

DOTs and the Modernized National Spatial Reference System (NSRS2022)

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Key Consideration: Timing of Migration

Timing of migration to the Modernized NSRS will be an important consideration for all organizations, including Departments of Transportation (DOTs). No one is suggesting that DOTs must abruptly shift ongoing projects from the 1983/1988 datums to NSRS2022. In fact, there are strong reasons to complete projects under the original datums:

- **Budget and schedule constraints** — Mid-project migration adds cost and delays.
- **Risk of confusion** — Converting design data midstream can introduce errors.
- **Technology limitations** — Intelligent CAD elements (pipe networks, surfaces, etc.) may not survive transformation without extensive rework.
- **Coordination with related projects** — Adjacent or umbrella “mega-projects” may already be locked into older datums.
- **Regulatory and contractual obligations** — Existing commitments may restrict changes.

For these reasons, project-level migration may be impractical. However, system-wide activities such as asset management, as-builts, and control networks benefit greatly from earlier adoption or an interim dual-datum strategy.

Why Modernization Matters

While challenges exist, the benefits of NSRS2022 are significant. Importantly, DOTs are already working in a temporal system—even if not formally acknowledged. Crustal movement, gravity variations, and subsidence affect measurements over the lifespan of infrastructure projects. Modern GNSS technology has exposed these anomalies, making the limitations of 40-year-old datums increasingly apparent.

NSRS2022 directly addresses these realities by:

- **Modeling and quantifying crustal movement** rather than disregarding it.
- **Providing epoch-based tools** to align data collected at different times.
- **Minimizing discrepancies between published coordinates** by updating only when differences exceed tolerances relevant to organizational needs.

This approach reduces judgment calls based on “acceptable error” and replaces them with scientifically grounded corrections.



Strategic Benefits of Migration

Adopting NSRS2022 positions DOTs for long-term efficiency and integration:

- **Unified measurement system** — Enables precise, consistent data across jurisdictions, eliminating the need for fragmented project control surveys.
- **Seamless data integration** — Facilitates alignment with federal and other datasets (e.g., FEMA floodplain mapping, USGS 3DEP, and local imagery).
- **Support for advanced technologies** — Provides a foundation for digital twins, BIM/CIM systems, and autonomous navigation.
- **Leverage crowdsourced data** — Aligns professional datasets with citizen or sensor-collected data, maximizing the value of location intelligence.
- **“Measure Once – Use Many Times” efficiency** — Reduces duplication and increases organizational productivity.

Simply put, NSRS2022 ensures DOTs are “singing from the same song sheet,” avoiding the inefficiencies of disparate datasets.

Recommended Path Forward

- **Begin now** — Inventory existing data and plan for phased migration.
- **Require dual deliverables** — In the interim, contracts should specify survey control in both legacy and modern datums.
- **Preserve physical monuments** — Leave durable control points in place to support future transformations.
- **Visit [“Surveyors Prepare: Datums are Changing!”](#) for more information.**



Conclusion

Migrating to NSRS2022 is not about abandoning current projects midstream—it’s about preparing DOTs for a future where precision, integration, and efficiency are essential. By embracing modernization, DOTs will be better equipped to **manage assets, integrate with other datasets, and support emerging technologies** that depend on accurate spatial data.