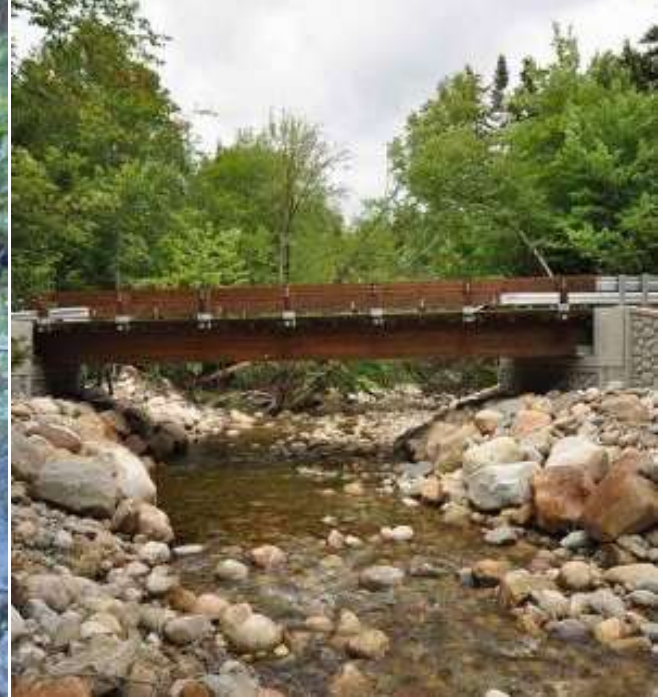

BRIDGE INSPECTION TIPS

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OVERVIEW

Federal Highway Administration – National Bridge Inspection Standards

- Routine Inspections every 24 months*
- Additional inspections after major events, underwater inspections, etc.

Today's Goal

- Provide working knowledge of common bridge defects and inspection techniques.
- Empower everyone to maintain reasonable safety on bridges.

Agenda:

- Bridge Mechanics and Components
- Routine Inspection Tips
- Scour
- Takeaways

BRIDGE MECHANICS

Live Loads

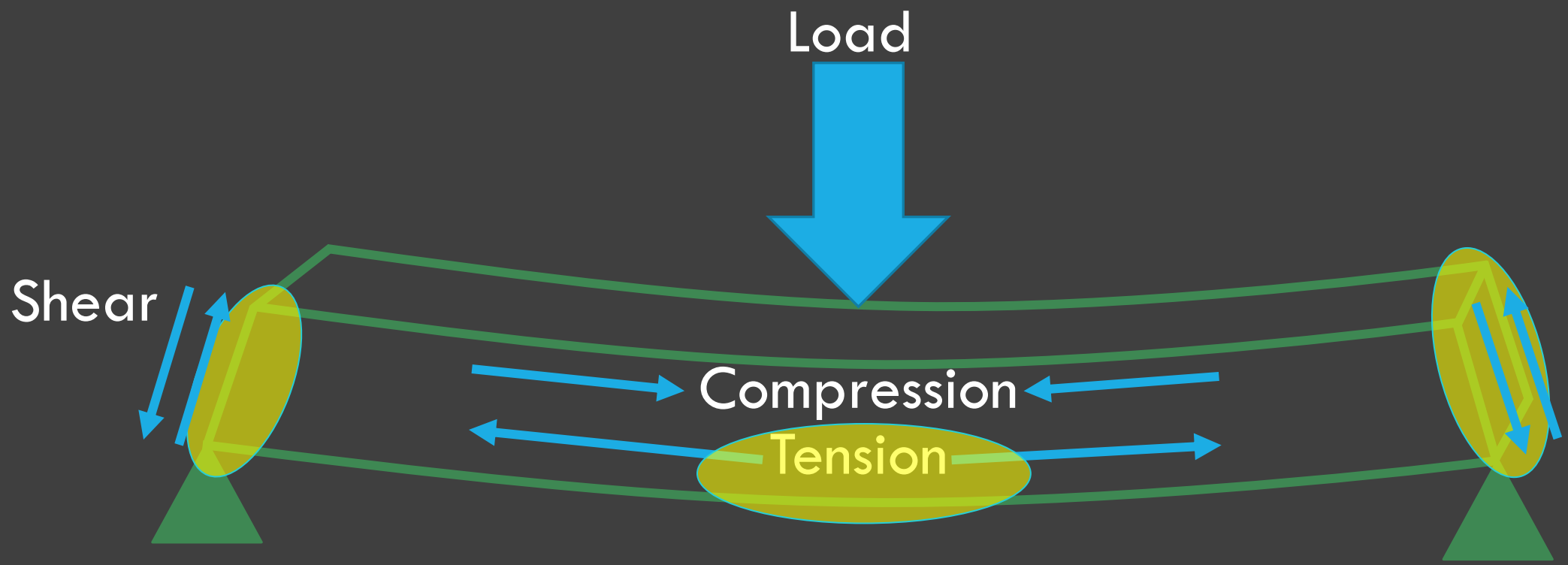
Deck

Superstructure

Substructure

Earth

BRIDGE MECHANICS



ROUTINE INSPECTION TIPS

1) Preparation
   a) Bring the right tools for the job
   b) Be prepared to look at the job from all angles.



So, what should you look for?

ROUTINE INSPECTION TIPS

What doesn't look right?

a. Condition of material

- Spalling, Delamination, Scaling & Exposed Rebar
- Cracks, Wear & Abrasion
- Internal Steel Corrosion
- Efflorescence, Discoloration

Concrete

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- Termites
- Fungi: Molds, Stains, Rot

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- Impact Damage
- Distortion/ Deflection/ Vertical & Lateral Movement
- Settlement
- Missing/Loose Hardware

ROUTINE INSPECTION TIPS

What doesn't look right?

a. Condition of material

b. Drivability of Approaches and Bridge

- Smooth drive over approach, transitions and bridge
- Signage – load rating, object markers
- Visibility
- Guard Rails
- Pooling water and poor drainage
- Cleanliness

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ROUTINE INSPECTION TIPS

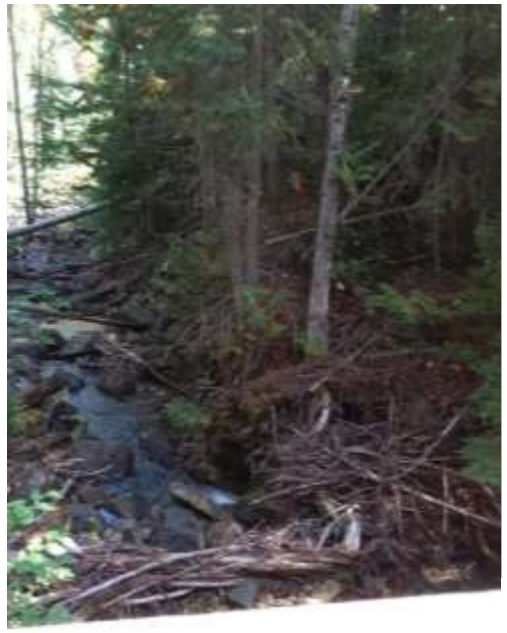
What doesn't look right?

a. Condition of materials

b. Drivability of Approaches and Bridge

c. Stream Conditions

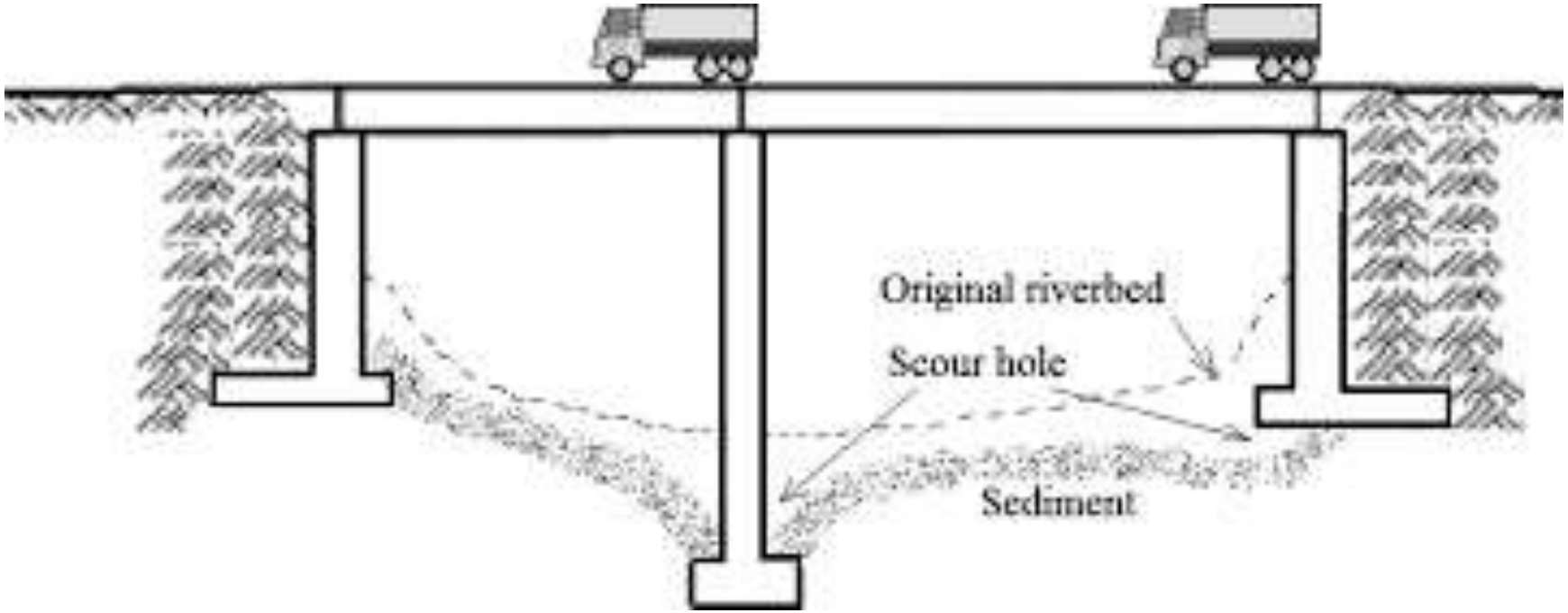
- Debris in channel
- Channel Erosion
- Channel Constriction
- Channel Migration
- Failing abutment protection



SCOUR

Approx. 60% of all bridge failures are from hydraulic or stream instability problems[1]

- "The erosion or removal of material of streambed or bank material from bridge foundations due to flowing water"



1. FHWA-NHI Feb. 2020

SCOUR

Flow Attacking

Stream Laterally or Vertically Unstable

Bank Erosion

Exposed Footing

Footing Undermined

Channel Constriction

SCOUR

Armoring / Riprap

TAKEAWAYS

Be observant and use common sense.
Check minor items while driving (safely).
Note changes over time.

- Regular Maintenance
  - **Trees/vegetation** in approach shoulders and growing under bridge should be removed
  - **Debris jams** upstream and downstream should be removed
  - Deck and **drains** should be kept **clean and clear**
  - **Signs** should be replaced if inaccurately placed, illegible or not-present
- Structural Concerns/ Other Noted Defects
  - Take multiple photos with documentation of bridge and location on bridge.
  - Relay information to necessary staff within your agency/company.
  - Public Safety is key. Act quickly. Document findings.
  - Closing bridges does not make friends – but can save lives

REFERENCES

Photos are from personal bridge inspections on USFS bridges in MT, ID, ND

FHWA HEC-23 Volume 1 Bridge Scour and Stream Instability Countermeasures – Volume 2

FHWA NHI Course Safety Inspection of In-service Bridges. Publication No. FHWA-NHI-19-038 (Sep 2019)

For more in-depth information, visit National Highway Institute (https://www.nhi.fhwa.dot.gov/course-search). They have a free 14 hr course on bridge inspections in addition to free courses on bridge maintenance, scour and other related topics.