C3 and N4 are the “best options”

In light of the NA2011 and recent PFO changes C3 and C4 are the "best options" but they are still not the "right way". Consider these “temporary” work-arounds until a true solution can be found. A desired solution is discussed at the end of this article

#	Choose Ref Position Source	Distance from base	Resulting .cor file	Choose Ref System and Transformation	Assign .prj file & Resulting shp
C3	Seed NGS “New” L1	1.34 m	IGS08	Lat/Long ITRF00 NAD 1983(2011)	UTM 11N NAD83.prj

#	Choose Ref Position Source	Distance from base	Resulting .cor file	Choose Ref System and Transformation	Assign .prj file & Resulting shp
N4	Seed NGS “New” L1 59.48067, 19.59255	0.05 m	NAD83 (2011)	UTM NAD83 NAD83 (Conus)	UTM 11N NAD83.prj

In the N4 workflow, GPS data is moved from its native WGS84 frame to NAD83 when **differenti ally corrected**
against a NAD83(2011) reference position. The base station coordinates position is manually entered (“seeded”) directly from the NGS datasheet. Barring human error when typing these into the Base Station Properties tab, this is location is from a reliable, documented source. Since the data is already in NAD83(2011), a null transformation NAD83(Conus) is selected during
export.
Assigning a NAD83.prj file identifies the GIS shapefile as NAD83.

C3 and N4 compared

N4 has a slight advantage over C3 in that it

- relies exclusively NGS base station coordinates
- eliminates the need for any transformation parameters
- is exclusively NAD83, our target datum (i.e. C3 coordinates are IGS08)

Bottom Line

For me, this peek behind the scenes has been very educational. With these recent release of NAD83(2011) and PFO changes. While Trimble boasts sub-meter accuracy with many of its receivers that same accuracy can easily be blown away by PFO. This is primarily caused by the transformation of IGS08 epoch 2005.0 coordinates ITRF00 epoch 1997.0. PFO introduces an error due to the difference between IGS08 and ITRF08. This shift is incorporated into any GPS data differentially corrected with these HTDP-transformed coordinates in the CBS. For users in tectonically active areas like HI or AK, these shifts are as large as 2 feet! This is unacceptable.

Michel Dennis, NGS has also express similar thoughts –

“If you want your results in NAD 83, then use the published NAD 83 values as seed coordinates. Relying on all this tricky and confusing transformation/velocity business is just asking for trouble.” e-mail communication, Feb 2012