



NAIC/Center for Insurance Policy and Research (CIPR) Infrastructure Investments Study

Economic Infrastructure Definition

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Infrastructure Definition

A standard, or commonly used, definition of infrastructure is not readily available in today’s market. The meaning of infrastructure can vary greatly from one party to another and can encompass a broad spectrum of different attributes, as well as investment risks. A clear definition for infrastructure is, therefore, critical so that investments in those assets provide the intended benefits of diversification, stable and predictable cash flows, and inflation protection. It would also be helpful in framing the discussion of infrastructure investments in this study and how the U.S. insurance industry can participate more effectively in this market going forward.

For the purposes of this NAIC/Center for Insurance Policy and Research (CIPR) Infrastructure Investments Study, we will use the following definition, which focuses on *Economic Infrastructure* only: “Long-lived, capital intensive, large physical assets that provide essential services or facilities to a country, state, municipality or region and contributes to its economic development or prosperity, including . . .”

SECTORS	EXAMPLES OF ASSETS
Transportation	Roads (streets and highways), bridges, tunnels, public transit, rail, airports, and maritime and inland waterway ports
Broadband	For rural communities (includes other high-speed data and communication conduits)
Telecommunications	Wireless towers
Waste Management	Wastewater, stormwater, solid waste, sewage, landfills, land revitalizations and Brownfields
Power and Energy	Power utilities, power generation, transmission and distribution facilities, renewable energy, pipelines, energy processing, distribution and storage, offshore infrastructure, production platforms, and liquified natural gas (LNG) terminals
Water and Water Resources	Drinking water, flood risk management (dams and levees), water supply and waterways

The sectors and examples of assets that are considered infrastructure for the analysis is provided for transparency. The definition, together with the sectors and assets, include a relatively wide range of assets, but at the same time, is not overly broad in scope to avoid possibly introducing unintended investment risks.

Definition Methodology

Given the challenge of developing a definition of infrastructure that would be amenable to a wide range of interested parties and, at the same time, be appropriate for this study, we began the Request For Information (RFI) process with focusing on the definition topic on its own. The RFI proposed a working definition based on those of the American Society of Civil Engineers (ASCE) and the Trump administration and asked for input from market participants about the reasonableness and scope of the definition.

We received 14 written responses from state insurance regulators, insurance companies, trade associations, asset managers and others who provided their thoughts and perspectives on the proposed definition. The suggestions for the definition, as well as the sectors and examples of assets considered infrastructure, were reviewed, and where appropriate, incorporated into a more refined definition of infrastructure. We also conducted an open conference call to discuss the revised definition, as well as specific exclusions to the definition.

Based on feedback from a majority of respondents, the revised definition was developed using a characteristics-based approach whereby the attributes of infrastructure assets provided the key defining factors. This was the most significant revision to the definition. The characteristics that were viewed to be the most important were highlighted in the definition: 1) large physical assets; 2) long operational life; 3) high capital intensity; 4) providing an essential need or service; 5) not easily duplicated (i.e., designed for a specific purpose with no alternative uses); and 6) having a positive economic impact on where the assets are physically located. Combining these factors together results in the definition of *economic infrastructure*.

The sectors and assets that are included in the economic infrastructure definition are largely based on the projects and facilities that the ASCE considers infrastructure¹ and the categories described in the legislative outline of the Trump administration's proposal to rebuild infrastructure in America.² Additional examples were added to some of the categories based on discussions with and feedback from respondents.

Note that the definition does not differentiate between domestic and international infrastructure as the economic risk of the investment is the main consideration, not the location of the investment. In addition, it focuses on specific areas with generally unmet financing needs, such as broadband for rural communities.

Definition Exclusions

Social infrastructure, or that with social benefits to a specific geographic location, are not included in the definition or the analysis in this study. Financing for social infrastructure assets is, at least in part, currently being met, in the U.S., by the municipal bond market and other similar conduits. Furthermore, the level of essentiality can vary greatly among social infrastructure assets, so determining a reasonable definition on a timely basis might be challenging. However, given the interest in social infrastructure from many market participants and its overall importance, a separate study of social infrastructure will be considered in the future.

Another area of particular interest to market participants is emerging infrastructure, which includes assets such as data centers, microgrids, vehicle electrification and autonomous equipment. In our opinion, however, this area is in relatively early stages of development, and its analysis would be difficult given the limited availability of market, financial and other relevant data. Consideration of emerging infrastructure will, therefore, be deferred to a later date.

Infrastructure Definition Context – International Initiative on Infrastructure Investments

The International Association of Insurance Supervisors (IAIS) is collecting data on investments in infrastructure debt and equity to determine whether they have a better risk profile than similar non-infrastructure investments. For the purposes of their data collection exercise, infrastructure assets are defined as “physical assets, structures or facilities, systems and networks that provide or support essential public services.” They also define infrastructure investments as “debt or equity investments in infrastructure corporates or projects which support owning, financing, developing, or operating infrastructure assets” where infrastructure corporates is “an entity or corporate group which derives most revenues from owning, financing, developing, or operating infrastructure assets,” and infrastructure projects “are typically set up for the construction phase of a new project.” Corporate infrastructure loans are generally unsecured, while lenders to infrastructure projects typically benefit from some type of collateral.

Note that the IAIS definitions are for field testing purposes only and are subject to change. They should not be construed as an internationally accepted definition for the calculation of solvency capital requirement. The comparison of definitions is for illustration purposes only for use in this study and to provide some relative context to the infrastructure definition we have derived for our NAIC/CIPR study.

Table 1 shows a comparison of the infrastructure sectors and example of assets included in the definition of infrastructure for this study and that of the IAIS. The NAIC/CIPR's sectors and assets broadly align with the IAIS' sectors and assets. However, the IAIS considers social infrastructure in its definition; it includes courts, public libraries, prisons, juvenile facilities, refugee camps, social housing for poor population, government owned hospitals, national museums, etc.

¹ <https://www.asce.org/issues-and-advocacy/public-policy/policy-statement-299---infrastructure-investment/>

² <https://www.whitehouse.gov/wp-content/uploads/2018/02/INFRASTRUCTURE-211.pdf>

Table 1: Comparison of NAIC/CIPR and IAIS Infrastructure Sectors and Assets

SECTORS	NAIC/CIPR STUDY	IAIS
Transportation	Roads (streets and highways), bridges, tunnels, public transit, rail, airports, and maritime and inland waterway ports	Airports, ports, roadways, and railway network
Broadband	For rural communities (includes other high-speed data and communication conduits)	
Telecommunications	Wireless towers	Core telecom infrastructure such as broadband equipment, optical fibers, radio masts, etc.
Waste Management	Wastewater, stormwater, solid waste, sewage, landfills, land revitalizations and Brownfields	Facilities dedicated to waste management and recycling
Power and Energy	Power utilities, power generation, transmission and distribution facilities, renewable energy, pipelines, energy processing, distribution and storage, offshore infrastructure, production platforms, and liquified natural gas (LNG) terminals	Generation, transmission, distribution, storage, and district heating
Water and Water Resources	Drinking water, flood risk management (dams and levees), water supply and waterways	Water supply/distribution and wastewater collection/treatment

The IAIS' definition also identifies assets that are not considered infrastructure investments. Table 2 shows the specific assets that are excluded from each of the infrastructure sectors.

Table 2: IAIS Infrastructure Investment Exclusions

SECTORS	IAIS EXCLUSIONS
Transportation	Car, aircraft, boat manufacture and spare parts for aircrafts, etc.
Telecommunications	Production and selling of phone instruments with or without contract with the end consumer and facilities for private use
Waste Management	Using spare parts from scrapped vehicles for other vehicles
Power and Energy	Batteries used in electric cars and insulation of houses
Water and Water Resources	Fixing water pipe leakages

Concluding Comments

The economic infrastructure definition in this study was developed with input and feedback from market participants and reflects the key characteristics of infrastructure assets: large physical assets, long operational life, high capital intensity, essential need or service, not easily duplicated and contribution to economic development. The definition incorporates a relatively wide range of assets, but at the same time, is not overly broad in scope to avoid possibly introducing unintended investment risks. Overall, it is generally a good fit with the infrastructure definition that the IAIS is using for field testing and data collection purposes, except for the inclusion of social infrastructure in the IAIS definition.

Following from this economic infrastructure definition, the study turns to the investigation of the remaining request for information components: Investment Characteristics, Market Size, Credit Performance, NAIC Treatment of Infrastructure, Insurance Industry Exposure, and Climate Resiliency of Infrastructure Projects. Future research overviews of these study components will be similarly produced.