

Flexible Data – Finding Value in Acceptance Testing

By Michael Gerardi

In most cases new construction, whether it be an entire runway, taxiway or ramp, replacing panels or producing short asphalt overlays, will require smoothness testing. The pavement's smoothness must meet certain FAA criteria in order to receive federal funding. Currently, there are two acceptable methods to assess the pavement's smoothness; the 12-foot straightedge and the California Profilograph.

Current Methods

Both acceptance methods were developed for the roads and highway industry and were adopted by the airport paving industry because the data that they produced was understood and trusted by the contractors and regulatory agencies that used them. However, that's not to say they don't have limitations. The 12-foot straightedge, which is typically done manually, is a slow, and labor intensive process. At 25-feet long (7.6m) long, the California Profilograph is more sophisticated and can detect wavelengths that are a little bit longer than the 12-foot straightedge, but it can get into trouble with much longer wavelengths and with repeated undulations of a certain wavelength¹. Additionally, it only produces an index, not actual profile data. Never-the-less, these are the two methods available to the industry.



Figure 1. The California Profilograph.

Flexible Data

The idea of *flexible data* is that you actually measure the pavement's elevation profile and use that measured data to evaluate the pavement using any criteria you want; the 12-foot / .25-inch straightedge criteria, the Profile Index produced by the California Profilograph or for non-US projects, ICAO's Annex 14 calling for a 3-meter straightedge. If you use a device such as APR's Auto Rod and Level – a device that produces non-proprietary, true profile data, you can

then assess that data using free third-party software such as ProVAL or ProFAA. These applications, as well as using APR's services, allow you to use whichever criterion you would like – hence the term *flexible data*.

Why Do I Want to Use Flexible Data?

Profile data measured with the Auto Rod and Level is true with respect to a known elevation (such as sea level). The profile measured to ensure FAA smoothness compliance with a flexible data device *can also* serve as the pavement's baseline profile, locking in the profile shape of the pavement for comparison to future profile surveys.

Establishing a profile baseline is an excellent tool for pavement management purposes. A baseline allows the changes that occur to the pavement's profile over time, typically due to settlement, to be identified and quantified. This can be seen in Figure 2. These changes can eventually produce poor aircraft ride quality. The baseline profile allows you to track and predict when poor ride quality will develop and help optimize rehabilitation efforts.

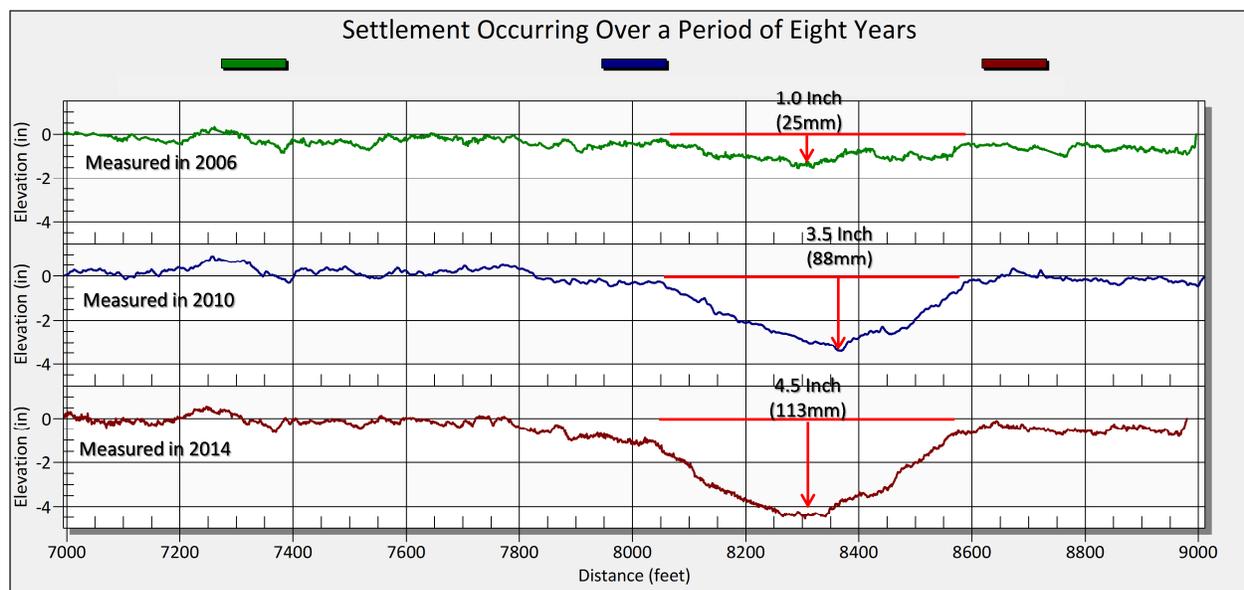


Figure 2. Profile as measured by APR's Auto Rod and Level showing shape changes due to Settlement over 8 years.

So, you know you have to assess the pavement. Why not use a device that collects *flexible data*? You can meet any specification required, you get the familiar output of deviations or profile index *and* you get the baseline profile for future pavement management use.

If you want to talk to us about how we can use the AR&L for this service, or if you would like to evaluate the AR&L for your own use, please contact us.

¹ Kulakowski, B. and J.C. Wambold. Development of Procedures for the Calibration of Profilographs. FHWA-RD-89-110. Federal Highway Administration, McLean, VA.