

# History and Role of NIST in Weights and Measures

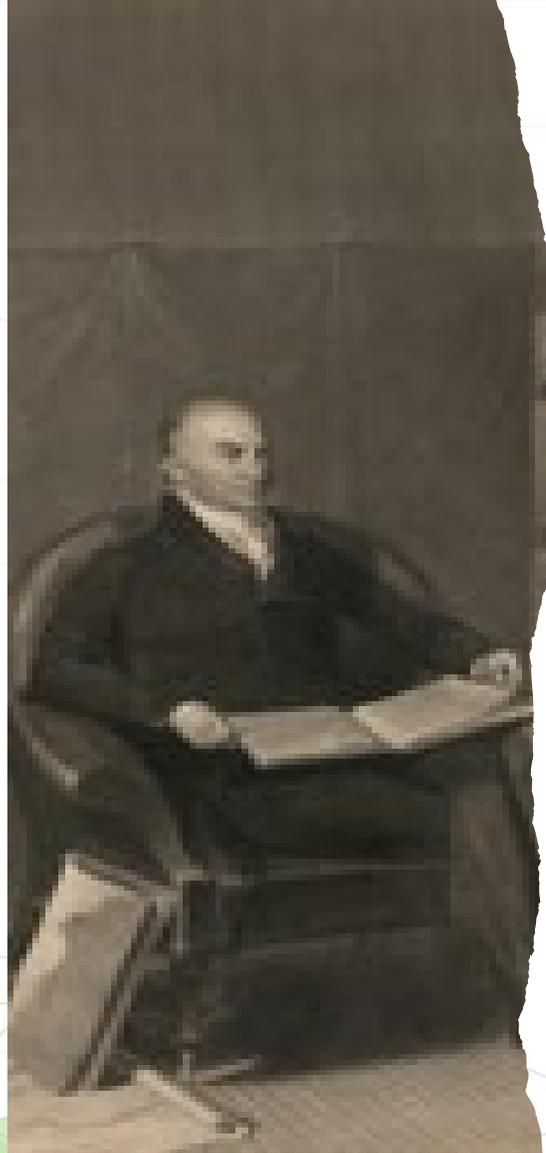
David Sefcik

Leader, National Legal Metrology Program  
Office of Weights and Measures (OWM)

# Office of Weights and Measures (OWM)



- **Directive to “fix the Standard of Weights and Measures” in the U.S. Constitution** (Article 1, Section 8, Clause 5)
- **OWM’s origin was established in 1836** as the “Office of Standard Weights and Measures”
- **In 1901**, the Office was transformed into the **National Bureau of Standards (NBS)** and the non-regulatory NMI function for the U.S.
- **In 2022**, **45% of all U.S. commercial transactions** involved weights and measures test devices and/or state-based inspections



*“Weights and measures may be ranked among the necessities of life, to every individual of human society. They enter into the economical arrangements and daily concerns of every family. They are necessary to every occupation of human industry; to the distribution and security of every species of property; to every transaction of trade and commerce; ... No legislator can attempt it with any prospect of success, or any regard to justice...”*

## **President John Quincy Adams The 6<sup>th</sup> President of the United States**

# Mission Statement

*OWM's mission is to establish uniformity, SI use, and traceability in weights and measures by advancing national and international legal metrology standards, procedures, capabilities, and training.*

# OWM Today



## Main Office



Katrice Lippa, Chief  
[katrice.lippa@nist.gov](mailto:katrice.lippa@nist.gov)

Administrative Staff  
and Training Coordinators

General, Technical,  
and Training Inquiries

[owm@nist.gov](mailto:owm@nist.gov)



Metrology Training  
Lab/Classroom in 101



Training & Video Studio  
"220"

## Programs and Leaders

National  
Legal Metrology



David Sefcik  
[david.sefcik@nist.gov](mailto:david.sefcik@nist.gov)

International  
Legal Metrology



Katya Delak  
[katya.delak@nist.gov](mailto:katya.delak@nist.gov)

Laboratory  
Metrology



Micheal Hicks  
[micheal.hicks@nist.gov](mailto:micheal.hicks@nist.gov)

Metric (SI)



Elizabeth Benham  
[elizabeth.benham@nist.gov](mailto:elizabeth.benham@nist.gov)  
[TheSI@nist.gov](mailto:TheSI@nist.gov)

# Legal Metrology 101

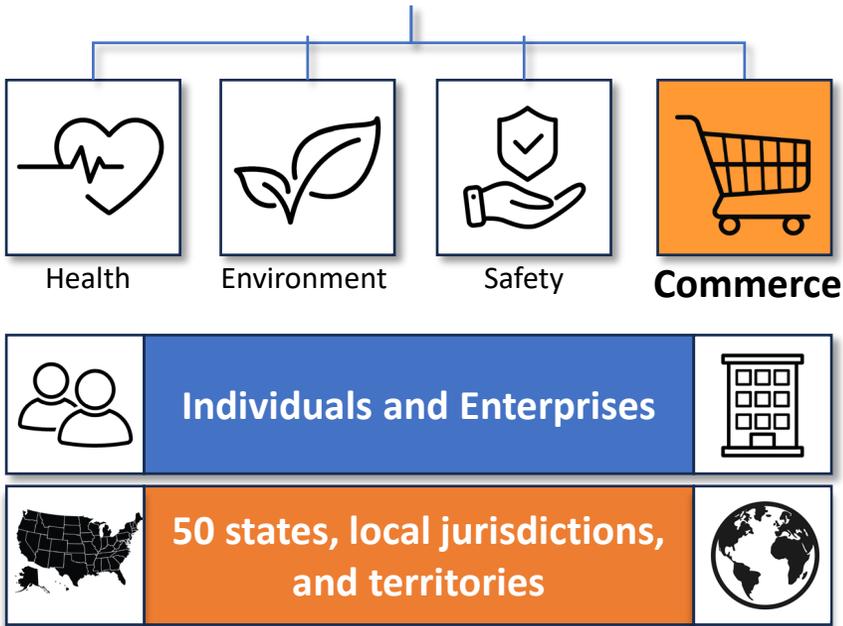
*“Legal metrology is the practice and process of applying statutory and regulatory structure and enforcement to metrology.”*

# What is Legal Metrology **in the U.S.?**

U.S. Weights and Measures System is unique...



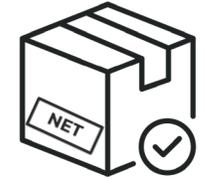
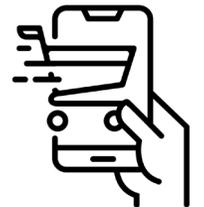
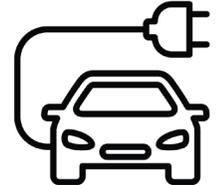
## U.S. Legal Metrology



## Weights and Measures

### Legal and Scientific Metrology Infrastructure

usage and performance of technical devices and artifacts



all commercial transactions

# U.S. Weights and Measures: Regulations



OWM facilitates and promotes national uniformity between Federal, State, and local laws and regulations and methods of inspection for measuring devices

- **NIST is a non-regulatory agency** within the U.S. Department of Commerce with no authority over the U.S. States or industry
- **State and local governments have regulatory responsibility**, with some Federal regulation and preemption (e.g., EPA, USDA, FDA)
- **NIST Organic Act 15 U.S.C. §272(c)(4) explicitly authorizes OWM to** *“cooperate with the States in securing uniformity in weights and measures laws and methods of inspection”*
- **NIST Handbooks are voluntarily adopted by U.S. States and local jurisdictions**



**Goal: Uniformity in Legal Metrology Standards for a Fair Marketplace**

# The Role Of NIST OWM



OWM facilitates and promotes national uniformity between Federal, State, and local laws and regulations and methods of inspection for measuring devices. To achieve this NIST OWM:

- Serves as technical advisors to technical committees and national working groups
- Publish model laws, regulations, procedures, and other documents for use in weights and measures enforcement
- Provides technical advice and support to regulators and industry (over 1,500 inquiries a year)
- Conducts training for metrologists, regulators and industry
- Represent U.S. interests in international legal metrology organizations



**Goal: Uniformity in Legal Metrology Standards for a Fair Marketplace**

# U.S. Weights and Measures: A Brief History



Credit: National Archives

“Office of Standard Weights and Measures” as part of the Coast and Geodetic Survey

1836

1893 - Meter and kilogram as fundamental U.S. standards



Meter Convention - BIPM formation

Metric Act

1866

1875

OWM becomes NBS

“Office of Standard Weights and Measures” becomes National Bureau of Standards (NBS)

1901

1905

1906 - First model law and uniform W&M State laws template



National Conference on Weights and Measures (NCWM)

OWM collaboration with U.S. federal agencies

Fair Packaging and Labeling Act (FPLA)

1966

OWM delegated for technical functions

International Organization of Legal Metrology (OIML) Treaty ratified

1972

Metric Conversion Act

1975

1988 - Metric is preferred system for trade and commerce



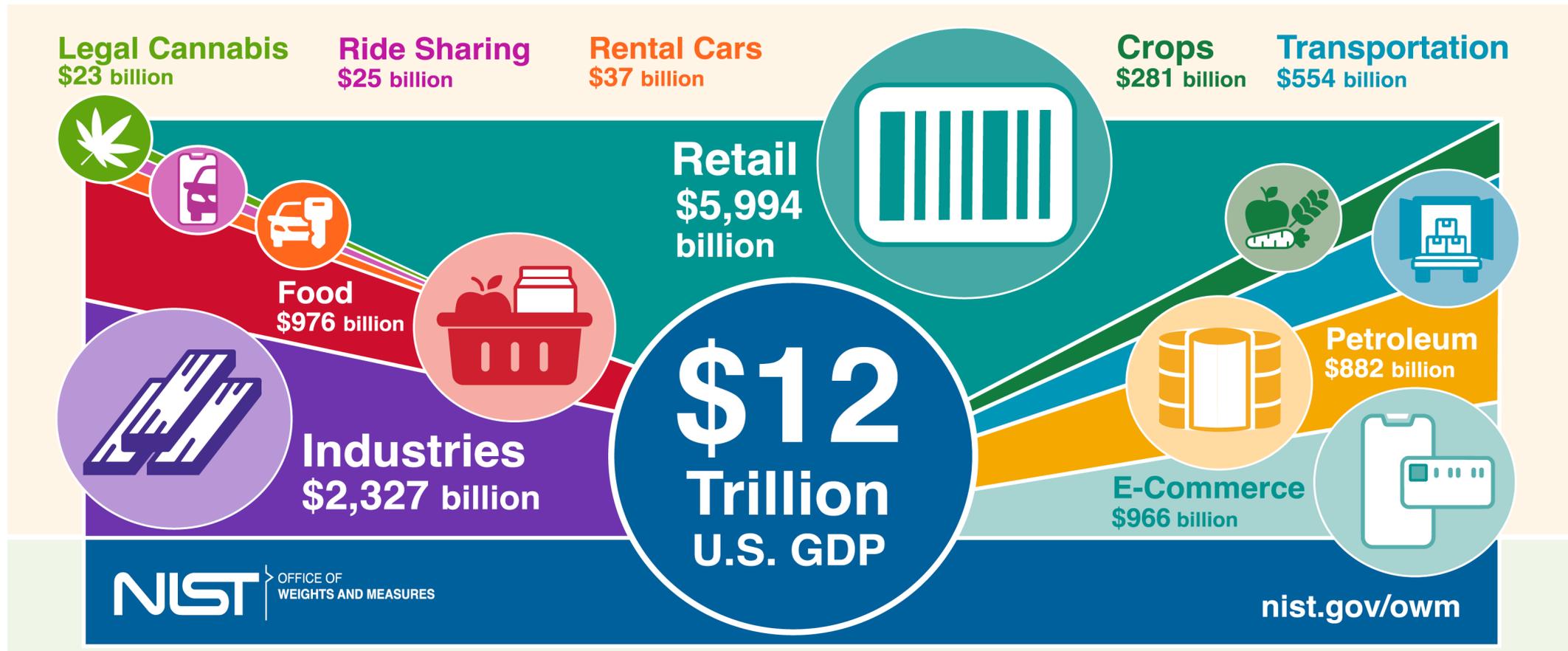
NBS renamed

NIST

1988

# U.S. Weights and Measures Economic Index

Goal: Reduce measurement errors in the marketplace to minimize economic loss to both buyers and sellers



Total dollar value of commodities and services sold based on weight or measure (2022 U.S. GDP)



# OWM Programs



Establish Uniformity in Standards, SI Traceability and Use in Weights and Measures for Industry, Manufacturers, State and Field Metrologists, and Federal Agencies through

## Documentary Standards



U.S. and International

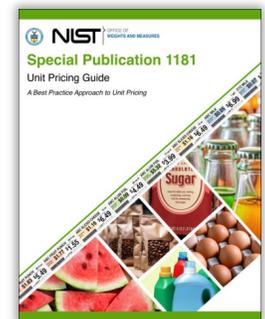
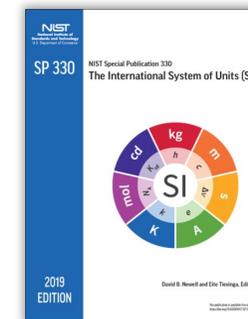
## Training: In-Person, Online, Video



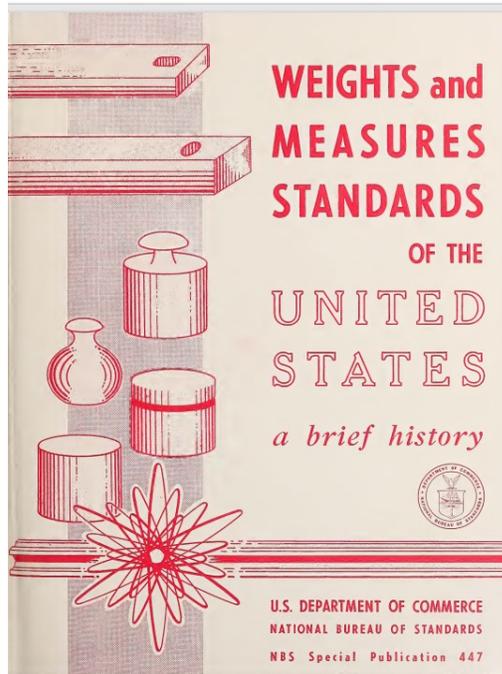
## Technical Guidance



4,000+ annual technical inquiries via "owm@nist.gov"



# U.S. Weights and Measures: A Brief History



Credit: NBC

## Saturday Night Live skit on Weights and Measures – Washington's Dream

YouTube (October 29, 2023) with over 22M views!

<https://www.youtube.com/watch?v=JYqfVE-fykk>

Visit our page

**[A Brief History of OWM](https://www.nist.gov/pml/owm/brief-history-owm)**

for more details

<https://www.nist.gov/pml/owm/brief-history-owm>

**Info Hour**  
**Presented by the NIST Office of Weights and Measures**



**OWM's Role Within NCWM and  
U.S. Weights and Measures  
System**

Presented by:

**John McGuire, NIST OWM Weights &  
Measures Coordinator**