



CITELUM

SOLUTIONS FOR SUSTAINABLE LIGHTING



**CAUTION
THIS VEHICLE
MAKES**



“Best Value” approach to design a custom Lighting Master Plan, finance, install and operate a sustainable street lighting system

**CITY
STRATEGIC PRIORITIES**

**BUDGET
EFFICIENCY**

**PUBLIC
SAFETY**

**ECONOMIC
DEVELOPMENT**

**SUSTAINABILITY
LIVABILITY**



**STREETLIGHT
PROGRAM GOALS**

Financial Goals
Budget Reduction
Finance Capital Upgrades

Operational Goals
Outage Rate Reduction
Appropriate Level of Light
Traffic Safety

Civic Goals
Neighborhood Look & Feel
Tourism Enhancement

Environmental Goals
Energy Savings
Carbon Footprint Reduction
Dark Sky



**CITELUM
CUSTOM SOLUTIONS**

Financial Engineering
Fixed Price
Contractual (de)incentives
Off-Balance Sheet Finance
Federal Grant Expertise

O&M Performance
Preventive Maintenance
Photometric Assessment
Intelligent Software Platform
Emergency Plan

Positive Social Impacts
Local Operational Partner
Local Job Creation
Architectural Lighting
City Branding

Energy Saving Guarantee
Citywide LED upgrade
Smart Technology
Renewable Energy Usage
Light Pollution Reduction



**SUPPORTS FROM
SERVICE PROVIDERS
AND THIRD-PARTY
STAKEHOLDERS**

Financial
Institutions,
Utilities

Neighborhood
Associations,
Emergency services

Local contractors,
DBE, Historical
Commission

Technology Providers,
LED Manufacturers,
Consultants



GLOBAL LEADER IN SUSTAINABLE URBAN LIGHTING

Created in 1993 and owned by two Fortune Global 100 companies, EDF and Veolia, Citelum delivers streetlight solutions to address urban development objectives

SUSTAINABILITY

Washington DC, USA
Design & implement LED lighting system at St Elizabeth's Campus.



CITY PROMOTION

London, England
Design & install LED state-of-art lighting on Tower Bridge for Summer Olympics



PUBLIC SAFETY

Paris, France
Install/maintain 1,100 surveillance cameras & related equipment.



BUDGET EFFICIENCY

Mexico City Mexico
PPP to design & finance complete renovation of lights in historic center



2.5 Million Streetlights
5 Continents, 22 Countries
3,000 Employees
\$470 Million in Revenues

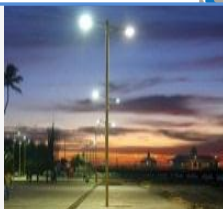
SMART GRID

Kunming, China
Design, install and maintain remote controls to optimize energy consumption



NEIGHBORHOOD IMPROVEMENT

Fortaleza, Brazil
34,000 new energy efficient fixtures and night patrol in low-income neighborhoods



RENEWABLE ENERGY

Sant Fost, Spain
Design, finance & install photovoltaic power station



CITY BRANDING

Shanghai, China
Powerful aesthetic impact with high energy performance



- **LIGHTING MASTER PLAN**
 - Packweb
 - Asset Inventory
 - Cross Analysis and Technical City Pattern
 - Lighting Strategy

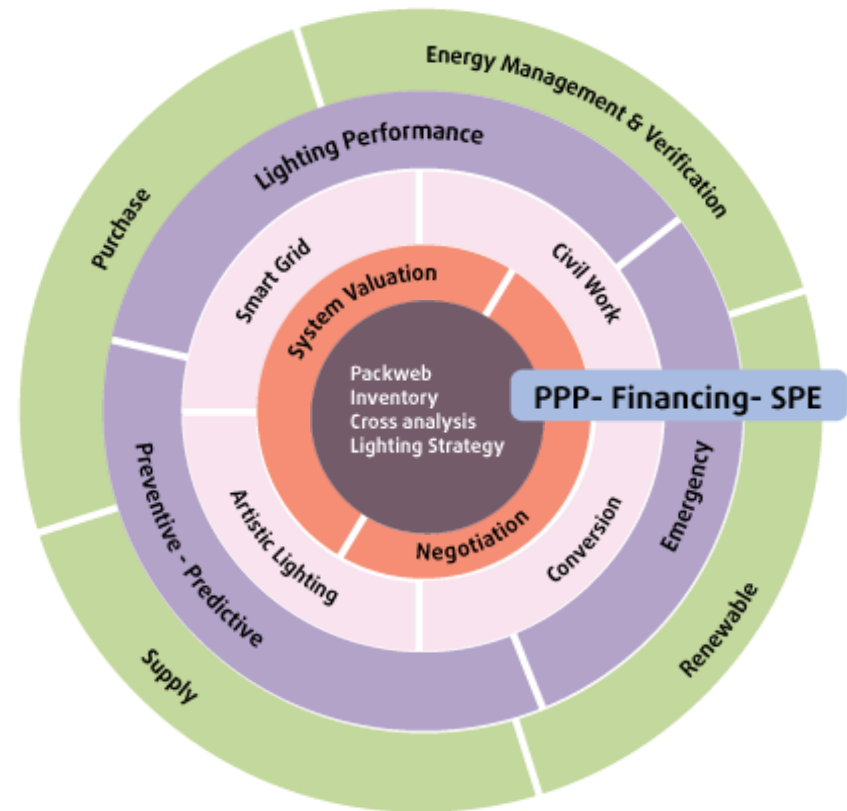
- **ASSET PURCHASE**
 - System Valuation
 - Negotiation Support

- **CAPITAL IMPROVEMENT**
 - Conversion to Energy Efficient Fixtures
 - Civil Work
 - Smart Grid
 - Artistic Lighting

- **OPERATION & MAINTENANCE**
 - Preventive-Predictive program
 - Emergency and Asset Protection
 - Lighting Performance

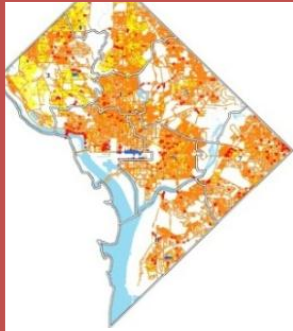
- **ENERGY MANAGEMENT**
 - Energy Management & Verification
 - Energy Purchase
 - Energy Supply
 - Renewable Energy

- **CONTRACTUAL & FINANCIAL ENGINEERING**
 - Public Private Partnership (PPP)
 - Off Balance Sheet Financing
 - Special Purpose Entity (SPE)

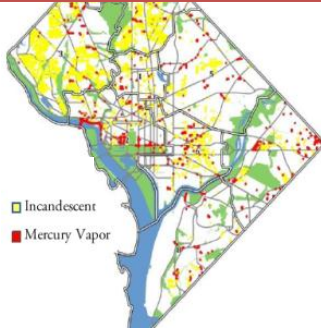


Cross-analysis of technical data and pattern for a custom strategy

TECHNICAL



Lamp Type
Wattage
Energy

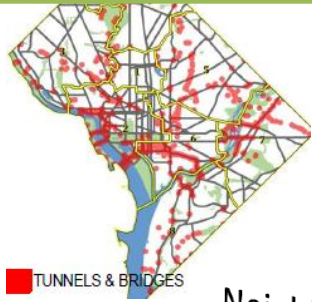


Fixture
Pole
Ballast

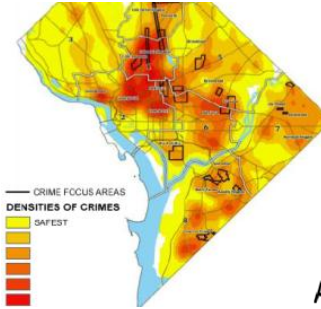


Light
Level
Uniformity

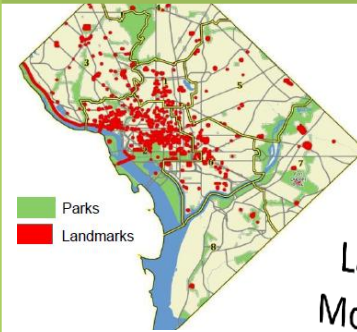
CITY PATTERN



Bridges
Tunnels
Neighborhoods

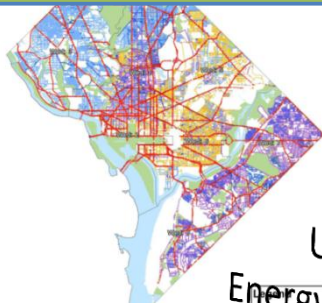


Safety
Crimes
Accidents

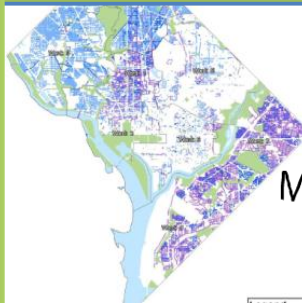


Parks
Landmarks
Monuments

RECOMMENDATION



Upgrades
Energy Savings



Maintenance
Operations
Efficiencies

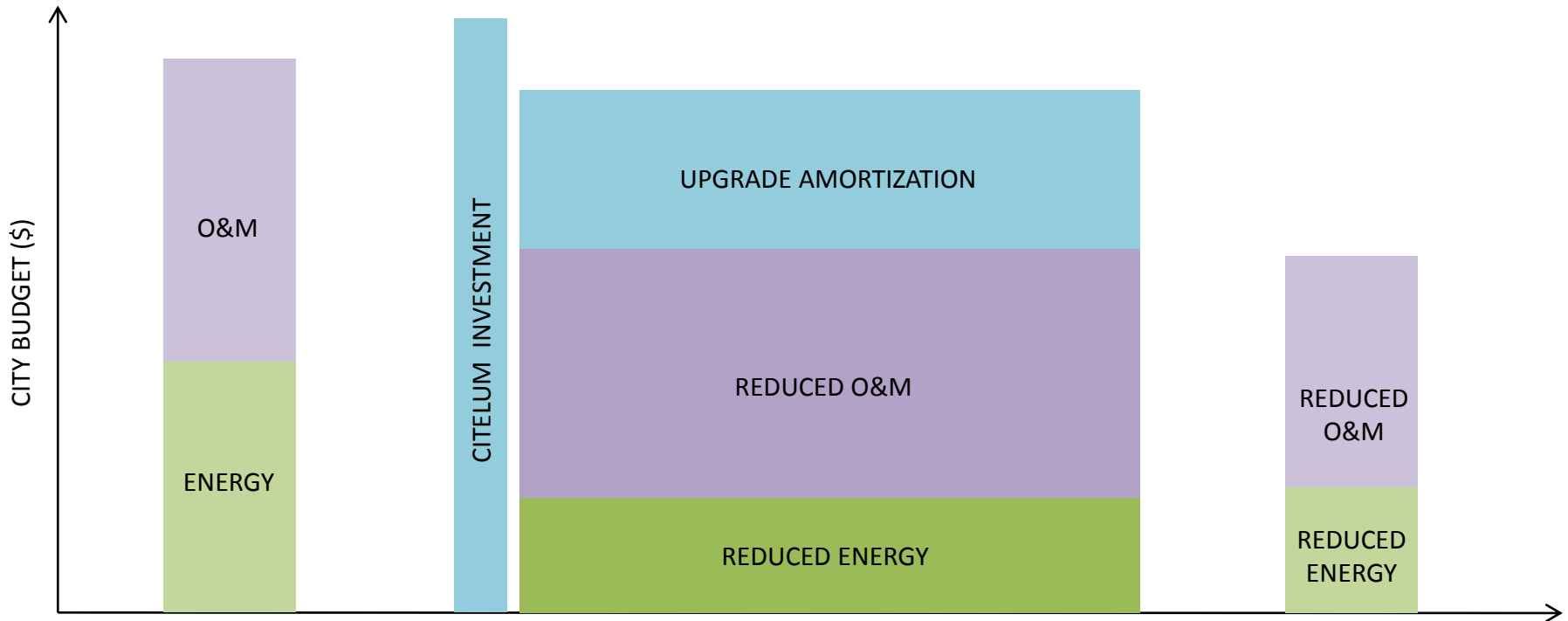


Smart Grid
Technology
Integration



BUDGET SAVING: LOWER COST OF OWNERSHIP

Lower TCO while upgrading the city's streetlight system with current or decreased budget



Before the contract:

Traditional O&M budget and energy consumption

Energy + O&M = TCO

(Total Cost of Ownership)

At the beginning of the contract:

Citelum's investment to upgrade the street light system

Through Contract:

Harvest savings in energy and O&M to pay back the

Amortization of the capital improvement

After the contract :

City fully benefits from TCO reduction.

All savings drop to City budget bottom line



PROGRAM IMPLEMENTATION: PROVEN MODEL & TECHNOLOGY

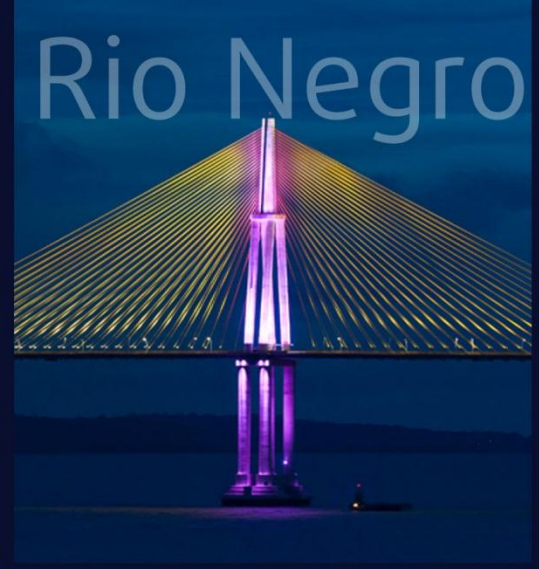
Cities of all size around the world have chosen Citelum model and improved their overall lighting experience

	Financial and Contractual Engineering	LMP Strategic Goals	Capital Improvement	Operational Efficiency	Energy Savings
FORTALEZA 165,000 lights	2X5 years Budget: \$17 M	Public Safety Positive social impacts	49,000 streetlights upgraded, 20 artistic illuminations	< 0.3% outage rate	37%
VENICE 52,000 lights	2x10 years Budget: \$150 M Investment: \$16 M	Budget savings O&M efficiency in historic center	20,600 streetlights upgraded, 15,000 with remote control system	< 0.1% outage rate	20%
PARIS 150,000 lights	2X10 years Budget: \$1.127 B	O&M efficiency Economic development through artistic lighting and technology integration	80% of overhead and underground dedicated grid reconstruction 1,100 video-surveillance cameras 150 Wi-Fi hotspots 300 architectural lighting projects	< 0.6% outage rate	30%
MEXICO CITY 49,000 lights	10 year PPP Budget: \$138 M Investment: \$80 M	Budget efficiency Energy efficiency	86% of existing equipment upgraded Artistic lighting on 30 of UNESCO World Heritage monuments	< 0.5% outage rate	44%
BARCELONA 45,500 lights	2x2 years Budget: \$13 M	O&M efficiency	500 cabinets upgraded – 1,000 painted with anti-graffiti paint	< 0.7% outage rate	NA
KUNMING 47,000 lights	15 years Budget: \$75 M Investment: \$18 M	Energy savings Communication system	42,500 streetlights upgraded 40,000 streetlights equipped with remote control system	< 1.5% outage rate	35%

CITELUM



London



Rio Negro



Paris



Mexico



LOUXOR



Madrid



Cannes



Venice



Shanghai