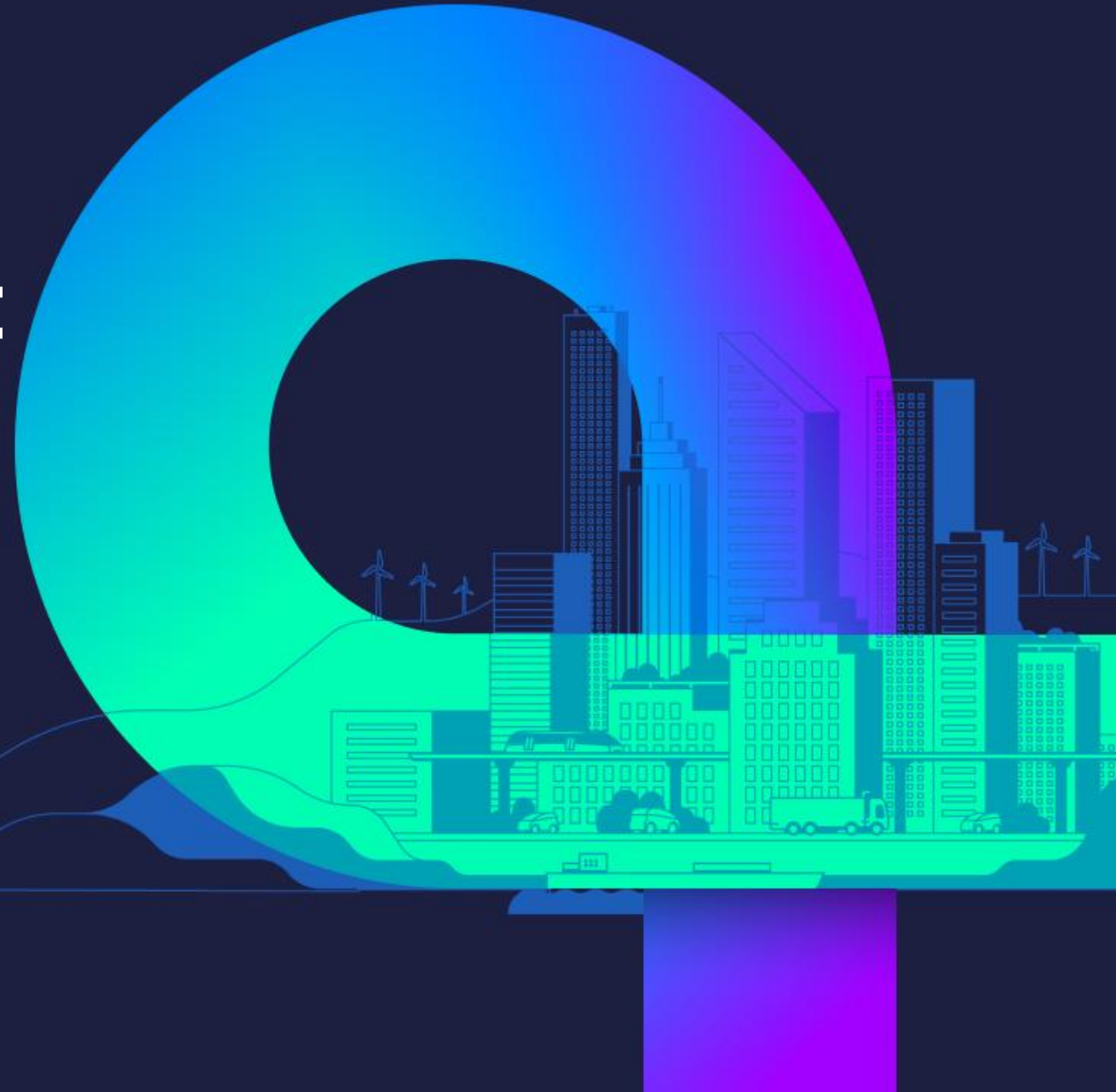




Helping GFV Fleets with Safety and Best Practices

An Overview of TTP's Technology &
Development Committee



Agenda

I. Technology & Development Committee Introduction

II. New TTP RPs

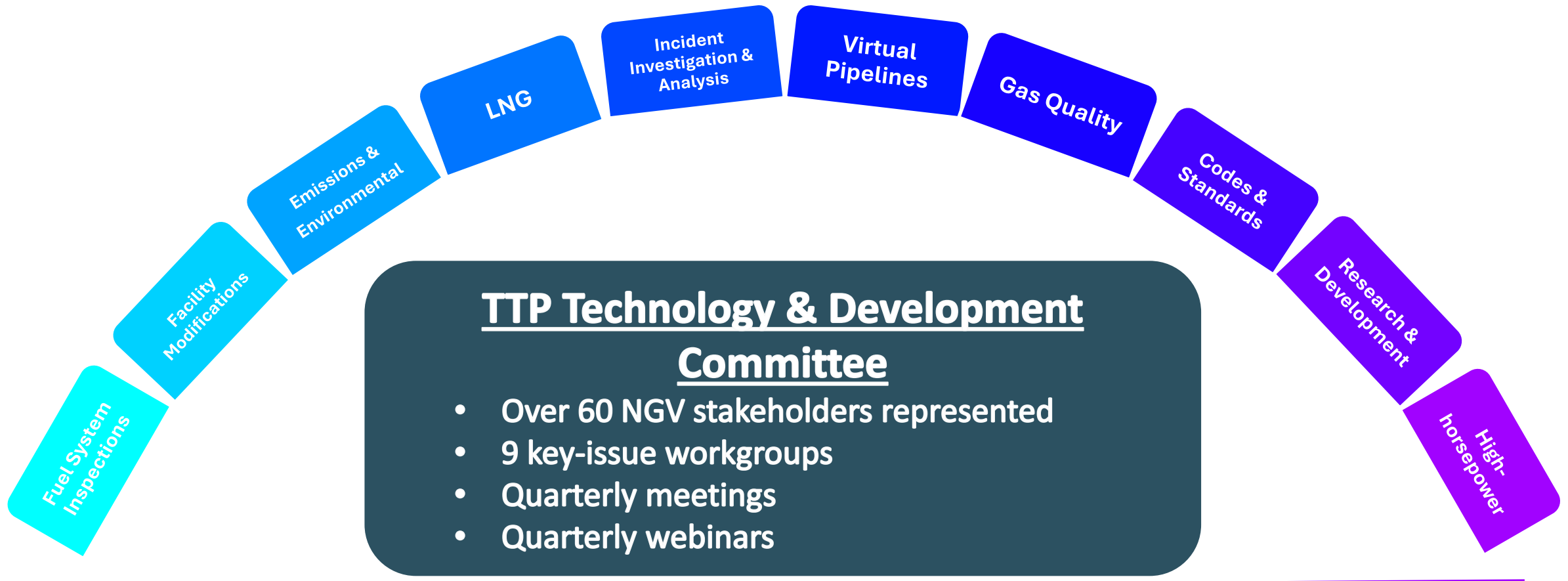
III. TTP's Continuing Commitment to the GFV Industry

- Fleet professionals are faced with many difficult decisions when considering the many alternative fuel options that exist today.
- The Transport Project perceives natural gas is the most proven, cost-effective, and ready-now solution for decarbonizing transportation today.
- Furthermore, when considering renewable sources of natural gas (i.e. RNG) there is no better solution available today for the transportation industry to meet their goals for sustainability and reduce their carbon footprint.

TTP's Technology & Development Committee

An Introduction...

Promoting Safety, Technology, Codes & Standards, and Best Practices



Technology & Development Committee Purpose

Safety

- Training and Accreditation
- Codes and Standards
- Testing/certification
- Incident Investigations & Root Cause Analysis
- GFV Fuel System Inspection Intervals
- GFV Maintenance Facility Modifications

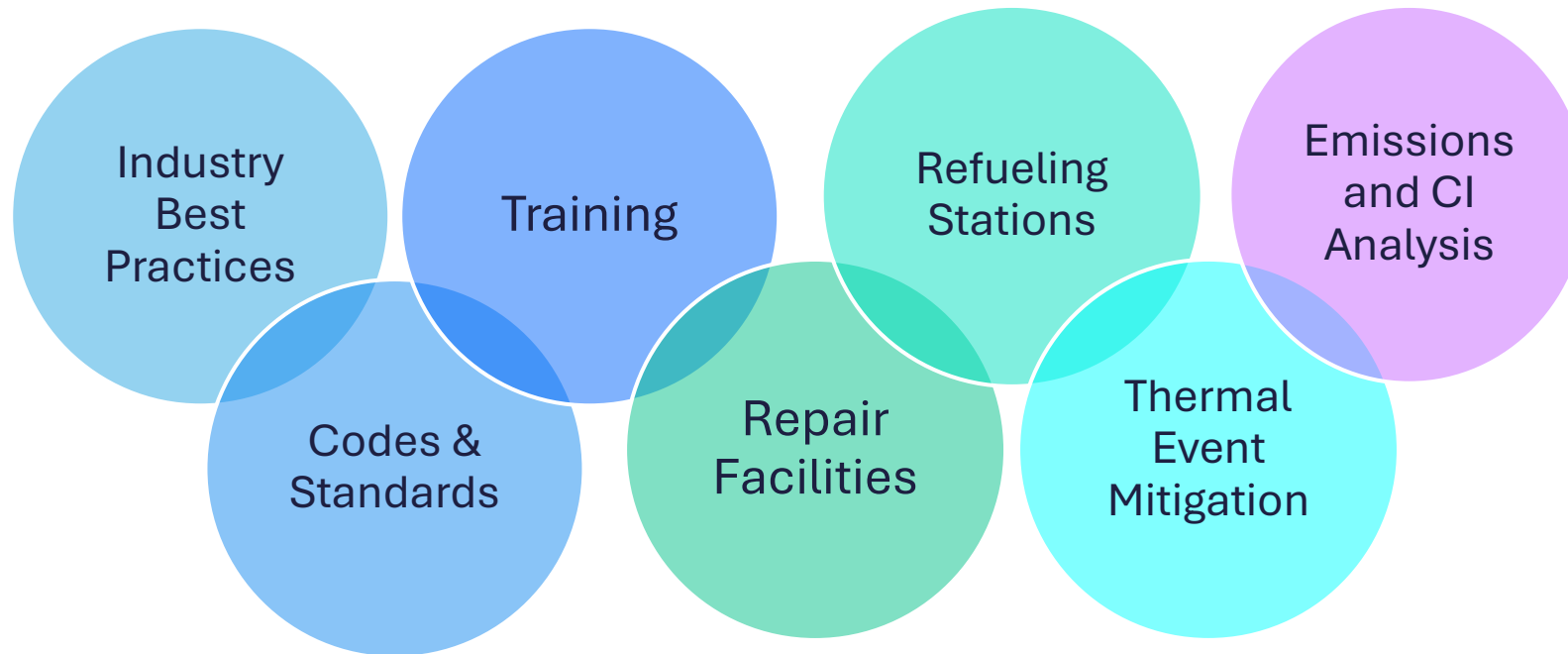
Sustainability

- Emissions & Environmental Messaging
- Methane Leakage Abatement Strategies
- H₂ as Indirect GHG
- Total Lifecycle Analysis of Fuels (well-to-wheel)
- Gas Quality Impacts of H₂ & CH₄ Blends

Industry Advancement

- Research & Development
- Innovation through USDOE Funding Appropriations
- Refueling Infrastructure
- Virtual Pipeline
- LNG
- Marine & Rail
- H₂ICE & Fuel Cells

Tackling Critical Technology Topics while Focusing on Safety



New Industry Guidelines for NGV Fleets

Best Practices and Safety Recommendations for CNG Refuse Truck Fleets to Achieve the Greatest Efficiency and Operational Success with the Lowest Risk

Your Go To Resource for CNG Refuse Truck Recommended Practices



Recommended Practices for CNG Powered
Refuse Trucks and the Supporting Facilities for
Refueling and Maintenance

FREE DOWNLOAD from TTP's Resource Center:

<https://transportproject.org/resource-center/>



Your Go To Resource for CNG Refuse Truck Recommended Practices

- 100 pages of industry best practices and safety recommendations
- Comprehensive guidelines to ensure a successful transition and to support operational efficiency for your CNG powered fleet
- 10 sections covering the following topics:
 - Training
 - Inspections
 - Emergency response procedures
 - Defueling
 - Vehicle decals/labels
 - Hot work
 - Facility upgrades
 - Fire prevention and detection
 - End of life

Training is Critical to Ensure Success

		NGV Personnel Responsibility Type									
		Vehicle Drivers and Fuelers	Routine Vehicle Maintenance Technicians	CNG Fuel System Maintenance Technicians	CNG Fuel System Repair Technicians	CNG Fuel System Inspectors	Technicians that Service All Aspects of HD Trucks Except CNG Fuel Systems	Fleet and Dealership Maintenance Support Teams	CNG Refueling Station Maintenance Teams	Designated Emergency Contact for the Fleet and/or Site	Firefighters / First Responders / Fire Marshals / Code Officials
Recommended Training Course	NGV Driver and Fueler Training	✓								✓	
	Fundamental NGV Technician Safety Training		✓	✓	✓	✓	✓	✓		✓	
	CNG Fuel System Inspector Training			✓	✓	✓	✓				
	CNG Fuel System Inspector Certification				✓	✓					
	HD Truck NGV Maintenance and Diagnostics Training				✓		✓				
	HD NGV Fuel System Repair and Diagnostics Training				✓						
	Defueling, Decommissioning, or Disposal of CNG Fuel Tanks			✓	✓	✓	✓			✓	
	CNG Refueling Station Operation & Maintenance Training								✓	✓	
	Firefighter/First-responder Training									✓	✓
	Fire Marshal/Code-official Training										✓



Code & Standard References

EXAMPLE EXCERPT FROM
MAINTENANCE FACILITY
CONSIDERATIONS

Modification Category	Code References
Ventilation	NFPA 30A (2024) 7.5, 7.8.7, 7.8.11.2, 7.8.12, 8.3; NFPA 88A (2023) 5.5.6, 5.6, 6.3, 6.6.2, 9.2.3; IBC (2024) 406.8.1; IFC (2024) 2311.7.1, 2311.4.3, 2311.8.4.2, 2311.8.5, 2311.8.8, 2311.8.10; IMC (2024) Section 403
Ventilation in Pits	IFC (2024) 2311.4; NFPA 30A (2024) 7.4.4.4, 7.8.9
Gas Detection	IBC (2024) 406.8.2, 916; IFC (2024) 2311.8.9; NFPA 30A (2024) 7.4.6, 7.8.11
Sources of Ignition	IFC (2024) 2311.3; NFPA 30A (2024) 7.6.6, 7.8.13, 9.2.5.1, 11.5
Electrical Classification	IFC (2024) 2311.8.10; NFPA 30A (2024) 8.2, 8.3; NFPA 70 (2023) Article 511
Preparation of Vehicles for Maintenance	IFC (2024) 2311.8.1; NFPA 30A (2024) 7.8.14
Maintenance and Decommissioning of Tanks	NFPA 52 (2023) 15.4.3.1.5, 16.3.5

CNG Fuel System Inspections

RECOMMENDATIONS FOR WHAT TO INSPECT, HOW OFTEN, AND INSPECTOR QUALIFICATIONS

Inspection Level	Inspector	Recommended Inspection Interval
Pre-Service Visual Inspection	Fuel System Installer, Dealer, or Truck Body Builder	Once before the vehicle is put in service
Daily Visual Inspection	Vehicle Driver or Operator	Daily Pre-Trip and Post-Trip
General Visual Inspection	Trained PM or vehicle Technician	At every scheduled preventative maintenance vehicle event. Some examples are listed below: PMA - 200 hours PMB - 400 hours PMD - 800 hours/1200 hours
Detailed Visual Inspection	Qualified or Certified CNG Fuel System Inspector	At least once per year for heavy-duty trucks

CNG Decals for Improved First Responder Awareness and Safety



Future T&D Committee Work Products

More Valuable GFV Industry Resources Coming Soon...

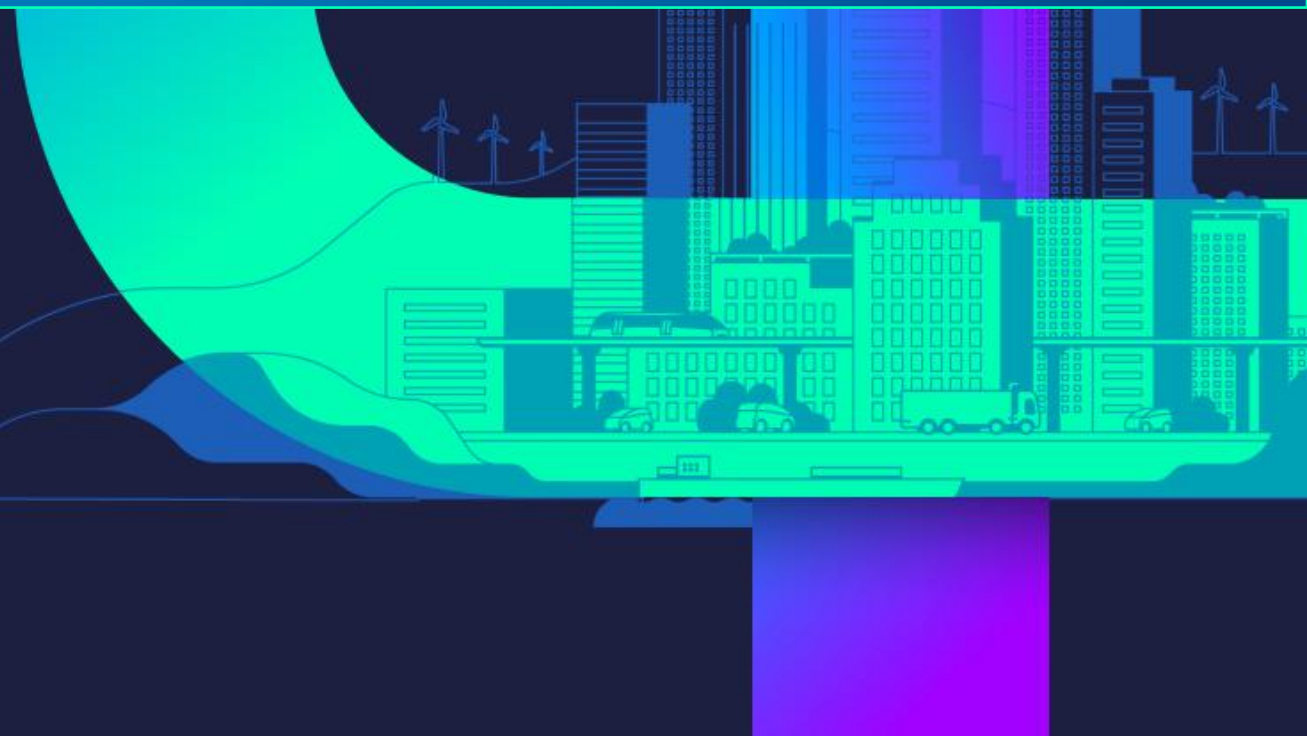
More TTP Resources In Development

FREE AND PUBLICLY AVAILABLE
INDUSTRY RESOURCES TO
ENHANCE SAFETY, ENSURE
COMPLIANCE WITH RELEVANT
STANDARDS, AND PROMOTE BEST
PRACTICES ACROSS ALL ASPECTS
OF GFV FLEET OPERATION AND
MANAGEMENT

- Fact Sheet to help laypersons and regulatory authorities to understand the impacts of increasing percentages of hydrogen in fuel for NGVs
- Facility modification guidelines for NGV service, maintenance, or repair (update to 2017 version in process)
- Safety bulletin to promote awareness of CNG dispenser nozzle adapters to fill portable cylinders and ANG cylinders

Coming Soon to a Theater Near You...

Publication of the *Best Practices and Safety Recommendations for CNG Refuse Truck Fleets to Achieve the Greatest Efficiency and Operational Success with the Lowest Risk*, will be announced publicly at a special Theater performance in the ACT Expo Hall:
Wednesday, April 30, at 12:40 PM





Paul Sandsted

Director of Technology and Sustainability

psandsted@transportproject.org

<https://transportproject.org/>

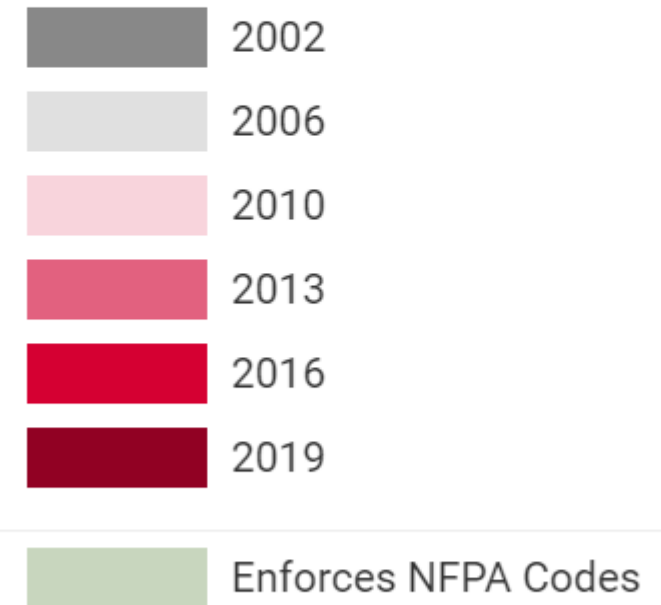


Appendix

NFPA 52 Code Adoption

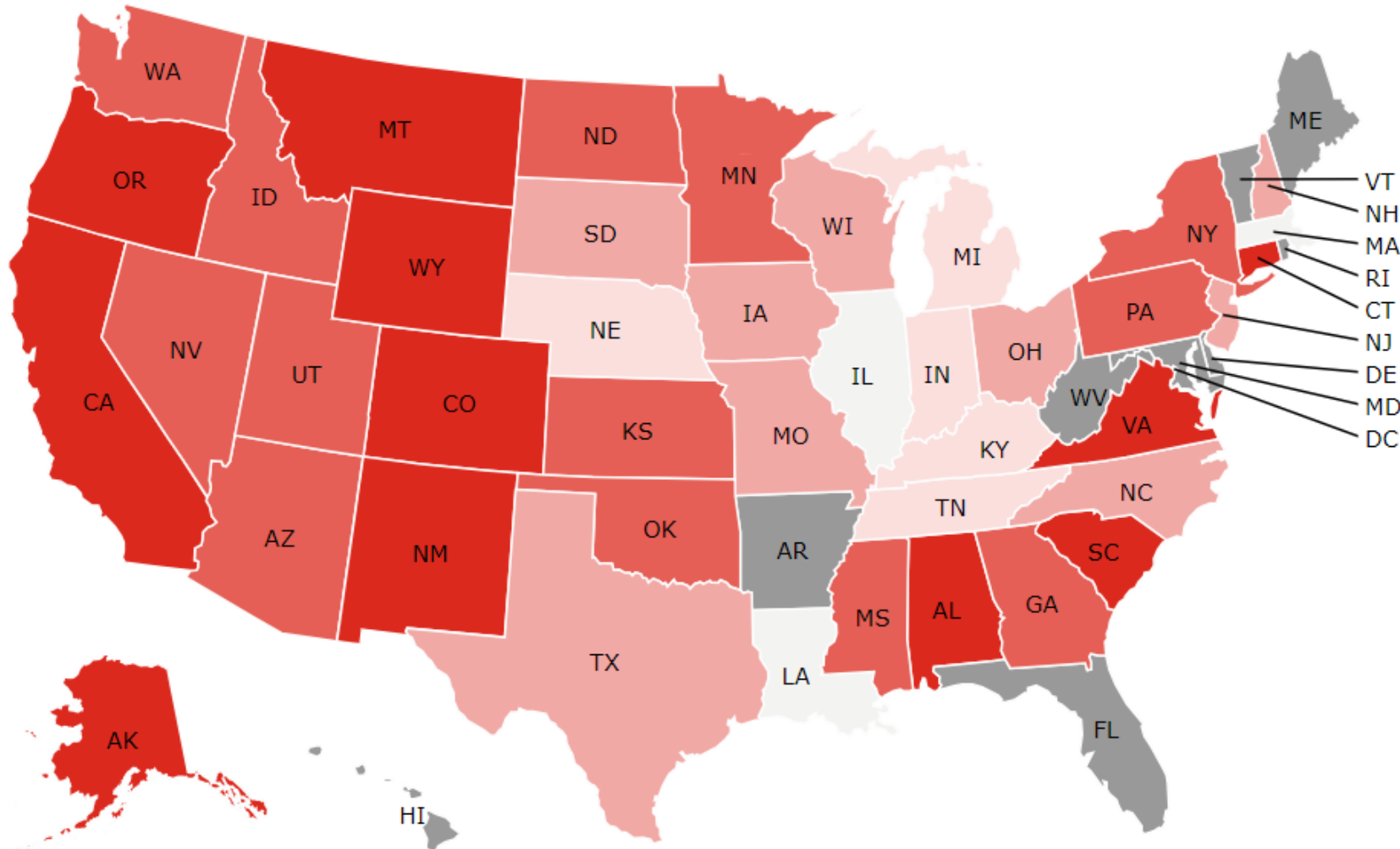
Vehicular Natural Gas Fuel Systems Code

Enforced Code Edition: of all the editions of this document incorporated in the jurisdiction, this is the most recent edition.



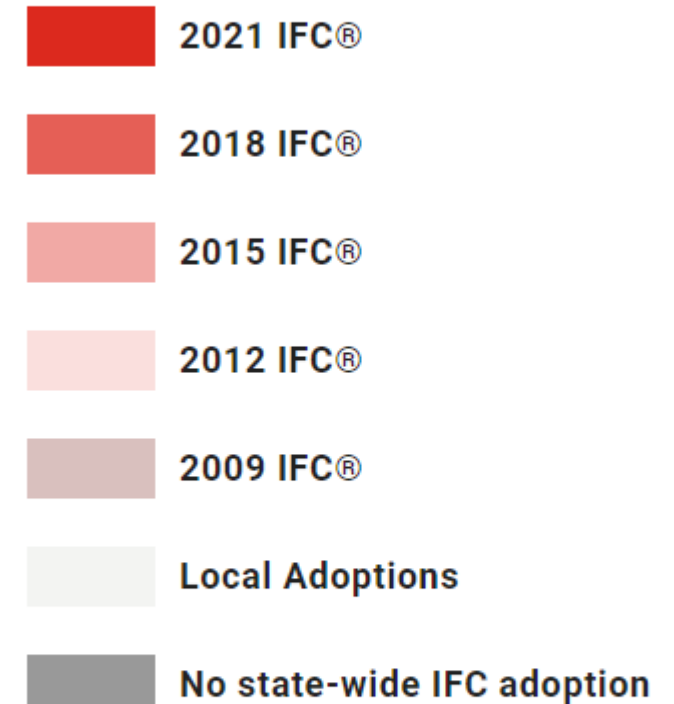
This tool is made available subject to Important Notices and Legal Disclaimers, which can be viewed at www.nfpa.org/disclaimers.

IFC Code Adoption



MAP KEY

Edition of code currently in effect by state:



Adoption information is provided for states where the IFC is adopted statewide, adopted statewide for certain categories of buildings, or adopted by a state body to guide local code adoption.