

CASM

Trail Condition Assessment Survey Matrix

A Guide to Recommended Survey Methods and Accuracies

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CASM is the Forest Service's guide for conducting efficient and appropriate trail inventory and condition surveys, based on the on the level of trail development or Trail Class, investment in trail structures, and visitor expectations. CASM values are recommended minimums for data accuracy and specificity. Local managers may select more rigorous frequencies, methods, or accuracies as determined necessary.

Assessment Factors	Trail Class 1	Trail Class 2	Trail Class 3	Trail Class 4	Trail Class 5
Survey Method ¹	Walk-through & Make Notes on Map or GPS ²	Cyclometer or GPS ²	Cyclometer or GPS ²	Cyclometer	Tape or Cyclometer & Hand Level with Digital Readout
Recommended Survey Accuracy & Specificity					
Measurement Interval ³	Major Physiographic Changes	Minor Physiographic Changes or ½ Mile	Typical Grade Changes of 10% or 500 Feet	Typical Grade Changes of 10% or 500 Feet	Inter-visible Alignment Changes, 2% Grade Changes, or 25 Feet
Typical Grade ⁴	+/- 10%	+/- 10%	+/- 5%	+/- 5%	+/- 1%
Typical Width ⁵	Not Measured	Optional +/- 6"	+/- 6"	+/- 6"	+/- 3"
Obstacles ⁶	Not Measured	Not Measured	Optional	Formidable Obstacles (e.g. narrow width with steep drop off)	All those defined as Obstacles
Typical Cross Slope ⁷	Not Measured	Not Measured	+/- 1%	+/- 1%	+/- 0.1%
Features & Tasks ⁸	Maximum Grouping of Features & Tasks	Grouping of Features & Tasks	Grouping of Features & Tasks Optional	Each Feature & Task Inventoried & Assessed Individually	Each Feature & Task Inventoried & Assessed Individually

¹ Survey Method: Most efficient method that accomplishes identified CASM accuracies.

² GPS: TRACS data collected via GPS must meet agency GIS spatial standards. This usually includes differential correction and editing for multi-pathing, spiking, and degraded satellite coverage.

³ Measurement Interval: Maximum interval between collecting a full set of survey points for Typical Grade, Typical Width, Obstacles, Typical Cross Slope, and applicable Features and Tasks. If an element (i.e. Typical Grade) changes more frequently than the maximum interval, record those changes based on the CASM accuracy identified for that element.

⁴ Typical Grade: Initiate new survey segment when Typical Grade changes by this amount.

⁵ Typical Width: Initiate new survey segment when Typical Width changes by this amount.

⁶ Obstacles: For those defined (see FSM/FSH, Infra Business Rules, Universal Access guidelines, etc.)

⁷ Typical Cross Slope: Accuracy of Rise-over-Run measurement across Typical Tread Width.

⁸ Grouping Features & Tasks: Features and Tasks can be grouped within survey segment.