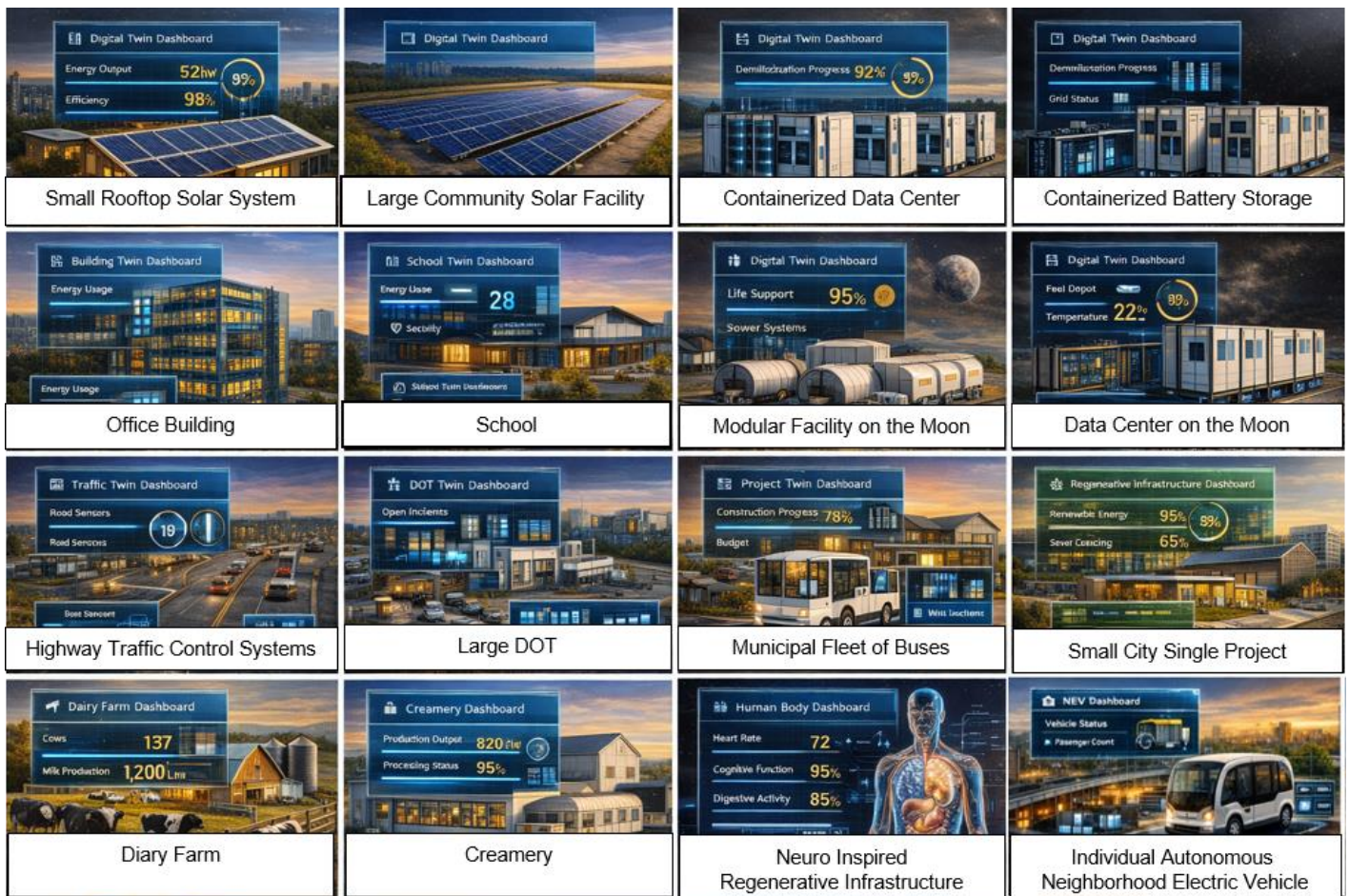


Next Generation Infrastructure
Connecting Digital Twin Data with the Application for Payment

Question: Which of these infrastructure Assets is a Digital Twin?



Answer: All of them.

Executive Summary

Infrastructure is evolving from disconnected assets into interconnected, data-rich digital twins.

From rooftop solar systems to smart cities, and even speculative infrastructure such as asteroid fueling stations and autonomous electric vehicles - the same foundational truths apply:

- Infrastructure is planned, designed, and built through contracts
- It is paid for through standardized processes like the Application for Payment (AFP)
- It is managed over time using detailed asset and lifecycle data

The [Infrastructure Financial Data \(IFD\) Working Group](#) is a national collaborative initiative focused on a holistic approach to data standards for next generation infrastructure, starting with the Application for Payment (AFP) data set –

- Synergizing open financial data standards (ISO, XBRL, FDX, and others) with digital twin data standards.
- Align with General Accounting Office May 2026 [Regulatory Reporting Reform: Financial Data Transparency Act Requires Initial Steps Toward Government-wide Data Standards](#)
- Support the intent of [Advanced Digital Construction Management Systems \(ADCMS\)](#) initiative
- Align with the [International Software System Interoperability Standard](#) for [commercializing space infrastructure](#).
- Provide the smallest city or entity with the same resources as the biggest company, city or DOT.
- Empower AI with high integrity data.
- Enable next-generation infrastructure without endorsement, exclusivity, or proprietary constraints.

The Vision: Infrastructure as a Connected System

“When we try to pick out anything by itself, we find it hitched to everything else in the Universe.”

John Muir, My First Summer in the Sierra (1911)

This insight perfectly describes modern infrastructure:

- A building depends on energy systems
- Energy systems depend on grid infrastructure
- Transportation systems depend on buildings and utilities
- Digital systems connect and manage all of the above

Everything is connected - and increasingly represented as digital twins.

Definition from the Digital Twin Consortium

A digital twin is an integrated data-driven virtual representation of real-world entities and processes, with synchronized interaction at a specified frequency and fidelity. ([Link](#))

- Digital Twins are motivated by outcomes, driven by use cases, powered by integration, built on data, enhanced by physics, guided by domain knowledge, and implemented in dependable and trustworthy IT/OT/ET systems.
- Digital Twin Systems transform business by accelerating and automating holistic understanding, continuous improvement, decision-making, and interventions through effective action.
- Digital Twin Systems are built on integrated and synchronized IT/OT/ET systems, use real-time and historical data to represent the past and present, and simulate predicted futures.
- Digital Twin Prototypes use data to model and simulate predicted futures before being integrated into IT/OT/ET Systems and before synchronization with the real-world entity or process.

What the IFD Working Group Does

Convening Stakeholders across industry segments to accelerate collaboration

- Academic Institutions
- Public agencies
- Private sector
- Technology providers
- Standards organizations
- Trade Associations

Aligning open standards

- ISO – global infrastructure and asset standards
- XBRL – financial reporting and structured data
- FDX – financial data exchange
- Other emerging digital twin and financial frameworks

Supporting Legislative Directives and Initiatives

- DATA Act
- Financial Transparency Act
- Advanced Digital Construction Management Systems (ADCMS)
- Genius Act
- Clarity Act

Infrastructure Scope: Everything is Included

The IFD Working Group is not limited to “construction” in the traditional sense. It includes all infrastructure:

- Business Owners
- Public Entities
- Small Rooftop Solar System
- Large Community Solar Facility
- Containerized Battery Energy Storage System
- Containerized Data Center
- Office Buildings
- Schools
- Modular Facility on the Moon
- Fueling Station on an Asteroid
- Highway Roadbed and Traffic Control Systems
- Waste Management Control Systems
- Large DOT
- Small City Single Project
- Municipal Fleet of Buses
- Individual Autonomous Neighborhood Electric Vehicle
- Modern Smart City
- Post Conflict Rebuilding
- Creamery
- Dairy Farm
- Apple Orchard

Infrastructure is everything—and everything is becoming a data-rich digital twin

Infrastructure Buildout: Everything is the Same

- Built by entities and paid by the Application for Payment Process
- Financed, insured, and bonded by capital markets
- Real-time performance monitoring during construction
- Real-time performance monitoring during asset lifecycle

Common Foundation Across All Infrastructure

Despite their diversity, all infrastructure assets share three universal characteristics:

1. Built through contracts

Every infrastructure asset:

- Has a defined scope of work
- Is governed by contracts between parties
- Involves multiple stakeholders

Examples:

- A school → public construction contract
- A solar farm → EPC contract
- A smart city system → multi-contract program

2. Paid using the Application for Payment (AFP) process

The AFP (progress payment) process:

- Breaks total cost into staged payments
- Pays contractors based on verified work completed
- Requires structured data such as:
 - Schedule of Values (SOV)
 - Percent complete
 - Materials installed

Infrastructure Financial Data (IFD) Working Group
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This is the financial backbone of infrastructure delivery:

- Payments flow through contracts
- Payments reflect real-world progress
- Payments generate high-value financial data

3. Maintained through asset lifecycle data

After construction, all infrastructure requires:

- Records of:
 - What was installed
 - When it was installed
 - Who installed it
- Ongoing tracking of:
 - Performance
 - Maintenance
 - Cost

This is exactly the data that feeds digital twins

Digital Twin Consortium principle:

Digital twins depend on continuous, trusted data flows across lifecycle and stakeholders

Construction reality:

AFP governs how money flows through that same lifecycle

A. Digital twins require financial data just like they require engineering data

Each digital twin includes:

- Physical asset data
- Operational data
- Performance data

But also inherently requires:

- Cost data (CAPEX)
- Operational cost data (OPEX)
- Funding and payment data

B. AFP is the “financial thread” of the digital twin lifecycle

Just as DTC defines a digital thread for technical data, the AFP process represents:

A financial digital thread connecting:

- Owner
- Contractor
- Subcontractor
- Supplier

Across:

- Design
- Construction
- Operations

C. Why financial data standards are essential

All examples demonstrate the need for standardized financial data because they:

1. Combine multiple systems and stakeholders

Requires interoperable financial data formats

2. Operate across lifecycle phases

- Design
- Construction
- Operation

Requires consistent financial data over time

3. Depend on real-time decision-making

- Energy optimization
- Traffic control
- Vehicle operations

Requires:

- Linking performance data ↔ cost data
- Enabling value-based decisions

4. Integrate with digital twin dashboards

Each image explicitly shows:

- Operational dashboards

Why Financial Data Standards Matter

Digital twins already integrate:

- Engineering data
- Operational data
- Sensor data

But without standardized financial data, digital twins remain incomplete.

The Missing Link: Financial Data Integration

The IFD Working Group addresses:

1. Fragmented financial data

- AFP data stored in PDFs, spreadsheets, disconnected systems
- Limited interoperability

2. Lack of lifecycle continuity

- Financial data often stops at construction
- Not integrated into operations

3. Limited decision-making capability

- Performance data is not aligned with:
 - Budget / Cost
 - ROI

IFD Solution

Standardized financial data enables:

- Digital thread integration
 - Finance ↔ construction ↔ operations
- Real-time financial dashboards
 - Budget vs actual
 - Progress vs anticipated
 - Risk monitoring
- Cross-asset comparability
 - From small projects to global infrastructure

Benefits to Stakeholders

For Public Agencies

- Better transparency and accountability
- Improved capital planning
- Integrated infrastructure management

For Contractors & Developers

- Reduced administrative burden
- Faster and more reliable payments
- Improved project control

For Financial Institutions

- Standardized data for:
 - Lending
 - Risk analysis
 - Investment decisions

For Small Businesses (Critical Focus)

- Simplified data requirements
- Easier participation in large infrastructure ecosystems
- Improved access to finance, insurance and surety.

Why Join the IFD Working Group Now

Joining the IFD Working Group positions stakeholders to:

- Shape national and global standards
- Influence the integration of:
 - Financial data
 - Digital twin systems
 - Infrastructure delivery
- Participate in building:
 - Next-generation infrastructure ecosystems

Conclusion

Infrastructure is no longer isolated projects—it is a connected, data-driven system of systems.

- Assets are:
 - Contracted
 - Paid through AFP
 - Tracked as a digital twin

- Systems are:
 - Connected
 - Interdependent
 - Data-rich

And as John Muir observed: Nothing exists in isolation - everything is connected.

Final Call to Action

The Infrastructure Financial Data (IFD) Working Group is the platform to:

- Align standards
- Connect financial and infrastructure data
- Enable true digital twin ecosystems
- Build resilient, regenerative communities

Join now to help define how infrastructure - and its financial data - works in the connected future.