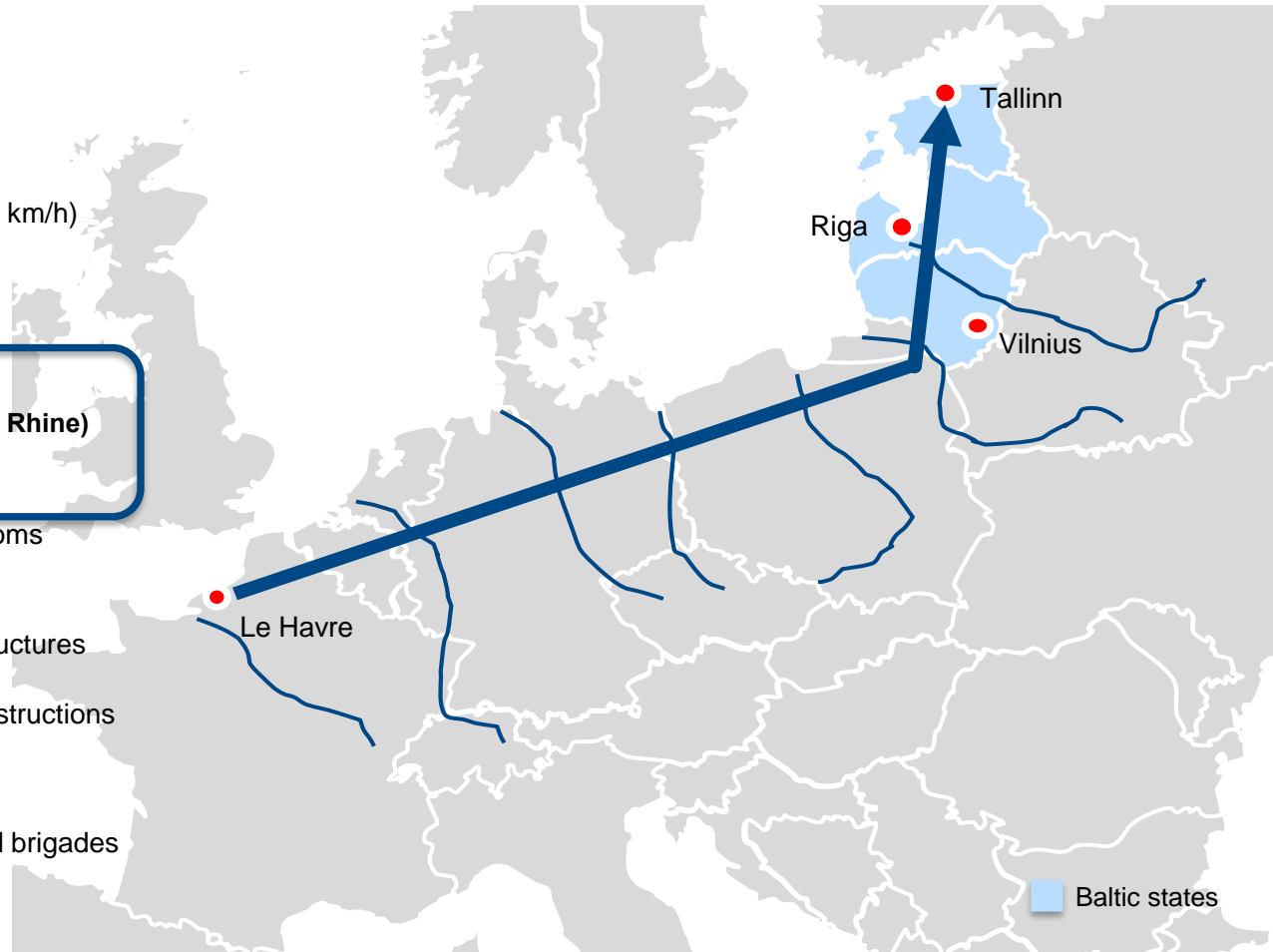
173 rivers (width ≥ 20 m)
13 rivers (width ≥ 100 m, e.g. Rhine)
13 km over water

 7 national borders and customs

 7 different road / rail infrastructures

 Currently 16 major road constructions

 Total railway capacity:
Transport of 1,5 mechanized brigades



Military Mobility – defence capabilities:

1. Deployability:




- 90 % of highways,
- 75 % of national roads,
- 40 % of local roads and bridges

are able to carry vehicles with MLC 50

2. Mobile bridging:

Ability to conduct **multiple, simultaneous, wide wet-gap crossings** to ensure **high operational speed** of joint forces

NATO mobile bridge assets: ≈ 10 km
 ➔ (scenarios-specific delta: 3 km)

- ### 3. Coalition force:
-  Interoperability
 -  Secured radio communication
 -  Common operating picture

Source: The CEPA Military Mobility Project: Moving mountains for Europe's defence.
 (<https://cepa.org/event/military-mobility-workshop>)

Targeting of logistical routes



Military mobility challenges



Speed to
the gap

Speed across
the gap

Speed from
the gap

Today's observations

Sustained ferry / raft operations wet gaps - M3 forward then reinforced by IRB ferries



Bridges should be considered expendable / expense items



Increase number of bridges / war stocks



“Short” logistical bridge allows freedom of movement



Crossing by civilians / civilian vehicles



Armored vehicles must launch forward to be combat effective



Engineer units cannot be the only units with small bridges (<12m gap)

Ferry over bridges for wet gaps

IRB – The best tested bridge in the world!

Year 2023



Not true anymore

Enhanced capability to carry highest MLC vehicles

IRB – The best tested bridge in the world!

Year 2024



Enhanced capability to carry highest MLC vehicles

Testing the limits of the IRB as a bridge in full scale tests 2021 at Vicksburg, Miss.



Enhanced capability to carry highest MLC vehicles

Testing the limits of the IRB as a ferry in full scale tests 2024 at Fort Knox, Kent.



Enhanced capability to carry highest MLC vehicles

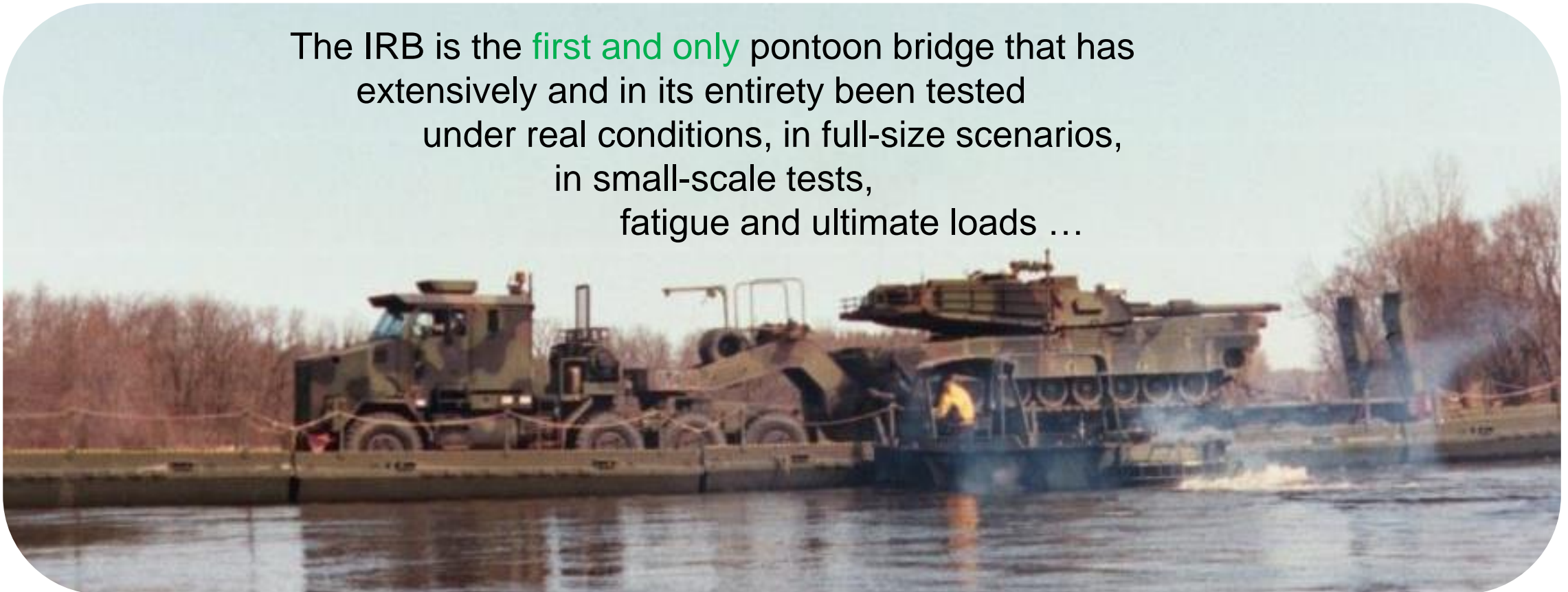
Testing the limits of the IRB as a ferry in full scale tests 2024 at Fort Knox, Kent.



IRB – The best tested bridge in the world!

and best tested ferry in the world!

The IRB is the **first and only** pontoon bridge that has extensively and in its entirety been tested under real conditions, in full-size scenarios, in small-scale tests, fatigue and ultimate loads ...



Enhanced capability to carry highest MLC vehicles

What you should take home with you:

and ferry

1. The IRB is the **best tested bridge** in the world!
2. It is so **robust** it would rather sink than break.
3. The IRB **can carry all NATO vehicles**.
4. All current MBTs with a **rating up to MLC120** can cross the bridge and can be ferried.

Rapid deployment enabled by our bridges

- GDELS signed another M3 order with Sweden on 05 March 2024
- High interest from other Nations
- M3 is in full running production since many years and will continue to be for many years
- M3 is the worldwide fastest and most capable amphibious bridge system
- All M3's are interoperable without the need of additional tools
- M3 is interoperable with IRB, SRB and FSB through an available bridge coupler



NATO – Unique Interoperability: M3 / IRB Coupling Device



M3 / Standard Ribbon Bridge coupling device in Korea

Easy coupling of M3 with IRB / SRB

Expands operational flexibility and deployment options in joint operations

Tested and sold to Sweden, Korea and US-Army



Bridges for forward / rear combat operations and disaster relief

DRY GAP BRIDGES

FLOATING BRIDGES



Bridges for forward / rear combat operations and disaster relief



ANACONDA



VIPER



COBRA



ANACONDA – wheeled assault bridge



MAXIMUM PAYLOAD

MLC 80
Higher MLC on request

BRIDGE LENGTH

1 x 22 m bridge
2 x 12 m bridge

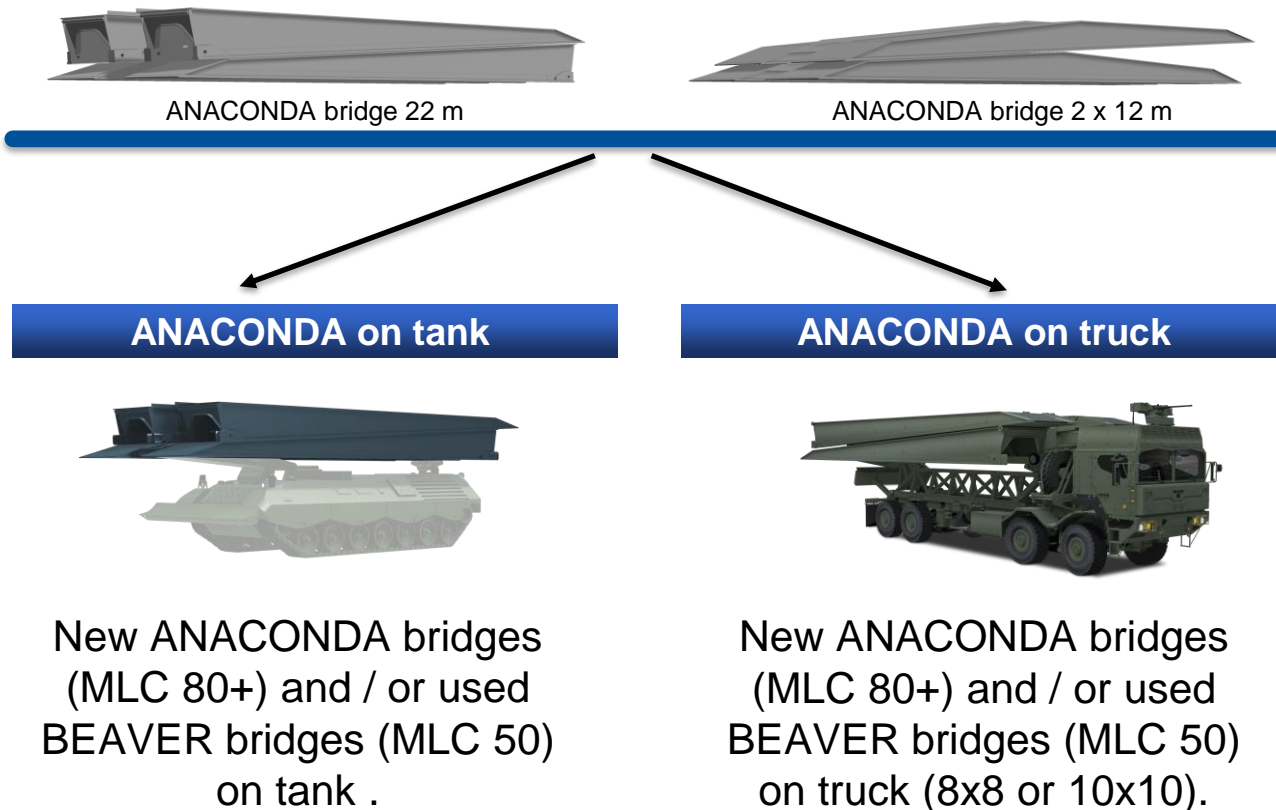
LAUNCHING TIME

Approximately 5 minutes

WEIGHTS

Bridge (22 m):	10 tons
Bridge (12 m):	6 tons
Launcher:	14 tons
Total with truck:	40 – 45 tons

ANACONDA – strengths






- Can be crossed by all NATO Main Battle Tanks
- Launching / retrieving time < 5 minutes
- Over 240 BEAVER bridges are in worldwide service and fully interoperable with the ANACONDA
- Low procurement and service costs compared to tracked systems
- Speed up to 90 km/h allows driving in a military convoy
- Wheeled bridge layer for independent transport over long distance
- Can also be used in civil defense and disaster relief operations
- Launcher and bridge were designed by GDELS-BS as a system

VIPER – Modular Trackway Bridge



CUSTOMERS

-  Undisclosed
-  USMC
-  The Netherlands

MAXIMUM PAYLOAD

MLC 50

BRIDGE LENGTH

Modular 5 m, 7 m or 9 m

TRANSPORT / OPERATIONS

Transport of the bridge components on carrier vehicle, support vehicle or on a trailer

Manual launch or recovery time for a 5 m bridge in approx. 5 min. with 4 soldiers

COBRA – Armored Assault Bridge



CUSTOMERS

Prototype bridge & launcher adapted and tested on

- PIRANHA
- ASCOD
- BOXER

PAYLOAD AND BRIDGE LENGTH

- MLC90 @ 15 Meter
- MLC120 @ 9 Meter

BRIDGE WIDTH

- 3.35 m

LAUNCHING TIME

- < 2 minutes

CARRIER VEHICLE

- Wheeled
- Tracked

COBRA on Tractor – Swiss knife solution



GENERAL DYNAMICS

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WE ENABLE MILITARY MOBILITY

