HORIZONTAL DISTANCE

Depending on the application and/or the precision needed, one chooses an appropriate definition of HORIZONTAL DISTANCE. See Burkholder (1991), options are:

- **HD(1) = the right triangle component of a slope distance.**
- **HD(2) = the distance between two plumb lines in a plane tangent to the earth at the instrument station.**
- **HD(3) = the chord distance between two plumb lines. The two end points have the same elevation and the chord is perpendicular to the vertical only at the midpoint of the chord.**
- **HD(4) = the arc distance along some level surface between two plumb lines.**
- **HD(5) = the arc distance at mean sea level between two plumb lines.**
- **HD(6) = the distance along the geodesic on the ellipsoid surface between two plumb lines.**
- **HD(7) = the state plane grid distance between two points.**

Comments:

1. **Most surveyors use HD(1), the right triangle component of slope distance.**
2. **Unless reduced to a common reference surface or unless the two points are at the same elevation, the horizontal distance from "Here" to "There" is different than the horizontal distance from "There" to "Here."**
3. **In most cases, due to elevation and grid scale factor, the state plane grid distance is significantly different than the horizontal ground distance, HD(1).**
4. **The horizontal distance obtained from a GPS vector is HD(1).**

