# Ethics in Engineering

## Symposium Infrastructure in the Border

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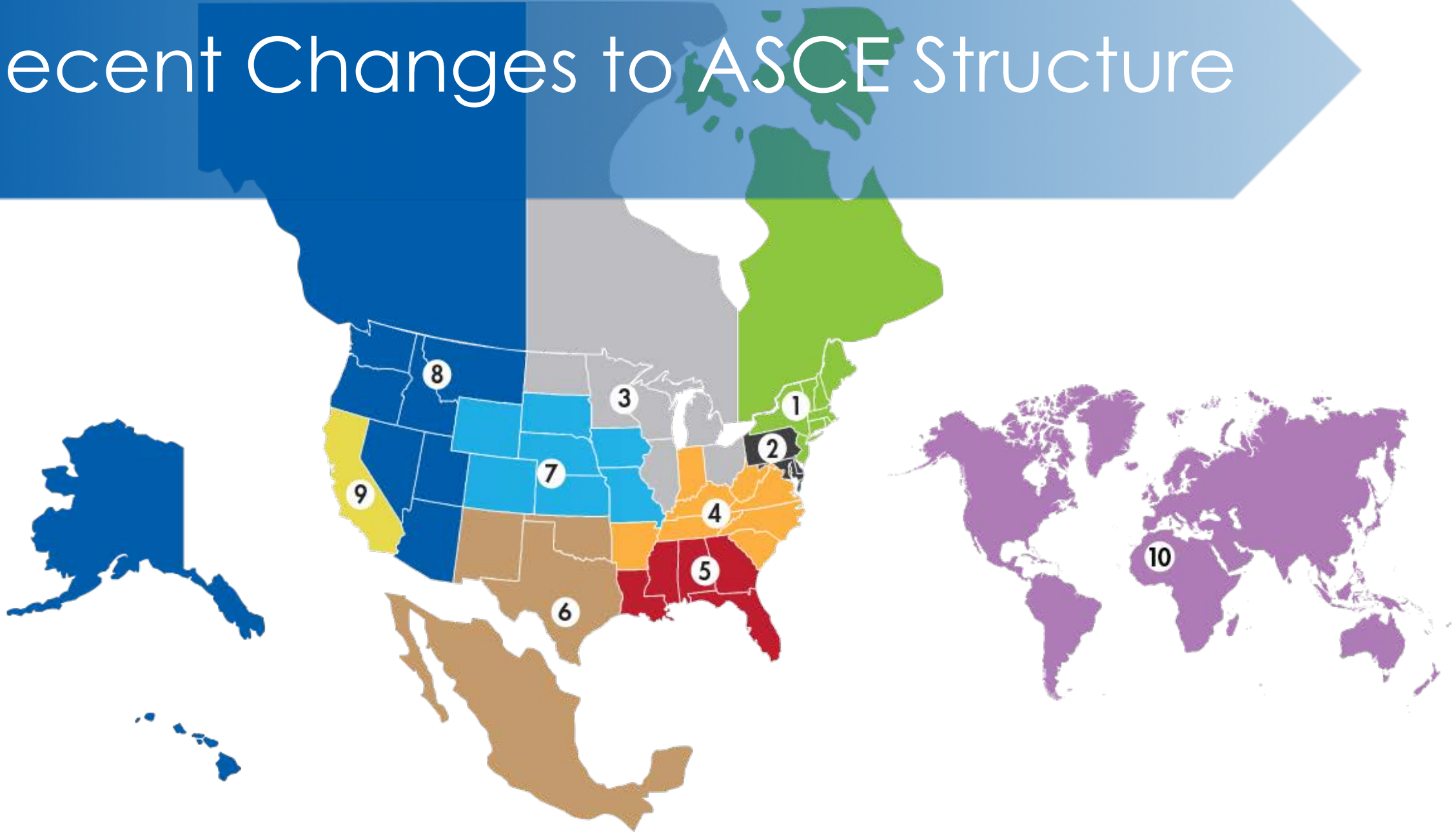
ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

# Recent Changes to ASCE Structure



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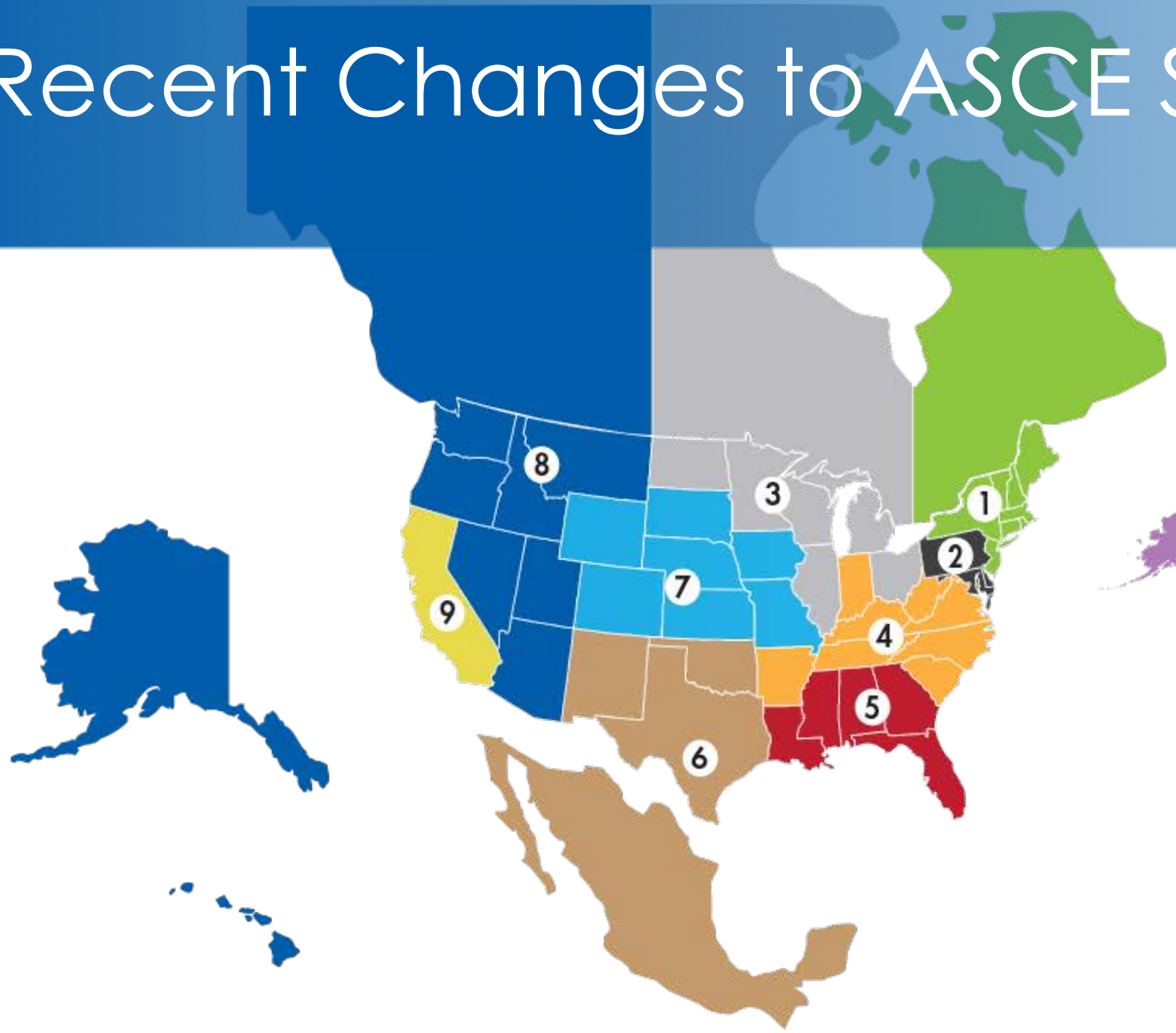
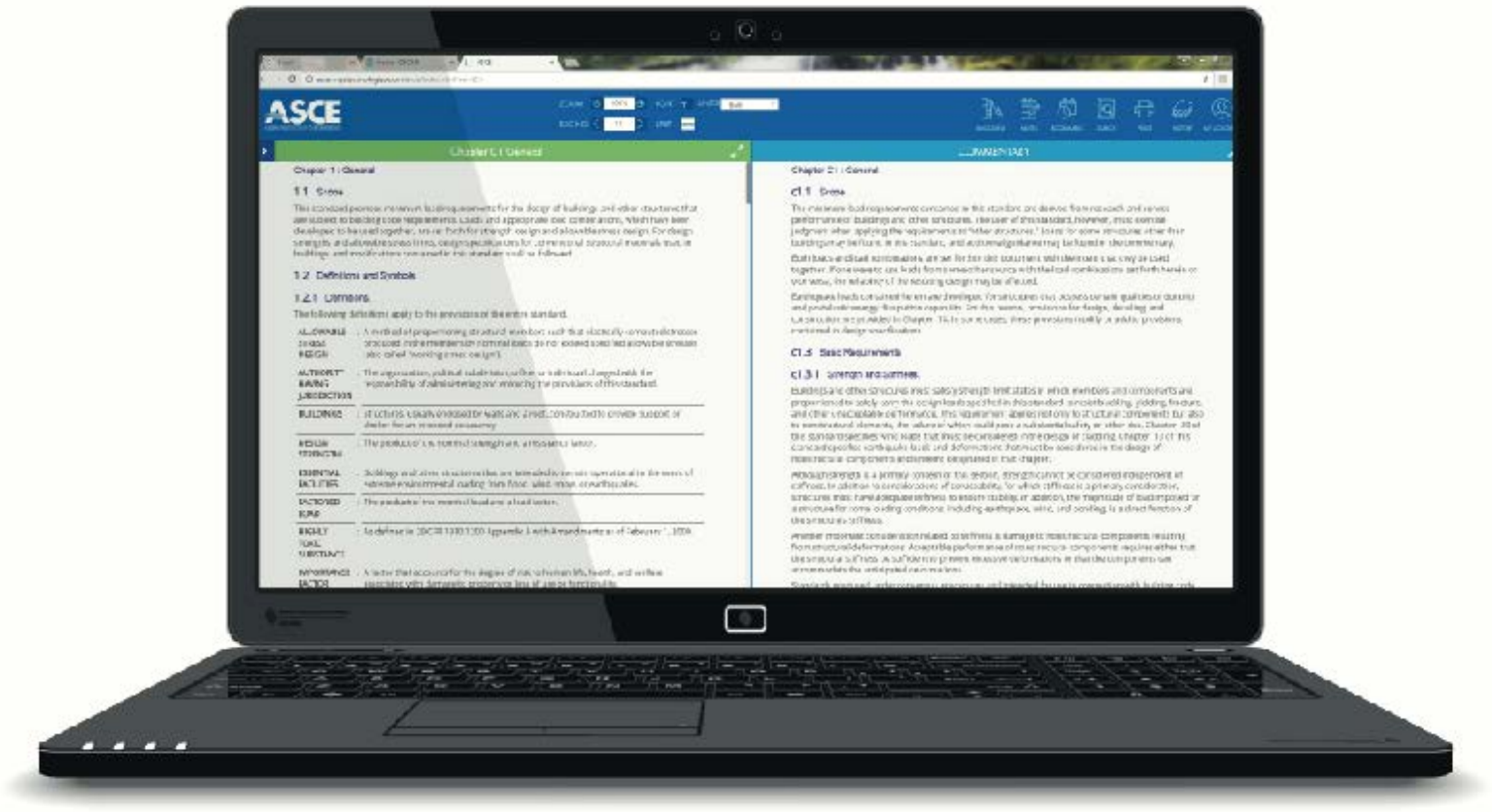



# ASCE 7 Online

*A faster, easier way to work with Standard ASCE 7*

asce7.online

- Side-by-side provisions & commentary
- Digital access to ASCE 7-10 and 7-16
- Real-time updates
- Redlining to track changes
- Corporate/personal note features



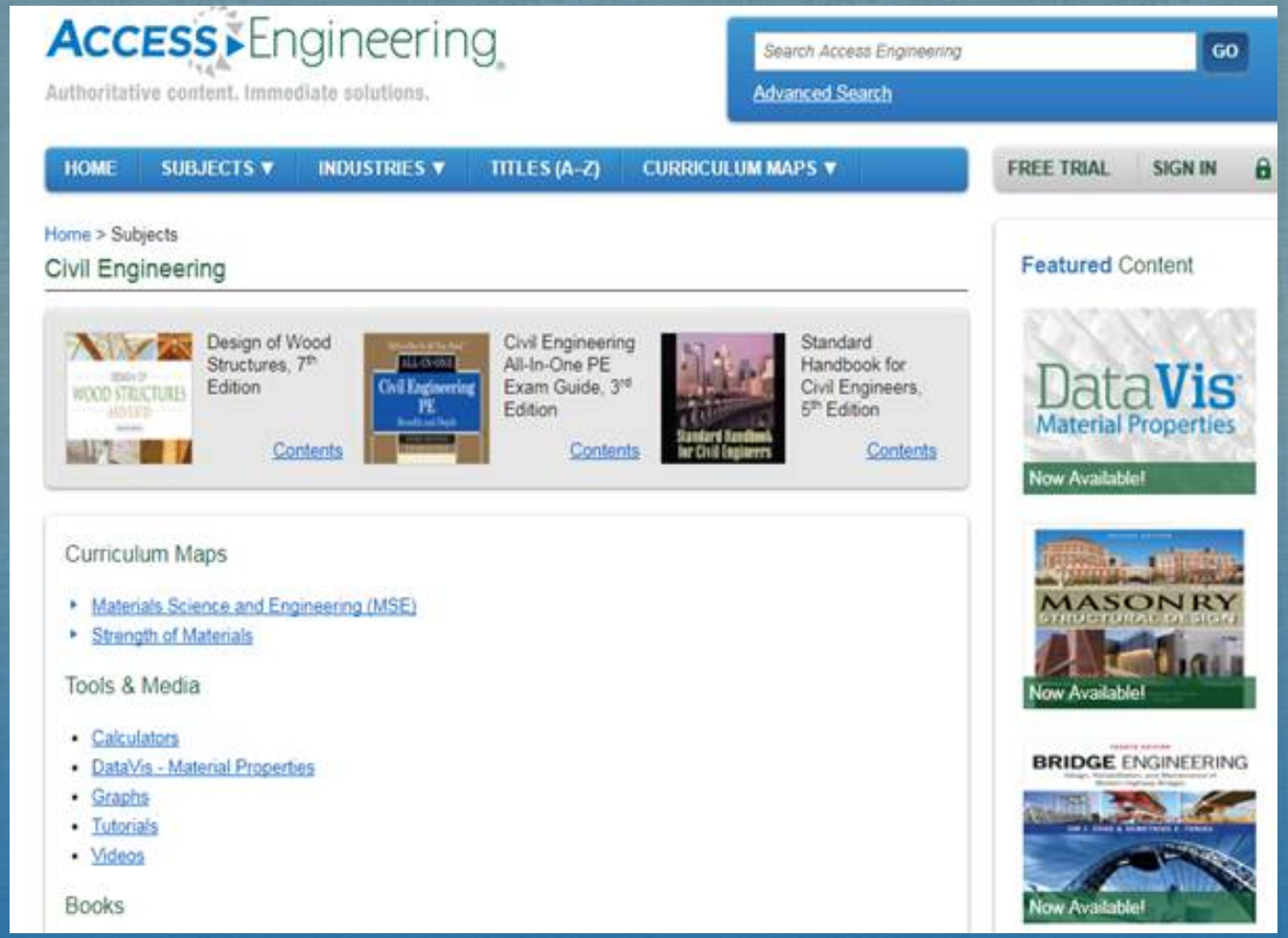
# ASCE 7 Hazard Tool

One Site. Precise Data. Fast Results

asce7hazardtool.online

- Look up of key design parameters specified by ASCE 7-10 and 7-16
- Get the 7 environmental hazard data: wind, seismic, ice, rain, snow, flood, and tsunami
- Generate and download PDF reports

# Access Engineering: Member Value




- **Connect to items with multidisciplinary professional engineering content**

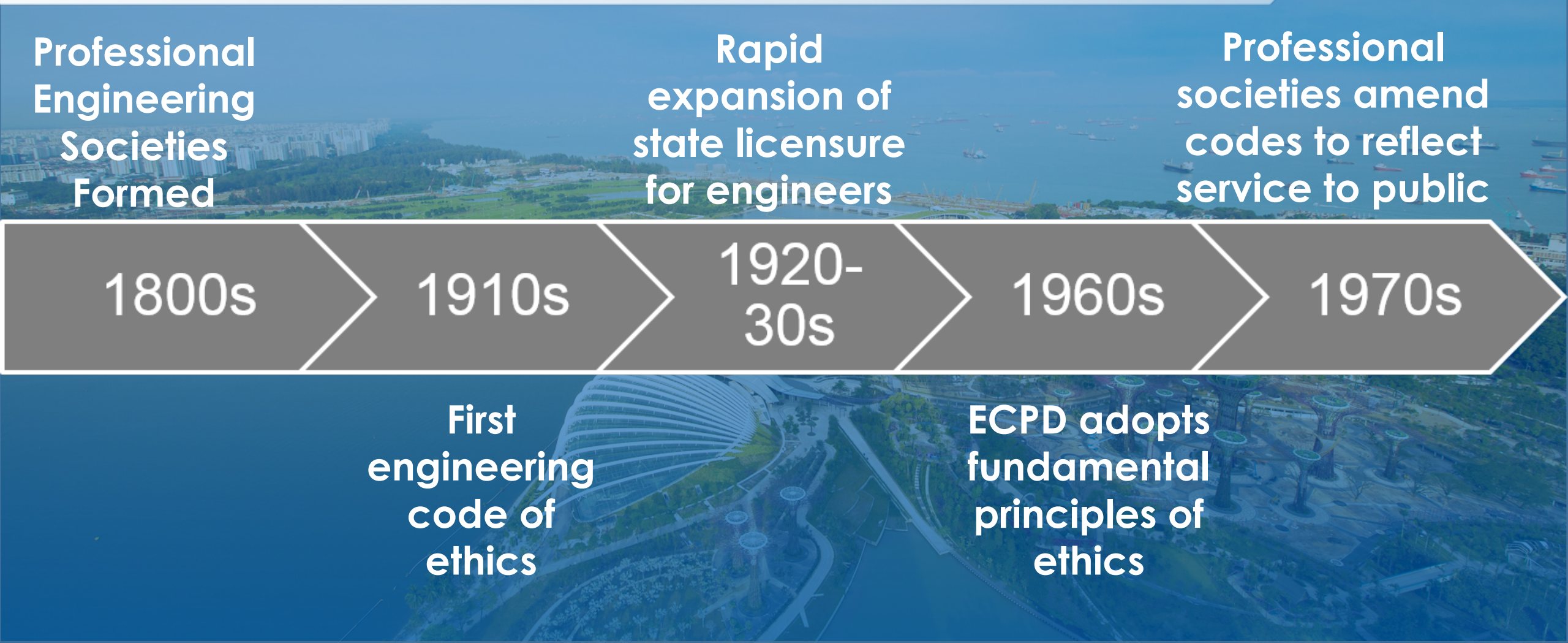
# Engineering Ethics

**Engineers are consistently rated by the US public among the most trusted and ethical professions, second only to medical professionals**

-Gallup poll, 2016

| | | | |
|---|---|---|---|
| Nurses | 84 | 3 | 13 |
| Pharmacists | 67 | 8 | 26 |
| Medical doctors | 65 | 7 | 29 |
| Engineers | 65 | 5 | 29 |
| Dentists | 59 | 7 | 34 |
| Police officers | 58 | 13 | 29 |
| College teachers | 47 | 18 | 32 |
| Clergy | 44 | 13 | 39 |
| Chiropractors | 38 | 13 | 45 |
| Psychiatrists | 38 | 12 | 45 |
| Bankers | 24 | 30 | 46 |
| Journalists | 23 | 41 | 34 |
| Lawyers | 18 | 37 | 45 |
| State governors | 18 | 35 | 45 |
| Business executives | 17 | 32 | 50 |
| HMO managers | 12 | 31 | 48 |
| Senators | 12 | 50 | 37 |
| Stockbrokers | 12 | 39 | 46 |
| Advertising practitioners | 11 | 40 | 46 |
| Insurance salespeople | 11 | 38 | 51 |
| Car salespeople | 9 | 46 | 45 |
| Members of Congress | 8 | 59 | 31 |

# History: Engineering Ethics

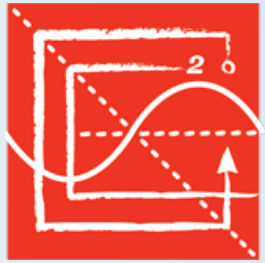


# Licensure: Protects the Public

# US Engineering Licensure

## CRITERIA FOR PROFESSIONAL LICENSURE

- Education
  - Bachelors degree from ABET accredited program
- Examination
  - Fundamentals of Engineering (FE) exam
  - Principles and Practice of Engineering (PE)
- Experience
  - Four years progressive engineering experience

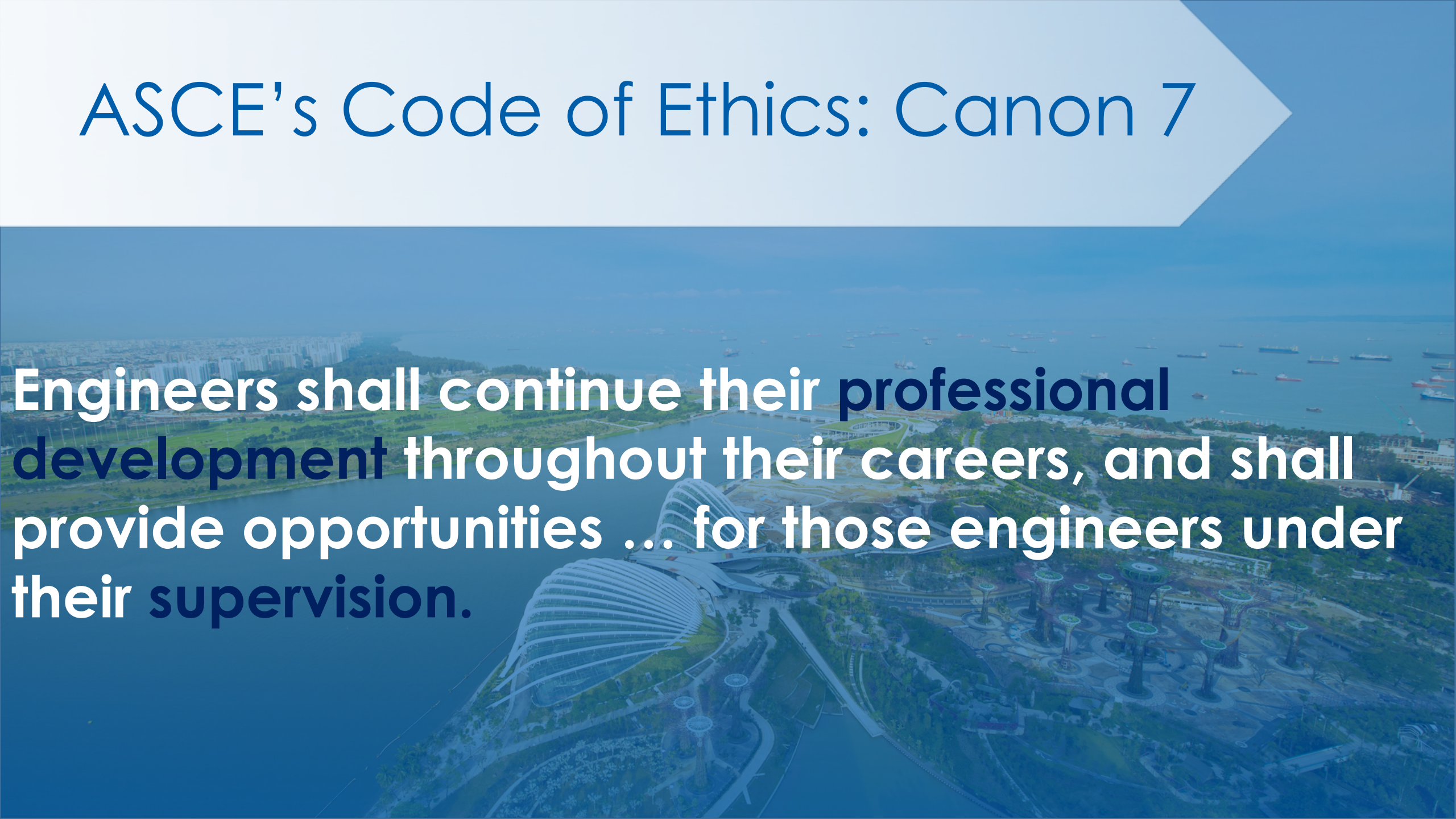
NCEES

- US Engineering Licensure
  - Legally required for professional practice
  - Regulated by each state/territory
  - Self-regulates and has legally required code of conduct
- NCEES, established 1920, provides services to licensees
  - Creates exams & model law, advances comity
- ABET accredits engineering programs (EAC)
  - Was the Engineer's Council of Professional Development (1932)
  - Originally to vet engineering programs for licensing boards

# ASCE's Code of Ethics: Canon 8

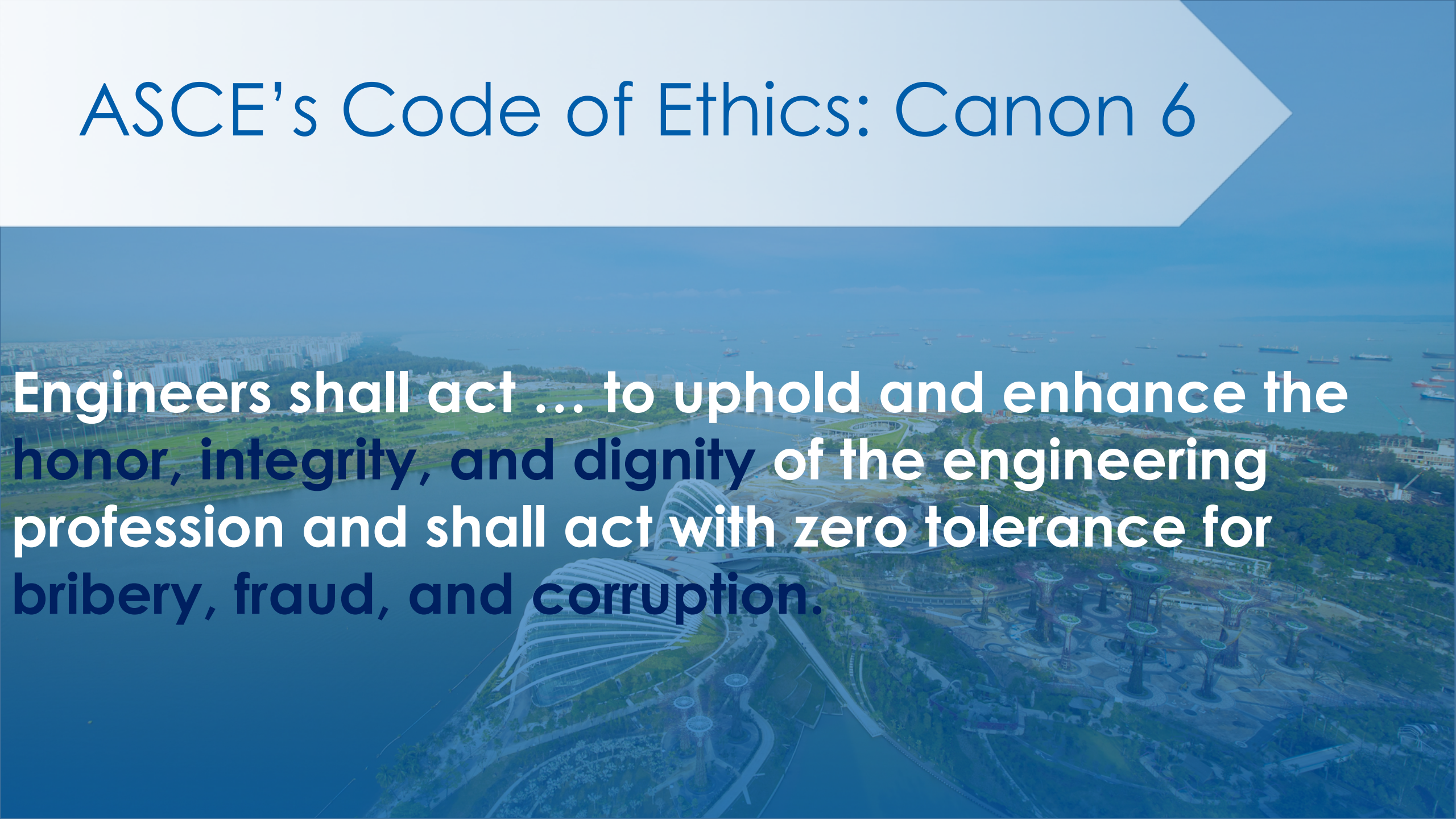
**Engineers shall…treat all persons fairly…without regard to gender or gender identity, race, national origin, ethnicity, religion, age, sexual orientation, disability, political affiliation, or family, marital, or economic status.**

# ASCE's Code of Ethics: Canon 7



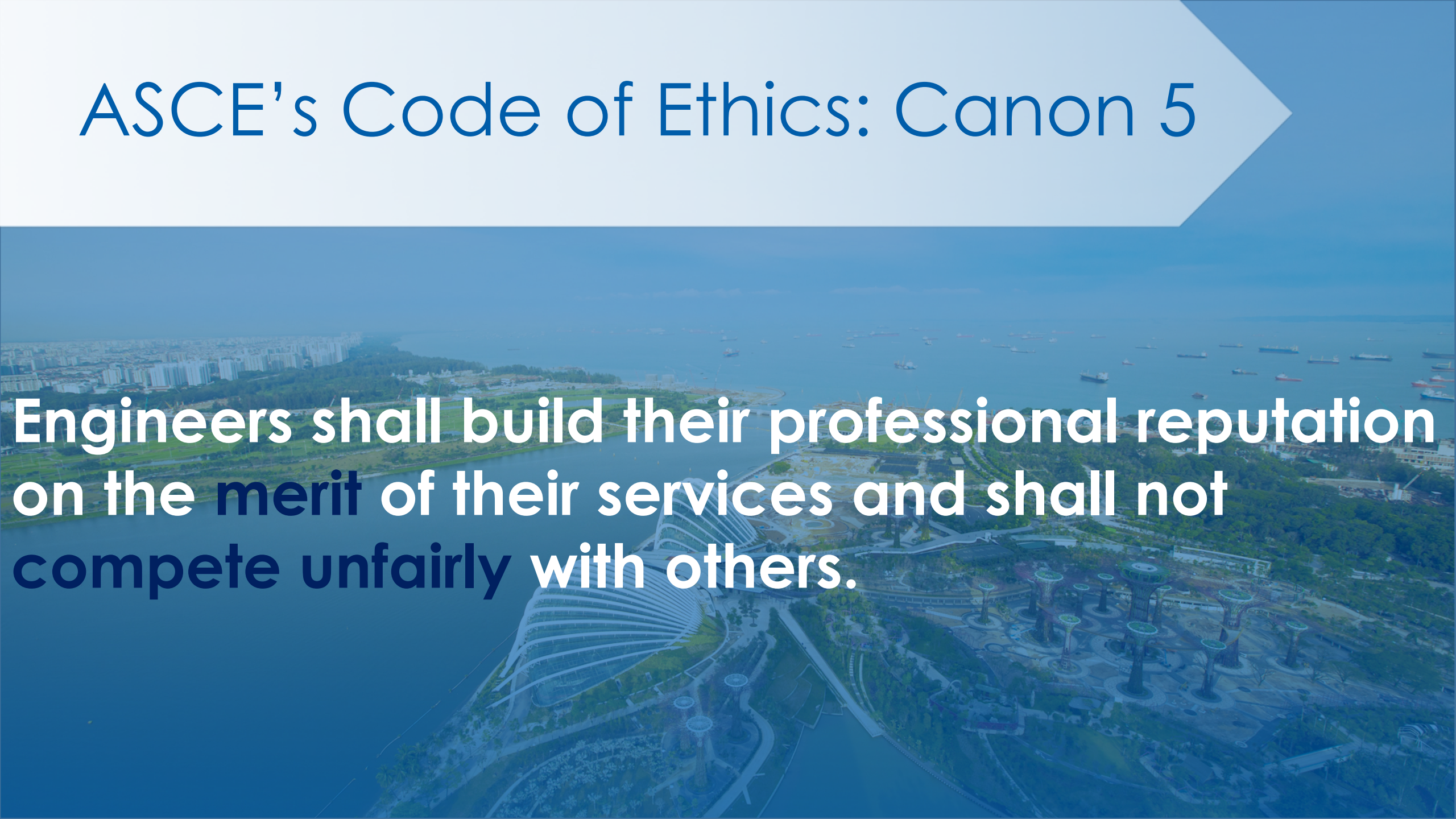
**Engineers shall continue their professional development throughout their careers, and shall provide opportunities … for those engineers under their supervision.**

# ASCE's Code of Ethics: Canon 6



**Engineers shall act … to uphold and enhance the honor, integrity, and dignity of the engineering profession and shall act with zero tolerance for bribery, fraud, and corruption.**

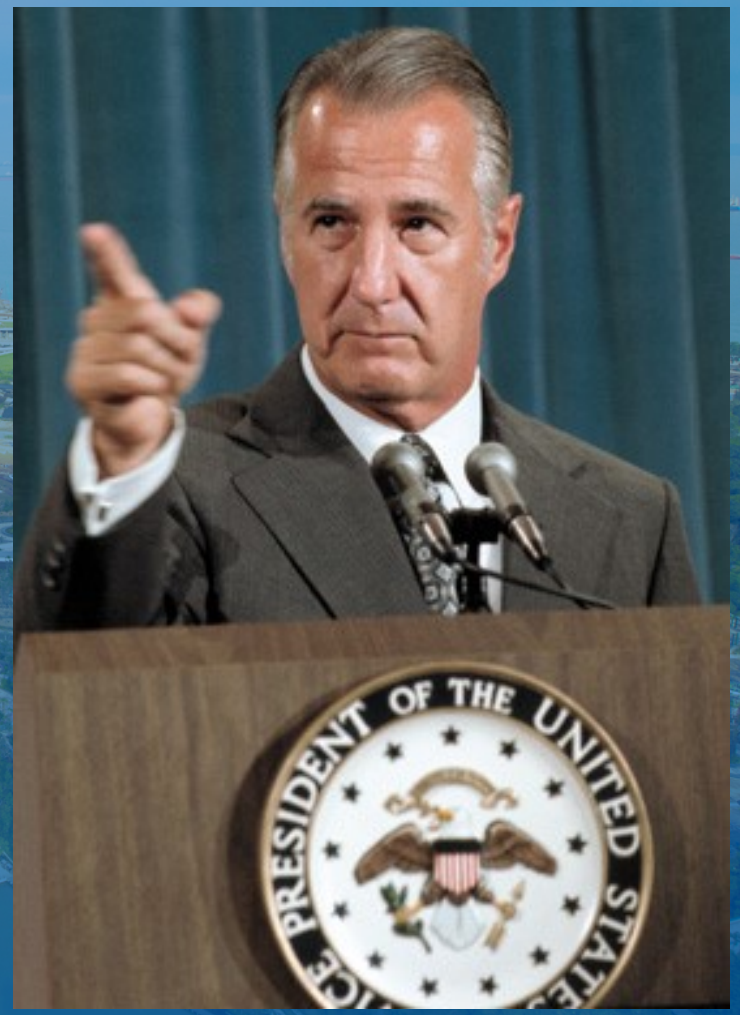
# ASCE's Code of Ethics: Canon 5



**Engineers shall build their professional reputation on the merit of their services and shall not compete unfairly with others.**

# Canons 5 & 6

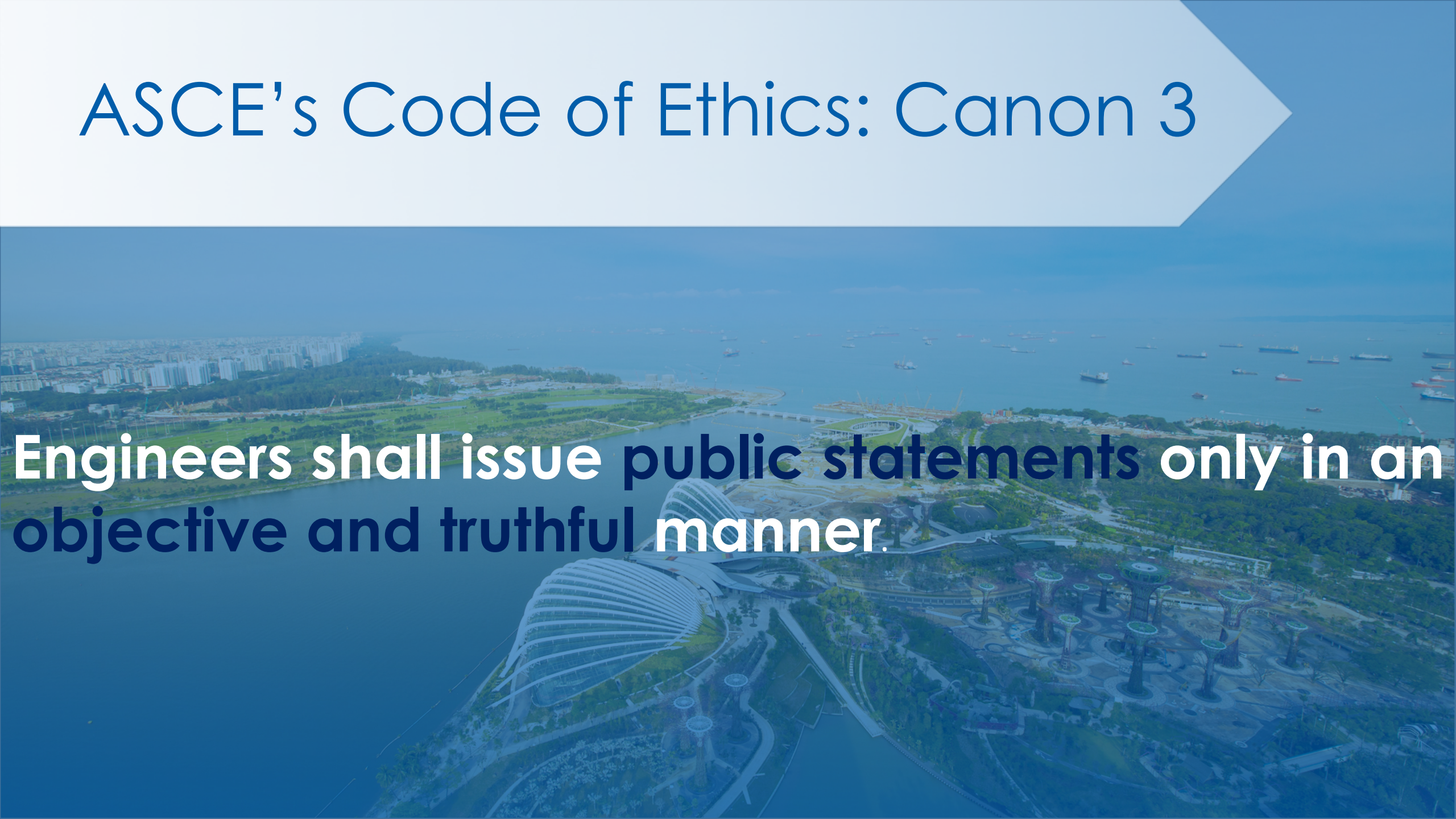
- In 1973, US VP Spiro Agnew resigns from office
  - charges of accepting kickbacks while Governor of Maryland
- Many engineering firms paid Agnew a % of public works fees
  - engineers claimed they would be unable to do business in Maryland if they did not participate



# ASCE's Code of Ethics: Canon 4

**Engineers shall act in professional matters for each employer or client as faithful agents or trustees, and shall avoid conflicts of interest.**

# ASCE's Code of Ethics: Canon 3



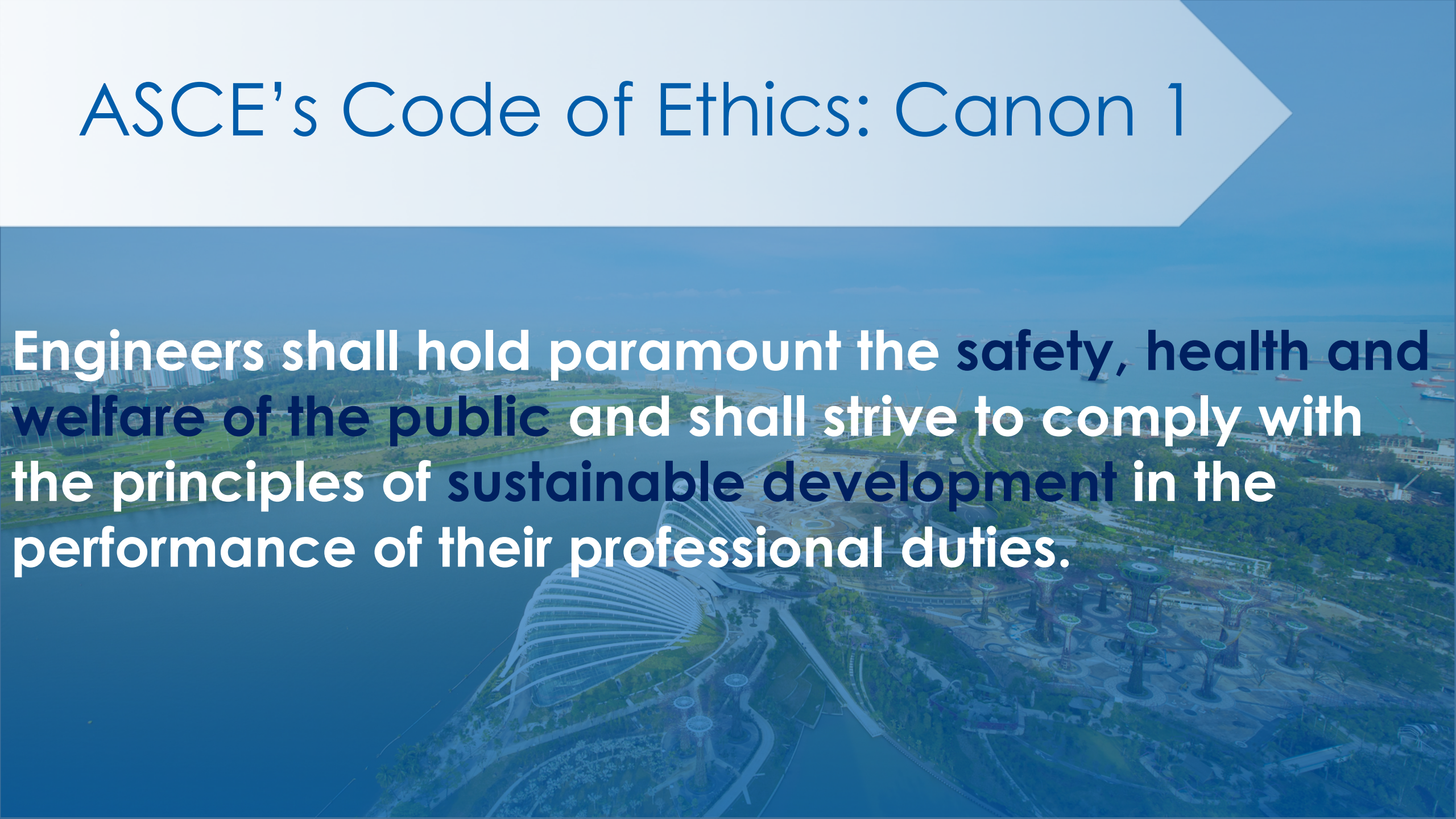
**Engineers shall issue public statements only in an objective and truthful manner.**

# Canon 3: L'Aquila Earthquake

# ASCE's Code of Ethics: Canon 2

**Engineers shall perform services only in areas of their competence.**

# ASCE's Code of Ethics: Canon 1



**Engineers shall hold paramount the safety, health and welfare of the public and shall strive to comply with the principles of sustainable development in the performance of their professional duties.**

# Canon 1: Citicorp Center

# Sustainable Infrastructure

# Rating Sustainability: Envision

Photo: San Diego International Airport

**San Diego International Airport Green Build Project : Envision Platinum**

ASCE

2017

# INFRASTRUCTURE REPORT CARD

# What the Grades Mean


**EXCEPTIONAL**
Fit for the future


**GOOD**
Adequate for now


**MEDIOCRE**
Requires attention


**POOR**
At risk


**FAILING/CRITICAL**
Unfit for purpose

# Report Card Methodology

- CAPACITY
- CONDITION
- FUNDING
- FUTURE NEED
- OPERATION AND MAINTENANCE
- PUBLIC SAFETY
- RESILIENCE
- INNOVATION

# 2017 Infrastructure Grades

| | | | |
|---|---|---|---|
| AVIATION | D | PARKS AND RECREATION | D+ |
| BRIDGES | C+ | PORTS | C+ |
| DAMS | D | RAIL | B |
| DRINKING WATER | D | ROADS | D |
| ENERGY | D+ | SCHOOLS | D+ |
| HAZARDOUS WASTE | D+ | SOLID WASTE | C+ |
| INLAND WATERWAYS | D | TRANSIT | D- |
| LEVEES | D | WASTEWATER | D+ |

**America's Cumulative Infrastructure Grade**


| | |
|---|---|
| A | EXCEPTIONAL |
| B | GOOD |
| C | MEDIOCRE |
| D | POOR |
| F | FAILING |

# Acueducto de Querétaro


# Global Corruption

# Cost of Global Corruption

- Cost estimated at US$ 2.6TR (World Economic Forum)
- US$ 1TR paid in bribes (World Bank)
- Corruption in construction = US$ 500B
- ASCE's Engineer's Charter asks individuals to sign on – pledging to combat corruption (Canon 6: zero tolerance)

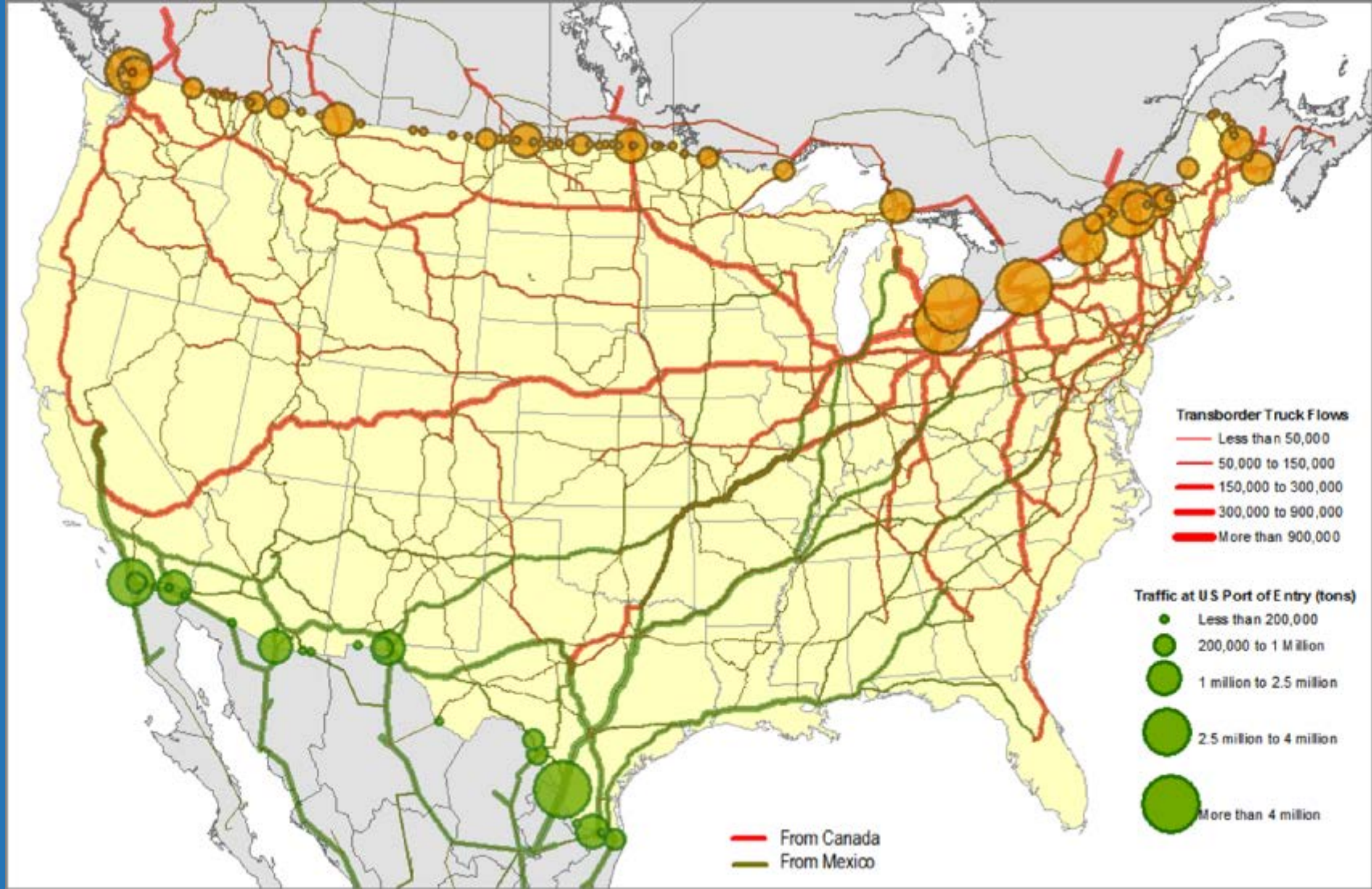
# Combatting Global Corruption

- United Nations Convention against Corruption (2003)
- ISO 37001 Anti-bribery Management Systems Standard
  - Aids an organization's compliance with relevant legal requirements in all countries
  - Mexico and US were participating countries (of 37)
  - Requires an Anti-Bribery Management System
  - Related to FIDIC's Intergrity Management System

# Mexico & US: Trading Partners

- US's second-largest export market (after Canada)
- US's third-largest trading partner (after Canada and China)
- Two-way trade in goods and services = >US$550B
  - Nearly 80% of Mexico's exports go to US
  - 3rd-largest supplier of foreign crude oil to US
  - The largest export market for US refined petroleum products
  - Top US exports = electrical machinery, nuclear equipment, motor vehicle parts, mineral fuels and oils, and plastics
- US stock direct investment in Mexico = US$101B
- Mexican investment in US = US$17.6B – the 7th fastest growing investor country

# Mexico, Canada & US: Tonnage at Ports of Entry



# 25 Ports of Entry for surface freight


# Sustainable Infrastructure: Its important!

# Thank You!