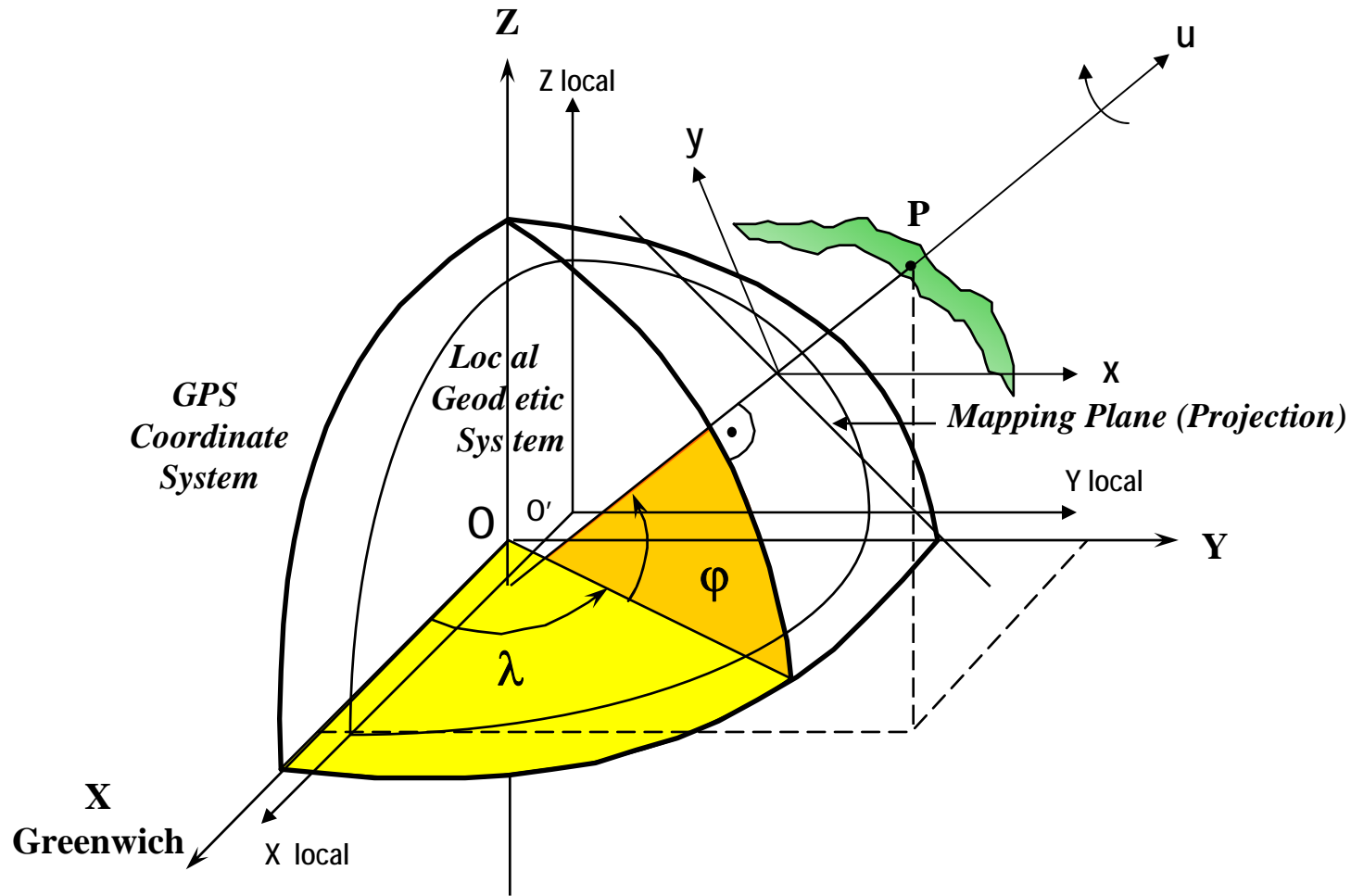
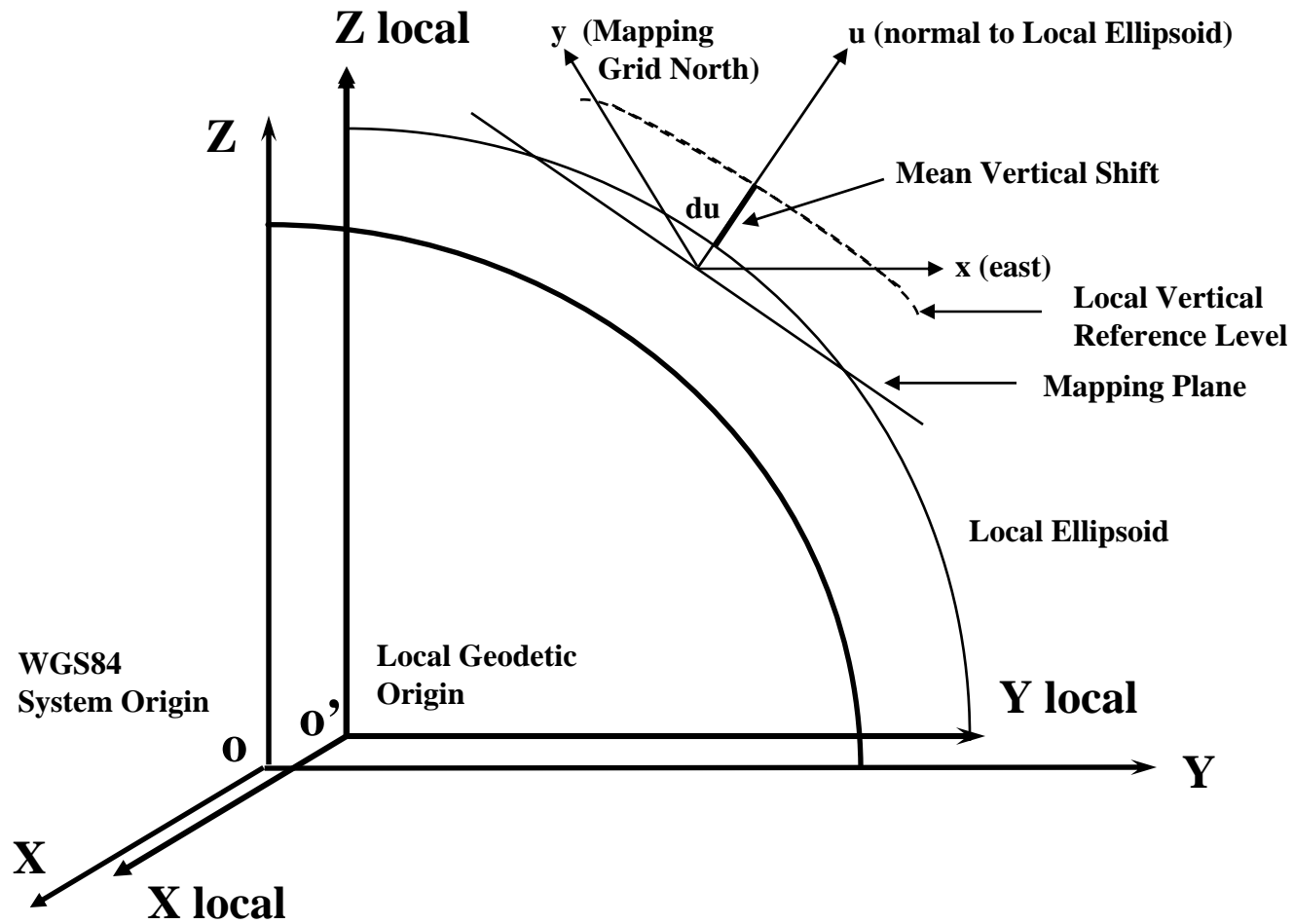


TwoStep Transformation

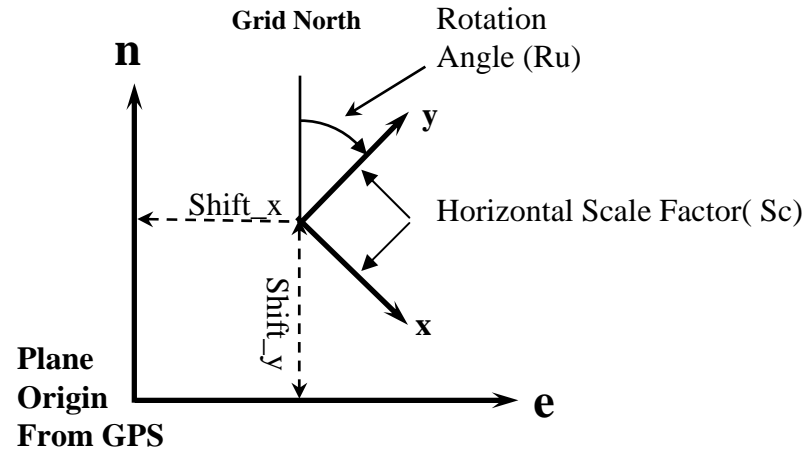
Transformation Characteristics



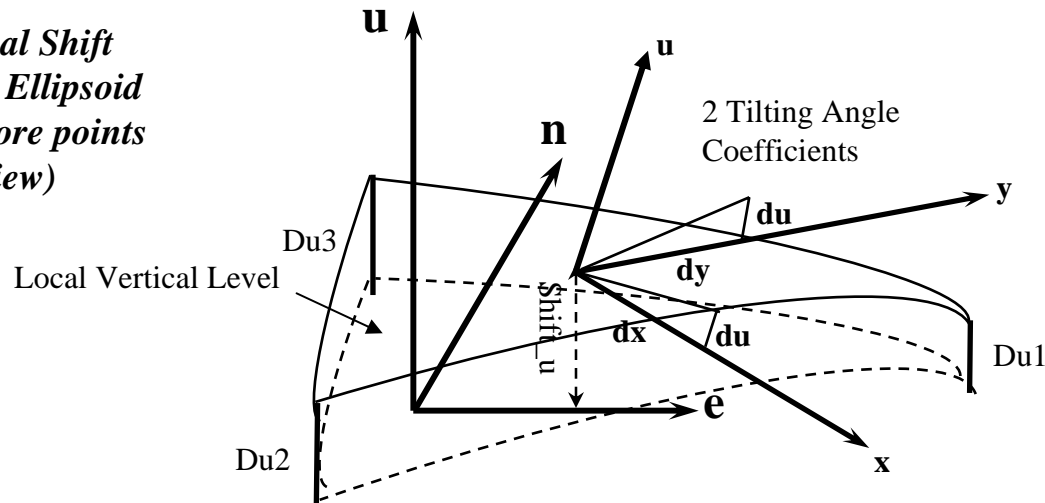


Mapping Plane to Local Grid

*2-D Helmert Horizontal Transformation
(Plane View)*



*1-D Vertical Shift
and Tilted Ellipsoid
for 3 or more points
(Profile View)*



Why use a TwoStep

- Allows common points to be used which are known only in position and height
- Not restricted to small areas as with a One Step
 - One Step limited to 6.5 miles
 - Two Step can cover an area 30 miles x 30 miles

How does it work?

- The first step, WGS84 coordinates are shifted closely to the local datum using the Pre-Transformation
- Local Cartesian coordinates are then converted to local Geodetic coordinates using a local ellipsoid
- Coordinates are then converted to a preliminary grid

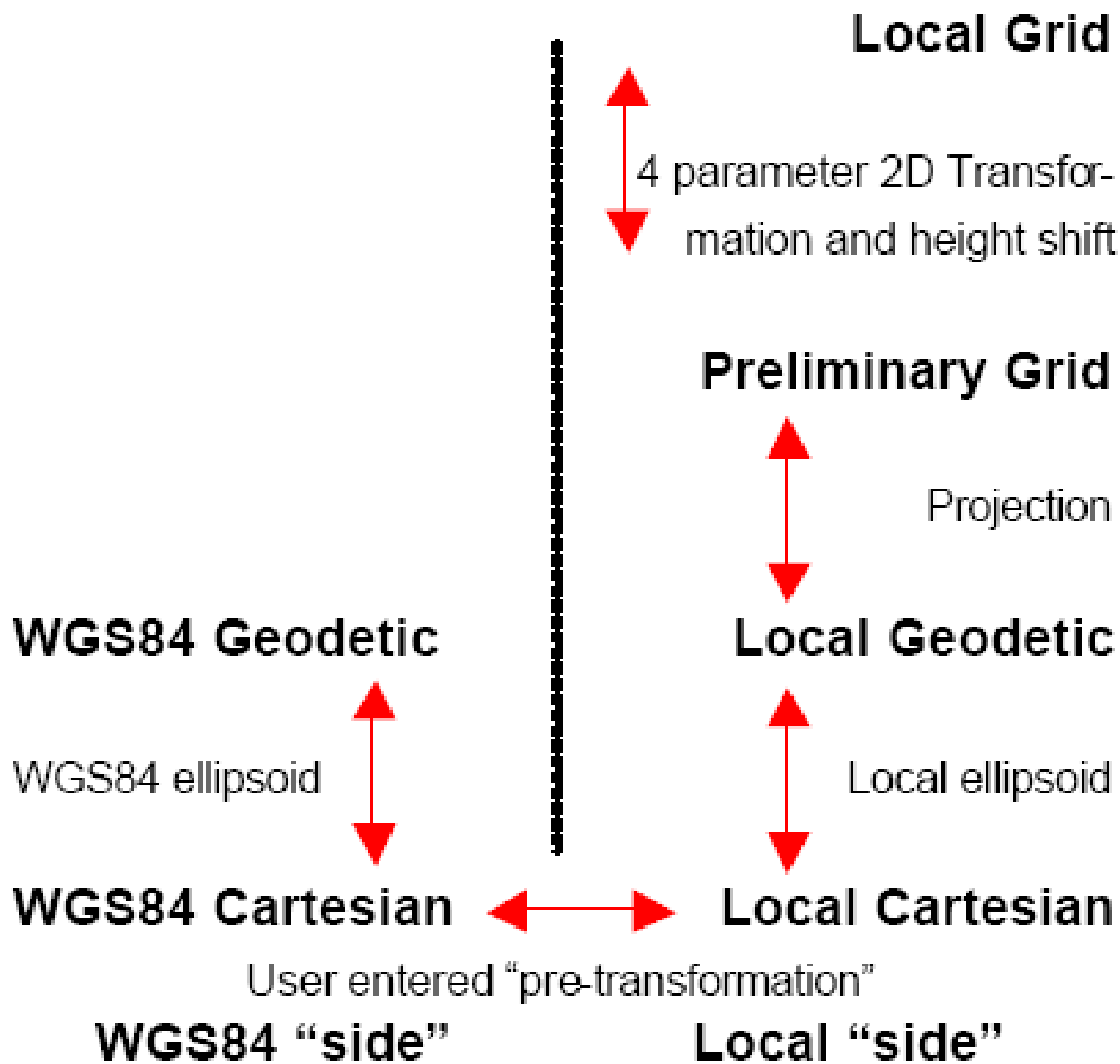
How does it work?

- TwoStep uses a true map projection on which the local points are based
- The second step is to match the grid coordinates to the known local coordinates
- This is done with a 2D positional transformation and height shift
- Avoids distortion and the influence of the scale factor of the map projection

- For these reasons the transformation fits much better over larger areas than the OneStep

What is Needed

- Knowledge of the Local Ellipsoid
 - GRS80 Ellipsoid
- Knowledge of the Map Projection
 - Oregon Coordinate System (North or South Zone)
- Classical 3D Pre-Transformation
 - We will use a Null Pre-Transformation



- Note, when using a TwoStep transformation it is not possible to see the “preliminary grid” coordinates either in LGO or on the System 1200 instruments. This is correct since the “preliminary grid” coordinates have no practical use.

Remember

- The main advantage of the TwoStep
 - Can be used over large areas
 - Minimizes the effects of distortion and scale
 - Match coordinates in position and or height
- It is necessary to know:
 - the local ellipsoid
 - the projection
 - select a pre-transformation (User Entered)

