Reconnaissance Formations and Civil Reconnaissance in Stability Operations

Using Field-Expedient Methods to Conduct Hasty Assessments of Host-Nation Transportation Infrastructure and Contribute to Civil Information Management

by CPT Thomas Westphal

Despite the conclusion of operations Iraqi Freedom and Enduring Freedom, there is little doubt that instability will remain a growth industry in our time. However, recent trends seem to indicate the nature of this conflict will remain unconventional for the foreseeable future. Even conventional formations, such as reconnaissance squadrons or armored combat teams, are now arguably more likely to be deployed in support of stability operations in the near term than they are in support of more traditional contingency operations.

As such, today's Armor leaders need to be prepared to adapt their existing skillsets and competencies to fit the requirements of stability operations. One such requirement is the gathering and management of civil information, which assists the commander or other U.S. government authorities in understanding the battlespace's civil component.

Civil-information management (CIM) is a core task carried out by Civil Affairs Soldiers that directly contributes to the commander's ability to understand the situation on the ground in a given area. During the CIM process, data relating to the civil component of the operating environment (OE) is collected, collated, processed, analyzed, formatted into useable products and disseminated (Field Manual (FM) 3-57). By understanding this component of the OE, commanders are able to make better-informed decisions and leverage existing conditions for maximum effect, which could potentially have a significant impact on mission success.

Civil reconnaissance is one of the methods by which Civil Affairs personnel collect relevant civil data as specified by the information-collection requirements formulated by their chain of command. Although doctrine allocates this function to Civil Affairs forces, the capabilities and traditional competencies of a reconnaissance formation place them in a unique position to contribute civil information about the state of host-nation (HN) transportation infrastructure, and therefore enhance the commander's understanding of the OE.

This article will lay out a few field-expedient methods for gathering information relevant to the HN transportation infrastructure during contingency operations with minimal specialized equipment and will pair these methods with common applications. This is not meant to be an exhaustive catalogue but a review and reference for an application of reconnaissance competencies not specifically addressed in current Armor doctrine.

An annotated bibliography of more doctrinal references is included to provide a few suggestions for further study. Also see the sidebar for doctrinal definitions.

Future relevancy

During future contingency operations, commanders or other appointed U.S. government authorities will need to gather relevant civil information to enhance their understanding of the OE. This can potentially include gathering information about the status of the HN transportation infrastructure to facilitate specific missions.

For example, if a particular HN is vulnerable to natural disasters in a certain region, an authority might begin gathering information about the transportation infrastructure in that area. In the event that it then becomes necessary to transport humanitarian assistance to the region, the ground commander – as well as collaborating government agencies, non-governmental organizations (NGOs) and HN institutions – has a basic idea of the HN infrastructure's capabilities. This will help answer questions in the planning process such as what routes can support what volume of traffic, or which routes have obstacles (such as sharp curves, steep slopes, fords or obstacles with low overhead clearance) that prevent heavy-vehicle traffic.

Depending on the OE, the formations tasked with gathering this information may not always have access to sophisticated equipment for collecting the data necessary for effective analysis of common transportation infrastructure (such as routes, tunnels, fords and bridges). This article will lay out a few field-expedient methods for taking measurements of transportation infrastructure with minimal specialized equipment. These methods are paired with common applications in the table in Figure 1 for easy reference. Such methods could enhance the effectiveness of reconnaissance forces and increase their capacity to conduct hasty assessments of transportation infrastructure in austere environments.

Common applications	Pace count	Triangulation	Felling	Slope pace	Time of travel	Compass
Route width	X					
Route slope				X		
Route curve		X				
Underpass and tunnel overhead clearance			X			
Rivers and fords width						X
Rivers and fords water velocity					X	
Bridge length	X					X
Bridge width	X					
Bridge overhead clearance			X			

Figure 1. Quick reference table for common applications of methods for assessing transportation infrastructure.

Field-expedient measurement methods

Method: Pace count
Equipment required: Known pace count

Application: All the following methods require one to two people with a known 100-meter pace count. This is a foundational method used throughout this article. It is also useful in its own right for taking measurements of short horizontal distances such as the width of a road or tunnel. Use the pace count to take any distance measurements unless otherwise specified.

Process:

- Step 1: Pace the distance of the measurement needed.
- Step 2: Divide the number of paces by the 100-meter pace count of the Soldier performing the measurement.
- Step 3: Multiply the result by 100. The resulting number is the measured distance in meters.

Method: Triangulation
Equipment required: None

Application: The ability of vehicles to move along a given route is impacted by sharp curves. This is especially true for larger cargo vehicles. To understand how curves on a route may impact traffic, it is necessary to find the radius of the curves. Any curves with a radius of 45 meters or less need to be recorded, and any curves with a radius of 25 meters or less are considered to be an obstruction for route-classification purposes.

Process:

- Step 1: Find the point of curvature (PC) and point of tangency (PT) on the curve (Figure 2). In laymen's terms, this is where the road begins to curve (PC) and the point at which it straightens out (PT) – i.e., the beginning and ending points of the curve.
- Step 2: Pace off right triangles at both points that are equal in proportion (3:4:5 proportions are recommended).
- Step 3: Extend the legs of the triangle that is perpendicular to the road at both PT and PC as shown in Figure 2. Ensure these two lines are as straight as possible. Mark where these two lines intersect (marked O in Figure 2).

- Step 4: Measure the distance between the intersection (Point O) and the road (either PC or PT) – this distance is the radius of the curve.

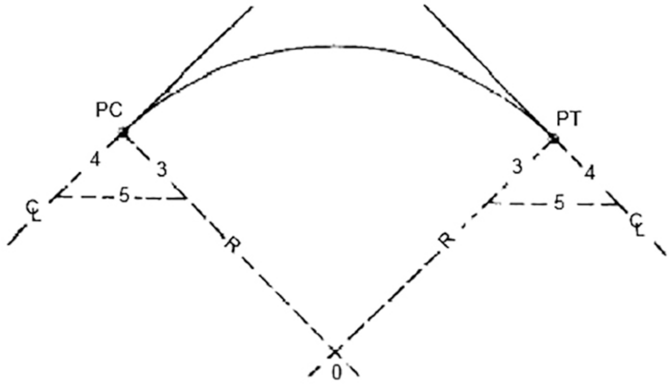

Figure 2. Calculating triangulation. *(From Figure 5-4, FM 3-34.170)*

Method: Felling
Equipment required: Small, straight object (e.g., stick, screwdriver, pencil, etc.)

Application: The "felling" method provides a rough estimate of the height of a given object. It can be used to estimate the height of infrastructure like underpasses and tunnels that can pose a possible obstruction to traffic along a route. The overhead-clearance restrictions of a route can be an important factor in the planning movement along it.

Process:
- Step 1: Stand a reasonable distance away from the object you need to measure (Line AB – see Figure 3).
- Step 2: Hold a small, straight object (for example, a stick) at arm's length. Adjust the stick so that its tip appears to touch the top of the object you need to measure (B).
- Step 3: Still holding the stick in the same position, use your thumb to mark the spot on the stick where the base of the object you need to measure is (A).
- Step 4: Rotate the stick sideways 90 degrees to a horizontal position, keeping your thumb in line with the base of the object. Mark the point where the tip touches the ground (C).
- Step 5: Use a pace count to measure the distance from that point to the base of the object you need to measure (AB = AC).

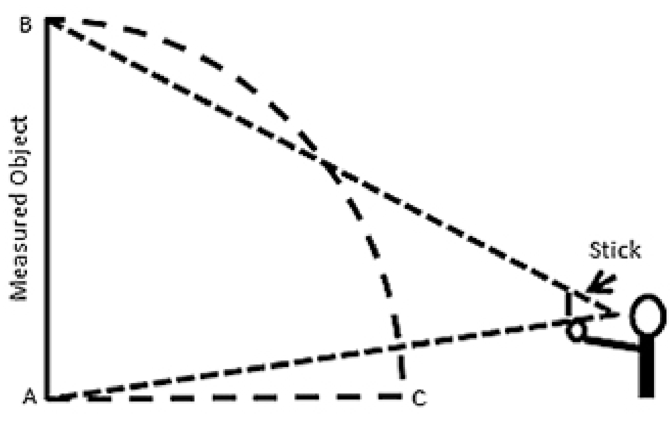

Figure 3. Applying felling.

Method: Slope pace
Equipment required: None

Application: Routes that contain particularly steep uphill slopes may not be suitable for all types of vehicles. Slopes of seven percent of greater must be recorded and are considered obstructions to traffic flow.

Process:

- Step 1: Stand at the bottom of the sloped area with head and eyes level. Pick a spot on the slope that is about at your current eye level.
- Step 2: Walk toward the sighted spot, measuring the distance with a pace count.
- Step 3: Repeat until the top of the slope has been reached. Keep record of the total distance measured.
- Step 4: Find the vertical distance traveled by multiplying your eye-level height (in the example in Figure 4, this is 1.75 meters) by the number of times you picked a new spot at eye level. Find the horizontal distance by computing the distance travelled based on your known pace count.
- Step 5: Divide the total vertical distance by the total horizontal distance and multiply by 100. This is the percentage of slope.

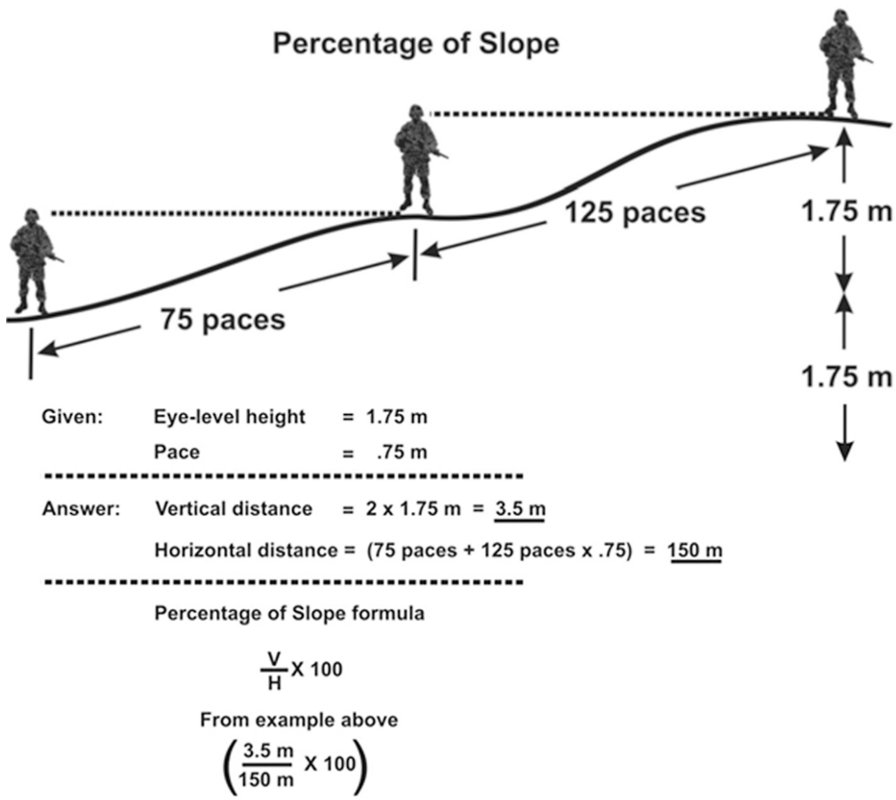

Figure 4. Estimating slope pace. *(From Figure 3-7, ATP 3-20.98)*

Method: Time of travel
Equipment required: A small floating object not affected by the wind (for example, a stick)

Application: This is an expedient method for measuring the velocity of moving bodies of water such as streams and rivers. This is relevant because swift-moving streams and rivers are more difficult for vehicles to traverse. In general, currents less than 1.5 meters per second are considered desirable for fording sites. Normally, a river current is not constant across the width of the river; generally, it is faster in the middle than on the sides and faster on the outside of a curve and along the inside (see FM 90-13).

Process:

- Step 1: Measure a distance (in meters) along a riverbank (i.e., 100 meters).
- Step 2: Throw a small floating object into the river or stream (i.e., a stick).
- Step 3: Record the amount of time it takes for the object to travel the measured distance (in seconds). Repeat several times and take the average time for accuracy.

- Step 4: Divide the measured distance along the riverbank by the average time it takes the object to travel the measured distance. This is the velocity in meters per second.

Method: Compass
Equipment required: Lensatic compass

Application: This method can be used to quickly determine the distance across an obstacle that Soldiers are not able to cross, such as a river or a structurally unsound bridge.

Process:

- Step 1: Take an azimuth from any point on the near side (A) to a point directly across on the far side (B) (see Figure 5).
- Step 2: Find another point on the near side (C) that ensures Angle D is 90 degrees and Angle E is 45 degrees.
- Step 3: Measure the distance between points A and C. This is equal to the distance between A and B, the distance across the obstacle.

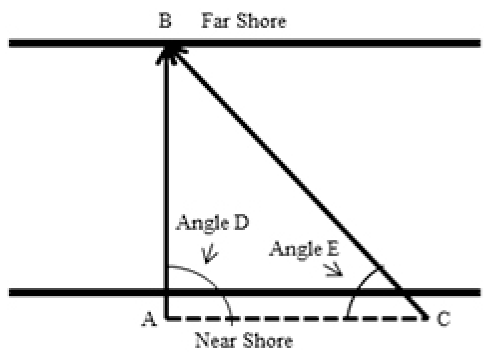

Figure 5. Sighting a compass.

Conclusion

Leaders of conventional reconnaissance need to continue to look for innovative ways to adapt their traditional competencies to meet the realities of the battlefield as the nature of the contemporary OE continues to evolve. During future contingency operations, reconnaissance formations that need to assess HN transportation infrastructure may not have quick or easy access to sophisticated equipment or the expertise necessary to use it. Using some of these field-expedient methods may increase their ability to collect the necessary data and allow better analysis of the HN infrastructure's capabilities. This, in turn, should help improve a commander's situational awareness and understanding of the OE's civil component, and make contributions to mission success.

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Further reading

ATP 3-20.98, ***Reconnaissance Platoon***, April 2013. Contains useful information regarding route classification from a maneuver reconnaissance platoon's perspective. Includes a discussion of different field-expedient methods and examples of the methods being used to evaluate routes.

FM 3-34.170, ***Engineer Reconnaissance***, March 2008. This is the definitive field manual for evaluating transportation infrastructure. Includes a detailed discussion of different methods and examples, as well as data

about military load classifications and conducting hasty evaluations the structural integrity of bridges, which are not covered in this article but could potentially be helpful to a Civil Affairs team conducting civil reconnaissance.

FM 3-57 C1, ***Civil Affairs Operations*****,** January 2014. This manual describes in broad terms the Civil Affairs core tasks, including civil information management. Also, it is the proponent manual for civil reconnaissance.

FM 3-57.50, ***Civil Affairs Civil Information Management***, September 2013. Provides an in-depth discussion of the civil information management process.

FM 90-13, ***River-Crossing Operations***, September 1992. Gives in-depth information and data regarding favorable conditions for military river-crossing operations, which gives insight into what sort of information commanders might want in future contingencies, as well as what may be important to non-military personnel attempting to traverse a route that includes un-bridged rivers.

ST 3-20.983, ***Reconnaissance Handbook***, April 2002. A condensed and easy-to-use publication that includes information about route classification from the Armor Branch's perspective.