

The Commercial Law Development Program *Presents* *Public-Private Partnership Webinar Series*



Project made possible through funding by:



USAID
FROM THE AMERICAN PEOPLE



Pre-Feasibility and Feasibility Studies Section Considerations

Today's presenters



Michael Tran
Bluebird Advisors
*(previously with World Bank,
KPMG, and Castalia)*



Chris Kane, P.E., Esq.
P3 Collaborative, LLC
*(previously with AECOM, WGI
and private law practice)*








Objective and Agenda

To provide detailed pre-feasibility and feasibility considerations for the following sectors:

- Power Transmission
- Transit
- Roads
- Water and Wastewater

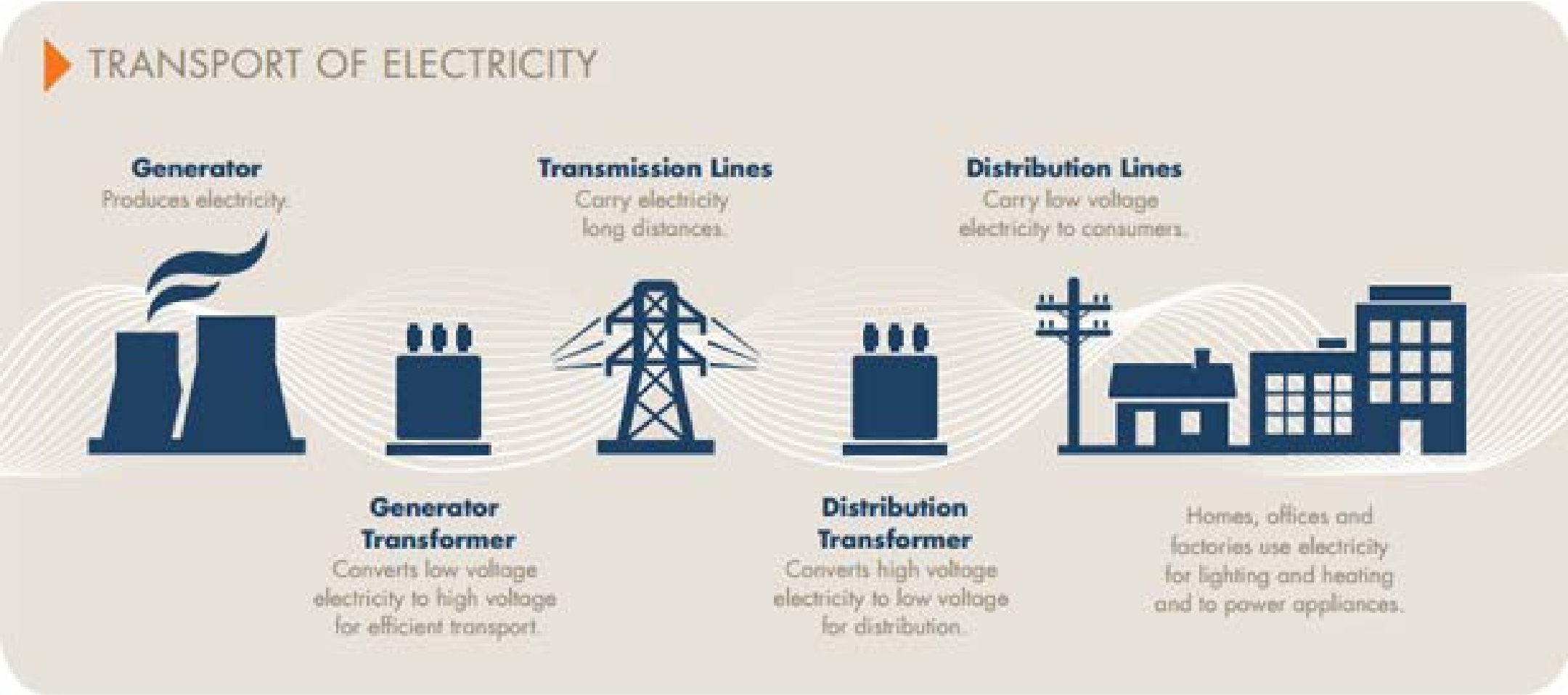


Feasibility analysis should assess five key elements of a project

	Pre-Feasibility	Feasibility
 Technical Solution and Cost	Develop technical solution and rough order of magnitude	Refine technical solution and finalize cost estimates
 Funding and Financing	Identify funding gap and identify potential funding sources	Determine affordability and secure funding sources
 Policy, Legal, and Regulatory	Survey regulations and laws and identify gaps and project concerns	Review likelihood of required changes to laws and regulations for project success
 Environmental and Social	Identify E&S “red flags” and develop mitigation strategy	Conduct environmental and social impact assessment and mitigation strategy
 Commercial Structuring and Delivery Models	Assess delivery model options, including PPPs	Select delivery model and develop key commercial terms



Overview of the Power Sector



Dynamics of the Power Transmission

- Power Transmission plays a critical role between generators and distribution. PPP transmission projects requires certainty on sector regulation
 - Power transmission is typically planned and highly regulated. Power transmission projects can include new transmission (connecting renewable energy resources to demand centers) or upgrade transmission (to keep up with more demand or generation)
 - Governments can incentivize private investment in power transmission through creating revenue for transmission (wheeling charges) or directly through PPPs



Power Transmission – distance, load, voltage, ROW, and reliability are key to technical feasibility

- Government or grid operator should demonstrate the need for new or upgraded transmission before beginning feasibility studies – Sector planning is essential to map out generation and demand centers
- Timing of transmission is important to match when new generation is expected to come online
- Technical analysis should include load forecasting and load flow analysis to determine technical requirements of transmission
- Route analysis will help determine the most feasible route for connection

Power Transmission – Key Viability Questions:

- What the distance and voltage requirement? What are the expected losses?
- What is the most feasible route? How does the line improve reliability of the grid?
- Are there issues in acquiring the right-of-way? What is the expected cost and timing of acquisition?
- When is the transmission line required? What is the expected cost?



Power Transmission – Cost Estimates

- The graphic is an example of the level of detail of cost estimates at the feasibility stage
- Pre-feasibility and feasibility estimates would fall into the Class 3-5 estimates
- Costs include right-of-way, structures and foundations, wire and conductor, equipment, and protection/fencing

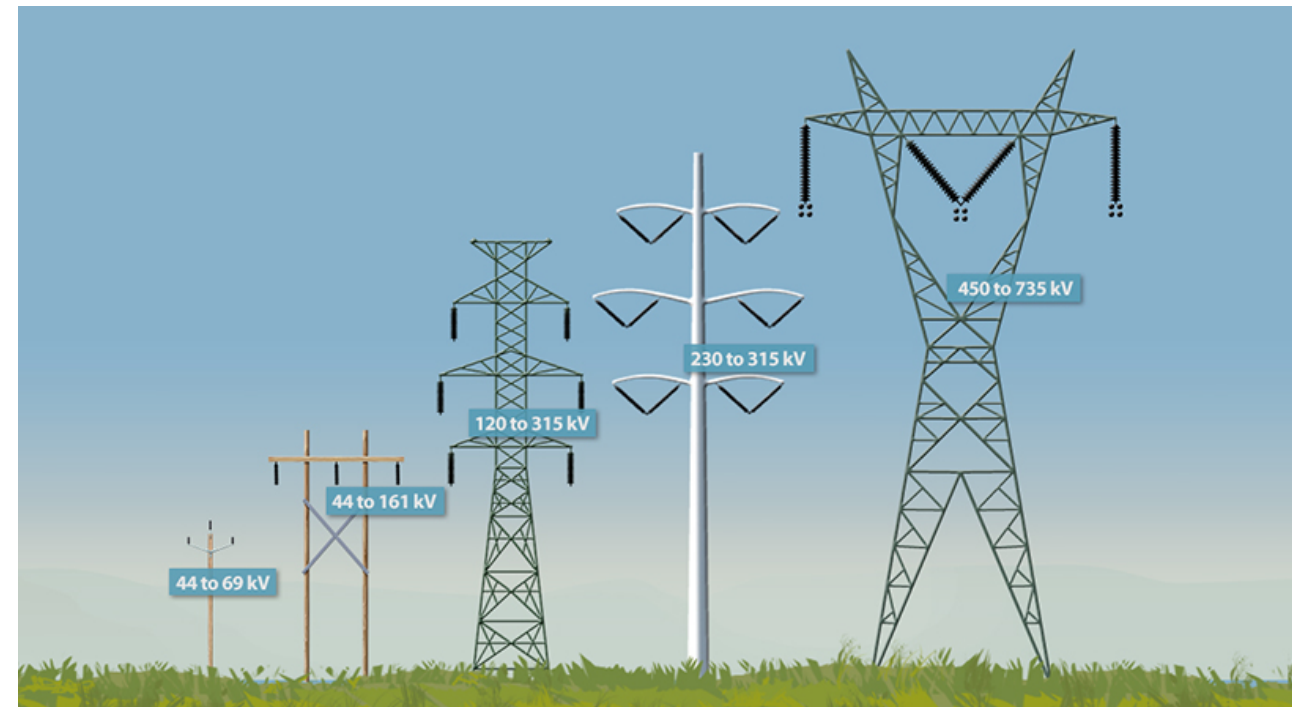
ESTIMATE CLASS	Primary Characteristic	Secondary Characteristic		
	MATURITY LEVEL OF PROJECT DEFINITION DELIVERABLES <small>Expressed as % of complete definition</small>	END USAGE <small>Typical purpose of estimate</small>	METHODOLOGY <small>Typical estimating method</small>	EXPECTED ACCURACY RANGE <small>Typical variation in low and high ranges ^[a]</small>
Class 5	0% to 2%	Concept screening	Capacity factored, parametric models, judgment, or analogy	L: -20% to -50% H: +30% to +100%
Class 4	1% to 15%	Study or feasibility	Equipment factored or parametric models	L: -15% to -30% H: +20% to +50%
Class 3	10% to 40%	Budget authorization or control	Semi-detailed unit costs with assembly level line items	L: -10% to -20% H: +10% to +30%
Class 2	30% to 75%	Control or bid/tender	Detailed unit cost with forced detailed take-off	L: -5% to -15% H: +5% to +20%
Class 1	65% to 100%	Check estimate or bid/tender	Detailed unit cost with detailed take-off	L: -3% to -10% H: +3% to +15%

Notes: [a] The state of process technology, availability of applicable reference cost data, and many other risks affect the range markedly. The +/- value represents typical percentage variation of actual costs from the cost estimate after application of contingency (typically at a 50% level of confidence) for given scope.



Power Transmission - Voltage

- Correct sizing of the system depends on the distance and demand/supply of power (load)
- Emerging Technology: High-voltage direct current (HVDC) lines are an alternative that has lower losses over long distances. These are typical more expensive upfront but reduction in losses compensate over time.



Power Transmission – funding is typically through ratepayers but requires a creditworthy counterparty to raise financing

- Power transmission is typically paid through rate base (customers) over time and returns are likely subject to regulation
- PPPs in power transmission can be through an “availability payment” structure, in which utility or government pays for capacity. The developer is not subject to demand/use of the transmission line
- PPPs can sometimes shift demand risk if demand is proven and stable – payment through “wheeling charges”

Power Transmission – Key Funding Questions:

- Can the cost of transmission be passed to customers? If not, government subsidies may be required.
- Is the utility a creditworthy counterparty? Is a guarantee required from government?
- Will government assist with right-of-way acquisition costs?
- How will the developer/concessionaire be compensated?



Power Transmission – Sector regulation will determine contractual relation with generators and distribution

- The regulation of the power sector will define the type of PPP. Sector regulation can include vertically integrated, wholesale markets, liberalization of distribution
- Recently, market has focused on liability issues around transmission lines as they have led to wildfires

Power Transmission – Key Legal Questions:

- Is there clear and stable regulation for the sector that allows for private investment?
- Is there an independent grid operator that provides technical planning?



Power Transmission – right-of-way and risks of sparking create the most significant E&S risks

- Transmission lines require significant right-of-way and buffer from development (e.g., risk of sparking)
- Right-of-way issues are particularly sensitive when connecting renewable energy generation that may be in culturally or environmentally sensitive areas (e.g., bird areas)
- Scope of E&S will also need to include access roads and substations connected to the transmission line
- E&S risks may be mitigated through planning and routing

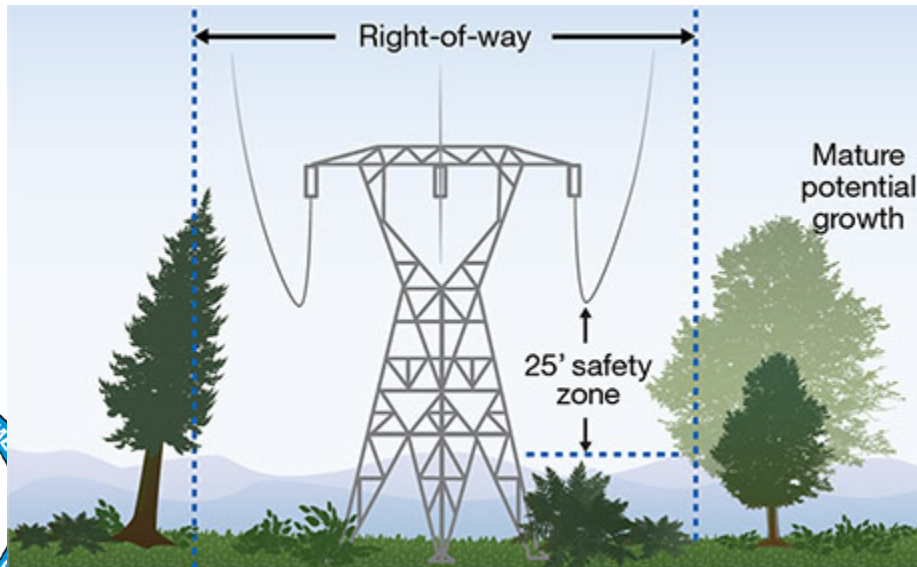
Power Transmission – Key E&S Questions:

- How many households are along the right-of-way and will it impact their livelihood?
- What is the risk of fire or other hazards in the area (e.g., risk of wildfire)?
- Does the transmission line go through any environmentally sensitive areas? Can these areas be accessed during construction and maintenance?



Power Transmission – government and concessionaire should work to address risks during maintenance period

- It is important for the concessionaire to prevent development near the transmission line and also clear brush in the ROW to prevent arcing that can lead to fires



Power Transmission – transmission is not as common for PPPs, so transaction structure will have to be tailored for the project

- Government or grid operator should consider the objective of the project, such as reliability, bring in new generation, or to sell excess power to another market
- Government should also assess which risks it should retain and transfer (right-of-way acquisition, demand, etc.) to determine the most efficient allocation
- Market interest and sounding can also help to structure a transaction structure that is palatable to investors

Power Transmission – Key Commercial Questions:

- Who will be the counterparty to the transaction (utility, grid operator, ministry)?
- What risks is appropriate to transfer to private sector (typically, design, construction, maintenance, and financing)?
- Are there upcoming changes to regulation that may impact the developer? How does the regulator manage stranded assets?



TRANSIT – Choice Among Alternative Systems



Streetcars



Light Rail Transit
Heavy Rail



High Speed Rail



Bus Rapid Transit



Commuter Rail



Major Components of Transit Systems

- Rail Transit Cars
- Track and Guideway
- Maintenance Facilities
- Stations and Access
- Park and Ride Facilities
- Power Distribution Systems
- Systems and Controls

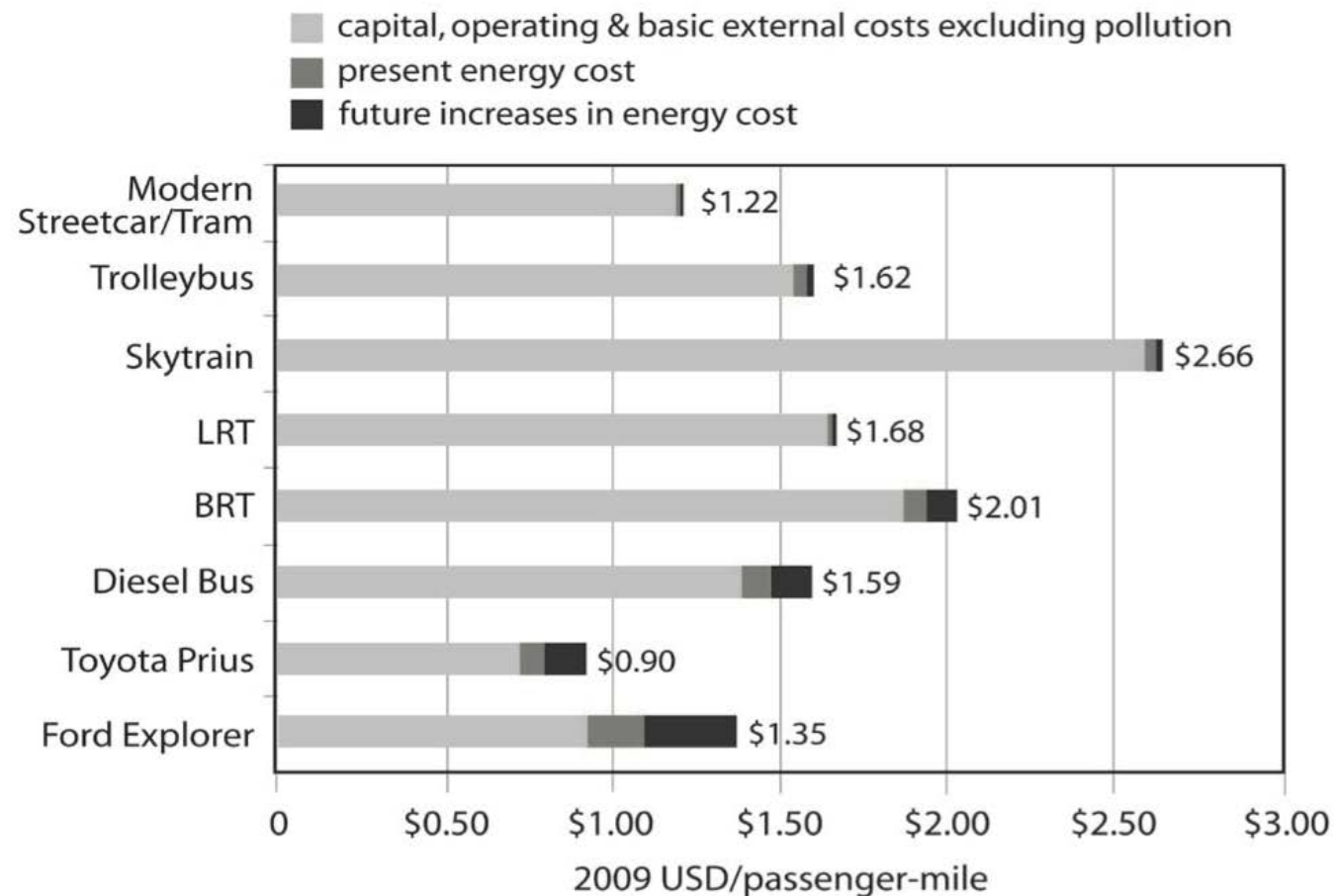


Transit– Preliminary Cost Estimates

- Estimating costs
- Contingencies based on utilities and ROW
- Traffic control
- Positive train controls
- Operating and maintenance

Note: Chart is from “A Cost Comparison of Modes”, 2008 by Patrick Condon, UBC, Vancouver BC

Total Costs per Passenger-Mile (basic external costs excluding pollution)



Transit - Shared Use with Freight, Safety and Scheduling



Transit – Technical Challenges



- Amount of ROW, property acquisitions & utilities relocations
- Type of transit vehicle system and power source
- Overhead catenary, electric battery or fossil fuels
- Fare collection systems



Transit – Funding Needs More Than Fares

Core Revenue Sources

- ◆ Farebox
- ◆ Taxes (Property, Sales, etc.)
- ◆ Special Assessments (TIF, etc.)
- ◆ State Transit Funding
- ◆ State Low Carbon Funding
- ◆ Federal Grants

Ancillary Revenue Sources

- ◆ Parking Revenues
- ◆ Advertising
- ◆ Telecoms/Fiber
- ◆ TOD/Ground Lease/Development Rights
- ◆ Cost Savings and Efficiencies

Capital Markets

- ◆ Municipal Bonds and Commercial Paper

Federal Financing

- ◆ Federal Financing Programs (RRIF and TIFIA)

Innovative Financing

◆ P3 Financing

- ◆ PABs
- ◆ Equity

◆ Equipment Financing and Lease

◆ Master Developer Arrangement/Blended Financing

◆ Private Placement

◆ Crowd Funding



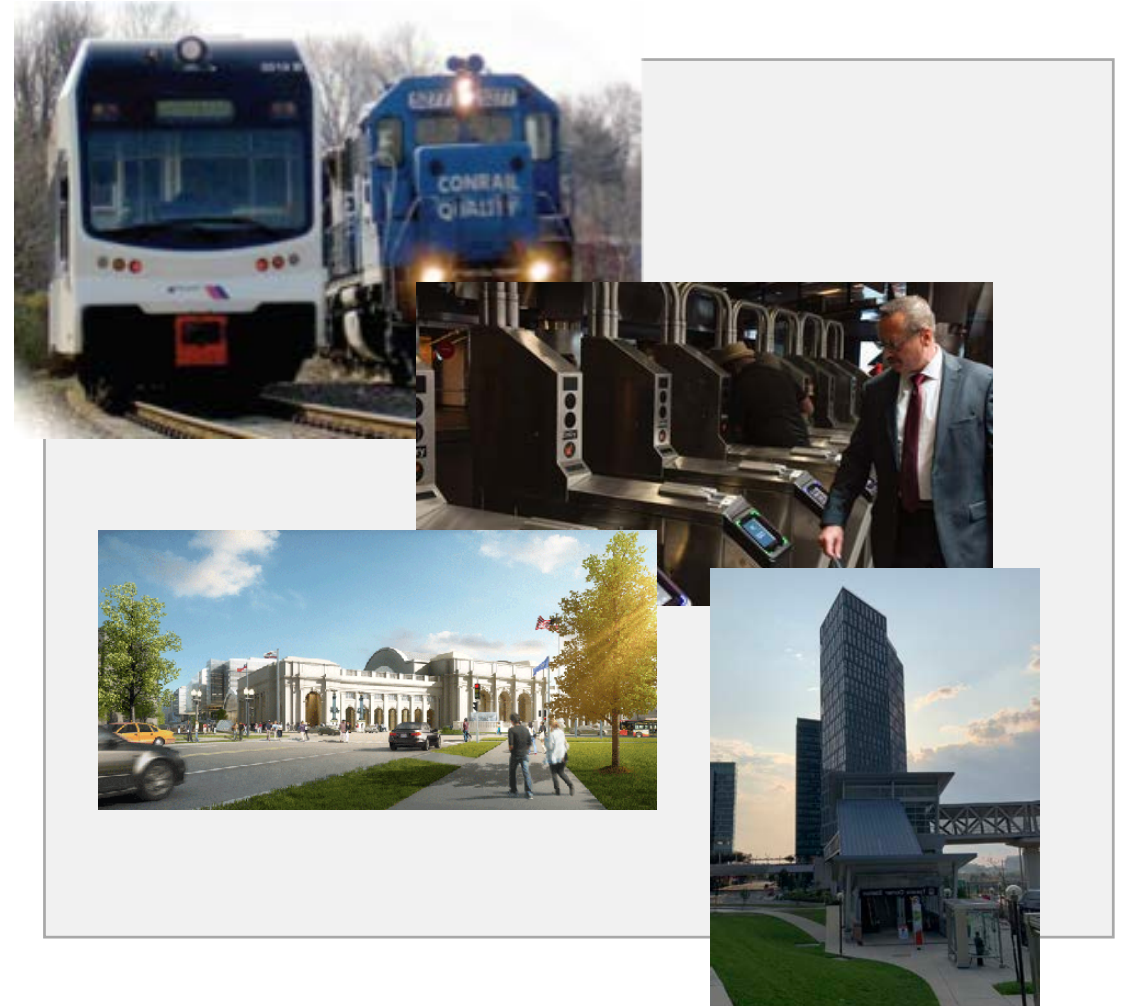
Conduct Value Capture *Study* – (*example 120k=pop.*)

- New streetcar project 3 miles, \$150 million
- Strategic economic development study took 6 months and cost \$50k
- Transit impact showed \$12.7 million/yr. additional tax revenues by 2020
- This will cover \$3-4 million/yr for O&M and debt capacity over 30 yrs \$100 mil.



Transit Public Policy Considerations

- Shared Access and PTC
- System safety and security
- Standards for operations, fare collection/evasion
- Favorable zoning and land use practices to support TOD
- Stakeholder Collaboration Key
- Tax Increment Financing and Transportation Improvement Districts

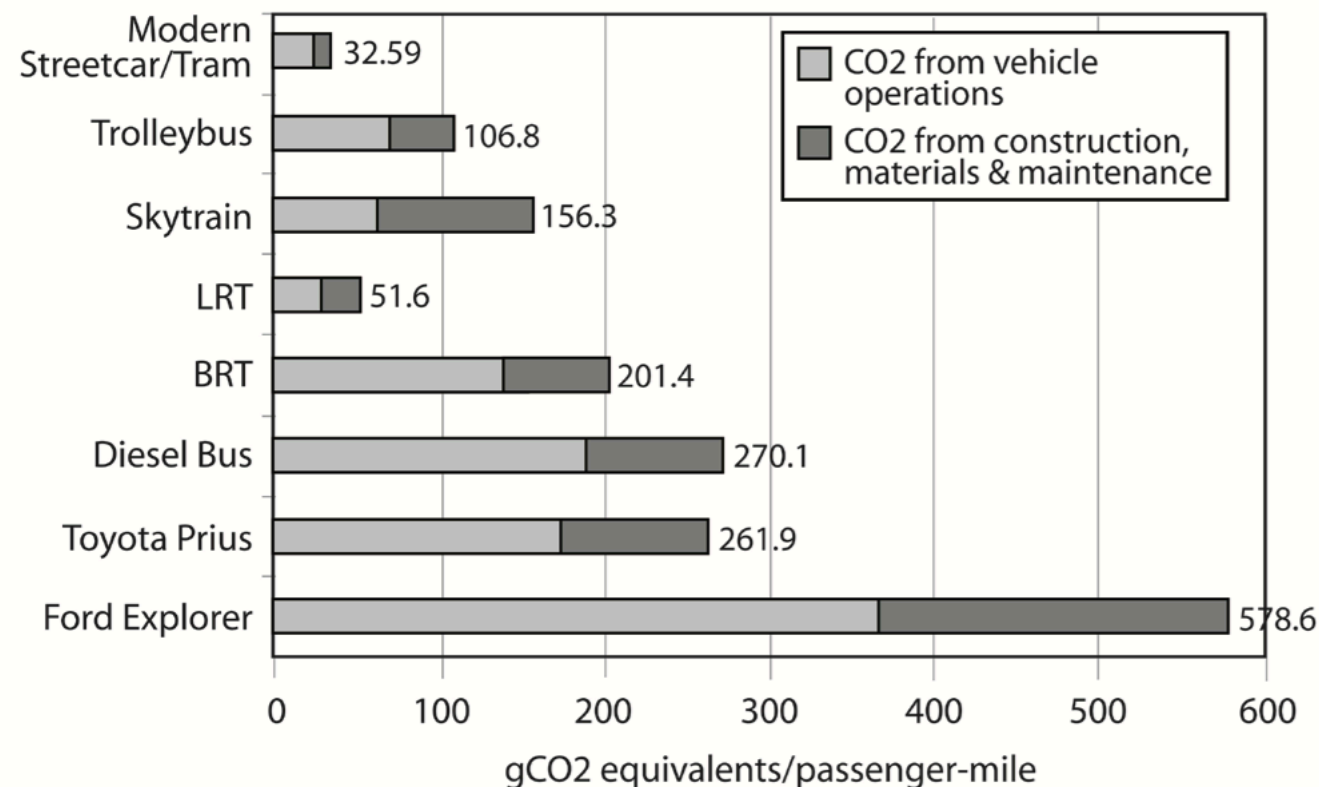


Transit – Evaluation of Environmental & Social Benefits

- Benefit calculation for climate change
- Environmental justice issues
- Gentrification around stations
- Rights of low income users
- Fuel and power source issues

Note: Chart is from “A Cost Comparison of Modes”, 2008
by Patrick Condon, UBC, Vancouver BC

Life Cycle Carbon Emissions per Passenger-Mile



Transit - Evaluation of Project Delivery Systems

- Design-Build Operate
- Design-Build Finance Operate
- Bifurcate Design-Build from O&M



Overview of the Road Sector

- Transportation has many facets, including roads, transit, pedestrian and biking
- The road sector is a critical component of the transportation network but should be considered as part of broader planning efforts



Roads – right-of-way and expected traffic should determine the service levels of the road

- Traffic studies and transportation modes will help to define the requirements of the road and how it connects to the remaining network
- Key aspects of the road is upfront design and construction costs and then maintenance costs over time. Roads are expected to have several major maintenance events
- Considerations should also be made for alternative uses for the road that meet public policy objectives, such as bus rapid transit, high-occupancy vehicle lanes, bike and pedestrian paths, and other uses

Roads – Key Viability Questions:

- What population centers and travel patterns is the road supporting? What are the key access points for the road?
- What is the expected level of service of this road?
- What is the forecasted traffic, origin and destination, and time of day? How can the road be optimized to serve those needs?



Roads – funding for roads can be through government budgets, special funds, or toll revenues

- In road transactions, payment can come in the form of an availability payment, which pays for capital and maintenance costs of the project over time; through toll revenues; or a combination
- Governments can make availability payments directly through general budgets or through special road funds (e.g., funded with gas tax)
- Traffic and revenue forecasts will be key to determining viability as a toll road; tolling policies (caps, etc.) will also impact financial viability of the project

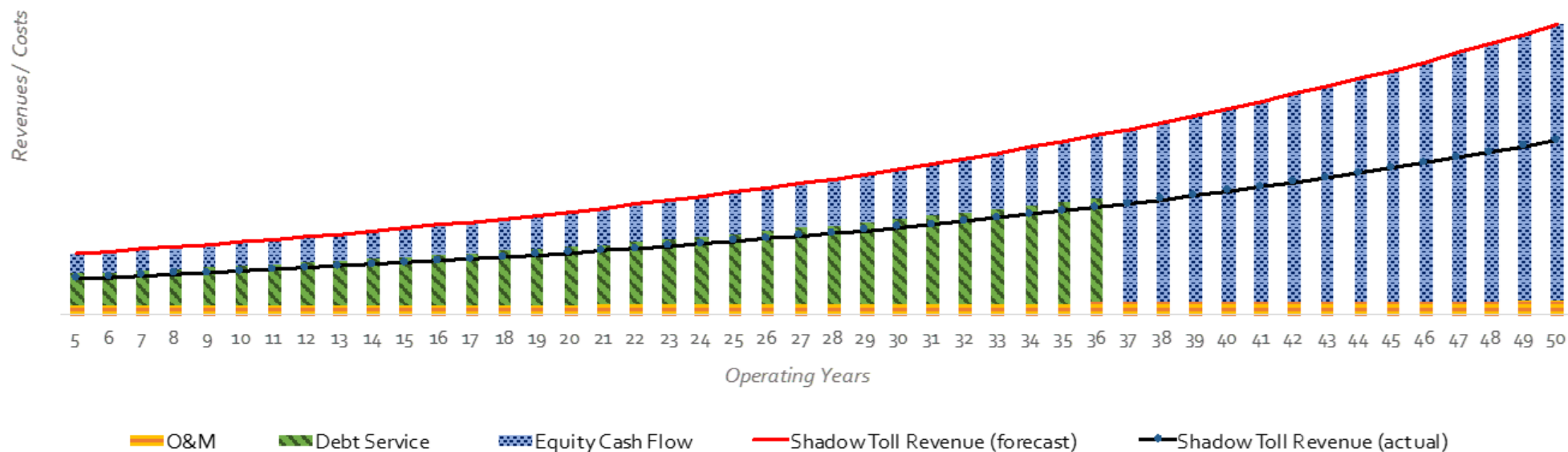
Road – Key Funding Questions:

- What is the source of upfront and ongoing maintenance funding of the project? Does government have the ability to commit funding over a long-term period?
- If a toll road, what are the expected traffic and revenue of the road and can they support the upfront, maintenance, and financing costs of the project?
- Are there precedent transactions in the country or region that indicate investor appetite?



Roads – hybrid funding models can share risk between government and developers

- Hybrid models include a shadow toll model. Under this model, the government covers the gap between toll revenue and actual costs based on demand for the road. This may incentivize contractors to be more efficient during maintenance and may mitigate some risks for investors



Roads – Policymakers should consider supporting alternative modes of transportation and congestion relief in design

- Policies could incentivize bus rapid transit, carpooling, bicycle and pedestrian traffic, and other mechanisms to reduce congestion
- As PPPs transfer risk, the government should assess its ability to manage these performance-based contracts and potential changes/disputes

Roads – Key Legal Questions:

- What are the overarching policy objectives in the transportation sector?
- Can the road help to support other transportation modes?
- Are there established policies and procedures to manage a third-party, including inspections for performance?



Roads – right-of-way, relocation, and safety are the main risks to address in an impact assessment

- Road expansions will likely impact residents that live along the roadway and depend on it for livelihoods.
- Relocation may also require livelihood restoration, and these impacts may be significantly pronounced in dense or urban areas
- Safety risks of drivers on the roadway should also be considered and should meet standards required by lenders and investors
- Scope of E&S should also include labor required for construction and ongoing maintenance

Road – Key E&S Questions:

- How many households are along the right-of-way and will it impact their livelihood?
- Will construction or maintenance require labor to move to the area? How will the contractor manage impacts on the community?
- Are there impacts to environmentally sensitive areas caused by the road (e.g., dams, culverts, wetlands, etc.)?



Roads – PPPs for roads are common but government should consider long-term implications

- PPPs are long-term contracts that require dedicating funding long-term to a project. This means that funding cannot be used for other purposes
- In projects that share demand risk with developers, the government may be limited in creating alternative routes during the concession

Roads – Key Commercial Questions:

- Does the legislation allow for multi-year budget commitments?
- Have risks been identified and analyzed to determine level of risk transfer?
- Has a market sounding been completed? Is there sufficient market interest in the project?



Overview of Water Infrastructure P3s



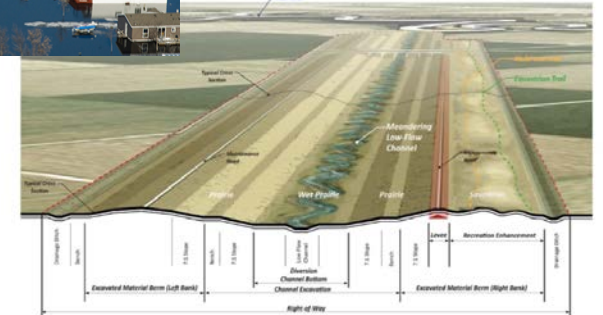
Water Treatment



Wastewater Treatment



Flood Control



Navigation



Water Storage & Hydro Power



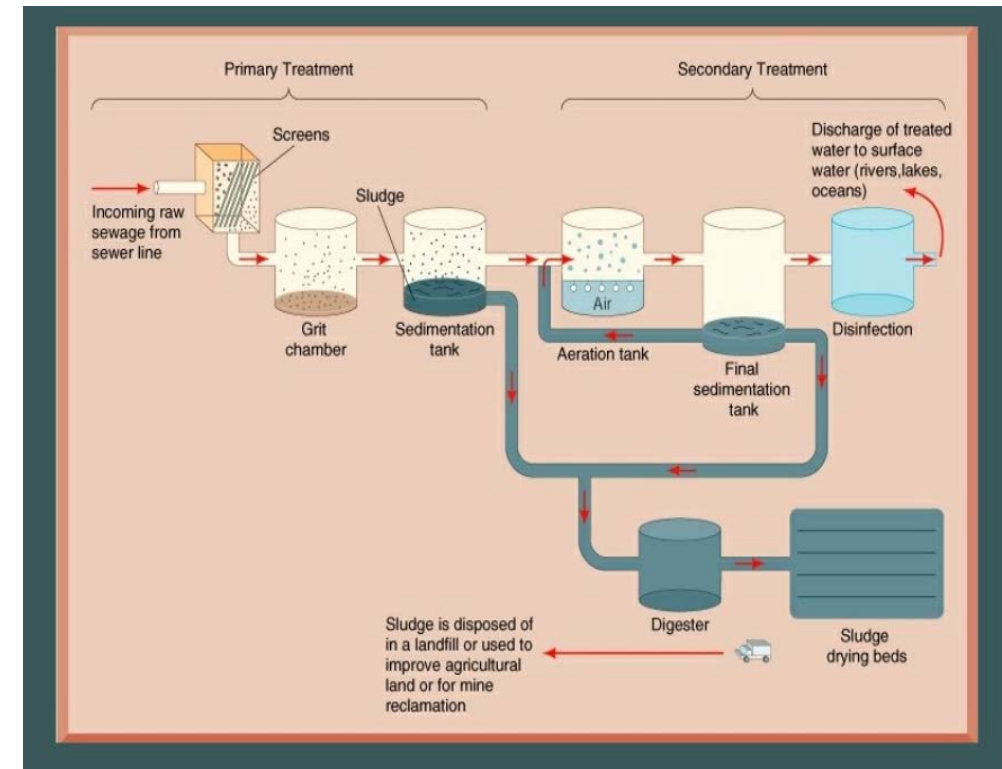
Water and Wastewater Primary Technical Issues

- **SOURCES OF WATER** for drinking (ground, surface, reservoirs, ocean)
- **POLLUTANTS** present for treatment of water or wastewater (contaminants, sewage, industrial waste, combined sewer overflow)
- What **LEVEL OF TREATMENT** is required both for drinking water, and discharge of wastewater
- **TREATMENT TECHNOLOGIES**



Levels of Treatment for Pre-Feasibility/Feasibility Analysis

- Pre-treatment (industrial users, agriculture, storm water runoff)
- Preliminary Treatment (screening)
- Primary Treatment (physical)
- Secondary Treatment (biological)
- Tertiary Treatment (reuse cleaning)
- Biosolid Disposals

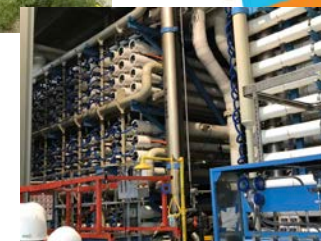


Key Drivers For Pre-Feasibility/ Feasibility Analysis

- Design Requirements
- Treatment Plant components
- Collection Systems
- Conveyance Systems
- Distribution Systems
- Disposal and Uses for Waste Products
- Metering and Billing Systems



Figure 1
Summary of Key Design Improvements



Water Funding and Financing Issues

- For P3 in water/wastewater must consider sources of funding
- What is the public ability to pay
- Taking revenue risk means some private control over rate setting
- To make water/ wastewater treatment affordable often requires government subsidies
- State Revolving Funds, Government Loans, User fees

Victoria, Canada

McLoughlin Point Wastewater Treatment Plant

Required a variety of funding sources



Water – Funding Sources to Explore

Core Revenue Sources

- ◆ User fees
- ◆ Taxes (Property, Sales, etc.)
- ◆ Special Assessments
- ◆ State Water Funding
- ◆ Federal Grants

Ancillary Revenue Sources

- ◆ Biosolid Production and Sale
- ◆ Biogas Production and Sale
- ◆ Cost Savings and Efficiencies

Capital Markets

- ◆ Municipal Bonds and Commercial Paper

Federal Financing

- ◆ Water Financing Programs (WIFIA)

Innovative Financing

- ◆ P3 Financing
 - ◆ PABs
 - ◆ Equity
- ◆ Equipment Financing and Lease
- ◆ Private Placement
- ◆ Crowd Funding



The Politics of Water Quality and Treatment

- Considerations whether it is an arid or wet country
- Dealing with the impacts of climate change
- Cross-boundary water resource issues
- Water resource management, safety and security
- Standards for storm water runoff, discharges, industrial pre-treatment
- Standards for safe drinking water
- Allocation among multiple users



Safe Drinking Water Standards and Availability

- Access to water and sanitation are recognized by the United Nations as human rights, reflecting the fundamental nature of these basics in every person's life
- W.H.O. Health-Based target setting
- Regulated pollutants and water treatment
- Environmental enforcement
- Right to minimum sustenance
- Agricultural and other needs



Water Wastewater - Evaluate Project Delivery Systems

- Design-Build Finance
- Design-Build Operate
- Design-Build Finance Operate
- Separate Design-Build from O&M



Thank You!



Mike Tran and Chris Kane



Upcoming Webinars

PPP Business Case Development

The PPP process requires a significant amount of time and resources. To ensure that those resources are well spent, it is important to ensure that PPPs have the requisite business case and make financial sense in order to move forward. In this webinar, we will learn about how to structure the business case for a PPP.

PPP Pre-Qualification and Evaluation

The PPP process requires a significant amount of time and resources. To ensure that those resources are well spent, it is important to have well established pre-qualification and evaluation procedures for the RfP process. Governments often run into difficulties in the pre-qualification and evaluation phase. This webinar will walk participants through how to design the evaluation process to ensure the best bid is selected.

Unsolicited Proposals

Unsolicited proposals when used properly are a way for the private sector to propose innovative solutions to problems. The webinar would provide an overview of how to implement procedures at the agency level, prioritizing or limiting the types of proposals received, confidentiality policies, transparent evaluation procedures, and fair reimbursement of costs for an accepted proposal.





Tel: +1 202 482 2400



1401 Constitution Avenue,
NW, Washington,
DC 20230



www.cldp.doc.gov



Lindsey Scannell
Senior Counsel
Asia Pacific Portfolio
Lscannell@doc.gov



Mohammed Loraoui
Attorney-Advisor
Power Africa Portfolio
Mloraoui@doc.gov



Hana Damore
Attorney-Advisor
Asia Pacific Portfolio
Hdamore@doc.gov