

State Plane Coordinate System for 2022

Presented to APLS State Meeting

By

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New Datum - 2022?

NAD83 => NATREF2022

NAVD88 => NAPGD2022

New Bluebooking => OPUS-2-IDB

RTK Bluebooking (GVX Data upload)

New Datums

National Geodetic Survey Positioning America for the Future

geodesy.noaa.gov



New Datums Are Coming!

NOAA is Replacing NAD 83 and NAVD 88.

NOAA's National Geodetic Survey (NGS) will be replacing the datums of the National Spatial Reference System (NSRS), including the **North American Datum of 1983 (NAD 83)** and the **North American Vertical Datum of 1988 (NAVD 88)**. NGS will provide the tools to easily transform between the new and old datums. Read the NGS Ten-Year Plan and visit the **New Datums Web page** on our site to learn more.

Benefits

The new reference frames (geometric and geopotential) will rely primarily on **Global Navigation Satellite Systems (GNSS)**, such as the Global Positioning System (GPS), as well as on a gravimetric geoid model resulting from NGS' **Gravity for the Redefinition of the American Vertical Datum (GRAV-D)** Project.

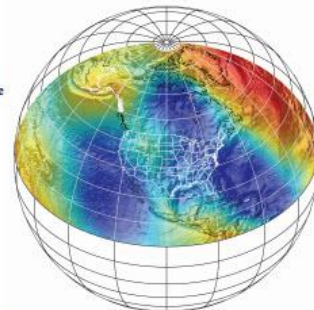
The target accuracy of differential orthometric heights (heights relative to sea level) in the geopotential reference frame will be 2 centimeters over any distance, where possible.

What You Can Expect

The magnitude of change with the new datums will vary depending on the datum you are using and your geographic location. The new geometric datum will change latitude, longitude, and ellipsoid height between 1 and 2 meters. In the conterminous United States (CONUS), the new vertical datum will change heights on average 50 centimeters, with approximately a 1-meter tilt towards the Pacific Northwest.

How You Can Prepare

- Learn if **legislation** or other formal documents referencing NAD 83 and NAVD 88 need to be changed in your state.
- **Transform existing data** to the latest NSRS datums and realizations; i.e. NAD 83 (2011), GEOID12B, and NAVD 88.
- **Obtain precise ellipsoidal heights** on NAVD 88 bench marks, and visit the GPS on Bench Marks Web page to learn more.
- Require and provide **complete metadata** on all mapping contracts. See our website for more details.



The new datums will extend across CONUS and U.S. territories. The geometric datum replacing NAD 83 will be consistent with geocentric global reference frames defining latitude and longitude. The geopotential datum replacing NAVD 88 will be based on a gravimetric geoid model, enhanced by data from NGS' Gravity for the Redefinition of the American Vertical Datum (GRAV-D) Project.

2022 Delay!

Covid19 has caused delays

New Datums - National Geodetic x +

geodesy.noaa.gov/datums/newdatums/index.shtml

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New Datums: Replacing NAVD 88 and NAD 83

To improve the National Spatial Reference System (NSRS), NGS will replace all three North American Datum of 1983 (NAD 83) frames and all vertical datums, including the North American Vertical Datum of 1988 (NAVD 88), with four new terrestrial reference frames and a geopotential datum.

The new reference frames will rely primarily on Global Navigation Satellite Systems (GNSS), such as the Global Positioning System (GPS), as well as on a gravimetric geoid model resulting from our Gravity for the Redefinition of the American Vertical Datum (GRAV-D) Project.

These new reference frames will be easier to access and to maintain than the current NSRS, which relies on physical survey marks that deteriorate over time.

Delayed Release Message

Background | **What to Expect** | Get Prepared

Blueprint Documents | Track our Progress | Naming Convention

FAQs | Watch Videos | Related Projects

FAQs
frequently asked questions

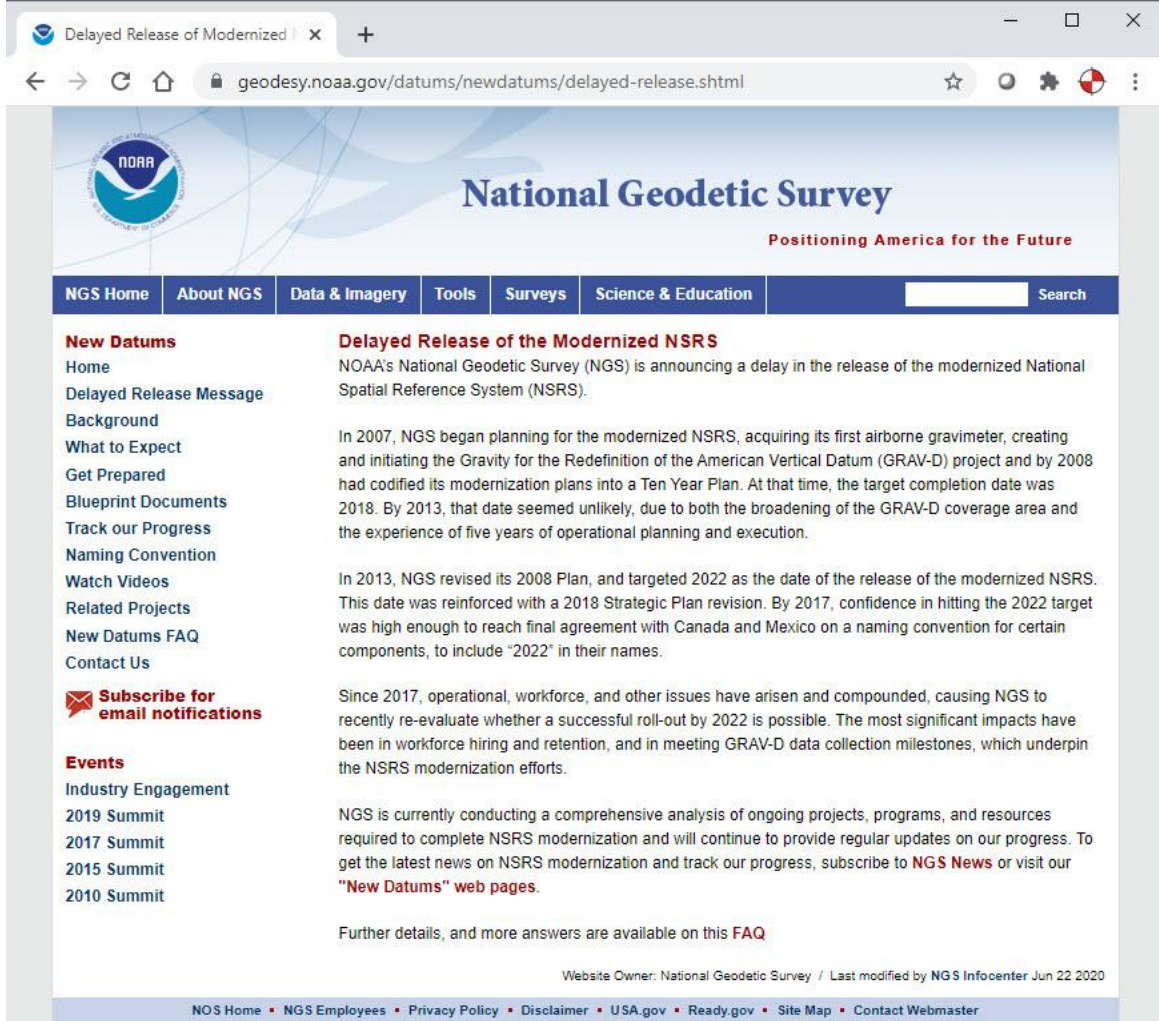
New Datums Are Coming!

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https://geodesy.noaa.gov/INFO/OnePagers/NewDatumsOnePager.pdf


2022 Delay!

Covid19 has caused delays



The screenshot shows a web browser window with the URL geodesy.noaa.gov/datums/newdatums/delayed-release.shtml. The page header features the NOAA logo and the text "National Geodetic Survey" with the tagline "Positioning America for the Future". A navigation menu includes links for "NGS Home", "About NGS", "Data & Imagery", "Tools", "Surveys", and "Science & Education", along with a search bar. The main content area is titled "Delayed Release of the Modernized NSRS" and contains the following text:

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Delayed Release of the Modernized NSRS
NOAA's National Geodetic Survey (NGS) is announcing a delay in the release of the modernized National Spatial Reference System (NSRS).

In 2007, NGS began planning for the modernized NSRS, acquiring its first airborne gravimeter, creating and initiating the Gravity for the Redefinition of the American Vertical Datum (GRAV-D) project and by 2008 had codified its modernization plans into a Ten Year Plan. At that time, the target completion date was 2018. By 2013, that date seemed unlikely, due to both the broadening of the GRAV-D coverage area and the experience of five years of operational planning and execution.

In 2013, NGS revised its 2008 Plan, and targeted 2022 as the date of the release of the modernized NSRS. This date was reinforced with a 2018 Strategic Plan revision. By 2017, confidence in hitting the 2022 target was high enough to reach final agreement with Canada and Mexico on a naming convention for certain components, to include "2022" in their names.

Since 2017, operational, workforce, and other issues have arisen and compounded, causing NGS to recently re-evaluate whether a successful roll-out by 2022 is possible. The most significant impacts have been in workforce hiring and retention, and in meeting GRAV-D data collection milestones, which underpin the NSRS modernization efforts.

NGS is currently conducting a comprehensive analysis of ongoing projects, programs, and resources required to complete NSRS modernization and will continue to provide regular updates on our progress. To get the latest news on NSRS modernization and track our progress, subscribe to [NGS News](#) or visit our ["New Datums" web pages](#).

Further details, and more answers are available on this [FAQ](#)

Website Owner: National Geodetic Survey / Last modified by NGS Infocenter Jun 22 2020

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2022 Delay!

Covid19 has caused delays

GRAVD new date announced for July 30 2024



Issue 23 January 2021

NSRS Modernization News

For all issues of NSRS Modernization News, visit:
geodesy.noaa.gov/datums/newdatums/TrackOurProgress.shtml

New Technical Paper Released

A new paper relating to the modernized NSRS was released recently. It is:

[NOAA Technical Memorandum NOS NGS 86 \(Quantifying Systematic Error When Using Axial Rotation Rates Rather Than Geographic Euler Pole Parameters When Describing Tectonic Plate Rotation\)](#)

Updates to Blueprint Documents

The release of updated versions of the three "Blueprint" documents was slightly delayed. All three are now expected to be released in the first quarter of calendar year 2021.

Retiring U.S. Survey Foot

On October 5, 2020, a [Federal Register Notice](#) announced the final decision to deprecate the U.S. survey foot on December 31, 2022. After that date, the U.S. survey foot will be superseded by the international foot definition (1 foot = 0.3048 meter exactly) in all applications. This action is coordinated with the National Institute of Standards and Technology (NIST) and is independent of the NSRS modernization timeline.

Although the deprecation date is prior to rollout of the modernized NSRS, it will have no effect on users of the existing NSRS. NGS will continue to provide the U.S. survey foot in products and services where it is currently supported, such as the State Plane Coordinate System of 1983 and 1927, but it will not be available for any component of the modernized NSRS (including SPCS2022 and vertical

coordinates). Retiring the U.S. survey foot before NSRS modernization ensures a timely and orderly transition to the international foot definition for NGS and the geospatial community.

Progress in Ongoing Projects

There are currently **23 ongoing projects** directly related to NSRS modernization around NGS. Here are highlights from one:

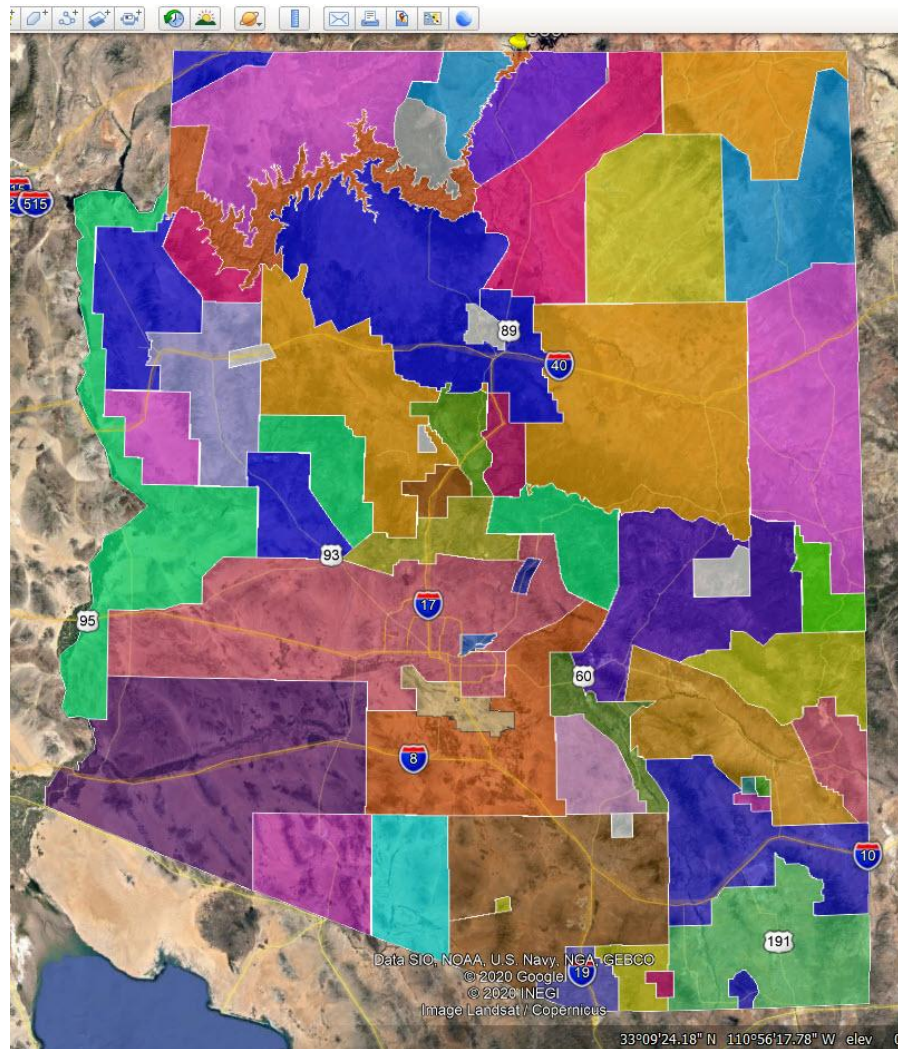
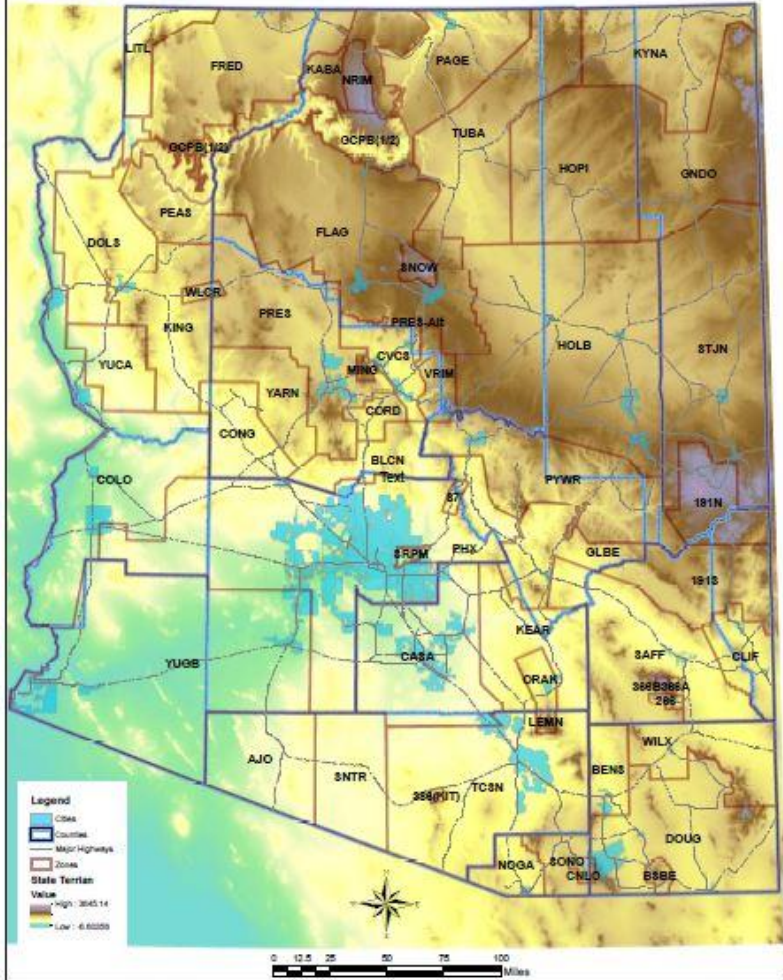
GRAV-D airborne campaign (Project Manager: Jeffery Johnson)

GRAV-D completed data collection for three blocks in the fall of 2020. The blocks completed and queued for processing are: ES08 over Alabama, eastern Mississippi, and much of Georgia; CS11 over parts of Arkansas, Kansas, Missouri, Oklahoma, and Tennessee; and PN04 over eastern Oregon and western Idaho. Flights to complete coverage of Hawaii are scheduled to begin on January 15.

Also, a new GRAV-D schedule was adopted, aligning with the delayed release of the modernized NSRS as announced in June 2020. The new 100% completion target for GRAV-D is June 30, 2024.

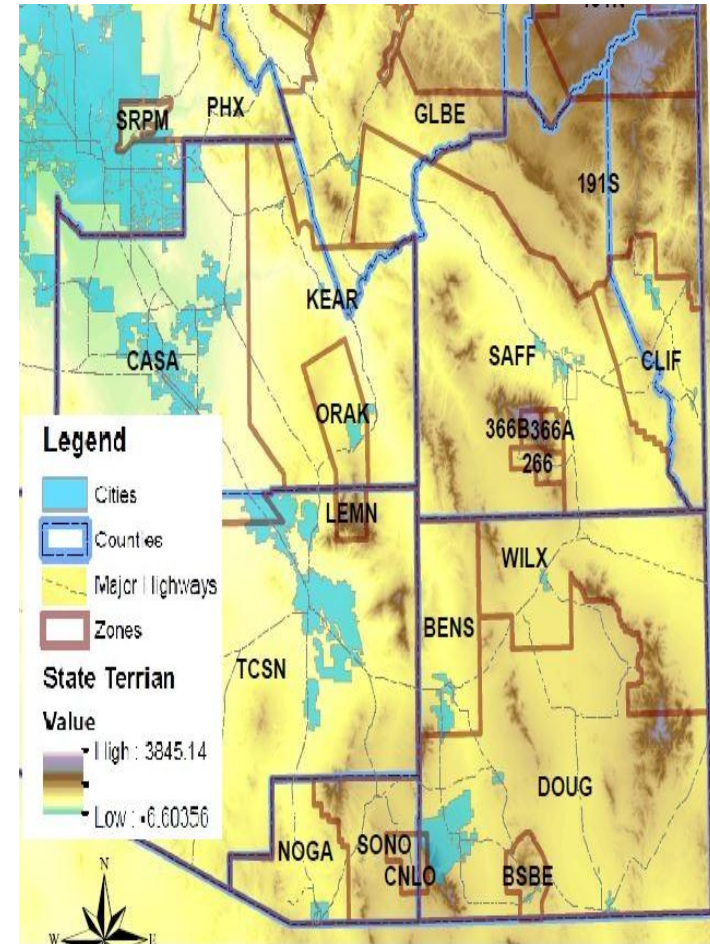


DRAFT Arizona State Planes 2022 Zones 08/14/20



Why are Zones Boundaries Irregular?

- Topography
 - Rims, Canyons, Mountains & steep slopes
 - Earth Curvature (over long distances)
- Designed to follow some kind of underlying boundary (Legal or Natural)
 - County lines
 - PLSS Lines
 - Federal boundaries
 - Forest, BLM, National Parks, Native Nations
 - Major Topographic Features (plateaus, valleys, etc.)
- Focus on Development
 - Private/State land
 - ADOT Highways
 - Municipal boundaries



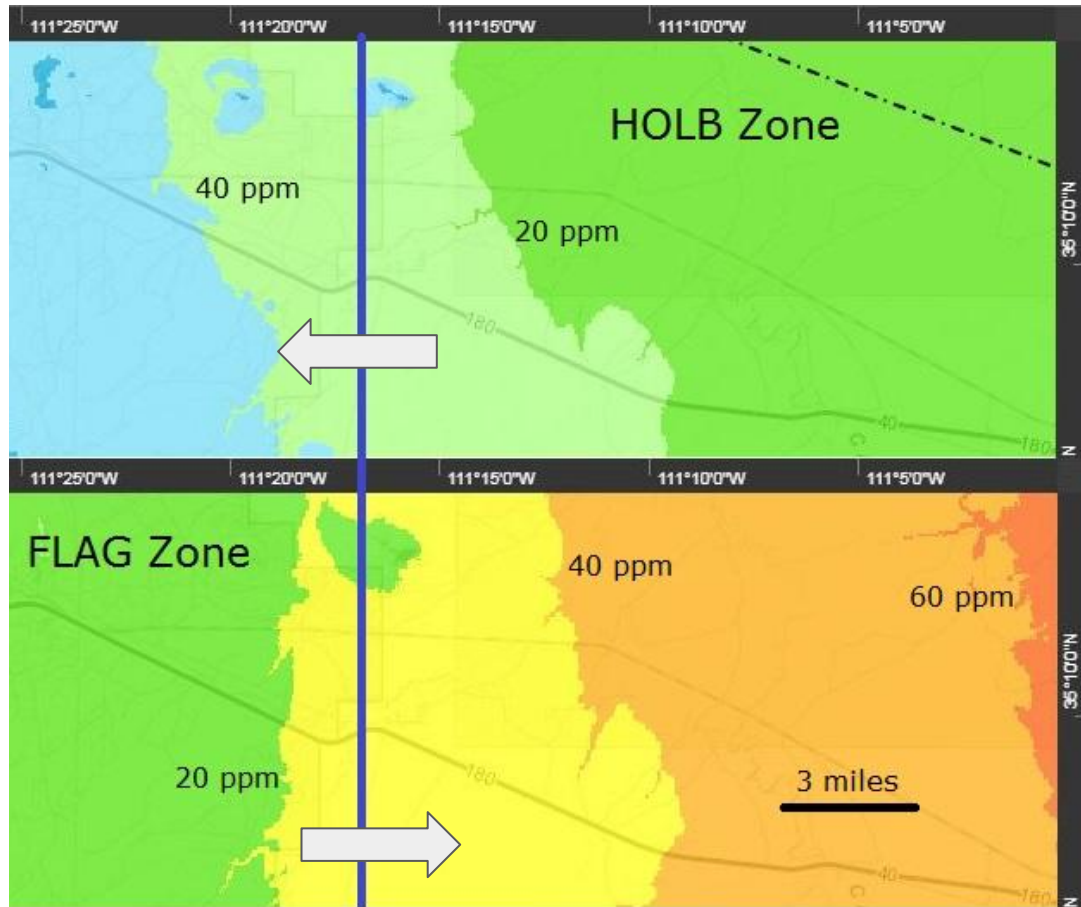
Are the Zone Boundaries “Set in Stone”?

No!

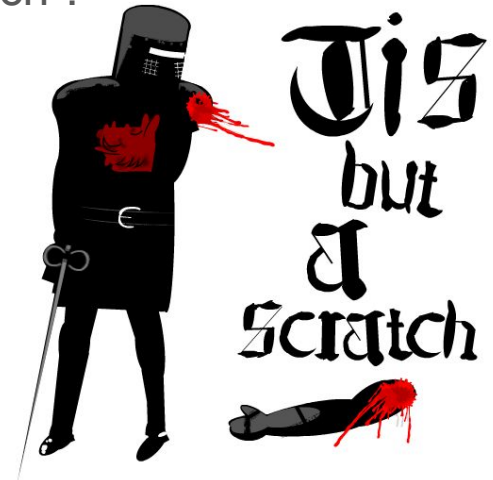
Zone boundaries are more like suggestions that can be “*BENT*” to meet local requirements. Think the International Date Line, not an “iron” line in the sand that “*none shall pass*”



Crossing Zone Boundary



Whereas linear distortion “can” start to increase relatively quickly (non-linear growth), on the “small” projects that cross a zone boundary, it “usually” isn’t a catastrophic event. In this example on I-40, three miles “Tis but a scratch”!



Thank you for your time!

Questions?

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